ZEBRA

Meeting the on-demand economy's challenges:

The Future of Field Operations Asia Pacific Vision Study

Leading organizations leverage mobility and innovative technologies to accommodate heightened service expectations

Zebra's Future of Field Operations Asia Pacific Vision Study

Zebra Technologies commissioned a APAC survey of leading organizations with field operations in five service categories: field service, fleet management, field sales, direct store delivery and merchandise courier services. The survey asked them how their organizations are evaluating and using mobile technology designed for business use as well as emerging technologies to respond to market and technological trends impacting field operations.

Mobile growth and transformation in field operations

$10.6 TRILLION

Growth of global e-commerce

60%

Mobility investment is a growing priority

57%+

Transformative field operations technologies

Three Trends Driving Field Operations Changes

1. Performance and convenience expectations growing

E-commerce and mobile connectivity give customers more ways to order goods and services, while online feedback platforms allow them to hold service providers to higher performance standards:

- Global e-commerce retail sales are expected to reach $4.48 trillion by 2021.[1] Global business-to-business e-commerce sales are much higher, estimated at $10.6 trillion in 2018.[2]
- In the Future of Field Operations survey, 66% said e-commerce is driving the need for faster field operations.
- 90% of consumers read online reviews before visiting a business, 88% trust online reviews as much as personal recommendations and 86% hesitate to purchase from a business that has negative online reviews.[3]

2. Mobile technology replacing paper in the field

- 58% are expanding mobile technology to enterprise-wide use — reaching 97% by 2023.
- Today, 74% of organizations rely on paper-based systems for over one-fifth of their field operations — by 2023, almost 35% of organizations will be less reliant on paperwork.
- From 2018 to 2023, the use of handheld mobile computers with built-in barcode scanners is forecasted to grow by 41%, mobile printers by 60% and rugged tablets by 57%.

3. Emerging technologies and faster networks are disrupting field operations

- Adoption of transformative field operations technologies is substantial: sensors, radio frequency identification (RFID) and intelligent labels (66%); blockchain (59%); and augmented or virtual reality (57%).
- More than one-quarter of decision makers view these technologies as disruptive: AR/VR (43%), blockchain (22%) and sensors, RFID and intelligent labels (20%).
- 66% say 4G/5G is one of the top factors driving field operations investments.

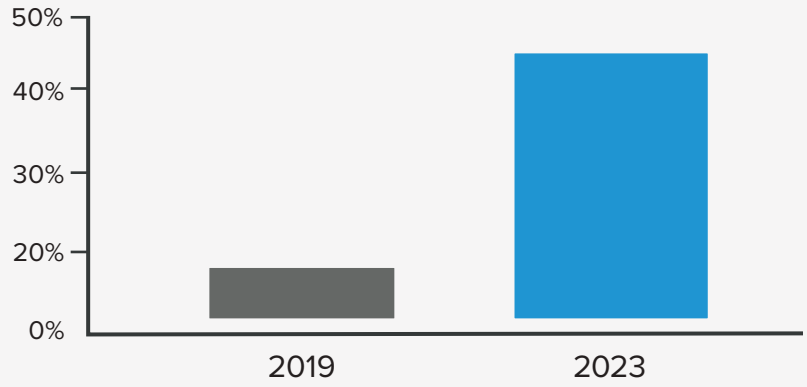
[1]Worldwide Retail and E-Commerce Sales: eMarketer's Estimates for 2016–2021. [2]In-depth: B2B e-Commerce 2019. Statista Digital Market Outlook–Trend Report.
[3]The Importance of Online Customer Reviews. Invesp infographic. https://www.invespcro.com/blog/the-importance-of-online-customer-reviews-infographic/.

Empowered customers and technological evolution driving mobility adoption

Whether in business-to-consumer or business-to-business, customers rely on the convenience of ordering service calls and product deliveries online, creating expectations for greater convenience throughout the entire customer experience. Now customers are tracking deliveries and appointments online and planning personal or business activities around service. They also expect faster deliveries and service.

