

Foreword by ELLIOTT MASIE, Author of BIG LEARNING DATA

Brandon Carson

LEARNING
IN THE AGE OF
IMMEDIACY

5 Factors for
How We Connect,
Communicate, and
Get Work Done

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Foreword

I WAS RECENTLY PREPARING TO GIVE A speech at an oil company in Saudi Arabia and playing with my new Snap Spectacles. Dozens of learning and business leaders flocked forward to touch, try, and explore the new wearable glasses that playfully capture 10-second videos and automatically share them with friends on Snapchat. We were experimenting with tomorrow's technology, today, in a social media context—changing the nature of innovation. An important realization for me and this audience was that future learning technology may no longer require a major system, significant expenditure, or expensive expertise.

Today, modern learning organizations are on the cusp of radical evolution and revolution. In business terms, technology has brought massive transformation in how we get things done. It's no longer possible for learning leaders to be stationary or rely on traditional methods to support their workforce.

This book is a primer on what Brandon Carson refers to as the five factors every learning leader needs to know as they evolve their organizations to move at the speed of business. *Learning in the Age of Immediacy* is an excellent guide for helping you begin to understand emerging trends, platforms, ecosystems, and the knowledge-building innovation that is requiring us to reimagine our learning strategies. The book explains in real terms how to best wrap your head around emerging technologies that are driving a wholesale transformation of how people communicate and learn. Brandon offers real-

world examples, case studies, and practical approaches to help you decide whether you should integrate these factors into your strategies. This book has reignited my belief that technology will always play a significant role in any learning strategy, and it's exciting to learn more about how these technologies, alone and combined, are really about learning. I now understand why the modern learning organization should never stop learning either.

Some important concepts explored in this book include:

- Automation in the workplace will radically transform how we work. We are just now entering an era of intelligent, connected devices that will forever alter the meaning of “work.” It’s imperative for learning organizations to know more now about the impact of automation. Here, you’ll learn about intelligent machines, immersive learning experiences, and how machines and humans work and learn together.
- The cloud has revolutionized how we communicate and collaborate. As Brandon states, “we’re still in the early stages of our move to the cloud, but it’s already obvious that [this factor] is a game changer for learning delivery.” Every learning leader needs to know and embrace cloud technology.
- Of the five factors Brandon discusses, mobile is the one with which we are all probably the most familiar. He discusses how we need to be thinking mobile-first now, shows us how mobile has consumed us all, and how it’s not just about a device in a hand. Mobile is how everyone gets their work done. You’ll be surprised by some of the observations about how mobile has accelerated our ability to build more relevant and meaningful learning experiences.
- Learning leaders also must foster more data-driven functions. Big data and learning analytics seem daunting at first, but you’ll learn how establishing a data strategy is the first step to understanding your impact on performance and business imperatives. Data are everywhere, and you now can extract meaning and guidance from them.

- Finally, Brandon dives in to the nascent but quickly growing Internet of Everything. He breaks down the meaning and explains the key points for learning organizations to focus on when it comes to harnessing our new world of “always-on and always-connected.”

Let me impress upon you that this book is not about hype and buzzwords. Brandon is more than just a fanatic early adopter. The five factors discussed may be emerging technology, or technology at an early stage, but all are already changing business models and enabling businesses to do more, faster. Each factor requires you to rethink how you design and deliver learning and, more important, helps you learn how to extend, widen, enrich, and deepen your contribution to the workplace you support.

After I wrapped up my speech in Saudi Arabia, the folks in the room circled around me, waiting to try on the new wearables. The discussion quickly evolved from excitement around a new gadget to how to incorporate them into their offerings to provide new learning opportunities. Now is the time to embrace the current emerging shifts that are becoming our future. Welcome to the Age of Immediacy.

Elliott Masie
May 2017

Preface

“I don’t need a hard disk in my computer if I can get to the server faster. . . . Carrying around these nonconnected devices is byzantine by comparison.”

—Steve Jobs, 1997

I HAVE BEEN USING DIGITAL TECHNOLOGY SINCE I was 15, when I was introduced to it by my first computer: a Radio Shack TRS-80. I learned how to program in BASIC, which started me on a technological journey that continues today. Until recently, I always considered technology separate from my day-to-day life, not interwoven into every aspect of it. I think we can all agree that has changed. Over the last two decades, technology has transformed our lives and accelerated our state of connectedness. It’s now imaginable for us to accept the idea that every person, place, and thing will eventually be connected, creating a vast network of everything.

I’ve spent the last 25 years in the learning industry as an instructional designer, strategist, and leader focused on how to improve the performance of the workforces I support. I strive to leverage technology resources when appropriate to build meaningful learning experiences that make people’s work lives better. I’ve been fortunate to experience the wholesale transformation of the learning industry over the years, and watch and participate in how almost everything we do has evolved. Along the way, some of what we valued most

has been questioned, such as the efficacy and ROI of classroom training. Some delivery methods, such as mobile learning, caused us to challenge our thinking of effective learning methods, but has now evolved into an important part of the learning toolbox.

The pace of change in the learning industry has progressed remarkably, and in recent years has begun to play a more central role in strategic planning at the C-suite level. In fact, many CEOs are relying more and more on their chief learning officers (CLOs) to help identify and measure workforce capabilities and align those to the needs of their business.

In recent years, technology has been the driving force behind much of the business transformation now occurring, creating completely new industries, and in some instances, remaking existing industries entirely. When the story of how technology disrupted the workplace in this era is written, it may be viewed from three distinct waves (based on Toffler 1980):

- **Wave 1: The Internet Revolution (1989-2000).** The rise of the Internet brings rapid technological change. The first focus is on developing the systems to connect people and standards for commerce and massive information dissemination.
- **Wave 2: The Information Revolution (2000-2025).** Where we are right now. Information becomes accessible in near real time, changing our content consumption patterns and behavior, and transforming education and how we acquire knowledge.
- **Wave 3: The Social Revolution (2025-).** There are no unconnected people on earth. We are less defined by physical geography, and more by our online activity.

As a learning leader, the forces of change affecting business require you to be more entrepreneurial, to navigate uncharted areas, and to make decisions in a space where skepticism may be high. For some, the barriers to successful integration of emerging technology with learning strategies may seem far greater than anything ever experienced. In the face of constant change, the modern learning organization has a responsibility to guide the business and

workforce forward, providing counsel to executive leadership teams on workforce capability and evidence that the workforce can execute on the business imperatives.

