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Thought Leadership Paper
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Extending The Value Of AI To Knowledge Workers



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Graph-powered AI can ultimately drive a better employee and customer experience.

Executive Summary

Knowledge workers depend on information to do their jobs well. But as company data stores grow, knowledge workers too often have trouble finding and organizing the information they need. Their workflows are frequently interrupted by searches for better information, making it difficult or impossible to maintain a state of flow in which they produce their best work. Worst of all, workers are regularly forced to make suboptimal decisions on bad data.

Graph-powered artificial intelligence (AI) presents an exciting opportunity for organizations to improve knowledge worker access to accurate and relevant information, improving productivity, agility, satisfaction, and business decision making.

AI with a deep, broad graph — a type of database that stores information about the relationships between data — can uncover unexpected and valuable insights that help organizations achieve greater efficiencies and profitability. Integrating these capabilities into the cloud makes AI insights available to the business users who need them most. This can ultimately drive a better employee and customer experience.

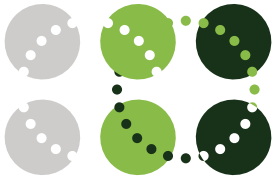
In July 2018, Microsoft commissioned Forrester Consulting to evaluate the importance of AI for knowledge workers and decision makers. Forrester conducted an online survey with 1,089 knowledge workers and 256 managers of knowledge workers at enterprises in North America, South America, Europe, Japan, New Zealand, and Australia. We found that graph-powered AI enables knowledge workers to be more effective in completing tasks. Forrester supplemented this survey with qualitative interviews and time savings data gathered for a concurrent Total Economic Impact™ study commissioned by Microsoft.

KEY FINDINGS

- › **Knowledge workers depend on the free flow of information.** Technology is critical for employees to access the information they need to make decisions and complete tasks. When they can't find the information they need, knowledge workers often make subpar decisions that affect the business as a whole.
- › **The human mind is remarkable at establishing context, and AI will augment that in powerful ways.** When graph information is properly analyzed and contextualized, it can help knowledge workers find the information needed to make decisions faster, find relevant expertise more easily, and make decisions more confidently.
- › **Graph-powered insights drive efficiency, productivity, and overall business benefits.** AI graph-powered insights can fuel worker productivity through discovery functionality, automatic completion of day-to-day tasks, and completion of nonroutine tasks.

Knowledge Workers Depend On The Free Flow Of Information

In the modern workplace, a rapidly increasing percentage of workers generate insights and intellectual property rather than producing physical products or performing manual services. Knowledge workers — workers who regularly perform “nonroutine” problem-solving tasks as a fundamental part of their job — are now the backbone of most enterprises. And instead of physical tools or machines, they deal in information: searching for it, synthesizing it into insights, and using those insights to inform major business decisions.



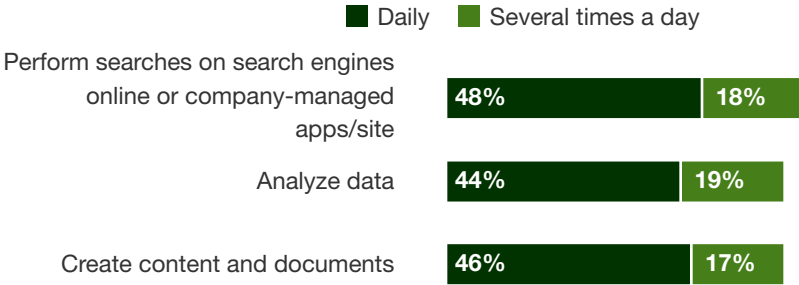
This means that employee productivity and ability to make sound and impactful business decisions depend on the ready and timely availability of accurate and contextually relevant information. When information isn’t readily accessible, knowledge workers spend an inordinate amount of time searching for it or are otherwise forced to rely on incomplete or less-than-relevant information. Too often, this leads knowledge workers to make suboptimal decisions — or no decisions at all.

In surveying 1,089 knowledge workers and 256 knowledge worker managers and decision makers, Forrester Consulting found that most knowledge workers:

- › **Frequently perform tasks that require finding and interpreting information to inform business decisions.** Most knowledge workers spend their days working in information: searching for it through communications and company repositories, analyzing it to derive insights, and using those insights to build content that informs major business decisions. (see Figure 1).