Digitally empowered customers are using technology to keep field organizations honest. Online reviews and social media posts are already pivotal to competitiveness and growing in importance.

Enterprise mobile device adoption



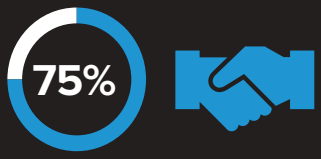
Mobile technology, faster networks and increasingly robust digital security equip field teams to answer these challenges:

- Teams can review equipment repair histories before leaving on their routes and quickly access online documents, specifications and parts inventories or order parts deliveries if they encounter problems later.
- Machine learning-based software applications can collect data from sensors in a localized Internet of Things, enabling condition-based equipment maintenance or stock monitoring, or optimized travel times for service or deliveries.
- These applications provide teams with data-driven indications of required equipment maintenance or merchandise replenishment so they can proactively set appointments.
- Mobile technology enables field teams to process mobile payments for customer convenience and shorter cash flow cycles.

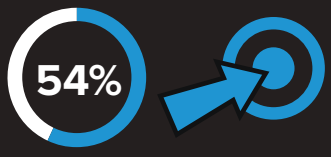
Data-driven, mobilized field operations offer beneficial workflow disruptions like these that can raise service to match or even exceed customers' growing expectations.

Key benefits of business mobile technology

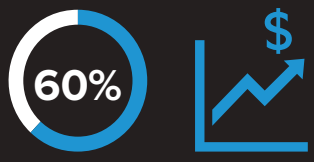
Employee productivity/efficiency



Customer/partner satisfaction



Order fulfillment accuracy



Revenue/sales

How leading organizations are transforming field operations

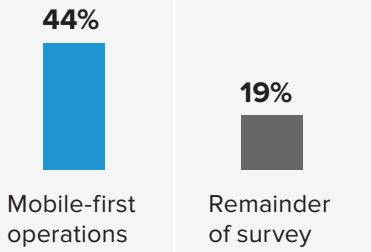
Fifty seven percent of survey participants agreed that their field operations strategies are 'mobile first,' an indication that they are aware of how adopting mobile technology can improve their teams' performance. This mobile-first group is transforming field operations in three ways.

1. Scaling mobile technology and support technologies enterprise-wide

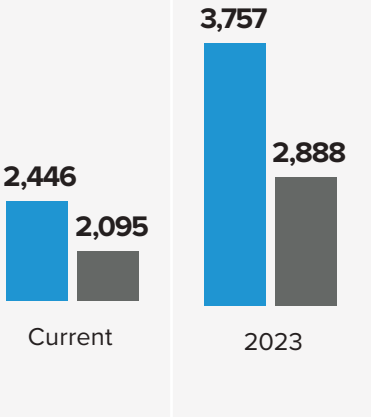
Mobile-first organizations indicate that they recognize the efficiencies mobile technology can offer their teams. For example, with their large screens and ruggedized design, business tablets make it easy to read detailed equipment schematics, delivery orders or task checklists and keep workflows moving in a wide range of environmental work conditions.

Having seen how these mobile devices help individual workers perform at a higher level, leading organizations are seeing opportunities to achieve economies of scale. They're scaling mobile technology enterprise-wide and boosting both efficiency and the accuracy of inventory, repair and maintenance procedures, merchandising and last-mile delivery.

