Mobile in the Enterprise:

A massive and urgent opportunity.
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Introduction

Technological advancement and innovation occurs unbelievably fast in today’s mobile environment. The past few years have seen the arrival of some incredibly interesting and transformative mobile technologies that include BLE, Touch ID, smart watches and wearables, and iBeacons, among others. Organizations that take advantage of these new hardware technologies through powerful mobile apps will have a distinct competitive advantage over those that do not.
But how should organizations go about building business apps that utilize the latest and greatest mobile technologies? It used to be that building custom apps required crippling investments in time, money, and resources. Fortunately, new software technology has evolved to help organizations overcome this hurdle. Mobile app platforms enable companies to quickly build and deploy enterprise mobile apps and allow them to continue to iterate and improve on their apps as new functionalities become available.

Businesses recognize the transformative power of putting information in the right hands at the right time. Timely access to critical business information can help a sales rep close a deal while sitting in front of a prospect or provide a retail store manager with critical insights about inventory levels right from the selling floor. Yet for many years, this intelligence has been stuck on the desktops of IT people and business analysts; it never made its way through the organization to the people in the business who would benefit the most from its use.

Over the past few years, there have been great strides in enterprise mobility. The revolution to change the status quo began with Apple’s innovative mobile devices—the iPhone and the iPad—that untethered computing power from the desktop. This revolution has continued as software providers and app developers have looked for ways to enable organizations to get the most out of these powerful, transformative devices.
Chapter 1:
Requirements and challenges for enterprise mobile deployment

Today, we are at a point where the intersection of cutting-edge mobile hardware and revolutionary mobile software is changing the way that people across the enterprise work. The opportunities for value, growth, and competitive advantage that the enterprise face are both massive and urgent.

To fully harness the power of mobility, enterprises need to plan for a number of different requirements and challenges. The ideal enterprise mobile deployment will:

• Support an agile app lifecycle
• Be powered by an enterprise-ready infrastructure
• Provide a superior user experience
• Be open and extensible to integrate easily with other technology investments

This chapter highlights each of the areas above.
Chapter 1, Section 1: Agile app lifecycle

Mobile applications are iterative by their very nature. The pace of mobile technological advancement and the changing, evolving needs of business users means that developers must regularly update and enhance their apps. This iterative nature of mobile apps is not a bad thing, in that it gives developers the opportunity to constantly improve their efforts, it does however make having a tool that allows them to quickly and easily navigate the app lifecycle paramount.

In the coming years, the sheer number of mobile apps that organizations will need to create is enormous, which makes the ease and rapidity of app development, deployment, maintenance, and monitoring a huge priority. In this section we will cover the unique challenges of enterprise mobility and the requirements of an ideal enterprise mobile deployment.

The ideal mobile app platform would allow for the rapid development of enterprise mobile apps. This encompasses a wide range of functionality including app development and deployment, app monitoring, and app maintenance.

Rapid app development and deployment

Due to the underlying work required to develop, deploy, maintain, and monitor mobile apps and the fragmentation of the mobile operating system landscape, three main ways to build mobile apps have evolved: native code, platform code, and platform code-free development.

**Native code development:** Native Code development mandates that developers start from scratch every time an app is built. This approach can be extremely time-consuming and often requires a great deal of manpower and advanced development expertise, which equates to greater expense and less scalability.

**Platform code development:** Platform code development occurs in an Integrated Development Environment (IDE). These environments use specialized code (usually Java or HTML5) to create a new branch of code for each operating system and device onto which
the app is being deployed. This translates into a huge expenditure of resources to modify the code for specific platforms, not to mention the astronomical effort required to maintain all of the different branches of code. The downside of platform code development is that app developers must still be able to program, yet the code generated is no longer fully-native to the device.

**Platform code-free development:** For most situations, the ideal enterprise mobile deployment would combine aspects of both of the above methods. It would have a development environment that is powerful enough to allow developers to take advantage of native device and operating system functionality and flexible enough to let them develop for multiple devices and operating systems in a single environment without sacrificing the ability to make use of native functionality or forcing them to write custom code for every unique device that the app will be deployed on.

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### Detailed app monitoring

Building a mobile app is one thing, perfecting it is a whole other story. Being able to monitor your mobile applications is essential to getting enterprise mobility right. The ideal mobile platform would make both the server and client-side monitoring easy, giving your developers valuable information that helps them intelligently tweak apps in further iterations. At the end of the day, mobile apps are only impactful if they are adopted by users. Sophisticated app monitoring means better apps, higher adoption, and more value for your business.

### Easy app maintenance

When it comes to enterprise mobile apps, the ability to quickly and effectively perform updates can be just as important as designing the app itself. Ultimately, every business app that an organization deploys will receive two responses: praise and requests for additional content and functionality.
Because of this, the ideal enterprise mobile deployment would have the ability to constantly make changes and instantly push new content to users without writing or compiling any additional code. This capability saves time, money, and makes for a better overall end user app experience.

Chapter 1, Section 2: Enterprise-ready infrastructure

Global organizations need enterprise-ready tools to ensure the success of their mobile business apps. These apps need to be able to handle the large, complex data sets stored across the enterprise. They need to work when hundreds of thousands of users access the system. They need to dynamically adjust to unique user’s business needs and preferences. And they need to ensure the security of an organization’s sensitive information on broadly dispersed mobile devices.

The ideal enterprise mobile deployment would be built on top of a truly enterprise-ready infrastructure that allows for:

- Scalability
- High performance
- Enterprise-grade security
- Unfettered access to systems
- Personalization

### Scalability
Scalability is at the core of a successful mobile app development platform. Even the best designed mobile app will fail if it cannot be easily scaled up and deployed to 100s or 1000s of users. A true enterprise-grade mobile app platform has the flexibility to allow designers to build any app that they can imagine and the infrastructure to make sure that their apps can be easily deployed to any number of users across the enterprise.

### High performance
There are few things more frustrating than poor performance in a mobile app. Mobile, more than any other medium, requires fast performance for adoption. Poor performance means a less valuable app experience for end users and more users abandoning the app and going back to traditional means of accessing information via web or desktop interfaces. Truly enterprise-grade mobile app platforms have the infrastructure to support mobile applications with lightning-fast performance.
Enterprise-grade security
Mobile security is no joke, and concerns about the security of sensitive information on employees’ mobile devices has long been an impediment to the widespread adoption of enterprise mobility. A truly enterprise-grade mobile app platform is built with the security of your organization’s information in mind. That means appreciating the unique security considerations of mobile and bringing together platform, application, and device level security functionality to help you build mobile apps that are secure enough for even your most sensitive data.

Unfettered access to systems
Enterprise mobile deployments should complimentary your organization’s existing investments in infrastructure, hardware, and systems. A true enterprise-grade mobile app platform allows developers to easily connect with large, disparate systems and databases across the organization to build mobile business apps that can transform workflows and processes and change the way that people work.

Personalization
As consumers we crave personalization in our mobile apps, and it’s no different at work. The ability to personalize business apps and deliver timely, relevant content to individuals is what often separates successful apps from those that fizzle out. A true enterprise-grade mobile app platform can support this type of user personalization with ease, pushing personalized information and content to 1000s of enterprise users in their native language.

Chapter 1, Section 3: Superior user experience
There are a multitude of options for building apps. Some of the mobile platform options offer great speed for building apps, but then enterprises must sacrifice valuable app functionality to produce a degraded user experience. To maximize the value of mobile apps for the enterprise, there are some key areas to consider that affect user experience:

• Native vs. HTML5/hybrid apps

• Breadth of mobile functionality

• Availability

Native vs. HTML5/hybrid apps
Ideally, an organization would be able to build native mobile apps for all of their employees’ devices. These native apps would take advantage of the unique device and operating system capabilities present on different mobile devices. Providing a rich, native app experience is greatly preferable to taking a hybrid or HTML5 approach. Native apps have three major advantages over their hybrid counterparts: user experience, performance, and security. By taking advantage of a device’s unique inputs and menus, native apps feel like they are part of the device, leading to a better end-user experience and increased adoption. Native apps also outperform hybrid and HTML5 apps and provide greater security.
Facebook learned their lesson about app performance back in 2012. According to a Forbes article, Zuckerberg stated that “Facebook’s biggest mistake was focusing virtually all its mobile efforts on HTML5.” Once the company changed their focus to building native apps, users experienced significantly faster performance and Facebook was able to create new monetization opportunities.