The learning industry is at a fork in the road, and it's important to view how your learning organization functions from two viewpoints: a startup entrepreneurship and an enterprise mindset. A nimble, responsive learning organization builds capabilities that the business identifies and leverages for competitive advantage. The growing demand for knowledge sharing, collaboration, and problem solving requires the ability to focus on the interdependency of all the business functions. It's important to perceive your learning business as one that needs to attract investors; is it positioned well to lure skeptical venture capitalists? You must be able to tell the story of where you're taking your learning organization and how you're providing value, and show the evidence supporting that narrative.

I hope the information in this book helps shape your thinking around some of the fundamental aspects of reimagining your learning business and more effectively position it to take full advantage of the forces of technological change. The stakes have never been higher—the choices you make now will either extend your learning organization's ability to focus on real outcomes and measurable results, or you will fail to deliver actionable results, requiring those you support to seek solutions elsewhere.

Acknowledgments

THIS BOOK IS THE RESULT OF A multiyear labor of love, beginning with observing how learning organizations navigate the complexity of modern-day business. I constantly compiled notes and ideas and delivered presentations at conferences and to other learning leaders on emerging technology and its effect on the learning function. Those around me suggested that the output of those notes, ideas, and presentations might make an interesting book, which ultimately led to this publication. I would like to thank these folks for supporting and advising me during the writing: Michelle Lentz for helping me get the words on paper in a way that makes the most sense; Penny Carson for making sure I stayed on target and consistently challenging me on my explanations and perspectives; Elliott Masie for his advice and support; and Richard Barr for being a nonindustry sounding board. I'd also like to thank Justin Brusino and Bridget Dunn from ATD for having the vision to take this project forward, and Christian Green and Caroline Coppel for their editing prowess.

Introduction: Welcome to the Age of Immediacy

WHICH WAS A MORE IMPORTANT INNOVATION: INDOOR plumbing, jet air travel, or the Internet? Each of these innovations ushered in new eras of productivity and human capability. Similar to air travel, but at an even more accelerated pace, the Internet has developed astoundingly fast, affecting every aspect of our lives, including the technological, political, social, and educational landscape. It has affected how we communicate, collaborate, congregate, and most important, learn. Over time, the Internet may stand as the most significant human achievement. How it evolves is hard to predict, but in less than 40 years it has completely altered how we experience our world. The Internet revolution was driven by the rise of easy-to-use, connected devices and near-ubiquitous access to networks. How we acquire and share knowledge has been fundamentally changed, requiring us to reevaluate the very construct of our training systems and frameworks. We are speeding head-on into the Age of Immediacy, where we expect information to be available when we want it, regardless of where we are, and in an easily consumable format.

You probably chose this book because of your role in learning and your need to address the turbulence brought on by the Age of Immediacy, including decisions regarding technology, strategic vision, tactical execution, and

workforce development. It may be your job to support the business as it moves away from business as usual, which means you have been placed in a position requiring you to rethink every aspect of your learning business.

This book is not about glorifying digital technology or imploring you to implement each of the five technology factors discussed. Instead, it's about helping you recognize how, in such a short time, digital technology has fundamentally affected almost every aspect of how business is conducted and has altered how we should be designing, developing, and delivering learning experiences. Much of what has happened over the past few years is a precursor to what will happen over the next 30. We are still in the formative stages of some of these factors, but it is certain we will be interacting with these technologies in all we do as everything on earth becomes connected.

From workplace automation, including robots, chatbots, artificial intelligence, and virtual and augmented reality, to the ascendance of the cloud and mobile technology, to the influence of big data and analytics and the Internet of Everything, these factors have begun to disrupt both business and learning organizations. Although I discuss each separately, they overlap; some are dependent on others, and at times it's a challenge to discuss one without another. However, it's important to look at each factor separately so you can gain more insight into the uniqueness of each.

Workplace Automation

Workplace automation is a topic that both entices and frightens people. The idea that computers, robots, and algorithms could make us obsolete and irrelevant is enough to make us wonder about the future of humanity itself. Automating job tasks is not a new paradigm. Our society has worried about how technology disrupts our livelihoods since the turn of the 20th century. This era is different. With advances in machine learning now moving at an accelerated pace, it won't be long until software can do much more than just react to input. Software will anticipate our needs, complete our tasks, and connect us to faster, simpler ways of working. For many tasks, software and machines will replace

humans, which begs the question: What will the workforce you support look like in the next several years? Are the skills and capabilities you have in your organization the same ones you will need to future-proof your team? Just look at Blockbuster, Nokia, or Blackberry, each of which had opportunities to transform their businesses to prepare for or anticipate changes brought on by technology. But they were slow to respond to the technological disruption that affected their businesses. Where are they now? Workplace automation is changing how you need to respond from a learning perspective, but it's also affecting the talent you need in areas such as collaboration, creativity, strategic and analytical thinking, and work intermediation (ability to integrate digitization into almost any work method). Your learning team cannot respond proactively if they do not have the technical acumen to provide the right learning solutions based on the rapid rise of automation in the workplace.

The Cloud

When asked about the cloud in 2008, Oracle founder Larry Ellison exclaimed, "What is it? It's complete gibberish. It's insane. When is this idiocy going to stop?" (Farber 2008). At the time, Ellison believed the cloud was no more than a buzzword. But as it has evolved, cloud computing has come to represent the perfect aggregation of technology and services driving our insatiable quest for real-time, contextual knowledge. As we begin to evolve from the ownership economy (owning or storing our data on our own hard drives) to the streaming economy (accessing data stored elsewhere on demand), we are seeing explosive growth in content decentralization. We can now access data from any device at any time from remote servers while we are connected. The cloud has become a utility that has changed the nature of how we interact with one another, transformed multidevice computing, and exponentially increased our ability to learn, share, and acquire new skills and knowledge in almost any context.

Mobile

Mobile technology is arguably the factor that has had the biggest influence on the workplace thus far. With mobile devices, our behavior has dramatically shifted. Now we're "always on" and our experiences are more direct and hyper-individualized. Information is only a tap away. This is why we have become emotionally attached to our devices—we touch and rely so much on them, so we form a deeper relationship. We expect our devices to assist us through almost every aspect of our lives: how we communicate to one another, research and purchase products and services, conduct work, schedule our day, and yes, learn. We expect our devices to entertain, but also shepherd us through our tasks. They are always with us and keep us connected. The mass adoption and major behavioral change brought on by smartphones is the primary reason you need to rethink everything you're doing when it comes to your learning strategy.

