

A Forrester Total Economic  
Impact™ Study  
Commissioned By Microsoft

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# Assessing The Value Of Accessible Technologies For Organizations

A Total Economic Impact™ Study  
Commissioned By Microsoft

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### ABOUT FORRESTER CONSULTING

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## Executive Summary

In today's digital economy, customers and employees are in the driving seat. Technology is changing the way people work, play, and perform most of their daily tasks. For the employer, a knowledge-based economy means that successful employees need to have access to a wide variety of technologies. And with the prevalence of consumer smartphones, tablets, and mature enterprise mobile applications, empowered employees are demanding flexible working styles, adding pressure on organizations to change how they support all of their employees and to ensure they can accommodate all of their customers. In an era where employees are always connected and able to work online from many locations, adopting accessible technologies and strategies offers organizations the flexibility to drive higher levels of productivity, boost employee retention, meet regulatory needs, and ensure that the content developed can be used by all of their customers. In order to measure the value of these types of benefits in quantified terms, we must first understand the drivers and metrics associated with the use of accessible technology within the organization.

Microsoft commissioned Forrester Consulting to conduct an independent study to identify and quantify economic and socioeconomic outcomes resulting from an investment in accessible technologies, to enable easier access for both employees and customers. To better understand the economic and socioeconomic benefits of leveraging accessible technologies, Forrester discussed with interviewees the role they play in facilitating access both internally (supporting employees) and externally (in customer-facing applications). Forrester defines accessible technologies as those that:

- “Are designed to provide additional accessibility and/or capabilities to individuals who have physical or cognitive difficulties, impairments, and disabilities”
- “Make it easier for people to see, hear, and use devices and services.”

Examples of accessible technologies include: screen readers, adaptive input devices, speech recognition, cognitive assistance tools, and wearables (e.g., smart glasses). Technologies of this type can be part of both mainstream technology and assistive technology.

While delving into the way that organizations acquire and use accessible technologies, Forrester also explored how adopting accessibility strategies affects both private and public sector organizations. Forrester defines an accessibility strategy as:

- “A deliberate plan to create and ensure a more accessible workforce or an intended strategy to make goods and services provided to customers more accessible.”

In this study, we find that adoption of accessible technologies provides tangible economic and social value, specifically in the context of employers. We quantify these trends to help organizations working on their accessibility strategies understand the wide range of benefits that accrue when investments are made in this area. We split the analysis into two main sections, to better understand the quantitative value accrued by providing both employees and customers better support. For employees, this quantified value is largely driven by an increase in productivity for everyone in the organization, as well as the ability to access the best talent; for customers, the quantification covers both an increase in potential revenue as well as cost reductions (see Figure 1).

FIGURE 1

## Summary List Of Benefits To The Organization Explored In The Study

| Focus  | Benefits                                      | As Measured By:                                  |
|--|---|--|
| <i>Benefits associated with providing accessibility options for employees</i>              | <b>Quantitative benefits:</b>                 |  |
|  | › Workforce productivity                      | › Time required to complete tasks                |
|  | › Recruitment costs                           | › Cost avoided by higher employee retention      |
|  | › Compliance                                  | › Legal fees avoided                             |
|  | <b>Qualitative benefits:</b>                  |  |
|  | › Access to wide pool of talent (recruitment) |  |
|  | › Improved employee morale/satisfaction       |  |
| <i>Benefits associated with providing accessibility options for customers/constituents</i> | <b>Quantitative benefits:</b>                 |  |
|  | › Private sector: improved revenue            | › Additional revenue from accessible website     |
|  | › Reduced servicing costs                     | › Costs avoided by servicing through the website |
|  | › Compliance                                  | › Legal fees avoided                             |
|  | <b>Qualitative benefits:</b>                  |  |
|  | › Improved brand recognition and engagement   |  |

Source: Forrester Research, Inc.

## KEY FINDINGS — ACCESSIBLE TECHNOLOGY ADOPTION OVERVIEW

The study revealed five key takeaways about the current perception of the importance of adoption of accessible technologies, from an organizational point of view:

- › **Possessing a robust accessibility strategy enables and empowers workforce diversity, and the value extends to everyone in the organization.** Many workforce technology strategies fail to consider that people want to be truly engaged and productive and how this drives customer experience and financial performance for the company. The study revealed that the perception of organizations, both by their employees and customers, is affected by the organization's policy on providing accessibility options and "content for all."
  - **The value of accessible strategies extends beyond just employees with disabilities.** Almost 80% of organizations surveyed said that by addressing accessibility, they can create workforce technology solutions that help the broader workforce.
  - **Accessible technologies allow you to reach a wider pool of talent.** Additionally, providing accessible technology enables employers to widen the potential pool of talent for hiring and to retain employees longer, enabling them to both select the best possible candidate and to keep those important resources within the organizations.
- › **Taking a standard or programmatic approach to accessible technologies reduces cost.** The study showed that organizations that have taken a more structured approach to dedicate the time and resources into developing a standard approach to accessible technology adoption benefited from lower costs over time. In turn, organizations that

accommodated each employee with a disability on a case-by-case basis and had to recreate testing and training each time saw higher costs and lower adoption.

- › **Private sector organizations are leading the way.** All organizations are seeing benefits of adopting accessible technologies through better regulatory compliance. However, private sector organizations, with a focus on driving business value, appear to be able to better exploit the opportunities provided by accessible technology. The survey revealed that that private sector organizations strongly agreed that their accessibility strategy enables them to reach a wider pool of talent when hiring, demonstrate a social vision for their organization, see higher employee morale, and improve their customer experience compared with public sector organizations that, despite having the executive support, are still challenged by a lack of funding to support their initiatives.
- › **Accessible technologies deliver tangible value for employers.** Through the in-depth interviews, we found that accessible technologies can deliver significant and tangible value to organizations through increased productivity and higher employee retention. Our discussion also revealed some intangible benefits for employers, including risk mitigation, higher employee morale, satisfaction, trust, and access to the best talent available because of their accessibility strategy.
- › **Revenues associated with widening the pool of potential customers can be huge.** We also explored the impact of accessible technologies on customer engagement. We found that private sector organizations have the potential to see higher revenue through more accessible websites and reduced costs by being able to digitally serve people with disabilities. According to research released by the Business Disability Forum (BDF) in March 2015, the “walk away pound,” representing lost revenue to businesses that do not offer sufficient access for people with disabilities, was estimated at 1.8 billion per month for UK businesses alone.<sup>1</sup> At the time of writing, the BDF is conducting research to estimate the value of the “click away pound,” an analogous total for online commerce. Both private and public sector organizations can also benefit from the potential avoidance of legal and compliance fees. As one interviewee told us: “Customers are aware of the needs of the people with disabilities and make purchasing decisions based on this kind of factor.”

## SUMMARY OF RECOMMENDATIONS FOR PUBLIC AND PRIVATE SECTOR ORGANIZATIONS

In the final section of this report, Forrester outlines five key actions for public and private sector organizations to boost the adoption of accessible technologies. In summary, these are:

- › Ensure clear executive leadership for accessibility initiatives.
- › Showcase success of accessibility initiatives.
- › Build partnerships with key business stakeholders.
- › Learn from peers in your industries and in others.
- › Put accessibility criteria into your technology procurement process.

## Disclosures

The reader should be aware of the following:

- › The study is commissioned by Microsoft and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.
- › Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the report to determine the appropriateness of an investment in Microsoft.
- › Microsoft reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.
- › Microsoft provided some of the customer names for the interviews but did not participate in the interviews.

## Study Methodology And Approach

From the information provided in the interviews, Forrester constructed a set of representative use cases for those organizations assessing the value of accessible technologies. The objective of the framework is to understand the value of accessibility to various communities. These include the overall social good, organizations themselves, and people with disabilities.