HTML5 apps tend to leave enterprises open to security vulnerabilities. Issues with URL security enable hackers to access and corrupt app code and data being loaded or submitted on the device. Native apps don’t suffer these vulnerabilities and enterprises who want to further secure their apps can put additional measures in place (i.e. VPN) without affecting performance.

**Breadth of functionality**

Truly great enterprise mobile apps have a wide breadth of functionality that includes: analytics, transactions, and multimedia. Analytics give users the ability to explore and manipulate information, in tabular, graphic, and widget formats. Transactions enable users to update databases and operate ERP systems using SQL for database write-back or XQuery for Web Services applications. Transactions greatly open up the scope of the type of applications you can build. Multimedia enables you to access unstructured information, such as links to web content and email, and also allows you to dynamically share information, like PDF files and ePubs.

**Online/offline availability**

Unlike desktop and laptop computers, an app’s usefulness is not limited to when it is connected to Wi-Fi. An ideal enterprise mobile deployment takes this knowledge into account and optimizes the offline app experience by optimizing caching and enabling transactional queues. This way people can still meaningfully use their app to access information and perform transactions regardless of internet connectivity.

**Chapter 1, Section 4: Openness and extensibility**

All enterprises have invested in technologies they likely want to leverage when deploying mobile apps. Instead of going down a cul-de-sac with your mobile app strategy, most enterprises find significant value in using a tool that allows them to integrate easily with other technologies including custom mobile apps you’ve already deployed.
Chapter 2:
Components for a complete enterprise mobile platform that’s robust, scalable and high-performing

There are numerous essential components required to ensure that an enterprise mobile platform is robust, scalable, and high-performing. This chapter will delve into the following topics as they relate to an ideal enterprise mobile platform.

- Rapid code-free development
- Platform capabilities
- Mobile-client deployment options
- Client-side usage monitoring
- Maintenance
- Openness/extensibility
Chapter 2, Section 1: Rapid code-free development

Because of the difficulties inherent in both native code and platform code development, the MicroStrategy Mobile App Platform was designed to be a code-free development environment. This facilitates scalable and rapid app creation by enabling any user to extend the company’s grids, graphs, enterprise reports, and dynamic dashboards to his or her mobile device—without requiring any additional coding or development expertise. Pre-populated with an array of features designed to help new and experienced users rapidly design and deploy app after app, the MicroStrategy Mobile App Platform makes app development intuitive and scalable. The platform leverages designer toolkits, unique app capabilities, and the enterprise functionality of the MicroStrategy Analytics Platform to deliver best-in-class mobile apps to the enterprise.

Designer toolkits

MicroStrategy Mobile has a powerful set of designer tools that demystify the mobile app creation process and open up mobile development to a wide-range of users. These tools make it easy to add powerful functionality directly into your app without writing custom code.

Analytics. Since the MicroStrategy Mobile App platform is tightly integrated with the MicroStrategy Analytics Platform, it’s easy for app developers to leverage their existing reports, dashboards, and visualizations in mobile analytical apps. MicroStrategy makes it easy to build and deploy BI applications for the web, smartphones, and tablets without writing a single line of code.

As a leading provider of analytics software, MicroStrategy offers powerful analytics, informative data visualizations, and an intuitive interface for data exploration. Any investment you make in MicroStrategy—setting up your data environment, building your grids, graphs, reports, and dashboards—can all be leveraged to deploy beautiful, information-rich mobile apps with little to no additional effort.
The MicroStrategy Analytics Platform supports an array of 300+ built-in analytical functions, data mining algorithms, and predictive models in its native function library. MicroStrategy also easily integrates with open source and standards-based proprietary analytic models. Leveraging these models in mobile analytical apps allows organizations to deliver the full spectrum of business analytics to their users and empower their users with advanced analytics.

Transactions. Monitoring your organization’s performance in the palm of your hand anytime and anywhere is a powerful business capability—but, interacting with that information to approve requests, submit orders, change plans, and capture information at the moment of insight takes that power to a new level. MicroStrategy Transaction Services lets you embed write-back functionality into documents and dashboards for the purposes of decision-making or initiating a transaction. Examples of mobile-enabled transactional inputs include:

- **Touch-based inputs:** Use a wide range of transactional input forms and a flexible drag-and-drop design template. Change and add new data using text and number inputs, calendar, camera, GPS, switches, steppers, and sliders. Utilize transactional widgets such as Photo Uploader, Interactive Grid, and Transactional Grids.

- **Offline transactions:** Approve, submit, or edit information even when away from a cellular or Wi-Fi signal. When offline, transactions are queued for submission when you next connect.

- **Image capture:** Capture and upload images to a database or ERP system. Retailers capture storefront or product displays. Insurance agents add images alongside claims notes. Business people attach visual records of receipts alongside expense filings.

MicroStrategy Mobile makes adding transactional capabilities to mobile apps simple. This highly scalable solution stores thousands of user transactions, triggering new business processes, reallocated resources, and accelerated business activity. Transaction capabilities can be embedded...
into your mobile apps, enabling you to submit and update data and images in ERP systems, CRM systems, and operational databases.

To implement transaction services, a secure connection is initiated between the device and the backend transaction systems and databases, and information is written to them from the mobile device. SQL is used to drive database transactions, while XQuery is used for Web Services applications. When completing transactions using Web Services, you use the Simple Object Access Protocol (SOAP) or the newer Representational State Transfer (REST) protocol. SOAP and REST are object-access protocols that are used in web services architectures.

**Multimedia.** Adding multimedia to your mobile apps greatly increases your ability to engage your audience. By directly delivering multimedia content to users via a mobile app, your users can access anything from promotional videos and product endorsements to training brochures and sales presentations, when and where they need them.

You can also equip your mobile workforce with instructional videos and product manuals; and, they will be able to access all of this information without ever leaving the app. Some examples of multimedia capabilities are the in-app PDF reader, email, and browser. For greater interactivity, HTML containers and ePub integration can also be utilized.

There are two ways to include multimedia in your apps: HTML containers and the plug-and-play multimedia widget:

- HTML containers enable you to access any content that is available on the world wide web, and place it in an iFrame directly into your app alongside your other content. URLs provide links to pull-up entire documents or web pages.

- Plug & Play allows you to employ an out-of-the-box multimedia widget, or alternatively browse any set of webDAV folders. The out-of-the-box multimedia
widget simplifies using multimedia, as it gives you a framework in which you can download, consume, and store multimedia files. WebDAV folder integration enables users to browse and view existing files and folders in a webDAV folder.

**Mapping.** MicroStrategy Mobile supports geospatial analysis and mapping on mobile devices. Maps offer a powerful way to explore and find insights in data and can provide important context when used in conjunction with traditional analyses like grids and graphs. Additionally, maps are a great tool for performing analysis at different levels of aggregation—from country, to state, to county, down all the way to zip code. Users can easily navigate data based on these different aggregations. MicroStrategy Mobile provides support for ESRI and Google Maps as well as the image layout widget.

Both ESRI and Google Maps display geospatial data overlaid on an interactive map. Users can swipe, scroll, and zoom in directly on the map, or even filter the data shown by selecting elements within their mobile app. Data can be displayed using a pin marker, a density map, or a bubble to provide multiple types of analysis within each map. In addition, ESRI maps can display data from a custom geographical region, such as the counties of a state or districts within a city.

The image layout widget is extremely flexible, allowing app developers to include visualizations representative of different geographic regions such as countries, states, and regions. Additionally, image layouts can be used to create images that represent custom spatial analyses like a store layout.

