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APRIL 2010

The Business Value of Duet Enterprise

white paper

**Duet[®]
Enterprise** | for Microsoft[®] SharePoint[®]
and SAP[®]

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Introduction

Many enterprises have consistently sought to extend the capabilities of SAP® ERP and other line-of-business applications to a wider group of people and to afford those users more flexibility. A multitude of different methods have been put to work to achieve this end, including portals, business process management, and enterprise mashups. Results have varied, but the goal remains the same.

While few people doubt that there is tremendous value in creating new processes and extending the scope of existing processes on top of these systems, historically it has been difficult to achieve the flexibility desired in a way that can be managed in the modern IT environment. Many attempts have brought data to more people but have fallen short in terms of incorporating workflow from line-of-business applications, as well as in the dimensions of administrative ease, compliance, compatibility, security, and scalability, all of which must be achieved simultaneously in the modern world of enterprise IT. Duet® Enterprise for Microsoft® SharePoint® and SAP®, a joint product from Microsoft and SAP, provides a solution that can meet these requirements.

Microsoft and SAP are two of the largest software companies on the planet. Not surprisingly, the companies have many customers in common, and their products are deeply embedded in the business processes of those customers. Duet Enterprise takes a new approach to providing the sought-after access and flexibility between SAP processes and information and Microsoft productivity applications, but in a way that fits in with existing IT management, development processes, and technologies. The object is to increase the efficiency, flexibility, and effectiveness of companies that run both environments by bringing SAP business content (see “Business Content from SAP Applications”) and processes forward into the realm of information workers who are more comfortable and familiar with Microsoft solutions.

Duet Enterprise is an evolution of a joint project between SAP and Microsoft that started with Duet™ for Microsoft® Office and SAP®, which appeared in two versions: Duet 1.0 and Duet 1.5. Duet Enterprise clearly distinguishes itself from previous versions. Duet Enterprise is a new product from the ground up and contains robust technologies that build on the lessons learned in the creation of Duet 1.0 and 1.5. This paper provides the following information:

- An explanation of how Duet Enterprise provides bidirectional interoperability between SAP workflows, and business objects using the familiar user interfaces of Microsoft® SharePoint® Server 2010 and Microsoft® Office 2010





- A description of the evolution from early Duet versions to Duet Enterprise
- An analysis of the implications of Duet Enterprise for businesses
- A description of the technology architecture that supports the interoperability
- A comparison of Duet Enterprise to other approaches, such as Business Connectivity Services in SharePoint Server 2010, which are leveraged by Duet Enterprise but which can also be used to access data directly, and Microsoft® BizTalk® Server, which is used for process orchestrations across heterogeneous landscapes

Business Content from SAP Applications

SAP applications are systems of record for the businesses that use them and track a wide variety of information. As such, SAP applications contain metadata and transaction data. Metadata describes customer, chart of accounts and other entities used across many transactions. Transaction data describes what happens in each specific transaction. Documents and unstructured information such as notes in text fields are also stored. The container for a collection of information about a specific entity, such as a customer, is often referred to as a business object.

One note of clarification: In 2007, SAP purchased a business intelligence company called BusinessObjects, which is now referred to as SAP BusinessObjects. We are never referring to the company SAP BusinessObjects in this paper. We use the term SAP business object to refer to specific entities in an application such as a customer, employee, or product.





The Mission of Duet Enterprise

The mission of Duet Enterprise is to provide an interoperability foundation and rapid development approach so that companies can take better advantage of their existing investments in Microsoft SharePoint, Microsoft Office, and SAP software. Duet Enterprise provides plumbing so that IT departments, systems integrators, and ISVs can start building their own collaborative composite applications and reusable site templates with minimal focus on the generic details of the underlying product and maximum focus on crafting the needed business solutions. The connectivity is built into the platform so that the focus can be on building business value. By leveraging Microsoft technology as a gateway to a line-of-business application, Duet Enterprise helps fulfill the vision of Office business applications (see “The Vision of Office Business Applications”).

Duet Enterprise helps address the fact that the world of enterprise software has changed dramatically since the Internet became central to business. Collaborative mechanisms such as wikis and mashups may be easy to develop but are rarely auditable, secure, scalable, or manageable. Many other techniques such as portals, screen-scraping technologies, and widget frameworks meet some but not all requirements for enterprise class solutions.

Duet Enterprise is based on a simple theory: combine the technology people use every day with the technology used to run the business. The technology that people use every day is primarily Microsoft Office applications, Microsoft Outlook®, and for a growing number of workers, Microsoft SharePoint Server 2010. Mobile devices and browser-based interfaces are also an important part of this mix. When it comes to running the operations of a business, a different set of technology is generally used, such as line-of-business applications like SAP with a whole different set of user interfaces.

Figure 1 shows at a high level the different parts that comprise a composite application built using Duet Enterprise.





Duet Enterprise enables building composites that allow SAP applications to be used through Microsoft applications

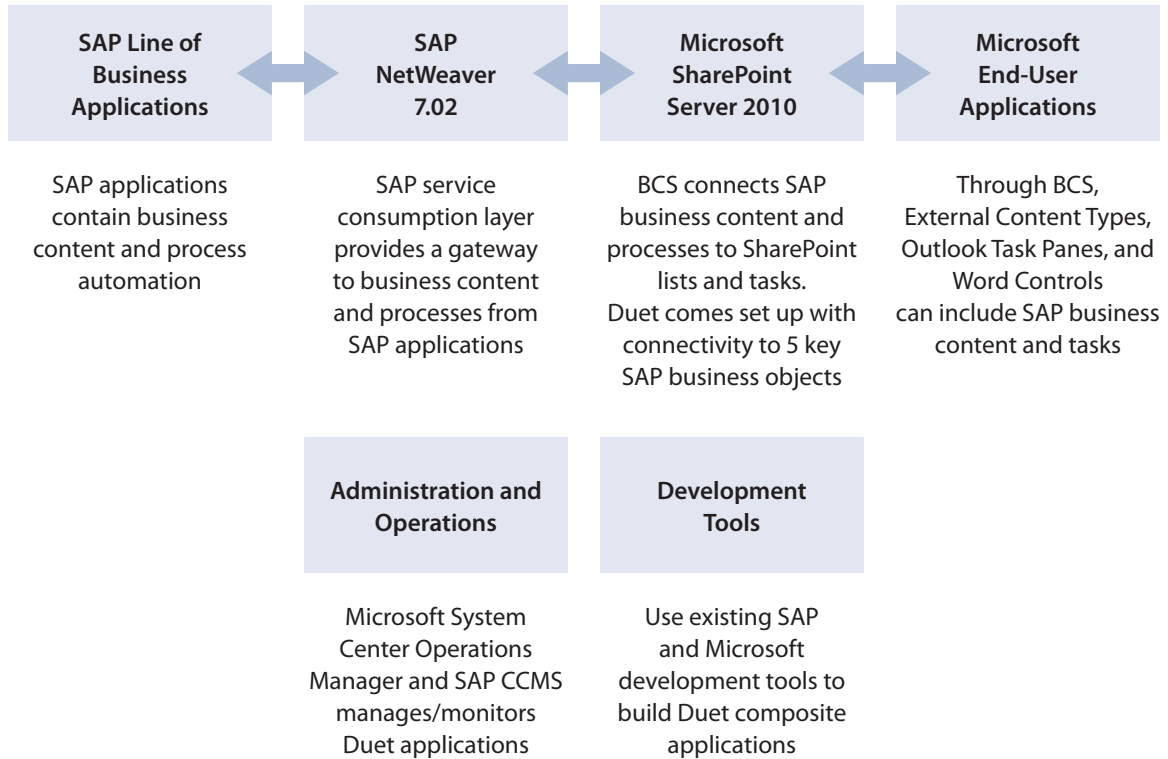


Figure 1: An Overview of Duet Enterprise

Duet Enterprise is a foundation born more from orchestration of existing componentry than from the invention of new components (see “Foundation vs. Platform”) Duet Enterprise will be successful if the composite applications it enables deliver business efficiency and agility and produce a greater return from existing investments in technology.





Foundation vs. Platform

The term platform is used widely in IT to refer to a general-purpose layer of technology that supports the creation of solutions. While an application refers to a specific solution, created from or on one or more platforms, a platform is usually a set of tools and capabilities.

While Duet Enterprise might be considered a platform in the sense that it enables the creation of a certain type of composite application that brings together the worlds of SAP and Microsoft, using the term in this way would be misleading.

