

inpixon 

/ THE STATE OF
INDOOR INTELLIGENCE
2021

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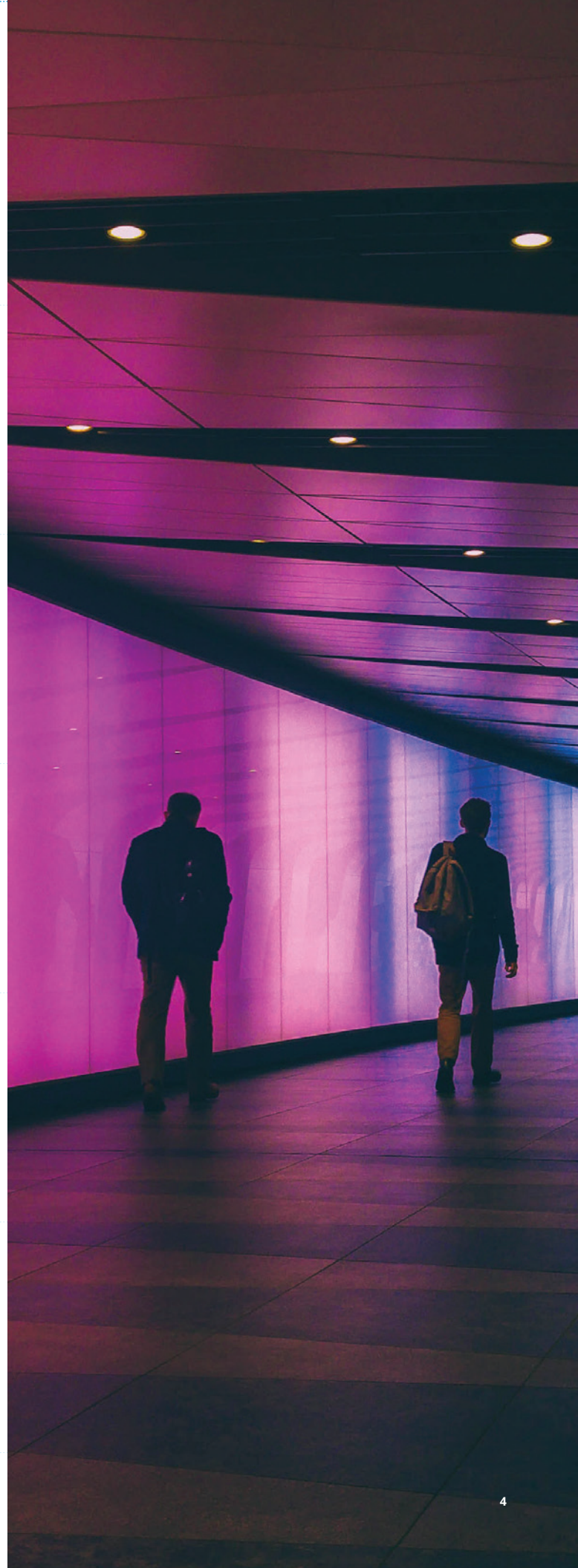
/ 19 CONCLUSIONS & PREDICTIONS FOR 2021

After a year of
unprecedented disruption
and global transformation,
indoor intelligence
technology has been thrust
into the spotlight.

In the face of great adversity, many firms accomplished digital transformations that seemed impossible a year ago – in some cases in a matter of days. Throughout 2020, many organizations chose to harness the power of indoor intelligence technologies to make life-saving decisions that, in many cases, had a huge impact on their likelihood of survival. Under the relentless pressure of new realities and customer needs, the situation became starkly clear: an organization's adaptability is a key determining factor to its success. Whilst there hopefully won't be another pandemic in our near future, there will always be hurdles and challenges. Adoption of innovative technologies, and its strategic application, will therefore be of highest priority.

Our future successes depend on how quickly and effectively we harness technology to empower workforces and build differentiated businesses, and indoor intelligence has quickly emerged as a solution to many of the issues faced by organizations globally.

Throughout this report derived from our proprietary research and industry analysis, technology adoption has been a common theme, and that is reflected in our 2021 predictions. The ability to harness the power of the multitude of indoor data housed within facilities to garner actionable insights will be key to building resiliency within organizations. In efforts to survive the current pandemic and not be knocked down by whatever challenges we face next, indoor location technologies open the door to growth and success for organizations in all sectors.





/ WHAT IS INDOOR INTELLIGENCE?

Indoor intelligence is created by leveraging algorithms and machine learning to convert raw data into actionable insights. It can be helpful to consider it as the convergence of several key elements: advanced indoor maps; precise indoor positioning; indoor analytics; and building and data security.

Activating indoor intelligence is the key to transforming the ways in which we interact with our built environment. It reveals a world of possibilities, allowing us to make our world better by improving operations and building energy efficiencies while simultaneously creating hyper-contextual personalized experiences. Indoor intelligence supports the use cases that keep people safe and secure while smoothing some of the greatest friction points of our daily lives.

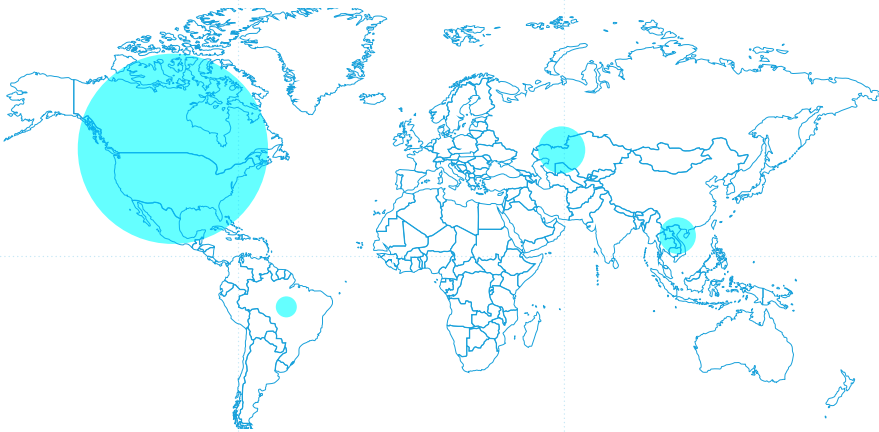
At its core, indoor intelligence comes down to the elements of location data collection, contextualization, and analysis, made simple with the power of an AI-driven indoor intelligence platform.