**Workflows.** While MicroStrategy makes extending your existing analytics to mobile devices a breeze, that’s not all we empower companies to do. MicroStrategy Mobile is a fully-featured app development platform that is capable of incorporating workflows and mobile business processes into enterprise mobile apps.
Nearly every industry and every role can benefit from workflow enabled mobile apps. MicroStrategy Mobile apps have the ability to mobilize processes, remove bottlenecks, improve access to information, and boost workforce productivity. Some examples of mobile apps with embedded workflows include:

- **Sales Productivity Apps**: Transactional apps let salespeople take back control of their day. With on-the-go processing, sales reps can update account information or forecasts, create sales quotes, and log meeting activities regardless of their connectivity; they never have to wait until the end of the day to catch up on administrative tasks.

- **Wealth Management Apps**: Wealth management apps integrate all relevant information, analytics, and business processes that a wealth manager needs to do their job into one compelling tool. This mobile solution frees financial advisors from the office, maximizes productivity, empowers them to more effectively win new business, nurture existing business, and create a new level of client-advisor relationship.

- **Store Inspector Apps**: Store Inspector apps allow managers and auditors to increase efficiency, eliminate paperwork, share results quickly, and improve follow up. These solutions enable the user to submit data directly from apps while on-site. By streamlining the inspection process, auditors or district managers can immediately review the results at the location they are visiting, spend more time coaching associates, and significantly increase productivity.

### App capabilities

With features including powerful app-level security, offline access, personalization, 24/7 alerting, and support for collaboration, MicroStrategy is uniquely suited to building powerful, enterprise-grade mobile apps.
App security. MicroStrategy Mobile effectively takes advantage of Apple and Android operating system features to secure the actual MicroStrategy Mobile app running on the mobile device.

- Authentication. MicroStrategy Mobile follows the "defense in depth" approach, which calls for several layers of security throughout an IT system. MicroStrategy provides several layers of authentication and password control. These authentication methods include secure application authentication, confidential project mode, and mutual authentication. These layers of authentication assure the confidentiality of data on MicroStrategy Mobile apps at all times.

- HTTPS with mutual authentication. MicroStrategy supports HTTPS mutual authentication, also known as two-way authentication, by adding a Certificate Server. The Certificate Server has the sole purpose of ensuring added security by providing mobile devices with specific certificates that are later used in authentication. In order to gain access to the MicroStrategy Mobile Server, the user must first enroll the device with the MicroStrategy Certificate Server. This entails presenting the user’s credentials to the Certificate Server and, upon validation, the Certificate Server will issue a certificate that is sent to the device and stored. All communications with the MicroStrategy Certificate Server are then conducted via an encrypted link using the HTTPS protocol.

- Data Transfer. Secure data transfer between MicroStrategy Mobile apps and the MicroStrategy Mobile server involves secure internet transfer connections and communication channels. In addition to HTTP, MicroStrategy Mobile apps support HTTPS (Hypertext Transfer Protocol Secure), which combines the HTTP protocol with the SSL (Secure Socket Layer)/TLS (Transport Layer Security) protocol. This provides encryption and secure identification of the server over an unsecured network. Data can also be transferred by placing the MicroStrategy Mobile server behind a firewall and using a VPN (Virtual Private Network) connection to retrieve data using MicroStrategy Mobile apps, regardless of the transfer protocol or wireless network to which they are connected. The VPN connection creates a secure communication channel between the MicroStrategy Mobile app and the MicroStrategy Mobile server, which provides the strongest security available for communications with iPad and iPhone devices.

- Authorization. Authorization refers to the three-dimensional process by which the app determines app functionality privileges, object access permissions, and data access security. MicroStrategy Mobile utilizes the same sophisticated user authorization management framework available in the MicroStrategy Analytics platform. This framework uses security filters to distinguish between users based on each individual’s knowledge, business needs and security level, allowing for more secure and organized data access. Each user’s access to app functionality, reports, and data within those reports is managed dynamically based on their profile and privileges. As a result, data security is maximized while every user benefits from a personalized app experience, tailored for their particular organizational role. For example, one report is used by the CEO to view sales data for all products.
A regional manager may view the same report but may only be able to view data related to the multiple production lines in his jurisdiction, while a national production manager may only have access to the data about the product line he/she manages. Thus, a single report with specific authorizations can satisfy the reporting needs of all these individuals.

- Confidential project mode. In the MicroStrategy Mobile Configuration, organizations can designate session expiration time limits for the mobile app and configure project-level authentication. These settings work when the mobile device is either online or offline, ensuring both live and cached data are secured. By default, MicroStrategy Mobile for iPhone and iPad do not require users to reconfirm their credentials when re-entering the app. From the Mobile configuration page, you can change this behavior and set a session expiration time limit. You can choose unit intervals of days, hours, or minutes. When the app has been running in the background, or the device has been locked for the allotted period of time, MicroStrategy will attempt to reauthenticate the user. At least one project must be treated as confidential for password expiration to take effect.

**Offline access**

Unlike desktop and laptop computers, an app’s usefulness is not limited to when it is connected to Wi-Fi. MicroStrategy Mobile makes it possible for mobile users to get the most out of their enterprise mobile apps regardless of internet connectivity. There are three main caching strategies and offline indicators that serve to improve the app’s offline experience for business users and customers: Automatic Caching, Pre-caching Folders, and Adaptive Mobile Caching.

**Automatic caching** is essentially like email. Devices check for new and updated content that is set to be available offline and syncs content to the device in the background. Check the synchronization status by using the MicroStrategy Mobile loading bar—which can be enabled in the Mobile Server settings at the Mobile Configuration level.

**Pre-caching folders** enables the mobile administrator to define a set of objects to be pre-cached by the mobile client when the app starts. On the Home Screen page of any Mobile configuration, administrators can define any folder, report, or document to be pre-cached at startup. This feature enables you to stream app content faster to your device and view content offline, improving app interactivity. This caching strategy provides enhanced app performance to the user and more extensive offline exploration.

**Adaptive mobile caching** enables you to cache and preload sets of reports and documents onto a mobile device upon initially launching the MicroStrategy Mobile app. The app prioritizes the background cache loading based on where the user is, so the app intuitively downloads content that the user might want so that it is ready before the user taps.

MicroStrategy Mobile apps are updated as soon as new or updated content is available. To avoid having the user “check” unnecessarily for new content by pushing some type of ‘refresh’ button, the checking for cache and the pushing of new cache content is managed by the app designer. The app designer can specify how often, in milliseconds, the app checks with the Mobile Server for new or updated content. The designer can also create schedules at the server level for updating
the cache so that content—especially content that is recently requested or shared across users—is refreshed by the ‘cache update subscription’ setup on the Intelligence Server.

Personalization

**Branded.** MicroStrategy makes it simple for organizations to customize apps so that they are in line with the look-and-feel of their company’s branding standards. Developers can easily adjust color palettes, change fonts, add logos, and alter app icons so that apps no longer resemble MicroStrategy apps. This enables our customers to express the personality of their organization, maintain brand consistency, and increase user adoption.

**Internationalization.** MicroStrategy makes it easy for an organization to roll out an app in multiple languages through its powerful internationalization functionality. Internationalization allows administrators to set language preferences for individual users, meaning that when they open the app they will see content in their language.

This makes deploying a mobile app to a global workforce much easier. Without internationalization, developers would need to recreate the app in every language that users needed or write in complex coding logic to allow the application to show multiple languages—both of which take a great deal of time, delaying the speed with which an organization can deliver an app to its employees.

**Permissions.** MicroStrategy Mobile makes it easy to make sure that the right information is given to the right person at the right time by empowering administrators to dictate permissions at the functionality, object, and user levels.

- **Functionality controls:** Users fall into various categories, such as casual user, power user, application developer, and administrator. Functionality privileges should fit the needs for their roles. For example, app developers will require the ability to create and edit objects; however, you run a considerable risk if you allow casual users to do the same.

