BSQUARE

2017
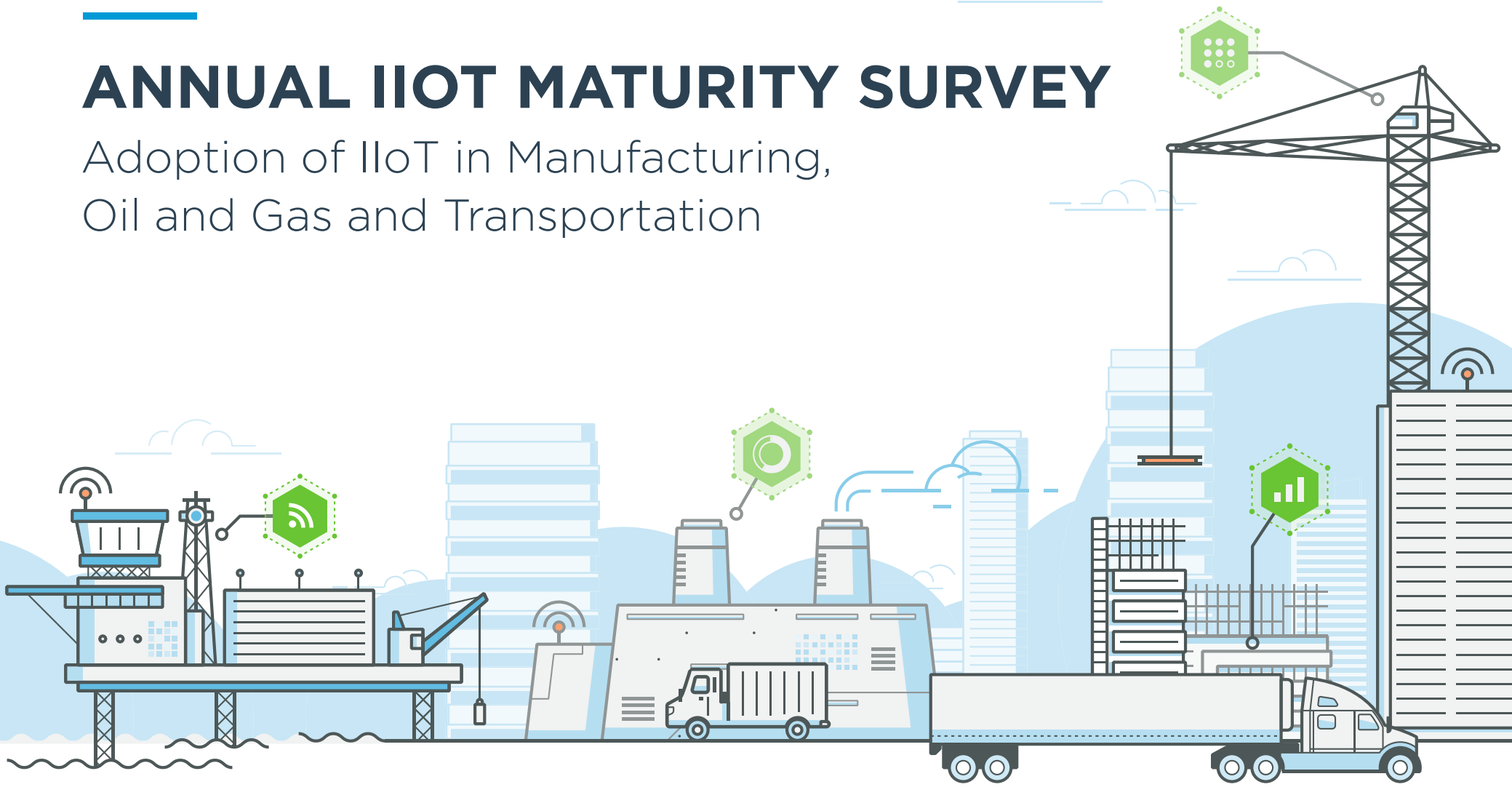
ANNUAL IIOT MATURITY SURVEY

Adoption of IIoT in Manufacturing,
Oil and Gas and Transportation

Industrial IIoT in Manufacturing, Oil and Gas and Transportation

As an ever-growing population of industrial equipment becomes connected, organizations in the manufacturing, transportation, and oil and gas (O&G) industries are broadly adopting Industrial Internet of Things (IIoT) solutions to drive digital transformation. Industrial companies are finding that they can save millions of dollars by establishing clear business goals like predicting and remediating failures before they occur and by improving operational processes such as repair and maintenance.