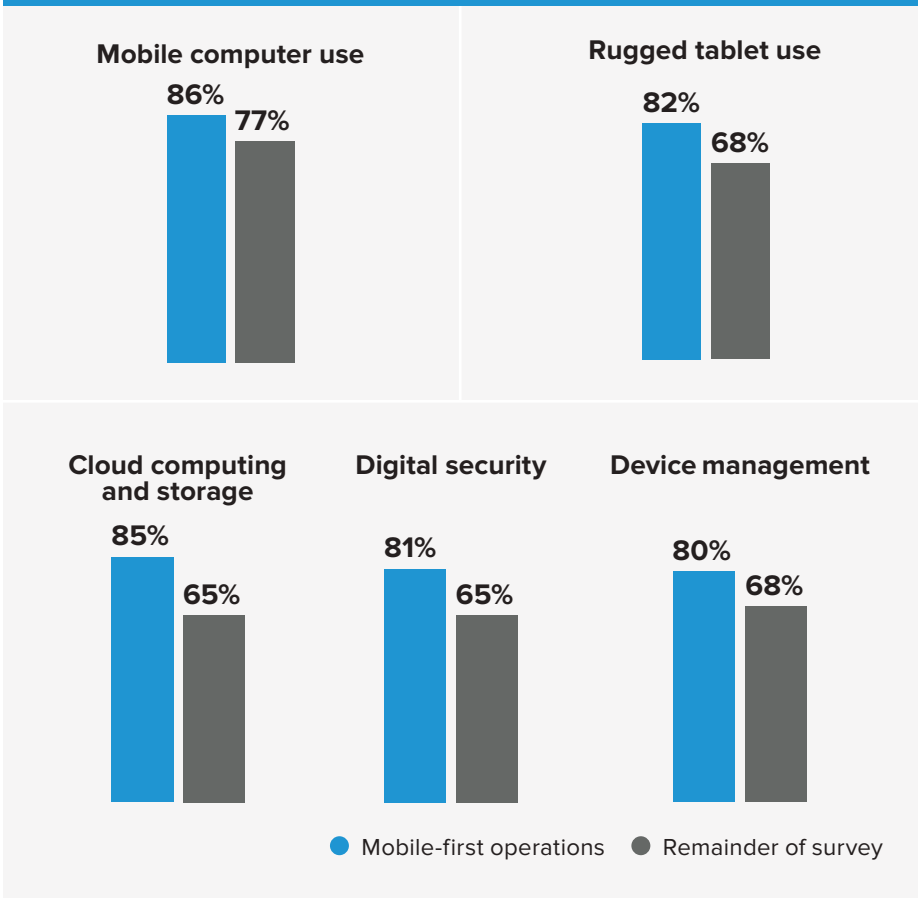
Mobility investment is a top priority



Growth of mobile devices deployment

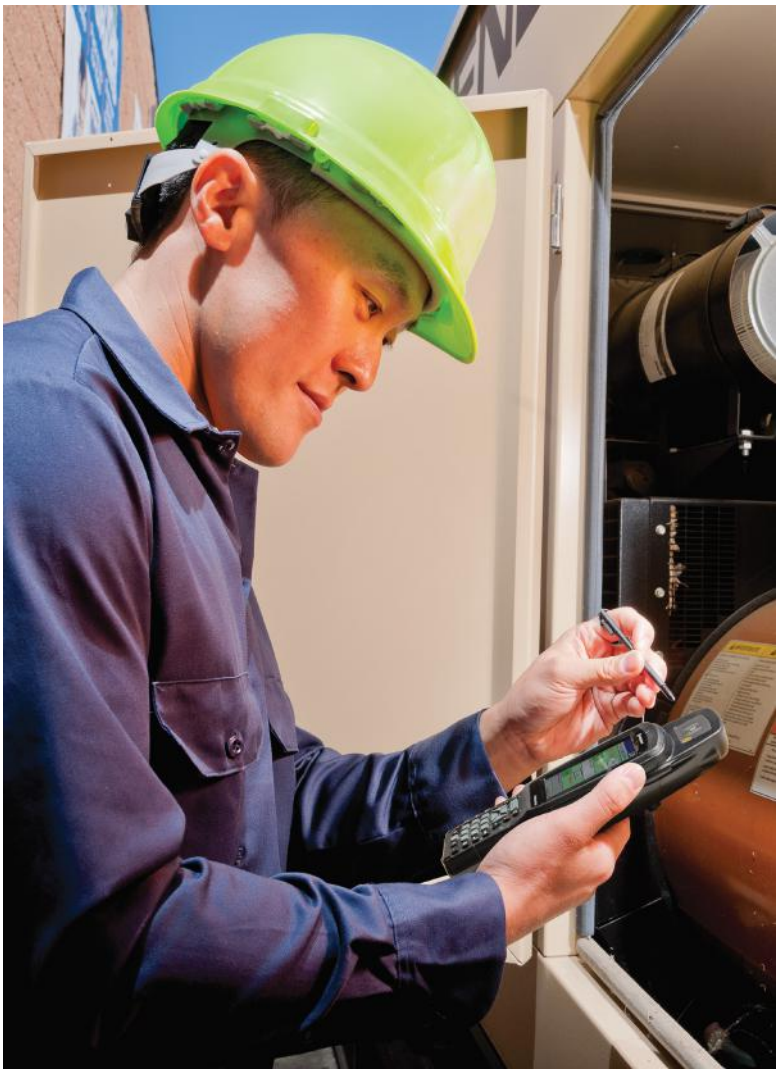


Mobile-first organizations leading the way with technology

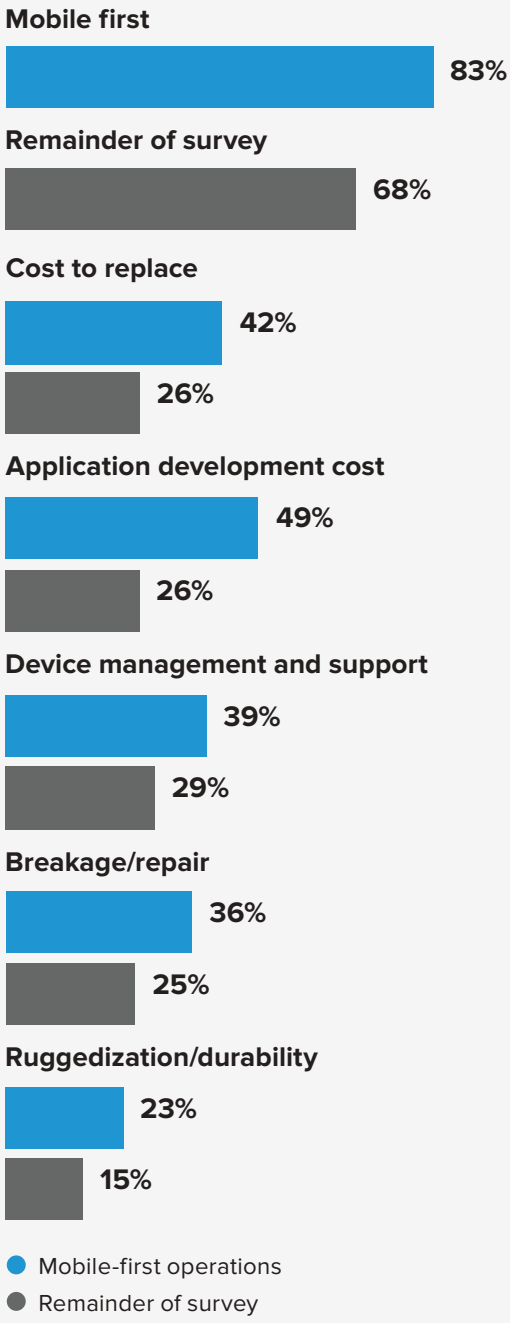


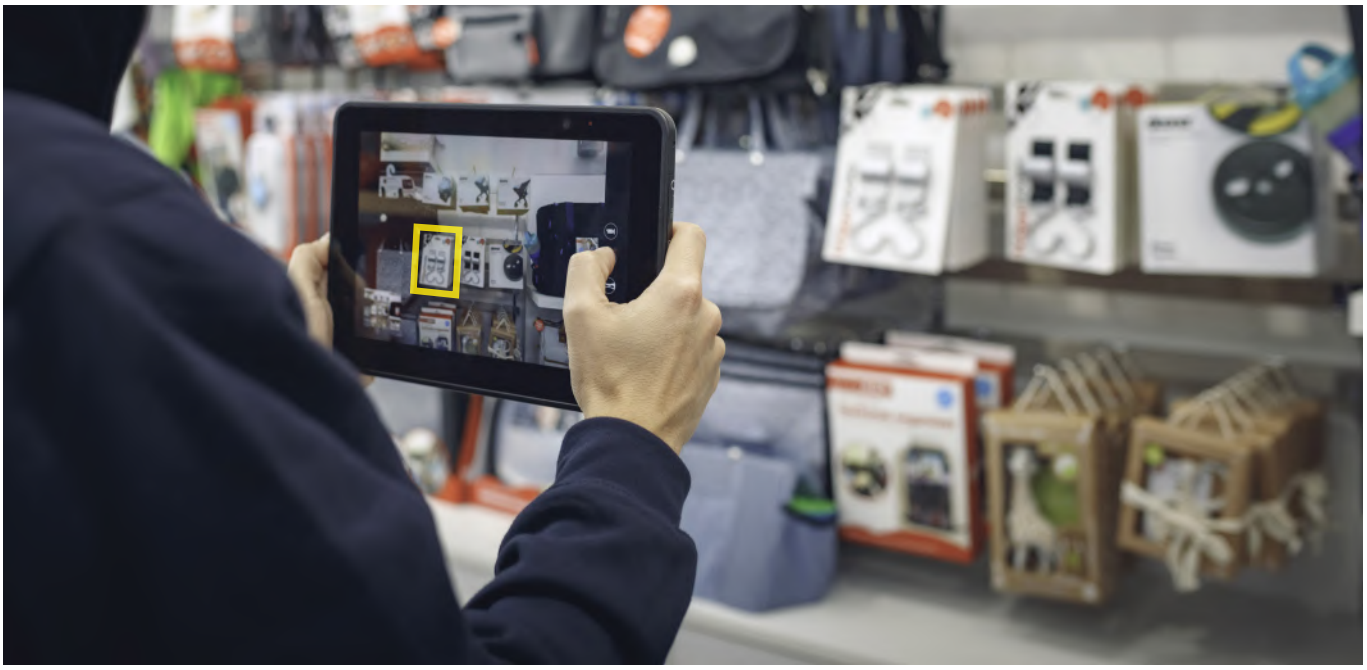
2. Evaluating the total cost of ownership (TCO) of mobile technology as a standard practice

A key driver of productivity, efficiency and cost-savings in field operations is ensuring ruggedized enterprise devices replace traditional consumer ones. Overall, field operations decision makers believe in the value of conducting a TCO analysis of enterprise devices. More than three-quarters of respondents usually or always conduct a TCO analysis of business devices prior to making a capital expenditure. Only 34% of respondents believe that consumer smartphones have better TCO than rugged devices.