Forrester took a multistep approach to evaluate the economic and socioeconomic impact that providing accessible solutions to both employees and customers can have on organizations (see Figure 2). Specifically, we:

- › Interviewed key Microsoft stakeholders from marketing and sales to gather insights relative to Microsoft positioning and customer use cases for accessible technologies.
- › Conducted an online survey of 319 organizations across Europe (in the UK, France, Germany, Italy, Spain, Sweden, and Poland) from both the public and private sectors (see demographics in Appendix B).
- › Conducted 12 interviews with organizations leveraging accessible technologies to obtain data with respect to costs, benefits, and risks associated with their investments. In addition, Forrester spoke to a number of prominent advocacy groups and government agencies (see interview profile in Appendix C).
- › Constructed financial models representative of selected use cases using Forrester's Total Economic Impact™ (TEI) methodology. The financial models are populated with the cost and benefit data obtained from the interviews and online survey.
- › Prepared and delivered a case study identifying the benefits, costs, and risks of accessible technologies.

**FIGURE 2**  
**Research Approach**



Source: Forrester Research, Inc.

### KEY DEFINITIONS

Throughout the report, Forrester refers to three types of disabilities:

- › **Permanent disability.** A physical or cognitive impairment that substantially limits one or more major life activity.
- › **Temporary disability.** An injury or condition that limits life activities for a period of time.
- › **Situation disability.** A more generic accessibility requirement for a specific use case not tied to disability; for example, a natural circumstance might limit a person's ability, such as the glare of the sun making it hard to read a mobile phone or a loud environment limiting hearing.

## Market Overview — Accessible Technologies Adoption

As we consider some of the drivers organizations experience as they adopt accessible technology within their groups, we begin with a look back at the evolution of the policies of the European Union (EU) in this area. We'll then examine the research findings that document the primary goals of the organization, as well as the ways in which an accessibility strategy can support the pursuit of those goals.

The EU approach toward people with disabilities has evolved considerably over the past several decades. Before 1999, Europe's legal and regulatory bodies took a highly medicalized viewpoint on people with disabilities: As one scholar wrote, "For instance, in the employment context, the policy aimed at their 'rehabilitation into vocational life or, where appropriate, by placing them in sheltered industries,'" adding, "such policies of segregation assumed the existence of an unbridgeable gap between the social capabilities of people with disabilities and those of a (nondisabled) majority."<sup>2</sup> As such, people with disabilities were seen "as objects of welfare, health, and charity programs," rather than as equal citizens with full legal rights.

In the late 1990s, these views changed and were codified into law. First, in 1996, the European Commission issued a "European Community Disability Strategy," which changed policy from simply accommodating the needs of people with disabilities to actively promoting integration into mainstream society. It also moved from a "charity" viewpoint to one of individual empowerment. With this change, disability was, in the words of two scholars, "reclassified as a human rights issue under international law. Reforms in this area were intended to provide equal opportunities for people with disabilities and to expose their segregation, institutionalization, and exclusion as typical forms of disability-based discrimination."<sup>3</sup>

In 1999, the Treaty of Amsterdam gave the European Community the legal authority to pass binding measures regarding how people with disabilities are treated.<sup>4</sup> And most recently, in 2007, the European Union ratified the [United Nations Convention on the Rights of Persons with Disabilities \(CRPD\)](#), which ensures the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, including employment, services, and information.<sup>5</sup> But realizing this vision requires both social changes and, importantly, better leveraging the power of accessible technologies.

### ACCESSIBLE TECHNOLOGIES HELP DELIVER KEY BUSINESS INITIATIVES

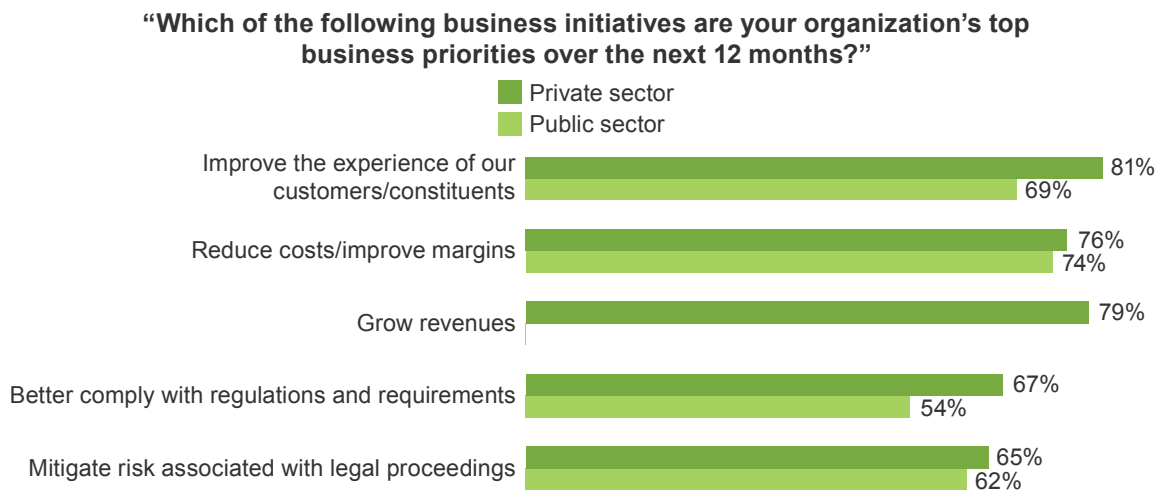
In March 2016, Microsoft commissioned Forrester Consulting to conduct a custom study with 319 organizations across Europe to evaluate their usage of accessible technologies. The survey captured insights into both public and private sector drivers, benefits, and challenges of leveraging accessible technologies.

To place accessibility efforts within an organizational context, we asked business and technology leaders in Europe what their overall key business initiatives will be for the next 12 months. We found that they plan to (see Figure 3):

- › **Improve their customer experience.** Over 80% of private sector and nearly 70% of public sector leaders said improving their customer or constituent experience was a high or critical priority. Over 30% of all organizations called it a critical priority.
- › **Drive fundamental business metrics.** Reducing costs and improving margins (76% overall) is a key priority for private and public sector organizations. For the private sector, growing revenues (79%) is a close second tier to customer experience.
- › **Manage the regulatory and risk environment.** Mitigating the risk of legal entanglements (65% overall) also ranked high for both private and public sector organizations in their overall organizational priorities. Better compliance with regulations (67%) was particularly important for private sector organizations.



**FIGURE 3**  
**Improving Customer Experience Is A Top Business Priority**



Base: 319 accessibility business and technology leaders from organizations across Europe

Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, March 2016

To support these overall business priorities, the top technology priorities focus on using data better, upgrading or replacing legacy systems, and supporting new capabilities for new employees.

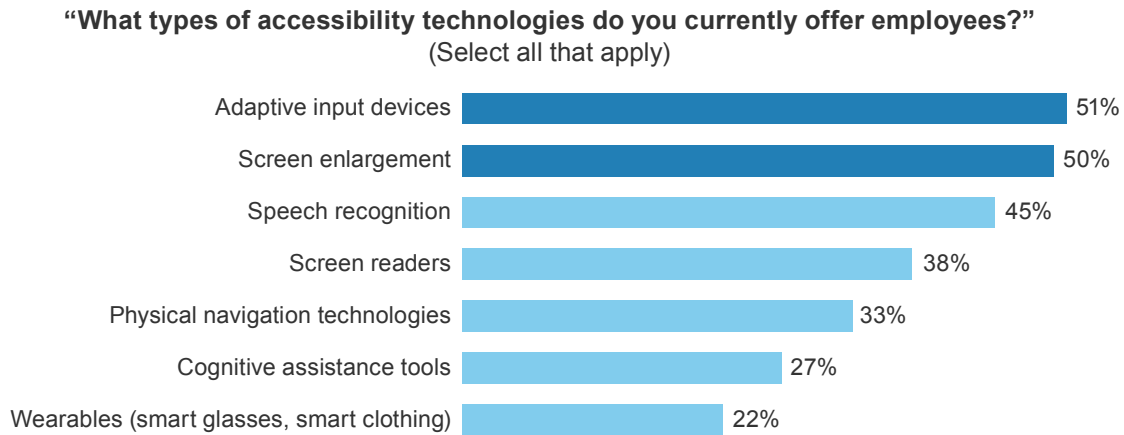
But accessibility also plays a role in driving these goals, as we will see throughout this report. For example, 79% of organizations agreed that accessible technologies have helped them improve the customer experience — showing the power that accessible technologies have in driving fundamental business goals.

