



Leveraging a Service-Oriented Architecture to Deliver a Services Commerce Network

Immediate Cost Savings for IT and the Enterprise

A REARDEN COMMERCE WHITE PAPER



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Executive Summary

New enterprise computing technologies enable IT to deliver business value more quickly, with less risk, and with lower cost than legacy technologies. Two examples are service-oriented architectures (SOAs) and on-demand models. In SOAs, individual reusable services interact in a loosely coupled fashion, which radically reduces the time required to create or modify a business service. On-demand models, in turn, greatly reduce application infrastructure costs by eliminating the need to install, customize, and maintain packaged or homegrown applications.

Until now, on-demand models have generated enormous interest but very few successful solutions. The reason is that the architecture beneath the very simple, web-based interface must provide coordination among myriad advanced technology components and standards, a complex technical challenge.

After five years of research and development, Rearden Commerce introduced the world's first commerce platform based on a web services architecture and delivered as an on-demand solution. The Rearden Commerce Network yields large, immediate savings opportunities for businesses of all sizes. Examples include travel, shipping, conferencing, and dining— which typically represent 10-40% of a company's indirect spend.² While most companies use some form of e-commerce for procuring individual employee business services, no vendor has been able to offer an integrated solution for procuring many different services because none had developed the technology to meet the complex requirements unique of employee services...until now. As a result, companies have made do with suboptimal tools and paid a realized rate that exceeds their negotiated rate by 10% to 35%.³

The Rearden Commerce Network provides IT with an opportunity to deliver immediate cost savings to the enterprise. Cost savings are a result of the superior economics of SOAs as well as reduced services spend from the following:

- Enforcing spend controls at the point of purchase
- Centralizing employee services spend visibility to increase leverage with suppliers
- Streamlining a cumbersome, disjointed procurement process that traditionally has required multiple systems, separate logins, and manual processes

Rearden Commerce's early customers have driven 10% to 30% savings of their current employee services spend directly to the bottom line.

This white paper explains the advantages of a web services-based architecture for business services procurement. It presents the unique IT and business challenges of services procurement, the limitations of past IT solutions, and the characteristics of a solution that meets the unique business and technology challenges of procuring employee services. It describes the Rearden Commerce solution and breakthrough technical architecture. The paper concludes with a summary of the implementation process and the benefits of the Rearden Commerce Network for IT, procurement, and employees.

² CAPS Research reported services spend of a 115 sample companies at about 33% of total indirect spend. Rearden Commerce customers reported services spend between 10% and 40% of total indirect spend.

³ Based on a Rearden Commerce customer opportunity assessment



Challenges of Services Procurement

HIGH COST

Companies spend vast amounts of time and money procuring business services (see Table 1), a non-strategic and inherently inefficient effort. Costs are high, both in terms of IT effort and sub-optimum spend. IT costs include software development or purchase, server platform, client software, administration, maintenance, and ongoing supplier integration. One financial services company in New York spent over \$10 million developing and maintaining a custom limousine reservation system with very limited ROI potential. Other companies invest so much in service supplier integration that they cannot cost-justify the change to another supplier that offers better economics and service levels. The crux of the problem is that spending money on services procurement is non-strategic for the company, and spending money on custom or single-vendor solutions of any kind is non-strategic for IT.

Table 1 – Business Services Spend Categories

OFFICE SERVICES	TRAVEL SERVICES	MEETING SERVICES	MEALS & ENTERTAINMENT
Package shipping	Flights	Audio/web conferencing	Dining
Messenger/courier	Hotels	Mobile communications	Event tickets
Printing and copying	Ground transportation	Conference rooms	Corporate gifts
Remote office facilities	Car rental	Catering	Business development activities
Direct mail	Parking	AV equipment	

WHAT'S DIFFERENT ABOUT SERVICES PROCUREMENT?

The procurement of business services is far more complicated than goods procurement. See Table 2.