- **Access control lists:** On the object level, you can create Access Control Lists to govern the ability to read, write, delete, use, and execute specific objects. For example, there are certain metrics that executives would like to see in their apps that they don’t want to make available to casual users. You can quickly change the privileges to the metrics, and those metrics won’t even show up on the casual users’ devices, even if they are still part of the report.

- **Security filters:** Security filters limit the data that a user or a group of users can access. The results of every data request by a user—including documents, reports, and prompt lists—are filtered based on the user’s permissions. For example, a regional manager will need to see granular information for his specific region, as well as high-level information about the company’s overall performance. Most companies offer only the security filter functionality and do not provide security at the object and functionality levels. Furthermore, the Mobile App Platform’s security filter strategy is much more secure. Most companies make the mistake of using hand-coded, static SQL queries to capture this functionality. The Mobile
App Platform also uses a SQL query but includes a ‘wildcard’ that dynamically inserts the proper user security conditions at runtime. This allows you to personalize the information that your employees routinely access and helps create a powerful security strategy.

Alerts
MicroStrategy Mobile supports powerful 24/7 alerting through device notifications. These data-driven ‘smart alerts’ are based off of KPI thresholds and are meant to inform business people of potential problems so they can take timely, corrective action.

Alerts on MicroStrategy Mobile are handled through the device’s native push notification system. MicroStrategy powered iOS apps utilize the Apple Push Notification Services (APNS) to make alerting a seamless part of the app experience. APNS provides the ability for a server to send a message to an iOS device (i.e., iPod, iPhone, or iPad) with application relevant information. This information can take one of three forms: A badge (a graphic associated with the application), an alert (a message to which the user can view and optionally interact with), or a sound.

Examples of MicroStrategy Mobile alerting in action include: a store manager receiving a push notification telling them they are at risk of a stockout for a specific item, a wealth manager being notified that a particular client’s portfolio is performing poorly, or a CFO being notified of unforeseen volatility in a foreign currency that their organization has a sizeable position in.
Collaboration

One of the best things about mobile is the enhanced ability to collaborate. Enterprise mobile apps mean that people are no longer tied to their desks, which in turn means that they are free to get up, move around, and collaborate. MicroStrategy Mobile makes it easy to collaborate with colleagues via its Annotate and Share functionality and its integration with Apple TV.

Annotate and Share: Want to ask someone a question about information displayed on your MicroStrategy Mobile app? Just use the Annotate and Share feature to draw shapes freehand or add a comment. Then share your annotated screen via email to your colleagues without ever leaving the app.

Integration with Apple TV: Carry your information wherever you go and throw it up onto the screen using Apple TV. Present your data-driven visualizations on the screen and control them from your iPad or iPhone.

Chapter 2, Section 2: Platform capabilities

In addition to the unique mobile capabilities that MicroStrategy Mobile provides developers, they also have access to the full feature set of our analytics platform. The MicroStrategy Analytics Platform is a leading enterprise analytics solution that delivers capabilities including: platform security, query optimization, multi-source and data blending, internationalization, concurrency, high performance, and tools for monitoring platform and system performance. Additionally, MicroStrategy offers flexible deployment options either on-premises or via our MicroStrategy Secure Cloud.

Platform security

The MicroStrategy Enterprise platform contains a robust security model to ensure that your data is kept secure. MicroStrategy integrates with existing authentication systems, but it also provides an additional level of security to manage access to specific apps or reports.

When accessing MicroStrategy data, all users must have their credentials validated. MicroStrategy offers several authentication modes, including:

- Standard: Intelligence Server is the authentication authority
- Database warehouse: The data warehouse database is the authentication authority
- LDAP (lightweight directory access protocol): An LDAP server is the authentication authority
- Windows NT authentication: Windows is the authentication authority
- Integrated authentication: A domain controller using Kerberos authentication is the authentication authority
- Third-Party: A third party authentication tool such as Tivoli, SiteMinder, or Oblix can be set as the authentication authority to enable single sign-on
MicroStrategy Usher also provides an alternative option to provide authentication. You can download the Usher app and define a badge, and MicroStrategy can authenticate users through the Usher server. Usher even integrates seamlessly with your mobile app, as the app can access your credentials directly from Usher on the same device.

MicroStrategy also utilizes a sophisticated user authorization management framework to determine access to data. This framework uses security filters to distinguish between users based on each individual’s knowledge, business needs, and security level, allowing for more secure and organized data access. Each user’s access to app functionality, reports, and data within those reports is managed dynamically based on their profile and privileges. As a result, data security is maximized while every user benefits from a personalized app experience, tailored for their particular organizational role.

Bi-directional optimized queries
The MicroStrategy Platform provides unmatched performance when reading and writing data to your database. Queries are optimized specific to each data source to ensure that each report is returned as quickly as possible, with minimal strain on your MicroStrategy Intelligence Server. MicroStrategy also provides the ability to perform advanced calculations by creating temporary tables that require many passes of SQL. By modifying optimization properties in your MicroStrategy Intelligence Server, you can manage the SQL executed to ensure the correct data is returned in the least amount of time.

Multi-source and data blending
As the amount of data storage has increased exponentially, many organizations store data in a variety of sources. You may require access to data in relational databases, Big Data sources, Excel or text files, or even unstructured data from Facebook or Twitter. MicroStrategy enables you to access all of this data within your mobile app and seamlessly integrate from a variety of sources. For example, you may want to compare your forecasts from your enterprise database warehouse with an Excel spreadsheet that contains actual sales figures. MicroStrategy can blend data from both sources to determine whether sales exceeded forecasts.

In addition, data import allows users to upload data directly into the Intelligence Server. Using data import improves response time, as the PRIME data engine can simplify queries and use a local copy of your data to bypass the database entirely. The data wrangler even enables modification of data before it is imported. You can concatenate or split fields, find and replace data, or filter to provide additional analysis.
Concurrency
Accessing data within a MicroStrategy Mobile app often requires simultaneous execution of SQL across multiple data sources. Using the Intelligence Server, MicroStrategy can seamlessly run and manage a variety of queries for your environment, without impacting the performance within your mobile app. Administrators can determine how to concurrently run reports, and determine how to prioritize data across thousands of users.

High performance
MicroStrategy Mobile is backed by the enterprise-grade performance of the MicroStrategy Analytics Platform. Our enterprise analytics platform is well-known for its performance, even at massive scale. MicroStrategy was built with performance and scalability in mind, which is why we’re a leader in the enterprise analytics market and the platform of choice for organizations with large, complicated data environments.

Performance monitoring / administrative tools

**Operations Manager.** MicroStrategy’s Operations Manager tool provides a single interface for administering multiple environments. Administrators can view multiple aspects of system performance, including statistics on jobs, memory, and user sessions. In addition, counters and alerts can be set up to easily manage relevant statistics.

**Counters.** It’s often easiest to identify trends and outliers using a graphical user interface. Counters enable you to select key performance indicators to see a quick view right on the landing page. You can also set up thresholds on counters, which will quickly identify whether counters are outside of the standard range.

**Alerts.** Since you may not always be able to monitor the Operations Manager interface, you can also set up alerts to automatically notify users if a certain event occurs. For example, the
administrator can automatically be notified if the memory usage exceeds a certain rate. The administrator can then determine whether there may be an issue within your environment.

Flexible deployment options
Organizations have the opportunity to deploy MicroStrategy Mobile either on-premises or via our Secure Cloud offering. Deploying on-premises means that you call all of the shots and control every aspect of your implementation. You can incorporate MicroStrategy directly with your existing security to manage all of your data in one place. If you want to reduce the demands of your IT team, you can also leave the management to us. MicroStrategy can manage any aspect of your implementation to ensure that you can focus on analyzing your data.

Chapter 2, Section 3: Mobile-client deployment options
MicroStrategy Mobile is a highly customizable app development platform that gives organizations the flexibility to deploy their mobile apps in a variety of ways, whether they are for internal ‘enterprise users’ or external ‘consumers’. MicroStrategy covers everything you need to deploy enterprise mobile apps over-the-air (OTA), via a web server, or through the Apple App Store.