The burgeoning IIoT market shows no signs of slowing. Gartner[1] predicts that businesses will have over 3 billion connected devices deployed by the end of 2017, growing to more than 7.5 billion by 2020. Industrial companies stand to reap increasing levels of benefit as more connected machinery comes online and they expand and deepen their IIoT capabilities.

Bsquare surveyed more than 300 senior-level IIoT influencers and decision-makers across the manufacturing, transportation, and O&G industries for their 2017 Annual IIoT Maturity Survey and found that IIoT has progressed well beyond being just a catchphrase to a technology that is driving measurable business value.
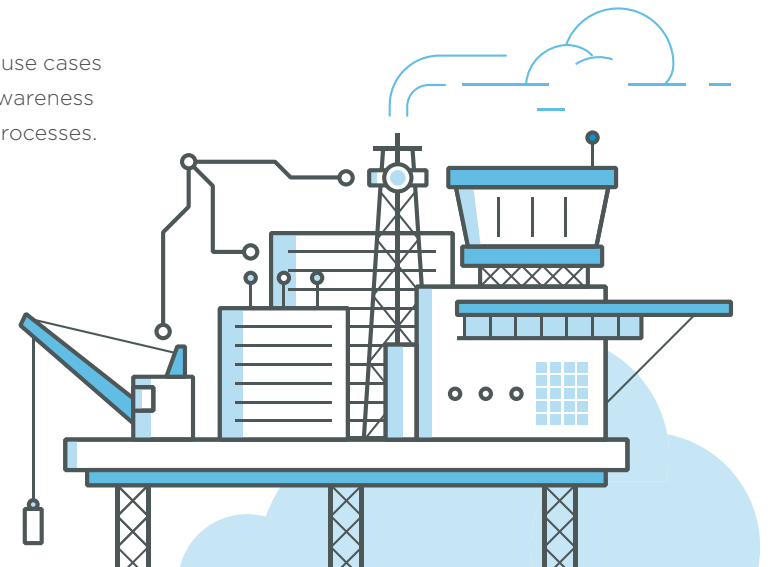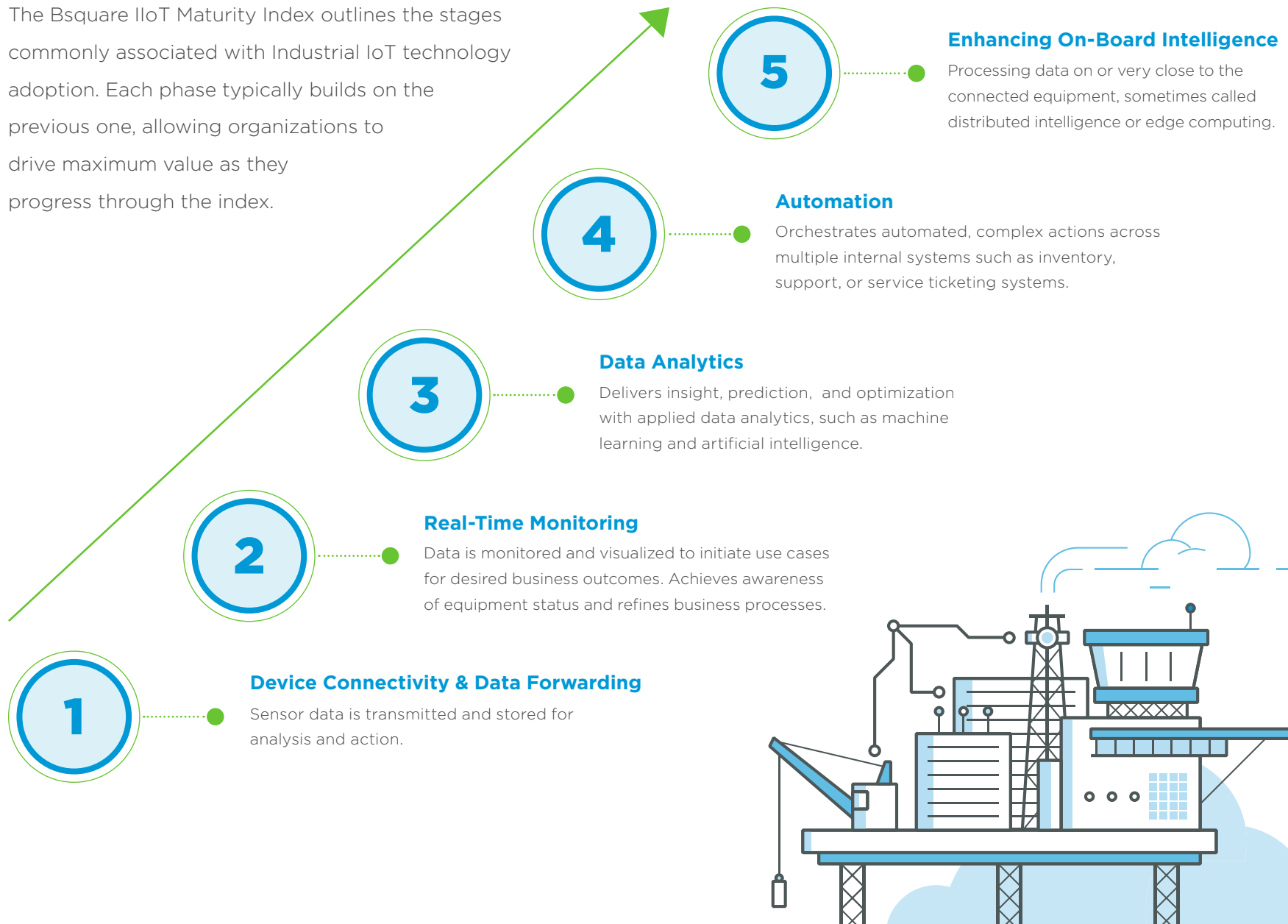
7.5B
Devices by 2020[1]