Table 2 – Unique Services Procurement Challenges

CHARACTERISTIC	HOW IT COMPLICATES PROCUREMENT
Calendar-based	Before the service is selected, the employee's calendar must be consulted. After the service is reserved or changed, the calendar must be updated.
Group-oriented	Different people's requirements and preferences must be coordinated when the reservation is made.
Time-critical	Business services do not lend themselves to extended approval processes.
Requires confirmations and updates	Employees need status updates—that a package was delivered on time, invitees accepted a conference invitation, or a flight has been rescheduled.
Real-time inventory	Availability, such as a particular airplane seat or table reservation, changes from minute to minute and cannot be represented in a static product catalog.
Dynamic pricing	Because the services inventory changes dynamically, many suppliers change their pricing dynamically.



HOW TRADITIONAL APPROACHES FALL SHORT

Table 3 lists the drawbacks of various existing approaches to business services procurement.

Table 3 – How Existing Approaches to Services Procurement Fall Short

PROCUREMENT APPROACH	DRAWBACKS
Point solutions	<ul style="list-style-type: none">• Require high IT costs for development and support, multiplied for each solution• Suffer low adoption and compliance, which significantly reduces company leverage with suppliers• Limit visibility and control for Procurement• Lack coordinated business logic among disparate systems
Portals for point solutions	<ul style="list-style-type: none">• Do not eliminate separate logons and interfaces• Lack consistent rules and logic across different solutions• Fail to provide control and visibility to Procurement
Supplier-provided systems	<ul style="list-style-type: none">• Create vendor lock-in• Encourage marketing directly to employees, who might choose non-optimum rates• Lack a consistent interface
E-procurement systems	<ul style="list-style-type: none">• Designed for purchase of goods; cannot handle dynamic inventory and pricing• Do not integrate with employees' contacts, calendars, and preferences• Do not coordinate procurement for groups of employees—for instance, a sales team that is traveling to a customer presentation



Attributes of the Ideal Services Procurement Solution

From the IT perspective, the ideal employee services procurement solution meets the business needs of the Procurement organization while also meeting IT's needs.

CENTRALIZED EMPLOYEE SERVICES SPEND MANAGEMENT

The ideal solution would give Procurement control over employee services spend. One way to control spend is to enforce policy at the point-of-purchase—for example, by presenting employees with a list of preferred suppliers and services, applying spending caps for different groups of employees, and automatically managing the approval workflow. Another way to control spend is by taking steps to ensure that the realized price equals the negotiated price. For example, by validating and correcting improper shipping addresses for package shipping destinations, companies can avoid the \$15 surcharge imposed by certain vendors. For one Fortune 500 telecommunications company, surcharges for incomplete addresses amounted to more than \$200,000 annually.

SUPPORT FOR REAL-TIME SUPPLIER AND POLICY CHANGES

The Procurement organization needs the ability to rapidly add or modify suppliers, policies, and employee spend privileges. After a merger or acquisition, for example, a company needs the ability to quickly add the new employees to the system and associate them with the appropriate procurement policies.

USER-CENTRIC, TO DRIVE ADOPTION

To enforce spend policy and negotiate the best rate, companies need to drive employees to use the solution. Examples of features that give employees an incentive to use an employee services procurement system include integration with employee calendars and contacts, storing preferences such as window or aisle seats on flights, the ability for end users to coordinate multiple services with multiple people via a collaborative interface, and automatic notification of reservation or shipping status sent to the employee's email or phone.

ON-DEMAND WEB INTERFACE

Managing the procurement of employee services is not a core activity for organizations of any size. Therefore, companies increasingly are cutting costs by outsourcing the underlying infrastructure to a third party. With an on-demand model, the company avoids the capital and operational expense of servers, software, integration, and administration. Because no hardware or software resides in-house, a solution based on the on-demand model can be deployed very quickly and return value rapidly.

LOW INFRASTRUCTURE COSTS

Rather than maintaining separate procurement systems for travel, conferencing, shipping, and dining, IT and Procurement organizations prefer a single, integrated solution. A common solution eliminates costs associated with:

- Developing or purchasing multiple solutions
- Deploying and maintaining client software on user desktops
- Purchasing and maintaining server platforms
- Supplier integration—a time-consuming process that often takes months or years

And because employee services procurement is non-strategic, the ideal solution is hosted elsewhere, eliminating redundant IT costs and resources.