Figure 1

“How often do you regularly perform the following tasks as part of your day-to-day work?”



Base: 1,089 knowledge workers in the US, the UK, Japan, Australia/New Zealand, and Brazil
 Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, October 2018

- › **Depend on technology to deliver ready access to quality information.** Technology, of course, drives knowledge worker productivity and outputs; 64% of respondents state that it is a vital part of their role. But the technology that they have today is not good enough at delivering accessible insights: Whether because of siloed data systems or a lack of analytical tools, 50% report interruptions to their workflows due to inability to find or access the data that they need. This leads to a majority of knowledge workers making decisions based on whatever information they can easily access, even when they know that better data likely exists elsewhere (see Figure 2).

Figure 2

“How much do you feel you agree or disagree with the following statements as they relate to your job?”
(Showing those selecting “Agree” or “Strongly agree” on a 5-point scale)

64% Technology is important to my role at work

57% I make decisions based on the info that I can find knowing there is potential other/better information out there

51% My work often requires deep concentration and focus

50% My work gets interrupted because I can’t find or get access to info I need to ocomplete my tasks

Base: 1,089 knowledge workers in the US, the UK, Japan, Australia/New Zealand, and Brazil
Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, October 2018

- › **Frequently make suboptimal business decisions based on suboptimal insights derived from suboptimal information sources.** When challenged to find the right information, knowledge workers will then face challenges deriving meaningful insights from the information they have available (see Figure 3). These insights then are what they rely on to make decisions that ultimately impact the business. Artificial intelligence solutions have emerged as the missing puzzle piece to ensure that these employees can make sound business decisions based on complete, predictive, and intuitive insights.

Figure 3

“When reflecting on challenges and concerns that you have regarding working with information, how challenging are the following for you on a day-to-day basis?”
(Showing those selecting “Very” or “Extremely challenging” on a 5-point scale)

63% Making sound and impactful business decisions based on the insights I have derived from information available to me

59% Finding the right sources (e.g., individuals, online sources, physical files, etc.) that can supply the information necessary to do my job

48% Deriving insights necessary for my job from the data I have available to me

Base: 1,089 knowledge workers in the US, the UK, Japan, Australia/New Zealand, and Brazil.
Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, October 2018

Graph-Powered AI Will Augment Human Capabilities In Powerful Ways

Among other unique strengths such as creativity and ingenuity, the human brain has remarkable ability to establish context when reviewing information. Knowledge workers use unstructured communication and content tools like email, messaging, search tools, and massive content stores extensively and can establish context very quickly. An email from a colleague with a certain subject can instantly be identified as relating to specific project or business activity. However, as good as humans are creating connections between unstructured data and communications and establishing context, we are extremely constrained in the amount of data we can monitor and evaluate.

For AI-driven machines to begin to understand and evaluate vast amounts of data and communications in context, data about the knowledge worker's information access patterns, preferences, and activities must be accessible in a form that is consumable and structured. The concept of a graph to gather, evaluate, and make that type of data available in AI applications is not new. What is new is that information is now often available in a cloud environment that can feed the graph and make those AI insights accessible to users as well as developers. Graph-powered AI can properly analyze and contextualize data, which helps knowledge workers:

- › **Find the information needed to make decisions faster.** By understanding the context of a knowledge worker's activities, a graph can identify relevant information and surface it automatically. This can dramatically cut the time and effort spent looking for information, giving the worker back time for more important activities.
- › **Find relevant expertise more easily.** Much like information, a graph can automatically surface relevant expertise. By analyzing work patterns across the entirety of an organization, a graph can identify relevant experts and drive personal connections that produce better insights and outcomes.
- › **Make decisions more confidently.** As noted in the earlier data, knowledge workers often make decisions based on the information available, which may or may not represent the full picture. The reason is simple: There is often simply too much information for a human to sift through, even if the worker knows the information exists. By analyzing vast amounts of information in the context of a knowledge worker's activity, AI supported by a knowledge graph can surface information the worker may not have known to look for, resulting in better decisions while making workers feel more empowered, confident, and productive.

Cloud integration makes graph analytics insights more accessible to business users and developers alike.

