

SharePoint Composites Handbook

A guide to creating business solutions with little or no code

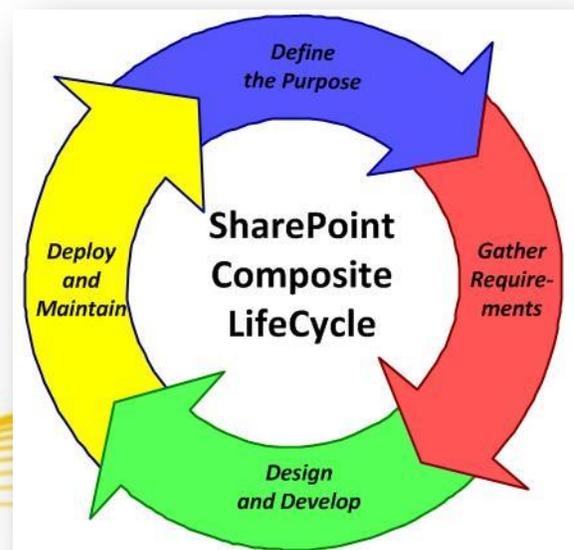
By Mark Gillis
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Summary

This handbook is intended for:

- Information workers, who want to create simple-to-develop, no-code solutions so they can rapidly respond to business needs.
- IT Technical staff, who want to develop solutions and prototypes with little or no code.
- Decision makers, who want to understand the benefits of SharePoint Composites for businesses of all shapes and sizes.
- Anyone, who wants to dramatically improve business productivity and become more agile in the workplace.

*SharePoint Composites make
collaboration-based business
solutions easier, faster, and better.*



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Contents

Part I: SharePoint Composite Fundamentals	5
What is a SharePoint Composite?	5
Why you should start creating SharePoint Composites	6
Understanding how SharePoint Composites scale and evolve	7
Building solutions on the SharePoint platform	8
Office 2010 integration points	10
Power tools for power users	13
SharePoint Designer 2010	13
InfoPath 2010	15
The SharePoint Composite solution life cycle	17
Define the purpose.....	19
Identify the requirements	19
Design and develop	31
Deploy and maintain	31
Pushing the SharePoint Composite envelope	31
Using JavaScript	32
Using Web Services and REST.....	33
Using code-based extensions in a sandboxed solution.....	33
Part II: Common SharePoint Composite design patterns.....	34
Beginning site customization.....	34
Advanced site customization.....	35
Document Information Panels	37
Social Computing.....	38
Dynamic diagrams	39
Form-centric solutions.....	40
Business process and workflows	41
Managing enterprise content.....	42
Document management.....	42
Records management and compliance	45
Media assets.....	46
Published sites.....	47
Web databases	48
Business intelligence	51
Quick status indicators (or KPIs).....	52
Business intelligence for everyone.....	53

Self-service business intelligence	55
Enterprise-wide business intelligence.....	57
Line-of-Business data integration.....	61
Appendices	65
The Fabulous 40	65
Summary of Web Parts.....	69



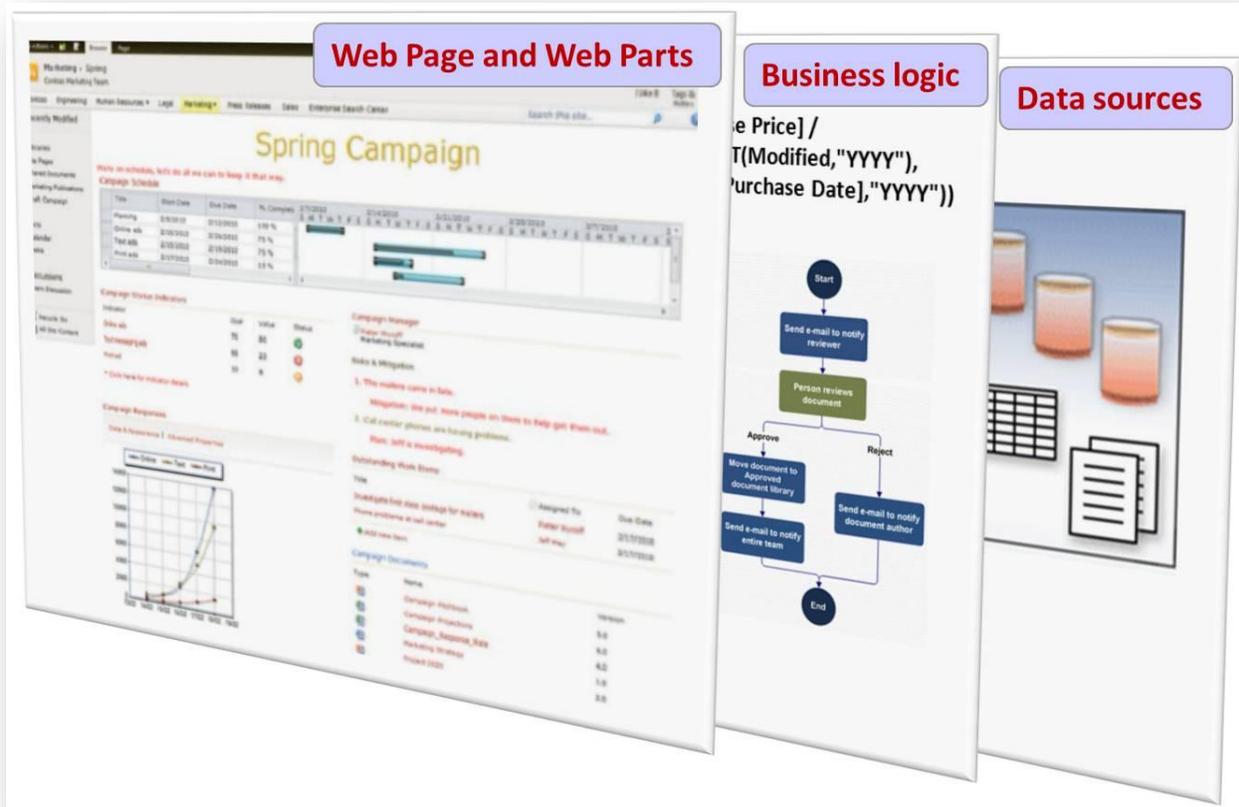
Part I: SharePoint Composite Fundamentals

What is a SharePoint Composite?

Your organization has chosen and deployed Microsoft SharePoint 2010, and you're on a mission to use and evangelize its many benefits. As you promote and adopt SharePoint 2010 throughout your business, you find the need to help users change old habits. Instead of storing files in network or e-mail folders, you gradually move them to SharePoint libraries for central management. Instead of routing documents in e-mail, you send links so that all users see the same and latest copy of the file in a shared library. Instead of attaching a spreadsheet of tables in e-mail, you use a list and list views to easily share and update the same data. Instead of manually performing routine business processes, you are using workflows to streamline regular tasks. Gradually, you are moving key project, content, and process information from individual e-mail accounts, personal computers, and network drives to SharePoint 2010 so that your teams and business can collaborate much more effectively.

But, is there more? Yes there is, and it's called SharePoint Composites.

SharePoint Composites enable you to rapidly create solutions by assembling, connecting, and configuring the basic building blocks of functionality available in SharePoint 2010, and in many cases, ably assisted by Microsoft Office 2010. A SharePoint Composite combines data, documents, and business process in a useful, productive way.



Think of a SharePoint Composite like a wood composite: Pre-engineered layers merged together to provide a solution that is practical, inexpensive, easy to maintain, and good for your environment

In most cases, these solutions do not require code. Now there's nothing wrong with writing code. But here's a motto you might live by from now on: "Let's not write code until we have to write code."

In short, a SharePoint Composite is a "do-it-yourself" business solution. A SharePoint Composite bears close resemblance to the often-used term, "mashup". A mashup (in contrast to a classic shrink-wrapped software product) is a quick Web application that incorporates data into a simple, visual, and interactive solution. However, the term "composite" emphasizes the breadth and depth of solutions you can build on the SharePoint 2010 platform.

Why you should start creating SharePoint Composites

Here are the main reasons why you should consider creating a SharePoint Composite.

To leverage existing investments Just using out-of-the-box SharePoint 2010 saves you time, money, and resources. These are the tangible benefits for which you can readily see the cost savings to your business. But, creating a SharePoint composite can make you and your workforce more productive. Those are the intangible benefits that affect your bottom line and successfulness every day.

To help eliminate content and data silos SharePoint 2010 is all about connection, collaboration, and helping to create a "shared brain" within your organization. The more you work in a cross-functional manner, the more you utilize the resources you already have, the more you realize the benefits of synergy and unification.

To unlock the value of Line-of-Business (LOB) data With a SharePoint Composite based on Business Connectivity Services (BCS), you can work with data from other business systems as if the data lived within your SharePoint sites. Create, read, update, delete, and search the data using external content types and external lists. Surface enterprise data in Microsoft Outlook 2010 and Microsoft Word 2010. Search across all your valuable business information. Work offline and synchronize your changes when you reconnect by using Microsoft SharePoint Workspace 2010 and InfoPath forms.

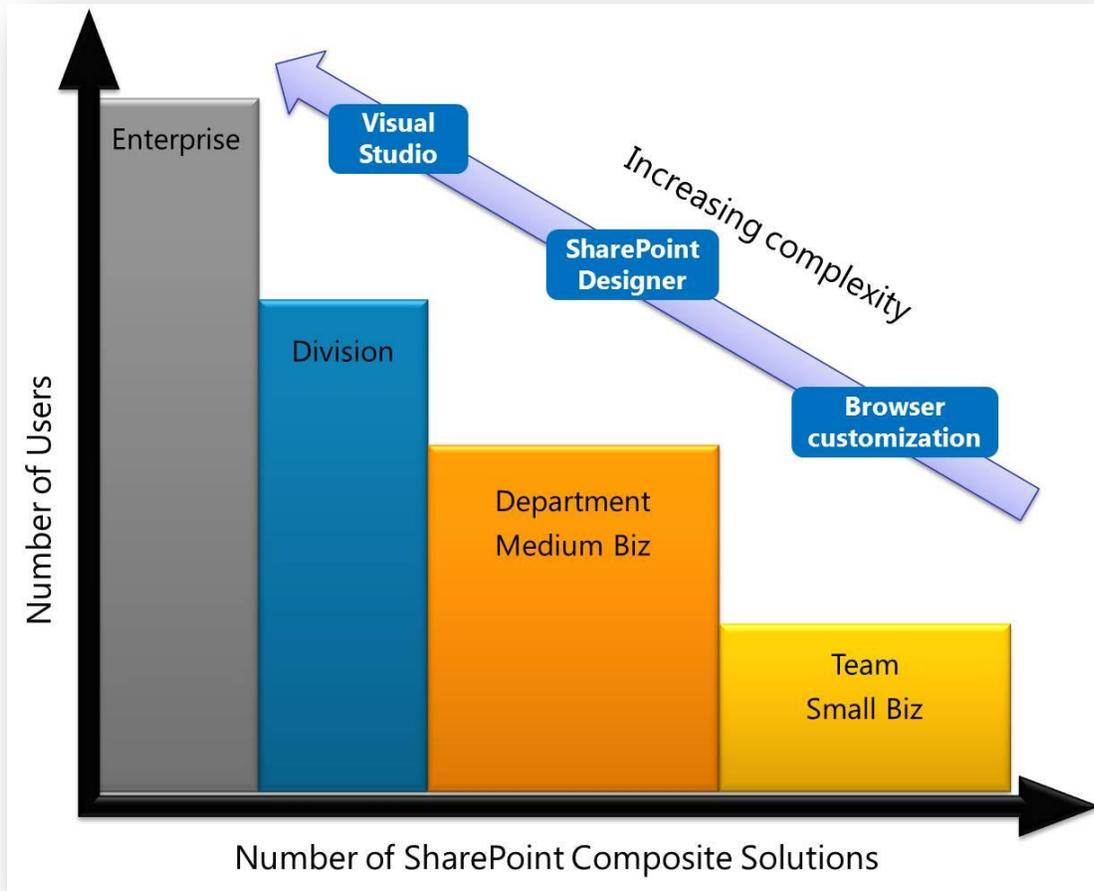
To rapidly create a business solution without dependence on technical staff You don't need to be a programmer to assemble these building blocks. Without code, you can create highly customized sites and solutions, share data-driven Visio diagrams, and publish Microsoft Access 2010 databases to the Web. Use Microsoft SharePoint Designer 2010 and Microsoft InfoPath 2010 to design and build declarative solutions based on workflows and forms. You'll be surprised by how many of your business challenges can be resolved with a code-free solution.

Because they are IT friendly Both end users and IT want to tackle that proverbial project backlog and improve the overall business. But, there is a traditional struggle with the paradox of user responsiveness and empowerment versus IT control and governance. SharePoint Composites help resolve this paradox in an effective way. Solutions are visible and integrated into your organization's information infrastructure, and therefore are easier to deploy, manage, maintain, and ensure compliance.

Because they are developer friendly Starting a new application from scratch is expensive, time-consuming, and risky. Enhancing a familiar, working solution is often a preferred path. From the perspective of a developer, a SharePoint Composite is like a working prototype that lays the foundation for an application, and that now needs to scale up to potentially thousands of users or millions of rows. Perhaps, you only need to add a custom Web Part. Or, you may need to revise the SharePoint Composite as a sandboxed solution with custom, managed code. Either way, the upgrade path is clear and smooth.

Understanding how SharePoint Composites scale and evolve

There's virtually no limit to the type of SharePoint Composites you can create, but it's best to think of them as existing within a sliding scale or spectrum of business solutions.



SharePoint Composites occupy a sweet spot in the spectrum of business solutions

Furthermore, a SharePoint Composite often starts off small, but can grow in an organic way. As these solutions evolve and scale from simple to advanced, and from small to large, there is usually an increase in cost, sophistication, and capacity.

Here's how a typical SharePoint Composite, expense reporting, might evolve over time.

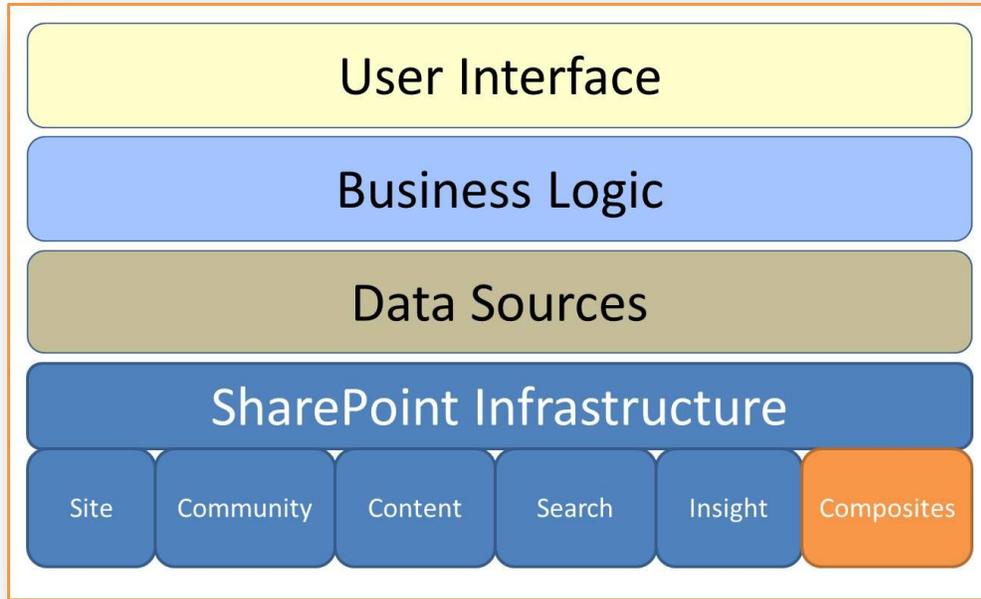
Version	Number of employees	Type	Amount of Code	Expense report features	Time to complete	Comments
1.0	1 to 25	Small Business	None	Mileage re-imbursement automatically calculated based on a list, list form, and formulas	Two days	A quick solution
		Enterprise Team				

Version	Number of employees	Type	Amount of Code	Expense report features	Time to complete	Comments
1.1	26 to 50	Small Business Enterprise Workgroup	None	Trip reimbursement based on an InfoPath form with validation and rules	Two weeks	An enhanced solution
1.2	51 to 200	Midsize Business Enterprise Department	Low	InfoPath form converted to an Excel template; Document Information Panel; reporting with Excel Services.	Two weeks	A further enhanced solution
2.0	201 to 500	Midsize Business Enterprise Division	Custom Web Part and Workflow action.	Enhanced user interface with advanced approval workflow.	One month	A major improvement expanded to more employees
2.1	501 to 1,000	Enterprise	Managed code in a sandboxed solution	Added connection to new direct deposit, credit card system	One month	A further major improvement expanded to more employees
3.0	1,001 plus	Large Enterprise	A complete managed code solution	Integrated, company-wide expense report system	Four months	A robust, scalable solution

Building solutions on the SharePoint platform

A software platform provides a set of layers that help you get better value from your business solutions portfolio. Typically, software platforms comprise four layers:

- **User Interface** Presents data, content, and the results of business logic to the user. Branding, design, navigation, visualization, and interaction all play an important role in making the application useful, easy-to-use, and satisfying.
- **Business Logic** Provides a middle tier for calculations and rules, and connects multiple systems and applications with each other. Handles transactions between applications and systems, and defines business processes through workflow services.
- **Data Sources** Provides services to store, retrieve, and analyze application data. Database systems process application transactions, collect information from multiple systems, and provide tools for reporting and analysis.
- **Infrastructure** Forms the foundation of a platform. Infrastructure provides core security, virtualization, identity, access, and networking services.