EXTENSIBLE

IT and Procurement organizations need the ability to quickly add new service categories, such as dining or conferencing, as well as new suppliers in those categories. To minimize change costs, adding new services and suppliers should not interrupt business continuity. That is, when a new supplier or service is available, it should simply appear on the employee procurement interface without requiring new software installation, or change management.

SECURE

The solution should incorporate security best practices for the host, data, network, and Internet connectivity. Best practices apply both to the use of security technology, such as virtual private networks (VPNs) and firewalls, as well as operational practices for data center personnel, such as segregation of duties.

SCALABLE

Projecting a company's services procurement volume is difficult. A company might acquire another company with thousands of additional employees who need to be added to the system, for example, or add new services categories. Therefore, scalability is an essential solution attribute. Ideally, the solution should scale without requiring additional capital expenditures on new hardware or client software, and without time-consuming provisioning.



The Rearden Commerce Network

Rearden Commerce pioneered the industry's first Services On-Demand™ commerce platform built from the ground up on a Web Services architecture, greatly improving commerce and interactions between businesses and suppliers. The Rearden Commerce Network is the world's largest online marketplace for services. It helps employees find, purchase and schedule services from hundreds of thousands of trusted suppliers, and provides sellers immediate access to thousands of qualified buyers at the point of purchase.

REARDEN SERVICES CONSOLE, FOR PROCUREMENT

The Rearden Services Console provides Procurement staff with a single interface to provision services and policies to employees, to add and modify merchants and service levels, and to analyze consolidated spend data.

REARDEN PERSONAL ASSISTANT, FOR END USERS

The Rearden Personal Assistant is the web application that delivers all the value of the network to the end user. Employees can purchase all services through a single, easy-to-use interface—a convenience that increases adoption and compliance. The interface is consistent and intuitive, and requires no training. Employees can access the system from any web browser—at work, at home, or on the road.

The personal assistant is user-centric, remembers each employee's preferences and organizational role, and utilizes their calendar and contacts to work on their behalf. As services are booked, the personal assistant automatically inserts scheduling information into the employee's calendar, coordinates plans with business contacts and notifies the employee of changes via their device of choice.

The Rearden Personal Assistant addresses a number of key service categories:

- **Travel.** A complete, GDS-independent corporate travel procurement tool that delivers seamless travel booking, transparent travel policy management, access to negotiated rates, and biasing for preferred suppliers. It provides access to more than 530 airlines and 80,000 hotel properties. The Travel services include flights, hotels, rental cars, airport parking, and chauffeured car service.
- **Entertainment.** This service category offers a revolutionary new way to find, schedule and manage corporate entertainment. Business managers using the Rearden Services Console can establish spending policies and guide employees to lower-cost dining options and appropriate entertainment venues. Current entertainment services include dining reservations and event tickets.
- **Meetings.** This service category currently enables employees to easily schedule audio and web conferences from leading providers, while at the same time, staying in line with corporate policies. It integrates with the employee calendar, contacts and preferences, and coordinates conferencing sessions for groups of employees.
- **Shipping.** This service allows employees to price, label, schedule, and track package shipments straight from the desktop, using company-preferred providers and service options. Senders and recipients receive automatic notification of shipping status via email, phone, text message or fax.

REARDEN MERCHANT NETWORK, FOR SUPPLIERS

The Rearden Commerce Network is an online services marketplace which connects buyers with sellers. Employees shopping for services using the Personal Assistant can view real-time availability and pricing information from Rearden's vast network of trusted merchants. By plugging into the Rearden Merchant Network, merchants gain immediate access to hundreds of thousands of qualified consumers who are ready to buy. The Merchant Network consists of hundreds of thousands of suppliers, whose services



business managers can provision to employees with mouse clicks. Rearden Commerce can quickly add new merchants to the network simply by building an adapter to transform and translate employee service requests into supplier requests.

