

# Achieving Business Mobility with Mobile Composite Applications

A Dexterra White Paper

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### **Executive Summary**

It comes as no surprise that companies are seeking new ways to help their mobile employees in order to improve the effectiveness of the company's sales and service efforts, or to improve the utilization of their assets and resources. Companies that take a strategic, rather than tactical, approach to mobility immediately achieve time and cost savings, streamlined processes, enhanced employee and customer satisfaction, improved decision making, and overall business agility, often gaining a competitive advantage in the process.

According to IDC, mobile work is defined as any tasks being done away from a worker's primary workspace, and recognizes the distinction between mobile and wireless. For instance, an employee can be mobile without accessing wireless technology, such as when working on a plane. 1

Even though the allure is strong and the reason compelling to launch an enterprise mobility initiative, many companies still hold back due to perceived risks, oftentimes triggered by widely publicized failures. These failures have been generally caused by the following three approaches to mobility:

- Extending an office-based application into the field: Applications designed for an office are meant to stay in the office. Everything from work processes to screen design is carefully considered when a vendor deploys an office-based solution. When these processes and designs are condensed to a small screen, field-based workers find it difficult to use the applications. The result? A poor user experience and low adoption rates.
- Utilizing the wrong mobile technology: Many companies try to use mobile browsers or synchronization technology to save money when deploying a mobile solution. These methods work effectively during the process of development in the lab but once they are deployed in the real world of wireless communications, they rarely work. Dependence on a persistent network connection and/or a redundant data store introduces unnecessary complexity and results in increased security risk and administration costs over the long term.
- **Deploying the "fast and cheap" point solution:** For a line-of-business person, mobile point solutions are a tempting way to solve pain immediately and effectively. Many software providers deliver effective products that solve a specific business need. This approach is fine until a business has deployed its second, third, fourth, or fifth independent point solution, effectively creating silos of technology and process whose initial low cost is now completely offset by a high ongoing cost of ownership.

This paper explores these three reasons for enterprise mobility failures, explains how mobile composite applications offer a new yet proven approach to enterprise mobility, and introduces the Dexterna TransApp<sup>™</sup> - an intelligent mobile composite application that allows any organization to achieve business mobility.

### Introduction

#### **The Mobile Explosion**

Over the last decade businesses both large and small have been adopting mobile solutions. Today the question of whether one should deploy a mobile solution is almost moot. In fact, mobile initiatives are being pushed up the list of priorities in many companies as they realize both the unavoidable need and the benefits of supporting the mobile requirements of their workforce. In a 2005 Gartner survey of 1,400 CIO's worldwide, respondents noted workforce mobility as one of their most important issues and expect its importance to grow.<sup>2</sup>

#### The Rise of the Mobile-Centric Organization

A mobile-centric organization is one that depends on the performance of the part of its business organization closest to its customer to achieve differentiation and competitive advantage. These organizations seek the immediacy and intimacy of interaction in the field to deliver and maintain higher-than-average customer satisfaction ratings, generally putting them at the forefront of their industries.

#### The Dawn of the Outside-In Approach

In spite of the explosion of interest in and deployment of mobile solutions, and the success of industry front-runners, many organizations are still struggling to identify the most strategic way to support their field-based workforce. Often they choose a path that's doomed to failure: an inside-out approach that simply extends their existing back-office applications to those in the field in response to a pressing and immediate need. No one can really blame them as this seems a logical approach; after all, this backoffice application just needs to be shared with a new set of devices.

Those that have tried to extend existing back-office applications to the field and failed – and are now seeking applications made specifically for mobility – should look for applications that:

• support the way workers operate in the field

• are intuitive and easy to use

guide users through business processes

support a wide range of mobile devices

The reality of the situation is that these applications do not typically translate well for use on the small screen of a mobile device, nor do they bode well for users operating in a dynamic and unpredictable environment. Because the inside-out approach does not respect the requirements of the mobile worker, users find it difficult to operate the application while they perform their work in the field. This leads to reduced effectiveness and low adoption.

As each organization considers the manner in which they support their employees in the field, they must look beyond ways to extend back-end systems to their workforce. The savvy mobile-centric organization is the one that realizes that the key to success lies in a mobile-architected solution that is designed from the outside-in around the needs of the frontline worker.

