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Topic: Mobile

Issues: What technologies and architectures make up a mobile ecosystem?

What are the trends affecting mobile computing?

Aragon Research Technology Arc™ for Mobile, 2015

Aragon Research presents its 2015 Technology Arc for mobile technologies. This edition features 33 technology profiles pertinent to the mobile domain.

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Introduction

In 2015, technology continues to focus on user needs. Workplace technologies are morphing into cloud and mobile enabled applications that can be accessed from anywhere with any device. Many of these reflect a shift from pure technology to business applications that embody business logic to enable specific business processes. Because of this, it's important for business planners to assess the maturity and suitability of a technology in its business context before making decisions about specific products or services.

The 2015 Technology Arcs feature emerging classes of applications that either extend or replace existing categories, or focus on business tasks or processes in order to produce specific outcomes. For mobility planners and managers, the mobile landscape is constantly changing as a growing app economy increases focus on specific business applications and processes.

Managing mobility in the enterprise has shifted from a world that was primarily Blackberry devices and email a few years ago to one in which devices, apps, data and content are exploding and poised to grow even more over the next five years. Enterprise mobile management (EMM) has become the de facto approach that incorporates and transcends mobile device management (MDM), mobile application management (MAM) and mobile content management (MCM). The shift is away from merely managing the assets themselves and toward transforming business through mobilizing the enterprise.

In 2015, the world will continue to embrace mobile, and there will be many more mobile apps that let users do more than they could before. They will be mobile-first, and they will be highly disruptive. For example, they will track users more than ever, which will force enterprises to take extra steps to protect both people and the content and data they have access to. As this plays out, more and more devices will be connected to apps via the phenomenon called the Internet of Things (IoT). IoT has many possibilities, but it requires a strategy.

About The Technology Arc

The Technology Arc is designed to help you identify important technologies, choose the ones to monitor, determine their potential benefits, and decide when to invest in them and how to use them. It encompasses three sequential maturity arcs: *emerge*, *adopt* and *mature*.

Emerge Arc

The Emerge Arc starts when the technology first appears outside of a pure research environment. Commercial pilots and first-generation products appear in the early part of this cycle, followed by the growth of the market that includes the technology. Generally, this phase lasts 1-3 years.

Adopt Arc

In the Adopt Arc a technology starts to be accepted as a product category and included in a general marketplace of similar products. The first 30 to 50 percent of this arc is considered an early adoption phase.

Many enterprises wait to see what others are doing with a technology before they try it. Social networks are a good example. While many companies have not adopted social networks enterprise-wide, enough have tried them to give the technology a track record and a reputation. As market activity increases, more users start pilots so they can learn to leverage the technology as their peers have. The demand attracts multiple vendors with a variety of approaches, price points and feature sets, which in turn drives further adoption. As a result of this activity, technologies advance along the Arc from year to year.

Mature Arc

As technologies mature, the pace of change generally slows and progress becomes incremental. Often, the most significant opportunity in this phase is to gain efficiency through lower cost, while the dramatic functional gains of the Emerge phase become infrequent.

Some enterprises wait for maturation before attempting to deploy. These late adopters are often holding back for cost reasons. The trade-off is that by waiting, transformative opportunities that could have been captured sooner are delayed, along with the potential ROI. However, enterprises with conservative adoption cultures often wait for technologies to mature before implementing, which can save costs. Another trade-off in using this late adopter approach is that some competitors may not wait.

Classifying a Technology's Potential Impact

Technologies have a wide range of different types and levels of impact on buyers. For those outside the mobile domain, a significant question is: *How does this affect mobile?* For most of these, we have added a section entitled “Mobile Impact” to address this question.

Aragon has called out two factors for special attention: 1) *transformative potential* (identified by pyramid icons) and 2) *cost-saving opportunity* (identified by green diamond icons).

▲ **Transformative Potential:** If a technology can transform a market, it is labeled with a *pyramid* icon instead of a bullet. Examples range from cognitive computing to enterprise social networks.

