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Today's Needs and Tomorrow's Demands: Uncovering Enterprise Priorities for IoT Adoption

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MachineQ Foreword

LoRaWAN® hits maturation point as enterprise adoption looks to double by 2024

Enterprise adoption of the Internet of Things (IoT) is on the brink of achieving mainstream status as evidenced by the steady rise in deployments. Elements fueling this growth include increased demand for affordable networks, greater adoption among key verticals, and the need for specific solutions like asset tracking, which is becoming a top priority for enterprises. And there are no signs of slowing down—the global IoT market is projected to reach $875 billion by 2025.

As more IoT deployments become a part of enterprise strategies and timelines, it will become imperative for decision-makers to fully understand and vet the options available to them across the entire IoT stack. At MachineQ, we fully recognize and understand that each enterprise deployment is unique, so a one-size-fits-all approach will never work. Adding to the complexity is the number of IoT connectivity options in the market—from the well-known protocols (LTE and Wi-Fi) to the new and emergent (5G) and the ones gaining momentum (LoRaWAN®). Although enterprises will require a blend of different technologies to support their IoT solutions, we've seen rising usage of the LoRaWAN protocol for low-power wide-area network (LPWAN) connectivity needs. It is poised to play a fundamental role in many enterprise-wide deployments.

Further, the complexities tied to IoT are driving enterprises to seek simplicity, serviceability, and scalability. By helping customers of varying, dynamic industries to securely build, connect, and deploy their IoT solutions at scale, MachineQ has delivered upon these priorities firsthand, as described below.

- A global biopharmaceutical company desired **simplicity**—from easily tracking the real-time location of its ~14,000 portable assets across an 850,000 square-foot campus to creating more efficient processes for better employee collaboration and equipment utilization. By deploying MachineQ's end-to-end asset tracking solution, which includes hardware leveraging BLE, a network connectivity foundation built on LoRaWAN, and in-house deployment services, the company removed inherent complexities typically found in IoT. The bonus: one sole provider for all the IoT stack components. Additionally, because the solution doesn't utilize the corporate Wi-Fi network, it provides increased security and a simpler, quick-to-market installation. With the solution deployed, the company can focus solely on its core business objectives.
- It's no coincidence that a major food service retailer with a penchant for excellent customer service turned to a provider with the same affinity for **serviceability** when it came to automating temperature monitoring processes in freezers and refrigerators across its nationwide stores. Due to the distributed nature of its enterprise, the nationwide deployment services and day 2/ongoing support provided by MachineQ were vital to the organization. With the solution deployed, the company can now streamline food safety and compliance reporting, enabling personnel to spend more time serving customers. Plus, the company is looking to further leverage its investment by adding other use cases on the LoRaWAN infrastructure that the current temperature monitoring solution is developed upon.

- It's always a race against time in the global auto auction industry. Whether it's reducing cycle times to get vehicles quickly on and off lots or striving to become the first to market with a vehicle inventory management solution, **scalability** is core to enterprises' business strategy. With the goal of scalability in mind, one global auto auction company sought a technology option that would provide them with the technical capability (i.e., data transfers over long ranges) and cost-effectiveness (i.e., reduce per device cellular connectivity fees and device battery replacement costs) that they weren't getting from their prior inventory management solution. The company quickly went from proof of concept—tracking a small segment of vehicles on a few lots—to full-scale deployment utilizing MachineQ's LoRaWAN platform, deployment expertise, and installation services. As a result of the offering, the company scaled to 325,000 vehicles across 80+ lots in North America—becoming the first to offer such a solution within their industry—and have gained operational efficiencies, improved employee productivity and increased customer satisfaction.

Summary

Long before the pandemic, digital transformation was a priority for enterprises seeking to modernize operations and remain competitive. Now, as labor shortages and supply chain issues linger, this priority has become a necessity for survival in an increasingly digital landscape.

IoT solutions are gaining favorable traction for enterprises seeking benefits like productivity gains, safety improvements, energy efficiencies, cost savings, and even opportunities for new revenue streams. Yet, the growing number of IoT use cases also presents an influx of various challenges. And in a sea of technology options and solution partners, determining the right fit requires incredible foresight, strategy, and execution.

To better understand the market, Omdia surveyed 200+ enterprises with North American operations planning or deploying IoT solutions. This white paper explores their technology preferences, requirements, and the difficulties they face related to IoT deployments. Additionally, the paper will provide an overview of the LoRaWAN technology and its perceived use.

Overall, survey results pointed to three key business needs and requirements from IoT solution partners while highlighting LoRaWAN as an ideal technology for meeting these needs:

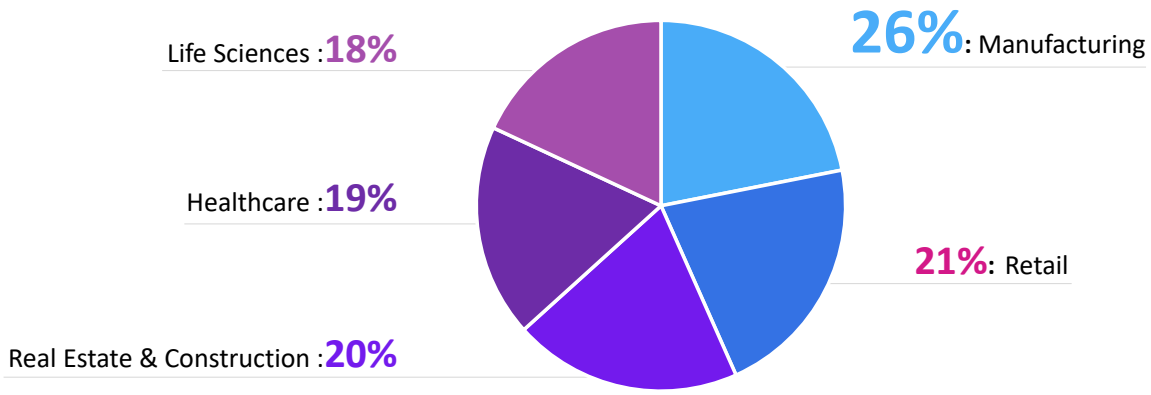
- **Scalability**: Support the quick deployment of IoT solutions, potentially across numerous campuses or geographies, moving from pilot to enterprise deployment and creating an infrastructure capable of accommodating a growing number of connected devices and IoT use cases.
- **Serviceability:** Provide technical and strategic support for the solution's lifetime, both pre- and post-IoT infrastructure, device, and solution deployment.
- **Simplicity:** The ability to help remove the complexity of developing, launching, and maintaining IoT solutions, regardless of industry or size.

Survey Framework

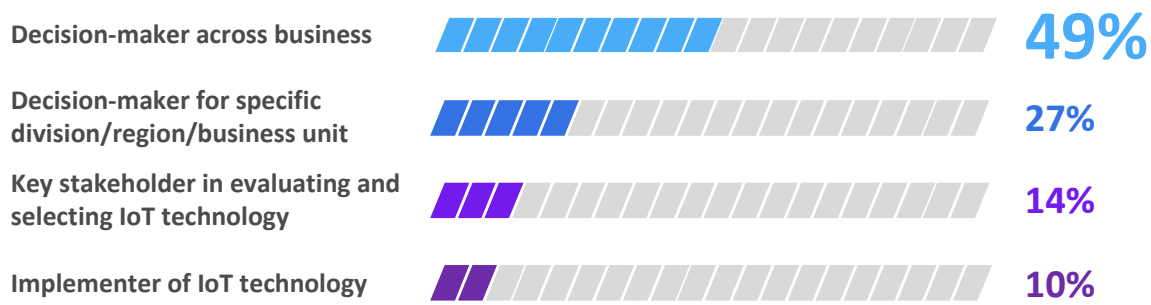
Surveying 200+ enterprises across healthcare, life sciences, manufacturing, real estate & construction, and retail, Omdia sought critical decision-makers, including implementors of IoT technology, key stakeholders in evaluating IoT technology, decision-makers for specific regions and business units, and decision-makers across the larger enterprise (*See Figure 1*). The survey excluded respondents who were either uncommitted or not planning IoT projects and respondents who were not in a position to influence IoT decisions.

Figure 1. Survey demographics

Q: Which industry do you work within?



Q: Which of the following describes your role in the organization?



Source: Omdia

Omdia asked these decision-makers about their current and future IoT deployments, strategies around driving factors and inhibitors, as well as their preferences in technologies and solution providers.

Key Findings

The survey identifies three essential enterprise requirements: scalability, serviceability, and simplicity. These requirements are highlighted by self-reported deployment plans/schedules, fiscal goals, and obstacles impeding timely, continuous project delivery.

What do enterprises desire?

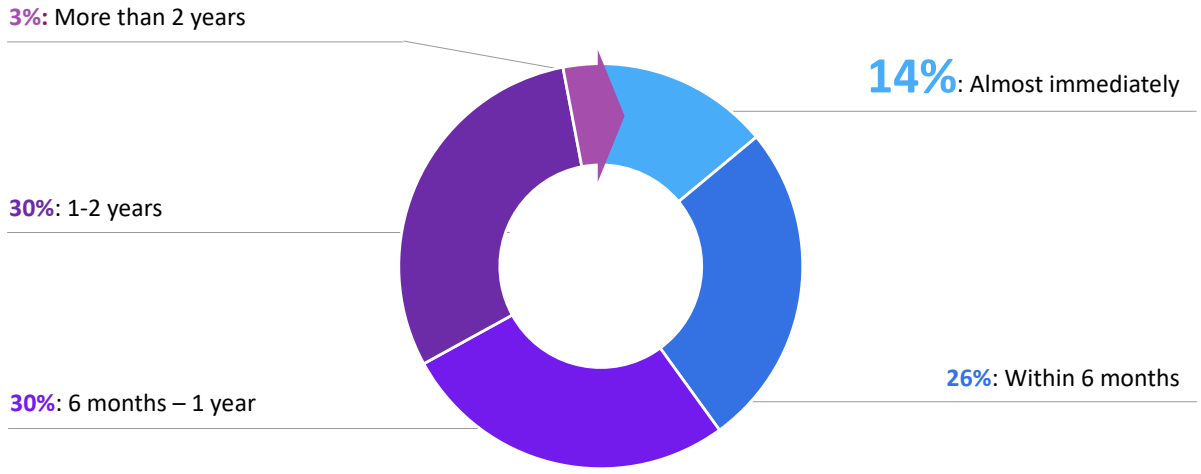
Quick ROI

Enterprises have high pressures and expectations for a quick return on investment (ROI) from their IoT projects, with two-thirds (67%) of survey respondents expecting an ROI within one year and only 3% expecting it to take more than two years (*See Figure 2*). This expectation challenges those with the narrative that IoT projects are largely "white elephants" or "money pits."

While the pursuit of instant ROI is relevant for meeting short-term goals, IoT implementation relies on crafting a plan that leaves room for unforeseen challenges and the support of solution partners to change direction if needed.