Duet Enterprise uses many existing platforms, most prominently Microsoft SharePoint® Server 2010 and SAP NetWeaver®, and associated environments to control aspects of those platforms, such as Microsoft System Center Operations Manager, the Computing Center Management System (CCMS), Microsoft® Visual Studio®, ABAP Workbench, and SharePoint Designer.

So to call Duet Enterprise a platform would perhaps give the incorrect impression that Duet Enterprise is one self-contained unit of technology, like all of the other platforms mentioned. In fact, Duet Enterprise is something different, a layer of interoperable technology that sits on top of many platforms and allows a certain class of composite application to be created. For this reason, Microsoft and SAP refer to Duet Enterprise as a “foundation,” not a platform.

One further terminology clarification: in other materials you read about Duet Enterprise, you may see the term environment used instead of platform to refer to the capabilities of the SAP platform or the Microsoft platform. We chose platform in this context because it is more commonly understood by developers as the foundation of technology you use. Environment sometimes only refers to development tools.

Duet Enterprise was created by teams of developers and engineers who understood what was possible in Microsoft Office, Microsoft SharePoint, and SAP. The combined team created a system with the following capabilities:

- Developers can quickly build solutions that allow users to participate in SAP business processes and to collaborate on data from SAP through familiar, well-understood environments such as Microsoft Office, Microsoft Outlook, and Microsoft SharePoint





- Duet Enterprise handles scenarios where the SAP environment at a particular company contains many generations of SAP applications, from SAP® R/3® 4.6C to SAP ERP 6.0 and beyond
- Duet Enterprise allows various forms of SAP business content to be surfaced and used in SharePoint, both data from SAP applications and metadata describing workflows and security profiles. Changes to the SAP business content, completion of workflow steps, and other events can be transmitted back to the SAP applications
- Duet Enterprise comes with ready-to-use Microsoft SharePoint site templates for five key business objects from SAP, including Customer, Employee, Product, Customer Inquiry, and Customer Quote. The site templates allow secure and administrable collaboration workspaces to be rapidly created. Other business objects in SAP applications can be accessed through Duet Enterprise by using prebuilt interoperability capabilities and standard tools
- Duet Enterprise differs in approach from Duet 1.0 and 1.5 (see “The Evolution of Duet Enterprise”), which automated specific business scenarios. Duet Enterprise provides a foundation for development so that custom composite applications can be rapidly constructed and captured for reuse and improved in SharePoint site templates
- Duet Enterprise also makes Microsoft SharePoint Server the platform around which the components for interoperability are constructed using Business Connectivity Services; SharePoint’s structures for site templates, web parts, lists, profiles, and user interfaces; and Microsoft Office for rich client-based user interfaces. Microsoft® Silverlight™ can be added to this mix to create web parts that can be part of rich custom user interfaces
- Duet Enterprise relies on the service consumption layer in SAP NetWeaver 7.02, which is able to handle any version of an SAP application
- Composite applications, site templates, web parts, and other components in Duet Enterprise can be developed using all the familiar tools from Microsoft and SAP, including Microsoft SharePoint Designer, Microsoft Visual Studio, and SAP ABAP Workbench
- Composite applications developed in Duet Enterprise can be managed and monitored using Microsoft System Center Operations Manager and SAP CCMS

Figure 2 summarizes the components that comprise Duet Enterprise composite applications. The rest of the white paper provides detailed explanations of the topics raised so far.



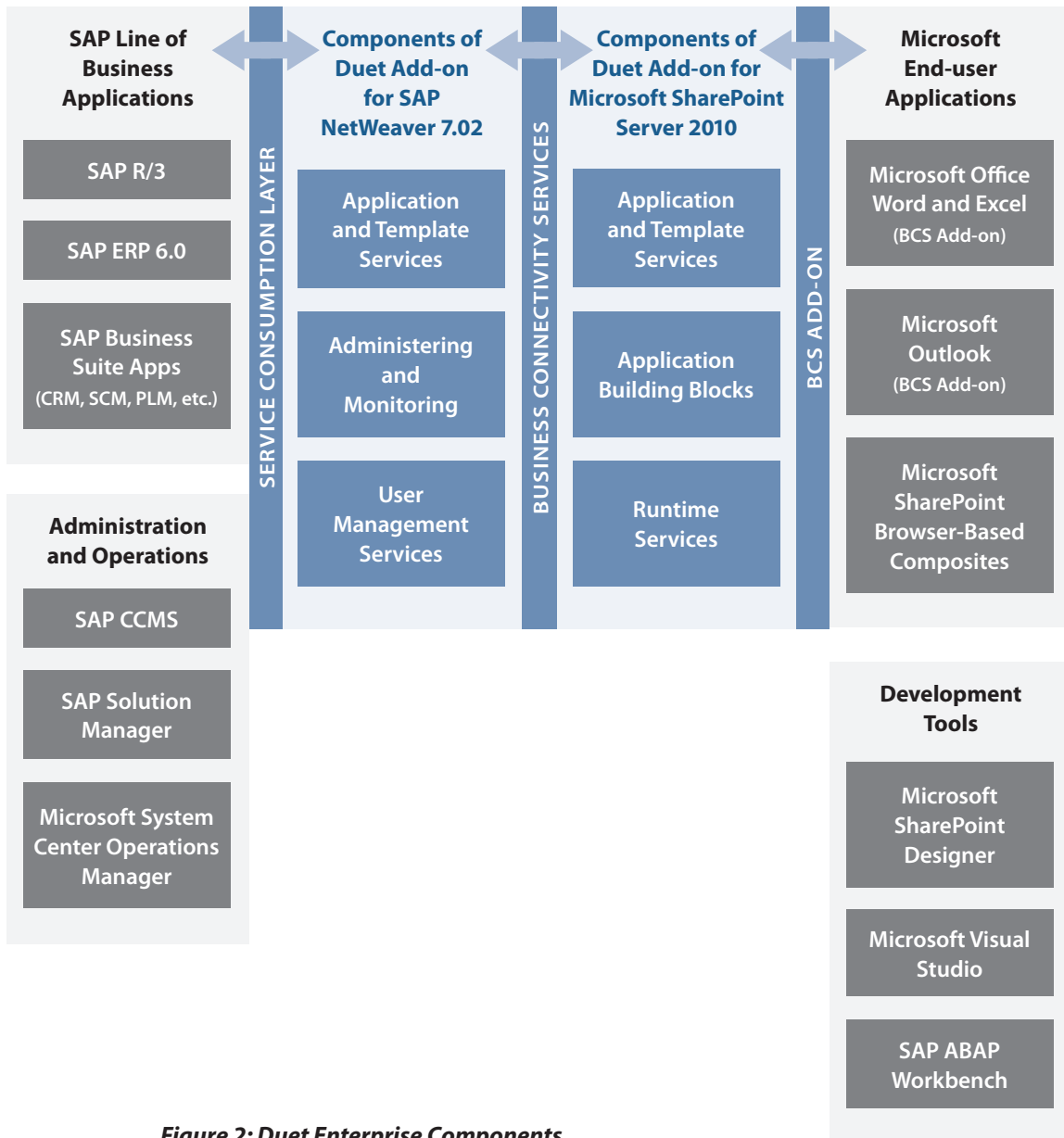


Figure 2: Duet Enterprise Components





The Evolution of Duet Enterprise

Duet 1.0, officially named Duet for Microsoft Office and SAP, was the first version of Duet, reflecting the initial collaboration of Microsoft and SAP to solve the problem of extending the value of SAP applications through the vehicle of Microsoft Office.

Duet 1.0 and the second release Duet 1.5 were the realization of this initial vision. The software focused on providing 11 specific scenarios through which SAP functionality, such as sales management and time and leave recording, could be accessed through Outlook and other parts of the Microsoft Office suite. The focus was to provide complete packaged solutions that would work out of the box.

People who needed these specific scenarios found the products useful, but the initial use case of Duet revealed that a much larger customer challenge could be addressed.

Duet Enterprise is the direct result of feedback from customers and partners who expressed a clear desire for tools and capabilities to solve their unique problems, not closed/fixed implementations of common scenarios. To better meet these requirements, Duet Enterprise is based on SharePoint, Microsoft's business productivity platform, which has capabilities for rapid assembly of composite applications.

Duet Enterprise provides building blocks and ready-to-use site templates that show how to put those building blocks to work rather than focusing on implemented out-of-the-box scenarios.

Duet Enterprise focuses on needed plumbing at every level so that interoperable solutions become very easy to assemble, essentially achieving the solution long sought after using wikis and mashups. For example, with Duet Enterprise, it is now possible to incorporate any generation of SAP enterprise technology into the framework, from SAP R/3 to the latest platform, SAP®Business Suite 7.0.