Download MicroStrategy Mobile From the App Store and distribute configuration link
Organizations can use the free MicroStrategy Mobile App (available on the App Store) to deploy their applications to enterprise users. In this deployment scenario, all users must download the MicroStrategy Mobile App to their device. The mobile administrator then uses the MicroStrategy Mobile Server to generate a ‘configuration link’ that is unique to the specific application that is being deployed. The administrator then has to share the unique configuration link with the enterprise mobile users. Once received, users simply need to click on the configuration link in the mobile device and the MicroStrategy Mobile App will re-point at the newly deployed application.

Enterprise app deployment
Alternatively, mobile administrators can re-compile the MicroStrategy Mobile App code using an Apple Enterprise License and the MicroStrategy Mobile SDK. This allows organizations to re-skin the app and deploy it either via the Apple App Store or through an internal app store.

Recommendations for Enterprise Mobile App Deployment. MicroStrategy recommends enterprise app deployment through an internal apps store for enterprises looking to deploy mobile apps to their employees. This approach has several key benefits:

- You control when users upgrade: The Apple App Store always has the most recent version of the MicroStrategy Mobile App. Enterprise software management frequently requires additional client-side diligence to test any new software with the organizations’ systems and implementations before rolling it out to users. By deploying via an internal app store, you can be certain that your employees are only upgrading when you want them to.

- You control the app version, and can roll back as necessary. In the event of any issue with the application after rolling out to you users, you retain
the ability to roll users back to a previous version of the code; or maintain multiple versions of the code deployed to users—it’s your choice.

• The app code comes directly from MicroStrategy. In the event of an issue specific to your implementation, MicroStrategy can provide you with a specific fix to your problem anytime. Customers using the App Store App have to wait until the next update becomes available for all customers.

• Enterprise deployment is simple for end-users. iOS supports OTA deployment which means that an internal enterprise app can be downloaded with a single tap from a link on a webpage or in an email—just like an App Store app.

• Enterprise deployment supports custom branding (re-skinning). Re-skinning an enterprise mobile app means that you can add your own icon, department name, or company branding to the splash (start) screen. This allows the people in charge of app development to distribute multiple, differently branded versions of an app that points to different projects for the different departments/organizations within a company.

While these are definitely compelling reasons to deploy MicroStrategy Mobile apps through an internal app store, there are instances when administrators would want to utilize the other deployment methods. For instance, if an app is ultimately destined for external consumers it would be best to deploy via the App Store. Likewise, in a small, agile organization, the enterprise deployment method might be overkill. In this situation, using the MicroStrategy Mobile app with configuration links might be the best option.

Chapter 2, Section 4: Client-side usage monitoring

MicroStrategy delivers superior monitoring capabilities which are embedded into every MicroStrategy Mobile powered app. Client-side monitoring captures personalized analysis every time a user taps on an app screen. Statistics are gathered on time spent on each app screen, exploration paths, GPS location, app usage, device type, operating system version, and cache usage. With this information, app developers can track overall app adoption, geo-location of usage, perform cohort analysis, support continuous development cycles, analyze app performance, spot network issues, and track adoption rates of new devices, operating systems, and clients.

End-to-end mobile app monitoring with Enterprise Manager

In order to properly administer an app, you need to have a 360 degree view of your app implementation at your fingertips. The Mobile App Platform, with the help of the time-tested Enterprise Manager product, can help you to obtain vital insight into app activity by monitoring mobile client statistics. These statistics arm you with data that will help you refine your app. End-to-End Monitoring helps optimize efficiency and identify errors before they occur by providing granular insight into mobile device usage and performance information. These statistics are vitally important to dictating in-app changes (report availability, user personalization, identifying under-used sections) and honing the offline app experience (caching, transaction queueing).
Mobile Client statistics collection is based on the time-tested Enterprise Manager product. The MicroStrategy Enterprise Manager originated as a business intelligence application designed to measure the success of BI projects. However, it has now become a powerful app-refining tool, measuring device and app activity. Enterprise Manager logs statistics on app usage for every user. From there, it places a MicroStrategy Business Intelligence project called “Enterprise Manager” on top of the statistics so that you can dynamically ask questions of your app usage data. Furthermore, it comes pre-loaded with reports and dashboards that allow you to monitor system, user, and group activity—helping people at all levels of your company. Developers benefit from analyzing the use of objects by users and projects to create plans for future development and real-time maintenance. Project managers monitor the development and use of their applications to predict and manage growth. Administrators examine system activity to ensure that the appropriate resources are available at high use times and that they are utilized optimally. In MicroStrategy 10, Enterprise Manager can be incorporated with the Operations Manager tool to facilitate historical analysis and real-time updates in a single tool.

**Bandwidth issues**

Does it seem like users are struggling to access data due to network bandwidth limitations? Using Enterprise Manager, you can view detailed statistics on how they access data in the mobile app. You can view the estimated bandwidth for the connection, whether they are connecting via Wi-Fi, 3G, or LTE, and the amount of time it takes to render each view within the mobile app. Once you analyze this information in Enterprise Manager, you can determine if some dashboards need to be simplified or if additional Wi-Fi access should be set up.

**Cache utilization**

Performance on mobile apps can be greatly improved by hitting a cache instead of accessing the database each time. If your users are complaining that their mobile apps are rendering slowly, you can determine how often they are using a cache and the type of cache used. Then, it may be
possible to manage caches more effectively to ensure that important reports and dashboards are cached ahead of time.

**Apps and OS adoption**
A key part of any implementation is to review how many users have installed the app. Enterprise Manager can determine the number of installs and the type of device used for each installation. Also, you can determine the timeline from deployment to installation for each of your users. Data on adoptions can even be split across user groups to determine if certain user groups are more likely to install or update their mobile app.

**App section usage and navigation path analysis**
Once you deploy your mobile app, you can monitor how often users access the mobile app or execute certain reports or dashboards. Statistics on usage help developers to determine how to build additional apps. For example, suppose that a new app that contains a map widget is used by a majority of users. With this knowledge, developers can create additional apps that access geographical data. Enterprise Manager can also provide additional information on functionality usage by tracking manipulations. A metric counts each time a user selects a new element in a selector, so you can determine whether users are viewing static documents or interacting with data.

**Cohort analysis**
All the information MicroStrategy tracks can be used for additional analysis using reports and dashboards. Since statistics data can be viewed directly within MicroStrategy, it is easy to drill, filter, prompt, and perform calculations to understand your statistics. This enables easy comparisons between different users, as you can examine the usage behavior across many different attributes, including date, time, job title, and location.

**Geo-location of usage**
MicroStrategy also allows the native GPS in your mobile device to keep track of location. Geospatial data can identify trends or outliers, and can provide both analysis and security for your data. For instance, if you have deployed your mobile app across your sales team, you may notice that many salespeople access the app before meeting with a new client. This may help designers to add useful information about each client in the app.

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**Chapter 2, Section 5: Maintenance**
MicroStrategy makes it simple for app developers and administrators to take what they have learned from utilizing our platform’s monitoring capabilities and apply this insight to improve their organization’s mobile apps. MicroStrategy Mobile’s object-driven design makes edits easy, and we provide a broad set of enterprise-class system administration tools including: command manager, object manager, integrity manager, operations manager, and system manager.
Admin tools

**Command Manager.** Command Manager allows administrators to build, test, and execute automated scripts to complete nearly all administrative and maintenance tasks faster, more reliably, and with minimal IT resources. Command Manager facilitates rapid, scalable, and dependable script-based administration. Built for administrative efficiency, MicroStrategy Command Manager provides flexible user interfaces, a powerful library of sample outlines covering all administrative areas, and scalable asynchronous script execution in parallel. Command Manager can help companies reduce BI administrative and maintenance costs by up to 80% by: fully automating all administrative and maintenance tasks, enabling administrators to quickly react to changes within the organization, providing more reliable operations, and freeing up valuable IT resources.