Graph-Powered AI Drives Efficiency, Productivity, And Overall Business Benefits

Insights derived from AI can ultimately improve knowledge worker productivity, which in turn benefits those managing knowledge workers and the business as a whole. Automating tasks and removing obstacles to information discovery allow knowledge workers to reach a state of flow — a pleasurable experiential state that occurs during full-capacity engagement in which an individual is performing at a level that is matched with the demands of the task. This is the highest state of human performance, and businesses that foster a state of flow ultimately serve their customers better. AI solutions create flow for knowledge workers by using algorithms that adapt to real-world scenarios to quickly sort through large amounts of information faster than humans can and surface what’s most important.¹

This study proposed three different scenarios to knowledge workers and their managers that are possible with graph-powered AI insights. Our study found that these use cases can solve for some of the fundamental challenges that knowledge workers face. With those challenges alleviated, workers then can become more productive and provide more value — benefiting customers and the business.

DISCOVERY FUNCTIONALITY

Forrester asked respondents in this study to consider the benefits that they would expect from using “discovery” functionality of graph-powered AI tools. This describes functionality that evaluates how employees work and provides proactive suggestions of content, people, files, and documents that would be useful to their projects.

When asked to contextualize this use case of graph-powered AI in relation to their challenges, respondents indicated that discovery functionality (see Figure 4):

- › **Connects knowledge workers to the right sources of information, allowing them to make better business decisions.** A majority of knowledge workers believe that discovery functionality would be helpful or extremely helpful in deriving better insights (52%) and making better decisions (64%).
- › **Leads to more streamlined business processes and increased levels of business agility.** Less time wasted searching for information ultimately means efficient decision making. The majority of managers in our study believe that discovery functionality would benefit their employees through more streamlined processes (67%) that create a more agile business (66%) — translating to a better ability to serve customers (66%).



“We believe we can expand the business capabilities by providing insights, because we know that most of the people on a daily basis don’t have the time to rethink what they’re doing or have time to analyze their work. These tools can provide insight that no one is aware of.”

*Application manager
at a global materials
manufacturer*

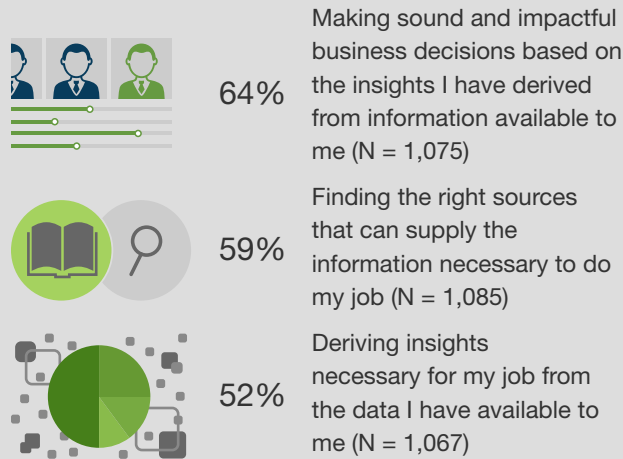


Figure 4

Scenario: Discovery functionality within the applications/workloads/resources that employees regularly use that automatically leverages information about how and with whom employees work — proactively delivering highly relevant and contextual information through machine learning-based insights.

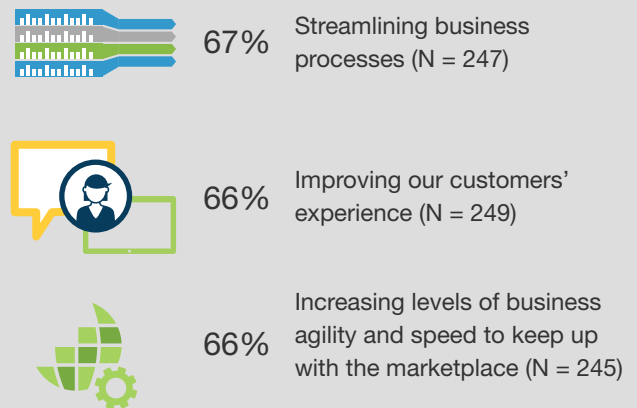
“If implemented at your organization, how helpful do you feel it would be solving the challenges you are experiencing?”

