# Technology and Innovation

# IoT Ambitions are Maturing
Phil Beecher

**Biography**

*Phil Beecher is President and CEO of Wi-SUN Alliance (https://wi-sun.org/), an industry alliance which promotes standards-based interoperable wireless communications products for smart city and IoT applications, and implements a rigorous testing and certification program to achieve its aims.*

*With his extensive experience in wireless communications protocols, standards and testing Phil was chairman of IEEE 802.15 TG4g, vice chairman of IEEE 802.15 TG4m (TV Whitespace), vice chairman of the WiFi Alliance Smart Grid Task Group, Chairman of OpenSG Edge Conformity Task Group, Contributing Editor to IEEE802.15.4-2006 and has held positions in the Telecom Industry Association and Bluetooth SIG.*

*Phil blogs at https://wi-sun.org/blog/*

**Phil Beecher**
President and CEO
Wi-SUN Alliance

## Abstract

*Five years is a long time in the technology industry. In 2017 the Wi-SUN Alliance published its first report on the state of the Internet of Things (IoT) industry. Returning for a review in 2022, this latest report explores how customer perspectives and adoption patterns have changed. Partnering with research company Vanson Bourne to survey 300 IT decision makers from UK and US IoT adopters, including smart cities, smart utilities and industrial IoT, Wi-SUN Alliance's latest research reveals a clear signal: in 2022, IoT is a bigger IT priority than ever for organizations across multiple sectors. In this article the author discusses how the IoT industry has changed since 2017.*

## Introduction

We published our first 'state of the nation' Internet of Things (IoT) report in 2017. Last year, we revisited this study, surveying 300 UK and US IT decision makers within organizations across a range of industries, including utilities, energy, telecoms, construction and government, to see whether (and how) attitudes and adoption patterns have changed.

It's perhaps no surprise to see that IoT is now a top priority among those adopting or planning to adopt IoT technologies and applications. It is a major priority for
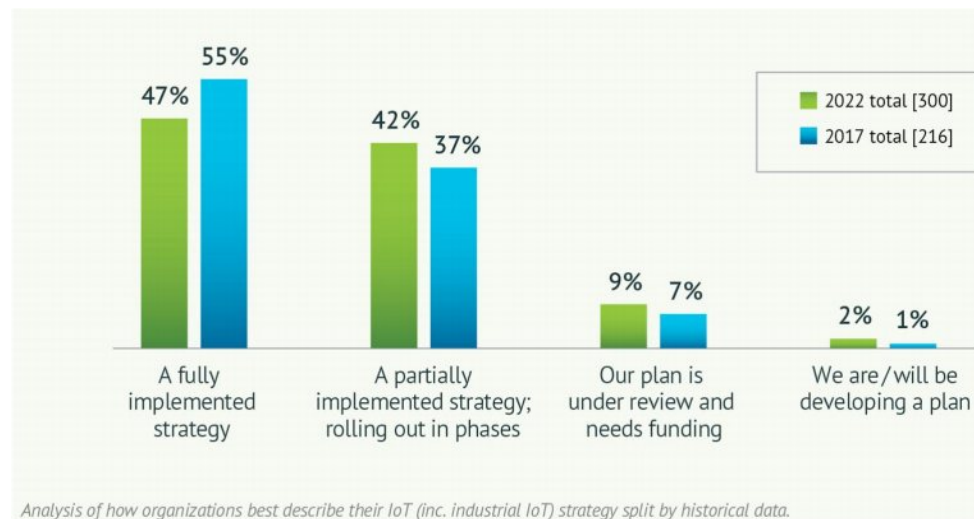
many, with more than nine in 10 (92%) saying they must invest in IoT over the next 12 months.  Examining the drivers for IoT adoption, for many it is an opportunity to gain a competitive advantage (29%), reduce operational costs (27%), and create business efficiencies (25%).

Comparing the two studies, there is a noticeable increase in the number of respondents not just thinking about the technology, but also planning to roll out IoT initiatives.  In terms of the most common use cases, security and surveillance tops the list, with 87% of respondents 'very likely' to or 'definitely' planning this in the next 12-18 months, up from 77% in 2017.

We also saw an increase in those planning to deploy IoT for distribution automation, up from 74% to 82%, and for advanced meter infrastructure, up to 80% from 68%. There is also potential for traffic management and parking, with smart parking, up from 57% to 77%; traffic lights/controls from 58% to 76%; and electric vehicle charging up from 66% to 79%.

While many IoT projects were in their infancy five years ago, the market is now maturing, with organizations more ambitious and open to the idea of adopting services and applications.   However, the number of respondents who have managed to fully implement an IoT strategy has fallen from 55% in 2017 to 47% in 2022.  While there is a corresponding rise in those admitting it is 'extremely difficult' to implement IoT – up from 14% to 17%.



