2017 Trends and Technologies: Mobile
Introduction

Since 2014, EDUCAUSE has examined higher education’s top strategic technology priorities. This year, in addition to reviewing the overall list of strategic technologies, EDUCAUSE will publish nine separate reports examining in detail the technology domains we asked about and reviewing each domain’s component technologies and the trends associated with those technologies. This report covers the eight technologies and the single trend included in the mobile domain.

The single trend and several technologies related to the mobile domain describe an environment characterized by the burgeoning use of mobile devices and the increasing diversity of mobile applications for higher education. The resulting growth in the mobile ecosystem is driving colleges and universities to consider strategies for managing complex data and access issues while taking advantage of the opportunities that mobile technologies present. Expectations are high. A 2016 EDUCAUSE study found that students use their devices extensively and view them as important to their academic success. Faculty, staff, and students all expect seamless connectivity from their mobile devices and access to the institution’s services and information, including connectivity to enterprise applications and analytics information. Institutions are starting to address the challenges and opportunities of using mobile devices in teaching and learning and of supporting research efforts that use mobile devices and infrastructure.

Understanding the impact of this complex mobile environment on your institution is an important part of developing a mobile strategy. The tools described in this report reflect IT’s growing need to keep up with stakeholder demands; take advantage of new possibilities for teaching and learning, administrative, and research efforts; and manage policy and governance issues such as data access.

This report focuses on the trends and strategic technologies associated with mobile computing. Mature, commonly deployed technologies (such as financial information systems or networks) may be among the most mission-critical technologies, but they are generally more likely to receive operational than strategic attention. Strategic technologies, by contrast, are the relatively new technologies institutions will be spending the most time implementing, planning for, and tracking in 2017. None of the eight mobile technologies analyzed in this research is currently in place in more than 30% of institutions.

Technologies are what IT organizations do. Trends, on the other hand, are widespread external factors that influence institutional and IT strategy and often spur the adoption of technologies. This report examines the trends that institutions are paying the most attention to and that are influencing emerging institutional IT strategy the most. This year’s trend list included one item closely associated with mobile.
Covered in This Report

**Trend**

- Managing mobility (people, data, institutional resources)

**Technologies**

- Development tools to support multiple key platforms
- High-precision location-sensing technologies
- Incorporation of mobile devices in teaching and learning*
- Location-based computing
- Mobile app development
- Mobile apps for enterprise applications*
- Mobile apps for institutional BI/analytics
- Mobile device management*

*Part of the overall 2017 Top 10 Strategic Technologies*
Findings and Recommendations

What do we know about the kind of progress higher education might make with mobile technologies? What trends might influence this progress? While our data can never be a substitute for an institution’s own mobile strategic plan or roadmap, this report can inform an institution’s overall IT strategy and mobile technology–deployment strategy.

The Trends

We characterized a trend as “influential” if it was already incorporated into IT strategy or exerting a major influence over emerging IT strategy. We used that characterization to classify the trends into four levels of influence, based on the prevalence of influence across institutions:

- **Most influential**: Trends that are influential in 61% or more of institutions
- **Taking hold**: Influential in 41–60% of institutions
- **Worth understanding**: Influential in 21–40% of institutions
- **Limited impact**: Influential in 20% or less of institutions

Only one of the trends we studied was relevant to the mobile domain, falling into the category of “worth understanding.”

**Understand how the most influential trends are affecting your institution.**

No trends in the mobile domain fall into this category.

**Review the trends that are taking hold and address them at your institution.**

No trends in the mobile domain fall into this category.