Figure 2. ROI expectations

Q: How soon after deployment must your IoT solution(s) show a return on investment?



Source: Omdia

Speed to market

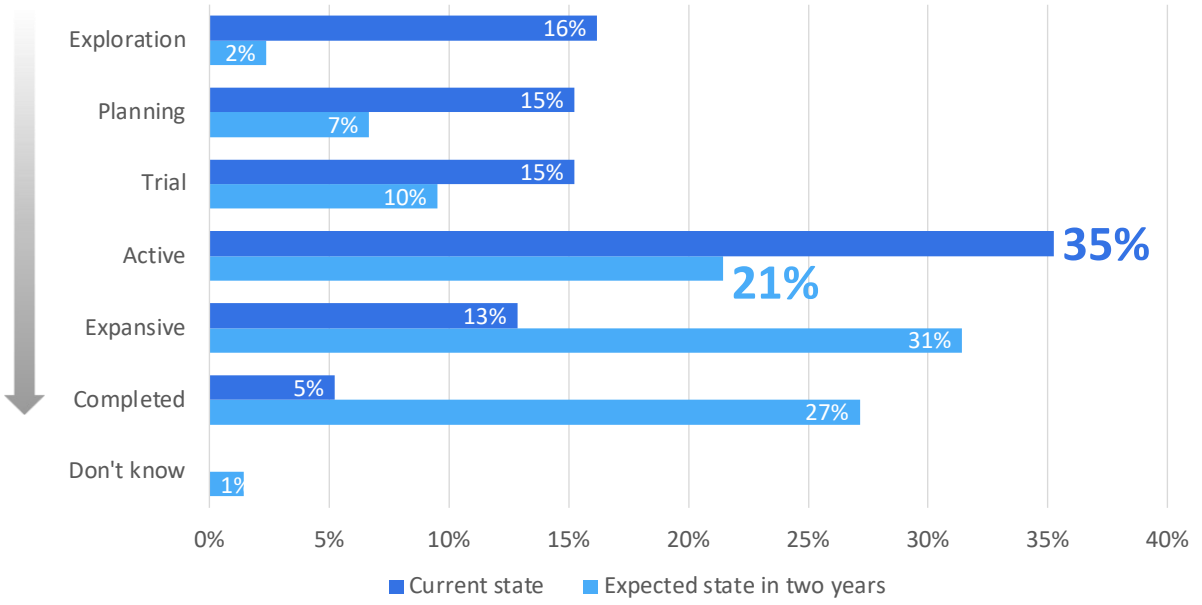
Enterprises have high expectations regarding speed to market and the pace in which they can move their IoT projects from trials/proof-of-concepts (POCs) to scaled deployments. The survey found that, today, 46% of enterprises were in the early stages of their IoT journey, currently exploring, planning, or trialing an IoT deployment. However, the next two years present a massive shift, where nearly 80% expect to be in an active or expansive phase or to have completed their IoT projects (*See Figure 3*).

While growth is good for business, scaling IoT projects can present unanticipated complexities delaying speed-to-market. Trials, for instance, are usually done in controlled environments, and moving to real-world deployments is tricky. Additionally, a network created for a trial is far simpler than the large array of servers, gateways, and routers needed to support a live, real-world deployment. Therefore, many enterprises will need help from a partner, one that has the network backing, expertise, and deployment services necessary to quickly scale and get to market.

Figure 3. IoT deployment status

Q: At what stage is your company in its IoT deployment?

Current state; expected state in two years



Source: Omdia

Increased number of connected devices

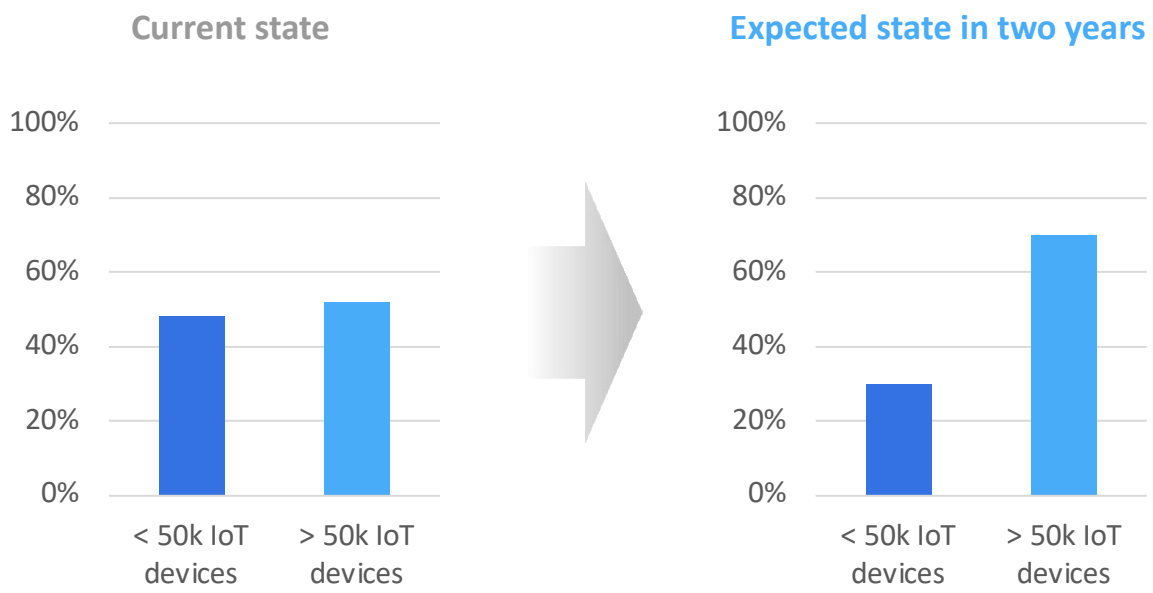
While skeptics have been cynical about the aggressive growth curves forecasted for IoT connections, survey data illuminates the contrary. In fact, over the next two years, enterprises are looking to mature their IoT solutions and significantly expand network infrastructures, along with end-point devices deployed.