(Showing those selecting “Very” or “Extremely helpful” on a 5-point scale)



“If implemented at your organization, how much would the immediate benefits received by all the employees ultimately help the organization achieve its overall business priorities?”*

(Showing those selecting “Very” or “Extremely helpful” on a 5-point scale)



Base: Knowledge workers in the US, the UK, Japan, Australia/New Zealand, and Brazil

*Base: Decision makers in the US, the UK, Japan, Australia/New Zealand, and Brazil with insights into knowledge worker activities

Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, October 2018

AUTOMATIC COMPLETION OF DAY-TO-DAY TASKS

Forrester next asked respondents to consider the use case of routine task automation leveraging graph-powered AI. This would include tasks like scheduling and/or rescheduling meetings due to information contained in emails, generating automated responses to routine requests, and automatically prioritizing employee communications.

Manager responses to how automating day-to-day tasks would solve their employees' challenges indicate that it would (see Figure 5):

- › **Improve knowledge worker productivity, reduce burnout, and increase retention.** Although knowledge workers ultimately perform high-level tasks that demand deep concentration, mundane tasks associated with office life often impede that concentration — calendar scheduling, responding to emails, etc. Automating these tasks lets knowledge workers focus on tasks of higher value — improving overall productivity (rated as a benefit of routine task automation by 67% of decision makers), stemming burnout (68%), improving employee satisfaction with their roles (51%), and ensuring retention (59%).

“Repetitive tasks can be automated, or they can be executed without human intervention [so that] knowledge workers can focus on decision-making or strategy-oriented tasks.”

*Application manager
at a global materials
manufacturer*



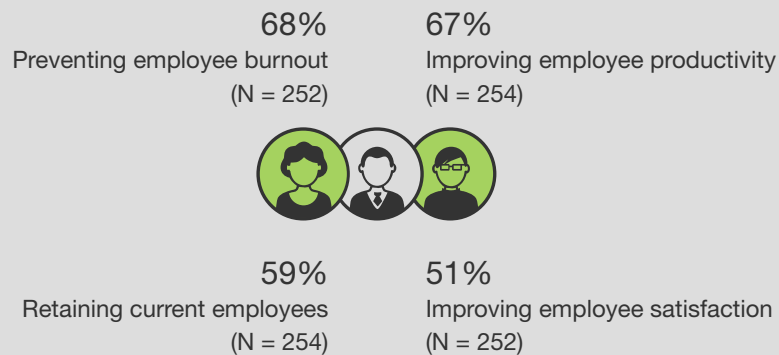
- › **Result in a happier, more productive employee — leading to a more streamlined business that enables a focus on serving customers.** More focused, productive employees do better work, resulting in better outputs that benefit everyone — the customer through better experiences (67%) and increased retention (56%), and the overall business through increased agility (60%) and better processes (62%).

Figure 5

Scenario: Automatic completion of day-to-day tasks based on both the contextual information about the employee, as well as what the employee needs to accomplish at that specific time.

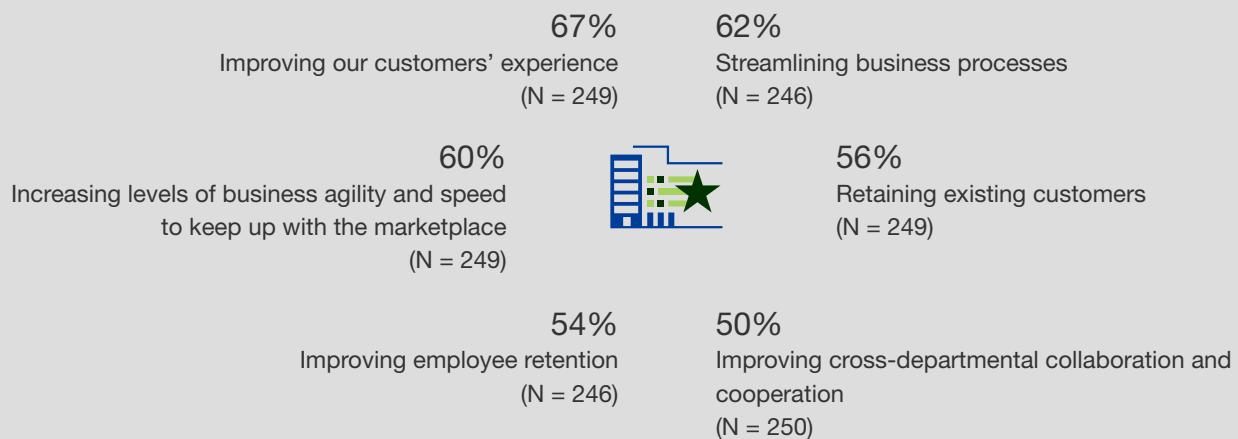
“If implemented at your organization, how much would the immediate benefits received by your employees ultimately help you achieve your knowledge worker management priorities?”