**Object Manager.** Every successful application goes through development and testing cycles before being deployed to the production environment for end users to access. Even after an application is successfully deployed in production, changing business requirements mandate adding, removing, and modifying reports and other application objects on a regular basis. It is not unusual to find individual development, testing, and production environments for every application. Therefore, effective change management of such distributed and disparate applications is vital to significantly reduce maintenance costs. MicroStrategy Object Manager is a change management tool used to assess the impact of business intelligence application changes and migrate those changes between development, test, and production environments from a single interface and from any geographic location. Object Manager allows administrators to govern change management, versioning, and internationalization among unrelated and distributed environments.

**Integrity Manager.** MicroStrategy Integrity Manager is a powerful tool for BI developers, administrators, and power users that can automatically test large sets of reports to uncover inconsistencies or errors so that business users can rely 100% on the accuracy of their information.

**Operations Manager.** Operations Manager is a web-based analysis tool that enables administrators to analyze real-time performance of multiple servers. Administrators can create counters and alerts to manage key performance indicators and identify potential issues within your network. Operations Manager can also incorporate Health Center, which provides several options for resolving known issues. You can even view analysis using the heartbeat tap, which displays changes in counters over time.

**System Manager.** MicroStrategy System Manager provides a workflow graphical user interface that can be used for automating system tasks. For example, administrators can create a workflow that can check for the status of the server and restart the server if it is not operating correctly.
Value of metadata layer

A change made here...

...is instantly reflected everywhere that object is used.

Value of metadata layer: automatic updates everywhere that an object appears.

Leveraging the Metadata. While the Mobile App Platform’s metadata makes app development a breeze, it is also vitally important during the maintenance process. As mentioned previously, the metadata stores a unique definition for every object and enhances object reusability. Any change to an object will be reflected instantly in the metadata and will automatically update every instance of the object. This is critical during app maintenance, as every change you make will instantly be reflected in-app, speeding the app refinement and redesign process. This simplifies the deployment and maintenance process as objects can constantly be edited and updated if changes are made to the workflow or objects within the app. Additionally, these instant content updates require no code submission to Apple, which has traditionally proven to be an area of gridlock for other companies.
Instant updates with no code recompilation
The Mobile App Platform is the most sophisticated and malleable piece of software you will ever use. Earlier, we discussed our rationale behind selecting a platform code-free environment for an app development space. However, nowhere is this decision more important than during the process of maintaining your apps. When using native or platform code, every time you want to move an object, you have to specify the pixel location and recompile the code before you can see the change. This is a time-consuming and largely inefficient process. On the other hand, the Mobile App Platform’s drag-and-drop interface gives you the freedom to move items whenever and wherever you want, and you can see the results instantly. The same principle of instant updates also applies to the objects themselves.

Chapter 2, Section 6: Openness/extensibility
As previously touched upon, all enterprises have invested in technologies they want to leverage when deploying mobile apps. This section will discuss the capabilities MicroStrategy extends to our customers that allows them to easily integrate with the other technologies they have already deployed.

MicroStrategy SDK
MicroStrategy SDK (Software Development Kit) is a comprehensive development environment that enables easy customization and integration of the MicroStrategy BI platform with enterprise business applications. Through documentation of the application programming interfaces (API), sample code, utilities and developer tools, the MicroStrategy SDK empowers developers to implement highly customized, functional, and powerful Web reporting BI applications, meeting all of your organization’s BI requirements. The MicroStrategy SDK is a comprehensive software development kit that enables developers to extend out-of-the-box MicroStrategy functionality and build powerful, custom applications using the MicroStrategy platform. Using the MicroStrategy Developer Library, developers can quickly learn the necessary architecture and API references to build custom applications, and use sample code to jumpstart their customizations. With the MicroStrategy SDK, developers can create solutions that provide relevant, timely information to business users at all levels in concise and visually-compelling web-based presentations—solutions that let them successfully drive their businesses with critical, informed decision-making.

Easy management and portability of customizations. MicroStrategy Web provides a framework for plugging in customization changes as a piece of software (called a plug-in) into the application. With this architecture, no compilation or modification of the source code is required to deploy the customization changes. MicroStrategy SDK includes the Web Customization Editor which, with its intuitive, easy-to-use interface and its comprehensive scope, works together with the MicroStrategy plug-in architecture to simplify and streamline the customization process and to ease upgrades.

Open, functionally-rich API. Developers have access to the entire range of MicroStrategy BI Platform functionality through the various APIs that comprise the foundation of the
MicroStrategy Platform. The Intelligence Server API exposes all the functions needed to build data models and reports, implement security, and administer the system. Using the Web API, developers can build custom web-based BI applications that provide the full range of application functionality available in MicroStrategy and more. The MicroStrategy Visualization SDK allows developers to use Flash to build any type of visualization and Rich Internet Application, and include it in their applications. Other MicroStrategy APIs include the Web Services API and Office API, which allow application developers to develop and deploy Web Services-based applications or design integrated Microsoft Office applications, respectively.

**Access MicroStrategy functionality from any client, and any protocol.** MicroStrategy tasks are well-defined operations in MicroStrategy Web that are packaged as Web-accessible services. Developers can use the wide variety of pre-built tasks, and extend or build custom ones in order to easily access data from any client, using any protocol.

**Adherence to industry standards.** By supporting industry standards such as XML, Java, COM, MDX, Adobe Flex, and Web services, the MicroStrategy SDK provides various levels of rich API support for development on multiple platforms. In addition, developers can use the Web Services Development Kit to expose and deploy MicroStrategy functionality as highly-functional Web Services.

**Integrate with or embed inside other existing business mobile apps.** There also may be other internal apps that companies have deployed for their employees. Again, instead of re-building these apps which may have proven useful already and employees have already adopted, companies can quickly enhance those apps with MicroStrategy Mobile functionality by leveraging the MicroStrategy Mobile SDK.

**Integrate with existing customer-facing apps.** Many organizations have already invested in building and deploying apps for their customers to use in interfacing with the company. These customer-facing apps have typically been built from scratch using various code languages for each mobile operating system. With MicroStrategy’s SDK, you can leverage the investment you’ve made and integrate those custom apps with MicroStrategy Mobile. This is a much quicker and easier way to enhance those apps with powerful, new functionality.
Chapter 3: Real-world enterprise mobile experiences

Anyone who owns a smartphone and/or tablet knows first-hand examples of amazing, transformational consumer apps. Within the enterprise, MicroStrategy is changing how people work. Some of our customers have captured and measured specific impact.
Chapter 3, Section 1: Lidl

Lidl’s Sales Managers (Regional/District Store Managers) are always on the road. They are responsible for maintaining contact with store and HQ employees, while driving business in their assigned stores. In the past, Lidl’s Sales Managers relied on large binders and clipboards for their information needs. Coordination with the regional company and headquarters was often made on paper, either as printouts or via fax. This process was prone to errors and critical information was regularly not up-to-date or available at all.

This is why Lidl initially made the decision to move forward with mobile technology and use MicroStrategy Mobile to develop the Lidl Mobile Office project (LIMO). This app has since been rolled out to store managers as well and provides users with KPI information, task and inventory management capabilities, planogram visibility/execution, training materials, etc. Essential business information is now available in real-time to 10,000+ store personnel and large binders and clipboards are a thing of the past. Lidl quantifies that this app has been so successful that they have been able to achieve a 17% time savings for their store managers due to productivity increases tied to the use of LIMO.

Chapter 3, Section 2: Liverpool Community Health

Prior to having MicroStrategy, LCH would have to prepare for board meetings by manually analyzing data and preparing reports in Excel. This process took several weeks so the information given to the board was usually a month old. Additionally, each month, staff was required to spend several days printing packages for each board member and sometimes they had to be hand delivered by courier.

Now, with the implementation of MicroStrategy, the Board has near real-time information and can access that data anytime and anywhere on their iPads with their Organizational Performance Electronic Reporting Application (OPERA). Another benefit of this app is that it provides clinicians with the ability to more securely collect patient information without the need to handle paper.
OPERA also provides the clinicians with instant analysis from the patient’s feedback and acts as a diagnostic tool.