Big Data and Analytics

For training, the impact of big data and analytics is twofold. First, it provides more complete information about what your learners are doing, where they're excelling, where they're struggling, and how they're actually using your content. Second, big data can help predict learner behavior. You want a workforce that can perform to the capabilities the business needs to execute on its goals. Your challenge is knowing whether the workforce is capable of achieving those business needs. Every time someone does something with their connected device, you can gather data.

The emerging practice of data science and behavior prediction is leveraging these data to find trends and analyze those trends to predict action. You want to have the capability to know what action is about to happen so you can step in and change any action that is not desired. You also want to interpret both formative and summative data to inform your training strategy.

The Internet of Everything

The growing Internet of Everything is emerging as the grand connector that enables all our devices to communicate with one another and us. The promise of a more connected ecosystem is to truly realize the idea of contextual learning. Imagine a day when workplace knowledge is less about pushing information through one centralized system, such as your learning management system (LMS), but instead focusing on decentralizing content. Learning content becomes more of a feed delivered through multiple channels at any moment of need—think smart displays in the work environment, signage, product packaging, mobile devices, wearables, sensors, and so on. Everything will be capable of connecting to the network and assisting. Think of how sensors communicating to other sensors will craft a customized experience specific to the context of the learner.

The primary goal of this book is to help establish a frame of reference for these factors so you can decide whether and how to integrate them into your learning strategies in both the short term and the long term. My hope is that the information presented will aid you in making strategic choices based on what works best for your organization, its values, culture, and processes.

Why This Matters Now

While technology alone doesn't improve training, it's become our permanent partner in how we design and deliver learning experiences and evaluate their effectiveness. Increasingly, the workforce we support must learn new skills, innovate and create quicker, and boost performance while absorbing rapid change in how they communicate and collaborate to get their work done. Unlike previous technological disruptions, such as radio and television, the Internet has always been about handing the power of communication to the masses; no invention has spread as quickly and transformed our society as much in such a short time.

The five factors discussed in this book are or will affect how training is designed, delivered, and evaluated. These factors, sometimes referred to as “edge technologies,” consist of emerging technology products, services, and trends that are predicted to have a significant impact not only on business but also on workers and their performance. It’s important to be aware of these factors so you can appropriately determine their place, if any, in your organization. These five factors will cause the biggest transformation in how we connect, communicate, and get work done. Many other technology factors disrupt business, but as an aggregate, these five will have the most influence over the next several years. The irony is that each factor offers both interesting opportunities and daunting challenges for typical learning organizations.

One of the biggest hurdles to overcome is the realization that these factors aren’t really meant to help you do things the way you always have; they’re not just about making it easier to implement your existing strategy. These factors demand a new way of thinking about how you should approach the business of learning in its entirety. Many learning leaders strive to find a way to do more of the same with increased efficiency, productivity, and cost effectiveness. John Hagel (2014), co-chair of Deloitte’s Center for the Edge, a management research consulting firm, has said that when it comes to digital strategies, executives need to “fundamentally step back and rethink what business they’re in.” Now, more than ever, it’s time to rethink talent needs across learning teams. Jobs are evolving, technology is embedded in almost all work tasks, and the right talent will be scarce as skill sets evolve. Your team needs the capabilities to proactively deliver relevant training across the spectrum of these changes.

Our newfound ability to instantly share and receive information with anyone, anywhere means we are now in a world of not only real-time information, but also real-time learning. How does this affect your learning organization? Never again will anyone expect to *wait* to learn something. Can you support your audiences with up-to-date, meaningful content? Are you able to make that content easily discoverable, on demand? Do you have the skill sets

and resources on your learning team to design and deliver device-optimized content to your audiences?

Through conversations with industry experts and explorations into emerging technologies and services, I hope to help you gain a deeper understanding of the importance of knowing what's coming next, to make more informed decisions about which factors may be right for your organization. For your learning team, the next few years are the beginning of everything they do changing for the better.

Mobile

“Mobile is eating the world.”

—Benedict Evans, Andreessen Horowitz

SHARON GASKER'S ALARM STARTED PLAYING SOFT MUSIC at 4:30 a.m. She set it to wake her up extra early because this was day one at her new job. Sharon was now a marketing manager at the company of her dreams, a global provider of technology services. She wanted to get a head start on what would probably be a very busy day. She's eager, but not quite ready to jump out of bed yet, so she asked her alarm to give her just a few more minutes of shut eye.

After her quick snooze, she showered, grabbed her iPhone from her nightstand and headed out for breakfast. She saw a few notifications on her lock screen and swiped the first one. It was the HR department sending her links to an onboarding video and a quick, two-minute module welcoming her to the company. She could complete her initial onboarding while on the train to the office.

After she completed the two short training modules, she texted her new manager to let her know she already completed some of her required training before getting to work! In our new mobile-first world, Sharon is already a productive new hire before she is technically on the clock.

By providing orientation information to new hires before their first day, Sharon's company is not only helping her get a jump start on her new role, but also significantly reducing the time it takes new employees to become

productive. Additionally, by creating and distributing a New Employee app, it's built a powerful recruiting experience it can use to target new talent.

On June 29, 2007, the iPhone was introduced and the world changed. The iPhone was the first mobile device not laden with bloatware and confusing hard keys and buttons. It was also seductive, begging to be touched. The user interface was intuitive. It responded to natural human gestures. The iPhone offered a great user experience, which previous mobile devices had failed to deliver. It opened a new realm of possibility for consumers and developers.

We have only begun to realize and understand the impact mobile devices and constant connectivity have on the workplace. For workers, the mobile device is insurance against not knowing what they need to know to do their job. From now on, we'll have access in our hands to information on a scale humanity has never known.

How has mobile technology affected the workplace? In just the few years since 2007, smartphones have become ubiquitous and touchscreens are now standard. Entirely new behavior patterns have emerged, as learners have become untethered. Learners now expect personalized learning experiences whenever they want and wherever they are.

Why Mobile?

Of the five factors, mobile is easily the one that has received the most attention over the last several years. It has rapidly become a central part of all our lives. Recent developments in mobile technology, such as easier app development, faster carrier connectivity, higher-resolution screens, and faster processors have quickly become the fuel driving the Age of Immediacy.