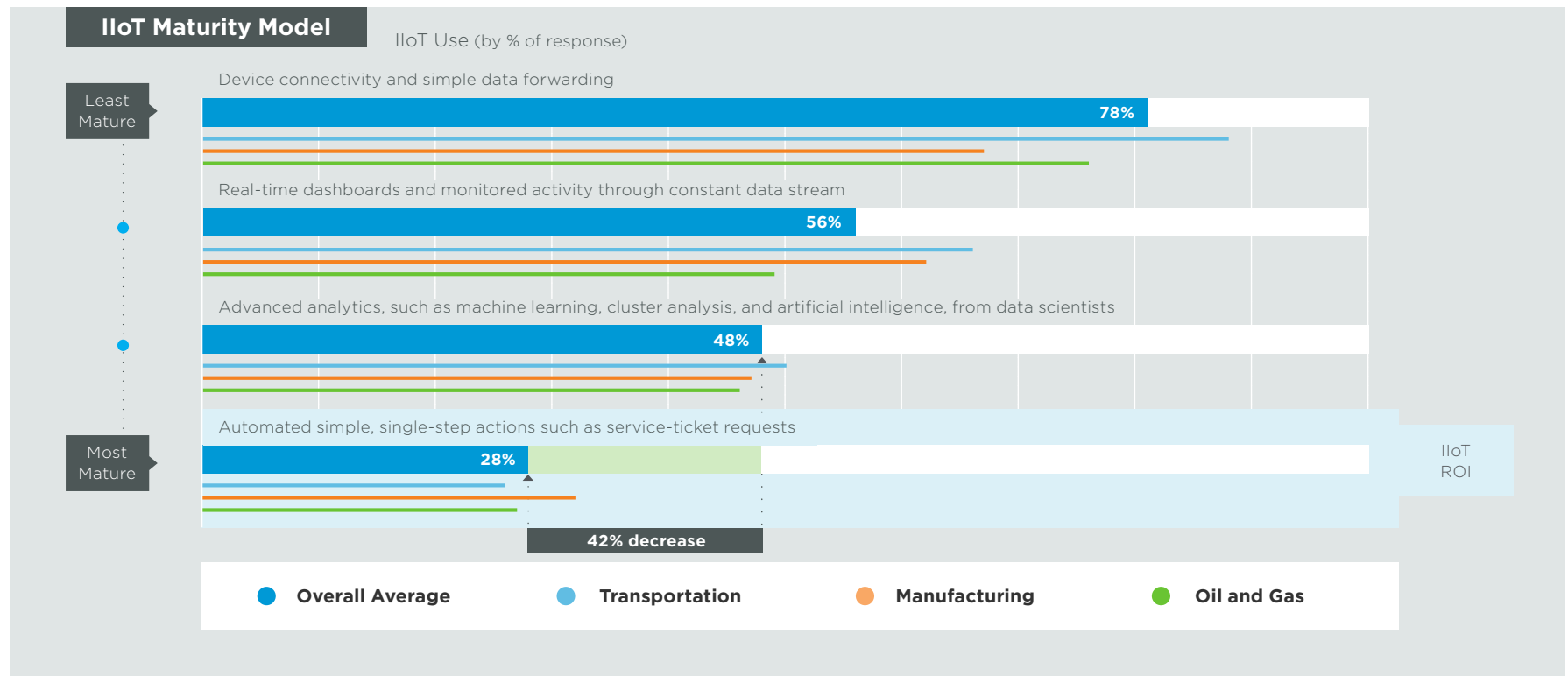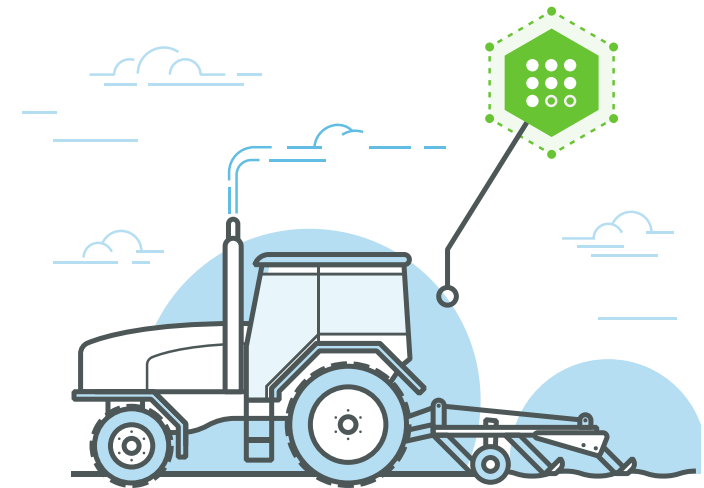[1] https://www.gartner.com/newsroom/id/3598917