Duet Enterprise leverages standard SAP and Microsoft mechanisms for security, administration, workflow, reporting, rich user interfaces, and collaboration.

It is important to remember that Duet Enterprise, while benefitting from knowledge gained about Duet 1.0 and 1.5 and extensive customer and partner feedback, is a new, re-engineered product. It is not a replacement or new release version for Duet 1.0 or Duet 1.5.





What Duet Enterprise Makes Possible

The business value of Duet Enterprise comes from assembling composite applications that bring business content and processes from SAP line-of-business applications to users who can be more productive because the user interface is tailored to their needs. SharePoint’s features support collaboration as well as integration of many data sources. The benefits to the bottom line accrue through increased efficiency and agility and higher quality analysis and decision-making. Composite applications close the loop between collaboration, analysis, and taking action through line-of-business applications. The changes to business content, the process and workflow events that take place (see “Process, Workflow, and SAP User Decision Steps Defined”), and the record of what happened are transmitted back to the line-of-business applications.

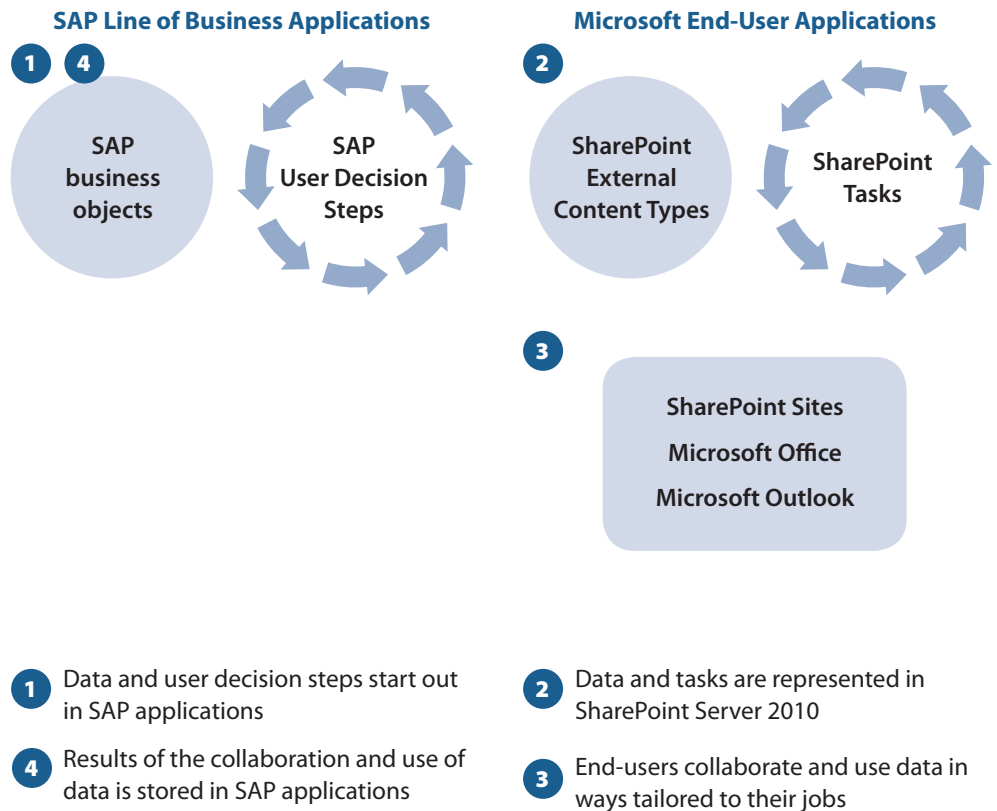


Figure 3: The Business Value of Duet Enterprise





Process, Workflow, and SAP User Decision Steps Defined

The words process and workflow are generally understood to have different but related meanings, although the words are not always used with precision. Process in general has a larger scope. Order-to-cash or procure-to-pay refer to large complicated business processes that span many activities and tasks. Long-running transactions are another form of process that may have many steps that are executed over a period of days, weeks, or months. Workflow generally refers to activities and tasks that have a smaller scope. Workflows sometimes involve a small number of people or those working together in a team on a task of limited duration, such as adding a new employee to an HR system.

The key aspect of both processes and workflows that is relevant to Duet Enterprise revolves around getting input from someone involved in a process or a workflow. SAP applications used the concept of a user decision step to offer the user a choice between different options for the next step in a process or to get approval for an activity. Duet Enterprise allows a user decision step to be surfaced in SharePoint, Microsoft Office, or Microsoft Outlook. The service consumption layer in SAP NetWeaver provides access to the user decision step through the BCS layer. Then SharePoint allows that user decision step to be acted on through SharePoint, through email sent to Outlook, or in a task pane.

Duet Enterprise's efficiency comes from the ability to rapidly get information from SAP applications and develop organization-specific business scenarios using tools that are already familiar. Also, because of its collaborative capabilities, Duet Enterprise lets you involve more staff at all levels than ever before, including decision makers, experts, and staff in the field who can benefit from ready access to business content from SAP applications. You can make focused decisions with more input and richer information in a shorter period of time, which ultimately saves both time and money.

Duet Enterprise is an important step in the implementation of the Office Business Applications (OBA) vision (see "The Vision of Office Business Applications"). It is important to note that there are many paths for Microsoft technology to obtain data from SAP and other line-of-business applications, including Business Connectivity Services and Microsoft BizTalk Server, which will be discussed in a later section. Duet Enterprise will never be the only way to achieve interoperability with SAP. But for easy access through familiar interfaces to business content and process tasks from SAP, enhanced by collaboration and other SharePoint capabilities, Duet Enterprise provides an optimized experience.





The Vision of Office Business Applications

Duet Enterprise is one way that Microsoft's vision for Office Business Applications (OBA) is being realized. OBA was part of the launch of Microsoft Office 2007 to describe a new role for Microsoft's end-user productivity tools. The original Office Business Applications vision is that Microsoft Office, Microsoft Outlook, and Microsoft SharePoint all should become useful ways to craft interfaces to line-of-business applications like SAP.

The Microsoft® Office 2007 release contained the capability to connect Microsoft Office, Microsoft® Exchange, and Microsoft SharePoint to line-of-business applications, such as SAP ERP and SAP® Customer Relationship Management (SAP CRM). The OBA vision at the release of Office 2007 was that Microsoft tools be used as a way to conduct activity inside line-of-business applications through an easy-to-use Microsoft interface while also extending those applications beyond their original capabilities.

The updated version of this vision also includes Microsoft SharePoint 2010 and more specifically the new Business Connectivity Services as part of the mix. SharePoint 2010 recognizes the shift in corporate technology toward the collaborative platforms characterized by mashups, blogs, and wikis that have been forming on the periphery of corporate IT—which, incidentally, are often used by information workers outside the bounds of corporate IT and security, even if to accomplish legitimate business tasks.

Microsoft SharePoint 2010 expands the reach of the OBA vision so that, through the transport mechanism of Business Connectivity Services (BCS), users can not only connect Office applications to line-of-business applications, but also interact with data from Office applications in collaborative platforms such as blogs, wikis, and mashups with the security, controls, and reliability of a full-fledged corporate IT system.

Duet Enterprise links SAP applications with the benefits of the Web 2.0 collaborative world of Microsoft SharePoint, without leaving behind the structure, data quality, and defined processes users have come to expect from the line-of-business world. Key data, workflow tasks, and steps that are initiated from the well-defined processes of SAP applications can be brought into the collaborative environment of Microsoft SharePoint for analysis and completion.

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There, the surrounding context for the tasks and decisions can be extended using unstructured information and various forms of collaboration. Duet Enterprise helps you take a full “roundtrip” with those processes, from unstructured collaboration back into your structured system of record, with all of the attendant controls and metadata that are so critical to your line-of-business system. The broadest vision of OBA is to achieve this kind of rich interactivity with every line-of-business application. Duet Enterprise is the first major step forward, achieving that deep connection and information flow with SAP.