For years, most learning organizations have designed e-learning experiences for desktop and laptop computers. Many of us never really thought about e-learning as a “web product,” although it's mostly delivered through a web browser. When the iPhone was introduced, Steve Jobs's keynote presented the mobile version of Apple's Safari browser displaying the *New York Times*. It

seemed like a game changer at the time: a true user experience on a small screen that mimicked the desktop, no longer a special mobile-only view. Back then, Safari on the iPhone was often an unpleasant experience. Websites still needed to be optimized for small-screen displays, and performance was spotty at best. However, that presentation opened the door to the idea that there was a world beyond the desktop for consuming information, and ultimately for learning. Since then, smartphones have become extensions of our very selves, and are often the first place we go for information. Knowing this, how long can you ignore mobile technology to help your organization achieve its learning goals?

Many learning leaders ask themselves, “Why should my team develop mobile learning? If a workforce is tethered to a desktop computer for day-to-day tasks, why should I worry about mobile learning?” When you pick up your mobile device, you have in your hand one of the most advanced real-time collective content and learning experience mechanisms ever created.

In today’s world, almost all workers are mobile in some sense. Constant connectivity has sparked a revolution in processes and agility, as well as rapid change in how business is conducted. Just because workers are tied to one place for a set amount of time does not mean they aren’t using a mobile device. In fact, an important realization about mobile is that “being mobile” isn’t just for workers on the move. Most mobile device usage occurs when people are in one location. Studies show that people always have their mobile devices, and often access devices in multimode usage; some tasks may be done on their laptop, while they pause and pick up their phone to complete a different task. People move back and forth between devices based on context, task, and ease of access.

Furthermore, people have integrated mobile devices into every aspect of their lives, including work, and are heavily reliant upon them for communicating, connecting, finding information, and sharing. Mobile in the workplace is really all about productivity, and its primary change to productivity is in shifting worker focus from efficiency to effectiveness. Would Amazon’s two-hour delivery service be possible without mobile technology? From customer browsing and ordering to fulfillment and delivery, workers use mobile devices to ensure the

two-hour customer promise is met. Workers use mobile devices to look up information at the moment of need as well as for real-time sharing of information.

Determining if Mobile Is Right for Your Organization

Mobile, however, poses major challenges for learning organizations. It's a technology that received mass adoption by the workforce, and now, in many ways, the workplace is playing catch-up. As entire industries adjust to the rise of mobile in the workplace, many job roles are affected. The debate about mobile for learning organizations is often polarized between those who see new channels for learning and those who see more distraction and less rigor around the formality of learning. The key is to determine if and when moving to mobile is right for your organization.

At its most basic, mobile is a confluence of devices, people, and connectivity with the ability to give a deep reach into the learner's context. However, not everything about mobile may be appropriate for your current needs. Like any of the factors discussed in this book, mobile can solve specific needs, but can also create a host of challenges:

- **Do you know how your workforce uses mobile now?** More than likely, they already use mobile devices. They may search with Google, use your consumer app (if you have one) to research information, collaborate with friends and colleagues using social apps, and use productivity apps to accomplish tasks. Do you have policies that allow access to mobile devices while working? Is it culturally acceptable to access learning resources while working? Is there Wi-Fi available and is it robust enough?
- **Is your team prepared to move from lengthy content creation efforts to curating and maintaining a living, breathing ecosystem of relevant, up-to-date content?** Mobile provides meaningful in-the-moment access for information and support. As a stand-alone learning tool, mobile is powerful, but when combined

with the cloud and the Internet of Everything, including wearables, it can open entirely new avenues for experiential learning.

- **Does your team have the skill sets mobile requires?** Resource shifting, upskilling, and integrating new systems takes considerable time and resources. Buying or building a platform, integrating it into existing infrastructure, and rolling it out require significant allotment of both budget and expertise across a wide range of capabilities. Ensuring you have the skills on your team to leverage mobile technology appropriately for learning is also vital. Designing and developing learning experiences for mobile requires a deep combination of both design and technical acumen.
- **Do you provide the device or does your workforce bring their own?** If you provide devices, then you need to manage and administer them. You need to consider the implications of “bring your own device” (BYOD) if your learning content requires authentication through the company network.
- **Does your company view learning as a formal event?** If your offerings are primarily classroom, how might mobile help? Formal classroom training will always have a place in learning. Some topics, such as leadership and sales training, are perfect for the instructor-led setting. In some situations, mobile might diminish the overall learning experience.
- **Can you gain support for the necessary technology shift to support mobile learning?** Many learning organizations rely on enterprise IT for technology support. In those situations, your tech support may come to you without substantial learning expertise, especially when it comes to implementing mobile learning.

Although there are challenges to integrating any new technology into your existing infrastructure, one reason you’re reading this book is because you feel the need to understand how these factors affect your learning organization. An important element to consider is the simple fact that your customers are most

likely using mobile devices to learn more about your business and interact with your company. In fact, customers are researching online and, with their mobile devices to help them, making buying decisions before they even entertain your product or service. Even if your workforce is tethered and not mobile in the classic sense, mobile learning can provide support for key business drivers, such as:

- **Offering faster training.** If you have a need for frequent training to support new products or services, mobile learning can reach your employees with product knowledge and selling skills. Consider offering all or parts of your mobile learning experience to customers as well.
- **Reducing training time.** Reducing time employees spend on nonrelevant training is critical, because now they can self-select the support they need for what they do, and then have more time to devote to work or customer service.
- **Reinforcing formal training.** Most training is intended to increase performance. Mobile enables learning organizations to increase performance by providing information when it's needed, rather than fire-hosing employees with information too early (or too late). By reinforcing prior learning, mobile can have a big impact on performance.

Mobile Technology's Evolution

Mobile technology is evolving separately from how people interact with mobile devices. In many ways, the mobile industry is still in the formative stage. For example, the voice-activated technology Siri turns the iPhone into a personal assistant that can complete tasks on command. Some Android devices sense your eyes on the device. If so, the screen won't dim, assuming you are reading. Although you are not tapping the screen, the device tracks your gaze, which could manifest still other behaviors, such as changing notifications.