**Understand these trends, and consider their possible role at your institution.**

The influence of this trend is limited to 21–40% of institutions. Higher education is monitoring this trend with respect to emerging IT strategy and the deployment of mobile strategic technologies:

- **Managing mobility (people, data, institutional resources)**. As mobile devices become more ubiquitous, as the Internet of Things expands, and as stakeholders expect seamless connectivity through mobile devices to institutional resources and data, institutions need to consider a number of IT and business processes that cover the management, administration, and support for mobile services. Finding a balance of access and control is important.
The Technologies

The list of strategic technologies included in our survey was derived from the 2016 list and from several authoritative sources that annually identify emerging and maturing technologies in higher education. A total of eight of the technologies in the survey pertain to mobile. For each of those technologies, respondents selected one of six response options to indicate the level of activity for that technology at their institution in 2017:

- **Institution-wide deployment**: Full production-quality technical capability is in place, including ongoing maintenance, funding, etc., with deployment potentially supporting institution-wide access.

- **Expanding deployment**: In 2017, we will move from initial or partial to broader or even institution-wide deployment.

- **Planning, piloting, initial deployment**: This technology is not yet available to users; however, meaningful planning for deployment is either in development or in place. Staff are investing significant time (multiple person-weeks of effort) and resources in executing the plan to pilot or deploy this technology within a defined time frame.

- **Tracking**: Multiple person-days of effort will be assigned but restricted to monitoring and understanding this technology (much more than just reading articles).

- **No deployment**: None of this technology is in place, and no work will be under way or resources committed for this technology in 2017.

- **Don't know**: I don’t know what this technology is.

We assigned attention scores to the responses, and the scores were weighted to highlight responses indicative of higher levels of activity (expanding deployment; planning, piloting, initial deployment; and tracking) over responses that suggest little or no activity of that kind (institution-wide deployment, no deployment, and don’t know).

Understanding what peer institutions (both current and aspirational) are doing can help you gauge whether your institution’s current approach is on track or might warrant reconsideration. Some technologies are more relevant for some types of institutions than others. We looked at broad demographic categories, including Carnegie class, institutional size, and approach to technology adoption and found differences in attention score based on those factors. In figure 1, the U.S. mean is the average attention score for an item from all U.S. respondents. The minimums and maximums are the lowest and highest average attention scores among all groups within the categories of Carnegie class, institution size, and timing of technology adoption, with labels indicating which group or groups returned that score. In the event of a tie, all tied groups are represented.
Looking beyond attention scores, we sought to understand the kind of effort that the largest proportion of institutions is devoting to each technology. We created four attention categories by combining adjacent responses:

- Expanding deployment and institution-wide deployment, combined as **deploy and maintain**
- Planning, piloting, initial deployment and expanding deployment, combined as **pilot and deploy**
- Tracking and planning, piloting, initial deployment, combined as **decide and plan**
- No deployment and tracking, combined as **track and learn**

Although nearly every technology was represented to some degree in each attention category, we assigned each technology to the attention category with the greatest amount of institutional activity for that technology in 2017.

**Complete initial deployment and maintain these technologies.**

Our research shows although many institutions are expanding deployment or already have some strategic mobile technologies in place, the bulk of the activity in 2017 will be at other levels. As a result, no technology was assigned to the **deploy and maintain** attention category.
Pilot and start deploying these technologies.

At this time, institutions are planning to pilot and deploy these mobile strategic technologies (listed below from highest to lowest attention):

- **Incorporation of mobile devices in teaching and learning.** Incorporation here means the deliberate and explicit integration of mobile devices in the fabric of a course's design or set of learning activities. At its most basic level, this kind of integration entails explicit planning to ensure that course resources and activities are accessible to students using mobile devices. At a more ambitious level, the designs of course content and learning engagements deliberately target the use of mobile devices by leveraging their unique capabilities. Mobile devices, once so integrated, can be used for course assignments and field work but also as tools to facilitate collaboration for all participants.

- **Mobile apps for enterprise applications.** Mobile apps for enterprise applications refers to web-based applications that run on mobile devices such as smartphones and are designed to integrate with all aspects of an organization's businesses and processes. These apps make it possible to access enterprise-wide resources (such as course catalogs, student information systems, and human resource systems) and to conduct enterprise transactions from mobile devices.

- **Mobile app development.** Mobile app development (responsive design, hybrid, etc.) is the organizational capability for the development of mobile applications. Organizations must make decisions about native apps for specific devices and mobile web development strategies. Issues of accessibility, security, data protection, and responsive web design also must be addressed when considering mobile app development.