Here are two examples of how Duet Enterprise can have a significant impact:

- **Supplier Sourcing:** Do you work on a sourcing project to find suppliers for a key part? With a composite application created using Duet Enterprise, you can design a collaboration site that pulls in material information, live from the SAP materials master objects, and create a set of sharable documents that allow core information to be used in collaboration with people inside and outside your company. Those newly found suppliers could be entered into the SAP system through a new vendor scenario, which is running on SharePoint. This allows for the engineering team, product team, development team, and marketing team to collaborate on the parts design and helps you find the best vendor to provide the materials
- **Collaborative Quotation:** Many projects require rapid collaboration on a document such as a quotation. Using Duet Enterprise, one team member might view a new quotation, identify the need for input from his team, set up a collaborative workspace and invite the team members, and add data so they can provide feedback. The team joins the workspace and can access the SAP documents they need to view. They then jointly author a response using Microsoft® Word and save the document to the SAP system. The supervisor is then notified that the quotation is ready for approval. All of this is done seamlessly, without emailing documents back and forth or logging in to multiple systems

Enabling collaboration and assembling information environments that allow people to do their jobs better increases business efficiency. It is possible to discover and implement new forms of automation on top of your existing portfolio of applications. Unlike open-source mashups and wikis, Duet Enterprise provides both loosely structured collaboration and execution of well-defined process steps in one consistent, controllable environment that is created and managed using development and operational tools that are already in place.





The Duet Enterprise infrastructure has been created to anticipate the need for interoperability. In most environments, the following benefits should accrue:

- The cost of creating customer-specific solutions drops
- The number of people who can build or configure solutions increases beyond a pool of advanced experts to encompass business users
- The scope of solutions you can build on your own rapidly increases
- You can create a new class of products that were always hoped for but never delivered
- More people in the enterprise can be involved in business processes, increasing compliance and making for a richer design experience
- Task workers and contractors who need to occasionally access processes can get specific access to business content and perform process steps via browsers or mobile devices
- Power users get advanced collaborative environments through rich clients

A Cost-Saving Platform for Interoperability

When you use SharePoint 2010 to access SAP information and processes, the extensibility of your most important applications increases, particularly where outside partners or contractors are concerned. Many internal or external users, the vast majority of whom will be familiar with Microsoft Office, will have a need to access and work with line-of-business processes. By using new solutions facilitated by Duet Enterprise, adoption and extension of your line-of-business systems becomes much easier, and the results are reflected in business metrics. Experience shows that adoption decreases as complex systems such as SAP are extended further away from the finance department that was their initial home. If Microsoft solutions, which have a familiar and intuitive user experience, can be the primary vehicle for adopting line-of-business systems, you can reduce training costs and increase data quality across applications that use both structured and unstructured data. People want a single façade for accessing all their information.





How Duet Enterprise Fits into Established IT Management Practices

Duet Enterprise rests on technology (SAP NetWeaver and Microsoft Office and SharePoint) that most companies have in place and have used for many years. From an IT perspective, Duet Enterprise provides a foundation that leverages existing practices for application lifecycle management functions (installation, application of patches, upgrades), security, scalability, load balancing, backup/restore, disaster recovery, and operational monitoring and troubleshooting. This section reviews the aspects of Duet Enterprise that have the most impact on IT departments.

Add-ons

Because it is a foundation not a platform, Duet Enterprise comes to life by adding its capabilities to existing platforms. To create a working instance of Duet Enterprise, add-ons must be installed on SAP NetWeaver and Microsoft SharePoint that orchestrate existing capabilities.

No add-ons or installation changes are needed on the client applications. SharePoint automatically manages any client side needs. Users of Duet Enterprise can bring SAP information into a Microsoft Office document, such as a customer profile. The information can also appear in Outlook as an email, in an Outlook Office Task Pane, in a Word document, or on an InfoPath® form.

Standards and Existing Systems

Duet Enterprise is built on known and proven components, leveraging preexisting tools and well-proven frameworks, platforms, and development environments. While Duet Enterprise adds new capabilities, it does not require a new set of skills. Everything that is implemented in Duet Enterprise fits neatly into existing systems used for administration, monitoring, landscape management, bug fixing, and upgrades. Users can leverage their existing skills in SAP and Microsoft. Duet Enterprise leverages tools from Microsoft and SAP. From an application perspective, Duet Enterprise extends the usage of standard forms of information such as SAP roles and profiles that can be used in Duet Enterprise. This means that introducing this vital information into wider schemes of collaboration and development occurs in the context of auditable and controllable security. The structure of processes and workflows can also be thought of as a standard form of information that Duet Enterprise allows to be surfaced and used from within Microsoft SharePoint, and Outlook.





Increase IT Effectiveness

Using Duet Enterprise, IT is able to **reduce the backlog of applications** business users' demand of their IT staff. Instead of building 10 applications per year, you can build dozens using the technology platforms you already know and trust. And as access to key process steps are added and collaboration is captured and stored over time, your IT institutional memory grows and becomes richer. And because of its built-in permissions, security controls, roles, and other SAP artifacts, the applications that had been lying fallow or partly finished because the development team ran out of time and had to move on to the next project can now be deployed in days rather than weeks or months. The more pernicious aspects of bringing to life—and maintaining and supervising—a SharePoint application using business content and process steps have been streamlined to a high degree. The detailed functionality that supports these productivity claims will be explored in “The Anatomy of Duet Enterprise” later in this paper.

Using Duet Enterprise also **opens the door to a much broader range of developers** than ever before. This means that the supply of SAP ABAP programmers is no longer a bottleneck to creating applications that extend the functionality and data from SAP to a wider group of users.

Mash Up Without Making a Mess

Duet Enterprise provides an answer for the quest to assemble information quickly from a variety of sources, combining structured and unstructured data, for the execution of one or more business scenarios.

The historical difficulty of creating customized composite applications is that they cannot be monitored, compliance cannot be analyzed, and the project does not fit within the larger complex of enterprise applications, operational procedures, or development methodology. Duet Enterprise addresses this conundrum by allowing developers to build collaborative applications, knowing that, from an SAP perspective, they can be monitored and secure. This unique joint development uses both SAP's technology for monitoring and diagnosing programs and Microsoft's development and monitoring tool sets.





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In the past, IT managers have been burned by technology that expanded the scope of developers. Small database applications and hastily created web servers initially met user needs, but then became a management problem for IT. With Duet Enterprise, the entire application lifecycle is addressed: **the problems of administration, operations, security, and compliance have been anticipated.** IT managers can allow a larger number of people to put Duet Enterprise to work because the applications that users create are closer to production-ready than those created by ad-hoc means from scratch. All of the support and infrastructure that accompany a new application is already in place with SharePoint. The extensibility and range of applications increase, without “reinventing the wheel.”

In other words, Duet Enterprise allows companies to **mash up without making a mess.** You can mash up as much as your needs require, but you are still within an environment that is manageable, and there is no need for retraining. Using Duet Enterprise means that you reuse not only the technology you have, but also the infrastructure, the skills, and the operational procedures that have underpinned your business to date. Further, **Duet Enterprise provides end-to-end traceability** so that you can track any problem that develops from SharePoint through to the SAP system and back out again, reducing troubleshooting time.

The Anatomy of Duet Enterprise

As we pointed out earlier, Duet Enterprise completes an evolution from a previous emphasis on implementing specific business scenarios to the creation of a foundation that allows companies to construct new solutions in the form of composite applications. This section provides a tour of the four types of capabilities used to create composites:

- **Ready-to-use sites:** Site templates to construct collaboration workspaces for five important business objects
- **Ready-to-use components:** Components that help to make your composites richer
- **Building blocks:** Aspects of the Duet Enterprise foundation that help create complete, manageable composites
- **Development tools:** The tools used to create the components that are assembled into a composite with Duet Enterprise





Duet Enterprise Pre-Built Site Templates for SAP Business Content

Site templates are one of the most powerful parts of Microsoft SharePoint that is exploited by Duet Enterprise. These templates allow a collection of web pages and web parts to be captured in a template so that new collaboration workspaces can be created at the click of a button.

Duet Enterprise provides ready-to-use site templates for the following SAP business objects:

Customer ■ Employee ■ Product ■ Customer Inquiry ■ Customer Quote

For example, if you want to create a collaboration workspace for a specific customer, you first go to the SharePoint administrator and ask for permission to create such a workspace. Then, an end-user can create a site based on that template. Once created, you can select which specific Customer objects will be the focus of the collaboration on the site. You can then use the existing web pages and web parts that allow customer information to be examined and updated and related objects such as the Sales Contact object to be viewed. You can also add new web parts to the site, but if you want them to become part of the template for future users, you must edit the template in SharePoint Designer. The SAP business objects can be updated and documents can be added to the SAP system from SharePoint. As we will discuss in more detail later in the “Duet Enterprise Workflow” section, it is possible to bring workflow steps from SAP applications into SharePoint and Microsoft Outlook for analysis and execution.

These site templates are possible because of several components that are used by Duet Enterprise.