Regarding devices deployed, 52% currently have fewer than 50,000 IoT devices - yet in two years, 70% plan to have more than 50,000 IoT devices deployed (with 5% expecting to have over 1 million) (*See Figure 4*). To achieve these growth goals, enterprises must select technologies that easily scale and vendors that can enable this scalability.

Figure 4. LoRaWAN® impact on IoT deployment status

Q: At what stage is your company in its IoT deployment?

Current state; expected state in two years. Showing 'later stages' as active/expansive/completed combined



Source: Omdia

What's preventing enterprises from getting there?

Misalignment between priorities & expectations

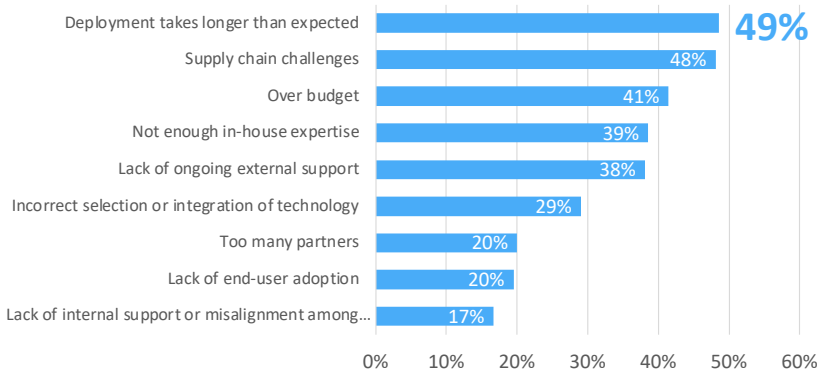
What survey respondents desire from their IoT solution is straightforward: an ability to connect and deploy more devices quickly for a swift ROI. But the data suggests a misalignment between expectations and the planning and execution of IoT projects.

For example, enterprises desire "speed to market" and indicate that "deployment takes longer than expected" as the number one roadblock to achieving ROI (*See Figure 5*).

Figure 5. IoT adoption roadblocks

Q: What are the biggest roadblocks to achieving ROI?

Select top three



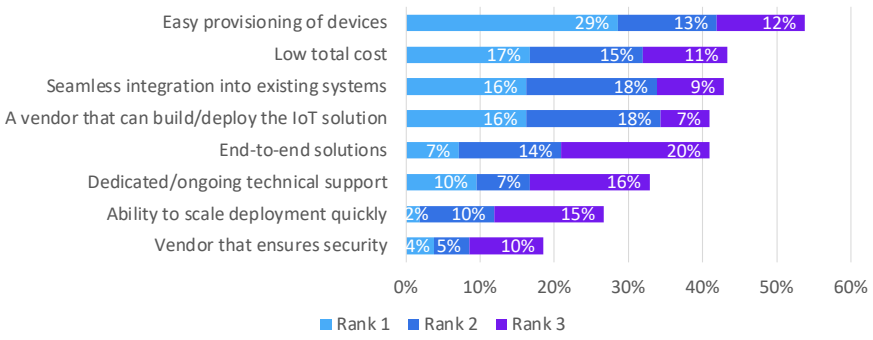
Source: Omdia

Surprisingly, when asked what the most important requirement is for evaluating an IoT solution, only 27% of enterprises ranked "ability to scale deployments quickly" as a top-three priority (*See Figure 6*). The data suggests that the top-three requirements are hinged on the quickest way to validate that the technology works, which comes at the expense of achieving scale in a timely fashion.

Figure 6. IoT evaluation requirements

Q: What are your most important requirements when evaluating an IoT solution?

