



SOFTWARE & DATA ENGINEERING

A STRATEGIC ROADMAP FOR A DISTRIBUTED WORKFORCE

Best Practices for Tech Leaders

Digitally-enabled workers are the driving force behind superior customer service, and frictionless workflows are key to exponential growth in productivity and profits. This calls for bold vision and a new strategic roadmap.

This eBook includes research on the state of the modern workplace, an overview of emerging technologies in the workplace — including case studies from Growth Acceleration Partners (GAP) clients, best-practice strategies for creating a technology roadmap, tips for calculating the ROI of new technologies, and recommendations for implementation and success.

The Future of Work:

Embracing Frictionless Technologies

In recent years, organizations have made a concerted effort to improve the customer experience. A data-driven approach, customer journey mapping and omnichannel experiences are all considered crucial steps to meeting customers' needs and exceeding expectations.

However, less priority has been placed on elevating the experiences of the people behind those customer interactions — the employees. According to Gallup in 2023, only 33% of employees are engaged at work, yet companies with highly engaged workforces outperform their peers by 147% in earnings per share. The study also found engaged companies have 22% higher customer loyalty, 65% lower turnover and 37% higher productivity¹.

As workplaces become more digitized and workforces become increasingly distributed, business leaders must provide frictionless workflows to establish consistency, spark efficiency and provide optimal customer service — their financial performance depends on it.

Frictionless means smooth, effortless and achieved with little difficulty. For employees in the workplace, this means the ability to work from anyplace, anytime on any device — indicating an instinctual and appropriate interaction with technology².



In addition to mobile and SaaS solutions, leading companies are looking at newer technologies as they transform the manner in which their workforce engages. Voice-activated interfaces, the Internet of Things (IoT), augmented reality (AR), wearable devices and artificial intelligence(AI)/machine learning all have significant potential to optimize workers and upgrade efficiency, productivity and safety. These technologies are becoming more commonplace in the enterprise, as they represent more cost-effective digital transformation solutions than other highly touted tech such as robotics.

For executives and technology leaders, managing the selection, integration, deployment and on-going performance and maintenance of new technology is a daunting prospect. They will have to develop a change management program to help employees grow comfortable with new hardware and software platforms. Yet, the time for companies to take the leap is imminent. Organizations that fail to forge a frictionless path for their workforce may risk loss of key growth opportunities.

Frictionless indicates an instinctual and appropriate interaction with technology.

Not sure where to begin? GAP is passionate about helping clients navigate the future of work by finding practical solutions that create real business value. Whether your organization is developing a proof of concept or considering a major system-wide implementation, GAP can guide you toward greater efficiencies for years to come.

The Evolution of the Way We Work

Our collective understanding of the workplace has been redefined by waves of technological innovation. We are now blurring the lines between physical and digital, and biological and artificial, in a way that is fundamentally changing the way we live, work and relate to each other.

We've all heard how the mobile mindset has instigated a more flexible, virtual work environment, thanks to sophisticated communication tools, advancements in cloud computing, Internet connectivity and the influx of tech-literate generations. Recent surveys show 40.9% of employed people now telecommute with some frequency and a majority of them work in management or professional services³.

Companies are also relying more on on-demand workers, digitally integrating talent from all over the world to increase capabilities and agility. An estimated 36% of U.S. workers now work on a contingent, part-time or contract basis⁴. Work hours and location are becoming less important as companies focus on employee goals, deliverables and information exchange.

Whether the workforce in consideration is salaried or hourly, centrally located or spread out, it's only a matter of time before digital communication overtakes all other forms of communication.

At the same time, there's a broader definition of a distributed workforce that's been around for a long time. Global corporations with workers around the world or mid-sized companies with locations in several cities are relying on dispersed workforces. Verizon describes the difference as, "Simply put, remote work is the physical location of an individual worker in relation to a central office. In contrast, a distributed workforce is the discipline an entire organization follows to enable employees to work from various locations.

Spreading the team around is already common for global companies with multiple regional headquarters or satellite offices to better serve their customers. In addition, it provides companies access to a broader talent pool and provides employees with increased options for career advancement and mobility.⁵"

Advances in emerging technology are making it possible to implement highly intelligent tools in work environments that boost productivity, increase accuracy and streamline operations. Leading companies are enabling their workforces with real-time data and creating a more effective workforce that not only generates more agile employees, but more satisfied customers as well.