The SharePoint platform is a unified common platform for team, divisional, intranet, extranet, and internet sites. The capabilities provided are extensive, and the infrastructure is broadly-based. The capabilities available to you depend on your unique environment, whether you have an on-premise, online (cloud), or hybrid (on-premise and cloud) installation, and the software licenses you have purchased. In an on-premise installation, these capabilities are also dependent on the enabling of SharePoint Features and Services, which allow you to activate or de-activate functionality at the site, site collection, Web application, or farm level.

There are six basic SharePoint capabilities, each of which bundles a related set of features. Five of these capabilities form the basis for the sixth capability which is SharePoint Composites. Think of these capabilities as the set of building blocks, SharePoint 2010 as the platform infrastructure, and SharePoint Composites as the way to assemble, connect, and configure these building blocks into collaborative business solutions. The following table summarizes the six SharePoint capabilities.

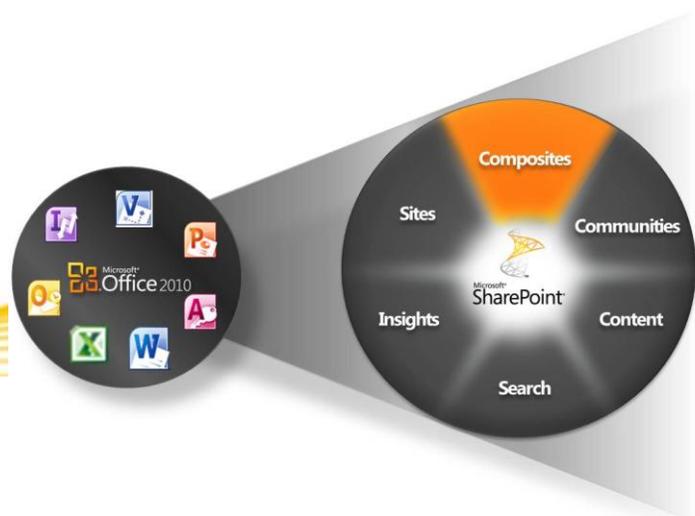


Capability	Out-of-the-Box Features
Sites	<p>Deliver a single infrastructure to provide portal and collaboration capabilities across intranet, extranet, and internet sites:</p> <ul style="list-style-type: none"> • Lists, libraries, views, column types, and content types • Site and page creation and customization • Site and site collection management, permissions management • Surveys and discussion boards, RSS and alerts • Formulas and functions, Web Parts, workflows • Personalization, standards, and accessibility • Ribbon user interface, easy web editing, cross-browser support • Office Web Applications, mobile experiences

Capability	Out-of-the-Box Features
Communities	Locate and interact with people through social networking: <ul style="list-style-type: none"> • Wikis and blogs, Organization Browser • My Sites and personal profile • NoteBoards, Expertise finder • Social Feedback, tagging, and content ratings • Outlook Social Connector Add-in
Content	Manage content of all types: <ul style="list-style-type: none"> • Documents Managed metadata, taxonomies, Documents Sets and Document IDs • Records Content Organizer, general compliance and archiving, advanced routing, in-Place records management, holds and eDiscovery • Rich media Digital assets, Asset picker, Asset Library, Media Web Part • Web content Enterprise Wikis, publishing sites, structured content, page layouts, and field controls; Branding, themes, and custom master pages; Publishing Workflow approval; Content Query Web Part; Multilingual Variations; Web Analytics
Search	Find content including information in LOB database systems: <ul style="list-style-type: none"> • Scoped search by site, list, or library • Refinement panel, Search Center • Advanced search, Boolean queries, and content properties • Results based on people, ratings, tags, and metadata • Search Web parts
Insights	Create business intelligence by transforming raw data into actionable information: <ul style="list-style-type: none"> • Status Indicators, Chart Web Part, Excel Services, PowerPivot • PerformancePoint Services: Key Performance Indicators (KPIs); Scorecards, Reports, Filters and Time Intelligence • Dashboards and Dashboard Designer
Composites	Rapidly create business solutions by using the following: <ul style="list-style-type: none"> • SharePoint Designer and InfoPath 2010 • InfoPath Forms Services, Business Connectivity Services • Access Services, Visio Services • Low-code enhancements (JavaScript, Web Services, REST, and so on) • Code extensions and sandboxed solutions

Office 2010 integration points

Office 2010 and SharePoint 2010 are often described as “better together” and this is no more apparent than with SharePoint Composites. Office 2010 are designed for client computers, provide unparalleled richness and speed, in many cases work online and offline, and therefore are often the best way to create and design documents from simple to sophisticated. On the other hand, SharePoint 2010 provides the best way to share and collaborate with this content, and lightly edit the same content, for example by using Office Web Applications.



The following tables summarize the key integration points between SharePoint 2010 and Office 2010. These integration points directly support the creation of SharePoint Composites or indirectly facilitate their design and development.

Directly supports SharePoint Composite solutions

Integration Point	Customer Benefit
Power Tools	Two Office 2010 products provide the power tools to create SharePoint Composites: <ul style="list-style-type: none"> • SharePoint Designer • InfoPath 2010
Document Information Panels	<ul style="list-style-type: none"> • In Word 2010, Microsoft Excel 2010, and Microsoft PowerPoint 2010, automate capture of metadata by using a Document Information Panel to make information more discoverable and re-usable. • In Word 2010, automatically include information entered in the document by using Quick Parts and field controls.
Web Forms	Using InfoPath 2010, do the following: <ul style="list-style-type: none"> • Update shared data via Web Forms (list forms, form library forms, external list forms, and workflow forms). • Connect an InfoPath Form Web Part to other Web Parts. • Replace a SharePoint list form with an InfoPath form. • Use Quick Publish functionality to publish forms in a single click.
Workflows	<ul style="list-style-type: none"> • Automate the design of business processes by using Microsoft Visio 2010, SharePoint Designer 2010, and Visual Studio, all of which work together as an integrated toolset. • Create reusable workflows and workflows attached to content types. • Display active workflows in a visual format.
Web diagrams	Using Visio 2010, do the following: <ul style="list-style-type: none"> • Publish Visio diagrams to the Web to share diagrams in the browser. • Ensure consistency and accuracy of workflows with diagram validation. • Integrate with the Process Repository to store, share, and reuse business process diagrams. • Connect diagrams from one or more refreshable data sources (such as Excel 2010) and publish them to SharePoint. • Create highly visual solutions by using the Visio Web Access Web Part connected to other Web Parts.
Business intelligence for everyone	<ul style="list-style-type: none"> • Share analysis and results across the organization by publishing Excel spreadsheets to a SharePoint site by using Excel Services. • Create Excel dashboards by using conditional formatting, sparklines, and slicers. • Selectively publish parts of a worksheet, hide formulas, and define parameters. • Connect the Excel Web Access Web part to other Web Parts.
Self-service business intelligence	<ul style="list-style-type: none"> • Use PowerPivot for Excel to combine data from multiple sources and manipulate large data sets with millions of rows. • Publish and share this analysis by using PowerPivot for SharePoint.

Integration Point	Customer Benefit
Web database	<p>Using Access 2010, do the following:</p> <ul style="list-style-type: none"> • Publish data, forms, logic/macros, and reports with nearly the same look and feel in the browser as Access 2010 on a client computer. • Securely publish database applications to the Web so IT managers can meet requirements for data compliance, backup, and audits. • Get started quickly with several Access Web database site templates.
Integrate Line-of-Business (LOB) data with Business Connectivity Services (BCS)	<ul style="list-style-type: none"> • Word 2010 Expose LOB data in Document Information Panels and as Word document properties, and insert it into documents. • Outlook 2010 Map external list data to a native Office item type such as a contact or task. • InfoPath 2010 Create forms to update business data from a back-end system. • SharePoint Workspace 2010 Take LOB data offline, and then synchronize changes automatically when back online.

Indirectly supports SharePoint Composite solutions

Integration Point	Customer Benefit
Office Backstage	<ul style="list-style-type: none"> • Obtain SharePoint information: view metadata, interact with workflows, access author profiles, and so on. • Add custom actions to suit custom needs.
Lists and Libraries	<ul style="list-style-type: none"> • Save Office documents directly to SharePoint sites. • Import Excel data to a SharePoint list. • Open or check out Office files from a SharePoint library. • Save a document to SharePoint 2010 from Office 2010 products with versioning. • Automatically discover SharePoint document libraries to make saving content easier and more intuitive by using Connect to Office. • Open, edit, and update files from a SharePoint site. • Use Slide Libraries to share and reuse PowerPoint slides. • Track project work using SharePoint project tasks lists.
Blogging	<ul style="list-style-type: none"> • Conveniently post to a SharePoint blog by using a Word template. • Quickly check your spelling, add hyperlinks, add pictures and tables, format the text, and then upload your blog post to your site from Word 2010.
Coauthoring	<ul style="list-style-type: none"> • Simultaneously edit Word documents and PowerPoint presentations stored in SharePoint. • Simultaneously edit Office Web Excel spreadsheets and Office Web OneNote Notebooks in a Web browser.
E-mail and Calendars	<ul style="list-style-type: none"> • Participate in online discussions by using e-mail messages. • Display SharePoint and Outlook calendars side-by-side. • Manage SharePoint alerts and RSS Feeds. • Create a meeting workspace. • Use Outlook Web Parts to, for example, display Outlook messages.
Site Themes	<ul style="list-style-type: none"> • Apply PowerPoint themes to SharePoint sites and make customization of sites easier.
Social Networks	<ul style="list-style-type: none"> • Use the Outlook Social Connector to connect Outlook 2010 to your business and personal social networks. • Within Outlook 2010, stay up to date on the status and activities of your contacts.

Integration Point	Customer Benefit
Office Web Apps	<ul style="list-style-type: none"> View and make light edits to Word documents, Excel spreadsheets, PowerPoint presentations, and OneNote Notebooks by using a browser. Preserve document formatting and content when changes are made in the browser as well as the client computer.
Online/Offline	<ul style="list-style-type: none"> From SharePoint Workspace 2010, take lists (both native and external) and libraries offline, and automatically synchronize changes when they occur either on the client or the server. From Access 2010, read and write native lists and work with all SharePoint data types by creating a two-way connection. From Excel 2010, export SharePoint lists to an Excel Table, and create a one-way data connection. From Outlook 2010, read and write Contact, Task, Calendar and Discussion Lists, as well as synchronize Document libraries. From Project, synchronize a SharePoint list with a Project task list. From Visio 2010, synchronize SharePoint task lists with a PivotDiagram.
Broadcast Presentations	<ul style="list-style-type: none"> Share a PowerPoint presentation over the Web. Audiences do not need to have PowerPoint 2010 installed. View the presentation in high fidelity in a Web browser.
Mobile	<ul style="list-style-type: none"> Use Office Mobile to view and edit Office documents on SharePoint from a mobile device.

Power tools for power users



Like any good handyman, you know your tool set but you particularly value your power tools, because they help you get the job done smoothly and quickly. You also learn to use these power tools so you can maximize your effectiveness. Two Office 2010 products provide the power tools you need to create SharePoint Composites: SharePoint Designer 2010 and InfoPath 2010.

Note Depending on which SharePoint Composite solution you create, you can also think of Access 2010, Excel 2010, and Visio 2010 as additional design tools that you use to create the content you want to share, and then publish to their SharePoint counterparts, Access Services, Excel Services, and Visio Services.

SharePoint Designer 2010

SharePoint Designer 2010 (available as a free download) is an extensive Web page design program for SharePoint 2010. This power tool helps you customize the components that make up a site, design the logic of a site around a business process; access external data, and deploy the site as a packaged solution. Many if not most changes you want to make can be made by using the Ribbon. For all other changes, you can edit pages in Code view.

SharePoint Designer 2010 covers a wide area of functionality and includes the following:

- Lists and libraries (Data Views, custom forms, and data sources)
- Customized Web pages (Master pages, CSS, Web Parts, branding, and custom actions on the Ribbon)
- Workflows (Further discussed in the section, [Business Logic](#))
- External content types (Further discussed in the section [Line-of-Business data integration](#))

Lists and libraries

Although you can edit lists and libraries in the browser, you may find it more convenient to do your work in SharePoint Designer 2010, especially if you have a lot of customization to do. In general, you can do all the customization work available to you in the browser, and much more.

Data Views

All lists and libraries are implemented as an XSLT List View Web Part. This Web Part consolidates previous data views into one technology that uses shared XSLT style sheets residing in the `_layouts` directory. There is one template each to format a column, item, and table. When you customize the appearance of a data view, it's easier to work in Code view, and the Data View renders quickly in the browser. Additional advanced customization abilities include the following:

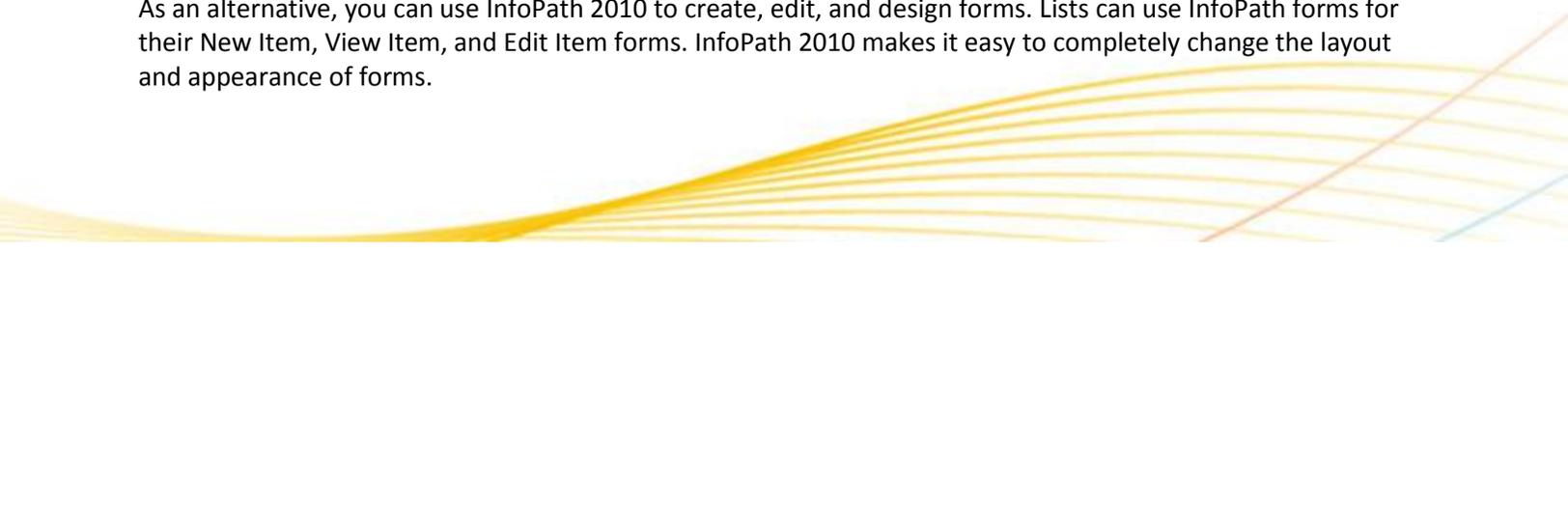
- **Customize the table layout** Add and remove table cells, change the width or height of a row or column, and show or hide the borders or shading.
- **Change font and formatting** Change the font size, font color, font family, and more of the column headings and fields. You might do this manually using the WYSIWYG tools in SharePoint Designer 2010 or apply CSS styles to these elements on the page.
- **Create a formula column** Display the result of a calculation of other columns in the view. This is similar to the way you use formulas in a spreadsheet program. You might, for example, multiply the unit price of a product by the number of units in stock to display the total value of items in a separate column.
- **Display data from multiple sources in a single view** This is a powerful way to combine data sources in one place. You may, for example, show product categories from one list and product information from another list in the same view.
- **Add parameters** Pass a parameter from another menu to the Data View and filter data by that parameter value.
- **Add server-side controls** Bind SharePoint controls, ASP.NET controls, and other types of controls to a data source and add them to a view to create rich, interactive data interfaces for users.
- **Enable Ajax support** The Data View retrieves data from the server in real-time and renders it in a browser without the user having to refresh the page.

Custom forms

Custom forms can be used to display data, edit data, and create data. you can design custom forms using the SharePoint Designer 2010 built-in forms editor (for .aspx files) or InfoPath 2010 (for .xsn files). Forms can be created and customized for specific data sources, such as a task list, and they can be used to collect user information in a workflow.

In a custom list form, you can show or hide certain fields, reorganize those fields, change the layout of the form, and add formatted text and graphics. You can use the Ribbon in SharePoint Designer 2010 to perform this customization.

As an alternative, you can use InfoPath 2010 to create, edit, and design forms. Lists can use InfoPath forms for their New Item, View Item, and Edit Item forms. InfoPath 2010 makes it easy to completely change the layout and appearance of forms.



Data Sources

With SharePoint Designer 2010, you can connect to numerous data sources and then integrate that data into your SharePoint site. Users, as a result, can see and interact with business data on your site, rather than having to connect to those data sources separately. Data Views can be used with a database query, XML document, Web services, REST, server-side scripts, and SharePoint lists and libraries. You can connect to data inside and outside of SharePoint.