Knowing how people use and behave with mobile devices is important. First and foremost, the devices that succeed offer the ability to keep in touch with a network of friends, family, and colleagues in a reliable, easy-to-use manner and encourage productivity. The technologies and trends detailed in the next sections are in their infancy now, but over the next decade will mature based on mobile technology evolution.

Mobile App Types

Currently, most developers choose from three types of apps: web, native, or hybrid. Web apps reside on a server and are coded once for multiple-operating systems. Native apps must be installed on the device and are written specifically for an operating system. Hybrid apps have components written in native languages for specific devices and are downloaded and installed to the device, but the content comes from the web. Developers are now blurring the line between the types of apps so that users are not aware when they link from one to another, or are not even required to download and install the app before seeing its content. Studies show that it's difficult to convince users to download apps, which means developers need to find new ways for people to discover content.

Mobile Payment Systems

Increasingly, smartphones are replacing wallets for everyday usage, such as payments. Amazon, Google, Apple, Chase, and others have all launched competing payment platforms. It's still very early in the adoption of mobile payments mainly due to financial regulation, merchant engagement, and technology integration. This is the one area that's evolving slowly, considering smartphones have been with us for almost a decade now. Just like commerce on the Internet took time to gain mass adoption, mobile payments will as well. However, in the future mobile payments will be a primary commerce mechanism.

Consumer-Led Mobile Health Monitoring, Diagnosis, and Wellness

Health monitoring is one of the most valuable applications for mobile because users always have their devices with them, and most smartphones have sensors

that lend themselves to tracking activity. Viewing health data is becoming more and more popular as developers create apps that gather specific activity data. As the technology evolves, devices will do more than just track activity; they will prompt users based on contextual monitoring and behavior patterns, such as “Hi Michelle, don’t forget to take your medicine; it’s 3:00.”

Corporate Adoption of Mobile Devices for Workforce Productivity

Many companies now see the value in providing devices for employees for tasks and to collaborate with colleagues during the workday. As the devices themselves become more commoditized, many more companies will adopt mobile devices for more employees. Some CIOs are also integrating BYOD policies that allow employees to access corporate servers and services with their own devices. Companies will mix the need to protect intellectual property with the need to ensure that employees are as productive as possible. Many employees now invest in devices and do not want to be required to use a less powerful or less feature-rich device than their own.

Sub-\$50 Smartphones

As mobile technology evolves and becomes more ubiquitous, the cost of ownership is falling. In many areas, providers already offer feature-rich smartphones for under \$100, and soon disposable smartphones will break the \$50 price barrier. Cloud technology enables people to move from one device to another to continue their experiences. Eventually, people will have a preferred personal device, but also move between multiple devices to achieve work tasks. Smartphones will eventually be like distributing pens and paper—a cost, but not a significant one.

Producing Mobile Learning Content

RIM, the maker of Blackberry devices, made a strategic decision to ignore the burgeoning BYOD movement, and the iPhone became the desired device in the workplace. The learning organization needs to proactively move in the right direction, aligning with the business. However, adopting mobile learning

requires a good understanding of the structural changes required for your team to effectively implement a mobile strategy.

Designing learning with a mobile-first mentality is becoming the standard for many learning organizations, providing more opportunities for multichannel access to your audiences. The basic philosophy of mobile first design is not new. In the late 1970s, Standard Generalized Markup Language (SGML), was created to provide descriptions for a document's structure and other attributes. Building on that is the idea to separate content from its display. By adding metadata (descriptions of the content) to the content itself, the content becomes portable and can be displayed on different devices and not confined to one style of formatting.

Most learning organizations will need to support both desktop and mobile, structuring delivery options to support multiple channels but minimizing redundancy in distributing content across those channels. Beware of setting up a system in which a mobile team is responsible for just the mobile content and a desktop team is responsible for just desktop e-learning content. In a perfect world, content is agnostic and can be easily optimized for necessary delivery channels, just like what the creators of SGML had in mind.

It's a waste of time and resources to develop one-off content experiences designed for specific delivery formats. Many content development processes and structures are still focused on delivering to nonmobile devices, and many learning teams start with thinking about delivering through the traditional web first and then converting that into a mobile experience. We have almost a generation of history and work flows to update, but it's important to evolve your work flow away from what your traditional systems dictate and move toward what content creators need when supporting mobile audiences.

Apply the same principles and techniques to your workflow design as you do to your content design. For the next several years, mobile usage will focus on the increasingly parallel world of technology and multiple devices. Even if you're not yet delivering on mobile, embracing a scalable content management and distribution system that supports mobile insures you against redesigning

or redeveloping content across multiple channels. A cohesive, platform-agnostic content strategy is critical. Each of the technologies discussed in this book is directly affected by content, and vice versa, but none more important than mobile. Think about these questions as you formulate how to produce mobile content:

- Do you need to support various devices (smartphone, tablet, desktop, or wearables) across your workforce?
- Do you want to support single-source publishing?
- Do you have the necessary capabilities on your staff to design and develop for mobile?
- How will you support and maintain content?

One of the biggest challenges with adopting and integrating new technology is determining the level of interoperability with your existing infrastructure. Considering how quickly technology options evolve, it can be daunting to finally land on a solution only to learn there is something around the corner that may provide new, enhanced capabilities. As a learning organization, you want to provide a seamless experience for your learners, which means integrating with existing systems and devices. With mobile, it's even more daunting. As mobile evolves, it's fragmenting. Discrepancies among devices, operating systems, and online access make it difficult to develop experiences that are consistent across channels.

If your enterprise already has a mobile strategy that includes development of mobile experiences (a consumer-facing app or a mobile website), consider partnering with that department to leverage the technology and learn from their implementation. You may find the enterprise favors a specific mobile development platform, and there may be licenses to grant you access. By coordinating your mobile content strategy across the enterprise, you ensure deeper interoperability to curate existing content into your learning experiences. It's best to align to the enterprise strategy, if possible, but if you do have to go it alone as a learning department, consider the following approaches.

Don't Design for Specific Hardware Devices

Unless you're certain the enterprise is locked in on one device, it's important to remain device agnostic. If your content experiences can bend to any device, you'll ensure compatibility with the enterprise regardless of how they evolve. This is especially important if your enterprise allows BYOD for the workforce. Even if the enterprise has landed on one device for everyone, the lifespan of a device is probably shorter than the life of your content.