Select top three

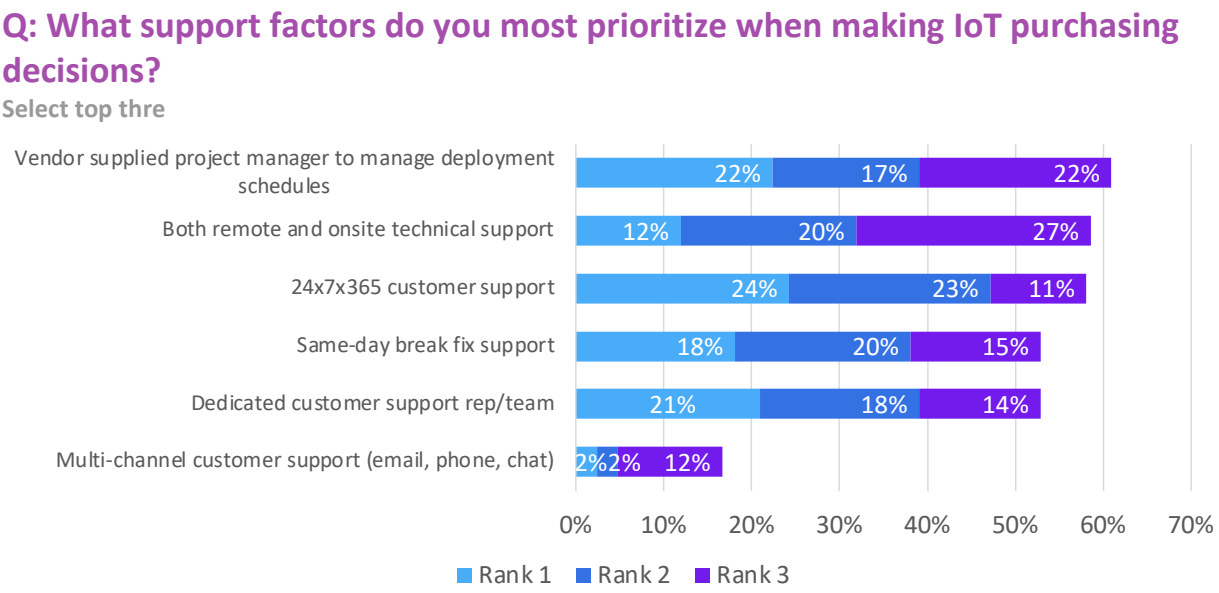


Source: Omdia

Deployment challenges

As noted, there is a desire for speed to market, but the ability to quickly deploy prevented enterprises from doing so, likely stemming from deployment-related challenges. Omdia's survey (*See Figure 7*) shows how enterprises prioritize vendors who can provide the proper levels of support and service. The need for vendor-supplied project managers cuts across all three requirements for managing scalability, reducing complexity, and providing top-notch service. Not far behind are the need for "remote and onsite technical support," "24x7x365," and "same-day break-fix support." Indirectly, this data showcases the importance of well-resourced vendors capable of providing onsite and same-day technical support and services, such as a large, reputable company with a proven track record. In contrast, smaller companies will simply lack the resources, bandwidth, or experience needed to provide the level of support that enterprises need when they need it.

Figure 7. IoT support factors



Source: Omdia

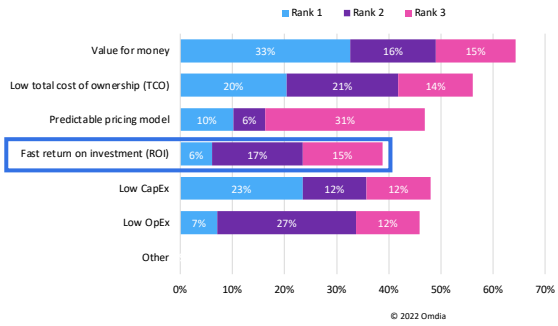
Need to plan for ROI sooner in the IoT journey

Given the ambitious ROI goals enterprises seek, greater emphasis on reaching those goals needs to start at the planning stage and stay top of mind throughout the IoT journey. According to respondents, ROI was the lowest ranking financial factor when making IoT purchasing decisions in the early stages of the IoT journey (i.e., exploration, planning, trial), with only 6% ranking it as a number one priority (*See Figure 8*). That number doubles to 12% in the latter stages of the IoT journey (i.e., active, expansive, completed). Additionally, more than half of the respondents (55%) in the latter stages ranked ROI as a top-three priority, compared to only 38% in the early stages. This suggests the need for IoT decision-makers to understand and work towards their ROI goals from the onset to improve their chances of obtaining the financial benefits when they want it.

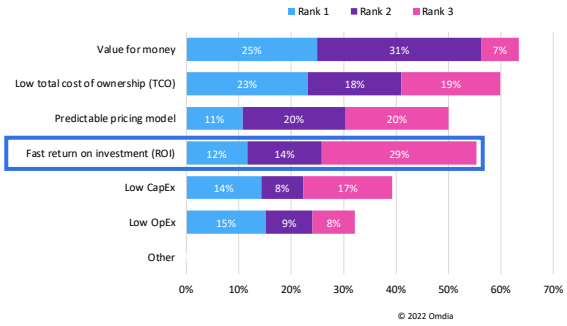
Figure 8. IoT financial factors

Q: What financial factors do you most prioritize when making IoT purchasing decisions?

Early Stages of IoT Journey
(planning, trial)



Later Stage of IoT Journey
(active, expansive, completed)



Source: Omdia

What is LoRaWAN®?

The underlying technology behind LoRaWAN is LoRa®, the modulation technique developed by Semtech for communicating over the spectrum. LoRaWAN is an open protocol supported by a standardized body, interoperable with other technologies, and equipped to handle the growing number of devices and enterprise needs for IoT. Formally recognized as an ITU standard in December 2021, LoRaWAN has emerged as a network technology protocol that can specifically address use cases requiring secure, long-range, low-power communications, often at a lower cost than other competing technologies. The network is deployed on an unlicensed spectrum where gateways relay messages between end devices and a central network server.

The technology is highly scalable and deployed by thousands of enterprises and operators spanning millions of devices globally. Over 170 global network operators support public, private, and hybrid models; coverage can be indoors and outdoors; and roaming for both fixed and mobile devices is supported across 181 countries and growing.