◆ **Cost-Saving Opportunity:** Some technologies bring more efficient ways to do things that lower the cost of doing them. A *green diamond* identifies these entries. For example, the shift from on-premise to cloud-based email can offer significant savings over time, which is one reason many enterprises are evaluating it.

Not every product or technology will lower your costs, but some may do so significantly. Aragon can help you find the ones with the greatest savings potential.

Maturity Timing

Sometimes technologies can get stuck in the middle of a cycle. For example, when instant messaging was introduced, many enterprises would not deploy it because of archiving and records management requirements. As a result, enterprises delayed implementations until they were comfortable with the instant messaging products' archiving capabilities.

● ▲ An entry with a *black* icon generally has a 4-5 year maturity cycle.

● ▲ An entry with a *red* icon has a longer maturity cycle, generally 5 to 10 years.

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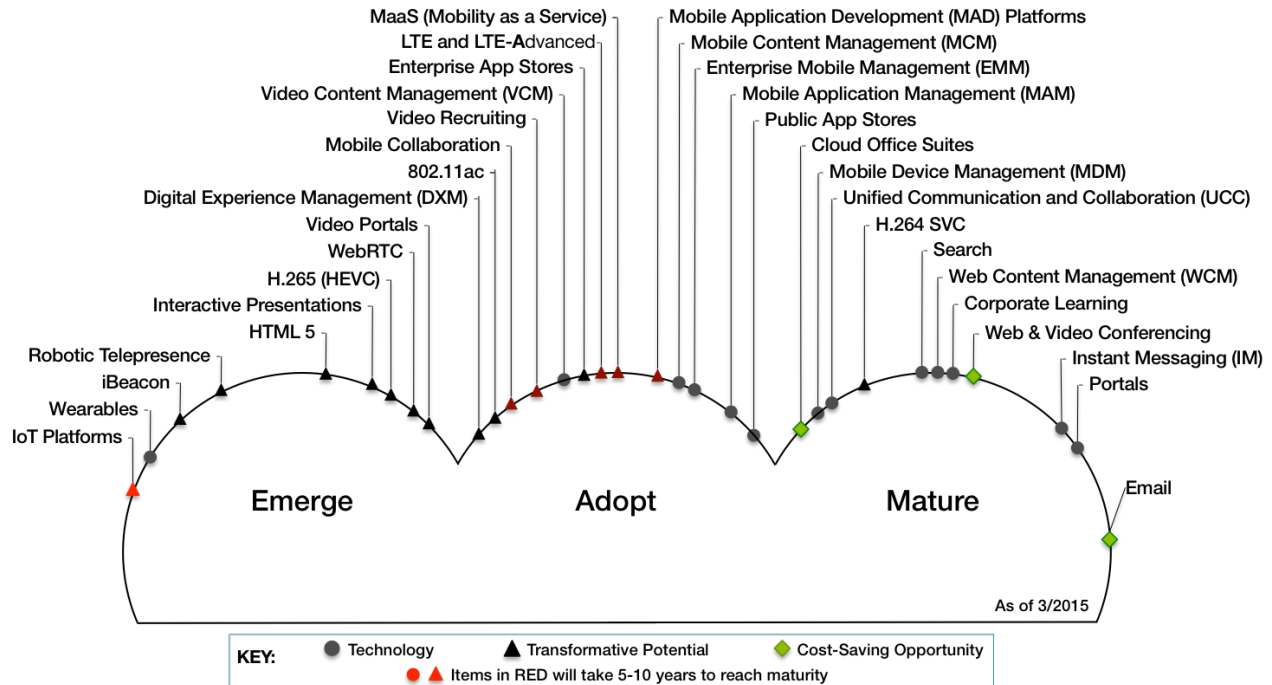


Figure 1: Aragon Research Technology Arc™ for Mobile, 2015

The workplace is undergoing fundamental changes, with people increasingly mobile in an increasingly virtual work environment. The technologies that make a difference are those that can deliver information securely to mobile users and empower them to contribute to the business process as fully as their colleagues on other platforms.

Wherever people are, mobile devices, cloud services, social networks and video give them access to each other and help to nullify distance and time barriers in a more intelligent, more collaborative workplace focused on people in it and the business activities they engage in.