The Age of the Connected Worker

Technology is once again changing what it means to be a worker. According to a survey by Pew Research, most Americans (97%) own a smartphone⁶, and with many companies well past the fear that the BYOD (Bring Your Own Device) concept is a threat to data security, mobile technology has firmly implanted itself into the workplace.

According to FirstUp, 78% of employees in today's digital workplace use an average of 6-10 digital tools in their daily routine. Many of these employees are given the autonomy to choose the devices, apps and even the processes with which to complete a task. This is placing an increasing amount of pressure on IT departments to develop a larger variety of apps in shorter time frames.

Companies adapting to the new consumer device-driven landscape are seeing results. Of the companies that redesigned work processes to align with the use of mobile devices, Avanade found 73% were more likely to report improved sales and 54% were more likely to report increased profits than businesses that are not adapting in this way. They were also 58% more likely to report improvement in bringing products and services to market.

What's more, the 2024 Impact of Technology on the Workplace report reveals high-performing companies that have invested in collaborative tools like interactive portals and analytical dashboards have found them to be 80% more effective at improving productivity⁷.

Forrester reports one-third of enterprises in North America and Europe have implemented virtual collaboration tools to unify communications and overcome business and technology complexities, with an additional one-third in the planning or pilot phase.

Emerging Technologies in the Workplace

To stay competitive, business leaders must set the stage for innovation by breaking down barriers and embracing the opportunities technology can bring. Managers must consider what impacts future trends and technologies will have on their businesses.

Managers should also consider their value in supporting employees feeling overwhelmed with data, organizational complexity and a 24/7 work environment. Two-thirds of companies now believe complexity is an obstacle to business success and productivity⁸. The more employers can automate routine tasks, the more time employees will have to focus on more strategic activities.

Increased adoption of lean start-up methodology has best practice organizations streamlining the work environment and the employee experience. GE, for example, has prioritized simplification of its work processes to foster a culture of agility, inspiration and a focus on the customer. Their approach includes mobile apps for goal tracking and collaboration.

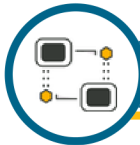
A variety of employee-facing technologies are capable of creating frictionless workflows that lead to substantial competitive advantages. Among the most promising digital technologies transforming the workforce are:



Handheld devices and enterprise apps



Speech recognition and voice response



IoT



AR, wearables and haptics



AI and machine learning

Mobile and emerging technologies present an opportunity for organizations to re-think their processes and workflows. Why require an employee to log in location information when a device's location services can do that automatically? Why wait for paperwork, signatures and payments to be processed manually when a device's camera can send that data instantaneously?



Handheld devices and enterprise apps

It's difficult to find a company that isn't investing in a mobile initiative. While there is still a broader functionality on the desktop, it's becoming increasingly secondary to mobile devices for work-related tasks. And yet, the nature of mobile is changing.

Today, handheld devices have a wide variety of applications in the work environment. Although they can serve in almost any capacity, they are frequently used in businesses that require employees to keep track of inventory, such as warehouses, shipping and retail. Businesses that expect staff to communicate frequently with a central location — such as restaurant servers and busy kitchens or field workers and their managers — may also find handheld devices useful. And industries with mobile employees, such as transportation companies, frequently deploy handheld devices for workers.

Similarly, enterprise apps designed for employees are on the rise and the productivity benefits are boundless. Employees can submit and respond to corporate communication, complete data entry, generate analytical reports and often handle customer service issues all from their own personal devices while on-the-go. Tasks and deadlines are tracked, company information such as product portfolios are presented consistently, and team members can receive push notifications for important messages and events so that instructions and requests are synced and resources are not misused.

Mobile employee apps are making an impact on retail, according to Capital One Shopping. While the percentage of revenue from brick and mortar has steadily decreased since 2012, the physical store still brings in the largest portion of retail revenue — around 85%¹⁰. Widespread research shows shoppers still expect to have an informed, knowledgeable sales associate available when they want it. According to retail advocacy group consultancy Expert Voice, knowledge-empowered employees sell 123% more than untrained peers¹¹.