### PC-BASED ACCESSIBLE TECHNOLOGIES LEAD TODAY’S IMPLEMENTATIONS

Forty-four percent of both public and private sector organizations said that employees with disabilities can perform most, if not all, tasks they need with the help of company-provided accessible technologies. Business and technology leaders reported offering employees a variety of different technologies — some established, some new — to aid accessibility. Of the organizations surveyed, they offer employees an average of three different types of accessible technologies. These include (see Figure 4):

- **Traditional PC adaptive technologies.** About half of respondents from private and public sector organizations said their company offers employees choices of adaptive input devices or screen enlargement. Another 38% offer screen readers for PCs. These technologies allow employees to continue existing PC-based workflows with additional assistance from peripherals.
- **Cognitive or speech-based tools.** Speech recognition (45%) and cognitive assistance tools (27%) show the growing importance of software intelligence, which holds the promise of empowering people with physical and cognitive disabilities. These technologies are opening up the promise of new types of interaction between employees and computers, beyond existing adaptive technologies.
- **Physical devices.** Physical navigation tools (33%) and wearables (22%) provide a personalized level of accessibility directly on the employee’s body. These technologies make accessibility immediate, mobile, and personal to employees. This was particularly the case in private sector organizations, which are more likely to offer wearable devices to employees (23% in the private sector versus only 8% in the public sector).

**FIGURE 4**  
**Organizations Offer A Wide Variety Of Accessible Technologies**



Base: 319 accessibility business and technology leaders from organizations across Europe

Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, March 2016

## ACCESSIBILITY DRIVES THREE CLASSES OF BENEFITS

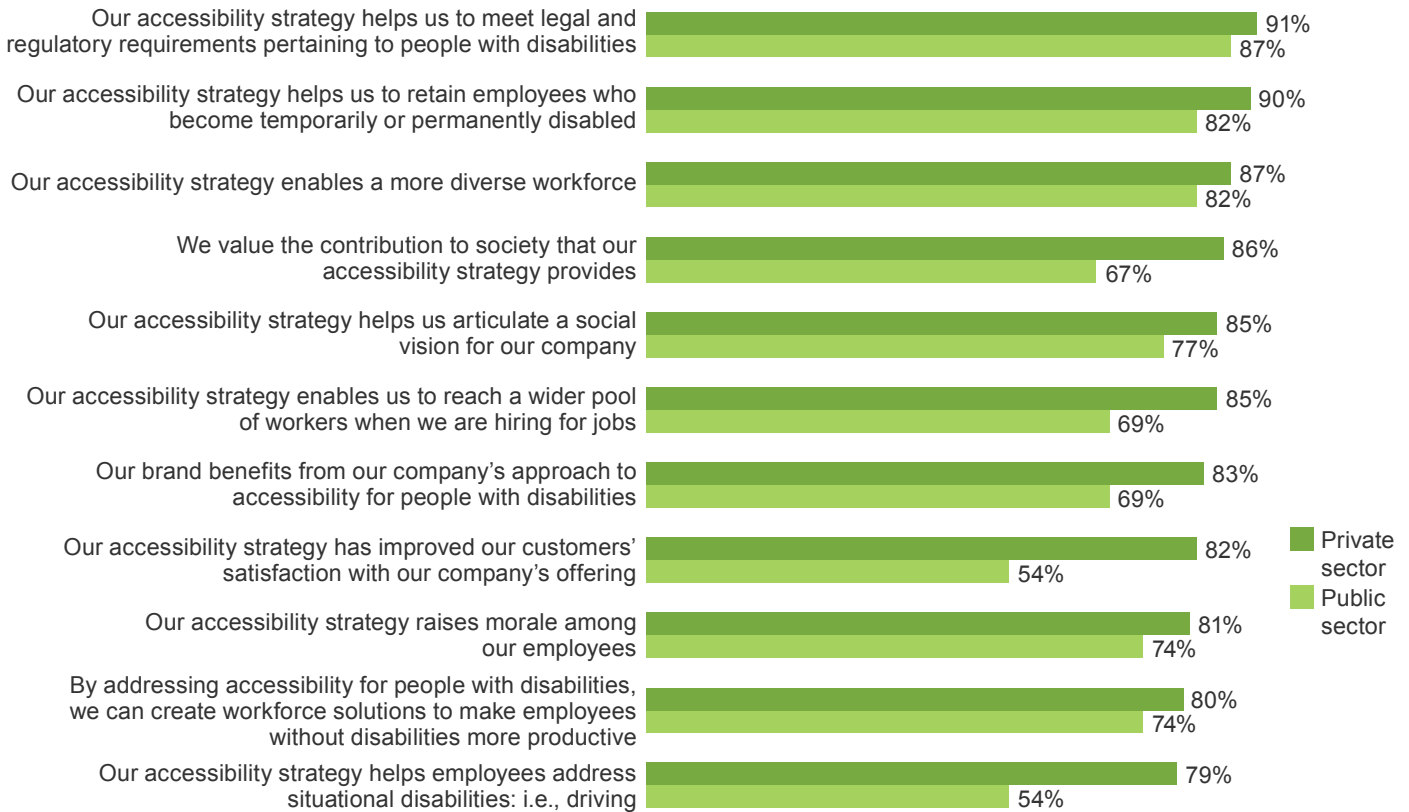
Both public and private sector organizations share some common drivers for accessibility programs (see Figure 5):

- › **Workforce productivity and diversity.** Both private and public sector organizations highlighted that their accessibility strategy helps them to retain employees who become temporarily or permanently disabled, thereby retaining their knowledge, skills, and talent. But accessible technology can also help employees without disabilities: 80% of private sector and 74% of public sector organizations agreed that by addressing accessibility, they can create workforce technology solutions that help the broader, nondisabled workforce. In this instance, imagine employing dictation software to people with visual constraints, only to find that mobile employees use the technology, too, making them more productive.
- › **Public good.** Large majorities cited the impact made by accessibility toward helping them establish a social vision for their company (85% of private sector and 77% of public sector).
- › **Boosts in employee morale.** Over 80% of private sector and 74% of public sector organizations also agreed that an accessibility strategy raises morale among employees.
- › **Regulatory compliance.** The large majority, 91% of private sector and 87% of public sector respondents, agreed that their accessibility strategy helps them meet legal and regulatory requirements in relation to people with disabilities.

However, significant variations evolve between both groups when we delve further into the data. Unsurprisingly, the study revealed that private sector organizations focus much more on the business value aspects of accessibility. Private sector organizations had a much stronger focus on improving customer satisfaction (82% versus 54% in the public sector) and the impact on the brand (83% versus 69% in the public sector) that an accessibility strategy can deliver. In addition, private sector organizations agreed that their accessibility strategy helps address situational disabilities (79% versus 54% in the public sector) and reach a wider pool of talent (85% versus 69% in the public sector).