- Security and single-sign on is the functionality that allows a SharePoint profile to be used to gain access to an SAP system. This functionality rests on Duet Enterprise’s ability to synchronize SharePoint’s user IDs to SAP user IDs
- BCS allows SharePoint External Content Types to be populated with data from SAP applications
- The service consumption layer in SAP NetWeaver 7.02 allows the web services used by BCS to get to the Customer business object and related business objects. If you want to get access to objects outside of the first five created, some services must be enabled using SAP NetWeaver





A more detailed description of the interactions between BCS and the service consumption layer in SAP NetWeaver 7.02 is provided in “The Personality of Duet Enterprise Composites” later in this paper. But a few points are worth mentioning about how the site templates show what can be done with Duet Enterprise:

- **Making Objects Flat:** Most of the time business objects in SAP or any other enterprise application are accessed in a hierarchical fashion, where a master object has many other subsidiary objects hanging off of it. The site templates in Duet Enterprise present the flattened view of the business objects created in the SAP NetWeaver service consumption layer. The flat table of objects is far easier to deal with in a collaborative setting or in Microsoft Office applications
- **Supporting Mixed Generations of SAP Applications:** Duet Enterprise, along with supporting interoperability features from SAP, was designed to enable the creation of web services that allow business objects from any generation of SAP applications to be accessed through Duet Enterprise. In other words, if you have information in SAP R/3 in one part of the company and in SAP ERP 6.0 in another, Duet can bring together business content from both applications in a unified fashion on Microsoft SharePoint
- **Support of Distributed SAP Environments:** Duet Enterprise allows business content from SAP applications distributed throughout the world to be brought together in one unified view. Through the BCS and the service consumption layer of SAP NetWeaver 7.02, Duet Enterprise can bring all of the information across the entire collection of applications together in one place for analysis and collaboration

Duet Enterprise Ready-to-Use Capabilities

While the ready-to-use site templates do provide a clear example of what sort of applications Duet Enterprise makes possible, the full promise of Duet Enterprise is intended to be realized by companies and systems integrators creating their own composite applications for special purposes. The following list of components can be used out of the box to enhance a SharePoint site or as part of special purpose composite applications and templates built on SharePoint.





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A variety of reusable capabilities will be needed by composites. The following capabilities of Duet Enterprise provide ready-to-use functionality to accelerate development. While this list may be extended in the future, right now the ready-to-use components consist of:

- Duet Enterprise Reporting
- Duet Enterprise Profile
- Enterprise Collaboration
- Duet Enterprise Sites
- Duet Enterprise Workflow

Duet Enterprise Reporting

With Duet Enterprise, SAP reports can be retrieved directly from SharePoint and Office applications. End-users can subscribe, schedule retrieval, and get automatic delivery of reports and run ad hoc reports. Reports are delivered to SharePoint in all formats supported by SAP reporting. Administrators can monitor and control all of the report templates to which an end user has access, from both a configuration and a permissions standpoint.

Duet Profile—My Site Enrichment

Duet Enterprise allows you to enrich SharePoint's User profiles with HR data from your SAP system. For example, if someone in your organization changes titles, it will be reflected immediately in My Site, if you enable that feature.

Enterprise Collaboration

SharePoint has multiple collaboration features such as shareable documents, discussion forums, blogs, wikis, tagging, document sets that share common metadata, workflow, task management, and integration with Office Communication Services that allow users to collectively get work done.

With Duet Enterprise, you can collaborate around an SAP business object. For example, if you are working on a purchase order, you can bring together data from disparate business units, and those content users can use a site template to create a collaboration site on the fly around that order and share information that will populate the fields until the order is complete. If you're working on a big proposal, you need qualifications, resumes, and data from across your organization—or several organizations if it is a joint venture. Instead of concentrating responsibility in one person, who will be relying on email threads and attachments, with Duet Enterprise, you can centralize the proposal effort, drawing off information in one or more SAP and Office systems.





Duet Enterprise Sites

The ready-to-use Duet Enterprise Site definition templates that allow quick access to five specific SAP business objects show one way to put a template to use. Microsoft SharePoint Designer makes it very easy to create templates of all sorts. These templates can include web pages, web parts, and any Duet Enterprise or SharePoint features. Site templates are an excellent way to capture knowledge and best practices about how to execute informal processes or to support specific business roles and analysis tasks.

Duet Enterprise Workflow

When SAP applications need to have an end-user make some decision as part of a workflow, the software represents the set of possible actions as user decision steps (see “Process, Workflow, and SAP User Decision Steps Defined”). For example, if a vacation is requested, the user decision steps may offer two choices: approve or reject. Duet Enterprise allows such user decision steps to flow into SharePoint and become workflow tasks that can be assigned to users and sent out through email templates so that action can be taken on the tasks through a message in Microsoft Outlook or from a workflow site in SharePoint.

The automation of user decision steps starts with services created in SAP NetWeaver that expose the user decision step through BCS. Then, in the Microsoft SharePoint administrative interface, the BCS services are mapped to SharePoint tasks and email templates so that the action taken can be recorded and sent back to the SAP application.

Building Blocks for Manageable and Compliant Interoperability

While the ready-to-use capabilities of Duet Enterprise provide components that can be included in composite applications, the building blocks for interoperability operate under the hood. The capabilities described in this section work together to make sure that nothing is missing from a composite application created using Duet Enterprise. The capabilities in this category include:

- Administration and Supportability
- Security and Single Sign-On
- Landscape Management
- Application Lifecycle Management
- Offline Support





Administration and Supportability

Duet Enterprise uses existing tools from both SAP and Microsoft for administration and operations monitoring, which avoids the need for extensive training during adoption. Duet Enterprise directly uses Microsoft's SCOM and SAP's CCMS. Duet Enterprise uses plug-ins to these well-known tools, ensuring that monitoring and troubleshooting is quickly enabled and effectively achieved, using tools your team already knows.

In addition, Duet Enterprise's development team has provided a set of "health rules" for the SharePoint Maintenance Engine (SPME) to enable the monitoring of components within the SAP stack while message-oriented middleware (MOM) packs provide the interface between Duet Enterprise and Microsoft's built-in monitoring capabilities.

Security and Single Sign-On

The engineers behind Duet Enterprise have smoothed the connections between SAP and Microsoft security environments, which means you can have single sign-on (SSO) capabilities throughout your session, no matter where your information resides or whether you have different passwords or administrative privileges for different platforms. All of the integration has been pre-engineered through the use of mapping tables embedded in Duet Enterprise that map SharePoint user accounts to SAP user accounts.

Additionally, for complicated scenarios, such as Sarbanes-Oxley (SOX) compliance, where multiple personnel have varying levels of privileged access to different components throughout the landscape, Duet Enterprise enables these roles in a graphically simple, straightforward format by way of the people picker in SharePoint. All of the role assignments in SAP can be ported directly into SharePoint so that you don't have to rebuild them to work collaboratively on a project with a complicated permissions structure.

Landscape Management

Duet Enterprise uses capabilities in Microsoft SharePoint and SAP NetWeaver to enable failover scenarios, use mechanisms such as load-balancing, and connect to multiple back-end systems. For example, if your organization has multiple ERP systems across several locations, you can connect each of these systems to one Duet Enterprise environment, through which you can construct the mechanisms to manage the routing between them. That means that if a certain user from North America works out of an office in Asia, when she logs in, she automatically gets information from the corresponding SAP system.





Application Lifecycle Management

Duet Enterprise employs Microsoft and SAP tools and practices to maintain the entire lifecycle of an application as it passes through the commonly understood stages of Expose, Compose, Consume, Deploy, and Innovate.

Microsoft SharePoint 2010 has been enhanced with Application Lifecycle Management features that allow an orderly process of update management including solution updates, features updates, and logging mechanisms. Along with SharePoint 2010's enhanced ability to manage sites that were already deployed, these capabilities simplify the management of a suite of composite applications used broadly over a global IT landscape. The Click Once feature is also supported to deploy solutions created by Duet Enterprise to Microsoft Office.

SAP's capabilities for managing the solution lifecycle and changes to the system landscape can be applied to both its own products, to components of Duet Enterprise that run in SAP NetWeaver, and to custom development.

In addition, through Microsoft SharePoint and SAP NetWeaver, it is possible to set up access controls, ensuring that you have a reliable and safe rollout to each new geographic region or user group.

Offline Support

Through BCS, Duet Enterprise has built-in support for taking applicable types of content offline. As much as we live in a connected world today, it's still a fact that we, and our machines, are often offline, for example, on a flight or during a client visit. Duet Enterprise helps you to get the data you need onto your laptop or mobile device while you're offline.

This happens in two ways. First, the BCS Rich Content Services allow data to be moved into Outlook items, Task Panes, and Word content controls. For example, if you are visiting a customer, you can bring customer data into context within Outlook and have their information ready to access in one place, without being connected to core systems.