REARDEN OPERATIONS CONSOLE, FOR IT

Rearden Commerce operations staff manages the Rearden Commerce Network using an operations console at the Rearden Commerce data center, which provides information on supplier status, transaction volume, and network trends. Real-time access to solution metrics enables Rearden Commerce to proactively adjust server and network capacity as needed to ensure high performance.



The Rearden Commerce Platform

The Rearden Commerce Platform, hosted in the Rearden Commerce data center, is a Web Services-based platform that allows the description, discovery, and delivery of services to every employee in the organization. It comprises the Services On-Demand™ infrastructure, platform services, and a platform API and services development toolkit.

SERVICES ON-DEMAND™ INFRASTRUCTURE

The Rearden Commerce Services On-Demand™ infrastructure provides the hardware and software required to build scalable, high performing, configurable, extensible platform services. The standards-based infrastructure manages the complexities of dealing with scalability, caching, transaction management, asynchronous communication, monitoring, guaranteed delivery, and other challenges.

The Rearden Commerce Platform scales massively and cost-effectively by leveraging:

- An asynchronous messaging-based infrastructure
- Stateless services
- Use of commodity Linux-based servers with minimal software licensing cost

PLATFORM SERVICES

Platform services, which provide business logic, are event-driven software components that can be reused across different applications, have a well-defined standards-based interface, and can be remotely executed, managed, monitored, and instrumented. The Rearden Commerce Platform consists of multiple horizontal services, vertical services, and infrastructure services:

- **Horizontal services.** These include utility services like the Notification Engine service, as well as more complex service like the Workflow service that executes the process of service procurement, and the Orchestration service that coordinates and manages multiple processes.
- **Vertical services.** These are typically composite services that comprise one or more horizontal services. Examples include travel, entertainment, package shipping, and conferencing.
- **Infrastructure services.** These include the Rearden Commerce registry, services management console, messaging bus, and others. They form a unified platform for invoking and monitoring horizontal and vertical services in a trusted environment. The Rearden Commerce registry enables the dynamic description, discovery, and delivery of services in the Rearden Commerce Platform for trusted entities. The services management console provides a dashboard that shows the state of each instance of the service, and allows it to be instrumented and controlled remotely.

PLATFORM API AND SERVICES DEVELOPMENT TOOLKITS

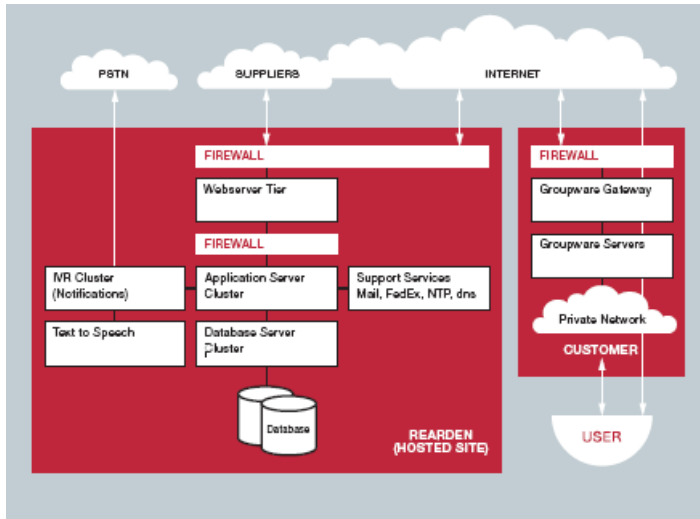
Platform API and services development toolkits facilitate rapid building of new services and applications. New applications can reuse existing services of the Rearden Commerce Platform or use new services that can be registered with the platform. The Rearden Commerce Platform includes services and application development toolkits such as visual aids for automatic code generation, user interface templates and tags, dynamic orchestration of services, and others. Using the toolkits, Rearden and its partners can build new services and applications in a fraction of the time and cost it would take to build the same applications with any other platform.



UNIQUE ATTRIBUTES OF THE REARDEN COMMERCE ARCHITECTURE

Figure 1 shows the path of requests and replies among subscribers, the data center, and suppliers.