**FIGURE 5**  
**Benefits Of Accessible Technologies**

**“How strongly do you agree or disagree with the following statements?”**



Base: 319 accessibility business and technology leaders from organizations across Europe

Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, March 2016

## **COST BARRIERS INHIBIT ACCESSIBLE TECHNOLOGY ADOPTION**

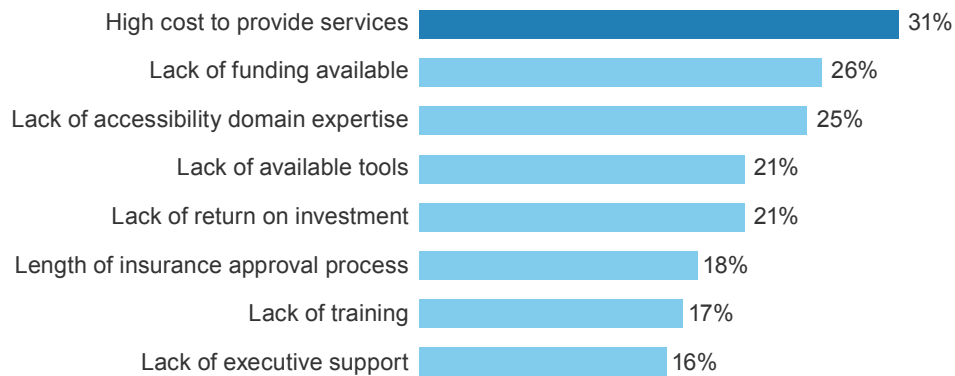
Only 17% of organizations said their accessibility program was extremely successful, with almost two-thirds stating it was somewhat successful. Several barriers hold these programs back from full success (see Figure 6):

- Costs are the leading inhibitor.** The high cost of providing accessible services and devices (31%) and a lack of funding availability (26%) top the list of barriers for all organizations. For public sector organizations, the lack of funding was the top barrier, with over 40% stating that this was their biggest barrier. Related, about one in five of all organizations cited a lack of return on investment (21%); our interviews suggest, however, that it's really a narrow or traditional ROI that's hard to calculate, and that many organizations do achieve an ROI, as we will see elsewhere in this paper.
- A lack of know-how also hinders success.** Respondents cited a lack of domain expertise (25%), a perceived lack of tools (21%), and a lack of training (17%) as further barriers. These factors suggest that wider proliferation of educational resources aimed at upgrading the skillsets of technology employees would help drive accessibility efforts forward.

› **A lack of executive support represents a relatively minor factor.** At the bottom (16% of all respondents), a perceived lack of executive support isn't a widespread problem, except insofar as it feeds back into costs and budgets. Only 8% of public sector organizations identified a lack of senior management support as being a big challenge.

**FIGURE 6**  
**Costs Lead Barriers To Providing Accessible Technologies**

**“What are the biggest barriers you are facing in providing accessibility technologies/ services to employees with disabilities?”**



Base: 319 accessibility business and technology leaders from organizations across Europe

Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, March 2016

## Accessible Technologies — Employee-Facing Benefits

Too many workforce technology strategies fail to take into account the factors that make people truly engaged and productive and how this drives customer experience and financial performance for the company.<sup>6</sup> For public sector organizations, the parallel benefit is that citizens are better served and better able to take advantage of public services. Happy employees create happy customers, a better customer experience, and higher profits.<sup>7</sup> Our survey showed a strong relationship between accessible technologies and employee and customer/constituent value.

With their employees with disabilities leveraging company-provided accessibilities, public and private respondents and interviewees cited several benefits from increasing convenience and comfort for their workforce (see Figure 7):

- › **Increased productivity from increased mobility.** Forrester's Global Business Technographics® Telecommunications And Mobility Workforce survey, 2016, revealed that information workers are spending a few times per month or more working from public places (26%), while traveling (39%) or from home (37%). Our interviewees indicated that providing accessible technologies helps both employees and employers; more work can be completed by all employees during typical business hours wherever they are, eliminating productivity losses.
- › **Increased productivity from time required to complete tasks.** Interviewees also reported increased productivity while employees are in the office, specifically from them being more efficient in completing tasks. This benefit applies to employees with disabilities but is not limited to those employees. In fact, survey findings indicate that 38% of firms noted an increase in productivity, specifically from employees who do not report any disabilities. One interviewee told us:

“We have seen evidence that for certain tasks, once provided with accessible technology, employees with disabilities at my organization were able to achieve better productivity than their counterparts”.
- › **Lower recruitment costs from high employee retention.** At an organization level, in order to boost employee retention and preserve institutional knowledge, employers must provide the right resources and tools, including accessible technologies, to all employees. As employees age and may not be able to complete their job functions in the same way as before, organizations must supplement their skills with additional training, technologies, and resources. The needs of the aging population should be on the radar of HR and IT directors, as the prevalence of disabilities increases with age and the population in Europe is aging. In Europe today, 53% of older people (over age 65) have a disability, compared with 17% of people ages 16 to 64. Only 18.5% of the population is over 65 today, but that number is expected to grow to 28.7% by 2080. As one interview said:

“Employees are likely to become disabled as they age. We've invested in them; we want to preserve the investment. That's why we give them the tools to continue into their work. Making someone redundant for medical reasons is a big loss.”
- › **Elimination of potential legal and compliance fees.** The Employee Equality Directive of 2000 prohibits discrimination across of variety of groups, including people with disabilities. It specifically states that organizations must “take appropriate measures, where needed in a particular case, to enable a person with a disability to have access to, participate in, or advance in employment, or to provide training for such a person, unless such measures would impose a disproportionate burden on the employer.” While the risk of litigation varies dramatically by organization, the resulting impacts can be steep. So it comes as no surprise that 90% of organizations have implemented their accessibility strategies to meet legal and regulatory requirements pertaining to people with disabilities. For example, one retailer in the UK was forced to pay nearly £10,000 to a young worker for wrongful termination based on a disability. Settlements in the US have been as high as \$6 million, so organizations that operate globally should pay particularly close attention to treatment of their employees with disabilities and take all necessary measures to accommodate them.
- › **Intangible benefits leading to workforce morale and access to a wider pool of talent.** Organizations also mentioned that providing accessible technology is a responsible practice and contributes to intangible benefits, such as fostering higher employee satisfaction and building a reputation as a great place to work. It's clear that creating public awareness programs around accessibility can offer additional business value to European public and private sector organizations. Organizations said that employees feel valued when they know accessible technology is available, even if they never need

it. One interviewee told us, “Keeping morale up by caring for people is a big factor.” They develop a sense of pride in their organization’s commitment to empowering its employees.

In addition, we heard that accessibility strategies and accessible technologies give employers wider access to talent. One of the interviewees mentioned that given the need to recruit the best and the brightest within their fields, “It’s difficult enough to find the right candidates. We need to be able to provide the support to hire the best candidate, including accessibility options.” Another perspective on hiring is the limitation of using e-recruiting if it’s not accessible; this can limit the applicant pool substantially. Employers might miss out on the best talent available if the hiring process is not open to all.

In the figure below, we list the most common accessible technology use cases discovered in our research. We’ve ranked the impact of these technology options based on the information provided by interviewees and survey respondents, either in terms of frequency of use or breadth of effect.

**FIGURE 7**  
**Accessible Technologies Use Cases — For Employers**

| Use Case Type | Metric              | As Measured By   | Impact  |
|---------------|---------------------|--|---|
| Employee      | › Productivity      | › Time required to complete tasks                        | › <b>High.</b> All employees — not just employees with disabilities — can benefit from tools that allow them to work faster and more efficiently. And providing people with disabilities with accessible technology has a snowballing effect on the rest of the organization, making it easier for everyone to get more done.   |
| Employee      | › Recruitment costs | › Lower recruitment costs from higher employee retention | › <b>Medium.</b> With better access to and support from technologies, aging employees and those with disabilities may stay in the workforce longer. Having fewer turnovers reduces the efforts and costs to replace these employees while retaining talent and experience. We have listed this as a medium impact due to the longer-term nature of the benefit as compared with the previous benefit, which is more immediate. However, as current workforces continue to age, we expect the impact to grow.                          |
| Employee      | › Compliance        | › Legal fees avoided                                     | › <b>Low.</b> The chances of being fined for noncompliance vary, but the costs incurred in those situations can be steep, both in fees and retrofitting infrastructure to make it accessible. While survey respondents consistently ranked this as a driver for accessible technology, interviewees listed it as less important than many other reasons, leading to our overall assessment as “low impact.” However, Forrester notes that while the <i>probability</i> of litigation may be low, the potential cost can be very high. |

Source: Forrester Research, Inc.

## BUILDING THE BUSINESS CASE FOR ACCESSIBILITY — EMPLOYEE BASED

With the data collected through the interviews and survey, we have structured calculations around the potential benefits of increased productivity due to the availability of accessible technologies as well as the value of recruitment cost avoidance through higher retention. While all of the use cases identified above have clear value to the organization, we find that the productivity increase and reduced hiring costs are the most straightforward to quantify using available metrics.