The second way this happens is through SharePoint's capability to store data in external content types in an offline mode.





There is risk inherent in offline operations for many companies—without proper security controls, employees make changes and spirit away data on laptops or USB drives, and the changes are never recorded. With SharePoint, when employees go back online after having made changes offline, the program will be aware of the changes made.

Duet Enterprise is aware of the roles of SAP users and accordingly provisions data. Because SAP users must use their single sign-on to access documents and applications related to or created with Duet Enterprise, roles that have been created in SAP are invoked in offline data. That means that even if a user opens a new PowerPoint document or Excel spreadsheet while offline, it will have the same security protections and encryption as any application the same user accesses online. Thus, access via roles is centralized, even when employees and partners are dispersed and working on a variety of devices with varying levels of connectivity to core systems.

Development Tools

Because Duet Enterprise is a foundation, not a platform, it does not have one development environment, but instead makes use of the standard development tools of each platform involved depending on the needs of the composite application. Here is list of the different development tools that may be used in order of frequency:

- **SharePoint Designer** is the primary tool used to create composites declaratively, that is, through changing settings and manipulating templates, not by writing code in programming languages. SharePoint Designer allows business power users to create new sites, applications, and document lists. Web parts, site templates, and all of the ready-to-use capabilities of both Duet Enterprise and SharePoint itself are brought together in this environment to allow rapid creation of composites founded on SAP business content
- **Microsoft Visual Studio** and the .NET development environments can be used to create special purpose components with advanced functionality. Components built using Microsoft Visual Studio include Microsoft Silverlight, Outlook Task Panes, custom UIs, and advanced business logic that may be included in a Duet Enterprise composite are all constructed using Microsoft Visual Studio





- **ABAP Workbench** is used along with the service consumption layer in SAP NetWeaver 7.02 to implement web services that are invoked through BCS stereotypes to communicate between SharePoint and SAP. (More details on how this works will be provided in “Choosing the Right Tool for the Job: Duet Enterprise, BCS, and BizTalk Server”). If advanced business logic is required on the SAP NetWeaver side of a composite, ABAP Workbench will be used to create advanced functionality and Duet Enterprise-enabled web services that can be incorporated into composites if needed

The ability of Duet Enterprise to create composite applications through SharePoint sometimes can cause confusion because so many other tools in the Microsoft universe are also able to build or play a role in creating composite applications based on data in other applications. It is worth taking the time to explain how each of these technologies is related to Duet Enterprise:

- **Microsoft Silverlight** is a technology that can be used to create rich user interfaces or special purpose components that can be delivered through a browser. Microsoft Silverlight can play a role in Duet Enterprise by creating web parts that may be included in SharePoint site templates or on web pages used in Duet Enterprise composites. Silverlight components are developed in Microsoft Visual Studio
- **Microsoft Office and Microsoft Outlook** both have BCS add-ons that allow business objects created in Microsoft SharePoint using Duet Enterprise to be incorporated into documents and interfaces. The Outlook task pane is a popular way to expose advanced functionality from a Duet Enterprise application in Outlook. The BCS add-on also allows data in a SharePoint external content type to be incorporated in Word or InfoPath forms

It is important to note that many of the development environments mentioned are quite powerful and it is possible to implement a composite in many different ways. Microsoft Business Connectivity Services (BCS) can be employed through SharePoint Designer to connect with data from non-SAP applications. Microsoft BizTalk Server can be used to create more complicated integrations and process orchestrations with SAP and non-SAP applications. Duet Enterprise does not aim to replace these environments, but instead seeks to be the right way to implement a specific type of application, one that is founded on SAP business objects and workflows. The next and final section of this paper will explore the personality of the composites that are most appropriate for Duet Enterprise, BCS, and BizTalk Server.





Choosing the Right Tool for the Job: Duet Enterprise, BCS, and BizTalk Server

Today's enterprises are enormously complex and rely on heterogeneous systems to run business processes. Even where SAP is the dominant application, there are usually other major systems of record, such as mainframes, databases, and competing ERP systems that play key roles in business operations. The integration of business content and the automation of processes that cross many applications is a goal that all technology vendors have sought to enable. Microsoft has developed BCS and BizTalk Server over many years to help business reach higher levels of integration and automation. Those who have participated in many generations of IT adoption will certainly wonder why a new foundation such as Duet Enterprise is needed. Such a person might ask, "Isn't the goal of SharePoint itself, along with Business Connectivity Services and BizTalk Server, exactly the same as what Duet Enterprise is seeking to do?"

The answer in the broadest sense is yes: supporting interoperability is the goal of all of the systems mentioned. But the general case is not really that important when selecting a method to create an application. What is crucial is the specific nature of the composite application in question, what we are going to call the personality of the application for the purposes of this discussion. To that end, we now turn our attention to the personality of the sorts of composites best served by Duet Enterprise, Business Connectivity Services, and BizTalk Server. A longer discussion of the workings of each technology follows, but here is a quick summary of the differences:

- Duet Enterprise is a foundation to support the creation of SharePoint- and Microsoft Office-based applications focused on interoperability between SAP and Microsoft. Duet Enterprise is best employed when:
 - The application will be created utilizing SharePoint and is driven by user interaction versus the machine-to-machine interaction in BizTalk Server
 - The data in the application primarily comes from SAP applications and also has a need to include unstructured data as well
 - The application will send data back to SAP applications
 - The application is needed to blend information and processes from SAP Applications and unstructured information from SharePoint





- The application is taking advantage of the set of ready-to-use capabilities that are delivered with Duet Enterprise
 - The application needs to be able to offline data from the SAP application in SharePoint or Microsoft Office
 - The data in the application comes from many different generations of SAP applications
 - The application seeks to allow users to execute user decision steps from SAP processes inside SharePoint or Microsoft Outlook
- BCS is a general-purpose platform for integrating SharePoint and Microsoft Office with any line-of-business platform or application. While BCS has amazingly broad reach, it is not optimized for any particular situation. BCS is best employed when:
- The application will be created in SharePoint
 - The application needs to be able to offline data in SharePoint or Microsoft Office
 - The application does not have SAP business content as its primary focus
 - The application uses data from many different non-SAP applications
 - The application requires information from non-SAP systems in addition to that of SAP systems
 - The focus of the application is primarily data integration as opposed to process integration or process monitoring
- BizTalk Server is a process automation, messaging integration, and process monitoring technology that is best employed when:
- The composite application is aggregating information from multiple line-of-business applications
 - The application is created in SharePoint and needs to connect to multiple data sources through BCS where BizTalk can provide connectivity to various systems
 - The application is focused on automating a process or long running transaction that spans across many applications
 - The user interfaces may be in many different environments and applications (including SharePoint) or may require more machine-to-machine interaction





- The application is focused on monitoring a process that may span many applications
- The application is focused on communicating through XML messages
- The application employs many industry standard protocols for electronic data interchange or ecommerce, such as SWIFT, Health Level Seven (HL7), and RosettaNet
- The application involves applying business rules to process messages or events
- The application is based on the enterprise service bus paradigm

It is important to remember that the guidance just offered is an attempt to describe the personality of each application.

Combinations Are Allowed

The difficult part of attempting to describe the sweet spot for Duet Enterprise, BCS, and BizTalk Server is that each technology is powerful, meets overlapping needs, and can be used together. For example, it is easy to imagine a scenario in which the following is true:

- Duet Enterprise is used to create an application in SharePoint to monitor and allow collaboration for supply chain activities managed in SAP applications
- BCS is used to move information back and forth from a variety of non-SAP supplier systems
- BizTalk Server is used for part of the application that automates the purchase and monitors the flow of goods being acquired from an intercompany exchange that uses the RosettaNet protocol

So in a case like this, it is not either/or but a choice of applying each technology to do what it does best. In other words, Duet Enterprise, BCS, and BizTalk Server stand side by side. You can accomplish virtually any scenario in SharePoint using one of these solutions or some combination of them. Duet Enterprise is compatible with, supported by, and extensible through BCS, BizTalk Server, and web services. What's important to remember is that using the wrong tool for the job is a needless expenditure of effort, time, and money.





It is important to point out that we need not cover the entire breadth of SharePoint in detail to explain the personality of applications that best fit Duet Enterprise and BCS. Any SharePoint application, whether it uses Duet Enterprise or BCS to access data from other applications, can have collaboration features such as blogs, wikis, discussion boards, tasks, workflows, and custom web parts. For example, Microsoft Silverlight can be used to enhance the user interface of a company with any of the personalities mentioned. In the same way, Microsoft Visual Studio and SAP's ABAP Workbench could be used to create advanced components for each of these composite personalities.