Figure 1 – Path of Requests and Replies



SERVICE-ORIENTED ARCHITECTURE

As a SOA, the Rearden Commerce Platform provides loose coupling among interacting software agents, or services. Loosely coupled services can be reused and easily maintained, and the underlying business logic can be rapidly extended to new services. Table 4 summarizes the advantages of SOA for the enterprise.

Table 4 – Advantages of a Services-Oriented Architecture for the Enterprise

ATTRIBUTE OF SOA	ADVANTAGE TO REARDEN COMMERCE CUSTOMERS
Reusability	Modular components can be reused across service categories. Rearden Commerce can rapidly add a new service or supplier to the platform. What normally would take months takes days.
Maintainability and extensibility	The logic for each service is modular, which makes it easy to maintain. Rearden Commerce can add new business services quickly in response to customer requests.
Scalability	As a native Web Services platform, the Rearden Commerce Platform is built from the ground up to scale massively.
Asynchronous operation	Because much of the processing associated with a service request occurs asynchronously, the platform avoids application latency, delivering high performance and fast response.



MULTI-PROCESS ORCHESTRATION

Workflow orchestration refers to coordinating the myriad interactions between employees and all entities involved with service reservations, including suppliers, other employees, systems such as HR and accounting, calendars, and communications devices such as phones, PDAs, and e-mail inboxes. The employee simply makes a service request, and the Rearden Commerce Platform orchestrates the details behind the scenes, in a fraction of the time it would take a person. For example, say an employee wants to set up a meeting from 9:00 a.m. to 10:00 a.m., and needs a web conference and audio bridge. The employee simply enters the requirements and clicks a button. The Rearden Commerce Platform asynchronously orchestrates the needed processes, including contacting providers, making the reservations, inviting the other participants, updating their calendars, and sending a confirmation to the employee who initiated the meeting.

The benefits of multi-process orchestration are especially compelling for services procurement, because service requirements change frequently. For instance, if the meeting time is changed to 10:00 a.m., the employee can simply return to the interface to change this one detail, and the solution executes all necessary processes, possibly dozens, or even hundreds. Or, if an employee on a business trip extends her stay by a day, she need only change the return date, and then the solution orchestrates all necessary services with the airlines, hotel, and limo, automatically handling approval workflow, updating her calendar, and sending a notification to her PDA to confirm the new arrangements.

Rearden's is the first technology platform with the ability to asynchronously orchestrate interactions with multiple suppliers and multiple employees' calendars, applying business logic to deliver results in a fraction of the time it would take a person.

SINGLE-INSTANCE

The Rearden Commerce architecture maintains a single instance of the application, which serves all customers. The advantages of this approach are:

- **Low Cost.** Customers need not invest in hardware or software, and Rearden Commerce can pass along its lower hardware and software costs in the form of competitive subscription fees.
- **Faster Access to New Features.** Once Rearden Commerce has added a new application feature and deployed it on the server, it's immediately available to all subscribers. Companies are not subject to delays while an upgrade is shipped on a CD and installed.

An Event-Driven, Service-Oriented Architecture (SOA)

The premise of the Rearden Commerce Platform is to deliver a set of applications that integrate simply and seamlessly, and can be accessed anywhere, anytime, and from any device. The Rearden Commerce Platform is based on the principles of an event-driven SOA, which allows rapid orchestration of standards-based, distributed, flexible, secure applications.

In the Rearden Commerce Platform, a service is:

Coarse-grained, a software component that executes unit(s) of work.

Event-driven, and can be invoked either synchronously or asynchronously, using reliable messaging.

High-performing because it executes tasks in a multi-threaded manner on different platforms.

Loosely coupled, which means it's functionally independent of other services and can communicate with other services via an asynchronous messaging bus.

Stateless, so multiple instances of services can be executed at the same time. An instance can be shut down without the loss of transactional integrity and without affecting the other instances.

Remotely managed, including introspection, execution, monitoring, and instrumentation.

Orchestratable, which means that developers can create new business processes by dynamically invoking services.

Services provide a level of abstraction for composing new applications. They can be simple or composite. For example, the Calendar Integration Service is simple, while the Travel Service is a composite application that uses other simpler services. Services can be dynamically orchestrated to create new applications.



