

The Mobile Enterprise: Moving to the Next Generation

Executive Summary

AT&T's vision for the mobile enterprise is to show its customers new ways that mobility can streamline operations, reduce costs, increase worker productivity and enable the power of real-time response. We believe mobility will let companies transcend distance and connectivity issues, create a virtual, personalized space for collaboration and empower front-line workers to make better, faster decisions.

This paper elaborates on that vision, to show how mobility will affect people, process and technology in the near term future, by enhancing workflow, improving access to knowledge, increasing the speed of business transactions and providing better modes of reporting and management.



Imagining the Future

Over the next three to five years, the continuing spread of mobile technology will have a dramatic impact on the way companies do business. Companies that embrace mobile technology will see improvements in productivity and operational efficiency that were unimaginable only a few years ago. In fact, mobile technology can't be seen as a luxury anymore; it's a necessity.

Some companies are already using mobile applications to deliver increased customer satisfaction and productivity; for them the future is already here. In many organizations, though, there's a disconnect between the changing nature of work and the way business is transacted. Processes, tools and infrastructure are falling out of alignment with the new demographics of a workforce that's informed by the "consumerization" of IT. Mobile email was the groundbreaking application here, but instant messaging, wikis and collaborative workspaces are also playing a role.

The good news is that speed, availability and price have never been better. Broadband connectivity is more available and less expensive. Despite these positive developments, many companies are slow to adopt mobile technology. For some companies, quantifying a solid overall ROI is a challenge, even with overwhelmingly positive feedback from users. Other companies tend to focus too much on device selection and costs, instead of on the underlying business processes that can be improved. And in many cases, internal IT is forced into the role of systems integrator, cobbling together a complex environment of devices, applications and platforms without a holistic development strategy. So what is the value of mobility and where should businesses look for benefits first?

Indicators of Value

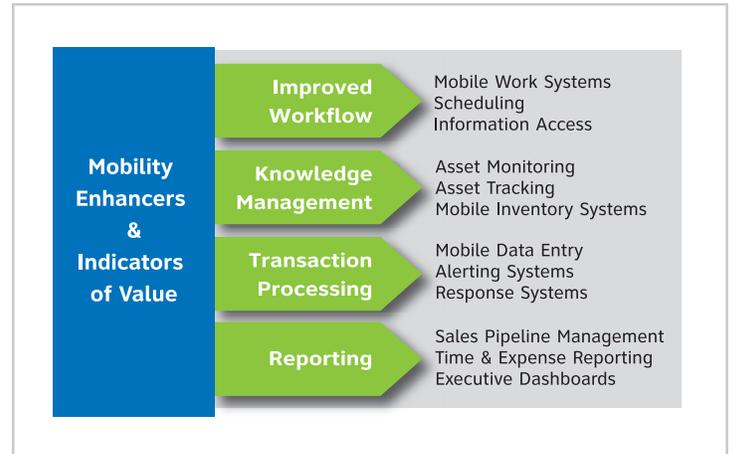
AT&T believes mobility creates value by allowing mobile access to contextually-relevant information so front-line workers can make informed decisions in their daily interaction with customers, partners and suppliers. In fact, mobility delivers more than just context-relevant information by supporting the capture of associated information as well as the transactional event itself. Accurately harvesting such data can produce a multiplier effect for efficiency and cost reduction. The key to adding value, then, is not finding the "killer app," but identifying business processes for which mobility could make a real difference. Some of these added values may be less tangible, such as customer satisfaction, but others may be readily quantifiable, such as increased revenue or reduced cost. In fact, AT&T has developed a methodology that can empirically identify the applications that can benefit most from mobilization, by looking at four indicators of value.

We have recognized that mobility serves to enhance a business in four ways: by improving workflow, knowledge management, transaction processing and reporting.

- Workflow enhancers are the foundations of mobility, since they can demonstrate clear benefits in a relatively stand-alone way. Examples are mobile work order systems, scheduling and dispatching, and information access.
- Knowledge enhancers can be paired with workflow enhancers to provide better understanding of the underlying details: asset tracking and monitoring, mobile inventory systems and knowledge-base look up.

- Transaction enhancers support mobile data entry and alerting and response systems, letting companies squeeze more value from other processes.
- Finally, reporting enhancers can add value within particular applications, such as sales pipeline management, time and expense monitoring and executive dashboards.