Focus More on Operating System Interoperability

Do your audiences use Android, iOS, Windows, or a combination of the three? You want your content to first work on the operating systems you are required to support. Your team should devise a "develop once, deliver anywhere" distribution method. How sure are you that the enterprise won't eventually move away from one operating system to another?

Create a Centralized Content Strategy

Try your best to remove your content from its presentation. For years, learning organizations have struggled with the idea of content management systems and how to most effectively acquire, design, develop, store, and deliver content. They usually have ended up combining content with formatting to create unique deliverables. For multichannel publishing, your first strategy should be to determine how to reduce redundancy and to have a scalable platform that appropriately supports multichannel publishing.

Understand That Mobile Learning and Performance Support Are Not Necessarily the Same

Mobile learning can be an experience designed to teach something. Mobile performance support can be viewed as helping the worker to perform a task at a moment of need. Mobile learning may be more of a "lean and learn" experience, whereas mobile performance support is task specific and needs to be accessed in the work flow.

How to Use Mobile Learning Content

Mobile can change the learning content you deliver. Here are some design affordances specific to mobile learning:

- **Device cameras for scanning and imaging**—You can use the hardware to make access to information easier and more natural. If your workforce moves around products during the day, scanning barcodes to acquire information may be quicker than entering text into a search query.
- **Geolocation for finding products, fellow employees, and customers**—Mobile devices have built-in sensors that provide location awareness, device orientation, and navigation. You can access that feature to help with wayfinding and ease of use in locating.
- **Internal apps for measuring and calculating**—You can access or point to apps to extend or augment learning: the calculator app, measuring apps if employees have to help customers decide how much of a product they need, or apps that provide product comparisons, ratings, or reviews.
- **Internet connectivity for search and collaboration**—Most devices have some type of connection. Constant connectivity means you can encourage employees to search or collaborate with others regardless of location.
- **Media viewer or playback for content**—Almost any type of media can be viewed, such as video, audio, webpages, PDFs, and documents.
- **Messaging for collaborating**—Every device comes with built-in apps for messaging. Messaging apps are not only becoming more common for communicating, but also great for photo sharing, short-range communication and document sharing, link sharing, instant feedback, and group discussions.

- **Microphone and audio recording for capturing ideas and suggestions to share**—Mobile devices are not only one-way information portals. Employees can provide input using the microphone, and video recording capabilities are included in almost every device. Think about the power of your employees providing their own training videos for their peers.
- **Notifications and alerts for time-sensitive information**—The ability to distribute near real-time information in an instant can help speed acquisition of important knowledge. If a product or service change occurs, content can be updated quickly and employees notified in multiple ways through devices.
- **Portability and mobility for moving around and connecting to printers and terminals**—This has become common in retail stores such as Apple, where you don't even see cash registers. Employees move around the store assisting customers and taking purchases with mobile devices. If devices are used for tasks, you can also let them be used for learning.

Determining the Effectiveness of Mobile Learning

When it comes to developing a successful mobile strategy, learning organizations are often faced with difficult considerations around the best way to measure effectiveness. The process of creating mobile learning and investing significant resources into it requires that you determine whether it provides a demonstrable return on investment.

With mobile learning directly affecting the performance and behavior of learners, it's easier in most instances to calculate the financial impact of mobile learning than it may be to calculate the learning, mastery, and retention of the information. Mobile learning tends to affect the learner at the higher levels of learning evaluation (Behavior and Results) compared with traditional training approaches (Reaction and Learning) (Kirkpatrick and Kirkpatrick 2006).

The first measure of success of mobile learning comes from changing how your learners consume learning experiences. By reducing the cost of learning development, reducing the seat-time commitment to longer learning, and providing more efficient transmission modes than traditional learning, the cost savings can be significant. Every business is different, and every worker context is unique. You first need to measure specific initiatives to get a true ROI. Next, look at efficiency over effectiveness in the short term to ensure your design and development strategy is correct for your environment. You also need to determine how to measure program benefits over program costs. In some situations, mobile learning may solve a broader problem with worker knowledge, performance, or morale you didn't know existed. To help determine the ROI of mobile learning, think about these tangible benefits:

- less need for formal learning (can have a labor-hour impact for nonsalaried workers)
- faster new worker readiness (on the job quicker, leading to improvement in productivity)
- improved customer satisfaction (better customer support or service, increased sales, more upselling).

When beginning to assess the efficacy of your overall mobile learning strategy, include the following considerations:

- **Identify mobile learning benefits.** These would include the ones mentioned (and the business objectives they support). Base them on your organization's specific context (people, processes, prerogatives).
- **Estimate usage of your mobile services.** Change management is necessary if introducing mobile devices is new to the company. If it's not new, estimate how usage of existing devices would change.
- **Calculate the total cost of ownership.** Devices are necessary. If you need new devices, you must estimate the cost of providing them, maintaining them, and supporting them. Even in BYOD settings, there's a cost to integrate and manage. Secondly, platform costs can be significant. Do you implement a vendor-driven software

as a service model for content development or an internal content management system, or do you augment internal resources? In many circumstances, you'll find "buy versus build" to be about the same cost overall. Given that, you need to determine if your internal resources can effectively support mobile learning from both the content and technical perspectives. For a first iteration, or to prove the concept, it may be worthwhile to partner with an external vendor.

- **Build a model to calculate the return over a period of time.**

Using a proof of concept, or prototype, as a model can help determine whether mobile learning can work for the company. A "build small and iterate" style will uncover systemic barriers you may encounter. It's always best to start small and phase a rollout. Choose a program or project that provides the best representation of audience considerations and development strategies.

Ask the Expert: Tom King on Why Mobile Learning Matters

Even though workers have overwhelmingly adopted it, mobile learning is still in its infancy in the enterprise. What does mobile mean for learning in the near future, and what are the short-term considerations you need to think about? Tom King is a mobile learning expert who has worked in both learning and technology for more than 15 years. He is a technical learning adviser specializing in the integration of standards and platforms and has consulted with both corporate and government agencies on how to implement learning technology.

It seems like mobile technology has dramatically changed over the past few years. What's your thinking on where we're at right now and where we're headed?

We have a lot to be grateful for in terms of mobile learning capabilities. Modern hardware is more capable and pervasive than ever. Multimedia is now truly multisensory. Though it may seem otherwise, we're actually in a new period of relative stability for platforms. Dominant platforms have emerged and powerful

capabilities are commonly implemented; although things will clearly continue to evolve, massive ecosystem-wide disruption is unlikely for a while. We are not facing the sort of sea changes we experienced with the vendor disruption of Blackberry and Nokia or the platform transition from laptops to smartphones.