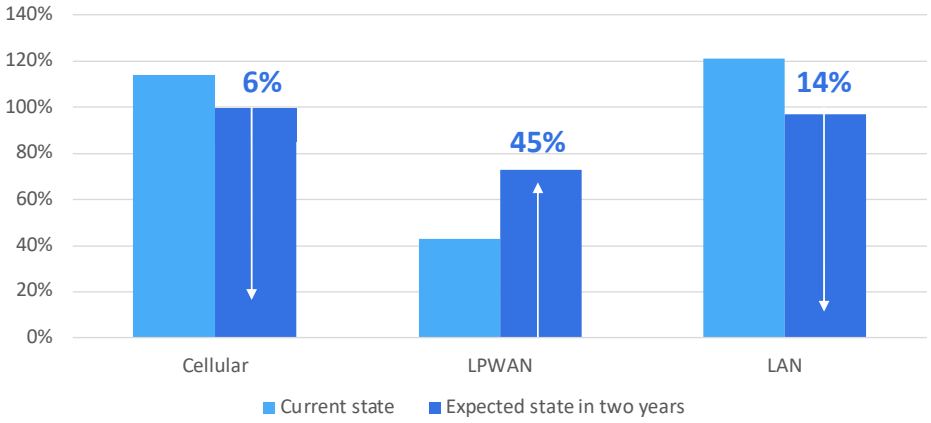
So many connectivity options adding to the complexity of IoT

Seldom will an enterprise rely on just one technology for all its IoT needs. Instead, enterprises often employ a multi-protocol strategy to address varying IoT use cases. In fact, 68% of respondents say they define the use case before deciding on the technologies to consider. Further, the data shows increasing adoption of LPWAN technologies by 45% over the next two years. During the same timeframe, cellular and LAN technologies showed decreasing trends at 6% and 14%, respectively (*See Figure 9*).

Figure 9. IoT network choices (overview)

Q: Which network technologies are used for your IoT solution(s)?

Select all that apply: Cellular (2G, 3G, 5G, LTE); LAN (Wi-Fi, Bluetooth); LPWAN (NB-IoT, Cat-M, LoRaWAN, Sigfox)



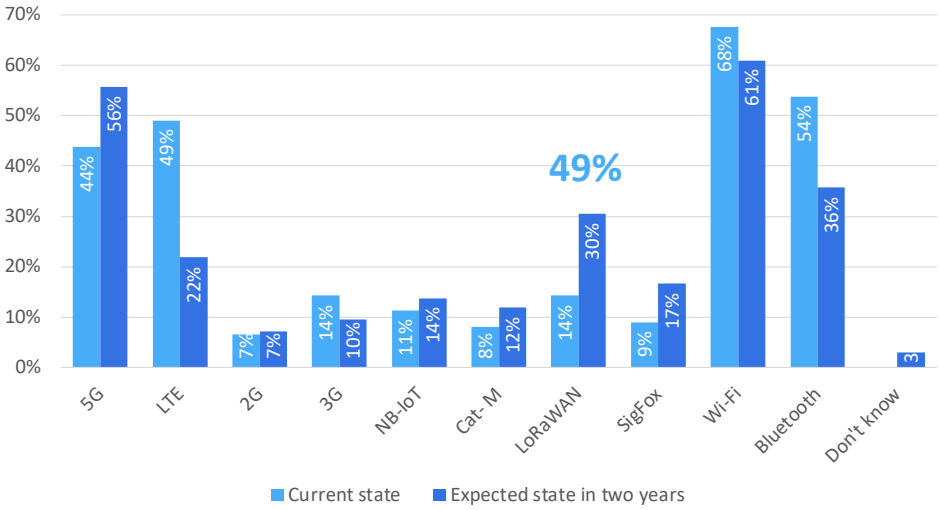
Source: Omdia

Of the connectivity options, LoRaWAN showed the highest expected growth—more than doubling in two years from 14% to 30%— only rivaled by 5G in comparison. (*See Figure 10)*

Figure 10. IoT network choices (detail)

Q: Which network technologies are used for your IoT solution(s)?

Select all that apply



Source: Omdia

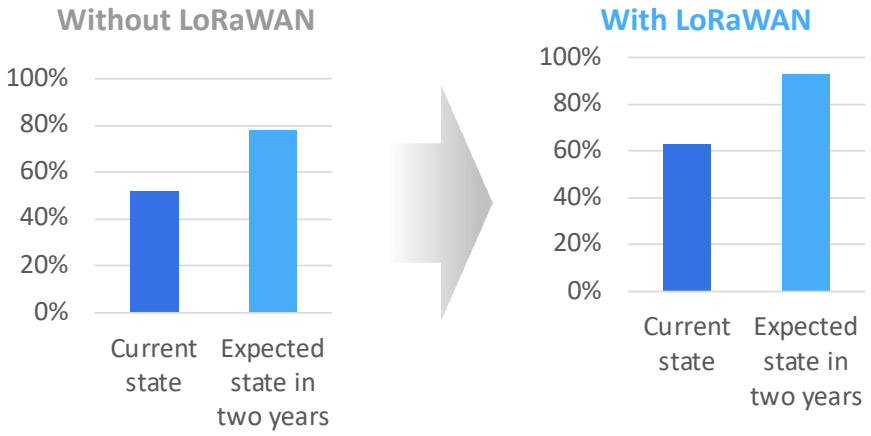
Survey results also show senior executives with the greatest excitement for LoRaWAN – with the percentage more than tripling from 14% to 47% in two years, without showing similar eagerness for licensed technologies.

Further, 63% of LoRaWAN users are currently in the latter stages of their IoT journey (i.e., active/expansive/completed phases) versus 52% of non-LoRaWAN users. In two years, the percentages increase to 93% and 78%, respectively (*See Figure 11*). Additionally, the ability to progress from one stage to the next looks promising for LoRaWAN users versus non-LoRaWAN users. Therefore, the data indicates that LoRaWAN is top-of-mind for enterprises as they look for a scalable, serviceable, and simple solution.