### The Many Generations of Mobility

While mobile technology has evolved significantly over the past few years, not all organizations are fully leveraging these capabilities. A clear understanding of each generation of mobile technology will help the mobile-centric organization employ a sound mobile strategy.

#### The Thin Client Generation

Early efforts in mobility were plagued by technical deficiencies that made it virtually impossible to adequately address the requirements of a mobile-centric organization. These first solutions, commonly delivered using a thin client, such as a Web browser or WAP interface, were limited in a number of ways. Because the client is thin, lacking local application logic or a data store, it requires real-time interaction with the back-end system to perform even the simplest task. Additionally a thin client requires a persistent connection resulting in variable performance based on the quality of a network connection. Even in today's 'wireless broadband' world, wireless connectivity is less than perfect, especially in environments where radio reception and transmission are spotty or non-existent. The result: the thin client tends to work well for very simple and unsophisticated information retrieval and simple data entry when the application is not mission-critical. However, this approach fails the minute the application requirements exceed the 'simple and unsophisticated' paradigm.

#### The Data Synchronization Generation

On the surface, data synchronization promises to alleviate many of the issues associated with the thin client. Unfortunately, data synchronization ultimately introduces a whole new set of challenges for the mobile-centric organization. Unlike an application delivered on a thin client, an application using data synchronization typically works only when the user is offline. The data-synchronization approach eliminates the issue of spotty or non-existent wireless coverage by maintaining a local data store. It also – unfortunately – eliminates the possibility of interacting with the back-end system as required by the business process. This leads to the possibility of data corruption or interaction errors due to a lack of synchronization between office and field processes.

Data synchronization is accomplished by creating redundant data stores: one on the mobile device and a second one behind the firewall, on the mobile middleware. This second data store must be integrated with the back-end system, resulting in a third location in which a single piece of data may reside. Imagine the technological challenge of maintaining the integrity of an individual piece of data across these different systems. Now multiply that by the number of individual pieces of data within an application, the number of users in both the office and field, and the number of systems with which the office-bound redundant data store is integrated. The result is an impending process, control, and administrative nightmare. In today's world where businesses are working every day to simplify their IT systems and reduce ownership and administration costs, this model just doesn't make sense. Additionally, due to the lack of clear data ownership and the cross-organizational data redundancies introduced by the data-synchronization approach, any organization that is subject to the Sarbanes-Oxley Act will find it very challenging to pass an audit of its mobile solution.

#### **The Smart Client Generation**

The smart client generation of mobility has embraced the concept of outside-in, whereby mobilearchitected solutions start from the perspective of the mobile worker rather than the back-end system with which they interact, resulting in a higher level of productivity and usability. The smart client is able to both utilize the transactional capabilities resident in the thin client, and manage and store data locally. Unlike previous generations, the smart client is able to retrieve, store, and transmit information based on the context of the application running within.

By combining the transactional capability of the thin client with the offline capability of data synchronization and eliminating the weaknesses of each, the smart client generation delivers highly useful and usable applications to the field with the clear understanding of business process and context necessary to deliver a satisfying user experience. Unfortunately, applications built using the smart client still tend to be monolithic in design and – even though they are infinitely superior to previous generations

- still fail to meet all the requirements of the mobile-centric organization. Companies that leverage this approach face challenges extending an out-of-the-box solution to fit their specific processes.

#### The Mobile Composite Generation

Enter the latest generation of mobility: the mobile composite. Leading analyst firm Gartner states that by 2009, 50% of enterprises will have migrated away from tactical mobile application silos (supporting a single application) to strategic platforms capable of supporting multiple applications, managing devices, and securing data and transport.<sup>3</sup> The mobile composite represents the path forward for how a business will execute on this vision. Mobile composite applications are comprised of reusable and manageable components running within a smart client. This enables a much more effective means to support the creation, management, and evolution of applications within a business.

With mobile composite applications, the functionality of an existing mobile application can easily be extended through the addition of components that are designed to run within the smart client. This functionality can then be automatically updated on the mobile device as business needs change. In addition, these mobile composite applications can contain functionality and data pulled What is a Composite Application?