I'd like to think that the enterprise learning and the e-learning vendor worlds will take this opportunity to catch up with the dramatic changes. Solutions, tooling, and governance for mobile learning still seems ad hoc and underdeveloped compared to the mass market offerings. Startups and innovators have had the nimbleness to develop workarounds for mobile learning that often feel just like that—workarounds. Much of the industry relies on desktop “rapid e-learning” tools based on paradigms that emerged 15 years ago.

Personally, I will continue to chase the hardware refinements and improvements, but I'm most excited about new tooling and models for mobile learning. Where are the tools to capture, create, or edit learning experiences using your smartphone or tablet? Mobile is by far the most widely adopted Internet and computing device, yet we continue to consider them second-class tools for creating the learning experience. We develop on desktop and “target” mobile for publishing, and that inherently isolates us from the native thinking and native experience of mobile.

So mobile is a big deal. Why do you think it's important for a corporate learning organization?

To connect, engage, and integrate with learners' lives, it is important for organizations to embrace mobile. It's a bit similar to the paradox of designing and developing exclusively on desktop while delivering on mobile. People embrace and rely on smartphones. They are how individuals connect, and how people engage with the services and businesses they use. Smartphones are integrated into our lives. It would be shortsighted to not integrate mobile as a key component of learning and training strategy. As the PC was coming of age, Microsoft had a mission statement of “a computer on every desktop.” Over time that transitioned to “a computer on every desktop and in every home.” Now we have the smartphone, a networked computer available in every hand. E-learning has, and will, follow a similar trend line. Computer-based training started with a mainframe for a campus, then computers on every desk in the training room, until the Microsoft mission was realized and we called it “e-learning” for the computer on every desktop and in every home. Growth and adoption of mobile has exceeded the rate and quantity of everything that came before it—faster

than radio, television, or computers. With pervasive cloud services, we're now seeing more people with more devices, and not just the device, but the information is accessible everywhere. Traditional desktop and laptop computers are now the minority of devices connected to the Internet; mobile phones, equipment, and the Internet of Things are the vast majority. Mobile is important if you want to reach your largest audience, with the technology that is most widely available, and that they choose to use most of the time.

How can learning leaders prepare their teams to be able to deliver mobile learning?

Three things come to mind regarding preparation: contradictions, empathy, and collaboration. First, it is important to realize that mobile is filled with contradictions. Mobile is both pervasive and fleeting, it is engrossing and distracting. It is cheap and it is costly. It is completely easy to do and seemingly impossible to do completely right. An important part of preparation is accepting the contradictions and making trade-offs. The trade-offs must be carefully weighed, executed decisively, and then scheduled for re-evaluation. It may seem like a great idea to make training on critical items entirely mobile, to get that wide reach and exploit the pervasiveness. But does that suit the topic? Would it be wiser to engage mobile as part of a blend or to break it up into smaller pieces? We spend a lot of time doing things without our smartphone, yet we only spend a short time doing things with our phone. The apps are small and focused; even if we have ostensibly one thing to do, we still hop from app to app. We get the reminder, check the flight, get the file from the cloud drive, send the email, call the Uber, and send the text. Sometimes we even answer a call. This behavior becomes deeply ingrained and reinforced. Initial acquisition of deeper concepts or complex skills isn't suited to such fractured, interrupt-driven experiences. Yet, those same stolen moments of attention could be exploited by e-learning used as gamification for removing some basic skill acquisition drudgery, drill-and-practice rehearsal for fluency, or spaced learning of small bits over longer intervals for increased retention. Evaluate and embrace the contradictions. Play the role or designate a devil's advocate, and more knowingly, make the better trade-offs.

Second, it is important to have empathy. The learner with a mobile device is also a doer. Mobile is a context, not a platform. Engage in your own ethnographic research and immerse yourself in that learner-doer's world. Use their type of device, in their type of environment, with their interruptions, demands,

distractions, and deliverables. Then you can bring your understanding of organizational and training goals into their context. Mobile learning must work in context. Consider the field technician who might have spotty network service, cold or gloved hands, loud equipment nearby, or a device screen washed-out with direct sunlight. Consider the customer service representative who might need to break away from the training at a moment's notice, or may have a cancellation that suddenly leaves them with an hour of free time and only access to some "three-minute trainers."

Third, collaboration. Empathy resurfaces in regard to collaboration. In a larger organization you must collaborate with multiple teams to succeed with mobile learning. You will need to have empathy for line-of-business management, mobile device management, IT personnel, accounting, legal, marketing and branding, information security, and others. Oftentimes, they will need to educate you, and often you will need to research issues and educate them (or even selectively push back on some of their assumptions or assertions). In larger organizations, the IT department will often have significant investment in mobile device management and IT resource to support field teams who have mobile devices to support operations. However, training rarely has a seat at the table when decisions are made for such mobile deployments. Be ready to collaborate with the line-of-business managers who drive the initial operational justification and deployment. Work with the IT team responsible for deployment. Check with colleagues in your organization and peers in analogous operations. You may be surprised to find out about issues with accounting for international data plans and app purchases, global trade concerns about encryption or data security, or even shipping concerns. I know of one organization that was ready to deploy a tablet-centric "e-classroom in a crate" only to discover at the last minute that a box of 24 tablets with lithium-ion batteries is considered hazardous materials and could not be sent on international flights. Remember to collaborate with your designers, developers, content publishers, and LMS vendors, too. They may have answers or they may need to be educated—don't depend on assumptions, count on collaborations.

Is there anything else you can think of that you've come across that learning leaders are wrestling with when it comes to mobile?

Yes. Many leaders or their colleagues assume that once mobile is in place, you're done. However, all those collaborations are moving pieces. A mobile strategy is a vector, not a location. You need to revisit things and should create your own monitors, metrics, and "seasons" to manage a mobile strategy

because it is an ongoing process, not an event or a reaction. Consider how you might align the entirety or portions of your mobile strategy based on indicators and external factors such as annual or quarterly company goals and initiatives, IT infrastructure updates and schedules, and supplier schedules. (The major fall releases of iOS and Android can wreak havoc on slow-to-update apps.) Consider strategies to use off-the-shelf apps like checklists or PDF viewers for documenting on-the-job training observations—and be ready for when those apps might need to be replaced. In short, be informed, be agile, and own your schedule as much as you can.