The Personality of Business Connectivity Services Composites

So far, we have made it clear that a certain class of applications has a Duet Enterprise personality and others have a personality more suited to the application of BCS. But to provide some help for determining which technology to apply, it is important to go deeper into the mechanisms used. The goal of this section is to help you understand when an application you are planning to build may be best suited to use BCS directly.

Our explanation starts with BCS because Duet Enterprise builds on BCS and adds new capabilities. This section covers what BCS does and provides an analysis of when it is best used. The next section looks at what Duet Enterprise adds. The following section looks at how BizTalk Server works and when it is appropriate.

What BCS Does

Microsoft Business Connectivity Services provides read/write access to external data from line-of-business systems, web services, databases, and other external systems. BCS can leverage BizTalk WCF adapters to connect to various line-of-business systems.

BCS provides a consistent and familiar way for the user to work with data no matter where it is. Whether the data is in SharePoint or in a system external to SharePoint, the user can deploy BCS to manage that data. Using SharePoint Designer or Visual Studio, developers can build solutions from that data through the familiar user experience of SharePoint and Office. Because BCS is centralized, corporate IT can centrally manage business data and maintain control over the applications, abstracting the information for the user's purposes.





BCS was developed to provide a systematic way to create reusable connectivity to external applications from Microsoft SharePoint and Microsoft Office. The goal of BCS is to make it as easy as possible to move data back and forth from external systems.

BCS also is aware that security and authentication, search, indexing, and other functions must be addressed as part of moving data back and forth.

In essence, BCS provides a simplified model of programming to allow SharePoint to have the connectivity desired. BCS defines stereotyped functions for data access (Create, Read, Update, Delete) and for all of the other functions mentioned. SharePoint can have a conversation with this simplified layer and then BCS does the translation to match the specific type of conversation that is taking place. Remember BCS provides only half the picture; if pre-built adapters have not been constructed, there must be coding on the external system to talk to BCS.

BCS then represents the data coming in as an external content type, either a list or a column. These external content types are then connected to SharePoint external lists, which can be used in many ways. BCS also has Add-ons for Microsoft Office and Microsoft Outlook that allow the data to be used from those environments and to be stored offline. Figure 4 shows the capabilities of BCS on page 30.

BCS Rich Client Components provide the connectivity to Microsoft Office 2010 applications like Word and Microsoft Outlook. Content controls in Word, for example, could be connected to a BCS external data column to retrieve a pick list for a product from an external application. In Outlook, a set of data from an external list could be represented in an Outlook task pane. SharePoint lists can also be connected. It is important to remember that this connectivity is virtual; the data still lives in the external application but it can be accessed from SharePoint and Microsoft Office. Selected data can be taken offline to Outlook 2010 or SharePoint Workspace 2010 if desired.

BCS External Lists, External Data Columns, Business Data Web Parts, and External Data Search are the workhorses of BCS. These capabilities allow the data from the external sources to be mapped to SharePoint lists, pages, tasks, and rich client Components. Functions for indexing content and searching are provided.

The **Secure Store Service** and **User Profile Pages** capabilities provide a general purpose way to authenticate users and transfer user information into SharePoint profile pages.



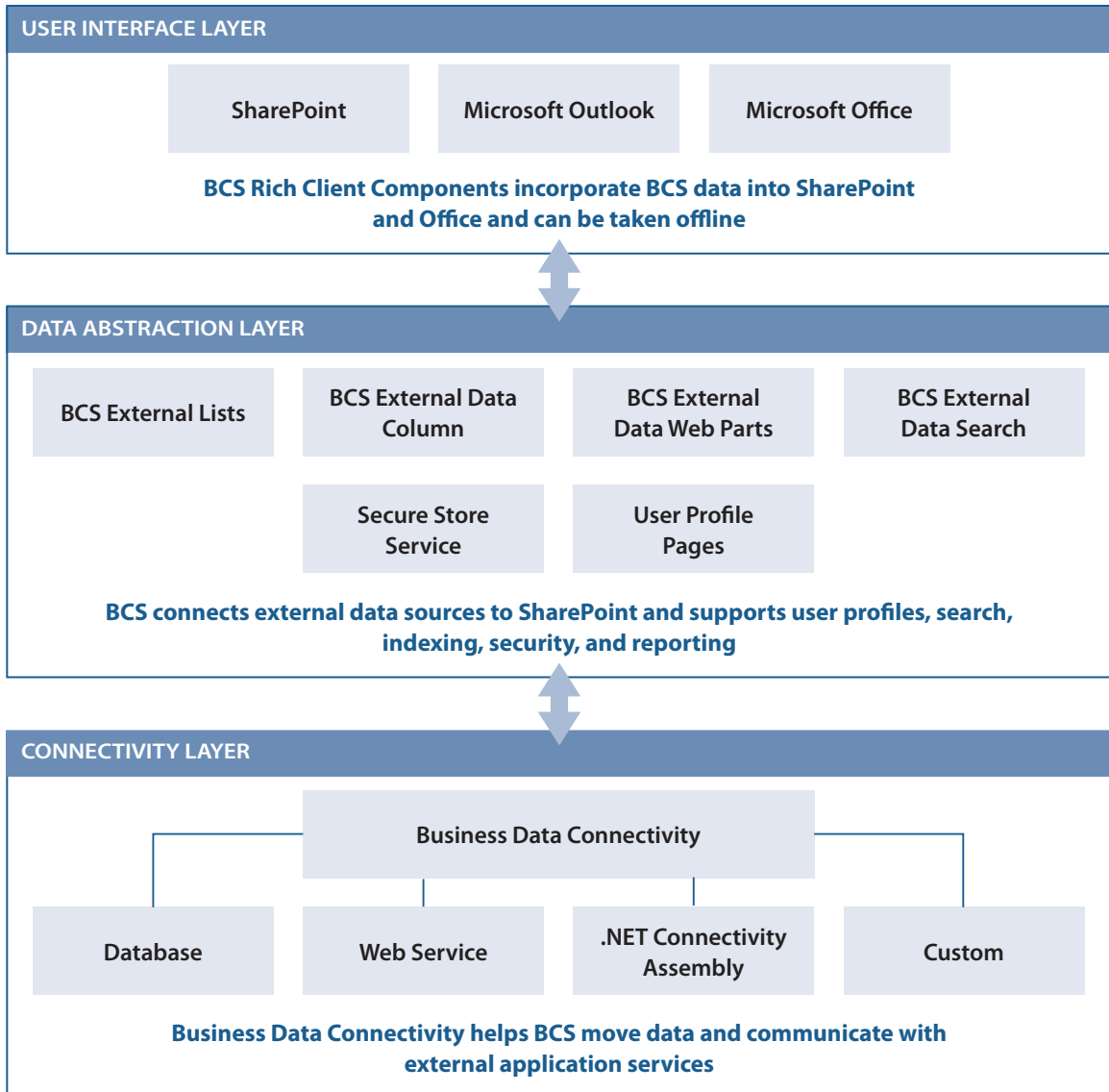


Figure 4: Business Connectivity Services Capabilities





Business Data Connectivity is the layer that translates the simplified programming model of BCS into the detailed programming required to handle the complexities of moving information back and forth between databases, through web services, through the .NET connector framework, or through custom methods.

Developers can leverage BCS to control the way data is moved back and forth. To make BCS work, a developer must understand how the simplified programming model is used to get access to the external system, to search for the desired content, to retrieve that content into an external content type, and then use that external content type in a SharePoint list, web part, or rich client component. Generally speaking, you should use BCS if you want to aggregate content from SAP and another system and bring that content into SharePoint and Office.

The Personality of Duet Enterprise Composites

When we talk about Duet Enterprise and BCS, it is not an either/or proposition. Duet Enterprise is built on top of the BCS backbone. In addition, Duet Enterprise also has components created on top of the service consumption layer in SAP NetWeaver 7.02. The advantages of using Duet Enterprise come in two ways:

- Through general purpose components created on top of BCS and the service consumption layer in SAP NetWeaver 7.02 to make SAP business content easy to access
- Through ready-to use site definitions for five specific SAP business objects

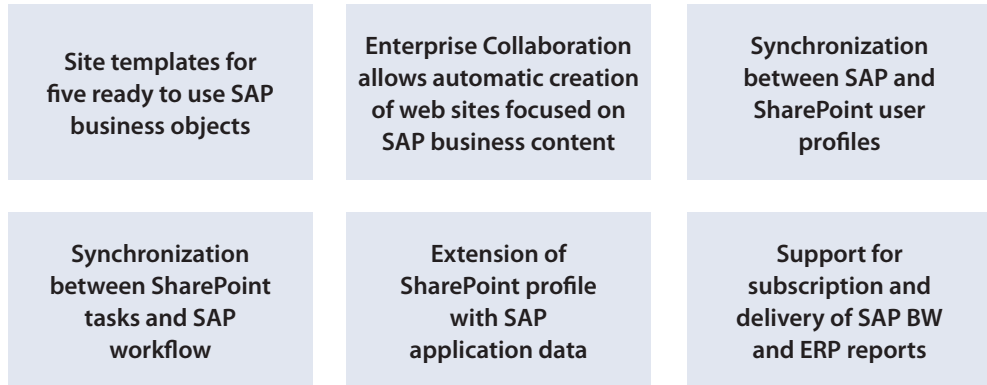
The extra capabilities that Duet Enterprise provides on top of BCS are shown in Figure 5 on page 32.