Conduct routine mobile technology TCO analyses

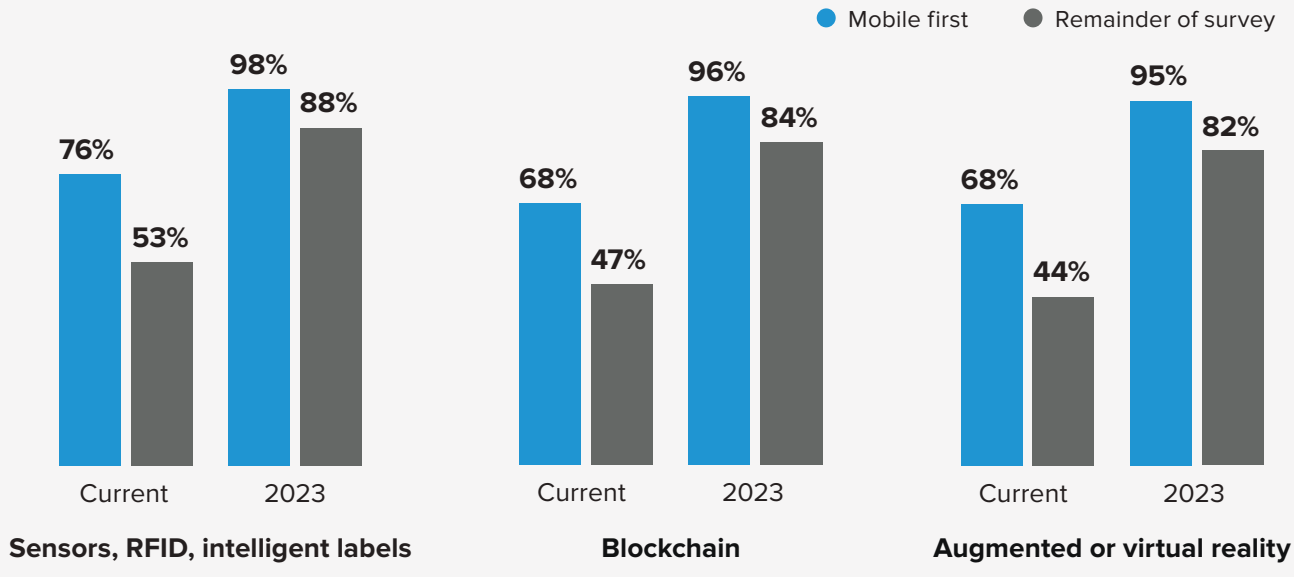




3. Utilizing emerging field operations technologies

Leading organizations are also early adopters of emerging field operations technologies such as augmented reality that can enhance the efficiency of detailed workflows such as merchandising. Other technologies they are adopting, such as RFID and blockchain, boost efficiency and data granularity in tracking goods and their chains of custody. Mobile-first operations are combining mobility scaling, building out the Internet of Things and integrating 4G and even faster 5G networks into their operations to get even more value from these technologies.

Emerging technology adoption projections



Integrating mobility and emerging technologies can be transformative

Mobile-first operations are leading the way for others to provide better field service performance than ever. In just a few years, 5G wireless technology will enable concurrent high-speed Big Data processing in the cloud and edge computing in the Internet of Things. Greater computational capability will power machine learning algorithms in applications developed to drive the creation of more specialized high-performance workflows that save time and money. A few examples demonstrate the potential of these technologies to transform field operations.

Challenge: Large-scale truck inspections

To stay in compliance with regulations, the manager of a fleet of several hundred trucks at a manufacturing company needs to establish a process for driver pre-and post-trip inspections that is both easy to do and verifiable.

Solution: Utilize RFID tags and handheld readers for task check-offs

Embedding a passive RFID tag near every component on the inspection list to be checked on each truck is part of a fleet-based Internet of Things. The system includes rugged tablets equipped with RFID readers and a vehicle telematics database with truck componentry operating and inspection data.

Before and after completing their delivery routes, drivers inspect each listed component and read its tag using the rugged tablets. The process effectively checks each component off the list, which is easy to read on a large screen. The fleet manager ensures compliance and combines vehicle operating data and inspection data to maximize fleet uptime.

Challenge: Ensure efficient, accurate store display stocking without supervision

On his first day on the job, a route sales associate for a grocery brand prepares to stock a display at several stores. Due to scheduling conflicts, his manager cannot accompany him and demonstrate the proper stocking method in person.

Solution: Use an augmented reality application and head-up display

Before the associate leaves the sales office, his manager has him quickly test a head-up display (HUD) running an augmented reality (AR) application that guides him through the proper stocking process. At the first store, he views the display with an overlay showing where items should be placed and their correct orientations. The system provides guidance as fast as he stocks the display. He repeats the process at each store on his route, consistently setting up displays correctly and finishing the last store ahead of schedule.

Challenge: Maximize and verify home medical device uptime

An equipment service manager at a home health agency needs to ensure the operational continuity of multiple manufacturers' oxygen concentrators and ventilators in hundreds of home accounts within her large rural district. A big part of her job is ensuring that field service technicians for multiple equipment suppliers keep the equipment in good operating condition, but on-location oversight is unrealistic.