/ RESPONDENT BREAKDOWN

In addition to industry analysis, Inpixon surveyed 143 leaders from organizations, largely based in North America. Our wide array of respondents enables us to share perspectives from many industries and regions.

143

TOTAL RESPONDENTS FROM
4 CONTINENTS ACROSS 22 INDUSTRIES

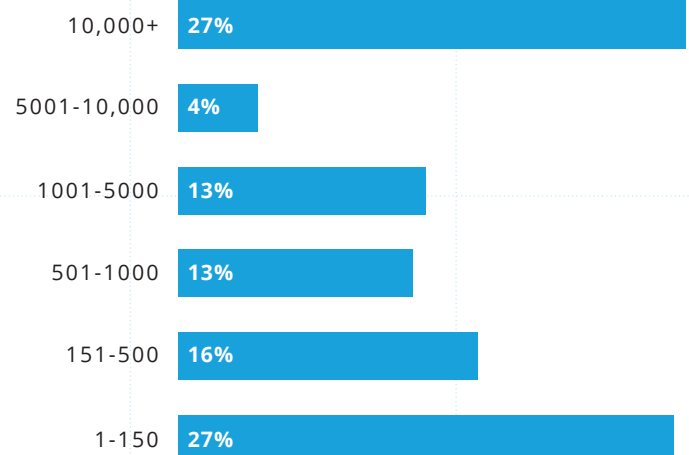


- 124** FROM NORTH AMERICA
- 2** FROM LATIN AMERICA
- 10** FROM EUROPE / MIDDLE EAST
- 7** FROM ASIA PACIFIC

INDUSTRIES

- 24%** TECHNOLOGY
- 15%** MANUFACTURING & LOGISTICS
- 13%** RETAIL & HOSPITALITY
- 13%** FINANCE & CORPORATE SERVICES
- 11%** EDUCATION
- 10%** HEALTHCARE
- 8%** GOVERNMENT
- 6%** OTHER

COMPANY SIZES



/ SUMMARY OF KEY FINDINGS

74%

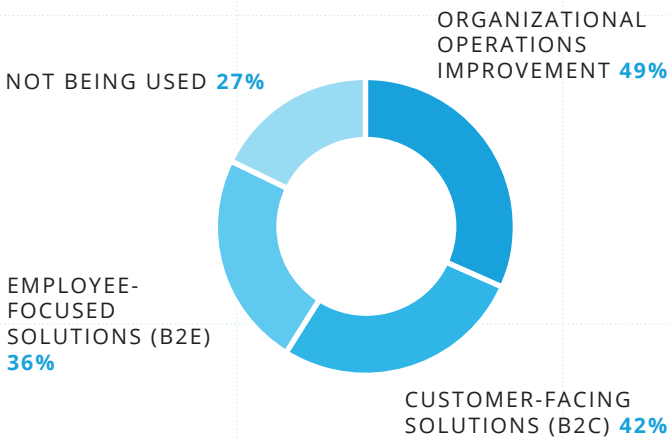
OF RESPONDENTS ARE USING INDOOR INTELLIGENCE IN THEIR ORGANIZATIONS,

YET ONLY 35% BELIEVE THAT EMPLOYEES WITHIN THEIR ORGANIZATIONS ARE AWARE OF INDOOR TECHNOLOGY AND ITS BENEFITS.

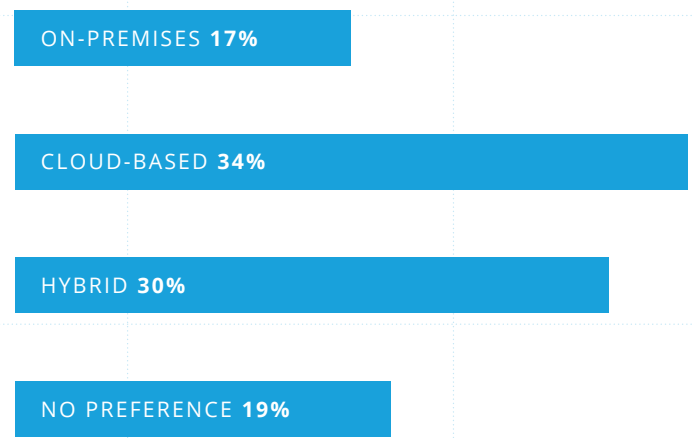
38%

DON'T FEEL THAT EMPLOYEES IN THEIR ORGANIZATION ARE AWARE OF INDOOR INTELLIGENCE AND ITS BENEFITS.

INDOOR INTELLIGENCE SOLUTIONS ARE BEING USED FOR:



IT'S IMPORTANT THAT AN INDOOR INTELLIGENCE SOLUTION IS:



82%

BELIEVE INDOOR INTELLIGENCE AND LOCATION-AWARENESS ARE IMPORTANT TO ACHIEVING THEIR GOALS IN 2021

81%

BELIEVE INDOOR INTELLIGENCE SOLUTIONS ARE IMPORTANT TO REMAIN COMPETITIVE IN THEIR INDUSTRIES

/ CURRENT STATE OF ADOPTION

In evaluating the current state of adoption of indoor intelligence technologies and associated use cases, we hoped to understand not only where each industry stood in terms of their efforts, but also to gain insight into the pervasive attitudes, hesitations or blockers to adoption, and general awareness of this area of technology and its benefits.

HOW IS INDOOR INTELLIGENCE TECHNOLOGY BEING USED?

42%

CUSTOMER-FACING SOLUTIONS (B2C)

36%

EMPLOYEE-FOCUSED SOLUTIONS (B2E)

49%

ORGANIZATIONAL OPERATIONS IMPROVEMENT

27%

NOT BEING USED

A recurring theme throughout our research is that indoor intelligence technology is not being treated as a one-off. Our findings suggest that it is rare for an organization to limit their use of indoor intelligence to a single problem area. Of the organizations that are using indoor intelligence technology for customer-facing solutions, employee-focused solutions, or organization operations improvements, 37% of organizations are using indoor intelligence technology for two or more areas.