(Showing those selecting “Very” or “Extremely helpful” on a 5-point scale)



“If implemented at your organization, how much would the immediate benefits received by all the employees ultimately help the organization achieve its overall business priorities?”

(Showing those selecting “Very” or “Extremely helpful” on a 5-point scale)



Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, October 2018
Base: Variable knowledge workers in the US, the UK, Japan, Australia/New Zealand, and Brazil

AUTOMATIC COMPLETION OF NONROUTINE TASKS

Building upon automating day-to-day tasks, respondents were then presented with the possibility of automating some of the nonroutine tasks that form the core of their work. This includes such examples as automatic presentation design, document creation, and raw data sorting and analysis based on reoccurring meetings or communications.

Intelligent technologies that augment employee capabilities in performing so many nonroutine tasks not only save time and effort but also drive better insights and outcomes, ultimately allowing knowledge workers to achieve a state of flow more regularly. Responses by decision makers with insight into knowledge workers indicate that, much like with day-to-day tasks automation, nonroutine task automation can (see Figure 6):

- › **Produce a more productive, satisfied knowledge worker.** Like with the automation of day-to-day tasks, most decision makers agree that nonroutine automation improves employee productivity (69%) and employee experience (65%) and prevents burnout (57%).
- › **Benefit the business through increased agility, efficiency, and customer obsession.** Managers feel that nonroutine task automation also makes the business more agile (47%) and streamlined (55%) — creating a business model that can focus more on winning (54%) and serving customers through deeper relationships (50%) and improved experiences (64%).

“Anything that improves the flow of collaboration that we have — whether it’s something as simple as making it easier to attach a file in context or even suggesting that people need to be part of a meeting — that’s all going to save people time.”

SVP of business solutions for a global consumer goods manufacture

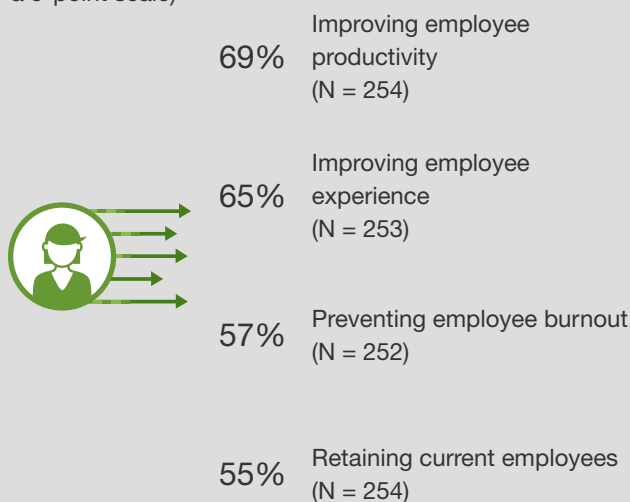


Figure 6

Scenario: Automatic completion of nonroutine tasks based on both the contextual information about the employee, as well as what the employee needs to accomplish at that specific time.

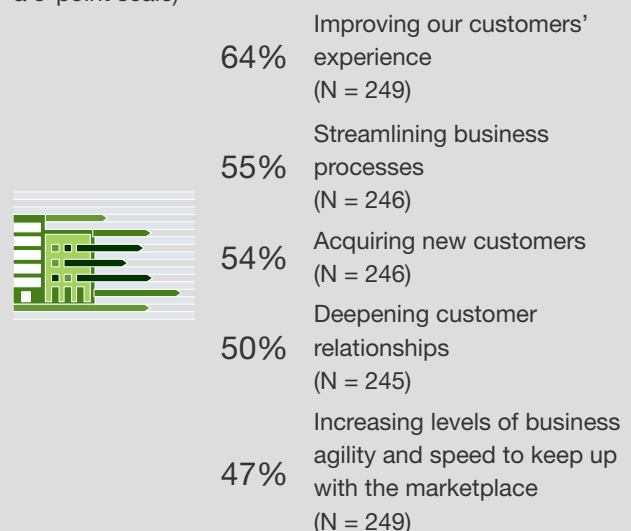
“If implemented at your organization, how much would the immediate benefits received by your employees ultimately help you achieve your knowledge worker management priorities?”