One challenge mentioned by interviewees was around obtaining the needed metrics for the calculations. As one said:

“No one knows how many employees with disabilities they’ve got — but we know a high percentage will experience disability at some point.”

Therefore, in order to project the potential value, Forrester suggests using percentages based on the overall population to quantify the benefit; this will likely vary from organization to organization depending on the demographics of the employee base.

### Increased Productivity

In order to quantify the value of increased productivity associated with the use of accessible technologies, we must consider a number of variables. These include the number of employees using the technology, the increase in productive work time facilitated by the technology, and the value of that time savings. By using an average absence rate, as well as the improvement in this rate provided by the accessible technology, we can calculate a total value. While actual averages can vary significantly by country, the European Foundation for the Improvement of Living and Working Conditions cites the average absentee rate in Europe to be 3.8%. Most interviewees agreed that by offering accessible technology to their employees, they experienced a variety of results in increasing employees’ ability to complete their work from anywhere; however, some interviewees detailed significant changes, including reducing lost productivity time by up to 50%. These productivity losses can tie to a permanent, temporary, or situational disability or to the general employee population; it’s clear from the research that users of accessible technology range far beyond people with disabilities, and that productivity increases are a result of accommodation being available for all. By multiplying the average absence rate within the organization by the improvement rate as well as an average daily compensation rate, we can arrive at a total projected financial value for this productivity improvement.

### Recruiting Costs Avoided With Higher Retention

While all interviewees believed that having accessible technology improved retention, none were able to articulate a specific metric. In order to calculate a value, we need to understand both the increase in retention as well as the cost avoidance associated with hiring. There are several factors contributing to the increase in retention, but the one most frequently cited was the ability to support employees as they age by providing accommodation with accessible technologies. This, in turn, allows organizations to maintain access to key talent and avoid the cost of hiring new resources, which is a very tangible cost. Assuming that the average cost of hiring is 50% of an employee’s compensation, the value of this savings adds up quickly. Additionally, interviewees mentioned the increase in employee satisfaction related to the perception of the organization, which was improved by the organization’s policy of providing accessible technology options; this is another driver in increased retention, compounding the value.

### Conclusions

In this section, we have discussed tactics to quantify the effect of the increase in productivity by providing accessible technologies, as well as the recruitment cost avoidance through higher employee retention from accessibility initiatives. We have also identified two additional quantifiable employee-facing. In order to evaluate the magnitude of the productivity savings associated with accessibility tools that increase speed or efficiency (in addition to providing the ability to complete tasks in a standard way, as discussed above), the hours saved can be multiplied by the hourly rate. An additional benefit, the ability to avoid litigation costs from suits presented by employees, was mentioned by several interviewees and survey respondents; this cost avoidance will vary widely based on the organization and specific situations. Therefore, we have not quantified this benefit, but we recognize that this area also has measurable impact. Forrester encourages the reader to consider the key drivers within his or her organization to project the potential impact in all of these areas.



# Accessible Technologies — Customer-Facing Benefits

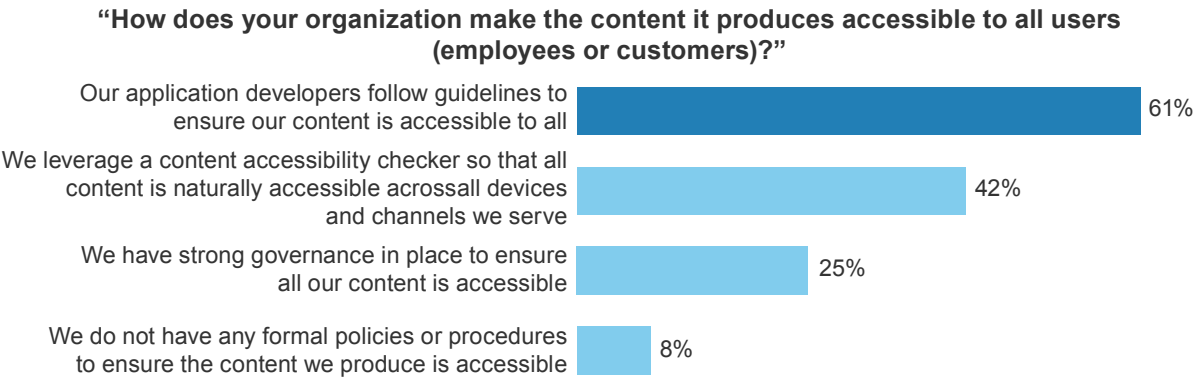
Customers, too, benefit from accessible technologies. In an era when Europe’s population is rapidly aging, the deployment rate of these technologies for customer use will increase in the coming years. This section covers benefits that affect the organization’s users: either customers in the private sector or citizens in the public sector. We consider benefits of website accessibility associated with both cost savings and increased revenue. These apply to both the private and public sector; while the profit motive may differ, both types of organizations work to contain costs and maintain revenue streams.

## CONTENT DISTRIBUTION HAPPENS AT THE DEVELOPER LEVEL

Today’s European business and technology leaders said that content becomes accessible (see Figure 8):

- Largely through application developers.** Over 60% said that developers follow guidelines to ensure the accessibility of all the content they produce.
- Less frequently, with a content checker.** Only 42% reported using a content accessibility checker to ensure accessibility across all devices and channels — this is a potential gap, given the proliferation of endpoints.
- Infrequently via governance.** Only a quarter said they have “strong” governance in place, though only 8% said they lack formal policies altogether. This suggests that policies should be strengthened and extended with better safeguards to ensure practical application of guidelines.

**FIGURE 8**  
Distributing Content In An Accessible Fashion



Base: 319 accessibility business and technology leaders from organizations across Europe  
Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, March 2016

Organizations interviewed cited several different customer-facing benefits associated with their adoption of accessible initiatives, including (see Figure 9):

- Increased revenue from accessible websites.** Traditional websites pose a challenge for many consumers with disabilities, specifically customers with vision impairments. By opening engagement up to this population with text alternatives for graphics and well-contrasted text, organizations have a wider reach. For private sector organizations, this provides a greater opportunity to increase web-based transactions. In terms of revenue, one interviewee from the private sector said: “Most of our wealthiest customers are the oldest, and there’s a correlation between disability and age. We need to make sure they can continue to be our customers.”

- › **Reduced servicing costs.** Customers' inability to interact on the web also drives unnecessary calls to the call center. If a customer is trying to make a purchase, look up an account or application status, or seek an answer to a question but cannot navigate the site, he or she is forced to call. Phone is one of the most expensive channels through which to serve customers, with organizations often looking for ways to cut costs in the call center. Widening access to the site through accessible technology is one way to achieve this goal.
- › **Avoidance of legal and compliance fees.** Much like the Employment Equality Directive of 2000 protects employees against discrimination in the workplace, laws exist across Europe to ensure organizations provide website access to all consumers. The UN Convention on The Rights of Persons With Disabilities, which convened in 2010 and was signed by 160 and ratified by 164 countries (as of June 2016), outlines principles for promoting and protecting persons with disabilities.<sup>8</sup> While enforcement varies by country within Europe, there are several examples where corporate negligence to provide an accessible website — among other noncompliance issues — has been settled in and out of court. For example, Target, a US-based retailer, was fined \$6 million by the National Federation for the Blind. In addition to paying the fine, it had to invest in a brand-new website.

Interviewees all agreed that providing web access to people with disabilities is key to their organizations' morale and ethical responsibility. We believe the number of accessible websites will increase as organizations refresh their websites in the coming years. Bear in mind that sites are difficult to retrofit. Accessibility needs to be part of the original site requirements in order to be realized.

