

Arkansas Enterprise Mobile Strategy

Table of Contents

EXECUTIVE SUMMARY	2
Current State	
Future State	
Supply	
Governance	
Risks	
CURRENT STATE	4
FUTURE STATE	6
All Users	
State Employees	
Tourism	
Developers	
Health Care	
SUPPLY	9
Application Development	
1) Inventory	
2) Updates	
3A) New Applications + Websites (Internal)	
3B) New Applications + Websites (External)	
3C) Public Code Challenge	
Mobile Device Management	
Educational Services	
Device Usage	
Workforce Skills	
GOVERNANCE	11
Accessibility	
RISKS	14
Secure the Data	
Training	
Device Usage	
Application Development	
APPENDICES	16
Appendix I: Business Requirements	
Appendix II: Mobile Device Management	
Appendix III: Drivers and Trends	
Appendix IV: Top Mobile Technologies	
Appendix V: Existing Examples and Services	
Appendix VI: Horizons	
Appendix VII: Native Vs. Mobile Web	
Appendix VIII: BYOD and Government Owned	

Executive Summary

With the extraordinary growth in the use of devices such as smartphones and tablets, mobile workforces and citizens alike have unprecedented access to information. It is easy to identify the benefits of a mobile workforce. Both worker efficiency and effectiveness improve as employees are able to quickly execute basic tasks such as filing time reports from their phones. And “data on the go” can empower employees in the field with fast access to information. Citizens will also have greater access to relevant information and services.

Strategic Purpose

This mobile strategy document is developed to ensure that the next-generation mobile strategy includes the major foundational elements that will be important in the future. State government has experience in the mobile arena and is moving from the first generation initiatives to a next generation strategy. This document describes the strategy to create a framework of practices to defend the confidentiality and integrity of business data that resides within the state of Arkansas infrastructure and to increase transparency and openness that has resulted in a greater interest in social media and the establishment of open data websites.

Current State

Arkansas is among the most progressive states in delivering mobile-friendly government solutions. Consumer demand for mobile services and mobile use in the workplace is increasing every year.

Top trends in Arkansas include application development for mobile devices. Customer demand and consumerization is requiring access to enterprise and productivity applications on mobile devices of all types and all form factors. Mobile devices command the need for web development, design professionals and system integrators with the ability to extend the life of applications known as legacy applications that are derived from earlier computer languages, platforms and technologies than that of current technology.

Future State

The Arkansas Enterprise Mobility Strategy is an approach that is aimed across state government to drive efficiency, enhance citizen-government interactions and seizes the opportunity to increase government employee productivity. Citizens will have easier access to relevant information and services. Tourists will have a better experience while visiting Arkansas. All from whichever device they are using or wherever they are.

Arkansas will supply a system of application programming interface (APIs) to facilitate easy access to government data. This access will allow easier development of systems in both the government and public sectors. There will be a Mobile Device Management (MDM) system in place for government employees' devices. Educational materials will be created and offered to assist any individual with the mobile usage of Arkansas systems, device security and application development. Putting a clean API on top of Arkansas's data will create a successful ecosystem of innovation.

Risks

The single biggest risk is security, particularly for any devices or applications used by government employees. The government APIs and data will be well secured, keeping the sensitive data safe on the backend. The MDM system put in place will assist with device security, and there will be a focus on improving device security through user device security education.



Current State

The trends in Arkansas, as well as across the globe have mobile becoming increasingly ubiquitous. In the government space, open government data, providing citizens and state agencies easy access to data is becoming more and more popular. **See Appendix III: Drivers and Trends and Appendix IV: Top Mobile Technologies for more in depth information.**

Arkansas uses a consistent approach to mobile service delivery to provide better access to information and services for citizens and businesses, with dozens of applications and websites now providing streamlined access for mobile users. Per a recent study released by the Centers for Disease Control (CDC), at 35.2 percent, Arkansas is one of the leaders in the nation in the percentage of citizens living in wireless only households.*

Arkansas.gov, the official portal of the state, has adopted a “mobile first” development methodology and standardized on the use of responsive design, which ensures that all online services will be usable on a variety of mobile devices. A growing number of websites make use of these standards. The state portal, Arkansas.gov, provides a streamlined responsive mobile interface for users and the state transparency portal, Transparency.Arkansas.gov, was the first state transparency site in the nation to provide an interface optimized for smartphones.

For business continuity and disaster recovery, state authorities can securely access communications and data from a remote or mobile location, in the event state facilities are affected by an emergency. Arkansas's Continuity of Operation Program is available via mobile devices allowing access to online plans during a disaster. The state does not currently have a work from home policy.

Information Network of Arkansas (INA) improves online citizen and business access to public services and maintains and hosts the state's official website, Arkansas.gov. Due to the explosive growth and demand for mobility, INA developed Arkansas.gov mobile allowing users to search for most state information and services available through Arkansas.gov from any mobile operating platform. Arkansas, in a study of 36 state websites, had six of the top 10 sites in mobile adoption. The average state government website currently experiences around 17 percent mobile traffic, a number that has doubled every year since 2010.

For the Departments of Correction and Community Correction, mobile optimization of the popular online application for paying supervision, drug court, or restitution fees made paying easier for users without access to a computer. The state's Streamline Auto Renewal (STAR) for tag renewal was recently optimized for mobile devices.

*2011 National Health Statistics Report, U.S. Centers for Disease Control and Prevention

After the award winning “YOUuniversal” Financial Aid System developed for the Arkansas Department of Higher Education which helps students determine scholarship eligibility and streamlines the application process was initially launched, it was soon discovered that a large percentage of users were using the online application from a mobile device creating the need to adapt it for the mobile marketplace. As much as 29 percent of visitors use a mobile device to access the site.

The Arkansas Game and Fish Commission's electronic game check app was the first application in the Apple app store with the ability to process a game check transaction with a government agency. Over 30 percent of all game checks in Arkansas are completed from a mobile device. There have been over 99,000 downloads of the mobile app to date (85,000 for iPhone and 14,000 for Android). The Commission's website, AGFC.com, has one of the highest rates of mobile usage in the country – during hunting season, over 56 percent of visitors to the site use a mobile device.