Following the services-oriented architecture (SOA) model, composite applications - or packaged composite applications - are applications built by combining multiple components or services. A composite application consists of functionality drawn from several different sources within an SOA. The components may be individual Web services, selected functions from within other applications, or entire systems whose outputs have been packaged as Web services. Organizations can combine and repurpose composite application components and data to create a wide variety of additional applications that address business requirements in real time. Composite applications introduce a best-practice approach to application development, providing new capabilities without requiring development from scratch.

from a variety of existing back-end solutions, delivering the right level of contextual functionality suited to each user. It is this model that drives intelligence in the field, allowing the mobile workforce to gain new insight from data collected via various applications. The result? More effective, intelligent business processes where business is occurring – in the field.

### Using Mobile Composite Applications

To be of the greatest value, a mobile application must present a single, integrated, and informed view of the customer to the worker in the field, regardless of where data resides. It is no wonder that composite applications have emerged as the best way of achieving this requirement. In simple terms, a composite application consists of functionality drawn from several different sources. The components may be individual Web services, selected functions from within other applications, or entire systems whose outputs have been packaged as Web services. Composite applications are opening the door to an application development model that assembles applications from available components, quickly adapts

#### What to Look For in a Composite Application

The typical mobile application satisfies 80% of an organization's requirements out of the box; the other 20% represent unique processes for that company. It is nearly impossible to make changes to typical mobile applications (i.e., those not developed as composite applications) in order to address unique requirements. Through a composite approach, Dexterra can easily develop additional components or leverage its library of components that plug into the existing environment, allowing organizations to quickly address their needs. Organizations should look for applications that are developed using a reusable component approach based on an SOA-based platform.

them to unique requirements, and is then capable of dynamic evolution as needs change.

The promotion and development of packaged composite applications is a key strategy of industry leaders such as SAP (with its xApps<sup>™</sup> brand), IBM, and Oracle. Many industry pundits view this shift – one that combines new functionality with services from existing applications in order to enable flexible, crossfunctional automation – as revolutionary in the software industry. That is because this approach allows a business to quickly develop new industry- and role-specific solutions to solve corporate challenges.

A mobile composite application provides business functionality and information gathered from multiple information sources and delivers it effectively to a mobile device. Designed to support the business processes of the mobile workforce, the application is

able to intelligently map the processes to the relevant back-end enterprise system or external data source (e.g., RSS feed), while making these systems and data sources invisible to the end user. These applications run on multiple types of mobile devices and enable a mobile ecosystem through intelligent reusable components, intuitive user interfaces, and pre-built integration with back-end systems.

According to Gartner, half of all tactical mobile software deployed by large enterprises today will be replaced by 2009 with MAG [multichannel access gateway] approaches, which allow organizations to create composite applications specifically for business transactions at a time when the variety of devices, networks, and peripherals is steadily growing.<sup>4</sup> (A multichannel access gateway facilitates network-agnostic connectivity between multiple, non-integrated back-end systems and devices, such as PDAs and laptops).

Furthermore, using mobile composite applications, an organization can couple smaller existing standard components – for example, account details, sales order, work order, time entry, and expense entry – to develop a robust solution for mobile workers.

**Use Case: Direct Store Delivery** 

A consumer packaged goods company is interested in enabling its field force with next-generation capabilities. Specifically, the company wants certain delivery drivers to also now take pre-sales order, while it wants other drivers to be able to also provide basic field-service alert tasks. In this way, the company could increase productivity by adding tasks that could easily be accomplished by those already in the field without adding additional resources. To accommodate this, the company could add a mobile composite component to its existing direct-store-delivery solution – without having to develop a new application or writing any code – so that its delivery drivers gain access to pre-sales ordering and work order business process components.

Mobile composite applications provide rich and intelligent functionality that empowers mobile workforces to effectively perform their jobs. The following are just a sampling of the ways that organizations can benefit from mobile composite applications:

- Manage people and processes more effectively
- Spend more time on value-added tasks and less time on administration.
- Help workers adhere to a standardized process without a high level of administrative overhead
- · Provide timely access to comprehensive and accurate information, in the field and in the office
- Make faster decisions and improve customer service
- · Consistently serve customers, regardless of how they interact with them
- Reduce programming requirements to deploy needed functionality
- Increase efficiencies and drive down costs by reusing existing assets
- Enjoy a new level of responsiveness and flexibility

### An Effective Mobile Strategy

As discussed earlier in this paper, many organizations take a point-solution approach to solving mobility issues, choosing to deploy applications that are packaged for a particular industry or business problem. Unfortunately, this approach quickly proves painful as each point application becomes a trapped in a complete end-to-end solution silo. The resulting pain is exacerbated as the organization grows and multiplies, creating an ever-increasing number of separate solution silos that must be maintained. Ultimately this approach limits a company's ability to evolve, as changes in the business require separate

changes to each of these applications, stressing an already overworked IT staff.