**Figure 1: Under half of organizations overall have so far managed to fully implement their IoT strategy**

*Analysis of how organizations best describe their IoT (inc. industrial IoT) strategy split by historical data.*

This may be due to recent advancements in IoT technologies, adding complexity, or down to a growing understanding of what a 'fully implemented strategy' is and what it entails.
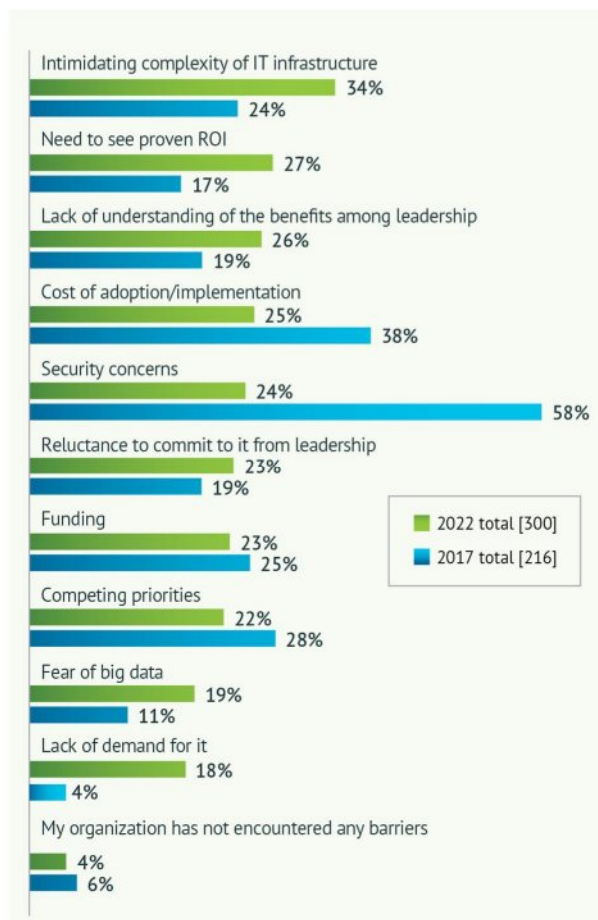
While some senior stakeholders clearly understand the potential of IoT technologies to the business, others are not yet seeing it. Nearly a quarter (23%) of leaders are reluctant to commit to IoT solutions just yet, up from 19% five years ago.

## Challenges remain with the focus on security and compliance

As IoT strategies mature, security is becoming less of an issue than it was five years' ago. Those respondents ranking it as one of their top three challenges when rolling out IoT fell from 58% in 2017 to 24% in 2022. The number of IoT adopters viewing security as a technical challenge also fell, from 65% in 2017 to 42% last year.

**Figure 2: Security and cost are less likely to be barriers to rolling out IoT initiatives than they were in 2017, but the complexity of IT infrastructure is a growing hurdle**

Intimidating complexity of IT infrastructure
- 34%
- 24%

Need to see proven ROI
- 27%
- 17%

Lack of understanding of the benefits among leadership
- 26%
- 19%

Cost of adoption/implementation
- 25%
- 38%

Security concerns
- 24%
- 58%

Reluctance to commit to it from leadership
- 23%
- 19%

Funding
- 23%
- 25%

Competing priorities
- 22%
- 28%

Fear of big data
- 19%
- 11%

Lack of demand for it
- 18%
- 4%

My organization has not encountered any barriers
- 4%
- 6%

Legend:
- 2022 total [300]
- 2017 total [216]

Organizations are still eager to ensure their systems are secure. The latest study shows a slight rise in the proportion of respondents demanding proven security with multi-layer protection and continuous monitoring when considering smart city solutions. This is either very important or critical for 86% of respondents, compared to 82% in 2017.