The Arkansas Crime Information Center's (ACIC) Centralized Electronic Network for Sex Offender Registries System (CENSOR) provides a more efficient method for local law enforcement officers and the Department of Correction (DOC) to electronically register the more than 11,720 sex offenders in Arkansas and manage sex offender information. CENSOR allows offenders to register electronically alleviating the state's responsibility to continue sending out certified letters. This mobile app allows users to both search for and register to receive alerts of sex offenders in their area.



Future State

By opening government data and providing well documented APIs, the future state of mobile in Arkansas will provide several advantages and efficiencies for many different areas of the population.

All Users

- Improve the way government makes data available to citizens.
- Improve app development and be device agnostic.
- Mobile website and mobile native application available to all types of devices and smartphones.
- Use mobile technology to optimize the entire infrastructure for applications, platforms, devices, network, and wireless architecture.
- Provide educational services to improve device usage security and assist users.
- Simplify the user experience and give users exactly what they want.
- Increase the ability to provide electronic access of documents to state employees and citizens.
- Increase the ability to share documents over the existing network.
- Improve constituent service by improving speed of access, reducing costs, increasing their satisfaction, and minimizing the administrative burden.
- Increase security and accessibility.
- Ensure electronic documents are available to citizens and employees to reduce the need for travel expenses (reduces fuel usage and carbon emissions) thereby saving energy, increasing employee effectiveness, and improving customer and employee satisfaction.

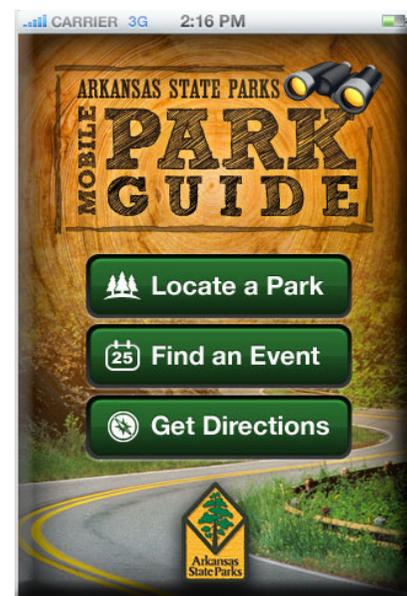
State Employees

- Extend the enterprise to mobile employees wherever they are on a wide variety of devices securely and efficiently.
- Make state government more efficient by giving employees the right tools.
- Bring your own device or BYOD is being considered.
- Include mobile device management (MDM) capabilities.
- Maximize enterprise mobility investments.
- Transform government operations to do things in a leaner way.
- Include mobile lifecycle management (MLM).
- Focus on applications enabled for collaboration and knowledge sharing.
- View enterprise mobility as enablement tool.
- Workforce specific mobile training.

Tourism

Location based services are available that enhance the value of the following information:

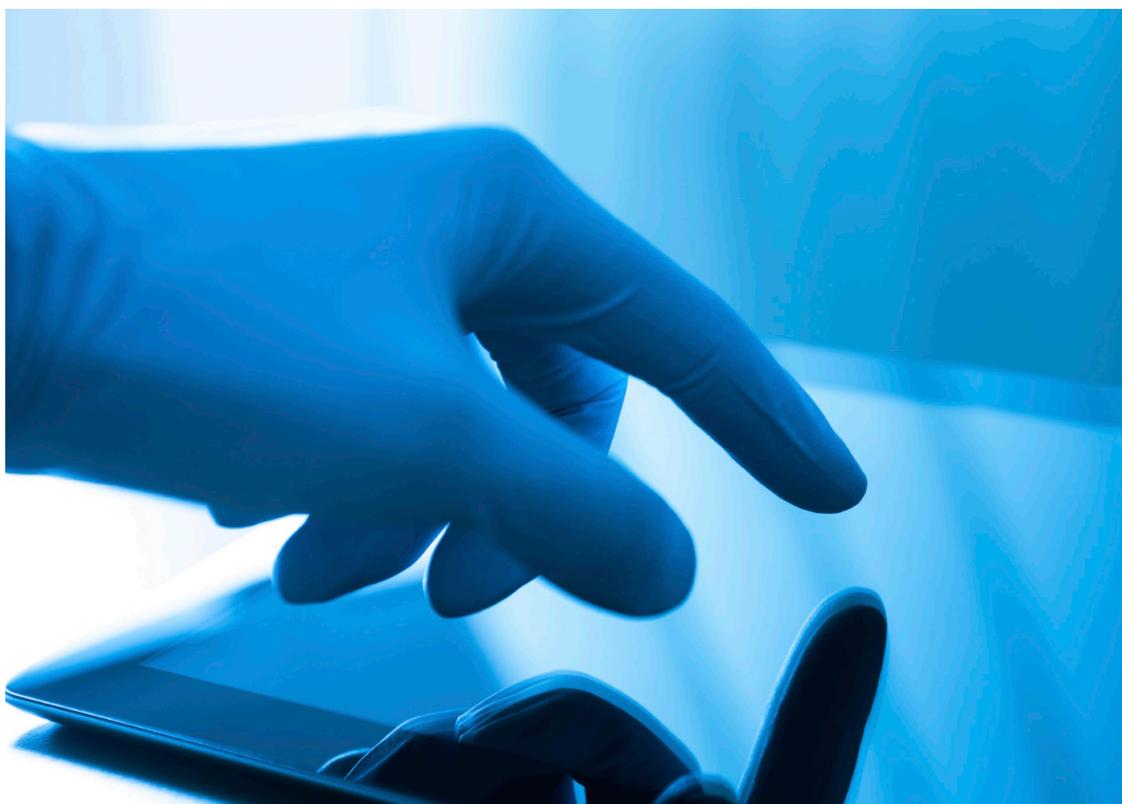
- Traffic information
- Parking locations and prices
- Events calendar
- Popular destinations, parks, hours
- Numbers to call in an emergency
- Social media



Health Care

Aside from electronic health records (EHRs), mobility is one of the most transformational movements in health care, and represents the new face of user engagement. In the light of this advancing movement, health care delivery organizations (HDOs) need to assess how mobility opportunities and challenges will impact their organizations.