Our research indicates that while there has been an increase in indoor location technology adoption in the last year, there is still a long way to go in terms of industry education. When asked if the employees within their organization were aware of indoor intelligence technology and its benefits, only 35% agreed compared to the remaining 65% who either disagreed with that sentiment (38%), or neither agreed nor disagreed (27%).

Organizations who are undertaking digital transformations in the next twelve to twenty-four months would be wise to leverage change management tools and practices to educate

their workforce on the types of technologies they are implementing and how they relate to security initiatives.

In our evaluation of hesitations and blockers around indoor intelligence technology adoption, privacy concerns and a lack of internal understanding presented a huge blocker to adoption and advancement.

BLOCKERS / REASONS FOR HESITATION:

PRICING 51%

PRIVACY 47%

LACK OF UNDERSTANDING 41%

LACK OF DEMONSTRATED NEED 24%

LACK OF INTERNAL PROJECT OWNERSHIP 22%

NONE 10%

41% of those who indicated a lack of internal understanding also pointed to privacy concerns as being a major hesitation for their organization. Understandably, privacy concerns were noted across government and public sector respondents, with **67%** flagging privacy as their major hesitation as compared to only **25%** calling out pricing.

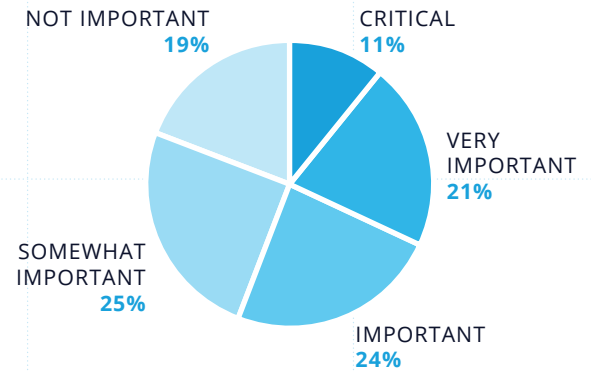
In contrast, the major potential blocker for the warehousing, manufacturing and logistics space was pricing, with **60%** flagging it as a major concern as opposed to **20%** indicating privacy issues.

If left unaddressed, this lack of understanding around privacy protection in indoor intelligence could lead to major delays on projects where time is of the essence, both in terms of execution and internal buy-in from key stakeholders, especially in public sector initiatives.

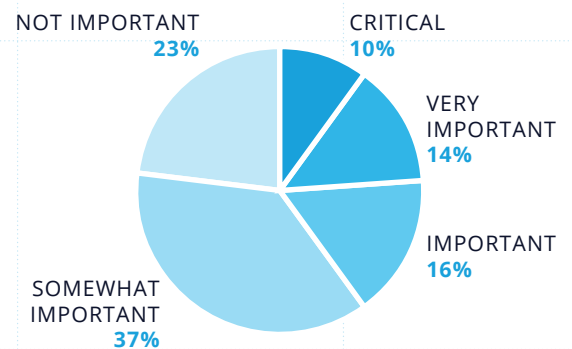
Our survey responses indicate that the industries that place a greater importance on indoor intelligence technologies are varied. However, when it comes to achieving organizational goals, the technology, healthcare and retail sectors stood apart with more respondents from those areas indicating that indoor intelligence was critical or very important. In contrast, the industries that consider indoor intelligence as a key point for remaining competitive are manufacturing, warehousing and logistics, technology, and finance and corporate services.

HOW IMPORTANT IS INDOOR INTELLIGENCE TO:

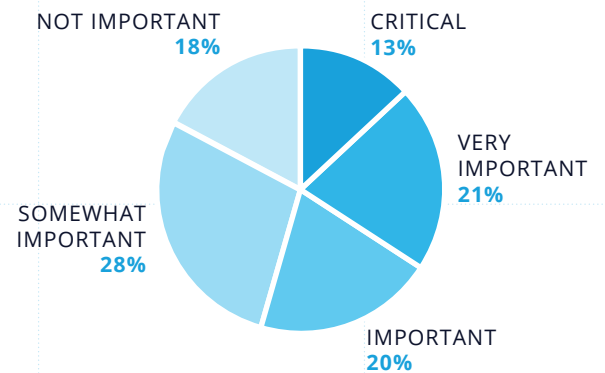
REMAINING COMPETITIVE:



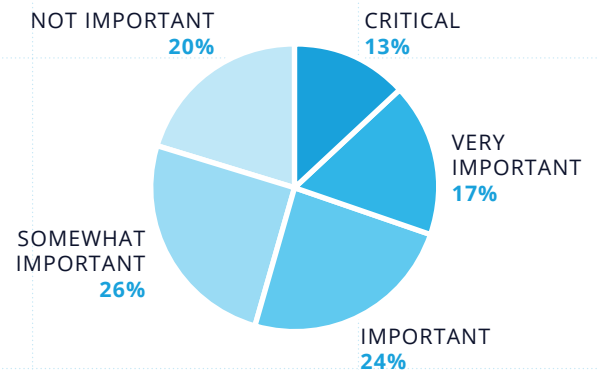
ONGOING OPERATIONS:



ACHIEVING ORGANIZATIONAL GOALS:



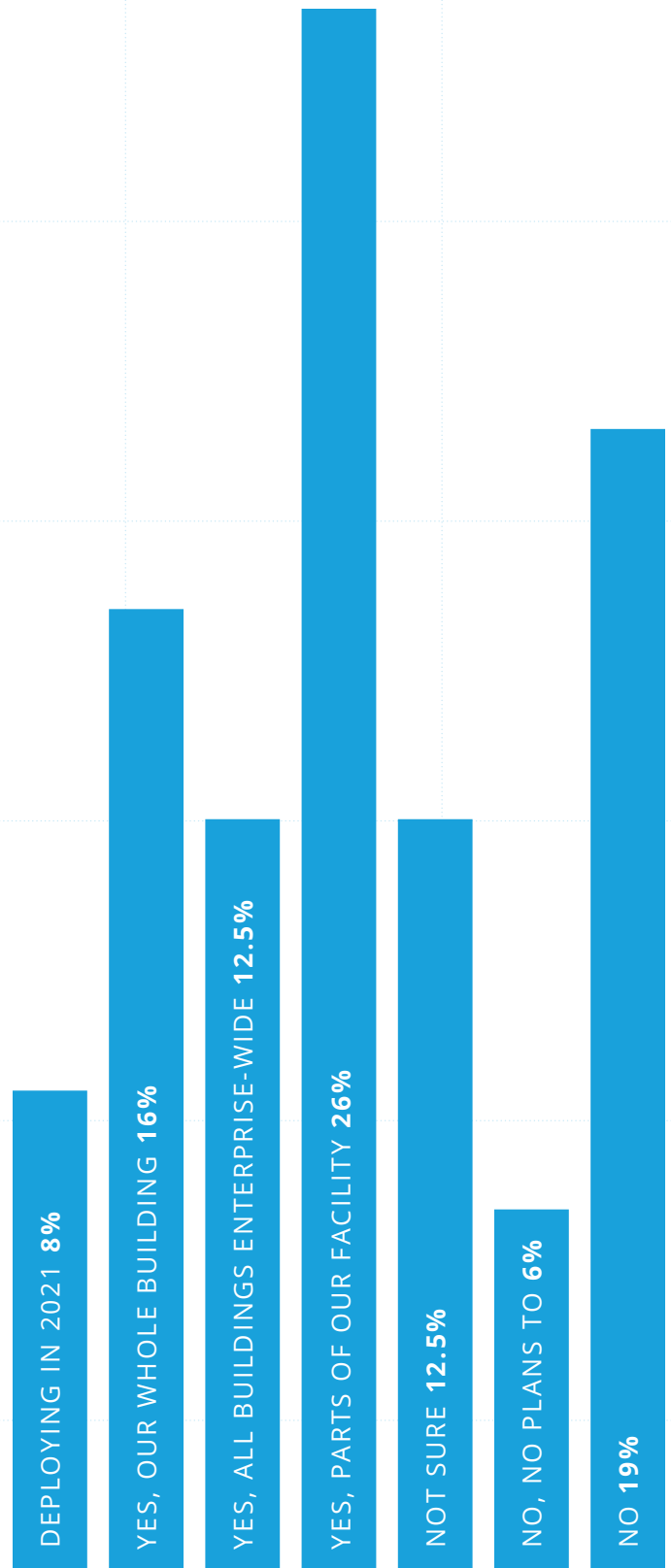
MAKING KEY DECISIONS:



As layer-based digital maps are the foundational layer for most indoor IoT use cases, the adoption and progress of indoor mapping initiatives are a key benchmark for indoor intelligence adoption.

30% of respondents indicated that prior to 2020, they had at least mapped parts of their facilities, whereas 50% hadn't mapped anything. 22% of those organizations who were lagging in map digitization were in the manufacturing, warehousing and logistics sector. 36% of the respondents who identified themselves as being very involved with their organization's indoor intelligence initiatives said their organizations had undertaken new indoor mapping initiatives in 2020, either to map whole buildings or parts of facilities.

Of the 64% of organizations that didn't undertake any new indoor mapping initiatives in the last year, only 22% of them had maps for any amount of their facilities. With a quarter of respondents indicating they hadn't, and 12.5% unsure if their organization had done any indoor mapping, there is clearly room to grow in the indoor mapping space. It is also important to note that of the 6% who have no plans to undertake indoor mapping initiatives, more than half (56%) were organizations with less than 1,000 employees.



AS OF DECEMBER 2020, ARE ANY OF YOUR MAPS DIGITIZED:



/ OTHER USE CASES

Security use cases that cultivate situational awareness, such as wireless device detection, are becoming more important in the industries where they are required for compliance and data protection. Outside of those sectors, awareness and engagement in wireless device detection solutions is virtually nonexistent. The respondents that indicated that they are planning to deploy these security solutions in 2021 were from the healthcare, finance, government and technology sectors.

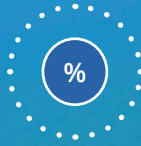
With 41% of respondents indicating that their organizations had implemented job site worker safety solutions before December of 2020, and a further 28% either in the process of or planning to deploy in 2021, this use case is nearing its zenith in terms of adoption rates. In contrast, despite the popular discussion in previous years, smart parking adoption has been underwhelming, and with 69% of organizations indicating they have no plans to deploy it, we expect smart parking to take a back seat in public discourse.

Generally, indoor intelligence use case rates are holding steady across the board, and in the next year, we predict that the significant number of respondents indicating that their organization has no plans to deploy indoor intelligence use cases will shift down from the current average of 43% when faced with issues around competitiveness and compliance.

LEGEND:



DEPLOYED PRIOR TO 2020



DEPLOYED IN 2020



IN PROCESS OF DEPLOYMENT



PLAN TO DEPLOY IN 2021



CURRENTLY NOT PLANNED

INDOOR NAVIGATION AND WAYFINDING:

ASSET TRACKING:



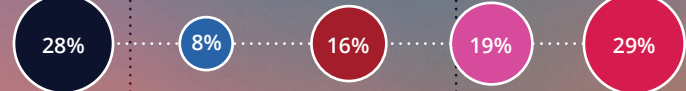
WIRELESS DEVICE DETECTION:

DIGITAL CONTACT TRACING:



LOCATION-AWARE EMPLOYEE APPLICATION:

BUSINESS INTELLIGENCE:



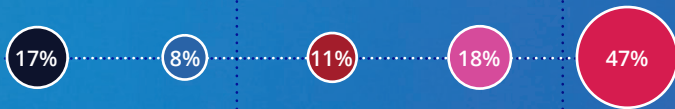
**POPULATION FLOW ANALYTICS
WITHIN BUILDINGS:**



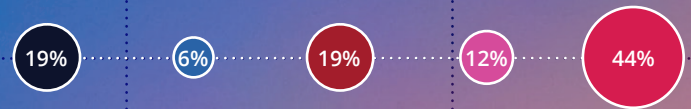
OUTDOOR-INDOOR NAVIGATION:



GEOFENCING:



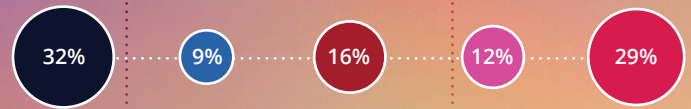
**LOCATION SHARING THROUGH
LOCATION-AWARE APPLICATION:**



PROXIMITY MESSAGING:



JOB SITE WORKER SAFETY:



SMART PARKING:



BUILDING ENERGY EFFICIENCY:



/ FEATURES AND INTEGRATIONS

IT'S IMPORTANT THAT AN INDOOR INTELLIGENCE SOLUTION IS:

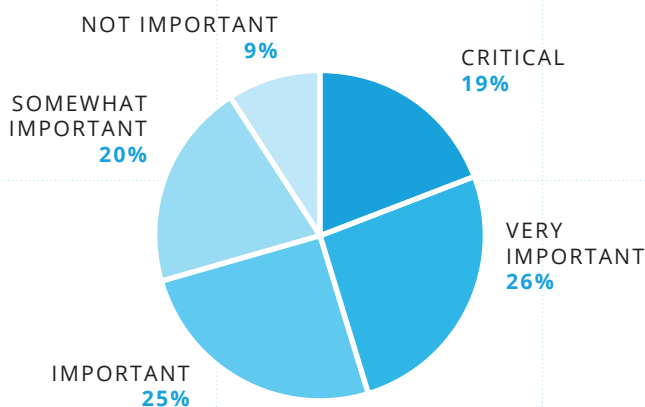
ON-PREMISES 17%

CLOUD-BASED 34%

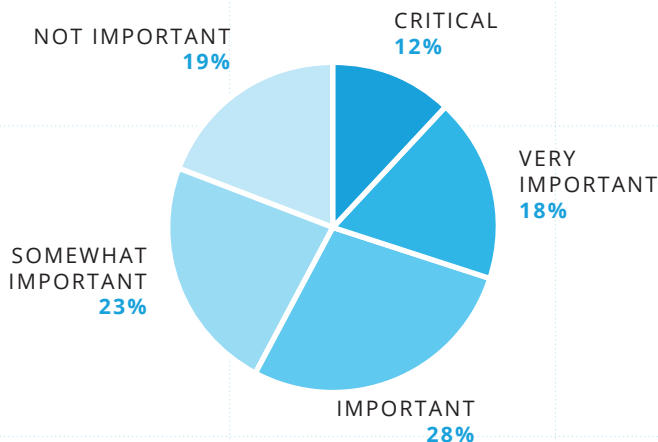
HYBRID 30%

NO PREFERENCE 19%

HOW IMPORTANT IS INTEROPERABILITY TO YOUR ORGANIZATION WHEN SELECTING AN INDOOR INTELLIGENCE PLATFORM?



HOW IMPORTANT IS IT THAT YOUR SOLUTION ADDRESSES MULTIPLE USE CASES?



When it comes to features and integrations, the extensibility of an indoor intelligence solution is key. Across the board, interoperability was important to all industries represented in our survey. Only 9% of respondents indicated that a platform's ability to integrate and work with third-party software and technologies was not an important consideration when choosing an indoor intelligence solution.

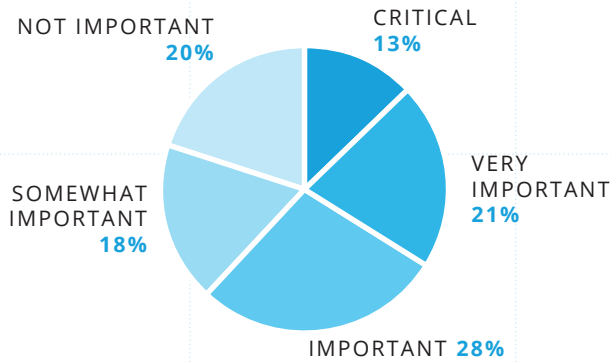
Similarly, albeit to a lesser extent, the data shows that organizations prefer indoor intelligence solutions that address multiple use cases. This corroborates the finding that a significant number of organizations who are using indoor intelligence technologies are doing so to address multiple pain points.

A key differentiator between the indoor intelligence solutions available on the market today is whether their offering is cloud-based, on-premises or a hybrid solution. Due to the nature of the kind of data indoor intelligence technology captures and interprets, we were interested to find out how important this consideration is to organizations, and if there was a trend toward which sectors mandated that data be hosted on-premises.

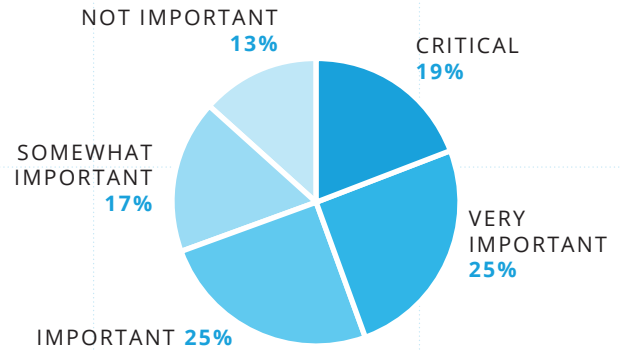
Our findings indicate that 34% of organizations prefer cloud-based solutions, while only 17% require a strictly on-premises solution. Of those who indicated a strong preference for on-premises solutions, 33% were public sector organizations who self-identified as being in the education, military and government fields. Interestingly, 19% of respondents had no preference for where their solution and its data are housed.

/ HOW IMPORTANT ARE THE FOLLOWING INTEGRATIONS?