Since deploying this app, LCH’s internal reporting team has achieved a **25% time savings**. OPERA has also improved the care provided to patients by their clinicians. Finally, **paper savings in the first year completely offset the MicroStrategy licenses cost**. The solution literally paid for itself.

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**Chapter 3, Section 3: BMC software**

BMC Software, provider of IT management solutions, needed a way to arm their sales forces with intuitive dashboards containing real-time, personalized data. This would allow their sales organization to increase sales productivity from sales concept to customer order.

MicroStrategy’s seamless integration with Salesforce.com and powerful mobile app platform has allowed BMC Software to build powerful, interactive dashboards that has enabled their sales teams to focus on engaging customers and executing sales. The reports and dashboards are built off of comprehensive data from multiple sources. BMC Software has embedded MicroStrategy Analytics within Salesforce.com and deployed a mobile app that surfaces all the information sales reps need out in the field selling. Whether viewing Salesforce.com on their laptop or using their native mobile sales enablement app, sales representatives can access personalized, up-to-date customer information to quickly form actionable insights in the office and on-the-go. Implementing MicroStrategy has allowed BMC Software to increase sales effectiveness and productivity, and reduce new sales rep onboarding time. BMC conducted an ROI analysis and found that sales reps who used **MicroStrategy increased their deal size by 30%**. This increase accounted for **$14M in incremental revenue** in the first 10 months after the app was deployed.

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**Chapter 3, Section 4: Sonic Automotive**

Sonic wanted to ensure that their executive team, regional management, and dealership management have 24-7 access to daily business tracking metrics via a mobile platform. They made the decision to partner with MicroStrategy on this initiative that would enable their business processes and provide their teams with critical enterprise information anytime, anywhere.

The resulting app is focused on an overarching view of business performance that touches on internal sales, service, finance, and insurance as well as external market data. Sonic corporate executives and regional leadership rely on this iPad app daily to evaluate sales performance at its 100+ dealerships, conduct monthly financial reviews, and to compare performance of the other dealerships across regions. This app also provides a scorecard for each dealership with insight into sales effectiveness across automotive brands, product categories, and geographic regions.

Since deploying this app, Sonic has replaced large binders of spreadsheets and has saved significant time by eliminating the need to perform manual analysis on data. They have seen a **38% increase in car product sales** and have gone from selling between $800 and $900 in products per car, to nearly $1,100.
Chapter 3, Section 5: AutoTrader.com

AutoTrader has a vast sales force of Advertising Consultants (ACs) that interact on a daily basis with auto dealers throughout the United States. The ACs used to spend many hours gathering information every day to prepare for meetings and presentations. Armed with spreadsheet printouts and their laptops, the ACs would meet with dealers. Even with extensive preparation, the ACs could not be prepared for every possible request posed by a dealer and were often asked questions that required additional research. In order to answer the dealer’s questions, the meeting would have to stop so that the AC could start up their laptop and research the answer. This time delay could easily cost the AC an opportunity.

Now, with their MicroStrategy sales productivity iPad application called Strategic Account Management Process (AMP), all the information the ACs need is at their fingertips and they can instantly respond to questions, making effective use of time spent with the customer. This app provides them with the ability to pull up reports or maps and show dealers the impact of their advertising on the spot. AMP not only provides detailed information in an intuitive manner, it also frees up ACs from the time they previously spent preparing for meetings and gives them more time to work on additional opportunities. This app has been so successful for AutoTrader that the usage of the MicroStrategy Analytics Platform has grown 40 times since deploying a mobile front end.

Chapter 3, Section 6: Andrews Distributing Company

In the past, executives, sales reps, and information workers of Andrews Distributing Company, one of the leading beverage distributors in the United States, used to rely on IT to provide all relevant business data. It often took days, or even weeks, to deliver the desired reports. Delayed responses and incorrect data limited report usefulness and credibility. Without up-to-date insight into the business, managers and executives were unable to effectively set strategic direction, perform analysis, or proactively make operational decisions. Sales reps were spending hours preparing for client visits and were often unable to answer on-the-spot questions during these meetings. Additionally, they would have to return to the office to update systems and place new orders.
Andrews Distributing made the decision to work with Denovo Group, a premier MicroStrategy Solutions Provider, to create an analytical solution that would eliminate these pain points and impact the entire organization. Together, they created a data model that allows for user-friendly, automated reporting. They also implemented a series of MicroStrategy dashboards accessible via a native mobile app that provides full visibility into sales goals, specific account performance, individual performance, supply chain data, and product information. Now, executives and managers are empowered to confidently address their daily business challenges, and sales reps have all the information they need for field activity, in-hand. Andrews Distributing can better serve their retail customers. At the same time, rather than spending time searching for answers, manually inputting orders, or sifting through inventory, sales reps can now spend 40% more time out of the office and on the ground, with the consumer—selling.

Chapter 3, Section 7: Large fast casual restaurant chain
The asset protection group of this customer annually audited about 25% of their stores. Data spreadsheet preparation for audits often took up to a week. One person could complete an inspection of two to three stores per day at most. All of the data from these inspections was collected on paper and the auditors would have to transfer it back to Excel at the end of the day. Additionally, post audit reports took up to a week to publish to operations.

This customer made the decision to deploy a store audit app that would allow auditors to submit data while on-site, directly from the app. This mobile app enabled them to do away with pre-inspection spreadsheet preparation, eliminate paperwork, increase audit efficiency, share results quickly, and improve follow up. In fact, this customer was able to achieve a 60% increase in the number of store inspections their auditors were able to complete annually since deploying this app. By streamlining their inspection processes, auditors are now able to complete the audits on-site, review the results with the store managers before they leave, and spend more time coaching the store teams.

Chapter 3, Section 8: One of the world’s largest airports
The process of accessing critical information was extremely cumbersome for this large airport as they had a large amount of data on multiple platforms. Over 50% of the staff’s time was spent compiling, transferring, and inputting data. Then many hours were required to proofread the data to make sure that it was accurate and that the manually created spreadsheet had all of the correct formulas in each of the cells.

The airport’s IT department partnered with MicroStrategy to create a unified data warehouse and various mobile apps including an operations app, HR wellness tracking app, and presentation app. These strategic changes have allowed the organization to eliminate the probability of human error due to manual data entry and increase the level of accountability, transparency, and efficiency within the various business units. They have been able to reduce their paper usage by 50% and have saved 4,000 man-hours every year with just the operations app alone.
Chapter 4: Creating and deploying mobile apps
Chapter 4, Section 1: Target business areas based on business value

Enterprise mobile applications have the potential to revolutionize the way work gets done in nearly any industry. Mobile apps unshackle field-facing employees, such as store managers, from their desks and empower them to make fast, information-based decisions. Sales reps armed with apps are able to have spontaneous conversations with customers that don’t end with “Let me get back to you.” Apps also provide individuals who don’t use or have limited use of existing business systems with a way to access critical information in a compelling, user-friendly environment. Below are some common use cases for MicroStrategy Mobile where apps can provide significant business value.

**Store operations solutions:** store operations apps enable managers to quickly access vital sales and inventory information, analyze buying trends, evaluate promotion success, and view associate and customer information. These apps provide store managers with a one-stop shop for all of their information needs and empower them to make better decisions and take action from the selling floor.
Clienteling solutions: apps that effectively analyze CRM data to gain a more complete view of the customer are extremely powerful tools for retailers and can provide a tremendous competitive advantage. This is especially true when this insight can be delivered into the hands of store associates. By combining customer insight with other information and capabilities such as guided selling, inventory management, product catalogs, training, and gamification, store personnel are empowered to deliver a superior, personalized shopping experience.

Store audit solutions: store inspection apps allow sales managers and auditors to increase efficiency, eliminate paperwork, share results quickly, and improve follow-up. These solutions enable users to submit data directly from the apps while on-site. By streamlining the inspection process, auditors can immediately review the results at the location they are visiting, spend more time coaching associates, and significantly increase productivity.
Risk management solutions: enterprise risk management (ERM) is a critical capability for all financial services organizations. Risk management apps allow for greater insight into risk exposure, better regulatory compliance, and improved transparency across the organization.