Retail associates are on the front lines of customer service and interaction, which is unparalleled compared to the online shopping experience. This presents a massive opportunity for retail brands looking to improve sales and drive customer loyalty.



Case Study: Asphalt Institute R-18LabQMS

Asphalt Institute is an international trade association of petroleum asphalt producers, manufacturers and affiliated businesses. GAP has partnered with the association to develop tools that have helped reshape their industry.

The Asphalt Institute wanted to provide a simpler and more efficient method for its members to manage their laboratory equipment, document their processes, and train their staff so they can achieve and maintain stringent government accreditations. Their strategy was to employ digital technology to transform rigorous and somewhat arcane methods to one that was nearly fully automated. To accomplish this, they asked GAP to create a SaaS platform to address the needs of their members, and to also provide a new revenue stream for Asphalt Institute.

GAP designed, developed and maintains a platform that supports subscription management, role-based access, workflows, document creation, and complex management of equipment inventory, testing procedures and employee performance tracking. The result is a mission critical, quality management system for laboratories that greatly simplifies the accreditation process, keeps quality manuals up-to-date and shortens the amount of time spent with the assessors when coming on-site.



Case Study: Leading Spirits Producer

A leading North American spirits supplier with a distributed workforce hired GAP to build a number of digital solutions. The spirits producer's team of sales reps (aka Brand Ambassadors) had developed an ad hoc system of spreadsheets, emails and check-ins that was inefficient and didn't adequately measure key metrics. The team needed a modern tool to empower Ambassadors to more accurately measure productivity and give management access to critical data in a timely fashion.

GAP developed a powerful custom web app that brings a new level of productivity measurement, goal tracking and detailed reporting to the Brand Ambassador program. The app's mobile-friendly design allows Ambassadors to log activity and track performance from their mobile devices while visiting bars and restaurants. That real-time logging gives management an instant snapshot of performance of individual team members and the Ambassador program at large.

For the first time since the Brand Ambassador program's inception, the spirits producer's management can clearly track performance, costs, and ROI of the program and individual employees using this new portal.