**Benefits of Mobile Composite Applications** 

Assemble new industry- and role-specific solutions from a library of mobile composite application components

Quickly personalize an existing solution to address specific needs

Continue to evolve and update a solution to meet dynamically changing business needs

It is neither cost-effective nor practical for a growing business to support multiple mobile environments for the sake of supporting a variety of different worker roles, such as for field sales or service. An additional level of complexity is introduced as one considers the explosion of the different types of mobile devices that are used these days. It is for these reasons that analysts advise every mobile-centric organization to seek a complete and comprehensive platform as part of the mobile strategy.

#### Learning from the Past

Early adopters of mobility have already learned these lessons and have adopted a more strategic approach in order to avoid the pitfalls associated with the early generations of mobility. Each of these businesses now understand their need for a platform that delivers maximum benefit to end users both now and in the future, yet does not require significant change to its existing IT infrastructure. This has led to interest in and adoption of a robust SOA platform and mobile composite application strategy. By leveraging mobile composite applications, these organizations can deliver business functionality and information gathered from multiple back-end enterprise information sources to a mobile device.

#### Designed from the Ground Up and the Outside In

The ideal solution comprises a robust mobile framework, tools which leverage industry standards, and mobile composite applications designed from the outside-in. This means the mobile platform solution architecture considers the mobile business process first and defines the data and processes required. Then, using a non-proprietary toolset and standards-based framework, the platform should easily accommodate existing enterprise back-end systems and their respective interfaces. The result should be a non-invasive, change-ready mobile platform that understands the marriage between back-end application architecture and technology architecture requirements, both for the back-office and mobile enterprise. The platform must have the capability to be easily extended to address the functional requirements of an outside-in mobile solution.

#### Mobilize at a Comfortable Pace

Key Components of a Mobile Composite Application Strategy

Metadata-driven, change-ready mobile platform that includes contextual intelligence to effectively manage workflows and information to and from the field

Toolset based on industry standards such as .NET, J2EE, XML Web services, and SOAP

Mobile composite applications designed from the outside-in and created for reusability

Non-invasive integration layer optimized to model and adapt to the way that users work in the field

Support for multiple mobile devices and today's most popular mobile operating systems

Mobile-centric architecture that enforces business processes and policies and automatically distributes updates to mobile devices

Deploying a mobile solution is often disruptive to an organization because many enterprise systems are not architected to support workers in the field. It is no wonder that many field processes are still managed with paper, pens, and cell phones. With mobile composite applications, organizations can take advantage of and immediately deploy discrete, packaged business processes for a fast ROI.

Once the immediate pain is solved, the organization can address additional issues by assembling new functionality using existing components – without a major code rewrite or consulting engagement. In other words, an advanced mobile platform enables an organization to slowly explore the world of mobility while

taking advantage of existing functionality to extend processes to the field, without disrupting users or the enterprise.

#### Adapt to Workers' Needs

As organizations assess their options for meeting the requirements of the mobile workforce, one of the most important considerations is whether or not the existing back-end architecture will support all the data required to drive efficient business processes. For example, is there a place to store signatures collected in the field by service personnel? If a data store does exist to accommodate this type of information, will the IT group need to modify it to accept new fields from applications such as Oracle?



Figure 1. Example of how Mobile Composite Applications can be assembled to develop horizontal and vertical solutions

The ideal solution allows users to adapt to various data sources without requiring intensive integration efforts. For instance, intelligence derived in the field often comes from analyzing events that are specific to the enterprise. Suppose a field service representative realizes that a customer needs a part that is not in stock. Ideally the field service representative could interface with the inventory and ordering systems to determine the estimated arrival of the part. In other words, the platform's integration layer should be optimized to model and adapt to the way that users work in the field. This enables a level of personalization that ensures business rules and processes are aligned with the organization's way of conducting business, for instance, referring to a contact versus a customer or an asset versus a warehouse.