They might be more relaxed about the security challenges thanks to protection like device identity certificates, but they also understand its importance more than ever and demand secure implementations from device and other vendors.
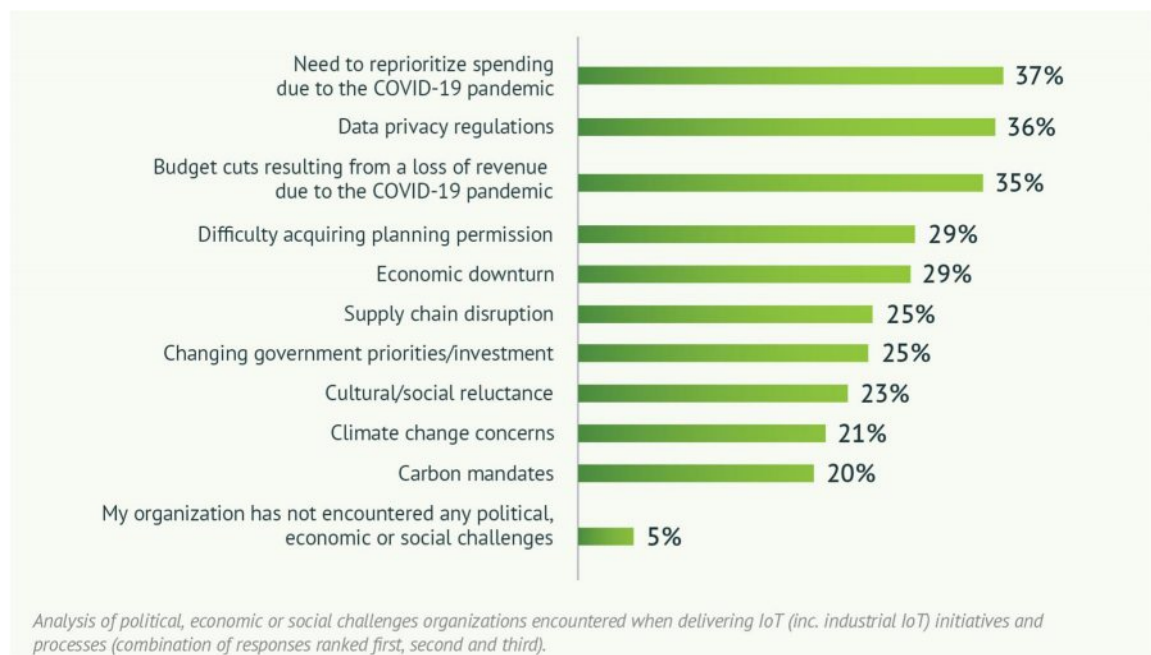
While some barriers to adoption have eased, others have increased, as companies comprehend the full implications of designing and deploying IoT solutions.  One of these is data privacy, which has become more of a concern as security concerns fall.

Respondents are more focused on compliance than they were five years ago.  One reason for this could be that since 2017, stricter privacy laws – such as the GDPR in Europe and the California Consumer Protection Act in the US – are putting pressure on organisations to protect sensitive data.

IoT projects by their nature have the potential to generate huge quantities of data. Even if this information is secure, handling it responsibly represents a privacy risk. Managing large volumes of data is technically difficult, especially when regulators interpret it as sensitive personal information.  Organizations that mishandle or misuse it risk running into regulatory or compliance issues.

Fears over big data have jumped 8% in five years, with 19% of respondents placing it in their top three IoT rollout challenges, and one in four citing regulatory concerns. While data privacy regulation is now ranked second on the list of most important political, economic, or social challenges for IoT adopters, with 36% of respondents placing it in their top three.



Figure 3: Political, economic or social challenges when adopting IoT initiatives and processes
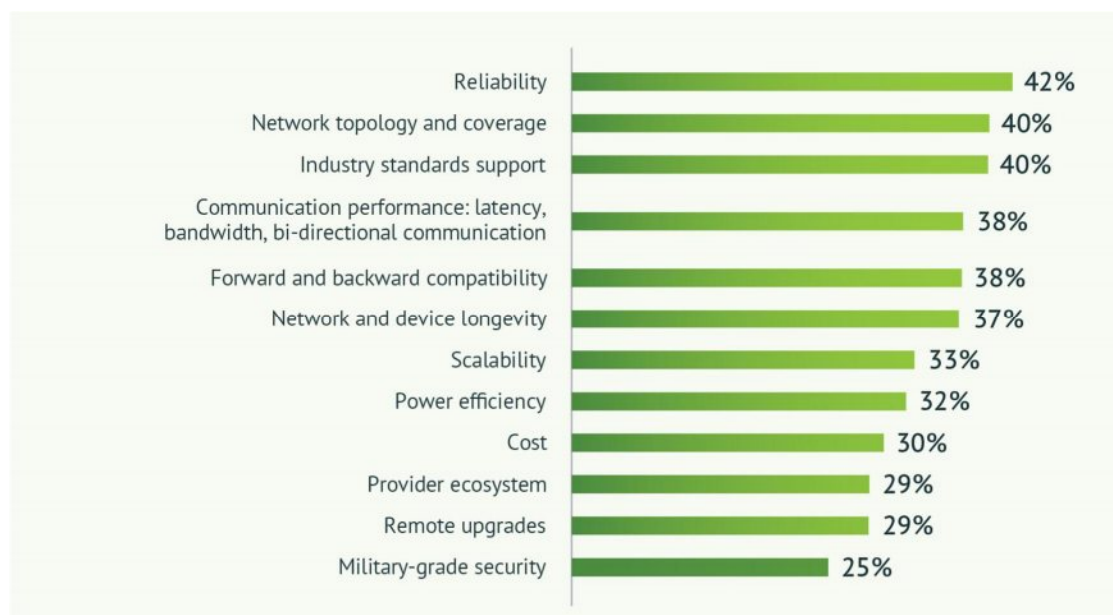
*Analysis of political, economic or social challenges organizations encountered when delivering IoT (inc. industrial IoT) initiatives and processes (combination of responses ranked first, second and third).*