Mobility contributes to a streamlined and collaborative clinical workflow, as well as timely access to personal health information (PHI). Devices are continually moving closer to the point of care, and wireless and mobility are used to extend the reach of expensive and critical clinical and business systems. With handheld devices like tablets and smartphones, a clinician no longer has to rely exclusively on a bedside terminal, a computer on wheels or a stationary workstation to view patient information. Handheld mobile devices can serve many purposes — for example, results viewing, ordering, e-prescribing, charge capture, vital-sign entry, dictation, reference data access, remote monitoring and Internet access. With increased coverage, security and integration, Wi-Fi and cellular have begun to have a profound effect on how and where care is delivered, and from where PHI is accessed. Smartphones are increasingly used to support user roles that would benefit from more robust bidirectional communications and collaboration. Vendors market mobile solutions that offer hands-free voice communications; secure texting and critical messaging; the management of mobile alarms, alerts and notifications from patient monitoring devices; nurse call integration; the communication of critical values from EHRs and other clinical systems; and call center integration over all major mobile device platforms.



Application Development

The foundations for application development will be improved, allowing for ongoing, device agnostic and efficient development. Systems will be put in place to create an ecosystem of development with constant improvements being made. The cornerstone of this strategy will be to develop APIs and open data up to developers. Clearly documenting APIs and opening data for consumption will simplify and encourage application and website development for a large variety of uses. In addition, many applications and websites may be created by non-government organizations, reducing the cost burden to the state.

In order to most efficiently use funds, a horizons approach (**see Appendix VI: Horizons**) to application development improvements will be utilized. Using this approach, the specifics of future steps will not be fully known until earlier steps are completed. In this case, the steps will occur in the following order:

1) Inventory

The initial step will be to inventory the existing data sources and APIs. An in depth Inventory of the existing applications, both mobile and web will also be performed. The business requirements (**see Appendix I: Business Requirements**) will be analyzed and the areas most in need of a mobile solution will be identified.

The National Association of Chief Information Officers (NASCIO) recently published a catalog of state government mobile apps. The catalog is continually updated as state apps are developed. The catalog is available at this link <http://www.nascio.org/apps/index.cfm>

In addition to inventorying the existing APIs, data and applications, an in depth study on available services will be performed. www.data.gov currently tracks existing open data government sites and contains information about how to properly open government data to citizens. **See Appendix V: Existing Examples and Services.**

Arkansas seeks to establish a collaborative environment for developers.

2) Updates

Following the inventory phase, the proposed updates to the existing data sources and APIs will be performed. Data and APIs will be standardized as much as possible. Any possible security increases will be performed to protect any sensitive data. Two separate API categories will be developed, one for public and one for private use. The private use APIs will be well protected and not exposed to the public, improving security. These APIs will be well documented and tested.

3a) New Applications + Websites (Internal)

Utilizing the new APIs, with a focus on improving access to data and services, new applications and websites will be created. Utilizing the internal APIs to standardize frequently built and used things, frameworks will be built so that every organization can easily take advantage of what has been created. Once it's built for one city, for example, it would be easy to roll out for another city.

Each application will need to independently address the native vs. web issue. Deciding on native, web or mixed has many factors to consider, including the available developers, how the application will be used, where it will be used and who is going to use it, among other factors. **See Appendix VII: Native vs. Mobile Web**

3b) New Applications + Websites (External)

Similar to the internal items, external items will be built around the new external APIs. Based on demand and usage, mobile apps and websites will be developed to focus on areas of greatest need. Employer's access to state data and systems will also be improved, making it easier for them to handle tax issues and promoting business in Arkansas.

Mobile Device Management

The use of smartphones and media tablets should be governed by appropriate mobile device policies. Mobile device policies, addressing business and technical requirements, are essential to define the administrative and security practices to the ever-increasing assortment of mobile devices within the enterprise. Arkansas will set up a system to manage government employee's devices and ensure security and proper use. **See Appendix II: Mobile Device Management** for further MDM information.

Research will be performed to determine the best way to combine mobile device management (MDM) and bring your own device (BYOD) for government employees. Citizens will not have access to this MDM, nor will they have devices purchased for them. **See Appendix VIII: BYOD and Government Owned** for more information on this.

Educational Services

Device Usage

Proper mobile device usage training will be offered for government employees as part of required security awareness training. This training can vastly reduce the potential for security breaches by teaching employees how to properly use and protect their device. In addition, proper training can reduce the burden on the MDM and IT systems, as users will be empowered to solve their own problems.

Workforce Skills

A training program on how to properly develop applications using the provided APIs will be identified. The documented APIs will be a large part of the training and an excellent resource for developers. The full details of this program are not yet finalized. An online training course and a classroom course are being considered. This training could be provided for both government employees as well as citizens. A well-structured and successful education program would yield many benefits, improved applications, a larger developer population in the state, more applications and general positive feedback into the developer ecosystem of Arkansas.

The systems put into place will be able to be leveraged by nearly every department and citizen in the state of Arkansas and beyond. The availability of open source software solutions can reduce the overall cost of the initial open data service creation. Following the open data API roll out, increased efficiency of state employees and increased citizen involvement in governmental matters can yield further savings and improvements. Lastly, but making some data available to all citizens, application development can be shifted into the public space, reducing the state's involvement required.

Governance

Accessibility

When procuring a technology product or when soliciting the development of such a product, the state of Arkansas is required to comply with the provisions of Arkansas Code Annotated § 25-26-201 et seq., as amended by Act 308 of 2013, which expresses the policy of the state to provide individuals who are blind or visually impaired with access to information technology purchased in whole or in part with state funds. The vendor expressly acknowledges and agrees that state funds may not be expended in connection with the purchase of information technology unless that system meets the statutory requirements found in 36 C.F.R. § 1194.21, as it existed on January 1, 2013, (software applications and operating systems) and 36 C.F.R. § 1194.22, as it existed on January 1, 2013, (web-based intranet and internet information and applications), in accordance with the state of Arkansas technology policy standards relating to accessibility by persons with visual impairments.