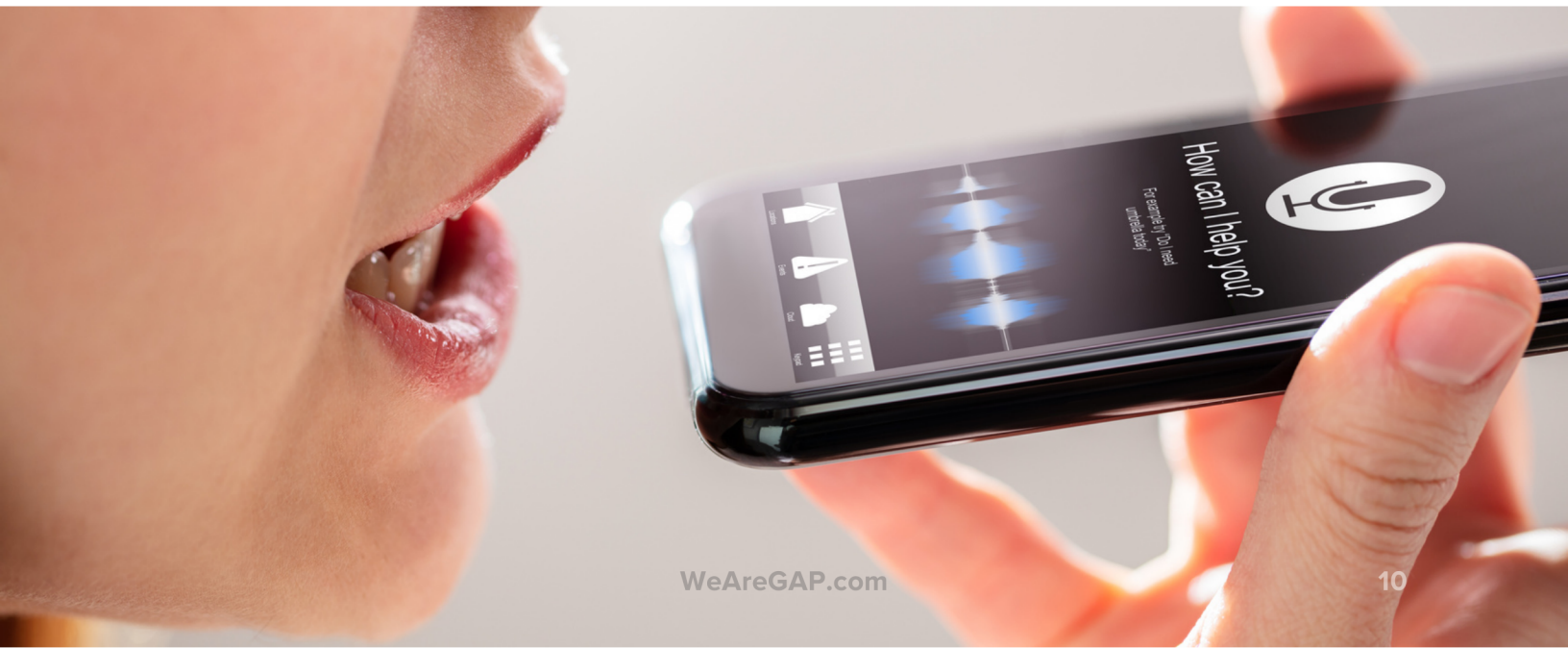
Speech recognition and voice response

Early generation speech recognition technology was frustrating to use and often not worth the trouble of getting it to work properly. Today, advancements in deep learning through digital neural networks have enhanced language technologies, resulting in more accurate predictive and conversational interfaces.

Beyond the commonly known consumer uses, voice recognition software will play a much larger role in how we do business. Considering the average person is able to speak around 150 words per minute (wpm) compared to typing an average of 40 wpm, a long list of administrative tasks could be executed faster with voice technology. Instead of typing out company correspondence, it can be dictated to a computer that generates flawless documents. Imagine a voice assistant in a conference room that records multiple conversations, produces meeting notes and provides lists of action items.

As primary senses, speech and hearing are naturally frictionless. And as a result, voice interfaces are being used to check inventories, book meetings, check account balances and place orders, among many uses. Impressive use cases involve those where workers need to keep their hands free, such as medical workers, assembly line workers and drivers. Mobile workers such as field sales teams can dictate information and fetch data while on the go.

Understandably, enterprises have expressed concerns around security and confidentiality when it comes to voice technology and listening devices. However, voice recognition offers an additional layer of security — voice user interfaces are increasingly being used as a form of biometric authentication, as all voices have subtle differences, similar to fingerprints.



The logo for Well Woven, featuring the words "Well Woven" in white text inside a red circle.

Well
Woven

Case Study: Well Woven

Well Woven, a leading rug manufacturer and distributor that packs and ships approximately 1,000 orders per day, asked GAP to evaluate the feasibility and value of leveraging a speech-based user interface in a warehouse environment. As a proof of concept, the effort is limited to the area of inventory management.

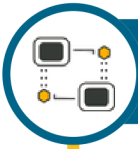
Given our interest in business use case scenarios appropriate for Amazon Echo's Alexa, GAP jumped at the opportunity to rapidly develop and test this proof of concept (POC). We developed two primary Alexa interactions — the inventory status and location of a SKU in the Well Woven warehouse. Sample commands include: "How many of item 8532 are there?" "What aisle is item 549103 in?"

GAP implemented custom, fundamental Alexa commands to explore the voice-based technology's capability to make improvements to Well Woven's operational efficiencies. The Alexa inventory support skills proof of concept was accepted, implemented and performed as expected. This leads the way to further exploration of voice-based interaction to improve Well Woven's operational processes.



“Voice-assisted warehouse management is an exciting new direction. We’re currently exploring the efficiencies and problems this capability will solve for Well Woven.”

— Adem Ogunc, Founder of Well Woven



Internet of Things

Following the trends of increasing data availability and mobility, IoT is creating an environment where almost any device or component can be connected to a network at relatively low cost. Devices can be remotely monitored or activated and data can be instantly distributed to other people, devices and data stores for analysis.