(Showing those selecting “Very” or “Extremely helpful” on a 5-point scale)



“If implemented at your organization, how much would the immediate benefits received by all the employees ultimately help the organization achieve its overall business priorities?”

(Showing those selecting “Very” or “Extremely helpful” on a 5-point scale)



Base: Variable knowledge workers in the US, the UK, Japan, Australia/New Zealand, and Brazil

Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, October 2018

Key Recommendations

Artificial intelligence is taking an increasingly important role in our personal and professional lives. However, the ability to augment knowledge worker activities — the most valuable and important activities in most organizations — is only now emerging. It is driven by a shift to cloud-based communication, content, and knowledge systems that aggregate large volumes of data; processing power to drive deep analysis; and graph technology to map that analysis to insights relevant to knowledge workers in the context of their daily activities.

Forrester's in-depth survey of knowledge workers and decision makers about the importance of graph-powered AI in workflow automation yielded several important recommendations:



Establish a strategy for AI to augment knowledge workers. Fifty-nine percent of knowledge workers struggle to find the sources of information that they need, and 63% lack confidence in making optimal decisions based on the insights available to them. Graph-powered AI can analyze vast amounts of content, communications, and worker connections and present insights to knowledge workers in the context of their normal business activities. This results in better decision making and significant time savings: One senior IT director at a systems integrator estimated that a single AI search tool in use at his organization can save individual users 5 to 6 hours per week.



Build your AI foundation in the cloud. While it's not always possible to place all workloads in the cloud, it is where the power of AI for knowledge workers will be unlocked.² With that in mind, a cloud strategy for knowledge worker communication, collaboration, and content systems will align them with AI services and processing power to drive critical insights.



Understand the role of a graph in supporting workers. One of the key benefits to cloud-based collaboration strategy is the ability to exploit the power of a graph, which can analyze content and communications across multiple systems. Forrester's data shows that more than 50% of global enterprises already have graph databases in place, with many more planning to implement them.³ Combining these with AI technologies can create contextual insights and connections that are extremely beneficial to knowledge workers.



Make graph-powered AI a key differentiating asset. For many organizations, knowledge workers are their greatest asset. Providing those workers with tools that drive better and faster decisions — along with increasing satisfaction and productivity — will become a critical differentiator. The time to start driving this is now.

“Our role within IT is just to ensure that we have the best tools in the hands of knowledge workers so that they can [do their jobs more effectively and efficiently] — collaborate amongst themselves, manage projects, share insights, do whatever kind of analysis that needs to be done within their subject matter area.”