Data source	Icon	Data source	Icon
Custom List		Linked Data Source	
SharePoint List		Database Connection	
Document Library		SOAP Service Connection	
External List		REST Service Connection	
List From Spreadsheet		XML File Connection	

Custom pages

There are a number of ways you can customize pages:

- **Default and advanced mode** Default mode provides a more focused way to edit lists and Web Parts, and add content inside the main content placeholder (PlaceholderMain), but keep the rest of the page locked for editing. Advanced mode, by contrast, lets you fully customize the master page.
- **Manage Web Parts** Although you can customize Web Parts in the browser, there are additional ways to work with Web Parts that only SharePoint Designer 2010 enables, such as changing Web zone layouts, creating connections between Web Parts on different pages, and making connections with multiple values.
- **Design and brand** To ensure that a consistent look and feel is applied to all pages, including color schemes, headers and footers, supporting graphics, custom navigation, and more, you can use custom master pages, page layouts, and Cascading Style Sheets (CSS). Collectively, this is called branding, and is an effort most likely performed by a Web designer.
- **Custom Actions** Using the Custom Action builder, you can add custom actions, such as links, icons, and scripts to the SharePoint Ribbon, toolbar, and list item menus. Anytime you add new functionality to the site, you can make it easier for users to discover it, such as starting a workflow on a list.

InfoPath 2010

Using InfoPath 2010, you can design and deploy sophisticated forms quickly and efficiently. Familiar tools (varied fonts and styles, spelling checker, table designer, clip art, Ribbon interface, and so on) help minimize training time and speed forms creation. The following are some key features that help you create first-class forms:

- Create calculated fields, default values, conditional formatting, and out-of-the-box rules, all with declarative logic.
- Add custom data validation that ensures that users cannot submit forms that contain incorrect data.
- Design multiple views, which simplify the form-filling experience by splitting forms into multiple pages or creating separate views optimized for specific users or tasks.
- Add data connections to other sources such as SharePoint lists or Web services to get supporting data into your forms.
- Use pre-built layout sections and form templates, so you don't need to define all parts of the form from scratch.

You can use InfoPath forms on a client computer or in the browser. The major benefit of creating browser forms is that users who fill out the forms do not have to have InfoPath 2010 installed on their computers. Many but not all controls can be used in a browser form. For more information, see [InfoPath 2010 features unavailable in Web browser forms](#).

InfoPath 2010 cuts a wide swath through SharePoint 2010 and includes the following:

- List forms
- Form library forms
- The InfoPath Form Web Part
- External list forms (discussed further in the section, [Line-of-Business data integration](#))
- Workflow forms (discussed further in the section, [Business process and workflows](#))

List forms

You can create InfoPath forms based on SharePoint lists. There are a number of reasons why you might want to replace native list forms with InfoPath forms including the following:

- Multiple form views
- Data validation
- Auto-population of fields
- Conditional display of controls, sections and views
- Generating automatic, derived and computed values
- Accessing multiple data sources

Form library forms

A form library is a SharePoint document library that uses an InfoPath form as its default content type. New forms created in the form library and individual forms that are filled out by users are stored as XML files in the library, one XML file for each form. You would use Form library forms if your solution requires any of the following features:

- **Complex schemas** Complex information models that incorporate both repeating one-to-many, and many-to-many relationships.
- **XML files** Information is captured in the form as XML data, which means other applications can easily read and process the information.
- **Property promotion** Specify that the values of the form automatically populate as columns in the library.

The InfoPath Form Web Part

The InfoPath Form Web Part provides numerous ways to create a SharePoint Composite solution. You can insert one or more InfoPath browser forms (list or Form library) that have been published onto any SharePoint page as Web Parts, and then interactively connect them together by sending and receiving data. There are essentially two ways you can use the InfoPath Web Part:

- Connection-based, where Web Parts communicate using part-to-part connections, such as connecting the InfoPath Form Web Part with an Excel 2010, Visio 2010, or custom Web Part.
- List-based, where Web Parts communicate and connected to one or more related lists. List forms are not stored in a Form library, but rather in the list folder structure, and list forms are, in fact, InfoPath Web Part forms behind the scenes.

For example, when filling out a new customer requirement form, you can automatically fill in the contact information with data from a Customers list by selecting an item in the Customers List Web Part and sending the values into the fields of the requirement form based on the InfoPath Form Web Part.

You can also pass data from the InfoPath Form Web Part in one of three ways: a new InfoPath rule action, the Update button in the Ribbon, and by using the Submit button control on the form. To pass one or more fields as input or output parameters, you define the parameter fields by using either the Publishing wizard or the **Form Options** dialog box. In the form, you can use the following controls and buttons:

- Text Box, Rich Text Box
- List Box, Drop-Down List Box, Combo Box
- Check Box, Option Button
- Date Picker, Date and Time Picker

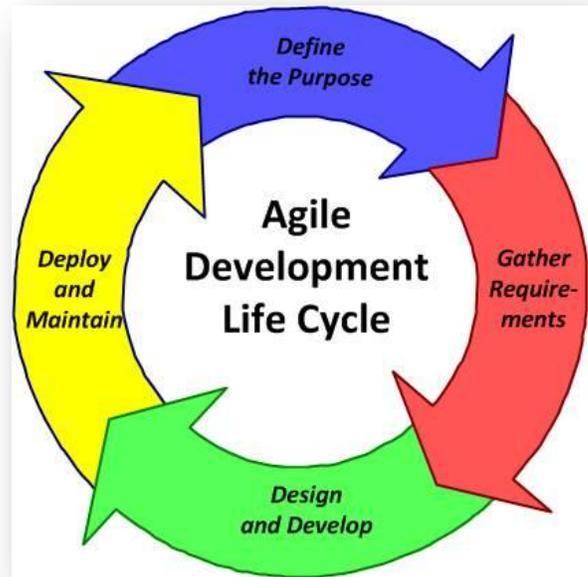
The SharePoint Composite solution life cycle

Although you may not be a programmer, if you want to create a SharePoint Composite solution, you still need to think like a programmer. Like any solution or application, carefully planning and designing a SharePoint Composite solution is a good idea. Because SharePoint 2010 provides a complete infrastructure to build upon and Office 2010 products are often familiar tools to you and your users, you are already well ahead of the typical solution life cycle. However, It's often best not to use a formally structured process, if only because it would be so time-consuming. A better approach is to use an agile or RAD (rapid application development) life cycle that promotes quick design and short, frequent iterations.

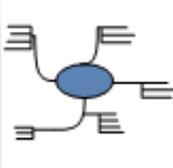
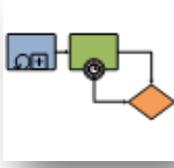
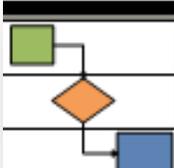
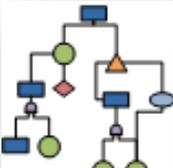
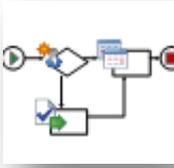
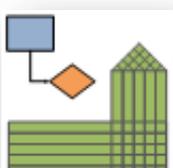
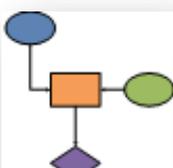
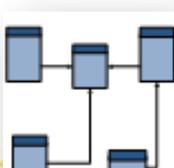
An agile life cycle is a good fit for developing SharePoint Composite solutions because it:

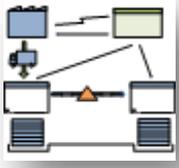
- Let's you start slow, and proceed step-by-step.
- Provides low overhead.
- Enables mid-course corrections.
- Makes progress visible to users and stakeholders.
- Allows for immediate testing and verification.
- Still has potential for growth into a more formal solution.

Don't forget to use the variety of features and tools that SharePoint 2010 provides for you to plan and design your solution. Instead of doing everything yourself, find expertise across your business to help vet your design, solve a specific problem, or enlist support. Instead of creating a lot of formal documents, create a project tracking site that you can use to quickly gather requirements, obtain user feedback (commenting, prioritizing, ratings, and so on), communicate midcourse corrections, and report issues and problems. As you develop your solution, keep track of all your notes and communications in a Wiki site, and then convert it to a help or support system if need be.



Finally, don't forget to use Visio diagrams to help you think about, analyze, and communicate your ideas. Here are common diagrams used throughout any solution life-cycle.

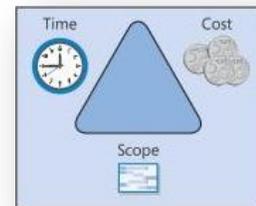
Description	Diagram	Description	Diagram
<p>Brainstorming Create a graphical representation of thought processes for planning, problem solving, and decision making.</p>		<p>Business Process Modeling Notation (BPMN) Create a flowchart that follows the Business Process Modeling Notation 1.2 standard.</p>	
<p>Cause and Effect Create a fishbone or Ishikawa diagram to systematically review factors that affect or contribute to a given situation.</p>		<p>Cross-Functional Flowchart Show the relationship between a business process and the organizational or functional units, such as departments, that are responsible for steps in that process.</p>	
<p>Fault Tree Analysis Create a Fault Tree diagram to document business processes.</p>		<p>SharePoint Workflow Create an annotated workflow diagram for SharePoint 2010 Workflows that can be exported for configuration to SharePoint Designer 2010.</p>	
<p>Six Sigma Create a Six Sigma flowchart or house of quality diagram.</p>		<p>Workflow Create a diagram of information flow, business process automation, business process re-engineering, accounting, management, and other human resources tasks.</p>	
<p>Total Quality Management (TQM) Create a cause and effect, top down or cross-functional process flow diagram for business process re-engineering and continuous improvement.</p>		<p>Database Model Document and design a database using Integration Definition for Information Modeling (IDEF1X) and relational notations.</p>	

Description	Diagram	Description	Diagram
<p>Value Stream Create a value stream map to illustrate the flow of material and information in a lean manufacturing process.</p>		<p>Wireframe Create a medium-fidelity wireframe diagram for software application prototyping and design.</p>	

Define the purpose

The first step of any life cycle is to define the purpose of the solution and assess the overall business context. A good place to start is a simple goal statement followed by a brainstorm for potential solutions and ideas. Then, ask yourself some key questions:

- Is there an element of risk to this solution and do you need to do a formal risk analysis?
- Is this a “skunk-works” solution, or do you have a formal process that might require sign off?
- What is the environment you are in? Are there political issues, changes in process, adoption concerns, and a system of governance (or lack of) that you may need to deal with?
- Is there a learning curve for products and technologies that you or your users need to address?
- What are the overall constraints and how should they be balanced as illustrated by the classic resource triangle:
 - Time (or duration)
 - Cost (or budget)
 - Scope (the amount of work)



Ultimately, you want make a go/no-go decision and not commit yourself too early without considering all the major consequences.

Identify the requirements

Now that you have decided to go for it, there are a basic set of requirements you want to identify before you start to design and develop your solution:

- Users and stakeholders
- Business logic
- Data and documents
- Content types
- User interface requirements
- Data presentation formats (grids, forms, reports, dashboards, charts, and diagrams)
- Software requirements
- Technical requirements

Let’s take a look at each requirement in more detail.

Users and stakeholders

Identifying users and stakeholders up front helps you in a number of ways, whether its specifying tasks, designing the right user interface, getting buy-in, understanding training and documentation needs, or finding resources. Don’t overlook stakeholders who are in different organizations such as IT, Marketing/Sales, and Legal. Users can be just about anybody and anyplace. Your goal is to understand them and fit the solution to their personality profile.

In a collaboration-based business solution, there are two main types of users:

User Type	Description
Desk-less Workers	<p>Users who either do not have access to their own computer, or it's secondary in nature to their primary job role. They require e-mail, use browsers, do light collaboration, and occasional editing. Examples include:</p> <ul style="list-style-type: none"> • Manufacturing floor workers • Retail associates • Bank tellers • Call center workers • Healthcare clinicians • Retail POS workers • Seasonal workers
Office Information workers	<p>Users whose primary job is to process information. They usually have one or more dedicated computers. There are three main types:</p> <ul style="list-style-type: none"> • Individual contributors, who create and edit new content, collaborate with co-workers, and need access to data and documents. • Project leaders, who create a project and maintain information about tasks, issues, and so on, and drive processes and work. • Decision-makers, who view rolled-up information, summary data, secure information, and who also do strategic work or presentations.

Business Logic

Business logic entails the following considerations: What are the day-to-day rules that must be enforced in the solution, and what is the workflow for the business process.

Rules and formulas

The use of calculated columns based on functions provides a lot of flexibility for encoding business rules and simplifying your technical requirements. They can reduce complexity and eliminate the need for code. For example, you might require:

- All meals must be ordered within 14 days of conference.
- The Price equals the sum of items multiplied by the quantity of each item plus sales tax and delivery charge if outside the free delivery zone.
- You must be a permanent employee to get a benefit or attend an event.

For more information, see [Formulas and functions](#).

When designing your solution and when iterating that design, you need to define and capture these business rules so that your solution aligns with the business and the actions that are taken in your solution are consistent with the way the business is run.

Access 2010 expressions and macros

If your solution uses Access 2010, you'll find that the Expression Builder greatly simplifies your expression creation experience. You spend less time memorizing expression names and syntax, and more time focusing on building your formulas. You'll find the Macro Designer is an intuitive way of creating advanced business logic in a declarative manner. Finally, data macros use an event model, similar to that of triggers in Microsoft SQL Server 2008, to enable reliable enforcement of data rules. You can use these features to help build a Web database.

Business workflows

All businesses engage in common, everyday processes that involve some combination of human tasks and document collaboration that are often manual and time-consuming, but could be largely automated to improve efficiency. Examples include approval of formal documents, team creation and review of specifications and proposals, and signature gathering.

A classic example of a business workflow is expense report approval which requires several people working together to assemble content that adheres to a formal financial process and requires approval by authorized employees.

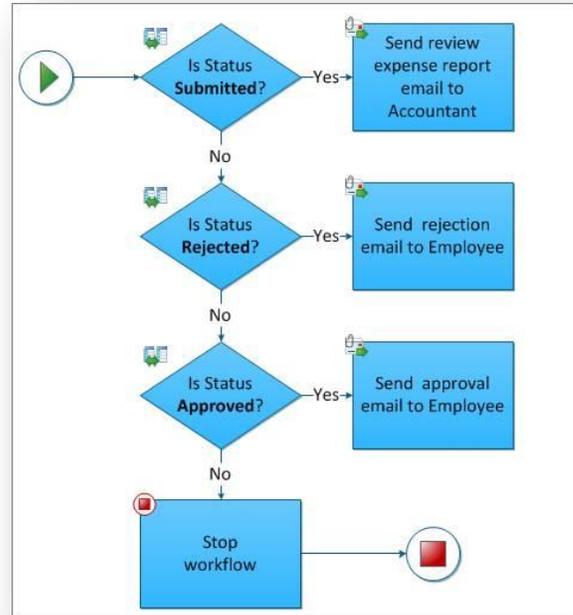
You can create automated workflows that manage the simplest to the most complex business processes in an organization. Workflows do this by automating both business application processes and human collaborative processes. Business application processes might update one data source when another data source changes. Human collaborative processes might send a document to an employee's manager for approval.

Automated workflows streamline:

- **Synchronous operations** For example in a lending library solution, a workflow is used to handle checkout and due date reminders for assets. Once an item is checked out, the workflow automatically sends a due date reminder when the item becomes due.
- **Asynchronous operations** For example, a project owner creates a project, milestones, tasks, and budget entries, and then tracks progress over time. The project owner has frequent access across all pieces of information, while task owners act on the data when their work schedules allow.

The following are the basic building blocks of a SharePoint workflow that you can create by using SharePoint Designer 2010:

- **Steps** Group conditions and actions so that one set of rules can be evaluated and performed before a second set.
- **Events** Start or initiate a workflow. A change to a data source—such as a new item created or an item changed—is one type of event. Another type of event is one activated by a user, a workflow participant.
- **Actions** do something useful. An action is the most basic unit of work in a workflow. For example, you can send an email, check an item in or out of a list, send items for approval, copy an item from one list to another, do a calculation, assign items for approval, utility actions to manipulate strings and dates, lookup a person's manager in the Active Directory, set permissions on a list item, and manage Document Sets.
- **Conditions** Determine when a workflow runs or an activity is performed.
- **Variables** Store different types of data in a workflow, including initiation form parameters and local variables, and at a later point reference that data using workflow lookups.
- **Forms** Collect information from workflow participants at predefined times in the workflow. Gather information from users when they start the workflow, create association forms to associate the workflow with a list or content type, and add forms for custom tasks associated with the Tasks list. When designing forms, you can use list forms (.aspx pages) or custom InfoPath forms (.xsn pages).



Finally, SharePoint 2010 provides an integrated set of tools that work together to help you create the glue that binds a business process into an automated workflow:

- The browser enables the editing of common, out-of-the-box workflows.
- Visio 2010 is used for flowchart design and user-friendly prototypes.
- SharePoint Designer 2010 is used for defining rules, steps, actions, events, and so in a declarative manner without code.
- Visual Studio is used for complex graphical design, build activities, custom actions, and pluggable services.

Data and Documents

Information is critical to efficiently run any enterprise, and data is the life-blood that supports it. Most enterprises spend major resources gathering, storing, updating, accessing, analyzing, reporting, and managing data and documents. In a collaboration-based SharePoint Composite, you need to give equal consideration to your data as well as your document needs. Essentially, there are three types of information:

- **Structured data** This type of data can be organized into tables, easily updated, sorted, filtered, and queried, and is commonly stored in flat files, lists, and databases. Structured data may also be hierarchical in nature. Structured data also includes metadata, often defined as “data about data”. Metadata gives meaning and constraint to the data, and includes column headers, data types and formats, and basic validation rules. Examples of structured data include purchase orders, statistics, inventories, budgets, and sales.
- **Unstructured data** This type of data is information that is stored in documents and presentations, and that cannot be automatically converted into structured data. Examples of unstructured data include memos, letters, publications, policies, proposals, specifications, slides, and resumes.
- **Semi-structured data** This type of data contains structured data combined with a modest amount of unstructured data, such as comment and memo fields, document attachments, and document properties. Examples of unstructured data include status reports, formalized Request for Proposal (RFP) documents, performance reviews, and product catalogs.