Evolution of a Connected Business Model: Stages of IIoT Maturity

The Bsquare IIoT Maturity Index outlines the stages commonly associated with Industrial IoT technology adoption. Each phase typically builds on the previous one, allowing organizations to drive maximum value as they progress through the index.

5

Enhancing On-Board Intelligence
Processing data on or very close to the connected equipment, sometimes called distributed intelligence or edge computing.

4

Automation
Orchestrates automated, complex actions across multiple internal systems such as inventory, support, or service ticketing systems.

3

Data Analytics
Delivers insight, prediction, and optimization with applied data analytics, such as machine learning and artificial intelligence.

2

Real-Time Monitoring
Data is monitored and visualized to initiate use cases for desired business outcomes. Achieves awareness of equipment status and refines business processes.

1

Device Connectivity & Data Forwarding
Sensor data is transmitted and stored for analysis and action.

The Current State of IIoT Adoption

Respondent organizations are taking a staged approach to IIoT adoption, based on their responses when asked how they are using IIoT. This aligns with the Bsquare Maturity Model, which outlines a multi-stage framework for IIoT advancement and return on investment (ROI) realization in industrial environments. Respondents validated that IIoT is a maturity progression, starting with basic device connectivity and advancing to fully automated business processes.

IIoT Maturity Model

IIoT Use (by % of response)

Least Mature

Device connectivity and simple data forwarding
78%

Real-time dashboards and monitored activity through constant data stream
56%

Advanced analytics, such as machine learning, cluster analysis, and artificial intelligence, from data scientists
48%

Automated simple, single-step actions such as service-ticket requests
28%

Most Mature

42% decrease

IIoT ROI

- ● **Overall Average**
- ● **Transportation**
- ● **Manufacturing**
- ● **Oil and Gas**

The Current State of IIoT Adoption

The vast majority of respondents (86%) already have a solution in place and 91% of those adopters say that their solutions are very or somewhat important for their company. Twelve percent plan to implement a solution this year, bringing the total of respondents who either have or plan to have one to nearly 100%.

Adopters select their implementation method based on business needs. More than three-fourths (77%) prefer a cloud-based solution, most likely due to its ease of use and lower cost of entry. Twenty-three percent have an on-premise deployment.

12% plan to implement an IIoT solution this year

Solution implementation is based on business needs:

77% Cloud-based
Preferred method, likely due to ease of use and lower cost

23% On-premise

86%
currently have an IIoT solution in place

42% have used IIoT for 12 months or more

45% established their IIoT solution in the past 12 months

91% of adopters indicate their solutions are very or somewhat important for their company
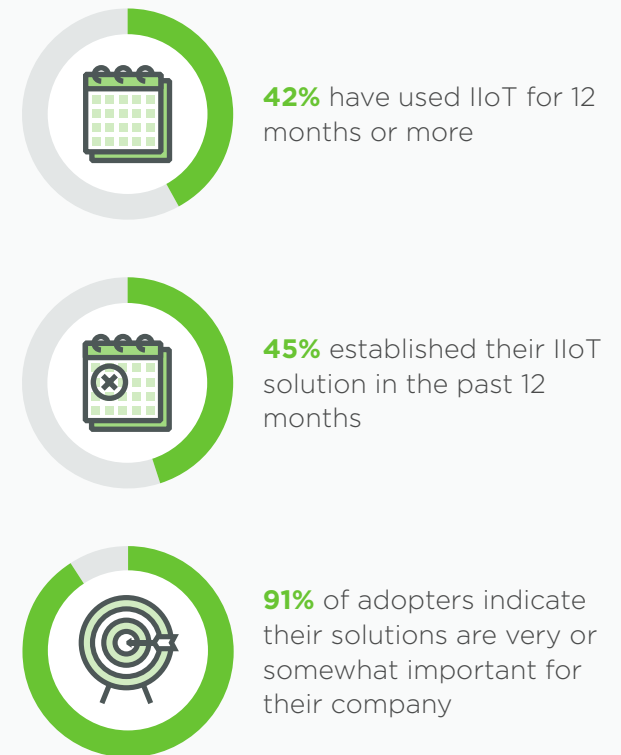
Enhancing Operations Performance with IIoT

Companies want better visibility into their business-critical equipment as evidenced by more than 90% of adopters citing device health-related goals as top drivers for IIoT adoption. Other goals included operating cost reduction (24%), increased production volume, and better compliance (18% each).

IIoT is working, according to those who have adopted it. Eighty-four percent said their IIoT solutions have been extremely or very effective, and 91% indicated a significant or fair amount of organizational performance improvement. Nearly all transportation respondents noted significant solution effectiveness and organizational improvement. Only about three-fourths of O&G respondents felt that their solutions were very or extremely effective, likely due to the relatively recent uptake of IIoT in their industry.

Current adopters cite these top business challenges targeted by IIoT solutions:

91%
Equipment Health

24%
Operating costs

18%
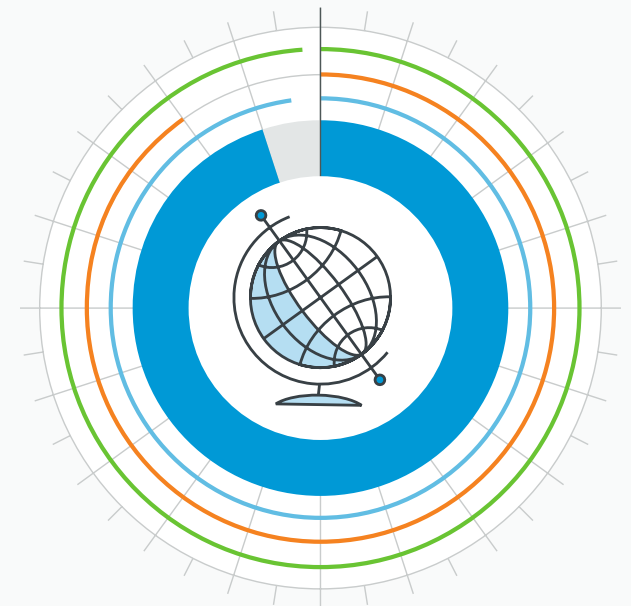Production volume increases

18%
Improved compliance

Considered Industry Impact at a Global Level

95%

consider IIoT to provide a tremendous or significant industry impact at a global level

99% Oil and Gas

98% Transportation

90% Manufacturing

A Connected Future

Companies plan to continue their investment into IIoT as they see its positive impacts. Nearly 100% of respondents expect to invest the same or more over the next 12 months, with nearly three-fourths projecting an increase. Eighty-five percent of transportation and 78% of manufacturing respondents expect to increase their investment. Slightly less than half of O&G respondents expect to increase spending, possibly due to their more nascent adoption

Most companies plan to continue their existing focus over the next 12 months, with 79% citing data analytics and 71% real-time monitoring as their core planned uses for IIoT. They also project an increase in advanced uses, including a 35% increase in automating simple, single-step actions and a 29% increase in real-time monitoring capabilities.
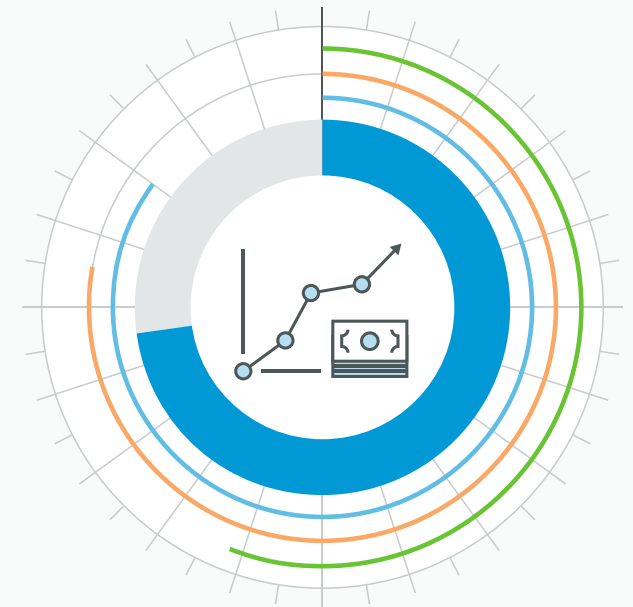
35%
Automating simple, single-step actions