Phase 1: Emerge

Emerging concepts and technologies are those that are just beginning to be identified and understood outside of narrow R&D communities. While they may not be as widely adopted as other more mature technologies, some of them are so attractive that they may not stay in the emerging phase for very long.

These efforts often address large-scale issues and carry significant upside potential. However, few enterprises implement new technologies during the Emerge phase, and those that do generally confine them to pilots and tightly controlled deployments.

▲ IoT Platforms

The Internet of things (IoT) platform is an emerging set of applications, operating systems, interface software, and connectivity hardware for navigating and controlling the Internet of Things. IoT “things” include anything that can move, measure or manipulate the physical world; they range from tiny sensors, light bulbs and home appliances to “smart” buildings, autonomous vehicles and every kind of programmable machine.

The IoT ecosystem is a growth area and is attracting numerous providers who offer device connectivity, data monitoring and management, applications and communication solutions. While industrial devices have always had proprietary interfaces, IoT allows any mobile device to track, monitor, access and control all kinds of machinery in a standardized way.

▲ **Transformative Potential:** The IoT “computerizes the world.” It will fundamentally change the relationship between humans and machines.

▲ **Long Maturation Cycle:** A lot of different vendors, many of which are outside the computing domain, make the “things” in the IoT. It will take many years to get agreement amongst them, and to deal with issues of safety, data security and privacy.

Representative Vendors: Apple, B&B Electronics, Blackberry, Google, Hewlett Packard, IBM, Microsoft, Splunk, Stream Technologies, ThingWorx, WOT.io and Zebra Technologies.

● Wearables

Wearable computers are a fast-growing category of devices that a person can wear on their bodies or in their clothing. Many early models are peripherals for smartphones, but a growing number are standalone devices comparable in power to early smartphones. The poster child for wearables so far has been Google Glass, but the practical applications have been fitness devices that are worn like a wristwatch and track a person’s activity.

The Apple Watch, revealed in March 2015, will help legitimize wearables, first as a consumer category and later for work. They have many potential uses, and much of the innovation in this area will focus on the apps that run on these devices. Candidates for wearables include doctors, soldiers, truck drivers, technicians and knowledge workers on the go.

Representative Vendors: Analog Devices, Apple, Fitbit, Garmin, Google, Jabra, Jawbone, Motorola Solutions, Pebble, Plantronics, Samsung and Sony.

▲ iBeacon

Beacons are tiny transmitters that combine Bluetooth with RFID features to broadcast their identity to nearby mobile devices. It is one of a family of technologies sometimes called “nearables,” a gateway to the Internet of Things. Developed by Apple, iBeacon is quickly becoming a standard beacon protocol supported by most beacon manufacturers and many apps for iOS, Android and Windows Phone devices.

When a receiving device detects a beacon, iBeacon apps can interact with local or cloud-based back-end systems to initiate complex processes. For example, beacons can provide more granular navigation than GPS, act as position sensors within large buildings for security purposes, or locate customers within a store to automate marketing, customer service and other retail engagements.

▲ **Transformative Potential:** The IoT will only be practical if there are standard APIs to interact with the “things” involved, and iBeacon is a strong candidate to democratize such interactions.

Representative Vendors: Apple, BlueCats, BlueUp, Easibeacon, Estimote, Google, Kontakt.io, Passkit, Qualcomm, Radius Networks, Red Bear, Roximity, Sensorberg and Twocanoes.

▲ Robotic Telepresence

Robotic telepresence blends two formerly distinct technologies into a new converged category. *Robots* are intelligent machines that can move around and act upon objects in the physical world. They expand the definition of “mobile” to include autonomous or remote-controlled devices as well as those carried by workers. These include autonomous cars, which are being tested by Google and several automobile companies, and drones, which are so far entirely remote-controlled outside of the military. Telepresence devices have a screen and camera and allow people in other locations to participate in remote office activities, perform industrial inspections, and operate in hazardous areas.

Use cases include general knowledge workers, manufacturing, military and other areas, especially healthcare. Increasingly, in scenarios involving physical security, remote-controlled