When working with data and documents in a SharePoint Composite, there are four major areas of consideration.

SharePoint lists

A SharePoint site usually includes many default lists, including Links, Announcements, Contacts, Issue Tracking, Surveys, and Tasks, that you can use as a focal point for a business solution. In many cases, these default lists can provide quick, effective solutions with little or no modifications. For example, you can use: Surveys, which include conditional branching and page breaks, for employee and customer satisfaction assessments, and Issue Tracking, which has versioning and version-history storage, for deeper analysis of workgroup projects and common work tasks.

Lists are rich and flexible and have many built-in features that provide a robust way to store, share, and work with structured and semi-structured data. You can:

- Include many types of data, such as dates, pictures, formulas and calculations based on other columns, append-only fields (useful for logging and tracking applications), and lookup fields where you can select a value from another list field.
- Create list views to organize, sort, and filter data in different and specific ways; change the metadata, such as adding and deleting columns, and modifying validation rules; and use lists consistently across SharePoint sites with content types, site columns, and templates.
- Create custom lists, display the data in Web Parts and pages, and import, export, and link to data from other programs, such as Excel 2010 and Access 2010.
- Track versions and detailed history, require approval to modify data, use item-level and folder security, check-in and check-out lists, and automatically stay informed about changes by using alerts and RSS feeds.

For more information, see [Introduction to lists](#).

SharePoint libraries

A SharePoint library is a location on a SharePoint site where you can create, collect, update, and manage documents with team members and other employees. Each library displays a list of documents and key metadata about those documents, which helps people use the files and work together, and each library provides useful features such as checking documents in and out, creating major and minor version numbering and tracking, and using rich policy, auditing, and workflow features. You can create and manage documents, pictures, presentations, forms, and other types of files in a library. Finally, you can use the default Shared Documents library, customize this library for your purposes, or you can create your own additional libraries.

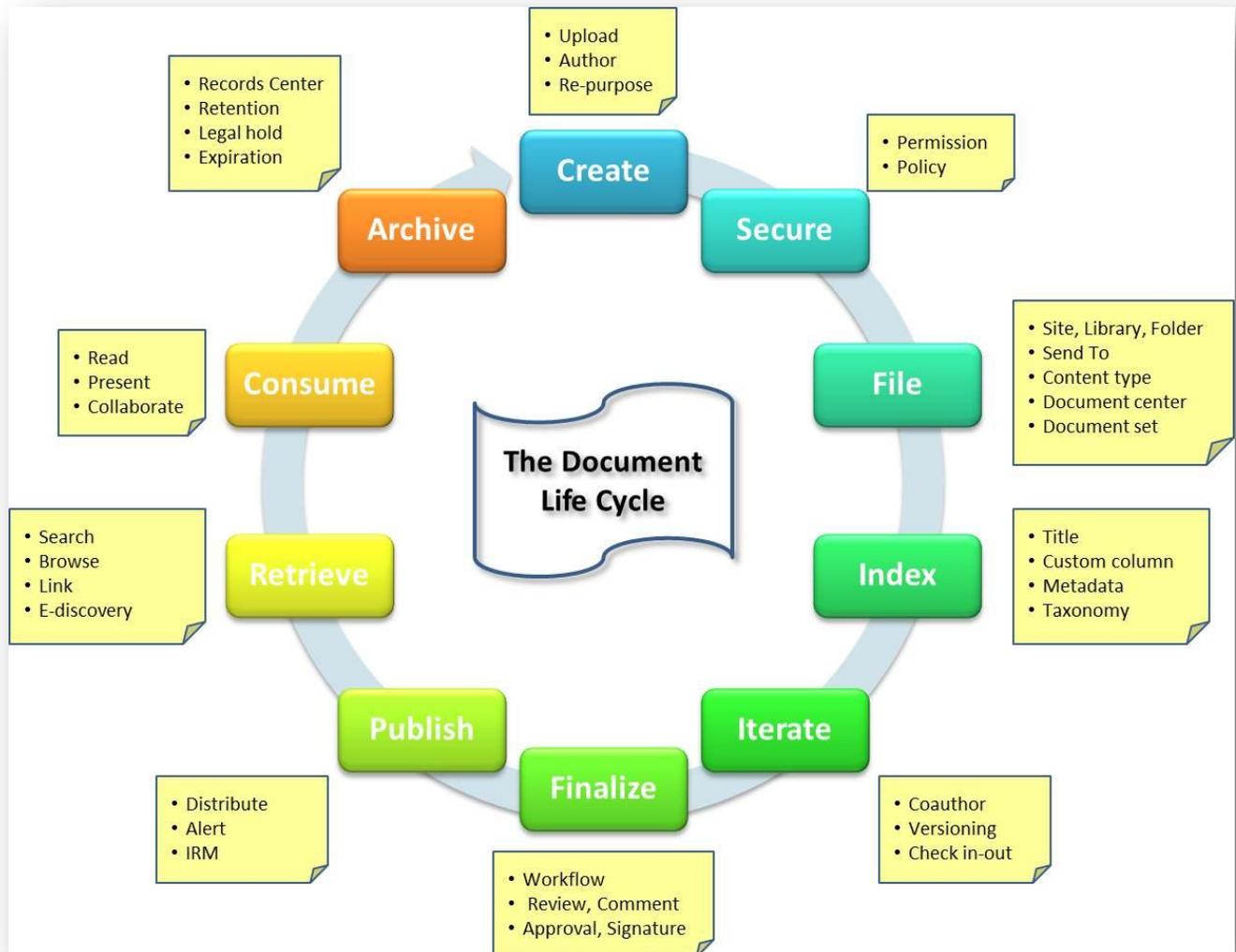
One important goal of your solution design is to organize the library for easy access. There are basically two approaches: columns and folders.

- **Columns** Customize the library by adding columns to classify content, and then create views with different columns, sorts, and filters.
- **Folders** Organize lots of documents by using folders that have a meaningful descriptive name, such as “RFP Proposal” or “Project Submissions” to help users locate documents. You can also specify default metadata on a per-folder basis by using the Column Default Value setting so you can synchronize metadata changes on multiple items all at once.

For more information, see [Introduction to libraries](#).



You can envision a document as going through a Document Process Life Cycle. Here are the potential phases to think about when designing your solution.



Data modeling

Data modeling boils down to identifying all the columns and data types you need for your solution and what are the key data relationships between each list or table you have identified. Key questions to ask are:

- What data and data types do you need?
- Will you only use data from native lists, or do you need to create external lists from data sources outside of SharePoint 2010, such as SQL Server 2008 or through a Web service?
- Will you need to import or export the data?
- Where will you store your data?
- What are the relationships between the data so you can create lookups and enforce the relationship (also called referential integrity)?
- How will you verify and validate the data?
- Do you need to do special data operations, such as bulk updates or complex aggregations?

Tip A simple way to do a bulk update is to open a list in datasheet view, and copy/paste the data into the grid. Also, if you link the list to Access 2010, you can run Action queries to append, update, and delete many items.

For more information about the data types you can create in a list or library, see [Site column types and options](#).

Lists are often like database tables. Aim to create a list that is a collection of named columns and multiple items and that stores information about a single subject, such as employees. Each column of the list is uniquely named and contains information about the subject, such as an employee's first name or address. The rows of the table contain occurrences of the subject, such as all the current employees in the company. A single value is stored in the intersection of an item and column, and is a single fact, such as "Seattle". Finally, make sure you can sort and filter items and columns without changing the meaning of the list.

1	2	3	4	5
ID	Last Name	First Name	Address	City
1	Davolio	Nancy	507 - 20th Ave. E.	Seattle
2	Fuller	Andrew	908 W. Capital Way	Tacoma
3	Leverling	Janet	722 Moss Bay Blvd.	Kirkland
4	Peacock	Margaret	4110 Old Redmond Rd.	Redmond
5	Buchanan	Steven	14 Garrett Hill	London
6	Suyama	Michael	Coventry House	London
7	King	Robert	Edgeham Hollow	London

- 1 A list represents a single subject — a person, place, thing, event, or concept.
- 2 Each item is unique and has a primary key, such as a badge number, or the Item ID.
- 3 Each column has a unique, short, and meaningful name.
- 4 All the values in a column are similar in meaning and format.
- 5 Each value in the list represents a single fact.

You may need several lists with relationships between them that bring the data together. For example, Employees *belong to* departments. In this scenario, you would create two lists Employees and Departments. Then you would create a Lookup column in the Employees list that “looks up” that specific employee’s department in the Departments list.

Well-defined lists and clear relationships between those lists make it easier to:

- Save space and improve performance, because repeating and redundant data is physically removed.
- Update data accurately and maintain the integrity of the data.
- Sort, filter, create calculated columns, and summarize data.
- Create views of you data in a variety of ways to answer expected and unanticipated questions.

For more information, see [Create list relationships by using unique and lookup columns](#).

Content types

In the course of doing business, a typical organization produces many different kinds of content, such as legal contracts, marketing proposals, product design specifications, manufacturing process documents, and so on. Each type of content has unique attributes, and each might be created, used, shared, and retained in different ways. An organization might want to maintain different kinds of metadata about these different kinds of content, or it might want to apply different kinds of retention or confidentiality policies to them.

Organizations can define each of these different sets of documents as a content type. A content type is a group of reusable settings that describe the shared attributes and behaviors for a specific kind of content. Content types can be defined for any item type, including documents, list items, media files, and folders. Content types enable you to centrally manage and reuse the metadata and behaviors of a document or item type. For

example, you can associate workflows and events to a content type, rather than having to add workflows and events to multiple documents or libraries.

You can also use content types to categorize content in a way that is meaningful and to specify the metadata properties, policies, workflows, and other rules for specific types of content (for example, press releases, legal contracts, project plans, financial reports). Content types also support an inheritance model, so site owners can define more specific content types with process and policy that are related to specific parts of the company. Finally, you can reuse content types across SharePoint sites collections and farms, helping to ensure consistent application of process and policy in company-wide deployments.

You can specify the following attributes for each content type:

- Document Information Panels that display in Office 2010 programs for items of this content type.
- Document templates that you want to apply to new documents.
- Columns that you want to assign to items of this type.
- Custom list forms (New, Edit, and Display) and InfoPath forms to use with this content type.
- Workflows available for items of this content type.
- Information management policies associated with items of this content type.

By declaring a document to be a particular content type, you automatically assign the set of metadata to it, which can be useful in the following ways:

- Track a document through its life.
- Produce catalogs of documents that can help users find information they want quickly.
- Organize documents in libraries.
- Manage the retention and disposition of documents.
- Obtain more accurate search results.
- Filter and sort lists on meaningful characteristics.

For more information, see [Use content types to manage content consistently on a site.](#)

User interface requirements

Most SharePoint Composite solutions do not require advanced skills in Web page design, and there a number of SharePoint features which make this important step much easier to do, and all from the browser.

Choose a site template

When you create a new site, you start by selecting a site template to base your site on. Site templates contain lists, libraries, pages, and other elements or features that support the needs of a solution. When you create a new site from a template, you can start using the site right away or customize the site so that it meets your needs. Although team sites are the most common sites, there are other sites to consider depending on your needs.

For more information, see [Preview of SharePoint Server 2010 site templates.](#)

Create either a workspace or a dashboard

There are at least two types of home pages that you might create in your SharePoint Composite solution: workspaces and dashboards.

In general a workspace is task-focused, and might do the following:

- Prioritize and highlight project or customer data to help you make effective decisions.

- Display an up-to-date work schedule and meeting information to quickly plan your day.
- Get quick access to business news, local weather, and your favorite Web sites to focus your Web browsing.

In general a dashboard reports information, and might do the following:

- Consolidate data from different data sources and create a report.
- Analyze and aggregate data (for example, sums, totals, or counts).
- Summarize key KPI information that you want to see at the beginning of each day.

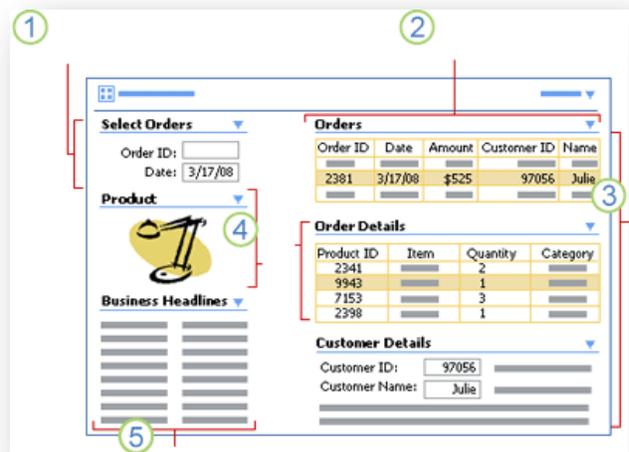
Create page content and navigation

From the browser you can edit SharePoint pages that have varied layouts, richly formatted text, and diverse objects such as images and media. These features help you create pages that are more compelling and informative. SharePoint Designer 2010 offers even more options for editing pages.

Many page navigation decisions are easy to implement. The top link bar helps users of your site navigate to other sites in the site collection by displaying a row of tabs at the top of pages in the site. The Quick Launch contains links to select lists and libraries of the current site and can optionally contain links to subsites and pages of the current site. You use the Quick Launch to navigate between different areas of your site, such as between a list and a library or from a parent site to a subsite. Lastly, the tree view is a navigation option that provides a hierarchical view of the lists, libraries, and subsites. The tree view is displayed to the side of most pages of the site, below the Quick Launch, but is disabled by default. If your site has a complex hierarchy, the tree view can make it easier for the users of your site to navigate between content in the site hierarchy, such as between a library in the current site and a list in a subsite.

Add Web Parts

You can handle much of the dynamic, data-driven aspects of a modern Web page by using Web Parts. A Web Part is a modular unit of information that forms the basic building block of a page. You can add Web Parts to pages or to Web Part zones in a Web Part Page and then customize the individual Web Parts to create a unique page for your site users. You can use Web Parts to consolidate data, such as lists and charts, and Web content, such as text and images, into a dynamic information display that is built around a common task or special interest. Pages and Web Part Pages often contain several Web Parts that are connected so that you can dynamically display data and content to see the results that you want.



For example, you can create a Web Part Page called Customer Orders that you use to display critical information. You get a call from a customer who has a question about an order, does not remember the order ID number, but does remember the date when the order was placed. You can use a Web Part Page to do the following.

- 1 Look up an order by order ID number or, in this case, the order date.
- 2 Display all orders by date.
- 3 Select the correct order, based on the customer's name, and look up order and customer details.
- 4 Select a line item (in this case, the lamp), and display a product picture to confirm the customer's question.
- 5 Scan for late-breaking business news that is pertinent to the customer's order.

For more information, see [Summary of Web Parts](#) .

Personalize the page

A useful technique is to use the Filter By User Web Part to customize the display of content based on who is currently using the page. This is especially useful for solutions used by Human Resources groups. Information workers, project leads, and managers might also require different views relevant to their activities. The task owners want to see all issues assigned to them, for example, while the project owner wants to see all past due issues.

Data Presentation

Because SharePoint Composites can work with data in a variety of ways, it's helpful to clearly understand the basic data presentation formats that you can use and combine in your solution.

Data Grids

The simplest way to work with data is often by using a data grid. A data grid is a tabular display of data in columns and rows that lets you easily sort, filter, query, and manipulate the data. Data grids also provide a way to obtain the correct set of data for your business solution from several data sources. For some users, a data grid is enough to effectively work with the data. For other users, you need more user-friendly ways to manage the data, such as forms, reports, and dashboards. You can create and use data grids by using Datasheet view, Access datasheets, and Excel tables.

Last Name	First name	Company
Hayakawa	Satomi	Adventure Works
Peoples	John	Contoso, Ltd
Riley	Steve	Alpine Ski House
*		

Datasheet view provides a data grid for viewing and editing data for many types of lists. You may find Datasheet View more convenient and powerful than the standard list view. It displays the contents of a list or a document library in rows and columns. You can add and edit rows and columns, apply filters and sort orders, display calculated values and totals, and conveniently edit data in the grid cells.

Forms

Structured and semi-structured data often needs updating and changing, and that's where forms come in to play. A form, whether printed or online, is a document or program component designed with a standard structure and format that makes it easier to gather, capture, organize, and edit data. Forms are windows through which users see and access your data. Online forms contain instructions, formatting, labels, and blank spaces for entering data, much like a printed form. Online forms also contain controls that display data or make it easier for users to enter or edit data, perform an action, or make a selection, such as list boxes, option buttons, and command buttons. A visually attractive form makes working with the data more pleasant and more efficient, and helps prevent incorrect data from being entered. You can create and use forms by using SharePoint list forms, InfoPath forms, and Access forms.

Reports

Structured and semi-structured data is commonly made available to users through business reports. A report is the presentation of data transformed into formatted and organized information according to specific business requirements. Examples of reports include budget forecasts, sales summaries, phone lists, mailing labels, and product catalogs. Reports can be a simple one-page synopsis or a hierarchical

display of extensive data. A report may also contain subreports, vary based on parameters that are passed to it, and be highly interactive so that users can sort, filter, and drill down on or even drill through the data.

By using reports, information workers can make good business decisions by helping them to answer questions, focus on objectives, find best alternatives, devise correct strategies and tactics, determine consequences and trade-offs, and assess unknowns and risks. You can create and use a wide variety of reports by using Access 2010, Excel 2010, SQL Server 2008 Reporting Services, InfoPath 2010 (by using form merging) and SharePoint Designer 2010 (by using read-only Data Views).

The following table provides suggestions on fitting a report to the type of user.