Solution: Set up a secure blockchain to document maintenance events

She proposes a secure blockchain, an 'encrypted digital ledger,' to the agency's chief technology officer. The CTO sets up a blockchain that stores data documenting each device's chain of custody, from the manufacturer to the home health aide who puts it into service. Technicians use multi-step authentication to access each device's historical service record with handheld mobile computers and document maintenance activity in the blockchain. The blockchain also contains each device's manufacturing data, including date, facility, lot number and warranty information, as well as service history — valuable in case of operating disruptions between maintenance events.

The service manager can look up the history of every device and generate reports to provide visibility into the degree of technicians' adherence to preventive maintenance schedules. The reports keep the agency in compliance with regulations for safe device operating conditions. Over time, she develops performance-based maintenance service level agreements from service event data, allowing her to use data-driven contract negotiations with device suppliers to control costs.

Regional Findings

On a global scale, the survey indicates that leading organizations are equipping their teams with mobile technology to improve work performance. The data also revealed a few regional differences in approaches to better performance.

Asia Pacific
44% of respondents consider truck loading automation will be among one of the most disruptive technologies, compared respectively to 28 percent globally.

44%

70%

Europe, Middle East and Africa
70% of respondents agree e-commerce is driving the need for faster field operation.

Latin America
83% agree that faster wireless networks (4G/5G) are driving greater investment in new field operations technologies, compared with 70% of the overall sample.