By the end of 2024, Forbes predicts there will be 207 billion connected devices, all working together to transform workplaces. Companies are equipping themselves with software, sensors and robust networks to unlock the immense value of IoT. And increasingly, smart devices will be augmented with AI and capable of making autonomous decisions.

Kroger

Case Study: Kroger

Kroger, the nation's largest grocer, employs more than 430,000 associates who serve customers in over 2,700 supermarkets in 35 states. GAP engineers have developed several IoT, mobile and web-based solutions to support Kroger's mission to provide frictionless experiences for customers and employees.



Kroger — Fast Alerts

Kroger installed temperature monitoring systems in all stores to consistently uphold its food safety standards. Previously, employees had to regularly visit each case to manually document temps, which was time-consuming and inefficient. Using the Fast Alerts IoT solution, these units are monitored 24/7 and alerts are automatically triggered when the temperature of any one unit falls outside the prescribed limits. This allows the retailer to relocate food immediately so that it is not compromised, reducing losses associated with food spoilage. The retail giant achieved a 5:1 ROI on operating expenses from this initiative.

Kroger — EDGE Shelving

At a typical grocery store, paper price tags line the shelves and perhaps some coupons stick out. At Kroger's test stores where new technologies are implemented, some 2,000 paper tags that needed periodic changing by Associates have been replaced with Enhanced Display for Grocery Environments (EDGE), a fully-integrated IoT solution. The digital displays can present pricing information, videos about the products and other information.

Kroger — ATM

Associate Task Management (ATM) is a mobile technology that streamlines store operations. Managers and Associates use handheld devices to communicate tasks quickly and efficiently. Managers can use ATM to assign Associates to specific roles or tasks, schedule automated tasks and plan staffing resources. This solution gives employees access to information they need in real-time, allows for faster onboarding of new employees and it seamlessly integrates with other store IoT solutions.





Augmented Reality, Wearables and Haptics

While wearable devices also fall under the category of IoT, and most of the buzz around them has focused on consumer uses such as fitness tracking. Wearables — along with haptics and AR — have made their way to the enterprise. Rapid advancements in head-mounted devices (HMDs) and smart glasses utilizing biometric sensors trick the human brain into visualizing virtual images as real.

While virtual reality (VR) provides interesting use cases around worker training, overall it currently does not fit our definition of frictionless — VR is simply too disorienting and disruptive to most workflows. However, AR merges a person's surroundings with 3-D images to create a continuous view of both virtual and real worlds and is expected to make a bigger impact on the enterprise market than VR.

AR, wearable devices and haptic feedback all aim to make significant improvements to complex work processes such as medical procedures and equipment maintenance. Workers wearing headsets can see information overlaid directly on physical surfaces, or feel haptic feedback as they make movements, reducing errors and saving time.

The start-up company AccuVein is using AR to help healthcare professionals find patients' veins faster, reducing the chance of infection. These hands-free technologies also are expected to make drastic improvements to high-risk industries such as field services, utilities and construction.

For example, workers could have their vitals tracked when performing hot work to reduce likelihood of heat exhaustion. Honeywell Industrial Safety and semiconductor producer Intel have worked together to make an IoT proof of concept geared toward firefighters and industrial workers featuring a wearable mobile hub that monitors breathing, heart rate, activity and location, to create remote situational awareness.

GE is testing its Smart Helmets designed to connect field engineers with more experienced colleagues at its headquarters to streamline complex tasks with audio and video assistance. Developed by Italian company VRMedia, an AR pioneer spun off from the University of Pisa, the Smart Helmet began with an industry-certified safety hard hat. Equipped with a video camera, a near eye display, and a Bluetooth-enabled headset with enough bandwidth to support uninterrupted connectivity and two-way communication, the helmet allows technicians to receive voice commands and exchange information with a centralized team while working.



Case Study:

Ottocast 3D Audio Augmented Reality App

Ottocast is a platform offering mobile audio guides to various points of interest, enhancing the tour experience. Ottocast sought to integrate Bose Frames into its mobile app to create an enhanced 3D audio experience for guided walking tours.

GAP engineered a location-aware 3D audio experience within the Ottocast iOS mobile app, leveraging the Bose AR SDK. This feature allows users to pair their Bose Frames with the Ottocast app for a hands-free walking tour experience.