Type of user	Example	Report actions
Casual users	Frontline workers	Read standard, simple reports and access reports through simple displays, such as flowcharts.
Moderate users	Managers and information workers	Read detailed reports, customize and interact with reports by filtering, sorting, and setting parameters, and create ad hoc queries and reports.
Power users	Data and business analysts	Create and customize reports, work with Online Analytical Processing (OLAP) PivotTable reports, use report authoring tools, conduct statistical analysis, and perform analytics using data-mining tools.

Dashboards

Dashboards are a vital business-intelligence technique that combines reporting and analytics to visualize critical information at the enterprise, departmental, and group level. Dashboards often use a number of Web Parts to create a unified view of scattered information throughout the site in one place.

There are three types of dashboards: operational dashboards used to monitor daily work for employees, tactical dashboards for analysis of data and monitoring of monthly and quarterly activities, and strategic dashboards for long-term enterprise management. Dashboard data can be quantitative, such as order amounts, market share, profits, support calls, manufacturing defects, or Web page hits. Or dashboard data can be qualitative, such as Top 10 customers, key issues, current tasks awaiting completion, and critical news updates.

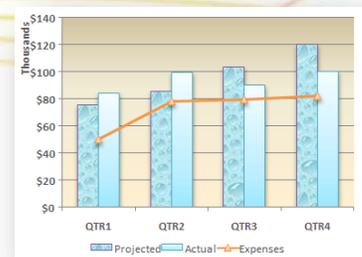


Dashboards can be characterized in many ways, for example by:

- Role, such as strategic, analytical, and operational.
- Data type, such as quantitative and non-quantitative.
- Business function, such as Sales, Finance, Marketing, Manufacturing, and Human Resources.
- Scale, such as enterprise-wide, departmental, team, and individual.
- Refresh schedule, such as monthly, weekly, daily, hourly, or immediate.
- Nature, such as static or Interactive.
- Display, such as graphical, textual or integrated.

Charts

Charts are used to display series of numeric data in a graphical format to make it easier to understand large quantities of data and the relationship between different series of data. The two primary ways to use charts in a



SharePoint Composite solution are by using Excel Services and the Chart Web Part.

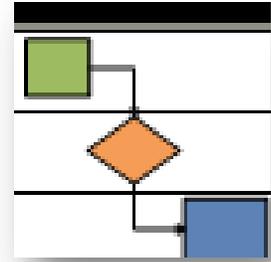
Note If your solution includes the use of SQL Server Reporting Services, you can also create reports that contain charts, as well as maps and other diagrams.

The Chart Web Part can be connected to other Web Parts, but by itself can be configured a number of different ways with a number of different data sources, including Excel Services. Additional built-in features include filtering, formulas, a wide variety of chart types, tooltips, and annotations.

Diagrams

Because of the data connection and refresh capabilities of Visio diagrams, diagrams are now a first-class citizen when it comes to presenting data. You can:

- Publish Visio diagrams to the Web to share rich, compelling visuals, shapes, and processes.
- Connect diagrams from one or more data sources (such as Excel 2010) and publish them to SharePoint. Real-time data within the shapes can be refreshed.
- Create highly interactive, visual solutions by using the Visio Web Access Web Part connected to other Web Parts.



Software Requirements

SharePoint 2010 and Office 2010 are available in a number of different product tiers each of which provides a greater subset of features. It's important to understand which product you need, so you have the features you require to create your solution. Another consideration is whether or not your infrastructure is on-premise, online, or a hybrid installation. Although the SharePoint Online service contains a large subset of features available in the SharePoint 2010 that is installed on-premise, not all features are available.

For SharePoint 2010 on-premises, the three product tiers are:

- SharePoint Foundation 2010
- SharePoint Server 2010, Standard
- SharePoint Server 2010, Enterprise

For SharePoint 2010 online, the two product tiers are:

- Office 365 for professionals and small businesses
- Office 365 for enterprises

For the Office 2010 business suite, the two tiers available are:

- Office Standard 2010 (Word, Excel, PowerPoint, OneNote, Outlook, Publisher, and Office Web Apps)
- Office Professional Plus 2010 (Access, InfoPath, SharePoint Workspace, and Lync)

For Office Visio 2010, the three product tiers are:

- Visio 2010 Standard Edition
- Visio 2010 Professional Edition
- Visio 2010 Premium Edition

Technical Requirements

Depending on your site and needs, you may need to work closely with your IT department to customize your SharePoint installation. The following is a short, but critical list of considerations:

- Features and Services to activate.

- Special performance and capacity planning.
- Security and adjustment to permission levels.
- Installation and upgrades to products.
- Data connection files, libraries, and trustworthiness.
- General Central Administration settings and configurations.
- Authorization, authentication, user identity management, and Single Sign-On (SSO).

Design and develop

Once the wheel was invented, the idea of using a round object to transport people and goods was widely adopted. Overtime, the wheel was improved upon and different types of wheels, or “wheel patterns” were created. There’s no need to reinvent the wheel and there’s no need to re-invent a SharePoint Composite solution. There’s a pattern or combination of patterns that fits your solution and helps ensure that you have made the right set of choices and tradeoffs, confirms that you are on the right track, and makes sure you are not using the wrong type of wheel. That’s what [Part II: Common SharePoint Composite Design Patterns](#) is all about (and why this section seems so short).



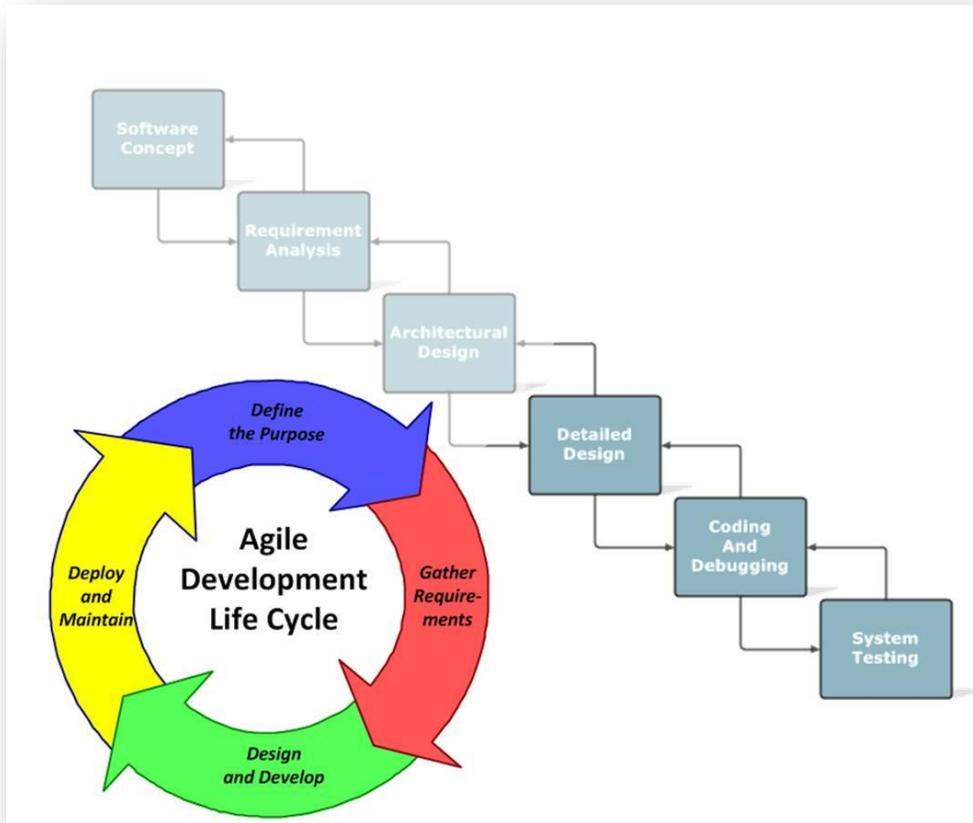
Deploy and maintain

Deploying a SharePoint Composite solution is a relatively simple process because it’s usually a matter of displaying or publishing one or more Web pages. Alternatively, you can save an entire SharePoint site as a template, and then deploy it where you wish. Another big advantage to using SharePoint 2010 is that there are a number of features and tools that make it easier to maintain your solution. Here are some things to think about:

- **Deploy the solution** If you want to distribute your solution as a site, you can save it as a template to the Solution Gallery for the site collection. Everything that you create as part of the solution is saved in the template, and then you or an IT administrator can activate the template so it can be created just like any other site template. For more information, see [Save a SharePoint site as a template](#).
- **Promote the solution** Help people to know that the solution is available. Use alerts, announcements, e-mails, blog posts, site newsletters, or other online social computing techniques that will make your solution go viral.
- **Train your users** Make your solution quickly successful by educating users on how to use your solution and what are its benefits. Use PowerPoint Broadcasts, video demos, podcasts, or online training.
- **Support the solution** Keep your solution working and on track. Create and update a help wiki, set up a discussion board or list to track issues and bugs, provide backup resources to your Enterprise Help desk in a subsite, regularly e-mail rotating tips, or create an online suggestion box for feedback and ideas.

Pushing the SharePoint Composite envelope

Although a SharePoint Composite is often designed and developed by a power user or business analyst, there is not a hard and fast line between a SharePoint Composite no-code solution and an application that is partly or completely coded by a programmer. As we have seen, one of the benefits of a SharePoint Composite is that it can incrementally evolve into a programmed solution, and that from a developer point-of-view, it is like a working prototype that can form the basis for an enterprise-scale solution.



A SharePoint Composite can help shorten the traditional application development lifecycle

There are several ways you can use code to enhance your SharePoint Composite solution including JavaScript, Web Services, REST, and code-based extensions that use a sandboxed solution.

Using JavaScript

A SharePoint page is a Web page, and so you can use JavaScript to add functionality and improve the user interface. Although you can simply edit a page to add JavaScript in the browser or SharePoint Designer 2010, one useful, maintainable approach is to add a text file containing JavaScript stored in a library by using the **Content Link** parameter of the Content Editor Web Part. Examples of using JavaScript on a SharePoint page include custom navigation menus, tabbed pages, and hiding of SharePoint controls.

Visio 2010, Excel 2010, and the Media Web Part, all have JavaScript Object Model extensions that let you perform a number of useful tasks and detect user interaction. For example:

- In a Visio drawing, you can capture a click event, highlight and annotate shapes, navigate and refresh the diagram, and read shape data.
- In an Excel Services Web Part, you can validate cell entry, create a drop-down list, or click a cell and pass a parameter to another Web Part.
- In the Media Web Part, by using the **createMediaPlayer** method, you can dynamically specify which asset in an Asset library to load based on page parameters and content, and control the play, pause, and seek operations of the media.

Using Web Services and REST

A Web service is a standard method for communication between Web sites using SOAP (Simple Object Access Protocol) to exchange information in XML format. It uses an interface language called WSDL (Web Services Description Language). For example, you can use SharePoint Designer 2010 or InfoPath 2010 to include data from a Web Service.

REST (Representational State Transfer) is a special type of Web service that processes XML representations of Web information using stateless operations. A client requests information from a server that responds to the request. The information is often a document or a portion of a document. For example, you can incorporate REST data by:

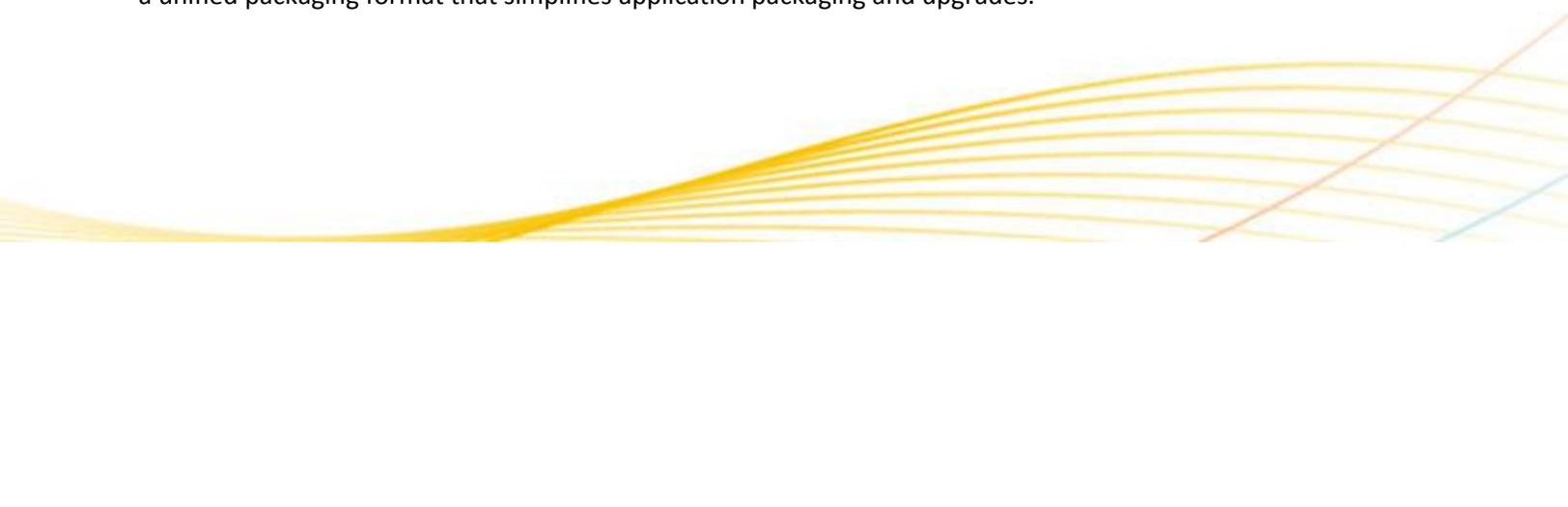
- Using SharePoint Designer 2010 to create a List View Web Part based on list data from another site.
- Creating an InfoPath form to enhance the requested REST data source with functions and rules.
- Adding and refreshing a REST data source in PowerPivot to combine it with other data sources.
- Displaying portions of an Excel workbook, such as a chart or named range, on a Web Part page or even within a Word document.

Using code-based extensions in a sandboxed solution

Code-based extensions that use sandboxed solutions are ways to further enhance a SharePoint Composite solution by adding managed code in a targeted way. For example, you can:

- Customize field types for use in a list or library.
- Modify out-of-the-box list or site workflows.
- Add a custom workflow action.
- Create user-defined functions in Excel Services.
- Customize content types specific to a particular need.
- Deploy an InfoPath form containing managed code.
- Create a custom Web Part, such as a Silverlight user interface with rich data visualization and maps.
- Create a custom event-receiver.

Sandboxed solutions give developers (who must be a server administrator or a site collection owner) the ability to deploy fully-trusted, managed code “in the sandbox” by using a subset of the SharePoint Object Model within the current site collection. Sandboxed solutions also enable hands-off IT management of those solutions by automatically ensuring solutions stay within predefined thresholds of memory use, database query times, and CPU utilization. Developers are empowered to independently upload code solutions to their sites, but administrators can automatically monitor and control resource utilization by using policies to make sure there is no undue impact on system performance and stability. When you create a sandboxed solution, you can also use a unified packaging format that simplifies application packaging and upgrades.



Part II: Common SharePoint Composite design patterns

The following sections describe fundamental SharePoint Composite design patterns. A design pattern is a practical way to organize the basic SharePoint building blocks and Office 2010 products according to common types of business solutions. A pattern helps to organize your thinking and planning. A pattern also fits a typical scenario and helps you understand how that scenario is similar to your needs.

But, a pattern is not a strait-jacket, and, with some experience, may be adapted and combined to fit your unique and specific requirements. After doing your up-front analysis, you may end up adopting just one pattern. Or, you may end up combining patterns in a unique way. Whatever the case, it's a good idea to read or browse through all the patterns to make sure you are getting the big picture and to help you make good choices. The following patterns are more-or-less listed in the order of simple to advanced development.

At the end of each pattern is a section called **Sample solutions and resources** that contains a related list of links to one or more existing solutions, case studies, scenarios, articles, videos, or other resources. You can use solutions and resources to help create your own solutions, adopt best practices, and learn needed skills.

Beginning site customization

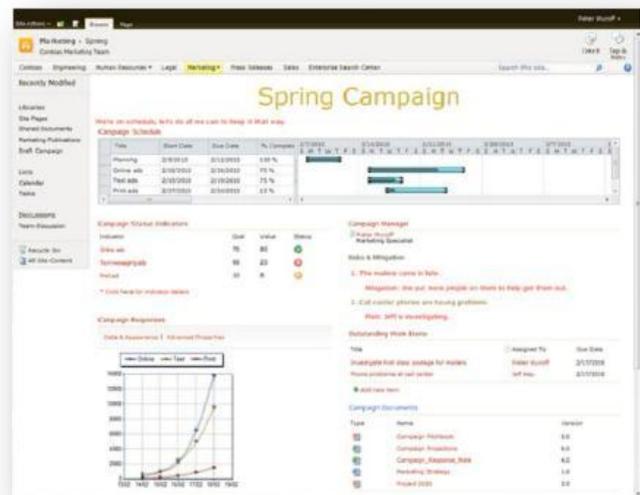
Just by editing the contents of a Web page and adding a few Web Parts, you can create a simple SharePoint Composite solution. You can instantly add and update text, tables, images, and links by using the SharePoint ribbon, and you'll find the editing experience is familiar, especially if you use Word 2010. Once you have captured data in a list or documents in a library, you can quickly add them by using the List View Web Part to display important or current information.

A common approach is to plan your page layout as several container boxes, and then adjust the size and format of the Web Parts to fit into one page without requiring users to scroll horizontally. You can modify the Web Part chrome and toolbar or even minimize the Web Part to save space. When you add a List view Web Part, consider first creating a view that limits the columns, sorts the data, and filters it to the just the subset of data you need for your purpose. Of course, it's easy to iterate the design until you get it just right.