Decide when these technologies fit your strategy, and start planning.

Institutions are watching this mobile strategic technology carefully, deciding and planning for potential future deployment:

- **Mobile device management.** Mobile device management is the approach an institution takes for the policies, support, and procedures related to the variety of cell phones, tablets, and laptops on campus. Mobile device management involves a balance between security of institutional data and user convenience and productivity. Some institutions use third-party products and services to manage mobile devices. Considerations include data security issues, support for personally owned equipment, and application management.
Learn about and track these technologies.
Institutions are tracking and learning about the following mobile strategic technologies (listed below from highest to lowest attention):

- **Development tools to support multiple key platforms.** Because mobile devices use a variety of platforms, software developers need to program applications to run on various operating systems. Design strategies include responsive web design, which provides an optimal experience across a wide range of devices. Development tools exist that aid in this cross-platform development.

- **Mobile apps for institutional BI/Analytics.** These mobile apps allow the user to access institutional BI and analytics resources and technologies via handheld devices.

- **Location-based computing.** Location-based computing uses location data to deliver online content to users based on their physical location, using various technologies including GPS, cell phone infrastructure, and wireless access points.

- **High-precision location-sensing technologies.** These technologies enable applications to use precise indoor location, allowing systems to know an individual’s location within a few meters. This precise location sensing, combined with the Internet of Things and mobile apps, will make possible more personalized services and information.
Preparing for the Future

Understanding the technologies that are most relevant for your institution and how fast a certain strategic technology may be growing is critical to institutional IT strategy. We estimated the pace of growth based on the percentage of institutions we predict will implement each technology over the next five years (by 2022). Figure 2 positions each technology in one of 12 cells based on institutional intentions (the “recommendation for today”) and the expected pace of growth of that technology. Reflecting what was noted above, the figure shows that most of the technologies we tracked are still being explored—rather than deployed—by most institutions.

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<thead>
<tr>
<th>Recommendation for today</th>
<th>Expected pace of growth</th>
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<tr>
<td><strong>Deploy and maintain</strong></td>
<td>SLOW</td>
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<tr>
<td><strong>Pilot and deploy</strong></td>
<td>• Mobile app development</td>
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<td><strong>Decide and plan</strong></td>
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*Figure 2. Plans for 2017 and pace of growth for mobile strategic technologies*
Conclusion

The mobile domain is characterized by the increasing use of mobile devices across all aspects of the college or university environment. The trend of managing mobility presents challenges and opportunities for institutions as they consider how to address issues of access and control while providing stakeholders with the types of mobile services that are quickly becoming central to their lives. This trend is beginning to take hold across higher education, and institutions should be considering its role as they plan for the future.

The strategic technologies described in this report suggest ways colleges and universities can address the challenges presented by the mobile domain while also taking advantage of the opportunities for the use of mobile in all aspects of institutional work. Institutions should be planning to pilot and deploy technologies closely associated with the areas of teaching and learning and access to enterprise resources. They should be paying close attention to many of the other technologies, tracking and learning about the impact they could have on the strategic capabilities of the institution and making plans to adopt those with the greatest potential for their institution.

Notes

1. Eden Dahlstrom, D. Christopher Brooks, Jeffrey Pomerantz, and Jamie Reeves, ECAR Study of Undergraduate Students and Information Technology, 2016, research report (Louisville, CO: ECAR, July 2016).

2. EDUCAUSE tracks these types of established technologies in the Core Data Service because they are widespread enough to enable institution-level benchmarking.

3. Primary sources were The Horizon Report, Gartner’s Top 10 Strategic Technology Trends for 2014, and multiple 2014 Gartner Hype Cycles (education, big data, cloud computing, cloud security, enterprise architecture, enterprise information management, GRC, identity and access management, IT operations management, privacy, business intelligence and analytics, and emerging technologies). We augmented those with several additional technologies, most notably in analytics.

4. For more information, see ELI 7 Things You Should Know About Location-Aware Applications.