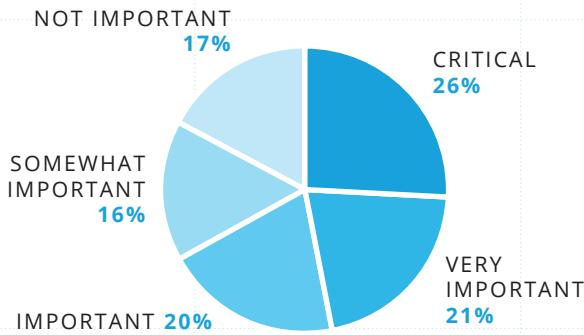
HRIS SYSTEMS:



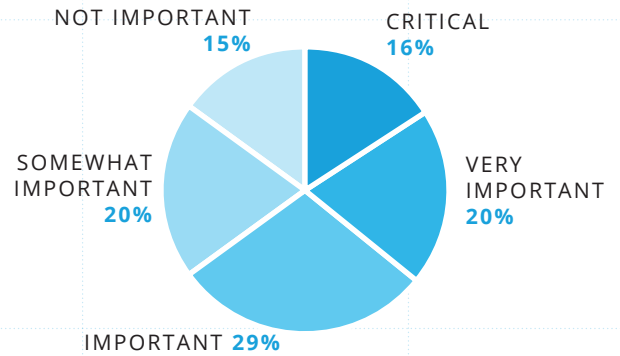
CALENDARS AND ROOM BOOKING TOOLS:



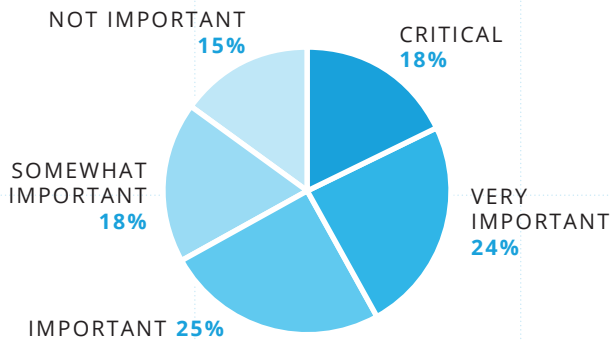
HVAC AND BUILDING SYSTEMS:



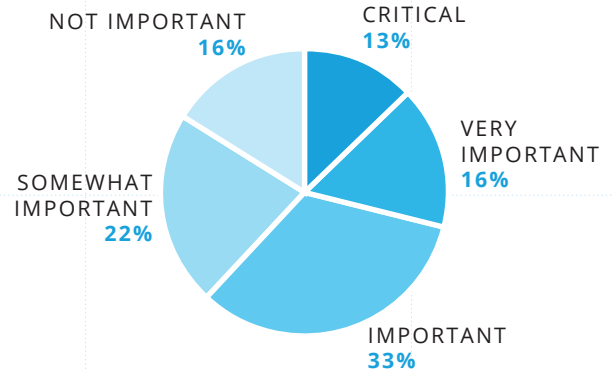
IOT DEVICES:



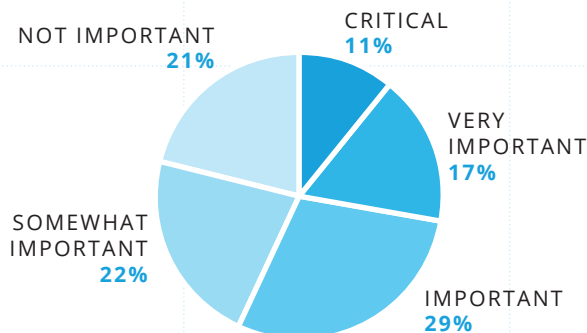
MOBILE DEVICE MANAGEMENT SOLUTIONS:



INDUSTRY-SPECIFIC INTEGRATIONS:



THIRD-PARTY POSITIONING SENSOR TECHNOLOGY:

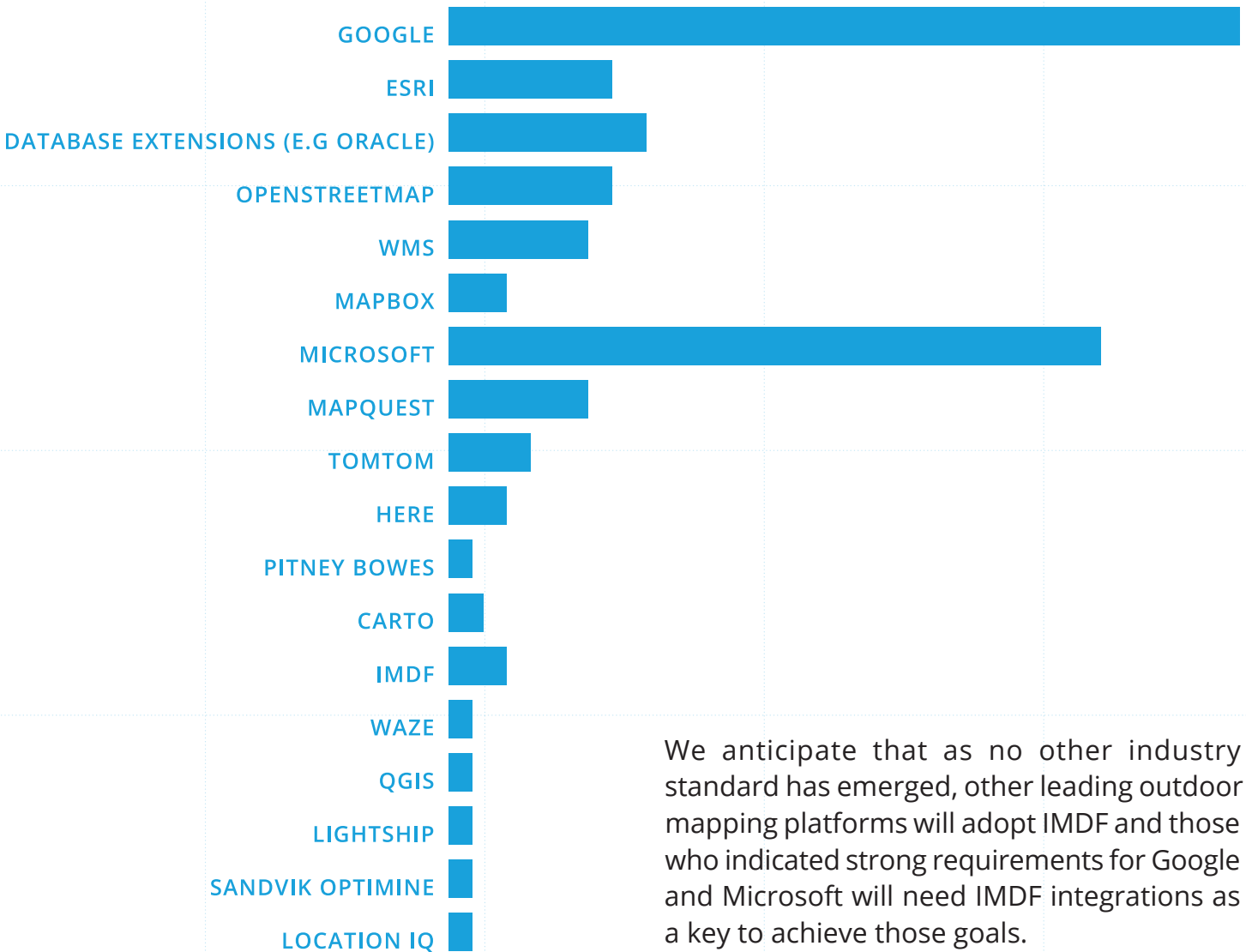
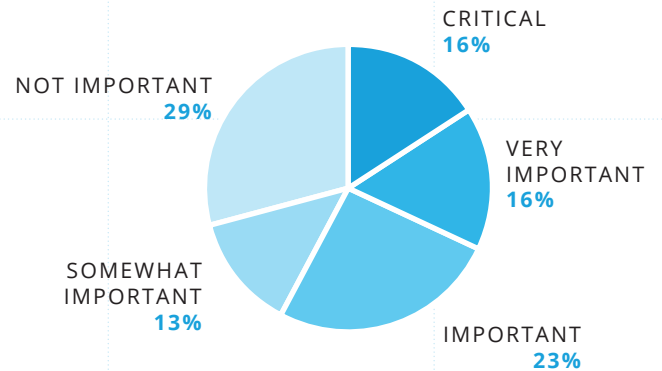