The ready-to-use site definitions provided by Duet Enterprise have been described earlier. The advantage of using Duet Enterprise for construction of new applications is based on the acceleration of development provided by the general purpose components. For most applications that involve using SAP business content from SharePoint, the functionality provided by these general purpose components would have to be implemented somehow. In most cases, Duet Enterprise provides the least expensive pathway to creating such applications.

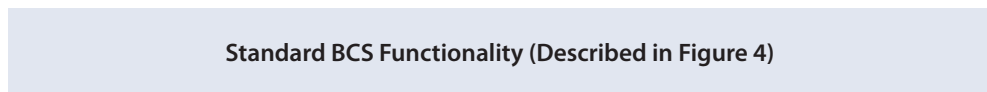




Duet Enterprise Components Added to SharePoint Server 2010



Duet Enterprise Components Communicate with SAP through Standard BCS Capabilities



Duet Enterprise Components Added to SAP NetWeaver 7.02 through SAP service consumption layer

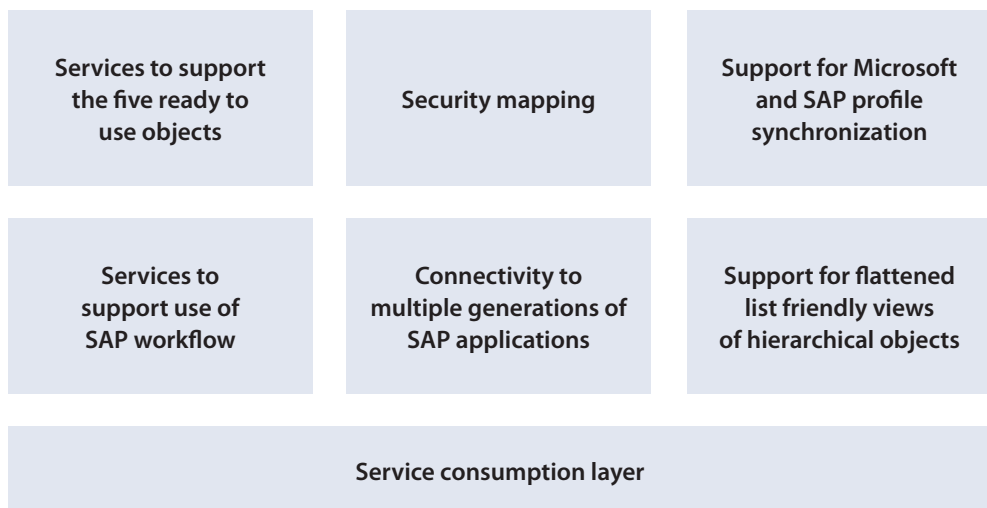


Figure 5: Duet Enterprise Components built on top of BCS and the SAP service consumption layer





For example, **enterprise collaboration** allows sites that focus on SAP business content to be rapidly created by end-users once a site template has been defined. These site templates have a huge head start to becoming fully functional composite applications because of all the componentry in the Duet Enterprise foundation.

The **single sign-on and user-profile synchronization** feature of Duet Enterprise uses the capabilities of the Secure Store Service and the security features provided by the service consumption layer of SAP NetWeaver 7.02 to automatically authenticate users who are trying to access business content in SAP systems. Duet Enterprise uses the BCS User Profile service and capabilities added to the service consumption layer of SAP NetWeaver 7.02 to synchronize user profiles from SAP to SharePoint. In both cases, Duet Enterprise solves this problem for many generations of SAP applications.

To allow **user decision steps** in an SAP application to be handled through SharePoint, a workflow handler must be created in the service consumption layer of SAP NetWeaver 7.02. The services must then be registered and connected to email templates or Outlook task panes using the SharePoint administrator interface. Then, the user decision steps can be executed from SharePoint or Outlook. Any external content associated with the user decision step is kept up to date. Duet Enterprise supports all of this activity.

Duet Enterprise also offers the ability to access SAP content and to take that content offline via Outlook or a SharePoint workspace. **Delivery and formatting of reports** from SAP to SharePoint is also supported.

In all of these cases, Duet Enterprise adds components to both Microsoft SharePoint 2010 as well as on top of the service consumption layer of SAP NetWeaver 7.02.

Duet Enterprise lets you take advantage of the power of BCS without any of the attendant issues that plague applications built from scratch, allowing you to focus on the parts of your application that provide business value directly rather than worrying about the plumbing beneath it. Also, Duet Enterprise is specific to SAP and takes care of all the underlying plumbing between the two platforms while BCS is generic. The more an application is concerned with SAP business content, the more Duet Enterprise will accelerate development.





The Personality of BizTalk Server Composites

BizTalk Server provides connectivity between core systems both inside and outside your organization. It is optimized for machine-to-machine transaction management and systems integration.

BizTalk is primarily an integration server that can also automate processes that span many applications. BizTalk Server allows users to manage these processes from interfaces that can be embedded in many different applications.

BizTalk Server also has advanced business rules capabilities that can be used to transform and route information in XML messages. BizTalk Server is often used to implement systems that fall under the enterprise service bus paradigm.

BizTalk Server does its work this through the following facilities:

- **Cross Application Process Automation:** Unlike BCS or Duet, BizTalk Server is primarily process focused. New processes or long-running transactions can be defined in BizTalk Server that execute and orchestrate processes implemented in other applications. BCS and Duet Enterprise are primarily focused on bringing existing processes to the world of Microsoft SharePoint and Office
- **BizTalk Messaging:** BizTalk Server uses the Messaging and the Orchestration Engine to provide the underlying architecture for integrating and exchanging messages between various services, both within and outside your organization. BizTalk Server implements the publish/subscribe model to route messages. The publish/subscribe model enables developers to design processes and services that subscribe to messages rather than create point-to-point connections between two services. This enables new service providers and consumers to be added or existing services to be modified without having to redesign the application
- **B2B Integration:** BizTalk Server also enables business-to-business integration. Through its support of communications EDI protocols such as SWIFT, HL 7 and RosettaNet. BizTalk Server automates processes with outside partners, including those in different business verticals from your own. Thus you can run a process on a single system or run processes across multiple systems based on business-to-business transactions
- **Business Rules:** BizTalk Server has a powerful ability to automate the response to process events or messages using business rules. This allows advanced automation to be created that can be configured with greater ease than if a programming language was used





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- **Adapters:** BizTalk Server has more than 25 adapters to established systems, such as mainframes and databases. These adapters can be used from BCS for connectivity to line-of-business applications. BizTalk Server can seamlessly convert a mainframe “green screen” into SharePoint forms, for example. It also supports Oracle eBusiness Suite, JD Edwards, SAP Business Suite and others, including Microsoft Dynamics. Users who need to integrate and automate processes between these platforms and SharePoint, and between SAP and other platforms, should use BizTalk Server
- **Business Process Monitoring:** BizTalk Server has advanced capabilities for tracking the execution of processes. These capabilities are used to help track and implement long-running transactions and to create systems that fall under the umbrella of Business Activity Monitoring. The processes monitored can be automated in BizTalk Server or external applications

In a heterogeneous environment with multiple data sources and applications, when there is a need to create a process and monitor it, BizTalk Server fits the bill. BizTalk Server is optimized for automated process-based transactions and for scenarios that do not require a user-centric interface. Unlike BCS and Duet, BizTalk Server is not SharePoint focused.

Conclusion

Microsoft created Duet Enterprise to accelerate creating SAP-centric composite applications in SharePoint and Office, not to replace BCS and BizTalk Server. In fact, Duet Enterprise is built on top of BCS.

The goal of this document is to bring to light the specific capabilities of Duet Enterprise and to compare and contrast them to BCS and BizTalk Server. With this information in hand, we hope that you are able to make an informed decision about how best to leverage your investment in technology to serve your business.

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