#### **Enforce Business Processes and Ensure Compliance**

After mobile solutions are deployed, organizations must concern themselves with management and governance issues. For instance, how is new or changed functionality deployed to the field? How are updates deployed without compromising data integrity or requiring all users to ship their mobile devices back to the IT department or asking them to call the IT help desk for assistance with the upgrade? A mobile-centric architecture enforces business processes and policies and ensures conformance. All information is encrypted and captured for audits. And as updates occur in the back end, they are automatically pushed out to mobile devices.

Figure 2: Dexterra enables organizations to assemble, adapt, and evolve their mobile solutions



### Mobile Composite Applications Extend Business Processes

While all of the current packaged composite application solutions are focused on the traditional desktop usage model, Dexterra has taken this approach one step further by extending this same capability to mobile devices.

Each Dexterra TransApp<sup>™</sup> is a uniquely powerful implementation of a mobile composite application with potential that extends far beyond the typical mobile application of today. Designed with the needs of the mobile worker in mind, they are the essential building blocks of intelligent mobile business processes. The following are some of the unique attributes of a Dexterra TransApp:

- Each TransApp works out-of-the box, yet can adapt and evolve to satisfy each organization's unique business requirements
- Multiple TransApps can be assembled together to create complete horizontal and vertical business applications that deliver exactly the right combination of capability
- With TransApps, organizations get the capabilities they need, when they need them, without the expense of custom solutions or the risk of being locked into narrow point solutions

Using TransApps, Dexterra's intelligent mobile composite application approach enables organizations to deploy the functionality that is required to solve critical business pain points without adding additional complexity. Enterprises can rapidly realize the benefits by adapting mobile composite applications to their existing enterprise data sources using the broad range of Dexterra enterprise adapters that non-

By extending the concept of an SOA to the mobile application layer, Dexterra enables organizations to componentize and reassemble applications – without rewriting hard code. In this way, Dexterra supports the agility required by today's organizations, particularly in the field, where the pace of change is greatest. intrusively interface with all popular back-end systems.

By leveraging standard APIs, Dexterra creates a solution that allows it to view all business objects in a system for easy and seamless integration. This non-invasive approach to enterprise integration enables a quicker implementation.

As business pain points arise across multiple lines of business, organizations can assemble additional TransApps leveraging the existing Dexterra Concert<sup>™</sup> Platform. And they can do all this

without disrupting the field force and without the lengthy traditional development processes associated with typical software applications. In addition, with the built-in application provisioning and revision control, these applications can be deployed remotely over the air to the field without end-user intervention. The Dexterra Concert platform and Dexterra's TransApps enable organizations to easily achieve The Mobile Way of Business.

Each Dexterra TransApp supports a unique business process or function that targets a specific business need, and multiple TransApps can be easily assembled to form the building blocks for a more comprehensive solution. TransApps can be used to address key business requirements, such as:

- Barcode and RFID capture
- Opportunity management
- Contract renewal and SLA capture
- Parts and inventory
- Cycle count
- Proof of delivery
- Expense capture
- Sales KPI dashboard
- Work order and RMA capture
- Location capture, GIS and spatial data display
- Task inspection/data collection
- Mobile catalog
- Territory management
- Mobile invoicing
- Time and labor capture
- Mobile sales
- Mobile survey





### Case Study: Tennant Company Automates 85% of Service Orders to Save \$600K Annually

Tennant Company is a manufacturer of industrial and commercial cleaning equipment such as street sweepers and vacuum cleaners, serving customers including shopping malls, parking garages, and hospitals. The company has a distributed workforce of 400 field technicians across North America to service its customers' equipment.

#### Challenge

The techs handle approximately 200,000 service calls each year and received and completed service orders in a 100% paper-based process. These representatives mailed completed service orders to regional offices every day, so at any given time, there could be 10 days' worth of mail in the system representing uncollected revenue. In addition, Tennant had no visibility into status of service calls. The company wanted to improve this inefficient process to collect money more quickly for completed work.

#### **Solution and Results**

Tennant implemented a service order automation solution using the Dexterra Field Service mobile platform to create a custom application called ServiceLINKSM. ServiceLINK communicates with Tennant's back-end SAP system and sends electronic service orders to the techs' tablet PCs via a wireless data network. Techs complete the orders electronically and then wirelessly send them back through ServiceLINK, which then sends them to SAP. With the solution, Tennant automated 85% of its service orders, creating invoices without human intervention, and saved \$600,000 in annual salaries due to reduced data entry headcount.