Figure 11. LoRaWAN® impact on IoT deployment status

Q: At what stage is your company in its IoT deployment?

Current state; expected state in two years (*note: showing "later stages" as active/expansive/completed combined*)



Source: Omdia

Cost and familiarity are likely reasons Wi-Fi and Bluetooth are the most widely utilized connectivity technologies. Yet, they fall in utilization over the forecast period, with both technologies seen as less reliable and more challenging to manage for IoT than LPWAN solutions.

With strong network coverage in the US, LTE markets render the speed and bandwidth sufficient for most IoT applications. However, LTE use falls by over half during the two-year period – possibly because enterprises are looking to reap the benefits of what 5G connectivity has to offer—mainly its enablement of high bandwidth applications—and to future-proof their solutions against the sunsetting of technologies (i.e., 2G and 3G). As it pertains to IoT solutions leveraging battery-powered sensors, signs indicate that LoRaWAN will continue to be the dominant player in the market.

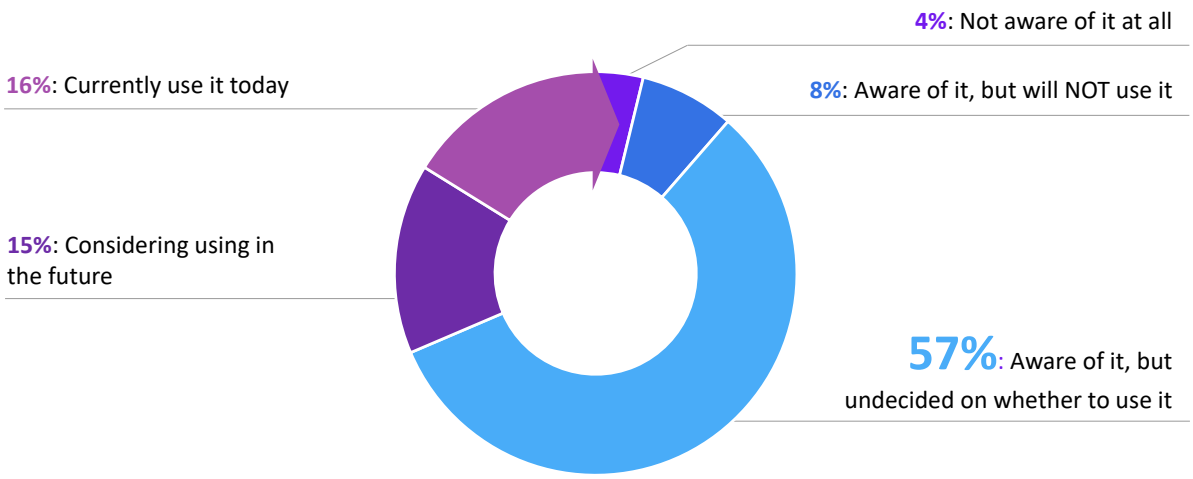
NB-IoT and Cat-M showed signs of growth, but only in the low, single digits. While the growth of NB-IoT in China is often referenced as a sign of coming success elsewhere, Omdia's survey suggests enterprise needs or market dynamics might be different in the US - at least across enterprises in specific verticals surveyed.

In contrast to these other technologies, Omdia believes LoRaWAN is reaching a maturation point. Despite strong awareness and interest in the technology's benefits, room for growth over the next two years exists. The 57% of undecided enterprises showcase a massive opportunity for LoRaWAN to

factor into IoT solutions, with another 4% potential among the group needing further education. While it is compelling that 30% (*See Figure 12*) will be using it in two years, there remains a significant chance to convert those who are undecided and unaware. Given the rapidly changing nature of IoT deployments, it is fair to speculate some of the 8% who have decided against LoRaWAN will change their minds.

Figure 12. LoRaWAN awareness

Q: What is your position on LoRaWAN as a connectivity option?



Source: Omdia

The Three S's: Scalability, Simplicity, and Serviceability

Survey data underscores that enterprises are indeed looking to advance their IoT solution development and deployment and want to do so quickly yet correctly to achieve long-term success. That's why there's an intense focus on three essential enterprise requirements: scalability, serviceability, and simplicity.

Scalability

To achieve growth goals, enterprises must select technologies and vendors that can enable effortless scalability with simple solutions and a high level of service once the solution is deployed. In addition to benefits like reducing the total cost of ownership and increasing ROI, LoRaWAN is a desirable technology for scalability, as indicated by survey results and the rise in its adoption over the next two years. The technology supports rapid scaling with wide device availability, interoperability, and the ability to easily add use cases to an already deployed network. Additionally, LoRaWAN alleviates security concerns for enterprises because of its ability to bypass the corporate Wi-Fi network infrastructure, making it faster and simpler to implement. In contrast, networks like 5G are still evolving, with a very limited number of market-ready 5G IoT devices aimed at high average revenue per connection (ARPC) but low volume markets. Time will tell whether 5G cements itself as a future-proof technology option for enterprise IoT deployments.

Simplicity

With all IoT projects, eliminating unnecessary complexity is essential, whether removing roadblocks or understanding that one size does not fit all. While some enterprises will desire an end-to-end, out-of-the-box solution comprised of hardware, software, and connectivity, others will prefer a strong partner who can reduce the friction of the "messy middle" layer of connectivity.

Enterprises are assigning great value to removing the complexity of their IoT solution and the respective burdens that could potentially fall on internal IT departments. That's why prioritizing the selection of a vendor that can help enterprises build solutions from the ground up while helping maintain their deployment with dedicated schedules and ongoing support fortifies sustainable project success.