Mobility Enhancers



The truly mobile enterprise is an exciting prospect to consider. The spread of this technology will revolutionize the way companies do business, and things will seem very different on the other side of this paradigm shift. To understand the big picture and all the possibilities, it's worth imagining this future state in some detail, and considering the individual impacts that mobility will likely have.

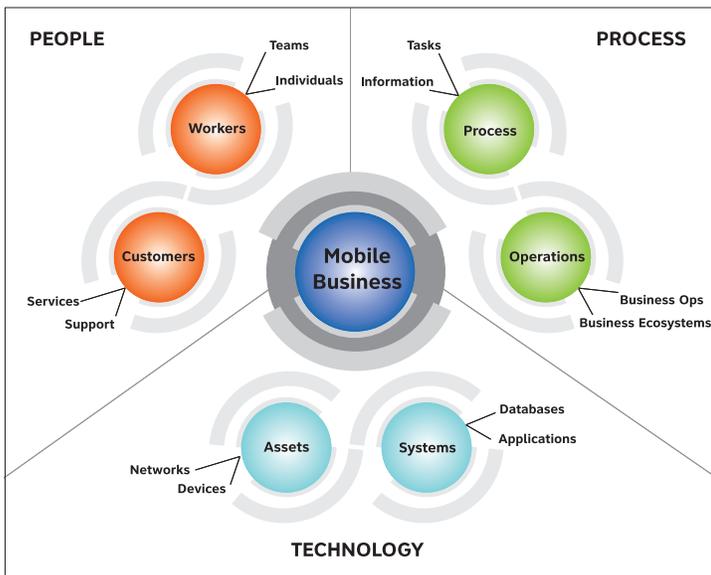
The Future State

Some of mobility's impacts will likely directly affect people, changing the way individuals and teams work together, and the ways customers receive service and support. Others will likely affect how companies manage their internal process flows and their alliance relationships, changing the nature of business processes and opening the door for new, transformational business models. Mobile technology will likely also require changes in the systems and infrastructure that support the business, with implications for networks, devices, databases and applications.

These changes are both interrelated and interdependent, requiring the commitment of all parties involved. Workers will need to adapt to new methods of collaboration. Companies will need to recognize the potential for new approaches to task management and be open to establishing systems that allow more direct and immediate communication with their supply chain partners. IT departments will need to support a broader portfolio of devices and operating systems in a more open architecture, while ensuring that security is maintained and privacy protected.

To imagine what this future looks like, we need to consider the mobile enterprise from six perspectives. Mobile technology will likely affect workers, customers and processes, as well as business operations, computer applications and technical infrastructure. In each of these areas, the mobile enterprise will likely do business in ways that are different from what's done today. So what is AT&T's vision of this "mobilized," real-time enterprise?

Mobile Technology Impacts



Impacts on People

In the enterprise of the future, mobilization affects individual workers in a number of ways. With location independence, people work from virtually anywhere and access the same resources they have in a traditional office. That means workers have more flexible schedules and perform work as needed, on demand. Employees in such an environment can be more easily rewarded based on performance, and management's focus has shifted from monitoring attendance to evaluating results – from activity to productivity. In the mobility future, the idea is not just to put in time, but to get things done more quickly. The mobile enterprise of the future is also realizing incredible savings because of the influence that mobility has on reducing cost structures.

Mobilization has also had an impact on how people work with each other, and how work teams are organized. Ad hoc virtual teams bring together gatherings of geographically separate people, letting them work toward a single, common objective. With real-time location and status awareness, teams are working together virtually, just as they do in a single location. New collaboration technologies, integrating voice, web and video, are supporting on-demand adaptive workspaces and social collaboration so teams can acquire and utilize resources more easily. This has a positive benefit for productivity, as well as for morale and employee satisfaction – when people have the right tools, they can get more done and take more pleasure in their jobs.

From the customer's perspective, mobility means higher quality service, and that leads naturally to increased customer satisfaction. Mobile queries provide real-time access to accurate inventory information, even in the field. On-demand order placement, management, fulfillment and payment processing now occur at the customer's premises, with remote status monitoring and order modification. Customers are issued real-time alert notifications of special events, something that adds value for them while driving additional revenue. These are potential examples of the kind of transactions enhancers mentioned earlier.