Critical industry-specific organizations included worker safety software for international compliance and low code productivity apps like MS Power and GoCanvas.

/ GIS INTEGRATIONS

47% of respondents elaborated further on their need for GIS integrations. In this category, interoperability with Google and Microsoft stood out overwhelmingly with 68% and 56% respectively. Apple’s Indoor Mapping Data Format (IMDF) is poised to become the industry standard for indoor mapping. It is a standardized data model used to describe a venue that can be rendered on any device and is the first step to enabling indoor positioning for iOS apps.

HOW IMPORTANT ARE GIS TECHNOLOGIES:



We anticipate that as no other industry standard has emerged, other leading outdoor mapping platforms will adopt IMDF and those who indicated strong requirements for Google and Microsoft will need IMDF integrations as a key to achieve those goals.

/ THE IMPACT OF COVID-19

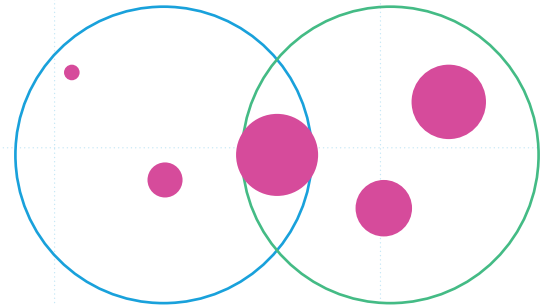
It is impossible to isolate the changes that happened in the last year from the overwhelming impact of the global COVID-19 pandemic. It proved to be an unexpected catalyst for IoT adoption as workplaces around the world undertook rapid digital transformations in order to stay afloat and keep operations going during tumultuous times. Only 17% of organizations surveyed disagreed with the statement that the COVID-19 pandemic accelerated their timelines for indoor intelligence technology initiatives.

THE COVID-19 PANDEMIC ACCELERATED OUR TIMELINES FOR OUR INDOOR INTELLIGENCE TECHNOLOGY INITIATIVES:

- STRONGLY AGREE **23%**
- SOMEWHAT AGREE **25%**
- NEUTRAL **33%**
- DISAGREE **11%**
- STRONGLY DISAGREE **6%**

DISAGREE

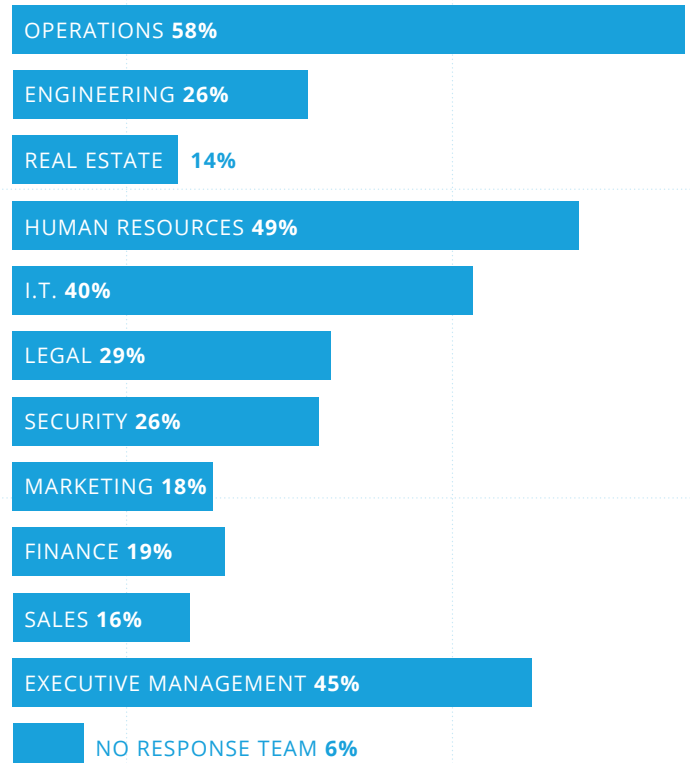
AGREE



2020 was shaped by the push to enable remote working and improve health and safety for the eventual return to the office. While many larger technology companies made the public decision to move to a remote-first workforce, some big players have been expanding their real estate footprint.