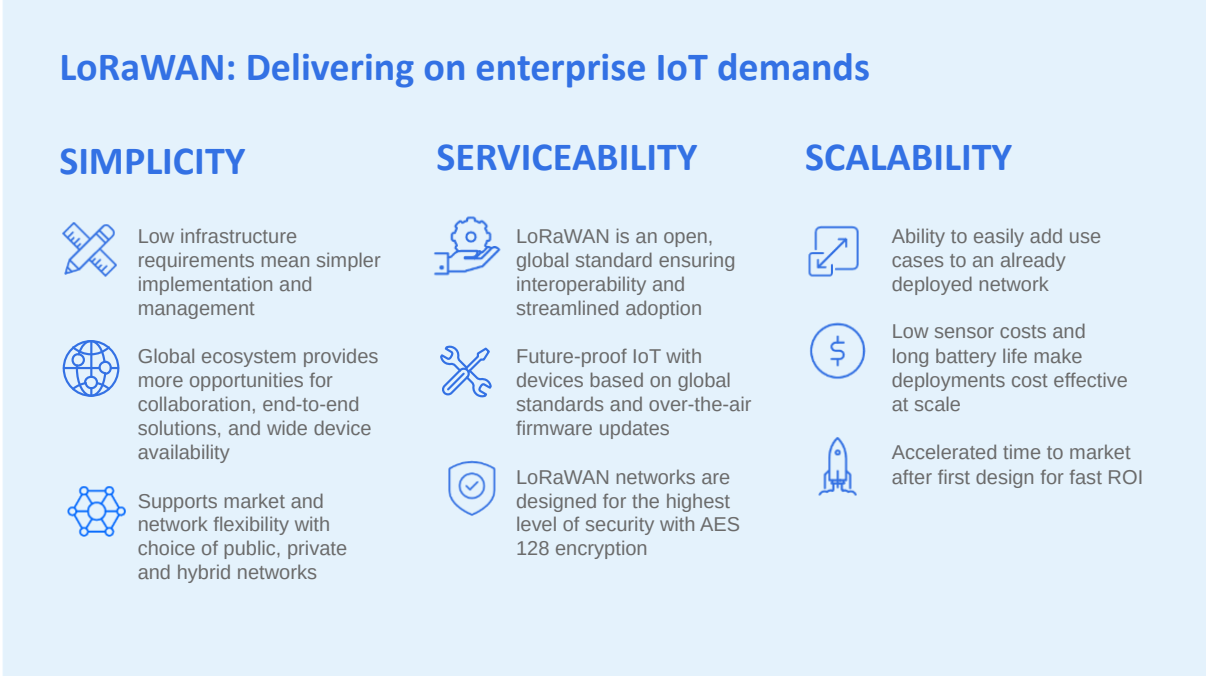
Serviceability

There are many obstacles to transitioning an IoT solution from trial to full deployment. Once deployed, keeping an IoT solution operational can present many challenges. Support is especially crucial on "day two," when many unexpected issues can come to light. With the overall tightness in the labor market and crucial gaps in skill sets, many enterprises lack the resources, time, or budget to create their own support teams. Therefore, leaning on vendors to provide consistent, reliable, and superior service levels alleviates the need for internal support.

Conclusion

The expected scale of deployment and pressure for short-term ROI means that enterprises need to close the gap between expectations and decision-making priorities and take a more holistic approach to planning their IoT journey. From vendor to technology choices, alignment at each project stage is critical for simple integration, quick deployment, and ongoing support.

While it is clear that no single IoT network technology will dominate in the future, LoRaWAN is poised to play a vital role in deployments moving forward because of the simplicity, scalability, and serviceability of the technology. This theme will play out as enterprises look to move their solutions from trial to production, scaling devices into the tens, hundreds of thousands, and even millions.



Making the LoRaWAN technology more compelling are players like MachineQ, a Comcast Company. Enterprises looking for LoRaWAN providers should consider the proven track record and vast resources that MachineQ provides, including the ability to quickly deploy secure, simple, and scalable solutions while providing unparalleled support post-deployment.

Additionally, with the backing of associations such as the LoRa Alliance, an open, non-profit association for standardizing and promoting LoRaWAN, enterprises can assuage that the technology has been well vetted and will receive support for many years to come.

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Appendix

About Omdia

Omdia is a global technology research powerhouse, established following the merger of the research division of Informa Tech (Ovum, Heavy Reading, and Tractica) and the acquired IHS Markit technology research portfolio.

We combine the expertise of more than 400 analysts across the entire technology spectrum, covering 150 markets. We publish over 3,000 research reports annually, reaching more than 14,000 subscribers, and cover thousands of technology, media, and telecommunications companies.

Our exhaustive intelligence and deep technology expertise enable us to uncover actionable insights that help our customers connect the dots in today's constantly evolving technology environment and empower them to improve their businesses – today and tomorrow.

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About MachineQ

MachineQ, a Comcast Company, makes it simple for enterprises to build, connect and deploy IoT solutions at scale. Our fully integrated LoRaWAN network connectivity platform delivers enhanced security and reduced total cost of ownership, while giving customers a single provider for technology, development, service, and support. Our end-to-end IoT solutions and partnerships with leading solution providers address a wide range of business challenges in key markets such as real estate, food service, retail, manufacturing, healthcare, utilities, government, and agriculture. For more information, visit www.MachineQ.com.

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