Wealth management solutions: wealth management apps integrate all relevant information, analytics, and business processes that a wealth manager needs into a single compelling tool. This mobile solution frees financial advisors from the office, maximizes productivity, and empowers them to effectively win new business.
Performance analysis solutions: understanding performance is key for financial institutions. Performance analysis apps enable decision makers to better understand performance—from macro-organizational trends, to departmental revenue streams, to the performance of individual employees. Improved visibility into performance numbers means smarter, more strategic decisions about where to invest resources.

CRM sales analytics solutions: CRM apps enable salespeople to view sales performance analytics as well as a comprehensive list of client companies and contacts, access individual company details, and view related business leads. Because this app is built on top of an existing CRM system (e.g. Salesforce.com), users can not only tap into their existing information, but instantaneously add or modify existing opportunity details, contacts, and leads.
Sales enablement solutions: sales enablement apps increase the effectiveness of sales reps, providing seamless access on their mobile devices to insights and information about customers, accounts, competitors, and product performance. Meetings with clients can last as little as fifteen minutes. These apps allow the sales rep to make the most of that time.

Transactional app solutions: these apps empower users to go from consumption to action directly from their mobile devices. App users across the organization can interact with information to approve requests, submit orders, change plans, and capture information at the moment of insight. Sales reps are empowered with location-specific, on-the-go processing apps. Store managers can immediately request more inventory for out-of-stock items. Managers can approve or deny employee requests at the tap of a button.
Chapter 4, Section 2: Use cases where mobile is infinitely better than web

When deploying enterprise mobile applications, organizations should not merely seek to replicate the experience of web or desktop apps, but rather to take advantage of all that a mobile interface brings to the table. Mobile apps are much faster and infinitely better than web apps. Just think about some common activities and how they are done on web vs. mobile:

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<th>PC USAGE</th>
<th>MOBILE USAGE</th>
<th>IMPACT</th>
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<tbody>
<tr>
<td>Mapping</td>
<td>Point and click mouse controls</td>
<td>Gesture navigation</td>
<td>30 seconds vs. 2 seconds</td>
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<tr>
<td>Data Capture (URL or SKU)</td>
<td>Keyboard data entry</td>
<td>QR codes, NFC, barcode</td>
<td>15 seconds vs. 1 second</td>
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<tr>
<td>Address</td>
<td>Type in address, street, city, zip</td>
<td>GPS Lookup</td>
<td>20 seconds vs. 1 second</td>
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<td>Image Capture</td>
<td>Camera and wires and sync.</td>
<td>Built-in camera</td>
<td>Infinitely better</td>
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<td>Any movement as input</td>
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<tr>
<td>Availability</td>
<td>At a desk</td>
<td>Anytime, anyplace</td>
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There are various ways mobile apps are faster and infinitely better than web apps. Speed is a major differentiator along with several other aspects of user engagement, data capture, information dissemination, and accessibility.

User engagement and interaction with mobile devices is drastically different from that of traditional computers. PCs involve our hands and fingers to interact with the machine and remain on a point and click orientation for control. Meanwhile, users engage with mobile through gestures and movement to navigate the apps and features on the device. Looking forward as mobile engineering progresses, our interactions with mobile devices will begin to change as smartphones are able to recognize and respond to specific hand gestures near the phone.

Next, with data capture and processing, PCs require keyboards or some sort of wired accessory. Arguably, wireless devices can connect to PCs. However, an additional element is needed to optimize PCs, while mobile devices can easily scan information and record it. These can include QR codes or barcodes, or other methods of near field communication (NFC).

This same concept applies with sharing information, such as geolocation services and image capture. PCs require users to type in the street name, city, and zip while mobile circumvents the process through GPS lookup. Image capture with PCs relies on an external camera and additional wire components to share captures across devices. Meanwhile, mobile captures a scene immediately and is ready to share within seconds.

Lastly, mobile devices are accessible at any given point in time. They are nimble and can be taken along anytime to anywhere, triumphing over the stationary state of desk-centric PCs. Mobile
inherently captures any sense of movement as input, whereas PCs lack this capability. The “tag-along” personality of mobile doesn’t apply to PCs, thereby making mobile infinitely better than PCs.

Mobile is changing the way we interact with technology, and it comes down to how we interact with a device. Mobile isn’t meant to replicate or replace the web experience, but instead leverages what the freedom of mobility can do for the user.

Chapter 4, Section 3: Post-PC era preparation

Will there be a future without PCs? That remains to be seen, but we will continue to see and experience extraordinary changes to how, when, and where business gets done. Those companies that focus their innovative efforts on desktop and web-based applications with no mobile component will get left behind, and will stay behind as the next wave of revolutionary computing interfaces, whatever they may be, enter the market.

There remains much debate as to whether there will one day be a world devoid of PCs as we know them today. Whether or not a true Post-PC era is coming is almost irrelevant—the important point is that change continues to come to computing, and is coming faster today than ever before. To prepare for this, there are a number of things to consider and to help you do so, we came up with a checklist:

- Give the project a name
- Catalog all information systems your employees, partners and customer touch.
- Rank priority for mobilizing each of those systems.
- Decide on your device strategy.
- Determine the type of app that’s appropriate for various systems.
- Get started.
- Move fast. Fail fast.

Start off by giving your project a name. By naming your project, you’ll transform what seems like a one-off task into a true concept.

Next, assess all of your current systems to rank which is ready for and can be best leveraged by adopting mobile. It is important to remind yourself of the business value as you develop your criteria. Not all apps were created equal and certain apps are better reimagined mobile.

Consider three dimensions about the user’s role and workflows when transitioning an application to mobile: first, to what extent is mobility required or an inherent part of the role; second, to what extent is speed a priority; third, to what extent is spontaneity and turnaround crucial to the role?

Take for example, a regional manager of a large grocery chain who makes his rounds to assess the quality and product assortment of a store and its employee productivity rates. He needs to input his notes immediately while walking up and down aisles or while interacting with employees, requiring him to be away from his desk for a bulk of the time. In this case, offering a mobile app to record his inputs on-the-go would better serve him and the organization by capturing rich and valuable business operations within minutes. Alternatively, he can continue to write notes on paper and wait to return to his office to
record and analyze the information he collected. The opportunity cost of making immediate decisions rises if the manager lacks mobility.

Once you have evaluated your existing systems and ranked which ones are best suited for mobilization, craft a device strategy and determine what type of app is best suited for your various systems’ needs. Your mobile strategy can be taken into various directions—three to be exact. First, you could provide the device for your employees. Second, you could employ BYOD at your organization since some apps may be more relevant to employee devices only. Third, you could go for a hybrid approach that’s a combination of company-issued and BYOD.

While drafting your device deployment strategy, also examine the type of apps you need to create. You can choose from native code, OOTB HTML, OOTB Native, virtualization, or platform approaches. Typically, native code is highly-customized and is reserved for customer-facing apps. OOTB HTML doesn’t require workflow or customization specifications, which is suited for workflows that aren’t highly critical. OOTB native apps aren’t modifiable but act similarly and hold pretty stable and solid functions. Virtualization is best for users who require similar workflow experiences to that of PC Windows. These are recommended for lower priority systems that will soon be phased out and replaced. Lastly, there’s the ever popular platform approach, which allows all sorts of systems, processes, and information sources to have an optimized native mobile app experience. This is equally true for the development experience, allowing organizations to easily scale across the business and apply to various solutions.

Upon finishing strategy, there’s nothing better than to simply get started. Remember that it’s also crucial to move fast and fail fast to make your mobile app better and better each time. We know the end result is important. Don’t underscore the process of reaching your long-term goal. Keep your vision at the core and ensure that you’re tracking and monitoring various resources, systems, processes, governance, and metrics.
Chapter 5: Next steps
Chapter 5, Section 1: Next steps with MicroStrategy

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