29%
Real-time monitoring

Businesses see IIoT's impact and are responding in kind

73% projected 12-month investment increase

- **85%** Transportation
- **78%** Manufacturing
- **56%** Oil and Gas

MANUFACTURING

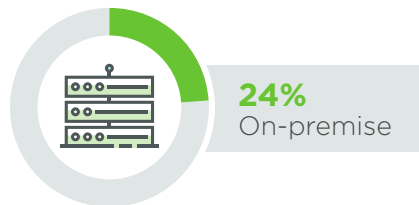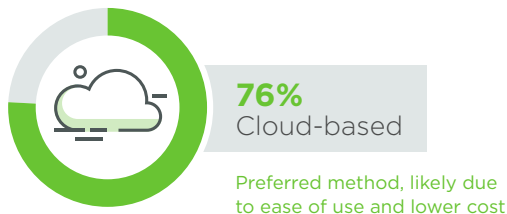# Manufacturing

IIOT IMPACT IN MANUFACTURING

Digital transformation and Industry 4.0 are vital to optimizing manufacturing processes in an environment of automated machines and systems. IIoT helps advance these initiatives by enabling manufacturers to connect critical assets, extract data, and improve factory operations.

CURRENT IIOT ADOPTION IN MANUFACTURING

IIoT is already making a difference in manufacturing environments. Manufacturers have a strong commitment to IIoT and believe it is very important to their organization.
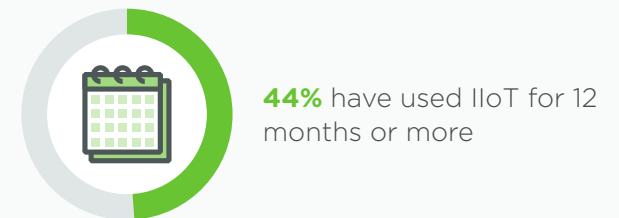
20% **plan to implement an IIoT solution this year**
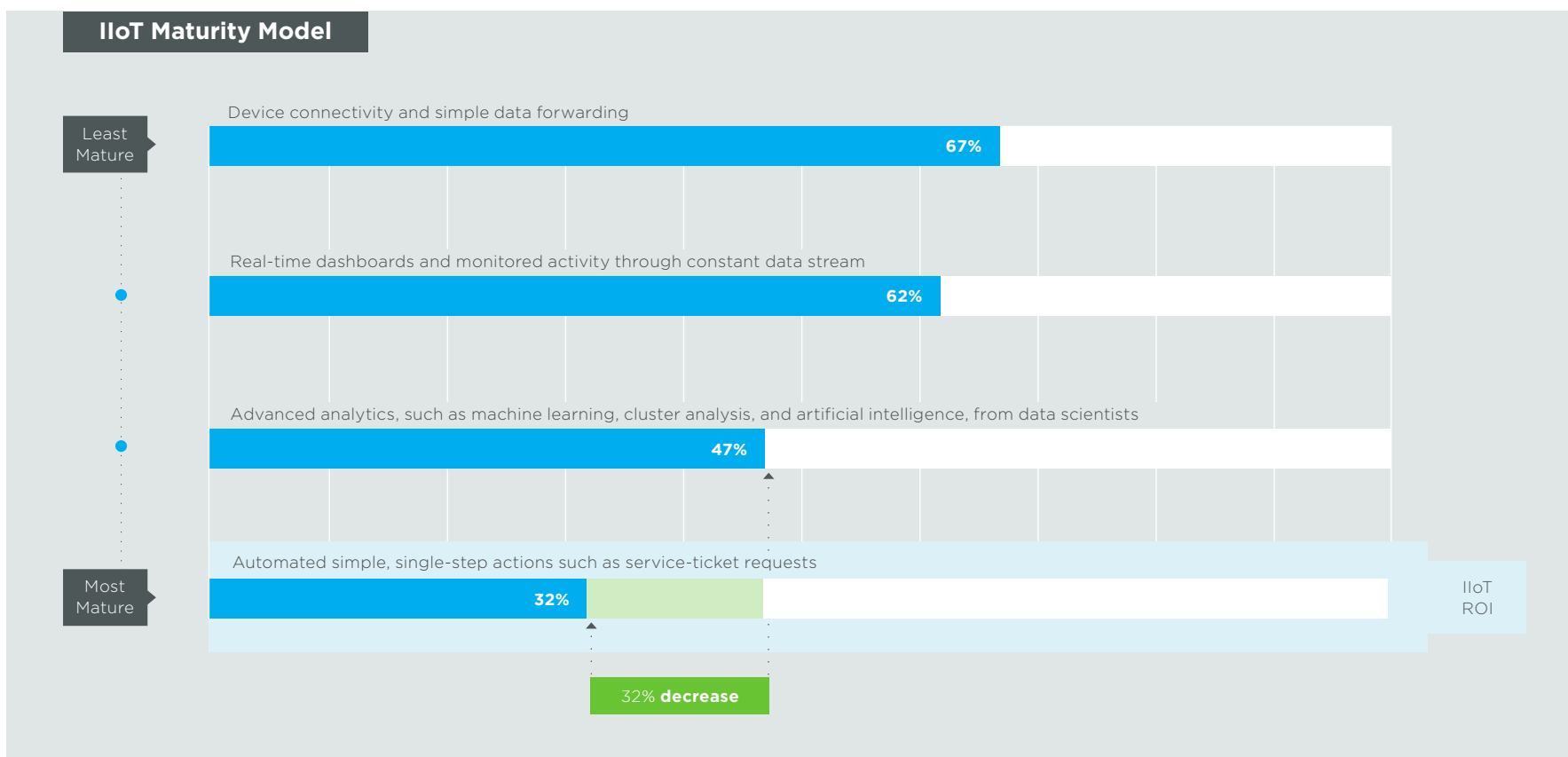
Solution implementation is based on business needs:

76% Cloud-based

Preferred method, likely due to ease of use and lower cost

24% On-premise

77%

currently have an IIoT solution in place

44% have used IIoT for 12 months or more

33% established their IIoT solution in the past 12 months

98% of adopters indicate their solutions are very or somewhat important for their company

Manufacturing

EVOLUTION OF THE MANUFACTURING BUSINESS MODEL

In keeping with the Bsquare Maturity Model framework, manufacturing respondents indicated their use of the IIoT adoption stages:

IIoT Maturity Model

Least Mature

Device connectivity and simple data forwarding
67%

Real-time dashboards and monitored activity through constant data stream
62%

Advanced analytics, such as machine learning, cluster analysis, and artificial intelligence, from data scientists
47%

Most Mature

Automated simple, single-step actions such as service-ticket requests
32%

IIoT ROI

32% **decrease**

Manufacturing

ENHANCING MANUFACTURING OPERATIONS WITH IIOT

Logistics-related items and machine health are the top business challenges manufacturers target with their IIoT solutions, indicating that maintaining and optimizing equipment and operational parameters are closely tied to supply chain efficiency.

Current adopters cite these top business challenges targeted by IIoT solutions:

95%
Logistics
(including factory floor)

82%
Machine Health

34%
Operating Costs

84% consider their IIoT solutions to be extremely/very effective

Improving Performance with IIoT:

For manufacturing and industrial environments, maintaining and optimizing equipment and operational parameters are essential for an efficient supply chain. Respondents rated the impact of IIoT on their business as:
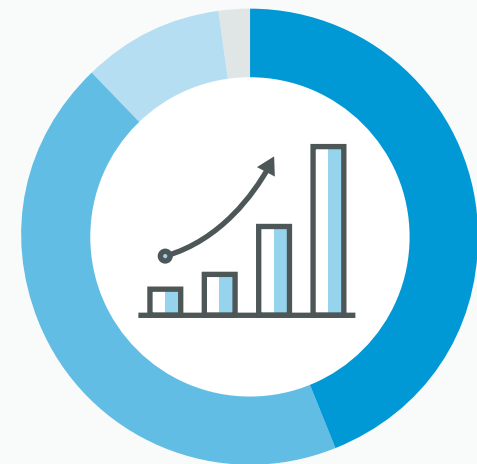
- **44%** Significant
- **44%** A Fair Amount
- **10%** A Little
- **1%** Don't know/Not applicable