## Open standards, connectivity, and network topologies

It's encouraging to see adopters embracing industry-wide open standards for IoT deployments, with many regarding them as crucial, particularly for smart cities. In the latest study, 86%, of respondents see these as either 'very important' or 'absolutely crucial', up from 78% in 2017.

The role of open standards should not be underestimated. They make it easier to integrate new IoT devices, products and software with existing infrastructure, while using compatible networks can lower the cost of further deployments.

Organizations are also keeping their connectivity options open by supporting flexible network topologies. Network topology is an increasingly important consideration, with 40% of respondents looking at it when evaluating IoT solutions.

**Figure 4: Characteristics organizations are looking for when evaluating IoT technologies**



| Characteristic | Percentage |
|---|---|
| Reliability | 42% |
| Network topology and coverage | 40% |
| Industry standards support | 40% |
| Communication performance: latency, bandwidth, bi-directional communication | 38% |
| Forward and backward compatibility | 38% |
| Network and device longevity | 37% |
| Scalability | 33% |
| Power efficiency | 32% |
| Cost | 30% |
| Provider ecosystem | 29% |
| Remote upgrades | 29% |
| Military-grade security | 25% |

Over half (58%) preferred a hybrid network topology, supporting both star and mesh configurations five years ago.  But in our latest study, this has risen to 68%, reflecting a growing move towards mesh-based networking, which lost no support among those wanting to use it exclusively.

**Figure 5: A growing number of organizations prefer hybrid networking topology when implementing IoT solutions**
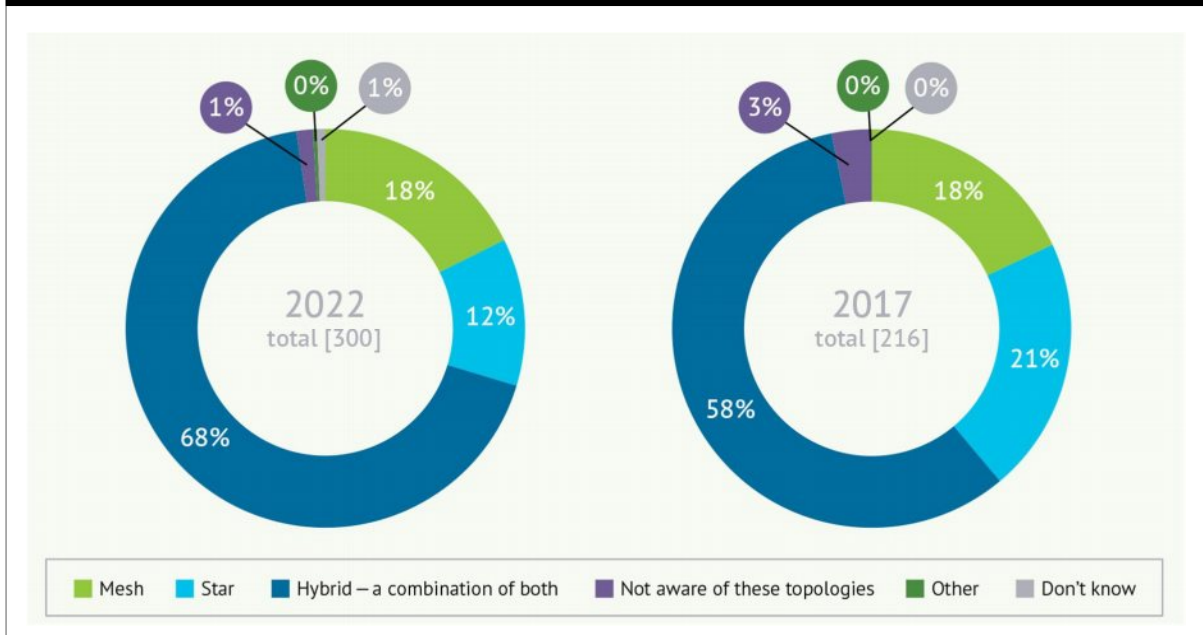


It is very encouraging to see that the journey to IoT maturing, with organizations becoming more ambitious in their thinking and their approach to what the technology can deliver in the context of smart cities, smart utilities and industrial IoT.