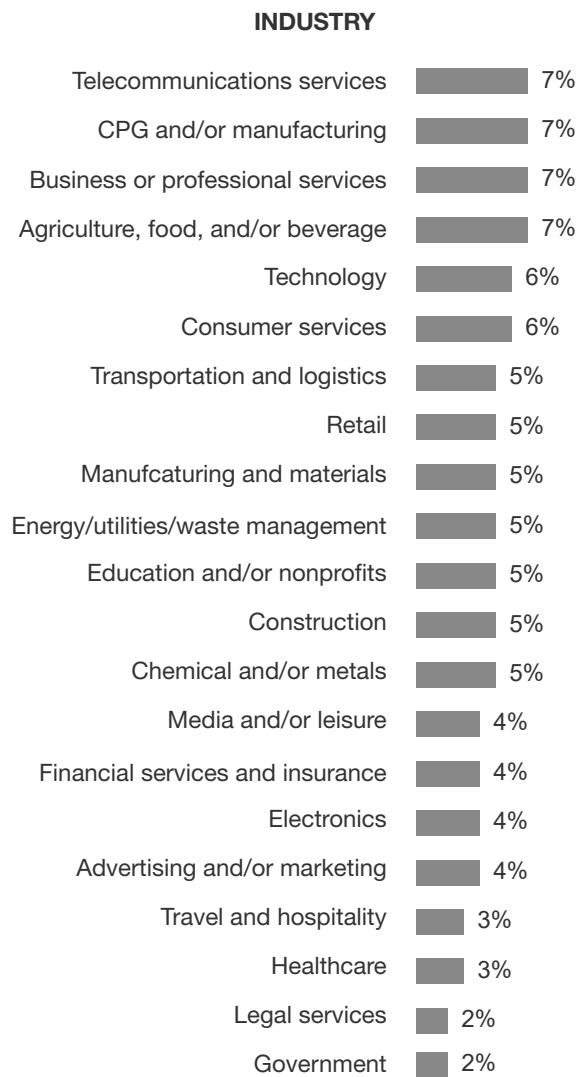
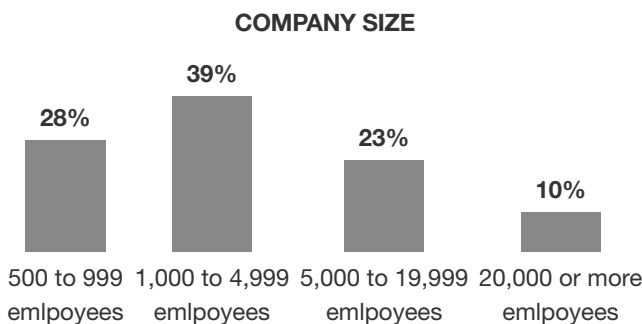
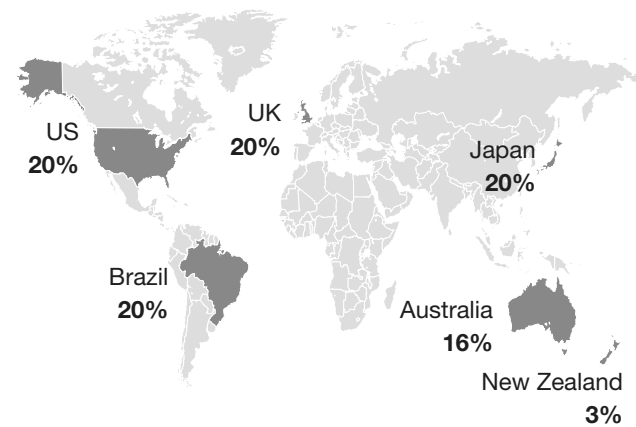
SVP of business solutions for a global consumer goods manufacturer

Appendix A: Methodology

In this study, Forrester conducted an online survey of 1,089 knowledge workers and 256 managers of knowledge workers in North America, South America, Europe, Japan, New Zealand, and Australia. The study focused on organizations with 500 or more employees in industries with traditionally high levels of use of enterprise applications — telecommunications services, consumer product goods and manufacturing, business or professional services, agriculture, food and beverage, and technology/tech services. These professionals came from a mix of line-of-business, IT, and security departments and have insight and influence over knowledge worker activities. Questions provided to the participants asked about their use of enterprise applications and resources, association with business benefits, and challenges experienced related to enterprise applications. The study began in July 2018 and was completed in October 2018.

Forrester also conducted 4 qualitative interviews with global organizations for a concurrent Forrester Total Economic Impact study. Quotes and time savings estimates are taken from this study.

Appendix B: Demographics/Data



Base: 1,345 knowledge workers and knowledge worker managers in the US, the UK, Japan, Australia/New Zealand, and Brazil Note: Percentages may not total 100 because of rounding.

Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, September 2018

Appendix C: Endnotes

¹ Source: “Engineer Your Technology Environment To Improve Employee Productivity And Flow,” Forrester Research, Inc., December 15, 2017.

² In addition to the fact that many collaboration and productivity tools exist in the cloud, the scalability and pricing structures of cloud allow more organizations to utilize compute-heavy AI workloads. For more information, see: “AI Deep Learning Workloads Demand A New Approach To Infrastructure,” Forrester Research, Inc., May 4, 2018.

³ Source: Forrester Analytics Global Business Technographics® Data And Analytics Survey, 2017.