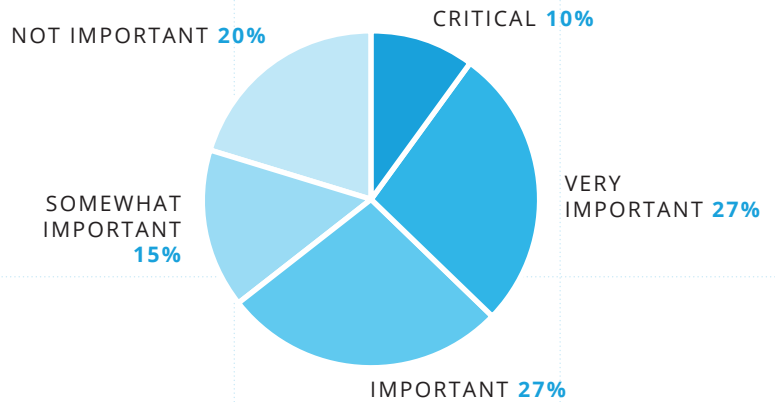
In order to assess risks and get their people back to work safely, many organizations established in-house task forces to coordinate the logistics around return-to-work best practices and procedures. Unsurprisingly, operations, human resources, executive management and IT had the greatest share of representation on these teams.

WHICH DEPARTMENTS HAD REPRESENTATION ON ORGANIZATIONAL PANDEMIC RESPONSE TEAMS:



Indoor intelligence technology can play many roles and support many efforts in the return-to-work process. While only 10% of organizations indicated that indoor intelligence and location technologies were critical to these efforts, 69% of organizations identified that it was still important to varying degrees for their post-pandemic workplace planning.

HOW IMPORTANT ARE INDOOR INTELLIGENCE AND LOCATION TECHNOLOGIES TO YOUR RETURN-TO-WORK PLAN?

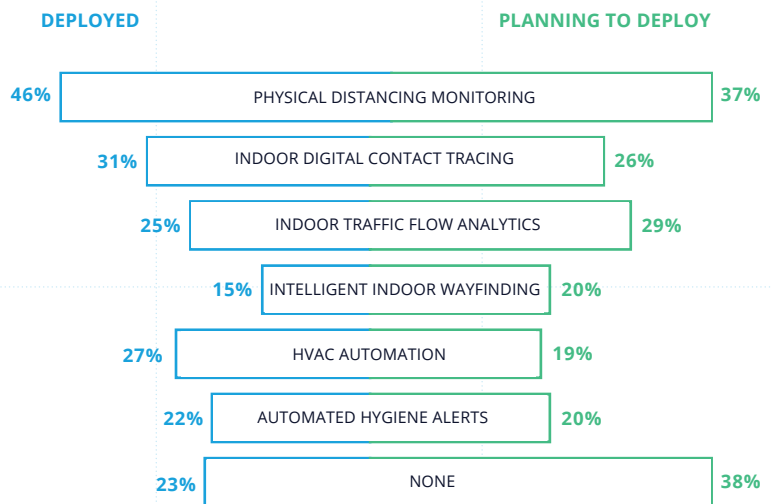


With 46% of respondents indicating that their organizations implemented physical distancing monitoring in the last year and 37% planning to in the next year, using physical distancing monitoring stands out as the most popular tool for organizations to make their spaces safer. Indoor digital contact tracing stands out as a high adoption and high opportunity use case for organizations who are serious about mitigating outbreaks in their offices in the future.

For all use cases aside from physical distancing, approximately a quarter of organizations are engaged in adoption, or have already adopted, these technologies. Our research also indicates that about a third of all respondents across industries have no plans to implement any technology solutions to make their spaces smarter. We predict that this may lead to continued remote working protocols in those organizations or may shift if it becomes a compliance issue in their respective regions.

USE CASES DEPLOYED BY ORGANIZATIONS TO ADDRESS COVID-19:

Because we are still in the midst of the second wave at the time of publication, we were very interested to find out what methods organizations used over the last twelve months, and which are in the deployment pipeline for 2021.



/ CONCLUSIONS AND PREDICTIONS FOR 2021

For all of the proclamations that 2020 was an unprecedented year, our world is constantly on the cusp of change. The global pandemic is not yet over and in the face of uncertainty, we anticipate that organizations will need to continue to shore up their technological infrastructure. Failure to undertake digital transformation initiatives now will lead to pain points for organizations of all sizes in the future.

According to Forrester's predictions for 2021, Edge is the New Cloud, "30% of firms will continue to accelerate their spend on cloud security and risk, networks, and mobility - including struggling firms looking to leapfrog less wily competitors and gain advantage coming out of the pandemic."

Willingness to embrace indoor intelligence solutions will become a key determinant of an organization's ability to remain competitive in the year to come. Those organizations that delay and remain short-sighted in their strategy will find themselves unable to grasp leadership positions in their industries, becoming stuck dealing with technical debt and employee attrition.

COVID-19 has taken center-stage as the unexpected catalyst of digital transformation, and 2021 will see further technology adoption as a result. Organization leaders and indoor intelligence technologies must devote time in 2021 to raising awareness of these solutions and educating workforces on these solutions and their benefits. Where there is misunderstanding and ignorance, especially around privacy concerns, there will be detrimental delays and roadblocks that put innovative initiatives at great risk.

/ ABOUT THE SURVEY & METHODOLOGY

Conducted in November and December 2020, Inpixon's online survey received 143 responses from around the world. Percentages indicated throughout the results are rounded to the nearest full point.

/ ABOUT INPIXON

Inpixon is an indoor data company. Our Indoor Intelligence™ platform and patented technologies empower users to harness the power of indoor data to create actionable intelligence. We specialize in capturing, interpreting and visualizing indoor data to make indoor spaces smarter, safer and more secure.

Our solutions are leveraged by a multitude of industries and disciplines to do good with indoor data. This multidisciplinary depiction of indoor data enables users to increase revenue, decrease costs, and enhance safety. Inpixon customers can take advantage of mapping, positioning, analytics, sensor fusion and the Internet of Things (IoT) to uncover the untold stories of the indoors.

Learn more at www.inpixon.com.



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