Many organizations also mentioned goodwill and improved brand recognition as intangible benefits of investing in accessible technologies to encourage and allow for engagement with more of their customer base. Many countries' laws dictate the use of accessible technology, but interviewees believe that it's their civic duty as well. As one interviewee told us, "Most companies are doing it because it's right thing to do." We heard this sentiment almost universally across the organizations we spoke with. They also believe that the presence — or lack — of accessible technology can improve or hinder customers' perceptions of the brand. During one interview, we heard that:

"Our company has made a public statement of intent to be the most accessible in our industry."

Companies are seen as empathetic and responsible when they invest in technology that enables the interaction of customers with disabilities who otherwise may not be able to engage.

**FIGURE 9**  
**Accessible Technologies Use Cases — Customers**

| Use Case Type | Metric                               | As Measured By                                   | Business Impact  |
|---------------|--------------------------------------|--|--|
| Customer      | › Private sector: additional revenue | › Additional revenue from accessible website     | › <b>Medium.</b> A portion of the population cannot interact with the web unless sites are accessible. By making a site accessible to these people, organizations widen their base of customers, bringing the opportunity for more transactions, and thus revenue. |
| Customer      | › Reduced servicing costs            | › Costs avoided by servicing through the website | › <b>Medium.</b> Customers who cannot transact on the web because it's not accessible will have to call the call center, driving up servicing costs.   |
| Customer      | › Compliance                         | › Legal fees avoided                             | › <b>High.</b> The chances of being fined for noncompliance vary, but the costs incurred in those situations can be steep, both in fees and from retrofitting infrastructure to make it accessible.  |

Source: Forrester Research, Inc.

## BUILDING THE BUSINESS CASE FOR ACCESSIBLE WEBSITES — CUSTOMER BASED

With available data, we have structured the calculation and estimated the benefits associated with additional revenue and lower support costs from providing accessible websites for customers. While this is not the only type of accessible technology that organizations provide for their customers, it is the most common and the most easily quantified among interviewees and survey respondents. For example, one interviewee mentioned the introduction of a device with larger buttons; while the device was popular among customers, the interviewee was not able to isolate the impact of the accessibility design change to quantify the benefit.

### Increased Revenue

We've based the calculation on a midsize private sector organization with roughly 1 million site visitors per day. Based on European retail data, we've assumed an average conversion rate of 2.5% and an average basket size of €50. Research suggests that 10% of the European population reports someone in their household has experienced difficulty using a website due to a disability. To account for household-level data, we've reduced that expected abandon rate down to 5%, for an expected annual increase in revenue of €2.3 million. Figure 10 below shows the details of this calculation.

FIGURE 10

## Increased Revenue From Accessible Website

| Ref.      | Metric  | Calculation           | Initial           |
|-----------|---|-----------------------|-------------------|
| A1        | Daily site visitors   |                       | 1,000,000         |
| A2        | Days per year   |                       | 365               |
| A3        | Average conversion rate   |                       | 2.5%              |
| A4        | Average basket size   |                       | €50               |
| A5        | Percent of customers with disabilities who abandon due to inability to access |                       | 5%                |
| <b>At</b> | <b>Annual additional revenue from accessible website</b>                      | <b>A1*A2*A3*A4*A5</b> | <b>€2,281,500</b> |

Source: Forrester Research, Inc.

## Reduced Servicing Costs

Organizations we spoke with cited a wide range of savings across diverse industries and customer bases, so we've used straightforward industry averages to determine an expected cost savings of €250,000 per 1 million annual calls. Figure 11 below shows the details of this calculation, based on annual call volume.

While we have included this cost savings in terms of the cost per call, we heard about other situations with measurable value in the interviews. For one government agency, regarding the submission of forms, the interviewee told us, "It's £10 for paper versus £1 for online." That is a cost savings that adds up quickly, which is as important in the public sector as in the private sector.

FIGURE 11

## Reduced Servicing Costs

| Ref.      | Metric  | Calculation     | Year 1          |
|-----------|---|-----------------|-----------------|
| B1        | Annual call volume  |                 | 1,000,000       |
| B2        | Percentage of customers with disabilities who call because they can't self-serve on the web |                 | 5%              |
| B3        | Cost per call   |                 | €5              |
| <b>Bt</b> | <b>Annual costs avoided</b>   | <b>B1*B2*B3</b> | <b>€250,000</b> |

Source: Forrester Research, Inc.

## Conclusions

From the two benefits quantified in this category of customer-facing value, it's clear that even with conservative assumptions, the total impact in terms of cost savings and incremental revenue can be substantial. While we have not quantified the value of risk avoidance associated with preventing litigation by customers seeking accessible technology options, these costs can quickly escalate. Forrester encourages the reader to consider the key drivers within his or her organization to project the potential impact in all three of these areas.

## Cost Considerations For Accessible Technologies

Echoing the sentiments we heard from many of the interviewees, one told us, “We’re very interested in this work [of increasing accessible technology to accommodate employees], but we’ve struggled to make a financial case to justify the cost.” This issue is hardly unique to justifying investments in accessible technology; in fact, Forrester finds that it is common across any kind of technology investment. Full transparency on both costs and benefits is rarely possible; however, with credible assumptions and reasonable calculations, a business case showing the approximate value of an investment can provide directional guidance. In this section, we discuss the costs associated with providing accommodation with accessible options, based on the survey respondents and the experiences of interviewees.

### COST CONSIDERATIONS FOR EMPLOYEE-FACING TECHNOLOGY

Interviewees and survey respondents strongly agree that the lack of budget and ongoing cost of service are the biggest barriers to providing accessible technology and services to their workforce. This indicates that many organizations consider accessibility initiatives as an ad hoc activity that is bolted on to existing services and solutions. Our findings revealed that when accessible technologies are not acquired as part of standard packages of productivity software, costs can roughly be categorized into three buckets: hardware, software, and process, with process encompassing implementation, training, and ongoing support (see Figure 12). While cost per “case” — defined as evaluation, purchase, implementation, and training — varied from €100 to €750 across organizations, the drivers of those costs were generally constant.

**FIGURE 12**

**Top Cost Categories For Accessible Technologies — When Bolted On To Existing Services**

| Cost Category   | Relative Cost | Description  |
|---|---------------|--|
| <b>Software</b>                                       | <b>10%</b>    | › Software tools include screen readers, speech recognition tools, and magnifiers.   |
| <b>Hardware</b>                                       | <b>40%</b>    | › Hardware, such as keyboards, mice, headsets, large monitors, and ergonomic chairs, will run up much higher invoices than software. |
| <b>Process: implementation, training, and support</b> | <b>50%</b>    | › Organizations can expect to spend about half of their budget on implementation, training, and support.                             |

Source: Forrester Research, Inc.

Interviewees identified three success factors for driving down costs and improving adoption:

- › **Take a programmatic approach to adopting accessible technologies.** Organizations that accommodated each employee with a disability on a case-by-case basis and had to recreate testing and training each time saw higher costs and lower adoption. On the other hand, organizations that invested the time and resources into developing a programmatic approach to making all employee solutions more accessible have benefited from lower costs over time. One interviewee reported significant savings by reducing the time and effort associated with formal assessment after moving to a more standard process, estimating figures of more than £100,000 in a single three-month period.
- › **Establish a centralized budget.** Interviewees noted a significant uptick in adoption when managers didn’t have to tap into their individual budgets to fund an employee’s need for accommodation. They told us about processes associated with making requests for adjustments using accessible technology; these often included using portals and other channels to request support. This allowed for an easy route for employees in getting the help they need and removed challenges

associated with one-off requests. When accessible technology was viewed as part of a larger budget, accessible options were often included as part of the cost of doing business.

- **Get support from the top.** Several interviewees told us about executive champions who facilitated the spread of accessible technologies within their organizations; this sped up the processes associated with bringing the technology to those who needed it.