Accordingly, the vendor expressly represents and warrants to the state of Arkansas through the procurement process by submission of a Voluntary Product Accessibility Template (VPAT) or similar documentation to demonstrate compliance with 36 C.F.R. § 1194.21, as it existed on January 1, 2013, (software applications and operating systems) and 36 C.F.R. § 1194.22, as it existed on January 1, 2013, (web-based intranet and Internet information and applications) that the technology provided to the state for purchase is capable, either by virtue of features included within the technology, or because it is readily adaptable by use with other technology, of:

- Providing, to the extent required by Arkansas Code Annotated § 25-26-201 et seq., as amended by Act 308 of 2013, equivalent access for effective use by both visual and non-visual means;
- Presenting information, including prompts used for interactive communications, in formats intended for non-visual use;
- After being made accessible, integrating into networks for obtaining, retrieving, and disseminating information used by individuals who are not blind or visually impaired;
- Providing effective, interactive control and use of the technology, including without limitation the operating system, software applications, and format of the data presented is readily achievable by nonvisual means;
- Being compatible with information technology used by other individuals with whom the blind or visually impaired individuals interact;
- Integrating into networks used to share communications among employees, program participants, and the public; and
- Providing the capability of equivalent access by nonvisual means to telecommunications or other interconnected network services used by persons who are not blind or visually impaired.

State agencies cannot claim a product as a whole is not commercially available because no product in the marketplace meets all the standards. If products are commercially available that meet some but not all of the standards, the agency must procure the product that best meets the standards or provide written documentation supporting selection of a different product.

For purposes of this section, the phrase “equivalent access” means a substantially similar ability to communicate with, or make use of, the technology, either directly, by features incorporated within the technology, or by other reasonable means such as assistive devices or services which would constitute reasonable accommodations under the Americans with Disabilities Act or similar state and federal laws. Examples of methods by which equivalent access may be provided include, but are not limited to, keyboard alternatives to mouse commands or other means of navigating graphical displays, and customizable display appearance.

As provided in Act 308 of 2013, if equivalent access is not reasonably available, then individuals who are blind or visually impaired shall be provided a reasonable accommodation as defined in 42 U.S.C. § 12111(9), as it existed on January 1, 2013. As provided in Act 308 of 2013, if the information manipulated or presented by the product is inherently visual in nature, so that its meaning cannot be conveyed non-visually, these specifications do not prohibit the purchase or use of an information technology product that does not meet these standards.

<http://www.dfa.arkansas.gov/offices/procurement/Documents/technologyAccessClause.pdf>

In regard to developing mobile applications, iOS accessibility is far ahead of Android accessibility. Mobile web development would follow the same Web Content Accessibility Guidelines (WCAG) 2.0 guidelines as standard web development. Following are links to additional information for Android, iOS, and web:

Android

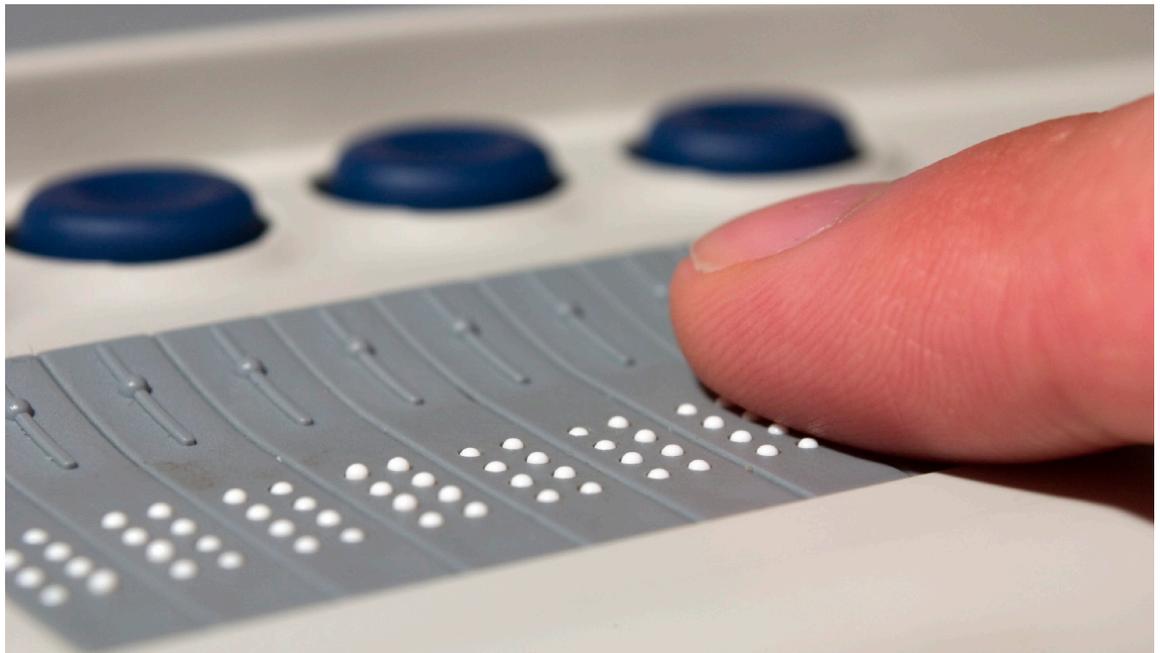
<https://developer.android.com/guide/topics/ui/accessibility/index.html>

iOS

<https://developer.apple.com/library/ios/#documentation/UserExperience/Conceptual/iPhoneaccessibility/Introduction/Introduction.html>

Web

<http://www.w3.org/WAI/intro/wcag.php>



Risks

The single biggest risk is security, particularly for any devices or applications used by government employees. The government APIs and data will be well secured, keeping the sensitive data safe on the backend. The MDM system put in place will assist with device security, and there will be a focus on improving device security through user device security education. Mobile applications pose a great risk, especially the free ones. The MDM system must block the ability for users to download applications that might access government data or systems in order to carry out malicious activities.

Secure the Data and Systems

Properly securing the API and sensitive data and systems on the back end is the single best way to ensure overall security of the sensitive data. As an example, the server should guard access to a minor's medical records. Properly building the security around access to the data will greatly reduce any security issues related to Arkansas providing data to people who shouldn't see it. Security mechanisms, such as passwords and automatic locking functions, will be used on mobile devices.