Case Study: Mobile Learning in Retail

In just the last several years, mobile technology has transformed the retail world. Customers use mobile devices before, during, and after transacting with retailers to ensure their product and service needs are met. Customers are becoming accustomed to receiving hyper-individualized attention as they make buying decisions, and they're using mobile to stay informed and aware. In many ways, retail customers are entering the buying journey with more information than the associates that serve them have.

Recently a large, U.S. big-box retailer embarked on a mobile learning pilot designed to help improve customer service by bringing knowledge for both their associates and customers into the aisles and out of the back rooms. The company has a large mix of part-time and full-time workers and a highly complex retail environment with a dedicated focus on customer service. The bulk of their current training is provided at the start of employment and consists of approximately 30 to 40 hours of selling skills and product knowledge training.

The retailer piloted a mobile performance support system designed to provide associates with product knowledge in the aisle to help customers with their product and project needs. The app is accessible from corporate devices or the employee's personal device and provides quick access to relevant information about top-selling products and popular projects.

In this context, mobile learning adds meaningful information at the moment of need instead of providing traditional training on products outside of the employee experiencing the product in the aisle. Before the mobile learning pilot, observations showed that employees learned by using their own devices to search product reviews and ratings, check inventory, and locate products in other stores.

A key reason this retailer is piloting placing a device in the hand of every sales associate is because it recognizes that learning happens anywhere, anytime, and most workers learn how to do their jobs while on the job. The ability to move about while remaining connected to information that helps the employee perform is the essence of learning embedded in the work stream. The employee equipped with a mobile device is similar to the employee equipped with a pair of gloves and a measuring tape. It's an essential utility to extend their knowledge so they can continue working with customers, instead of going off the floor and sitting in front of a computer for e-learning. Furthermore, customer research shows that the number-one customer desire in a retail shopping motion is to receive quick and knowledgeable help from an employee.

Initially the business wanted the pilot to answer these three questions:

1. Can mobile learning be used for training in the aisle?
2. Will it increase associate speed-to-readiness for the workforce?
3. Will it increase new associate competence and confidence to serve customers?

The retailer felt if the pilot showed positive data in each of these three areas, there would be justification to move forward with integrating mobile learning into its overall learning strategy.

App Development

The company decided to first construct a proof of concept with a small amount of content and limited functionality. The development team applied design thinking principles by going into the store to design a series of conceptual mock-ups. This enabled the team to get immediate feedback from the target audience. By ideating a proof of concept with the learner involved, the team quickly established a user-centric design pattern, shaving a considerable amount of time from the typical design process. For example, developers considered search functionality to be a core component of the user experience. They could quickly discern that most learners would not use it. Instead, they wanted more guidance through a menu system. (Consider the resource savings of not engineering functionality that won't be used.) Additionally, approaching the content development in design thinking mode, the prototype tested not only the effectiveness of the content itself but also how employees would access and use it. Usability and content together form the mobile experience, and the prototype was designed to test both the content and how employees might use the app.

From Prototype to Pilot

Once the prototype was constructed, it was delivered to 33 stores. The primary use case for the prototype was to observe employees using it in the context of their jobs, gauge reaction, and analyze behavior patterns. The team also focused on customer reaction to employees using the app while working. A key component in rolling out a mobile learning experience such as this is to identify how its usage in the workplace affects not only employee behavior but also customer behavior. It was also important to receive store leader feedback to discover whether the use of devices in the aisle affected customer service.

The app was well received during the prototype, which ran in the stores for 90 days. However, access and usage of the app over time suffered because of device limitations: Notifications were turned off and the app icon was not easily accessible.

Pilot

The team took the feedback from the prototype phase and iterated the design. The content was optimized to be more succinct and provide clearer guidance on helping the customer make purchasing decisions. The team also integrated game mechanics to provide a more interactive and engaging learning experience. With the addition of guided scavenger hunts and rapid-fire knowledge checks, the employee could leverage the app to not only help customers but also become more fluent in the work environment. The game mechanics assessed the employee's product knowledge, and using reward mechanisms such as points, badges, and leaderboards provided a competitive and challenging learning opportunity.

The pilot was conducted over a 90-day period in 78 of the retailer's stores. A control group was established to benchmark against the pilot group to help the team determine a return on learning effectiveness. Metrics such as app dwell time (the time spent in the app itself), motivation to complete game activities, and proficiency based on assessment responses were analyzed to determine the pilot's success.

Evaluation

For a large retailer, it was important to prototype and pilot a learning experience that would potentially transform how it delivered learning before launching a large-scale rollout. Iterating through the design and development experience by

connecting closely with the target audience allowed the team to reduce their reliance on assumptions and deliver to actual audience needs. Another key aspect of determining whether mobile would work was to recognize the change management necessary to facilitate learning in the aisle. From the employee's perspective, the leadership perspective, and the customer perspective, it was important to fully understand how (and if) the use of devices for learning in the work stream would have a detrimental effect on the business. The team found that quite to the contrary, customers, leaders, and employees welcomed the experience into the environment because at its core, it was designed to assist.

Key Takeaways

Of the five factors, mobile is the one that can demonstrate the most tangible ROI for a learning organization in the short term. We all know that more people will be typing on glass rather than keyboards in the future. Even if your workforce isn't mobile in the sense of moving around, they constantly use mobile devices to acquire information and learn. Having a learning strategy that incorporates mobile prepares you to accommodate your learners across the channels they feel most comfortable with and to which they have access. You should never incorporate emerging technology just because you can. You should also remain skeptical of emerging trends. However, mobile technology has completely reshaped business and provides continuing value as to how people get work done. Consider these guiding principles when thinking about making the move to mobile learning:

- Place learning opportunities where it matters most for the workforce: at the point of need, where it's more relevant and engaging.
- Accelerate the creation of learning content and increase the speed of access to keep your learners informed with up-to-date information.
- Stop the information fire hose and provide just the right amount at the right time.
- Untether your workforce from "dedicated training computers" and make information available anywhere, any time they need it.

- Leverage geolocation capabilities, internal sensors, text messaging, supportive notifications, collaborative learning, and smaller chunks of content inherent to mobile to redefine learning experiences.
- Move from formal learning to self-directed learning where the employee has more control.

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