Additional easy to use SharePoint lists include: Calendars, Tasks, and Links. Additional easy to use Web Parts include Summary Links, RSS Viewer, Image Viewer, Page Viewer, Picture Library Slideshow, and all the Outlook Web App Web Parts.

Here are some common tasks and ideas:

- Use Announcements to let your department or team know about an upcoming event, post important breaking news, or discuss a facilities issue such as new construction.
- Use Calendars to list your organization's holiday schedule, track upcoming vacation schedules, or track your organizations training events
- Use Links to track news sites (stock, partner, and distributor sites) or provide links to other intranet sites
- Display a library of policies and procedures, frequently used forms, meeting agendas, and current reports



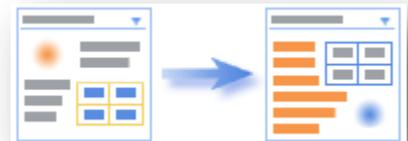
- Use team discussions to display the latest posts and the hottest topics.
- Display images, such as the company logo, a team photo, or pictures of morale events and holiday parties.
- Use the Page Viewer Web Part to display an embedded site, folder or document of interest to the team.

Sample solutions and resources

- [Solution: Using SharePoint to organize a research group](#)
- [Video: Manage a project with SharePoint Server 2010](#)
- [Video: Manage customer data](#)
- [Video: Manage employee schedules](#)

Advanced site customization

Adding Web Part connections takes page and site customization to a new level. From the browser or SharePoint Designer 2010, you can connect Web Parts to present alternate views of your data or documents, perform related calculations, or filter one Web Part by using values from another Web Part. For example, you can select from a list of top-selling products in a Filter Web Part, and then simultaneously display the current inventory level as a table in one Web Part, a bar chart of sales revenue over the past five years in a second Web Part, and a sales summary over the past year in a third Web Part.



A Web Part connection is a way to pass data from one Web Part to another Web Part and synchronize their behavior

Advanced Web Parts that you can connect together in a variety of flexible and useful ways include List View, Filter, Excel Web Access, Visio Web Access, Filter, InfoPath Form, and Chart Web Parts. The following table summarizes the most common types of Web Part connections you can make.

<p style="text-align: center;">Form view</p> <p>The diagram shows a list view web part on the left with columns ID, Name, and Title. An arrow points to a form view web part on the right, which displays the details for a selected item: ID: 8934, Title: Supervisor, and Name: Julie.</p>	<p style="text-align: center;">Summary and detail</p> <p>The diagram shows a summary table web part on the left with columns Salary, Sick, and Vacation. An arrow points to a detail table web part on the right with columns Week, Sick, and Vacation, showing data for weeks 5/1 and 6/17-6/24.</p>
<p style="text-align: center;">Alternate field view</p> <p>The diagram shows a table web part on the left with columns Name and Amount. An arrow points to a chart web part on the right showing a bar chart of a total amount of \$5822, with a red flask icon.</p>	<p style="text-align: center;">Search and filter</p> <p>The diagram shows a search and filter web part on the left with input fields for Title, Author, and Subject, and a SUBMIT button. An arrow points to a list view web part on the right with columns Title, Author, and Subject.</p>

Calculate

Amount:
 Rate:
 Years:

→

Month	Payment	Int	Principle
1			
2			
3			
.	.	.	.
.	.	.	.
.	.	.	.
120			

Data enhancement

ID	Name	Address
8756	Julie	Park Drive

→



→



Alternate list view

Emp ID	Name	Title	Mgr ID

→

-
- +
- +
-
- +
- +
- +
- +

→



Alternate item view

→



→



Master and detail

Order ID	Date	Amount	Customer ID	Name
2381	3/17/08	\$525	97056	Julie

→

Product ID	Item	Quantity	Category
2341		2	
9943		1	
7153		3	
2398		1	

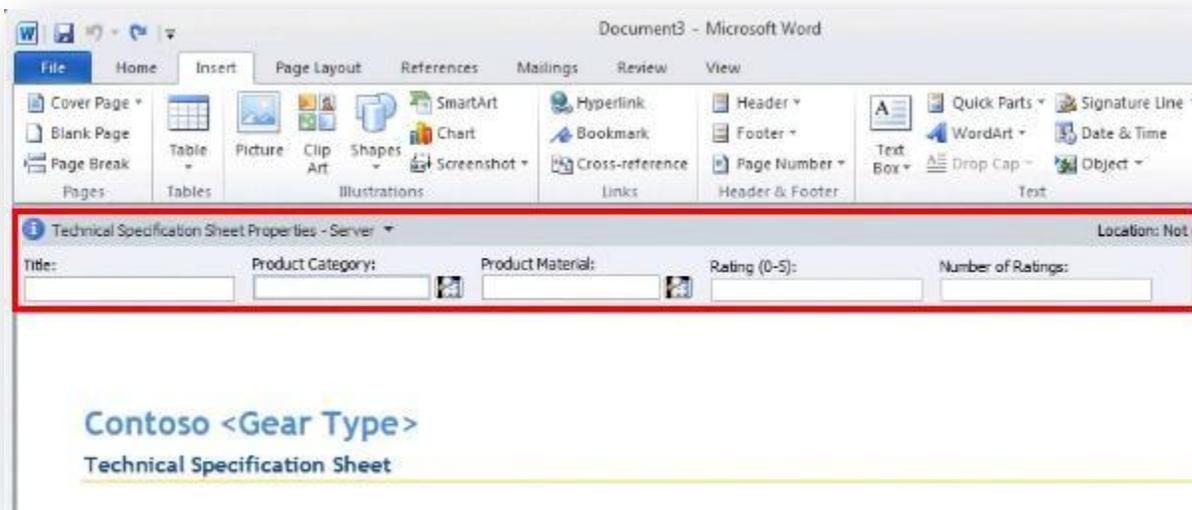


Sample solutions and resources

- [Walkthrough: Track and manage computer assets](#)
- [Video: Record, approve, and manage employee expenses](#)
- [Solution: SharePoint 2010 comes to the rescue](#)
- [Solution: How we built an equipment reservation site using the Group Work Site template](#)
- [Solution: SharePoint Saved our Business and our Sanity](#)
- [Solution: Add a map to your SharePoint site](#)
- [Solution: Customization and branding options in SharePoint 2010](#)
- [The Fabulous 40](#)

Document Information Panels

The Document Information Panel displays in Word 2010, Excel 2010, and PowerPoint 2010 for documents stored in a SharePoint library. By using a Document Information Panel, users can track and edit metadata for a document even as they continue to work in the document. As a site administrator, you can manage settings to specify how document conversions take place, use information management policies, and so on. The panel is actually an InfoPath form that is hosted and displayed within a document. You do not need InfoPath 2010 installed on your computer to see the panel, but you do need InfoPath 2010 to design or customize the panel.



By customizing the Document Information Panel, you can also add business logic, such as data validation, or add custom properties that are important to your organization. In addition, by creating a template part to contain common fields, you can organize the efficient reuse of Document Information Panels in different Office document types across your organization.

To use a Document Information Panel, you may need to first activate the **Developer** tab on the Ribbon in the programs where you want to use the Document Information Panel. You can then specify the location of the Document Information Panel by using a URL. In addition, you can choose to display the Document Information Panel by default when the document is opened and whether the custom properties that you created are visible by default.

Sample solutions and resources

- [Video: Use Microsoft Word 2010 with SharePoint](#)

Social Computing

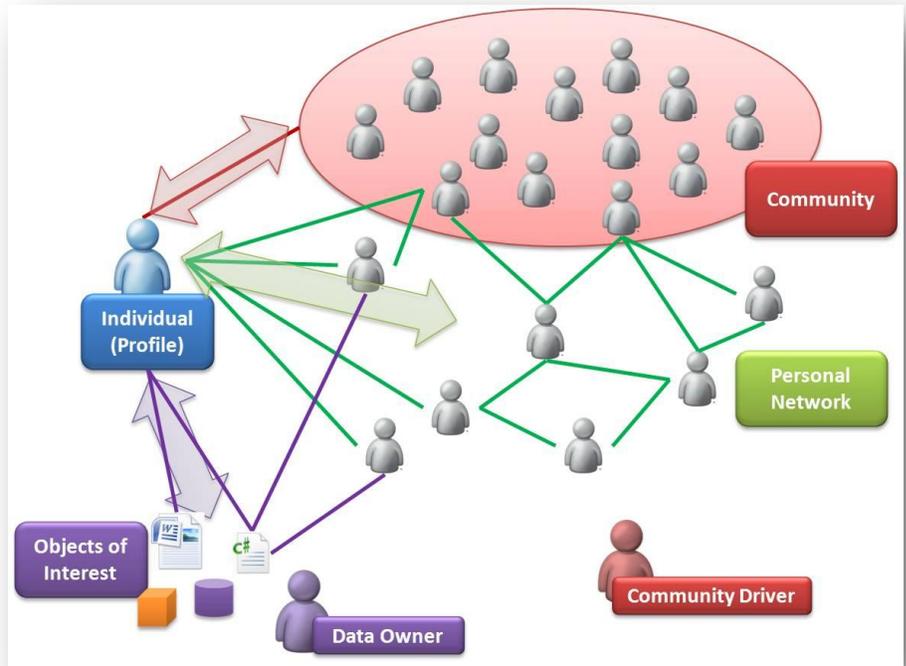
The set of capabilities collectively called SharePoint Communities empower people to collaborate in assorted groups, spontaneously share knowledge and ideas, connect with colleagues, easily find information and experts, and break down organization silos. Social computing entails the following:

User generated content

- Use blogs and wikis to collect and share social and informal and institutional knowledge.
- Use podcasts and video training to educate employees cost-effectively.
- Use PowerPoint broadcasts to announce, present, instruct, and promote.

Social Feedback

- Leverage ratings, tagging, and keyword suggestions.
- Refine search and discoverability, and find better answers based on social commentary.
- Use NoteBoards that provide quick ways to share and post timely facts.



Social Networking

- Use employee profiles, newsfeeds, and organization browsing to provide extensive ways to stay connected with your team and other groups and be in on the buzz.
- Use the Outlook Social Connector to connect Outlook 2010 to your business and personal social networks. Within Outlook 2010, you can stay up to date on the status and activities of your contacts, whether they are from your organization's network, or from other social networking sites on the Internet.

Find People and Expertise

- Encourage employees to build out their My Sites so all employees can share information about themselves, including past projects and areas of knowledge.
- Search by people and expertise helps you hunt for people with skills on a particular project, advertise to others what your skill set is, and build relationships through your human network based on common interests.

Sample solutions and resources

- [Solution: Boosting collaboration with wikis, blogs, My Sites, ratings, and tags](#)
- [Solution: 12 Tips for creating a "Collaboration Cafe" in SharePoint](#)
- [Case Study: Microsoft SharePoint Server 2010 - Unisys](#)

Dynamic diagrams

Most of us are not graphic designers, but perhaps secretly wish to be one because we know how powerful graphics are in communicating and persuading others. Whether you're creating an organizational chart, a network diagram, or a business process, by using Visio 2010, you can unleash the latent graphic designer within. You can make your diagrams more appealing and professional-looking in seconds with features like:



- Modern, pre-drawn shapes, intelligent templates, and sample drawings.
- Quick Shapes, a Mini toolbar, a dynamic grid to add and align shapes, auto connect and drag to connect.
- Formatting tools and design options and a rich gallery of themes.
- Automatic layout adjustments so you can insert and delete shapes with little impact.
- Large and complex diagrams that can be simplified by using sub processes and containers to group related shapes visually and logically, and to link across pages.



Once your diagram is created, you can then publish and share diagrams by using Visio Services, which supports central access to Visio diagrams. Use the Visio viewer for sharing interactive, browser-based diagrams (pan and zoom in the online diagram, follow hyperlinks in shapes, and so on). Users with Visio 2010 installed on their computer can also open the diagram in Visio 2010. Process Diagram libraries in Metric and US units act as a repository for sharing diagrams.

Furthermore, you can connect Visio Diagrams to data, so you can put information in context and make it more meaningful. Diagrams that are linked to data can be refreshed automatically or by the user. Connectable data sources include Excel 2010, SQL Server 2008, SharePoint Lists, OLE DB/ODBC, and Data Connection Libraries. Once the data connection is made, you can link data to shapes: Display data fields as callouts next to a shape, position fields in boxes below a shape, place fields of data directly on top or to the side of a shape, insert legends to clarify your data graphics, and communicate what the visuals (icons, colors, bar graphs) in a diagram mean and how they map to your data.

Data-driven diagrams are very useful and can help identify trends and exceptions at a glance. Examples include healthcare metrics on a hospital floor, retail metrics on a store layout, network health status on an IT network, and an organizational chart with metrics for each individual.

Sample solutions and resources

- [Solution: Using a Visio Process Repository](#)
- [Solution: Monitor SharePoint Server using Visio Services & System Center Operations Manager](#)
- [Video: Using Visio 2010 Containers & Lists to Create Server Drilldowns with Excel Data](#)

- [Video: Use Visio Services with SharePoint lists](#)
- [Solution: Creating a JavaScript Drawing to Display in SharePoint Server 2010](#)

Form-centric solutions

All business processes involve gathering data of some kind, and the success of any business process relies on the quality and integrity of that data. By using InfoPath forms in your SharePoint solutions, you can ensure that only valid, good quality data is gathered. InfoPath 2010 achieves this by letting you standardize, customize, and optimize the process of gathering data without writing any code.

You have two design choices when creating applications that will incorporate InfoPath browser forms: list forms and form-library forms. With form library forms, you can:

- Add workflow process to existing documents in a document library.
- Create custom InfoPath forms that drive workflow initialization and association and workflow tasks.

With list forms, you can:

- Start with one or more InfoPath forms for a SharePoint list. You can quickly customize a form, such as changing the layout or adding data validation.
- Add workflow and other components to the application.

Comparing list and form library forms

There are important functional differences between these two types of forms.

- **Schema** The schema structure for a list form is flat, it is not possible to build hierarchical information sets with grouped and nested items, and you cannot apply repeating, optional, or choice behavior to individual elements or groups, as you can with Form library forms.
- **Controls** List forms support only a subset of Web browser controls, essentially because lists are non-hierarchical, whereas Form library forms support all Web browser controls. The following controls are not supported in list forms:
 - Bulleted List, Numbered List, Plain List
 - External Item Picker, File Attachment
 - Optional Section, Repeating Section, Repeating Table
 - Choice Group, Choice Section
- **XML** List forms store data in the list columns, and do not generate an XML document as does a Form library form.

Common business solutions that use InfoPath forms include: data gathering, such as a help desk Web site, a procurement center, or an employee hiring center; and ad hoc business processes, such as issue tracking or tasks lists.

Sample solutions and resources

- [InfoPath Cool Forms: Weather Forecast Form](#)
- [Solution: Create a Loan Calculator using the InfoPath and Excel Web Parts](#)
- [Video: Create a Loan Calculator using InfoPath and Excel Web Parts](#)
- [Walkthrough: Create a Mortgage Calculator with the InfoPath Form Web Part](#)

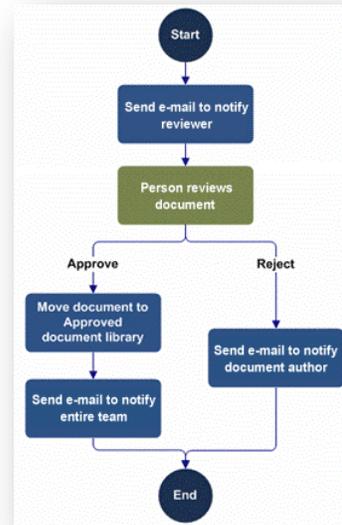
- [Solutions: Create Form Driven Mashups with the InfoPath Form Web Part](#)
- [Solutions: Form-Driven Mashups](#)
- [Solutions: Add a Dynamic Map to a Contact Form using REST Web Services](#)

Business process and workflows

As we have seen, a SharePoint workflow introduces application logic to your business processes without requiring you to write code. Start first by looking at out-of-the-box workflows you can edit from the browser. Alternatively, you can start the design and sharing of workflows by using Visio 2010 with its flowchart templates that can be exported to SharePoint Designer 2010. Then, move up to the powerful yet intuitive workflow designer in SharePoint Designer 2010 that is designed around rules consisting of sets of conditions and actions. Finally, use Visual Studio for advanced development.

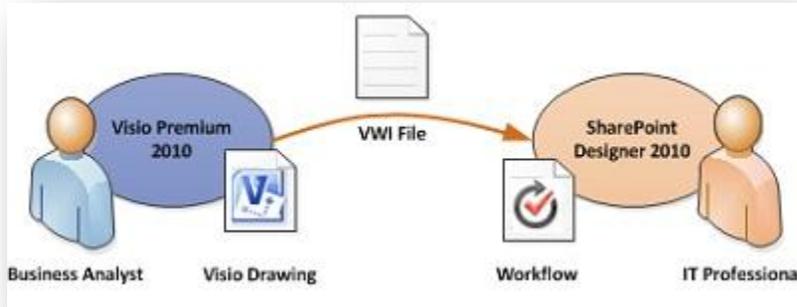
A great place to start is with the three most popular workflows, which capture 80% of all approval scenarios and are available out of the box:

- **Approval Workflow** Routes a document or item that is saved to a list or library to a group of people for approval. By default, the Approval workflow is associated with the document content type and it is thus automatically available in document libraries.
- **Collect Feedback Workflow** Routes a document or item that is saved to a list or library to a group of people to collect their review feedback. By default, the Collect Feedback workflow is associated with the document content type and it is thus automatically available in document libraries.
- **Collect Signatures Workflow** Routes an Office document that is saved to a list or library to a group of people to collect their digital signatures. By default, the Collect Signatures workflow is associated with the document content type and is automatically available in document libraries for documents or workbooks that contain signature lines.