Training

Device Usage

Even with properly secured data, it is still possible for users to be unsafe with data once it's available to them. Because of this, proper device usage training is required in order to ensure the data remains safe. Security awareness training will provide best practices and guidance for mobile device usage. Employees will be made aware of the ramifications of exposing sensitive data.

Application Development

In addition to proper device usage training, a focus of the developer training courses will center around proper protection of the data, both in how the APIs are used and how to encrypt and protect the data on the device. Proper training will reduce instances of applications improperly handling data and improve the overall data security.



Appendices

Appendix I: Business Requirements

Mobile business requirements for government entities include inspections for health and safety, case management, enforcement, research, service and repair. The following is a list of Arkansas agencies having remote or field workers in the above mentioned areas.

Agriculture Department, Arkansas
Alcoholic Beverage Control
Alcoholism and Drug Abuse Counselors, Arkansas Board of Examiners
Barber Examiners, Arkansas State Board of
Building Authority, Arkansas
Child Abuse, Rape, Domestic Violence Commission
Correction, Arkansas Department of
Cosmetology, Arkansas State Board of
Education, Arkansas Department of
Elevator Safety Board
Environmental Quality, Arkansas Department of
Fire Prevention Commission
Forestry Commission, Arkansas
Game and Fish Commission
Health, Arkansas Department of
Higher Education, Arkansas Department of
Highway and Transportation Department, Arkansas
Information Systems, Arkansas Department of
Liquefied Petroleum Gas Board, Arkansas
Livestock and Poultry Commission, Arkansas
Nursing, Arkansas State Board of
Oil and Gas Commission, Arkansas
Parks and Tourism, Arkansas Department of
Pollution Control and Ecology Commission, Arkansas
State Hospital, Arkansas
Tobacco Control Board, Arkansas
Water Well Construction, Arkansas Commission on
Waterways Commission, Arkansas
Workforce Services, Arkansas Department of

Appendix II: Mobile Device Management

Enterprise MDM solutions help enterprises manage the transition to a more complex, mobile computing and communications environment by supporting security, service, software and inventory management across multiple operating system platforms, primarily for handheld devices such as smartphones and tablets.

Introduction

As smartphones and other mobile devices grow in popularity in enterprises, management challenges are beginning to arise – from the cost of the telecom services associated with the devices, to the security and policy that mobile devices must observe. Mobile devices such as smartphones and tablets are increasing in power and memory, and, although they are not replacing PCs on a full-time basis, they are often used as primary communications devices. Also, the number of vendors and platforms in the mobile device market continues to increase and add complexity.

By 3Q10, there were more than 30 global smartphone vendors and more than 10 mobile operating system platforms, although the top four (Apple, Android, RIM and Symbian) control 89 percent of the total market. Most adopting companies that had previously standardized on a mobile platform (for example, Blackberry in North America) now need to support multiple operating systems as Apple and Android have become more popular. However, most organizations don't have anyone responsible for managing mobile devices.

Although procurement may be found in finance or IT, there hasn't been any reason to bother with cellular phones after purchase. However, that's changing. Today, the smartphone is likely to be managed by the messaging group, which is responsible for Blackberry Exchange Server (BES), rather than by the entity responsible for managing computing hardware. Although many companies may have device management responsibilities, usually for hardware such as PCs or phones, current software doesn't really cover mobile devices, nor is IT staff trained to support handheld devices.

Elements of Mobile Device Management (MDM)

Although many companies are trying to solve a similar problem, it takes multiple types of mobile software to address a full solution. A fully managed mobility solution cuts across standard MDM and telecom expense management and includes:

- Software Distribution–The ability to manage and support mobile applications including deploy, install, update, delete or block.
- Policy Management–Development, control and operations of enterprise mobile policy.
- Inventory Management–Beyond basic inventory management, this includes provisioning and support.
- Security Management–The enforcement of standard device security, authentication and encryption.
- Service Management–Rating of telecom services.

The MDM market is quickly evolving. The requirements and definitions are changing rapidly, and vendor offerings will evolve quickly and be even more capable and mature. High demand is creating a frenzy of development, as well as hope. Although many of the successful MDM providers have focuses almost exclusively on mobility, during the next few years, those managing PCs will also be investing and looking for opportunities in the MDM space. Most vendors now offers on premises or software-as-a-service (SaaS) based tools, and more mature managed service offering will emerge during the next three years to drive growth in the industry.

MDM Trends

- Introduction of new form factors, like tablets, is driving growth.
- Some of the device platforms will limit manageability, due to the inherent manufacturer design – don't expect MDM solutions to address each platform the same way or support it the same way.
- Android is the fastest growing OS.
- Consumer mobility and BYOD adoption are motivating MDM deployments.
- Blackberry support is still important – not all MDM vendors support BES integration. It is important that Blackberry support continues, because, in many regions, it is still the most supported enterprise device, even as other platforms take away market share. MDM tools won't beat the BES, but should be able to help manage and report on Blackberry devices.
- Don't underestimate reporting – for some vendors, their reporting and business intelligence (BI) tools are simple if they have them at all.
- Reporting on device status will be critical component, and vendor capability to offer both text and graphical reports, canned and customized, is critical.

With the advent of new devices, the MDM market is growing quickly. If we assess pure MDM revenue (excluding revenue for messaging, security, etc.) year-end 2010 is estimated at \$150 million, increasing as at compound annual rate of 15 percent to 20 percent during the next three years.