## COST CONSIDERATIONS FOR CUSTOMER-FACING TECHNOLOGY

While there can be many different cost considerations for customer-facing technologies, our interviewees were unanimous in highlighting the substantial upfront costs of creating an accessible website, especially if the team is attempting to retrofit the tools onto an existing site. The situation is similar for organizations incorporating accessibility options into their hardware or software; interviewees noted challenges with making the case to add functionality to existing technology, such as adding connections for hearing aids into mobile phones. However, fees are much more manageable and nearly just as incremental if accessible technology is considered a standard requirement and built into specs from the very beginning. In order for the 90% of companies without an accessible website to contain costs and improve functionality, Forrester recommends building accessible technology by design into your next refresh rather than making short-term accommodations. Standards and criteria for website accessibility have been developed by the Web Accessibility Initiative (WAI) of the World Wide Web Consortium (W3C) in order to offer guidance for providing accessible content.<sup>9</sup>

## Key Recommendations For Public And Private Organizations

### EMBARK ON AN ACCESSIBLE TECHNOLOGY MIND SHIFT

Business and technology leaders at both private and public sector organizations must consider how accessible technologies can benefit people with disabilities as well as how they can benefit the entire workforce. This requires an accessible technology mind shift: Leaders should not consider these technologies as a nice-to-have or ad hoc service to support a distinct group of people with disabilities; instead, they should think about how they help boost productivity of all employees, ensure compliance, boost employee morale, and ultimately deliver better services for customers and constituents. Five key recommendations emerged from in-depth conversations with private and public sector organizations leveraging accessible technologies, as well as prominent advocacy groups:

- › **Ensure clear executive leadership.** The study revealed that to in order to adopt accessible technologies in a programmatic way, organizations need clear direction and support from the CEO and executive management. The responsibility and accountability for delivering organizational and business process change to support accessibility strategies must come from the top down.
- › **Showcase success of accessibility initiatives and its impact on both employees and customers.** Throughout this study, we have seen that firms that invest in accessible technologies enjoy a wide range of benefits — for both employees and for customers — that drive revenue, productivity, morale, brand perceptions, and talent acquisition and retention. Getting this message out is paramount, since there's a tangible return on investment for many implementations of accessible technology. Business and technology leaders must frame arguments in terms of how both people with disabilities and the organizations benefit from the adoption of accessible technologies.
- › **Forge deep partnerships between IT, HR, and operations.** Effective adoption of accessible technologies requires organizations to bring together traditional inward-looking and siloed roles like IT, HR, and operations. Technology leaders must partner with operations to ensure all lines of business have the accessible technology tools and applications required to meet organizational priorities. Similarly, technology leaders should align with HR colleagues to identify the needs of employees with permanent, temporary, or situational disabilities and how accessible technologies can support them. In addition, ensure HR has the tools to access the widest talent pool available for all open vacancies.
- › **Learn from your peers from your industry and others.** New accessible technologies, tools, and services are constantly emerging. You need to understand how accessible technologies are being used by your competitors, as well as in other industries, so you can fully exploit the opportunity offered by them for your entire workforce, as well as deliver additional business value.
- › **Strengthen your technology procurement process to meet the accessibility needs of your customers and employees.** Technology innovations such as the internet of things (IoT), mobile, and social have already disrupted your organizations. Multiple devices need to be connected, and they need to facilitate collaboration in order to ensure the mobile experience, link different locations together, and bring together third parties in ecosystems. Technology and accessibility leaders must ensure their partners are able to deliver the accessibility experiences that are required by their employees and customers. To keep up with the pace of change, technology leaders must put accessibility criteria at the base of their technology procurement and seek partners that have accessibility features and functions at the center of their solutions.

## How Can Governments Encourage Adoption Of Accessible Technology?

As the study has shown, the adoption of accessible technologies can have a huge impact on governments, organizations, and individuals. While the early focus for accessible technologies was on reducing litigation, organizations and public sector agencies are now beginning to realize the wider socioeconomic and business value they can bring.

Policymakers should begin by fostering an environment of collaboration between public and private sector organizations to enable them to work together to overcome challenges associated with accessible technology adoption, as well as to find new ways to leverage accessible technologies to deliver wider business and socioeconomic benefit. Policymakers should set expectations around the process for accessible technology adoption, so that organizations embarking on this journey avoid taking a fragmented and ad hoc approach to driving adoption.

To speed up adoption of accessible technologies, policymakers have three tools at their disposal. They can:

- › Offer incentives in the form of tax breaks and other monetary incentives. Much as the European Union has favored tax incentives to drive environmentally responsible behavior, the same policy instrument can be used here.<sup>10</sup>
- › Create centers of excellence that offer advice, training, best practices, and IT expertise to companies that are considering, choosing, or deploying accessible technologies. Such centers of excellence would help eliminate uncertainty, educating organizations about how best to proceed on the accessible technology journey.
- › Help the public sector close the gap with the private sector by encouraging accessibility criteria and standards in public sector procurement to boost adoption of accessible technologies.



## Appendix A: Total Economic Impact™ Overview

Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders. TEI assists technology vendors in winning, serving, and retaining customers.

The TEI methodology consists of four components to evaluate investment value: benefits, costs, flexibility, and risks.

### BENEFITS

Benefits represent the value delivered to the user organization — IT and/or business units — by the proposed product or project. Often, product or project justification exercises focus just on IT cost and cost reduction, leaving little room to analyze the effect of the technology on the entire organization. The TEI methodology and the resulting financial model place equal weight on the measure of benefits and the measure of costs, allowing for a full examination of the effect of the technology on the entire organization. Calculation of benefit estimates involves a clear dialogue with the user organization to understand the specific value that is created. In addition, Forrester also requires that there be a clear line of accountability established between the measurement and justification of benefit estimates after the project has been completed. This ensures that benefit estimates tie back directly to the bottom line.

### COSTS

Costs represent the investment necessary to capture the value, or benefits, of the proposed project. IT or the business units may incur costs in the form of fully burdened labor, subcontractors, or materials. Costs consider all the investments and expenses necessary to deliver the proposed value. In addition, the cost category within TEI captures any incremental costs over the existing environment for ongoing costs associated with the solution. All costs must be tied to the benefits that are created.

### FLEXIBILITY

Within the TEI methodology, direct benefits represent one part of the investment value. While direct benefits can typically be the primary way to justify a project, Forrester believes that organizations should be able to measure the strategic value of an investment. Flexibility represents the value that can be obtained for some future additional investment building on top of the initial investment already made. For instance, an investment in an enterprise-wide upgrade of an office productivity suite can potentially increase standardization (to increase efficiency) and reduce licensing costs. However, an embedded collaboration feature may translate to greater worker productivity if activated. The collaboration can only be used with additional investment in training at some future point. However, having the ability to capture that benefit has a PV that can be estimated. The flexibility component of TEI captures that value.

### RISKS

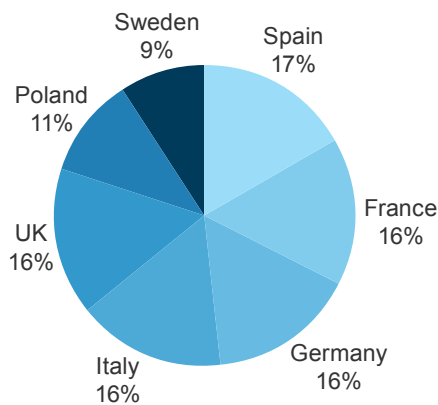
Risks measure the uncertainty of benefit and cost estimates contained within the investment. Uncertainty is measured in two ways: 1) the likelihood that the cost and benefit estimates will meet the original projections and 2) the likelihood that the estimates will be measured and tracked over time. TEI risk factors are based on a probability density function known as "triangular distribution" to the values entered. At a minimum, three values are calculated to estimate the risk factor around each cost and benefit.