Without even using SharePoint Designer 2010, you can customize these workflows in a wide variety of ways. These workflows are event-driven, and all of the important events in the workflow are surfaced in the workflow editor, both for each task in the process and for the process as a whole. For example, you can easily add conditions and actions to define what happens when each task is assigned, expired, or completed. You can even copy and revise them by using SharePoint Designer 2010.

A business analyst, who best understands the process that a workflow needs to capture, can sketch out workflows graphically in Visio 2010. Visio Professional 2010 includes a SharePoint Workflow template that includes shapes for all of the workflow conditions and actions. You can start in Visio 2010 and then export the diagram to SharePoint Designer 2010, you can start in SharePoint Designer 2010 and then export to Visio 2010, or you can iterate on a workflow design with many round trips between both programs without losing any content.



By using Visio 2010, you can also do the following:

- **Validate a workflow** When exporting a SharePoint workflow from Visio 2010 to SharePoint Designer 2010, you first validate the diagram. If the workflow diagram is not valid, an **Issues** window appears which includes a list of issues that must be repaired before the workflow can be exported. This ensures accuracy and consistency in diagrams. You can check for common errors and support diagramming standards across your organization. With one click, you can check a diagram against a set of rules to make sure the diagram is logical and properly constructed.
- **Visualize a workflow** With workflow visualization, a Visio diagram of your workflow is automatically created and displayed in a Visio Web Access Web Part on the Workflow Status page. The workflow visualization shows a live view of exactly where a specific workflow is.
- **Export a workflow** If you want, export a reusable workflow from one site collection and then upload and activate that workflow in a different site collection. SharePoint Designer 2010 also supports exporting a workflow as a solution package (.wsp).

Sample solutions and resources

- [Solution: About the workflows included with SharePoint](#)
- [Video: Create an approval workflow in SharePoint Designer 2010](#)
- [Solution: Guidelines for Developing a SharePoint Request for Proposal \(RFP\)](#)

Managing enterprise content

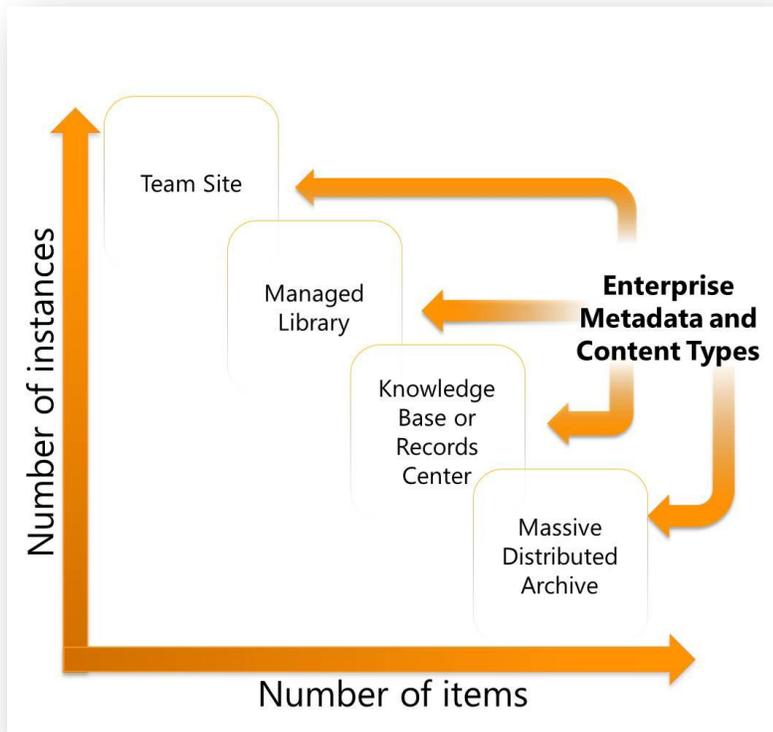
SharePoint 2010 blends the worlds of traditional content management, social computing, and search to deliver an Enterprise Content Management (ECM) platform that is accessible to everyone, and that could be dubbed “ECM for the masses”. ECM helps companies manage documents throughout their lifecycle from creation to disposition and comprises the following areas:

- Document management
- Records compliance
- Media assets

Document management

SharePoint 2010 includes a broad collection of capabilities that simplify and streamline how companies manage documents. You can apply features across an entire deployment, regardless of its size, and ensure that policies

are consistently and effectively implemented as shown in the following image and table.

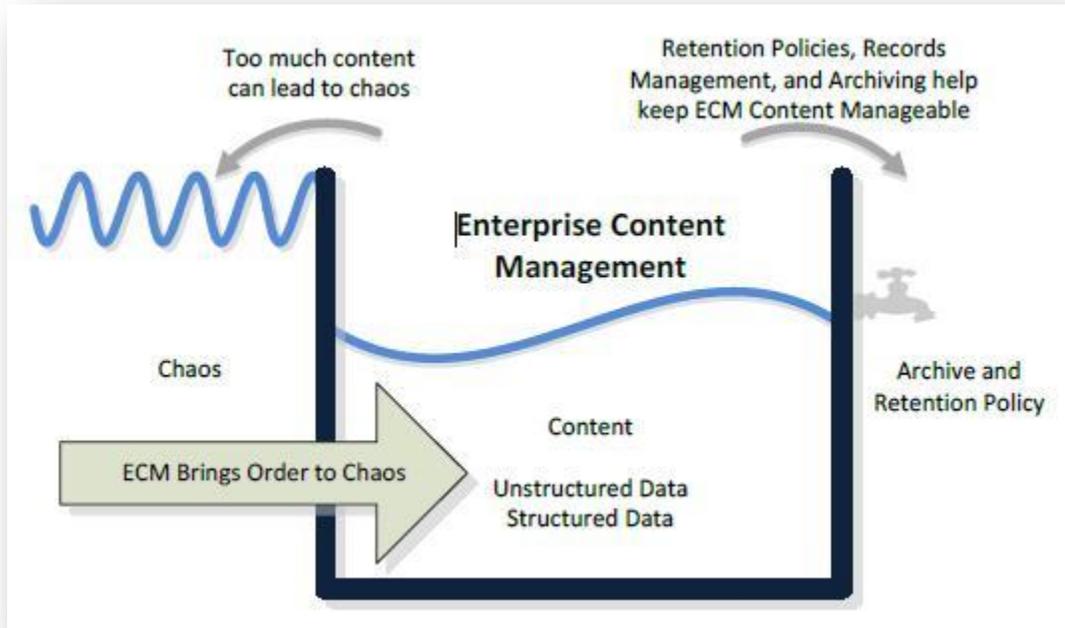


Scale	Who manages?	How added?	Comments
Team Site (100 to 200)	No manager	Ad hoc uploads	<ul style="list-style-type: none"> • Small projects and teams; Created ad hoc throughout the enterprise; Lightweight • Example: library for storing a small team’s work in progress docs or projects
Managed Library (100,000 plus)	Informally by subject owner	Upload, iterate	<ul style="list-style-type: none"> • Structured library per division; Enforced metadata capture • Examples: RFP library for a sales force; Spec library for an engineering team; Brand images repository for marketing
Knowledge Base or Records Center (One Million plus)	Dedicated content stewards	Formal Submission	<ul style="list-style-type: none"> • Archival; Finished work product; broad consumption • Example: Knowledge management repository
Massive, Distributed Archive (Millions)	Dedicated content stewards	Formal Submission	<ul style="list-style-type: none"> • Biggest scale • Example: Corporate records archive

Managed metadata

Managed metadata is a way to centrally define taxonomies that can be leveraged within and across farms to classify and find content quickly. Managed metadata helps bring structure out of the chaos of documents. As companies worldwide receive increasing amounts of unstructured content, people are having more difficulty

finding desired content with full text searching and basic keyword terms. However, if content owners tag documents with metadata, providing accurate details on the nature of the information, people can find that content more easily. Managed Metadata helps people easily tag content with metadata through auto completion and taxonomy-browsing tools. Using that metadata improves the process of finding content by providing search refiners and metadata-driven navigation. People can use metadata-driven navigation from within SharePoint sites or through Office 2010 products to find the content they need without knowing where it is stored.



Document Sets

Users often create multiple documents that support a single case or project. By using Document Sets, you can group all of these documents into a single entity that shares metadata properties, applies to workflows, and enables versioning as a whole. Examples include a pitch book (document, presentation, and spreadsheet) created in response to each request for proposal (RFP), or a standard set of documents related to design, testing, and fabrication of a manufactured product.

Each Document Set also has a customizable welcome page that displays shared metadata properties and can be used to display standard processes, workflow stages, and other set of related information. This Welcome Page is configurable per Document Set type defined, so that different Document Set templates can have their own unique Welcome Page.

Document IDs

In any content management repository or collaboration environment, content is often reorganized or moved. Hyperlinks to documents no longer work, which causes frustration and loss of efficiency. Document IDs are a way to assign documents a unique identification number. Each document has a “permalink” based on its unique ID, which lets people retrieve the document regardless of where it is within a SharePoint deployment. The ability to assign a document a unique identification number people can use to retrieve the document later, even if it is moved.

Sample solutions and resources

- [Solution: Guidelines for Developing a SharePoint Request for Proposal \(RFP\)](#)

- [Solution: Document Assembly - Merging Excel, PowerPoint, and Word Content Together](#)
- [Case Study: Microsoft LCA Legal Group Turns to Company's Own Software to Improve Document Management](#)
- [Video: Manage documents and content](#)
- [Training: SharePoint Enterprise Content Management Implementers Course](#)

Records management and compliance

You can declare all content within SharePoint 2010 as records, and manage either a central records archive or support in-place records management. Records compliance makes it easier to adhere to corporate policy and increase accuracy of content classification, and makes it easier for records managers to manage and monitor records management solutions. All users can participate in a governed, compliant content management lifecycle, and expertly balance user experience with process policies, including location-based policies and multisite disposition policies.



Three main areas are part of the records management content area.

- **Content Organizer** Where should new content be saved and how should it be classified? The Content Organizer addresses these challenges with, a rules-based classification engine that promotes consistent classification of content based on content type and specific metadata properties. Site owners can create rules to drive content to specific Document Libraries and folders, where they inherit access control policy, default metadata values, and specific retention schedules. Advanced routing provides the ability to submit documents to SharePoint sites and let the system determine which library or folder it should be saved to using the document's metadata and other rules.
- **In-Place records management** You can declare a record in a team site and prohibit any future changes. After a document is declared as a record, it is locked from future editing or deletion. Records are denoted by a lock image on the file and continue to reside with other content in the same document library. These official records can now reside within the same document libraries that contain other documents users collaborate upon. This helps you achieve compliance everywhere, which means that any document/record can be managed from SharePoint Retention policies to move information to an archive, backup or simply delete it. Users can declare a document as an in-place record either manually or automatically by using workflow activities.
- **Holds and eDiscovery** The Hold and eDiscovery feature enables organizations to locate and suspend items such as documents, images, pages, from expiration policies. You would typically use this feature for items that are subject to events such as litigation, audits, or investigations. Furthermore, when placing a hold on an item you have the option to lock it down so it cannot be edited or deleted.

Sample solutions and resources

- [Case Study: USDA is using SharePoint 2010 for their Records Management](#)

- [Video: Introduction to Records Management and Compliance](#)

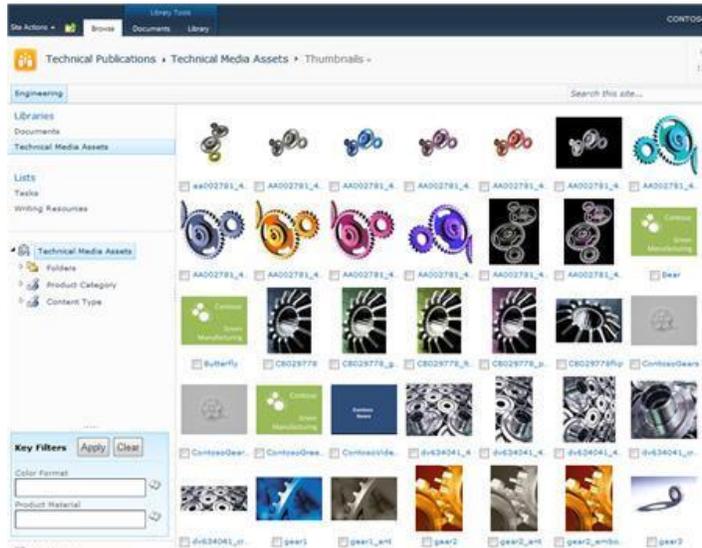
Media assets

SharePoint 2010 enables management and presentation of multimedia content through the use of the Asset Library and the Media Web Part.

The Asset library

Like any library, the Asset library can have views, content types, workflows, and policies. But the Asset Library template specifically supports the following features:

- **Digital asset content types** The Asset Library is pre-configured to support the content types for image, video, and audio files. These content types include new columns that enable you to track metadata that is specific to rich media assets.
- **Thumbnail-centric views** The default view for the Asset library is the Thumbnails view, which displays small thumbnails of the assets in the library. This view makes it easy to quickly browse for image and video files.
- **Image previews** When you move your pointer over an asset in the Thumbnails view, a preview window displays a larger version of the image, as well as image properties. You can take actions on the asset from the preview window.
- **Automatic metadata extraction for image files** When you upload image files to an Asset Library, any existing metadata for the file is extracted and promoted to corresponding columns in the library.
- **Podcasting support through RSS** You can use the RSS feature of the asset library to set up podcasting for audio or video files stored in the Asset Library. Site users can subscribe to the RSS feed for the library to receive new content as it is added via podcast.
- **Asset picker** Pick the right video from a library by using the asset picker.



The following table summarizes common ways to manage media assets in the Asset library.

Scenario	Description
Team site	Any team member can upload assets to the library for other team members to view and use. The content is managed as needed by contributors, and uses very little workflow or policy for its addition to and management in the library. Team members use content in the library by viewing, downloading, and inserting it into their work products, such as documents or presentations.
Divisional portal	Any contributor or designer can upload logos and images to the library for other people to view and use. The content is generally managed as needed by contributors, and uses minimal workflow or policy for its addition to and management in the library. For example, the divisional portal library might have multiple contributors but only a few approvers. Authors and Web designers of the site use content in the library by viewing, downloading, and inserting it into their work products, such as documents or presentations.

Scenario	Description
Corporate brand library	Store branded corporate assets such as logos, artwork, and other digital assets, and use moderate-to-heavy workflows and policies to manage the content. Creative teams can submit digital assets to the asset library where they are reviewed and published. Content stewards manage and edit the digital assets to ensure that they have been correctly tagged and organized. Information worker consumers and extranet partners who have to access to official, authorized corporate logos or brand assets use the library to find the content they need.
Corporate archive	An archive that catalogs pictures, video, documents, and other assets that have historical value to an organization. Users can submit current and past items, which are collected, scanned, organized, and tagged by curators who manage the library so that other users can browse, search, and view archived content.

Media Web Part

You can also add a customizable, Silverlight-based Media Web Part to any site, wiki page, or Web publishing page so you can stream media to a user. The Media Web Part enables you to seek or play from point forward or backward, and not with a full download, but by using a progressive download operation that simulates streaming media. You can also play videos from a remote location. This is useful when the media asset cannot be downloaded to your site because of size or access.

There are four ways to display digital assets:

- Browse the Asset library.
- Insert the Media Web Part into a Web page.
- Use the video field control on a publishing page of a publishing site.
- Use the Content Query Web Part.

Sample solutions and resources

- [Video: Manage digital assets](#)
- [Solution: Video Blogging with JavaScript and the Media Web Part](#)

Published sites

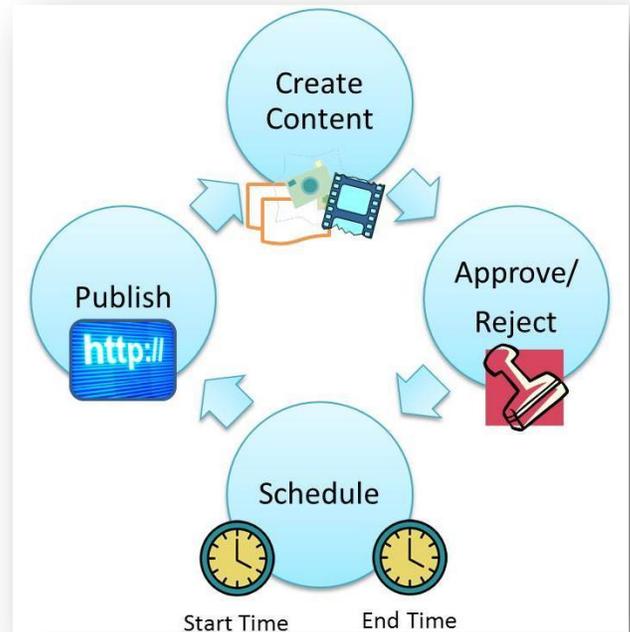
With Web content management, businesses that want to host rich, dynamic Web sites, a robust publishing infrastructure helps content owners to easily create, publish, and maintain content pages with appropriate controls over branding, page layout, and publishing approval. SharePoint 2010 is unique in that it provides a unified platform for team, divisional, intranet, extranet, and internet sites. These sites run the gamut from unstructured web sites, such as an enterprise Wiki, to highly structured publishing portals, as the following table shows.

Scale	Level of Structure	Creators	Approval	Branding
Enterprise Wiki	Unstructured	Many authors	No approval	Lightly branded
Divisional Portal	Semi-structured	Fewer authors	Lightweight approval with simple workflow	More branding
Corporate Intranet	Structured	Dedicated writing staff	Approval with workflow	Branded with custom master page
Internet	Highly structured content	Dedicated design and programming team	Highly controlled publishing	Pixel perfect branding

When you set up a structured Web site, you usually want to implement a well-thought out information architecture that balances the right freedoms and controls to create a successful experience for your creators and users.