### Case Study: Selection Services Transforms Field Operations

Founded in 1992, Selection Services has quickly established itself as a major force within the IT industry and as a market leader in computer maintenance, enterprise systems management and professional services. The company has more than 300 technical, service and business professionals supporting a diverse client base of over 400 organizations, including large retail outlets across the UK, Europe and the US.

#### Challenge

Every day, Selection Services' 120-strong team of field service engineers make more than 200 customer site visits. For the past five years, engineers had carried laptops to remotely access its service management system, Remedy. However, due to the time it took to boot up, dial up, and log on via the Web site just to find out details about which customer they were due to visit and what the job would entail, engineers largely stopped using the laptops, preferring to call the help desk for the information instead. The browser-based application presented connectivity and reliability issues as well.

#### **Solution and Results**

Using Dexterra's Field Service TransApp mobile application, Selection Services realized a number of benefits, including:

- Gaining an informed and up-to-date view of all the customer information required to fulfill each job in a way that is relevant to role, task and context, whenever and wherever the engineers need it.
- 100% data completeness and accuracy for each job, as Dexterra's business-process-driven methodology takes engineers through step by step.
- A 20% monthly reduction in calls to the call center as engineers get all the information they need on the PDA.
- Annual savings of approximately \$48,000 in Remedy licenses.
- An 80% decrease in mobile call charges as engineers spend less time calling the help desk and the Dexterra devices don't require an 'always-on' connection in order to deliver the right information to engineers.

## Case Study: John Sands Deploys Field Applications to Stay Ahead of the Competition

John Sands is a subsidiary of American Greetings, a gift and card distribution company. It merchandises card and gift packaging product to retailers in Australia and New Zealand, as well as contract merchandising services to third-party customers. The company's Field Sales representatives are responsible for various stores throughout their service area.

#### Challenge

With limited access to company information, Field Sales representatives relied on updates via phone and voice mail telling them which customer locations to visit for inventory checks, merchandising, and selling, among other responsibilities. At each site, they performed stock maintenance, order history, ordering, product catalog updates, and inventory checks through their outdated mobile terminal station. The reps would send updates back to HQ either via phone or paper and fax, which often resulted in inaccurate data collection, duplicate data entry, and excess time required for field merchandise updates.

#### **Solution and Results**

Dexterra Field Sales for Merchandising was deployed to help John Sands streamline its business by making schedule, catalog, ordering, and inventory information available in the field and on demand. John Sands realized an ROI within 6-9 months of deploying the application, decreasing its ordering time by 15%, and reducing order rejections by 12%.

### Conclusion

Surprisingly, the majority of enterprise applications and their related customer information remain locked tightly inside the four walls of the enterprise. Without easy and effective access to these applications and the information contained within, mobile workers are unable to fully address critical business and customer issues in the field where they occur. In the end, the value of these applications becomes limited both within and beyond The enterprise.

To achieve optimal productivity levels from a field force, every business must be enabled at the point of customer interaction, where business is actually conducted. That is why today's workforce requires mobile applications that fit how they work in the field, with access to the information they need, when they need it, where they need it. All this while ensuring that data stays secure, and the enterprise is able to rapidly adapt to any business change.

Dexterra offers the most robust mobile framework, mobile composite applications, and tools that enable enterprises to immediately support their mobile workforce without intrusive integration requirements. Organizations can deploy intelligent business processes to the field, taking full account of the users' role, task, location, and situation.

Once the organization addresses its specific line-of-business issue, it can easily support additional mobile workers with varying needs by reusing many of the components of the first mobile application. In this way, organizations can rapidly deliver value to a larger number of users throughout the enterprise.

By embracing the concept of mobility and becoming mobile-centric organizations, today's enterprises can provide their mobile workforce with the information and business functionality needed to rapidly resolve problems, quickly respond to new opportunities, outmaneuver the competition, and keep customers satisfied.

References

<sup>4</sup> Ibid

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<sup>&</sup>lt;sup>3</sup> Gartner Inc., Magic Quadrant for Multichannel Access Gateways, 2H06, October 6, 2006