Appendix III: Drivers and Trends

In January 2012, the Enterprise Mobility Foundation (EMF) made predictions for enterprise mobility in 2012. *

1. The year 2012 will be the year of mobile application management
2. Mobile security evolves into mobile risk management
3. Enterprise mobility will force Google to reduce Android fragmentation
4. Enterprise cloud and enterprise mobility become one with hybrid apps
5. Enterprise mobility begins its transformation into enterprise IT

In January 2013, the EMF made predictions for enterprise mobility in 2013#

1. Mobile application management follows the path of MDM
2. BYOD starts to lose its shine
3. M&A activity will significantly increase
4. Enterprise mobility: It's about big data
5. The winner of the mobile ecosystem wars will be the user

Other trends include:

- The mobile enterprise encompasses all aspects of an enterprise's mobile devices and platforms, including laptops, mobile phones and media tablets.
- Giving employees, partners and other stakeholders seamless mobile access to applications and data can increase productivity and improve customer satisfaction through faster, better service.
- Employees are now demanding anytime, anywhere access to information without concerns for potential compliance, security or cost implications.
- Estimates show 70 percent or more enterprise data now resides in some form on mobile devices
- Approximately three out of four organizations lack comprehensive formalized policies for dealing with the management and security of all their mobile devices.
- More than 187.9 million workers are mobile from the home to the corporation and the local hotspot (free or commercial)
- Research indicates 397.1 million workers would be mobile by 2012, representing 73 percent of the global enterprise workforce.
- Today's mobile technology innovations and mobile network connectivity options are being driven by the consumer market.
- The 4G upgrade is under way with Clearwire's WiMAX and Verizon's LTE now reaching roughly one-third of the US population.

*Enterprise Mobility Foundation (EMF), January 2012 Executive Insight, "Five Predictions for Enterprise Mobility in 2012".

#Enterprise Mobility Foundation (EMF), January 2013 Executive Insight, "Five Predictions for Enterprise Mobility in 2013".

- The 4G data rates should make all mobile data applications work better but mobile video will be the most visible addition.
- "Price rationalization" will be a key theme as carriers have come to realize that you can't keep offering all-you-can-eat data plans. Carriers may have to abandon true unlimited data plans as their subscriber base builds.
- 4G smartphones will continue to grow.
- Tablet use will continue to grow. The introduction of Android 4.0 may push the Android option past the iPad.
- Employees require a connection to one or more systems before they can work in a mobile mode-IP telephone (VoIP), cellular, or LAN Wi-Fi data.
- Constant change in user expectation, mobile services, devices and wireless technology is putting pressure on resource-constrained IT departments.
- Mobile native applications versus mobile websites.
- HTML5 and other web technologies.

Mobile Devices

Mobile devices are so ubiquitous that even middle schoolers are texting at the dinner table these days. Everyone gets excited about having the latest and greatest devices. It's easy to get caught up in wanting a super-mobile workforce with the most cutting-edge technology, but it's important to understand there are challenges when it comes to implementing a mobile strategy on an enterprise scale.

Security is Key

What concerns IT managers most about a very mobile workforce is security. Questions arise about where employees are getting connected and whether these networks are presenting any type of risks. Data loss through breaches is on the rise. It is a significant issue, especially as devices are getting more powerful and hold more. With more memory and processing power, people are storing more on these devices which means there is more to lose. A powerful protection measure for all types of devices, from smartphones to laptops, is the use of encryption.

Privacy

Mobility brings new concerns when it comes to privacy. More personally identifiable information is stored on mobile devices than the computing devices we have

used in the past, and users are more concerned about how their information is used than ever before. Today, mobile applications have access to users' personal information, contact list, physical location and more. In the future, users' payment information may be accessible as well. Governance is critical when it comes to managing privacy concerns – understanding what information a mobile app has access to, how it is used, stored and how long it is kept is key.

Standardization can be Valuable

Enterprises need to understand that trying to support too many types of devices or devices that are too new and untested can be a troubleshooting nightmare. IT would not only have to be familiar with each device's quirks but also ready to deal with multiple vendors when asking for repairs. Standardization allows IT to work with just one or two vendors and become experts at handling issues with those devices.

Usage Should Drive Choice

Enterprises might be tempted to choose smartphones loaded with options and fill them with applications before handing out to a workforce. That strategy can get expensive, however; applications often come with license agreements tied to the user and if an employee won't be using the software, it's a waste of money to pay licensing fees. But, more importantly, productivity could be affected if employees who need certain applications have to keep making requests to get access. The best way to combat these creeping costs is to choose devices based on usage, not features. Contact people might need a smartphone equipped only with an enterprise resource planning (ERP) application and global positioning system (GPS) capability while a CFO could require direct access to financial software, project planning applications and collaboration software. Someone who occasionally uses a mobile device can probably get by with one that simply provides email and calendar software. Analyzing usage needs can also be a factor into the standardization plan; for instance, you can establish different tiers of devices depending on levels of usage, choosing one standard devices for those who need basic features and one for those who need more advance capabilities.

Agencies should not be planning for MDM, but rather mobile data management, advised speakers at the Federal Office Systems Exposition (FOSE) government technology conference on April 3, 2012. With new mobile devices being developed commercially every few months, a device-centric strategy is never going to keep up. Some federal agencies are looking at it in a different way that is completely data-centric.

Examples of Stakeholder Needs:

Employees

- Employees need to access and share content quickly and securely from anywhere and anytime.

- Employees need access to information using different end user devices.
- Compatibility with remote device management solutions to enable auto logout and locking for mobile devices.

Citizens

- Citizens desire access to public records and services from anywhere, anytime.
- Citizens desire access to public records and services on many different end user devices.

Appendix IV: Top Mobile Technologies*

Hyper Text Markup Language (HTML)

What is it, and why is it important?

HTML5 is the next generation of HTML and is strongly supported by key mobile vendors, including Apple, Google, Research In Motion (RIM) and Microsoft. HTML5 substantially enhances mobile Web application features, and will cause a shift of architecture from native applications to hybrid and Web approaches. HTML5 will also displace more proprietary technologies such as Flash and Silverlight. Many mobile development tools will offer HTML5 generation.

When?

HTML5 is already available on the browsers of many new smartphones and tablets, but will take several years to penetrate the installed base of devices. It will also likely evolve and mature for several years as early implementations often are incomplete.

Who will be impacted?

All organizations developing mobile applications will be impacted.

Cautions:

HTML5 will reduce but not eliminate the need for native applications, as many underlying platform features aren't available to JavaScript. HTML5 will likely fragment as vendors add platform-specific extensions. Low-end feature phones won't support HTML5, and the new generation of low-cost Android smartphones may not have powerful enough processors or graphics to run complex HTML5 well.

Near Field Communication (NFC)

What is it, and why is it important?