Manufacturing

## THE FUTURE OF DIGITAL TRANSFORMATION IN MANUFACTURING

Manufacturers plan to continue their investment into IIoT, and the majority plan to invest more. Within the next 12 months, 78% plan to increase their investment and 20% plan to spend about the same as the past 12 months. None plan to decrease their investment, indicating that there is a clear ROI with IIoT.
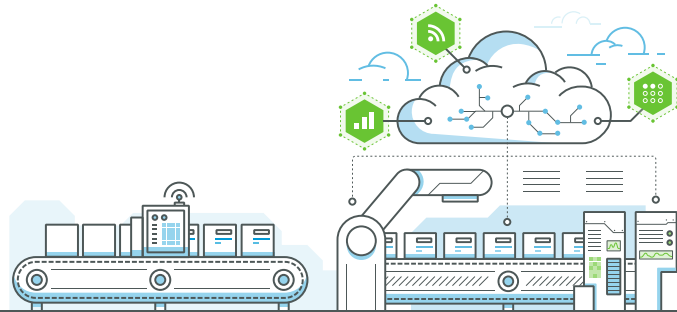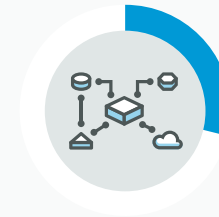
12-month projections:

78%
Investment will increase
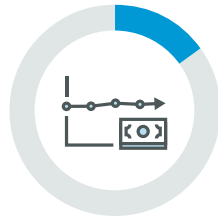
20%
Investment will not change

0%
Investment will decrease

29% Orchestrating complex actions across multiple systems (such equipment to inventory)

11% Orchestrating single-step actions (such as service ticket requests)

**8%** Using data streams to populate real-time dashboards

Conclusion

IIoT is entrenched and growing in the transportation, manufacturing, and O&G industries and is delivering solid business benefits. The vast majority of respondents in Bsquare's annual survey believe that IIoT has an important positive impact on their industry and already have effective solutions in place.

A key driver of deployment maturity and ROI is the establishment of clear business goals prior to deployment, such as reducing operating costs, better managing devices, or increasing production. Yet almost every respondent acknowledged that implementing IIoT is complex and requires solutions that help simplify initiatives. Device health-related uses were by far the primary reason organizations are embracing IIoT. Manufacturing and Transportation lead O&G in terms of maturity and results but O&G is adopting IIoT faster than the more widely connected manufacturing industry.

Over the next 12 months, almost all respondents plan to invest the same or more in IIoT and will continue to focus on existing business objectives and processes. They also plan to increase focus on more mature applications of IIoT such as advanced analytics and automation that allow simple and complex actions to be orchestrated across their organizations.

95%

consider IIoT to provide a tremendous or significant industry impact at a global level
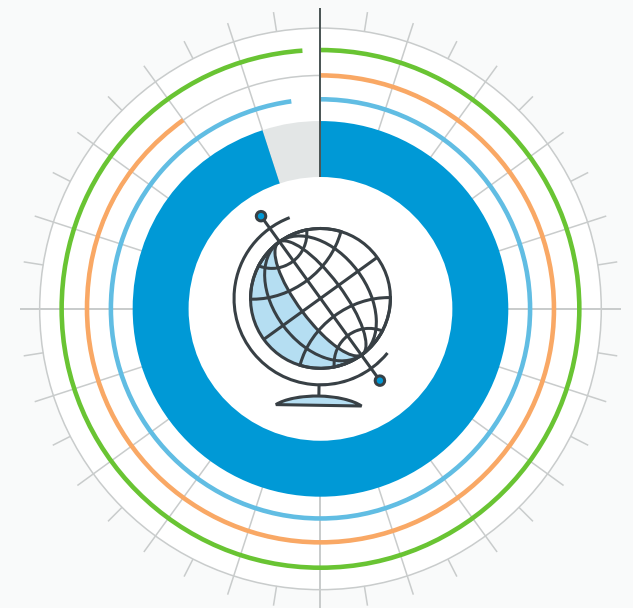
- 🟢 **98%** Transportation
- 🔵 **90%** Manufacturing
- 🟠 **99%** Oil and Gas

BSQUARE

For more than two decades, Bsquare has helped its customers extract business value from a broad array of physical assets by making them intelligent, connecting them, and using the data they generate to optimize business processes. Bsquare DataV software solutions can be deployed by a wide variety of enterprises to create business-focused Internet of Things (IoT) systems that more effectively monitor device data, automate processes, predict events, and produce better business outcomes. Bsquare goes a step further by coupling its purpose-built DataV software with comprehensive analytic and engineering services that help all types of organizations make IoT a business reality.

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