The app provides 3D location-pinned audio as users approach points of interest, with detailed narrations available through simple frame taps. This innovation enabled users to enjoy enhanced audio tours without the need to look at or hold their mobile phones.



Artificial Intelligence and Machine Learning

Among the myriad use cases for machine learning and AI, advances in natural language processing are giving rise to conversational interfaces — one of the most important paradigm shifts in technology.

Companies are catching on to using big data technology to complete internal functions in conversational, efficient ways. A recent survey by SoftServe noted 83% of respondents felt that within the next five years, the only competitively viable publishers of business and consumer software will be those that have successfully integrated AI/ML functionality into products and overall business strategy¹².

The coexistence between human workers and cognitive technology is creating a new class of digitally-enabled labor. With automation taking over routine tasks, employees are able to spend more time performing higher-level tasks and innovating.

Advances in conversational AI technology are transforming chat apps into a new way to navigate the Internet and interact with brands. Use of chatbots has skyrocketed in recent years, with the rise of chat platforms such as Slack, HipChat, Facebook Messenger and Microsoft Teams. At GAP, we've used Slackbots to provide a natural language interface for several solutions, including beacon tracking to discover where employees are located in our offices in real time.

Start-ups such as Chyme and Kore are developing bots specifically for the workplace. For example, Chyme's bots help workers in call centers quickly determine the customer's problem by identifying previous customer behavior. Kore's Smart Bots are designed for retail, helping shoppers speed through the checkout process and receive customer service support at any digital touchpoint.

Want more details on why adopting a frictionless employee experience strategy is essential to remaining competitive in an increasingly distributed global marketplace?

See GAP's [Best Practices for Charting a Strategic Roadmap](#) 

Implementation & Performance Management

A successful implementation of frictionless workflows will require an organization-wide communications strategy. IT should partner with other relevant departments and take an empathetic approach to deploying the changes. New technologies such as non-screen interfaces and wearable devices will take some getting used to.

In addition to messaging, make changes visible. Consider visual aids and reference guides to help employees map the changes. Remember to focus on the user and ensure all demographic segments of your workforce are accommodated with training and change management that meets their needs.

The replacement cycle for emerging technology solutions may be longer than the advancement cycle in sensors and software embedded in those tools. Companies should adapt to continuous delivery models to update software and products on a rolling basis. Additionally, new security measures may be needed. Consider ongoing support services to manage, maintain and monitor the program.

In conclusion...

In a transformative era driven by emerging technology, the imperative for your organization is clear: embrace innovation or risk falling behind. The case studies presented here underscore tangible benefits that await those who strategically adopt and integrate these technologies into their workflows and organizational culture.

The future is built by those who dare to embrace change and act with intention.

Now is the time to start sketching a strategic roadmap that shapes a future where humans and technology work together and unlock unprecedented possibilities. Don't wait for disruption to hit. Begin crafting your strategic roadmap now, and connect with the experts at GAP to ensure your initiative is successful.

Citations:

1. Gallup, "In New Workplace, U.S. Employee Engagement Stagnates," 2024.
2. Forbes, "The Frictionless Enterprise," 2018.
3. Forbes, "Remote Work Statistics and Trends in 2024," 2023.
4. McKinsey, "Freelance, side hustles and gigs: Many more workers have become independent contractors," August 2023.
5. Verizon, "Distributed workforce vs remote work: what's the difference?," 2024.
6. Pew Research Center, "Mobile Fact Sheet," 2024.
7. Gallup, "Employee Engagement vs Employee Satisfaction and Organization Culture," 2022.
8. Tech.co, "The Impact of Technology on the the Workplace: 2024 Report," 2024.
9. Forbes, "IoT and Smart Device Trends: What You Need to Know for the Future," 2023.
10. Capital One Shopping, "Brick and Mortar Retail Statistics," Updated November 2023.
11. ExpertVoice, "Knowledgeable associate provide a measurable lift to sales," 2024.
12. Softserve, "AI/ML capabilities fall short of executive expectations," 2023.



About Growth Acceleration Partners

At GAP, we consult, design, build and modernize revenue-generating software and data engineering solutions for clients. With modernization services and AI tools, we help businesses achieve a competitive advantage through technology.

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