Mobile customers of the future are also benefiting from improvements in support and customer care. Mobile-enabled field support teams respond more quickly, since they now have direct access to corporate

diagnostic tools, manuals and training – all examples of knowledge enhancers in action. Remote support employees are able to tap into expert collaboration networks with presence capabilities, seeking the advice of technical experts and delivering faster, smarter responses in the field. Remote monitoring and diagnostics are dramatically improving the overall support experience, since monitoring devices have been embedded in the products themselves, allowing machine-to-machine transactions.

Some companies have complex products that need to be maintained at the customers' premises. Photocopiers are a good example. The quality of field service and support is an obvious factor in establishing customer satisfaction, as well as in building the kind of customer loyalty that leads to repeat business. The companies that have leveraged the potential of wireless support tools are gaining ground in the marketplace.

Impacts on Process

In the mobilized future, the technology has changed the way businesses manage their internal and supply chain relationships, primarily in terms of information flow. Work task context awareness has brought improvements in the way tasks are assigned and performed, since status information is dynamically monitored by performance alerting support systems. Mobile data capture and viewing provide real-time visibility for "live" information streams, while optimized data delivery supports many kinds of end devices. These new information flows allow for very precise asset management, and data from tagged assets is tracked in-transit so problems can be recognized and reported in real-time.

Mobilization has also changed the business process at the task-management level. With remote task administration, work is centrally assigned, modified, optimized and redistributed to available resources. Mobilized workflows have increased self-sufficiency and decreased time to completion, and real-time monitoring has reduced downtime. Managers make better decisions more quickly, given the improved access to real-time situational information represented by mobile reporting enhancers. Mobilization also supports on-the-job training within a real work context. It has changed the way companies support internal operations and improved asset utilization. That means better supply chain management and more dynamic inventory control. As the workforce shifts to remote and mobile modes of working, the need for office space is being progressively reduced.

These process concepts are all examples of workflow enhancers, and good examples can be seen in the technology that supports express delivery services. It's already possible to follow a package as it moves through the system, traveling from warehouse to transport hub to the van in your own community. With that model extended to other kinds of business, and further enhanced with workflow logic, automated alerts and machine-to-machine communications, we see even greater efficiencies. In manufacturing, wireless smart-sensor technology has allowed the integration of scheduling, parts control, inventory management, equipment maintenance and dozens of other routine activities, as well as the dynamic monitoring of key performance indicators to support continuous process improvement.

Beyond the changes in internal operations, mobilization has changed the way companies are working with their business partners, leading to the development of business "ecosystems." Companies have

developed trusted integration and interdependence networks that allow real-time information flows across corporate and partner systems. The free flow of information means greater innovation as partners collaborate under a shared vision supported by an integrated infrastructure. The synchronization of mobile workforces and central information systems is a value-add for all participants, providing new and better ways to orchestrate the development of global markets.

Impacts on Technology

In a mobilized future, business systems have been enhanced to accommodate the potential of a mobile business model. With a unified voice/data communications environment, workers have a single inbox for voicemail, email and instant messaging, where they can set their own preferences for notification and optional connections to PBX systems. Presence awareness has improved efficiency by highlighting the location and availability of individual workers and individual assets. Awareness also supports the capture and transmission of information related to the work process. Rules-based engines are facilitating communications by understanding end-user preferences for information delivery.

The new technologies have also improved the way in which workers interact with core business systems. Personalization lets workers set application and device preferences to customize their interaction, in terms of work flow, content, formatting, accessories and features. Media integration applications let them use and share storage devices, media players, video, voicemail, music, pictures and more. Over the Air provisioning improves the control of mobile asset software, firmware and related parameters, making it easier to manage existing devices and facilitating the deployment of new ones. It also lets companies maintain field-based technology without the use of depot services. New software-defined radios are modified from remote locations, adapting to changing network technology to deliver a longer asset life.

"We'll continue to invest in our mobile broadband network to meet future customer demands. New devices, new applications and new uses of wireless connectivity are coming and we're committed to being the leader."

– Randall Stephenson, CEO

To make the most of the new environment, mobile applications have adopted new design principles. Applications are device agnostic, leveraging cross-platform tools to minimize the cost and time required for deployment and administration. They can accommodate dynamic content delivery and formatting, with auto-sensing of end-device specifications in order to deliver an optimal display based on form factor, content type and user role.