NFC is a technology for very short range (less than 10 centimeters) of communication, which will be incorporated in many future mobile handsets. Although it's often portrayed as a payment technology, it's more appropriate to think of it as a "touch to act" technology that will enable applications such as smart posters, discount tokens, mobile tickets, authentication and check-in to location-based services.

When?

Some smartphones incorporating NFC are already available, but we expect that by 2015 over 30 percent of all handsets shipped globally will include NFC. The proportion will be higher in mature markets.

Who will be impacted?

Through 2015, we expect consumer applications to dominate NFC. Consumer-facing industries with on-premises customer interactions should explore NFC opportunities. Examples include retail, travel, marketing and events.

Cautions:

Mobile payment is likely to be adopted slowly in many regions; look for other NFC applications in the short term (see Note 1). Payment and perhaps other NFC applications are likely to become a battleground among banks, network operators and mega vendors such as Google, which may slow adoption.

Platform-Independent Application Development (AD) Tools

What is it, and why is it important?

In most regions, between three and five smartphone platforms will have significant market share. Native applications will be required for sophisticated interactions and services, and platform-independent AD tools will substantially reduce the cost of maintaining multiple platform versions of the same application.

When?

A wide range of multiplatform tools is available now, some offering both HTML5 and native code generation options. In the future, we expect such tools to extend their definition of multiplatform to other devices such as smart TVs and other areas where fragmented mobile APIs exist, for example payment. We expect such tools to continue to become more sophisticated for several years.

Who will be impacted?

Any organization creating employee or consumer-facing mobile applications on more than one platform will be impacted.

Cautions:

The market for such tools is immature and volatile, so expect mergers, acquisitions and consolidation. The current separation between enterprise and consumer is vanishing, which will impact many vendor strategies. "Write once, run anywhere" remains an illusion for sophisticated applications, although "write 80% once and customize 20% per platform" is achievable and remains more cost-effective than maintaining separate program versions.

Location and Context

What is it, and why is it important?

Location is the first step toward contextual applications that are proactive and hyper-personalized, matching services to employee or customer needs at a specific time and place. The long-term vision of context will involve location, knowledge of individual needs, social networking, sensor information and many other clues to suggest appropriate offers and services.

When?

Location determined by cellular networks, GPS, Bluetooth or indoor Wi-Fi systems is already used for navigation and simple services such as location-aware marketing. However, we expect location-sensing technologies and principles such as context to evolve for a decade.

Who will be impacted?

In the midterm, through 2015, consumer-facing organizations are likely to make the most effective use of context; in the longer-term, we expect it to also become a standard feature of employee-facing systems.

Cautions:

The principles and enabling infrastructure for context are very immature. Context will raise challenging issues related to privacy and the use of personal information.

Bluetooth 4

What is it, and why is it important?

The headline feature of the latest Bluetooth 4 release is low energy (LE) operation, which allows a mobile handset to talk to a wide range of low-power peripherals and sensors. It will enable new mobile accessories and business models, many of which will use the mobile device as a channel to communicate with cloud services.

When?

In the first quarter of 2012, a few Bluetooth 4 handsets are shipping (for example, the iPhone 4S), and a few Bluetooth 4 peripherals are available, although it will take two to three years before the majority of the handset installed base in mature markets supports the technology.

Who will be impacted?

Bluetooth 4 will enable a wide range of new devices and business models. Manufacturers of peripheral devices and smart accessories will be early adopters, as will industries such as health care, which can benefit from personal sensing and applications.

Cautions:

Bluetooth 4 is still immature, and the installed base of devices will take time to grow, so the number of individuals able to exploit Bluetooth 4 accessories will be limited until 2013.

802.11ac

What is it, and why is it important?

802.11ac boosts Wi-Fi performance to 1 Gigabit per second (Gbps) levels. This and other new Wi-Fi standards, such as 802.11ad (60 GHz, multi-Gbps in-room Wi-Fi) and 802.11ah (low-frequency Wi-Fi), will continue to expand the capabilities of the Wi-Fi family of technologies. The strong Wi-Fi road map will enable it to address new application areas such as high-definition video streaming telemetry and offloading traffic from cellular networks.

When?

802.11ac is likely to be officially approved around 2013, although pre-standard equipment will become available before that date.

Who will be impacted?

Wi-Fi will be a key technology for consumers and enterprises. Networking and connectivity for a wide range of consumer electronics will be popular domestic applications. Businesses will be able to replace more wired networks with wireless as Wi-Fi becomes more capable, and will likely need to increase their Wi-Fi capacity to support consumerization and employee-owned IT.

Cautions:

As with all wireless technologies, real-world performance will be substantially less than peak theoretical speeds and will depend on many factors. Organizations purchasing equipment before the standard is ratified should seek to understand which features may be incompletely implemented and what the implications may be when the final standard is available.

Machine to Machine (M2M) and Smart Products**What is it, and why is it important?**

M2M wireless will be implemented using a range of protocols and bearers, including cellular, Wi-Fi, ZigBee and Dash7. M2M will enable a wide range of smart networked products and business opportunities such as converting ownership to pay-as-you-use models. Wireless M2M will comprise a substantial proportion of the future "Internet of things."

When?

Many non-phone wireless devices are already viable, for example, information products such as Kindle or cars with built-in cellular telemetry. Many leading cellular network operators have formed M2M business units to accelerate adoption, and M2M is already around 10 percent of some cellular networks' total subscribers. In the long term, machines will outnumber human cellular subscribers.

Who will be impacted?

A wide range of employee and consumer-facing industries will exploit M2M.

Cautions:

M2M product development and deployment involve a complex ecosystem, including hardware design, system integration, firmware development, data collection and aggregation services in the cloud. Projects will be complex and may involve many partners.

Augmented Reality (AR)**What is it, and why is it important?**

AR overlays information onto a real-time video of the world (usually displayed on a smartphone or tablet). This can take the form of tagging objects in view with information, or overlaying more complex video and gaming animation onto world views.

When?

Vendors and tools such as Aurasma, Layar, Wikitude and Qualcomm's AR toolkit are already used to create sophisticated AR experiences; however, we expect AR to continue to evolve for at least five years.

Who will be impacted?

Through 2015, consumer-grade AR is likely to be most useful for marketing and gaming purposes, although non-handset applications such as head-up displays in cars have potential.