## Appendix B: Online Survey Demographics

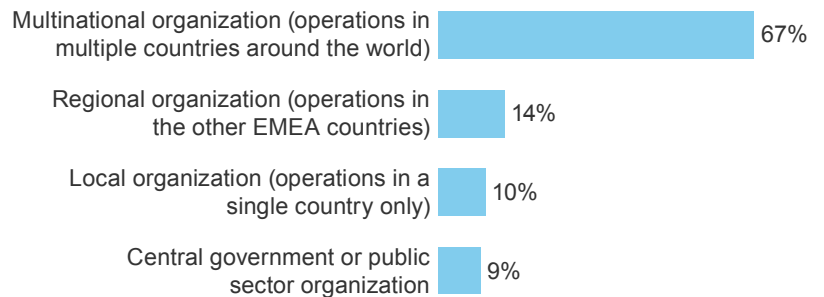
**FIGURE 13**

**Online Survey Demographics: Country, Size, Organization Type, And Industry**

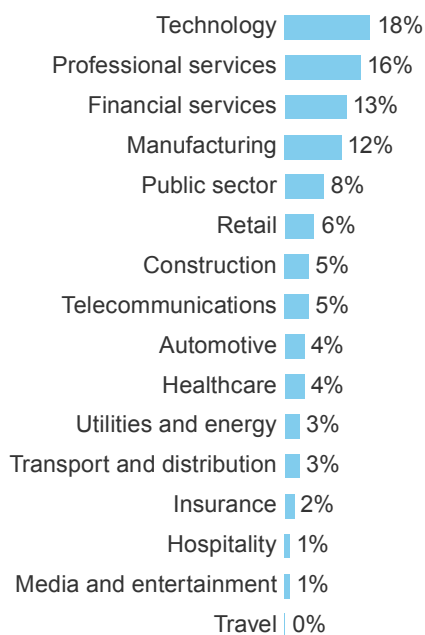
**“In which country is your organization headquartered?”**



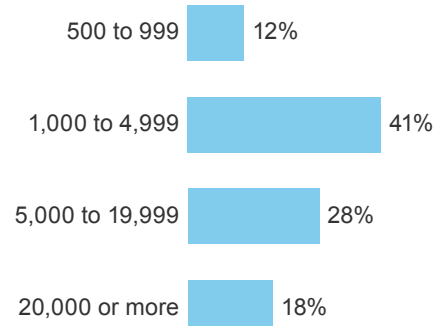
**“What of the following best describes the type of organization you work for?”**



**“In which industry do you work?”**



**“How many employees work for your work organization?”**



Base: 319 accessibility business and technology leaders from organizations across Europe  
(percentages may not total 100 because of rounding)

Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, March 2016

## Appendix C: Interview Profile List

**FIGURE 14**  
**List Of Interviewees**

| Job Role  | Industry  |
|---|---|
| Head of digital inclusion                           | UK-based charity  |
| International account manager                       | Global assistive technology provider                      |
| Architecture and knowledge leader                   | UK retail and commercial bank                             |
| VP of end user and infrastructure services          | Global pharmaceuticals organization                       |
| Head of IT accessibility                            | Multinational banking and financial services organization |
| Director of institutional relations                 | Global broadband and telecommunications provider          |
| Founder and CEO                                     | Not-for-profit UK national advocacy group                 |
| Head of accessibility and digital inclusion         | European IT services organization                         |
| IT accessibility manager                            | UK public sector  |
| Inclusion and accessibility manager                 | Multinational telecommunications services company         |
| Access technology manager/assistive technology lead | Broadcaster   |
| Head of infrastructure and accessibility area       | Spanish railway provider                                  |

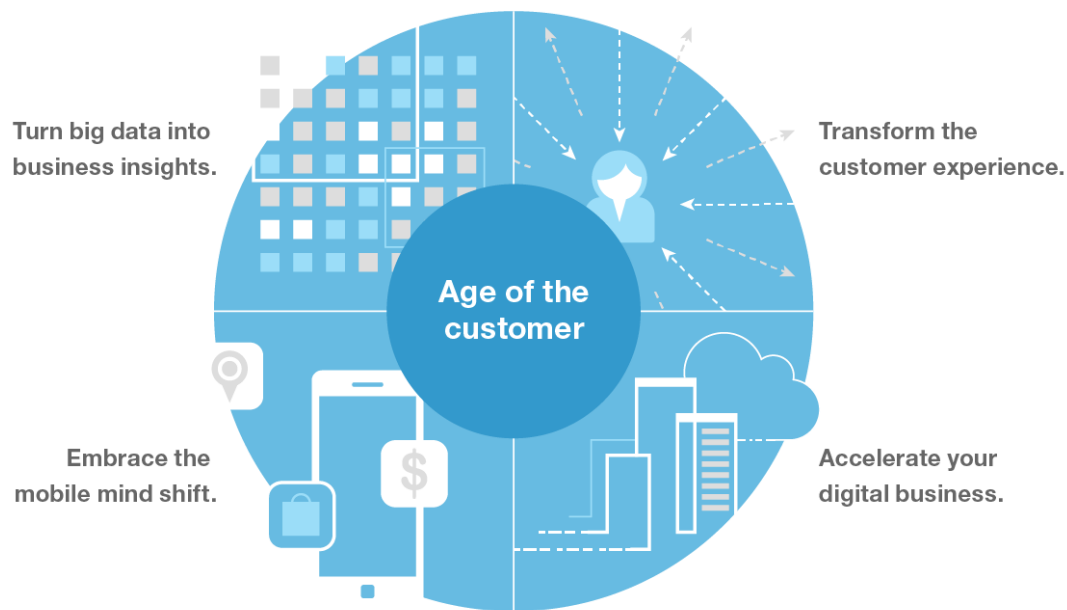
Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, March 2016

## Appendix D: Forrester And The Age Of The Customer

Your technology-empowered customers now know more than you do about your products and services, pricing, and reputation. Your competitors can copy or undermine the moves you take to compete. The only way to win, serve, and retain customers is to become customer-obsessed.

A customer-obsessed enterprise focuses its strategy, energy, and budget on processes that enhance knowledge of and engagement with customers and prioritizes these over maintaining traditional competitive barriers.

**CMOs and CIOs must work together to create this companywide transformation.**



Forrester has a four-part blueprint for strategy in the age of the customer, including the following imperatives to help establish new competitive advantages:



Transform the customer experience to gain sustainable competitive advantage.



Accelerate your digital business with new technology strategies that fuel business growth.



Embrace the mobile mind shift by giving customers what they want, when they want it.



Turn (big) data into business insights through innovative analytics.

## Appendix E: Endnotes

<sup>1</sup> Source: “Walkaway Pound Report 2015,” Business Disability Forum, June 25, 2015 (<http://businessdisabilityforum.org.uk/about-us/news/walkaway-pound-report-2015/>).

<sup>2</sup> Source: Vlad Perju, “Impairment, Discrimination, and the Legal Construction of Disability in the European Union and the United States,” Cornell International Law Journal (<http://www.lawschool.cornell.edu/research/ILJ/upload/Perju-final.pdf>).

<sup>3</sup> Source: Theresia Degener and Gerard Quinn, “A Survey of International, Comparative and Regional Disability Law Reform,” Disability Rights Education and Defense Fund (<http://dredf.org/news/publications/disability-rights-law-and-policy/a-survey-of-international-comparative-and-regional-disability-law-reform/>).

<sup>4</sup> Source: Vlad Perju, “Impairment, Discrimination, and the Legal Construction of Disability in the European Union and the United States,” Cornell International Law Journal (<http://www.lawschool.cornell.edu/research/ILJ/upload/Perju-final.pdf>).

<sup>5</sup> Source: “Convention on the Rights of Persons with Disabilities,” UN Division for Social Policy and Development Disability, (<http://www.un.org/disabilities/convention/conventionfull.shtml>).

<sup>6</sup> Source: “Elevate Human Performance With Workforce Enablement,” Forrester Research, Inc., May 2, 2016.

<sup>7</sup> Source: “Elevate Human Performance With Workforce Enablement,” Forrester Research, Inc., May 2, 2016.

<sup>8</sup> Source: G3ict (<http://g3ict.com/about>).

<sup>9</sup> Source: W3C (<https://www.w3.org/TR/WCAG20/>)

<sup>10</sup> Source: Katri Kosonen and Gaëtan Nicodème, “The role of fiscal instruments in environmental policy,” June 2009, ([http://ec.europa.eu/taxation\\_customs/resources/documents/taxation/gen\\_info/economic\\_analysis/tax\\_papers/taxation\\_paper\\_19.pdf](http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_19.pdf)).