Finally, the art of database management has embraced a new, more dynamic feature set. Real-time data processing and monitoring lets Customer Relationship Management (CRM) and other databases return data on demand or incorporate alerting systems that distribute data as required for prompt response and action. Applications have been

modified to deliver a high degree of interoperability so they can interact with ordering, supply chain and customer systems. Mobile-enabled systems also have powerful authentication protocols, helping customers set the appropriate level of security at network, application, server and device level.

To deliver real-time information to the mobile enterprise of the future, the network has been enhanced in four key areas: access, performance, intelligence and security. Mobile networks can provide anytime broadband access, virtually anywhere without regard to a home coverage area. They deliver robust performance in terms of availability, accessibility, retainability, speed, Quality of Service and Class of Service. Mobile networks incorporate access intelligence that can support the seamless handoff between different technologies, with active network monitoring and service level management. They also offer global reach, with technology based on international standards for broadly available coverage. Such networks take a proactive approach to security features, with active end-to-end monitoring and a flexible, adaptable security policy. This allows traffic segmentation at the enterprise level, with end-to-end 'clean pipes' that are designed to be self-detecting and self-healing.

In the mobile enterprise of the future, new, more sophisticated hardware provides a PC-like experience even for small hand-held devices. Folding screens and projection-style displays get past application usability issues, while speech recognition and virtual keyboards help remove barriers to content creation and editing. Power management systems incorporate software, hardware, alternative power sources and new battery technologies to enable 24/7 connectivity. Thanks to PC and server synchronization, users have ubiquitous data access from mobile devices as well as from office PCs.

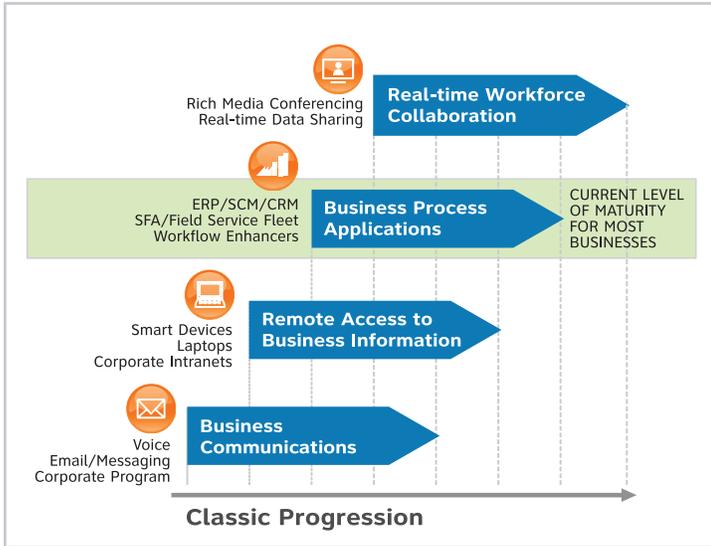
Improvements in the end-point devices and the supporting applications are combining to drive continued improvements in the quality of the mobile experience. New features will minimize keystrokes and reduce the effort required for data entry. Multi-screen integration provides an optimum viewing experience on different devices: content follows the owner, and self-adjusts for PDA, PC or large-screen formats. Personalization extends the Build-To-Order model used by PC makers to the mobile device. Users are able to load custom Read Only Memory chips with personalized applications and shortcuts. Today's complex menu structures have disappeared and the devices are more intuitive and voice-aware.

Mobile devices are also easier to manage from an enterprise perspective, thanks to various control developments. Over the Air diagnosis and repair supports the user with links to on-line help and smart repair agents. Near field communication and concierge features keep mobile devices in synch with other data stores, providing back-up in the event of device loss or failure. Asset tracking and proximity sensors spot likely cases of theft, and simultaneously wipe the data and render the stolen device inoperable.

For maximum impact, mobility needs to be woven into the technological and cultural fabric of the enterprise. Collaboration tools need to break out of functional silos and allow for integrated, enterprise-wide information sharing. Decision making should move away from traditional top-down models with the empowerment of individual knowledge

workers. Communications must evolve beyond email to converged and unified platforms, in which machines can communicate with each other. All of these important cultural changes will be accelerated by the broad adoption of mobile technology.