Cautions:

AR demands high-end devices with significant processing power and sensors to indicate handset location and attitude. It's also a very proprietary technology, and is unlikely to become standardized and embedded in Web browsers for at least five years. The quality and experience of AR are dependent on factors such as location precision, which varies depending on how the location is sensed.

Multiplatform Mobile Device Management (MDM)**What is it, and why is it important?**

Surveys show that the average CIO expects to support more than three smartphone platforms and many will have more. The challenges of managing employee devices are compounded by the fact that knowledge workers typically use at least three different mobile devices (e.g., smartphones, laptops and tablets), not all of which are owned by the enterprise. Therefore, enterprises must be prepared to manage and secure a wide range of devices, some of which they don't own. Multiplatform MDM tools are one way to achieve this.

When?

Multiplatform MDM is available now from a very wide range of vendors.

Who will be impacted?

All organizations whose employees use a wide range of mobile devices, especially those exploring new management models such as employee-owned IT or BYOD.

Cautions:

MDM tools are proprietary and seldom interoperate so organizations can become locked into vendors and technologies. Also, the MDM market is immature and has over 60 vendors, so consolidation is inevitable.

Long-term Evolution (LTE)**What is it, and why is it important?**

LTE is a next-generation cellular wireless technology that pushes peak theoretical speeds to hundreds of megabits per second and reduces latency. LTE will be adopted by code division multiple access (CDMA) and Global System for Mobile Communications (GSM) network operators.

When?

LTE is being widely adopted. By the end of April 2012, 72 LTE operators had launched commercial services which included 25 networks. The United States has seen the strongest growth and had over 75 percent of all LTE connections worldwide at the end of 2011. LTE-enabled devices will help push LTE services and uptake over the coming five years.

Available now; a few LTE handsets were announced in late 2011, but we expect them to remain niche products for several years. Although LTE coverage will be far from complete in 2013, some organizations will find applications that can benefit from LTE. Examples include data connectivity in urban areas.

Who will be impacted?

Initially, LTE is likely to be most useful for corporate PC and tablet users needing high data rates and low latency, e.g., for mobile Web applications. However, as it becomes more widely available and costs fall, it will enable a new generation of high-data-rate cellular applications, including video and fixed broadband replacement and high-performance M2M devices.

Cautions:

Cellular technology is very nondeterministic, so real-world performance will likely be multiple tens of megabits per second, far below theoretical peak values.

*Gartner, Inc., Top 10 Mobile Technologies for 2012 and 2012, published Feb. 14, 2012, ID:G00227234.

Appendix V: Existing Examples and Services

Many cities and states have used the open government data to great success.

Data.gov: <http://www.data.gov/>

Data.gov tracks all of the current open government sites and provides services for developers and government agencies. As of May 28, 2013, there have been 349 citizen-developed apps leveraging the datasets available.

OpenGov: <http://www.opengovtplatform.org/>

OpenGov is an open source solution jointly developed by India and the United States. It provides many features including data and content management and publicly available APIs.

Appendix VI: Horizons

Horizons are groups of activities within an interactive project that you cannot clearly see beyond until you've actually completed them. In order to accurately estimate and forecast a project, a thorough planning and definition process is recommended to better define later stages. By splitting projects and estimates across the horizons, we can ensure that projects consistently stay on budget and exceed expectations. Additionally, establishing the constraints of your project in early stages will allow one to determine a project scope that best fits within those boundaries.

Appendix VII: Native Vs. Mobile Web

Mobile web app-A website with screens designed to fit mobile devices

Hybrid app-An app that uses a mix of HTML5 and native technology

Native app-An app developed for a specific mobile platform using the native software development kit

The choice between a native app and a web app is essentially between user experience and affordability

Feature	Mobile Web App	Hybrid App	Native App
Cost	Low	Medium	High
User Experience	HTML5	HTML5	Native user experience
Cross Platform	Yes	Yes	No
Device Features	HTML5	HTML5	All
Developer Skill	Low	Medium	High
Available in App Store	No	Yes	Yes

Cost

Mobile web apps can be built once and deployed to any device, including those that haven't appeared yet. The device maker will ensure your app works without you needing to take special action. It's also easier to find the skills for a mobile web app, as it's more common.

User Experience

Web apps can be really good, but for the best user-experience you have to fully use the native environment.

Cross Platform

Native apps target a specific platform. Hybrid apps can target multiple platforms with a large degree of code reuse.

Device Features

This includes features like GPS, camera, and push notifications. Although there is increasing support for device features via HTML5 APIs, there will always be special features of the device that you can only access with the native software development kit.

Developer Skill

It's easier to find developers with the skills needed to develop mobile web applications. Native development requires skills specific to the device platform.

App Store

Many people look in the app store for applications, web applications lose this channel.

No App Store

App stores often add delay to deployment, making it harder for you to quickly add features and fix bugs. There may also be commercial issues and conflicts with terms of use. Fundamentally the device maker has veto power over your channel.

Appendix VIII: BYOD and Government Owned

The biggest difference between BYOD and government owned is who owns and manages the personal data and the device. In BYOD, the user owns the device, and therefore owns the data on it. The user tends to be responsible for device and networks costs.

In government owned, the employer owns the device, and therefore can legally limit the usage of the device and the data on it. The employer usually pays for carrier costs and for the device in government owned.

BYOD: Bring Your Own Device

Pros

- Users use what they are accustomed to
- Easier for users to update hardware
- Potential increase in productivity
- Reduced device costs for the employer (if employee paid)
- Reduced network costs for the employer (if employee paid)
- Increased user privacy
- More control for the user

Cons

- Increased MDM costs
- Increased IT costs
- Increased security risks
- No economy of scale in device purchasing
- Compliance concerns
- Less control for the employer
- More devices to target for development

Government Owned

- Increased security
- Decreased MDM costs
- Decreased IT costs
- Economy of scale in device purchasing
- Increased device compliance
- Fewer devices to target for development
- More control for the employer

Cons

- Less control for the user
- Users forced into a device they don't like
- Potential decrease in productivity
- Decreased user privacy
- Devices can become outdated quickly
- Increased device costs to employer (if employer paid)
- Increased network costs to employer (if employer paid)