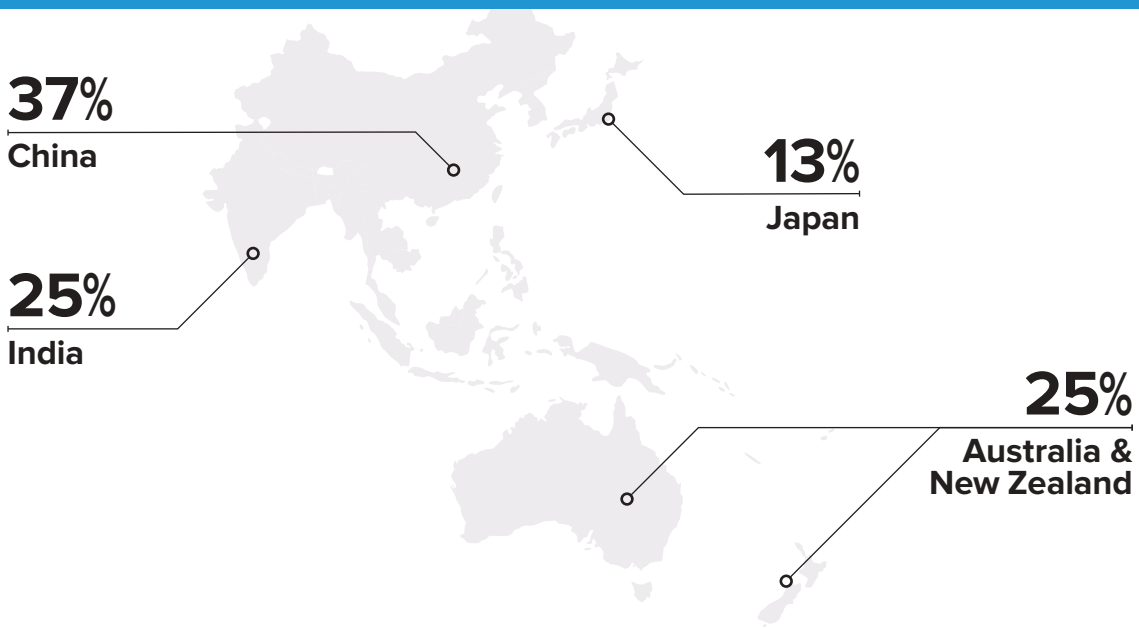
83%

36%

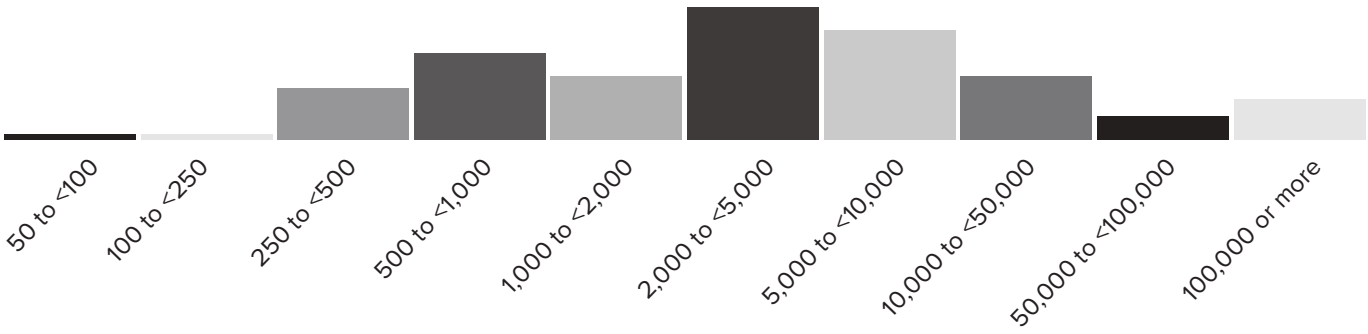
North America
36% of respondents plan to implement rugged tablets in the next year.

About the study

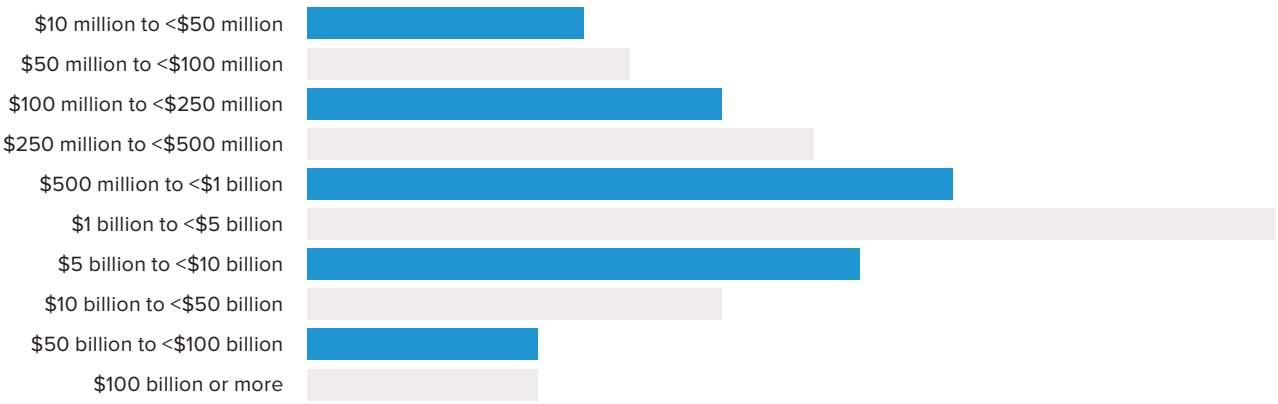
Participants by geographic region



By number of employees



By revenue (USD)



*Incomes are in U.S. Dollars

Mobility and edge computing technologies can power higher performance

Field operations teams are tasked with serving customers who are increasingly empowered to seize value when making purchase decisions. To build brand loyalty, field operations decision makers must continually figure out how to help their teams do their work faster, more proficiently and more cost-effectively.

In our increasingly connected world, organizations have endless possibilities for transforming field operations with new mobility and edge tech driven workflows. The technologies that can power new workflows already exist or will soon be available. Achieving better field operations performance is a matter of selecting the best combinations of mobile technology and software applications.

About Zebra Technologies

Zebra offers a portfolio of hardware, software, supplies and services to enable front-line field teams to raise their performance and meet the challenges of today's on-demand economy.

For more information, visit **zebra.com/fieldmobility**

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