The Stages of Mobility Maturity



Evolution in Action

The process of moving toward this new, mobile future will be evolutionary, rather than revolutionary. Maturity will typically be reached in four stages:

- The first stage is to establish basic electronic business communications which incorporate voice, email and messaging; this foundation stage has been completed by most companies, although the individual communications channels may not be fully integrated.
- The second stage is to establish remote access to business information, using laptops, smart hand-held devices and corporate intranets; many companies have also reached this level, thanks to the popularity of telecommuting and other work-from-home programs.
- The third stage adds mobile access options for various business information applications, such as CRM systems; this is the current level of mobilization maturity for most large enterprises, and the one that is getting the lion's share of attention.
- The fourth stage introduces real-time mobile workforce collaboration, with powerful remote conferencing and rich data sharing; this is the world of unified communications, in which the basic communications channels introduced in stage one are integrated in a way that maximizes their responsiveness and agility.

However, looking at mobility in evolutionary terms may distract attention from the fact that many of these emerging benefits are available today. Companies can be found at every one of these evolutionary stages, at different levels of maturity. Those in the fourth stage may be working at a fairly rudimentary level, while those at the first stage may be fully mature. Companies that want to obtain all the benefits of a wireless enterprise needn't wait for the "future state" technology to develop. Moving the enterprise forward is something

that can begin now. The current technology is amazing, compared to what was available just a few years ago. There will still be exponential improvements ahead, but the best way to take advantage of them in the future is to stay as up to date as possible.

Wherever a given enterprise may be on this evolutionary path, it can prepare for the future by developing an Enterprise Mobilization Strategy and Action Plan. Such a plan considers which systems are core to day-to-day decision making and operations. Which employee groups need access to those systems and which would benefit from the ability to access them remotely? What devices would an employee require in order to appropriately perform their responsibilities in the field? As brick and mortar is traded for remote access, which physical assets can be eliminated or moved to lower-cost facilities? Documenting this level of intrinsic detail lays the groundwork for full enterprise mobility.

The deployment of mobile enterprise application platforms represents a business opportunity for companies that are able to take a leadership position. The early adopters can be the first to reap benefits in terms of worker productivity and increased operational efficiency, as well as improving their competitiveness in the marketplace. In the end, mobilization will depend on the commitment of individual companies to share a vision of the wireless future and to work together to bring that vision into reality. Companies need to identify mobile workers, establish mobile work policies and identify customers that can benefit from mobile support. They need to collaborate on internal and inter-partner processes suitable for mobile enhancement, and initiate the changes needed. Having recognized the potential, they also need to identify which systems to mobilize, define the network requirements to support them and be willing to invest in the necessary end-user devices.

The Mobile Future

	Now	Future
Communication	<ul style="list-style-type: none"> • Person-to-person • Asynchronous and predominantly email based 	<ul style="list-style-type: none"> • Person-to-person, person-to-group and machine-to-machine • Real-time and dynamic
Collaboration	<ul style="list-style-type: none"> • Trapped in business silos • Constrained to specific devices • Limited by access issues 	<ul style="list-style-type: none"> • Enterprise-wide with location awareness • Device independent • Anywhere, anytime
Decision Making	<ul style="list-style-type: none"> • Top down • Limited by information access • Processing-lag dependent 	<ul style="list-style-type: none"> • Knowledge-enabled workers • Transactional information driven • Dynamic

AT&T's corporate vision is to deliver information in real time, and to do it virtually anywhere, to anyone, over any device. Combined with our methodology for finding the value of mobilized processes, we have both the long term perspective and a tactical road for moving forward.

As part of AT&T's vision, our network will provide reliable broadband connectivity with security features, and will make it seamlessly and globally available. To support this vision, AT&T is doing its part in building the mobile environment of the future. We are continuing to invest in our core network asset, to provide the nation's fastest 3G network¹ and the broadest global coverage of any U.S. wireless carrier. We are working to mobilize our own workforce. We are developing powerful, media-rich support options for large customers, that incorporate web conferencing, voice and video. We are providing industry specific mobilization expertise to help our customers define strategies and action plans, and aligning our capabilities with the development roadmaps of our mobile solution alliances. We are developing high-performance global connectivity solutions and working to develop specifications for future mobile devices.

When all these things come together, the broad promise of the mobile enterprise will be achieved. AT&T's customers will reap the benefits of the knowledge and experience that lie behind our comprehensive portfolio of offerings, available through a flexible, solution-as-a-service model. We are here now to help your organization move to the next generation of mobile business.

Notes

1. 3G not available in all areas.

For more information, or to arrange a consultation, contact your AT&T representative, or visit www.business.att.com/enterprise/Portfolio/enterprise-mobility-enterprise.