Implementation

SECURITY

Rearden Commerce follows best practices for the security of its data center, including both infrastructure and operational policy and controls. Examples of safeguards for the host, data, network, and Internet include encryption, segregated administration, hardened operating systems, physical security, third-party vulnerability audits, and firewalls and anti-virus protection.

DEPLOYMENT PROCESS

Rearden Commerce deploys its solution using a proven, phased methodology, enabling very rapid implementation for new subscribers. Deployment typically requires the equivalent of less than one full-time customer employee, who works with a Rearden Commerce professional dedicated to the customer. A typical deployment consists of an initial six-week implementation followed by two or three weeks to add new services and users.

To increase the quality and speed of deployment, Rearden Commerce offers a set of on-ramp tools and utilities that minimize the effort required by a customer's staff (see Table 5).

Table 5 – On Ramp Tools and Utilities Available from Rearden Commerce

TOOL	BUSINESS VALUE
Supplier configuration tools	Helps quickly configure suppliers based on customer account information.
Policy configuration tools	Enables quick entry of user groups and business rules.
Communication and adoption materials	Accelerates employee acceptance and service adoption by providing sample executive communications, employee microsites, adoption campaign templates, and more.
User focus groups	Provides educational materials for training.



Advantages for IT and the Enterprise

ELIMINATES INFRASTRUCTURE COSTS

By deploying the Rearden solution, IT departments can eliminate the costs associated with maintaining siloed travel and services procurement solutions—which often amount to \$50,000 annually. The platform also reduces enterprise infrastructure and the associated risk.

REDUCES SERVICES PROCUREMENT COSTS

Rearden Commerce customers have experienced the following cost savings:

- **Services Savings.** Our customers typically save 15-30% on the services procured through the Rearden solution. Savings results from the following factors:
 - Guiding employees to select preferred suppliers offering the best negotiated rates.
 - Empowering employees to make good business decisions by showing them the costs of different options.
 - Allowing Procurement to control which services and policies are provisioned to each employee.
- **Productivity Savings.** Employees using the Rearden solution to find, book and schedule services can save up to an hour a day. By presenting employees a one-stop-shop for all services and allowing them to order services online which they formerly ordered via the phone, companies can make their employees more productive. The Rearden Personal Assistant automatically updates the employee's calendar with reservation details for all services and delivers automatic service notifications via the phone, text message, email & fax.

PROVIDES SINGLE POINT OF SERVICE SUPPORT

Rather than managing support relationships with multiple services procurement application vendors, the enterprise maintains just one relationship, with Rearden Commerce. Rearden Commerce, in turn, maintains the connections and technical relationships with the dozens or hundreds of suppliers the company is using. This is a core competency of Rearden Commerce.

ENHANCES CONTROL, VISIBILITY, AND COMPLIANCE

The Rearden solution meets Procurement's business needs by empowering Procurement to:

- Enable and disable suppliers by division, department, cost center, or other category
- Enable and disable specific service types, such as early morning arrival for small package shipments
- Implement spend and vendor policies and manage them with an integrated approval process
- Gain real-time visibility into spend on services by department, cost center, or other categories
- Focus on category management versus vendor management.

SCALES WITH NO EFFORT OR CAPITAL EXPENSE

Companies that adopt the Rearden solution can add an unlimited number of new users, suppliers, or supplier services without purchasing or provisioning hardware or software. This radically simplifies the integration of new users after mergers or acquisitions, for example.



Conclusion

By adopting the Rearden Commerce solution, IT organizations have an opportunity to offload a significant non-strategic effort. The advantages are immediate cost savings, both from eliminating dedicated platform and client software and increasing the percent of employee business services spend that's optimum.

A procurement solution for managing employee business services has been elusive until now because of the dynamic nature of services pricing and availability, and the architectural sophistication required of the underlying Web Services platform. Rearden Commerce offers that platform today, with the world's first on-demand, Web Services-based architecture. The Rearden solution is the first of many planned applications from Rearden Commerce and its technology partners to capitalize on the underlying Rearden Commerce Platform and its user-centric design.

For more information, please visit <http://www.reardencommerce.com>.