Key considerations for a structured Web site include the following:

- **Authoring** Create rich web pages using a familiar user experience and include a variety of content including Web Parts and digital media.
- **Navigating** Create navigation structure, use metadata-based navigation, and supplement navigation using Web Parts.
- **Branding** Create and maintain a brand for a site, including custom master pages, page layouts, custom CSS, field controls logos, themes, and styles, to change the look and feel of a publishing site.
- **Content targeting** Roll up existing content in the Content Query Web Part to display lists of items based on values of specific columns (e.g., a list of all of the documents associated with a particular author, regardless of content type) as well as metadata associated with the page on which the Web Part is placed.
- **Translating** Provide for multilingual audiences through variations.
- **Workflow** Control the production, deployment and retirement of content and content types with a customizable, out of the box workflow that is specifically designed for the publishing cycle and that ensures that only the people with the required permissions can add and edit content on the site.
- **Web Analytics** Gain insight into your web site with workflow and reporting of site usage statistics, unpublished item, incoming links, and broken links.
- **Mobile browsing** Customize browsing for mobile devices and enable and disable mobile usage.



Sample solutions and resources

- [Case Study: Boy Scouts of America - Greater St. Louis Area Council](#)
- [Video: Demo of SharePoint 2010 for Internet Sites](#)
- [SilverLight Demo: Top SharePoint Internet Sites](#)
- [Training: SharePoint for Internet Sites Implementers Course](#)
- [Solution: Real World Branding with SharePoint 2010 Publishing Sites](#)

Web databases

Access 2010 has always been a powerful, rapid application development (RAD) tool. Access databases are traditionally used for a variety of tasks, but they are particularly effective at tracking and coordinating data for:

- People, such as contacts and memberships
- Things, such as assets and inventory
- Events, such as conferences and training
- Projects, such as issues, tasks, and milestones

Using Access 2010 and Access Services, you can publish a Web database to SharePoint 2010 and quickly deploy and share the contents of the database with other users. In short, a Web database enables you to create and share a SharePoint Composite solution from within Access 2010. Creating a Web database has several key advantages:

- Forms, reports, queries, and macros run in the browser.
- Data is stored in SharePoint lists and synchronized with the Access database in a bi-directional way.
- Web databases are more manageable by IT staff.

When you publish an Access database, here's what happens. The first step is that a SharePoint site is created. Then, the tables and any business rules are moved to SharePoint lists. Next, forms are translated into .aspx pages, reports are transformed into RDL to be processed by SQL Server Reporting Services, queries are converted into XML, data macros are converted to quick workflows, and user interface macros are changed to JavaScript. Finally, all client objects are exported as text and stored on the server so they can be round-tripped and "re-hydrated" from SharePoint 2010 to the client computer and back.

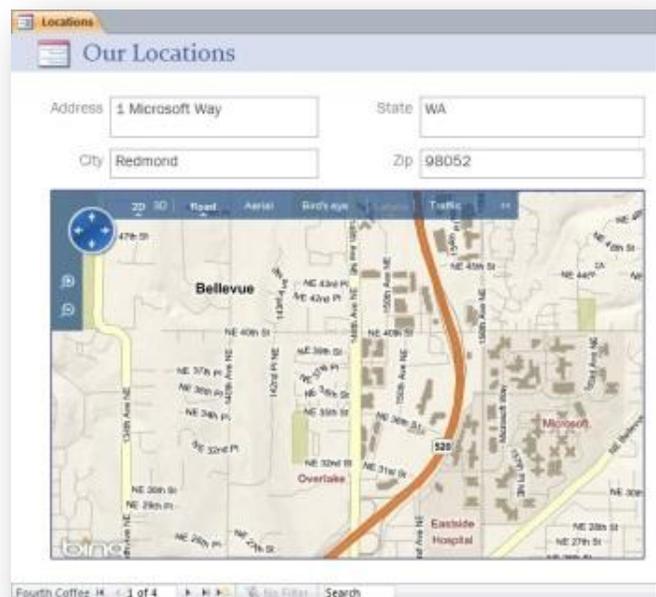
The following Access 2010 feature areas stand out as key benefits when you are considering Access 2010 and Access Services to create a SharePoint Composite solution:

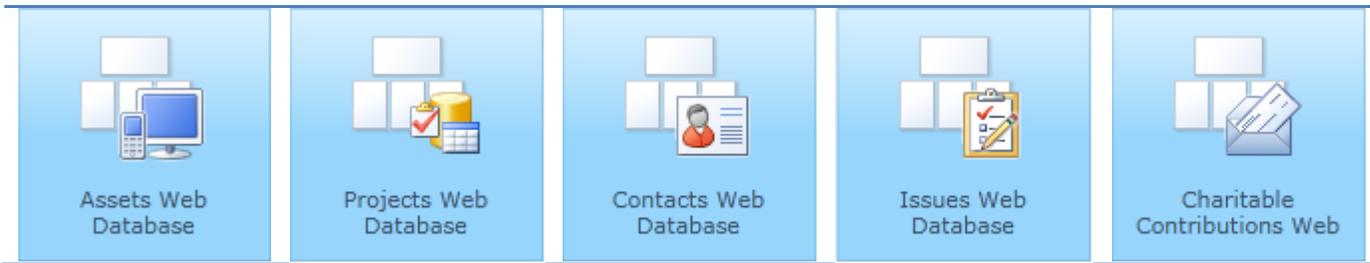
- General ease-of-use
- *The landing pad for data*
- Simple to advanced queries
- Relationships and enforced referential integrity
- Rich forms and reports
- Sophisticated business logic without code
- Large lists

General ease-of-use

The following are a few of the many ease-of-use features of Access 2010 that help you save time and effort:

- Develop your solution in Web database mode to isolate supported features and minimize any conversion errors.
- Add automation and advanced expressions more intuitively and without writing code by using the Expression Builder with IntelliSense.
- Use the Macro Designer, which makes it much easier to create, edit, and automate database logic in a declarative way.
- Create tab-based navigation forms simply by dragging and dropping forms, reports, and queries onto the main form.
- Use the Web Browser control to add dynamic Web content to your forms, such as a Bing Map linked to a customer address.
- Build your databases using Application Parts, which enable you to add a set of common, modular components, such as a table and form for task management, to your database in a few simple clicks. Even better, use pre-define templates that cover the most common scenario types.





The landing pad for data

Many databases must first get data from a variety of sources. But, you want to focus on creating the solution and not gathering all the data. Using Access 2010, you can quickly import and link data from a broad range of external sources, databases, spreadsheets, and XML files, or even collect and update your data via e-mail. Using Access 2010 is not only a great way to get data into SharePoint lists, but also to execute bulk data operations, such as appends, updates and deletes, against those lists.

Simple to advanced queries

A query is a request for data results based on SQL, isolates the subset of data you need, and forms a solid data foundation for forms and reports. Using a query, you can assemble just the data that you want to use before you design your form or report. You can use queries to: filter, sort, and choose columns; perform calculations and aggregate and total records; use calculated columns; and combine data from different tables. You can do this, in most cases, without needing to know SQL.

Relationships and enforced referential integrity

You can create relationships between lists by using a combination of unique columns, lookup columns, and relationship enforcement (cascade and restrict delete), all of which enhance your ability to create more sophisticated business solutions and help preserve the integrity of your data. In a lookup column with an enforced relationship (also called referential integrity), you can lookup single values and maintain the integrity of your data in the target list in one of two ways:

- **Cascade Delete** When an item in the target list is deleted, the related item or items in the source list are also deleted. In this case, you want to make sure that all related items are deleted as part of one transaction. For example, if you delete an order in a target list, you can ensure that the corresponding order item in the source list is also deleted. You don't want to have order items without a corresponding order, because that would create "orphan" order items that might cause confusion later on.
- **Restrict Delete** When you try to delete an item in the target list, and it has one or more related items in the source list, you are prevented from deleting the item in the target list. In this case, you want to ensure that the related item in the target list is preserved. For example, if someone tries to delete an order item from a target list, a customer might still have that order pending, and you want to prevent that delete operation from occurring until the order has been processed. You don't want the customer's order to be accidentally deleted because that would affect your ability to complete the order.

Rich forms and reports

There's no easier way to create polished forms and reports for your SharePoint Composite solutions. The Report designer is simply the best way to report on grouped or summary data. You can even use conditional formatting and data bars to spot trends and add emphasis to your data. The Form designer makes it easy to create a wide variety of forms. Finally, you can apply a consistent Office theme to all reports and forms that comprise your Web database solution.

Sophisticated business logic without code

The Expression Builder greatly simplifies your expression building experience. You spend less time memorizing expression names and syntax, and more time focusing on building your formulas. You'll find the Macro Designer is an intuitive way of creating advanced business logic in a declarative manner. Finally, data macros use an event model, similar to that of triggers in SQL Server 2008, to enable reliable enforcement of data rules. For example in a Donations Management database you can:

- Validate that a contributor doesn't have outstanding donations before accepting a new donation.
- Keep a history of any changes to a donation record.
- Send a "Thank You" email when a contributor makes a donation greater than \$1,000.
- Maintain a total of all donations and the last donation date in summary columns of the contributors table.

Large Lists

Using Access Services, you can work with considerably more data than the default List View Threshold of 5000 items without being blocked. Access Services automatically processes data in batches of 2000 items at a time and then reassembles the data. The default Access Services limit is 50,000 items although this can be changed by a farm administrator. But note that Access Services has additional limits and thresholds.

Sample solutions and resources

- [Video: Update an Access database from SharePoint Online](#)
- [Video: Use the Contacts Web Database template](#)
- [Video: Use the Assets Web Database template](#)
- [Video: Use the Charitable Contributions Web Database template](#)
- [Video: Use the Issues Web Database template](#)
- [Video: Use the Projects Web Database template](#)
- [Training: Build and publish web databases](#)
- [Video Solutions Channel: The Access Show](#)

Business intelligence

Business Intelligence (or Insights) turns raw, sometimes voluminous data into visual and interactive information, which in turn provides key insights about a business. The goal of business intelligence is to improve organizations by providing business insight to all employees, leading to better, faster, and more relevant decisions. Insights help to make good decisions that lead to best actions.



Business Intelligence solutions help understand the health of the organization and can directly impact the bottom line by measuring specific operations. Decision makers also need reliable, secure access to data to do their job effectively, tools to browse and analyze data and view reports, and the ability to create their own analytic and reporting experiences.

Here are some common business questions that business intelligence is designed to help answer:

- How are the sales territories performing by country and region?
- How does this quarter's performance compare to the same quarter last year?
- Our customer satisfaction score is below target. What is the reason?
- Based on the trends of this product line, can we predict how the product will sell six months in the future?

- What products do our customers buy together?

Daily business activities have associated information and insights that emerge into three main areas of business intelligence:

- **Team: Business intelligence for everyone** People don't work just as individuals but in groups and teams to complete projects. Business intelligence for everyone delivers information that reflects this, providing business intelligence that focuses on the ability to promote collaboration, and rapid sharing of information to drive to a common decision. The primary tools of use are SharePoint Status Indicators, Excel 2010, and Excel Services.
- **Group: Self-service business intelligence** Self-service business intelligence means individuals can make large quantities of information available or delivered to people when they need it and in the desired format. IT can quickly integrate a self- service business intelligence platform to reduce the backlog of requests. The primary tools of use are the PowerPivot for Excel and PowerPivot for SharePoint.
- **Enterprise: Organizational business intelligence** Organizational business intelligence describes a set of tools that help people align their objectives and activities with overall company goals, objectives, and metrics. It is business intelligence that helps synchronize individual efforts by using scorecards, strategy maps, and other tools that connect to corporate data. The primary tools of use are Dashboard Designer and PerformancePoint Services.

Lastly, SQL Server 2008 often plays a vital role as a primary external data source for the business intelligence capability. Two components often play a key part:

- Microsoft SQL Server 2008 Analysis Services, which provides hierarchical data, and is often the backend for Line-of-Business data systems.
- SQL Server Reporting Services, which is used to build and deliver reports and data feeds.

Quick status indicators (or KPIs)

Note SharePoint Server 2007 Key Performance Indicators (KPIs) have been renamed to SharePoint Status Indicators in SharePoint Server 2010.

Indicator	Goal	Value	Status
New customer contracts	60%	85.71%	✓

In general, a KPI is a key performance indicator, which is a number or value you would like to track over time to monitor progress of activities in your business, and that often has a visual component to it, such as a flag, color, or shape. SharePoint status indicators are KPIs, and can tell you important information about performance at a glance.

There are times when you need status indicators right away to meet a pressing need. For example, you may want to:

- Shows the status of business contracts by reporting the percentage of active contracts, or contracts that are complete.
- Report employee participation in training programs.
- Track the number of days tasks have been open, how many are open, and what percentage of a task is complete.
- Spot important totals, the total number of sales in a region, or bugs-per-week.
- Improve response rate for service requests by tracking the total number of customer service requests per day and the number of minutes spent on each request.
- Track the number of lost workdays due to illness and employee participation in on-site fitness programs.

You can manually enter the values that form the basis of a status indicator or you can retrieve the values from a data source such as an Excel workbook for automatic updating. There are four ways you can capture status indicator information:

Status Indicator	Description
Fixed value	Shows values that are manually entered.
SharePoint List	Shows a value based on the contents of a SharePoint list.
Excel	Shows values directly imported from an Excel Services workbook. The value can be specified by a cell address in the workbook.
SQL Server Analysis Services	Imports a selected Key Performance Indicator from SQL Server Analysis Services.

The following Web Parts can help you organize the information on the page:

- The Status List Web Part, which shows a list of Status Indicators.
- The Indicator Details Web Part, which displays the details of a single Status Indicator.

Sample solutions and resources

- [Solution: Display KPIs in a dashboard \(SharePoint 2007\)](#)

Business intelligence for everyone

To anyone doing business analysis, Excel 2010 is “comfort food” and the tool of choice for viewing, manipulating, analyzing, and reporting about organizational data. Excel spreadsheets are the predominant technology in use today for the following critical business scenarios:

- **Accounting** Use the powerful calculation features of Excel 2010 in many financial accounting statements, such as, a cash-flow statement, income statement, or profit and loss statement.
- **Budgeting** Create any type of budget, whether personal or business, such as a marketing, event, or retirement.
- **Billing and sales** Create common template-based forms, such as sales invoices, packing slips, or purchase orders.
- **Reporting** Summarize your data analysis in reports, such as project performance, forecasting, tabular reference, or actual-budgeted-variance data.
- **Planning** Create professional and useful planners, such as a weekly classes, marketing research, year-end taxes, or weddings.

	A	B	C	D	E	F	G	H
1	Calendar	CY2008 Q2						
2								
3	Row Labels	Phone	Sales	Goal	Status	Trend	Variance	Variance %
4	North America		6,051,229	5,900,000	●	↑	151,229	2.56%
5	Ansman-Wolfe, Pamela	340-555-0193	362,722	600,000	◆	↑	-237,278	-39.55%
6	Campbell, David	740-555-0182	380,815	300,000	●	↑	80,815	26.94%
7	Mensa-Annan, Tete	615-555-0153	449,859	450,000	▲	↓	-141	-0.03%
8	Blythe, Michael	257-555-0154	809,122	750,000	●	↓	59,122	7.88%
9	Carson, Jillian	517-555-0117	762,003	800,000	▲	↓	-37,997	-4.75%
10	Ito, Shu	330-555-0120	588,151	550,000	●	↑	38,151	6.94%
11	Mitchell, Linda	883-555-0116	1,034,438	850,000	●	↑	184,438	21.70%
12	Reiter, Tsvi	664-555-0112	605,255	600,000	●	↑	5,255	0.88%
13	Saraiva, José	185-555-0169	733,969	700,000	●	↑	33,969	4.85%
14	Vargas, Garrett	922-555-0165	324,895	300,000	●	↓	24,895	8.30%
15	Grand Total		6,051,229	5,900,000	●	↑	151,229	2.56%

Top Bottom		FOURTH COFFEE			
May - June Sales					
Location	May	June	May - June	Total	
France	\$160,828.22	\$197,504.50	\$36,676.28	\$395,009.00	
Charente-Maritime	\$15,645.48	\$7,869.85		\$23,515.33	
Essonne	\$27,055.33	\$27,055.33		\$54,110.66	
Garonne (Haute)	\$1,888.94	\$1,966.23		\$3,855.17	
Hauts de Seine	\$15,715.75	\$29,365.88		\$45,081.63	
Nord	\$31,746.93	\$21,552.56		\$53,299.49	
Pos de Calais	\$68.97	\$2,294.99		\$2,363.96	
Seine (Paris)	\$30,847.17	\$35,761.72		\$66,608.89	
Seine et Mame	\$12,651.41	\$4,786.61		\$17,438.02	
Seine Saint Denis	\$12,524.59	\$28,555.29		\$41,079.88	
Yveline	\$25,627.51	\$23,487.56		\$49,115.07	

The combination of Excel 2010 and Excel Services gives users browser-based access to a server-calculated version of an Excel spreadsheet displayed in high-fidelity. By using Excel Services, you can view, refresh, and interact with all these analytic models online. You can do this with data stored in the workbook, or connected to external data sources, including and especially SQL Server Analysis Services. One critical and achievable goal is to maintain a “single version of the truth” for smooth collaboration when it comes time to reconcile the numbers.

The following key Excel features make Excel 2010, in and of itself, a first-class business intelligence tool and effectively enable you to create your very own dashboards just by using Excel 2010 and Excel Services:

- Easy loading, calculating, and displaying of Excel workbooks in SharePoint 2010.
- Interactive reporting and parameterized what-if analysis.
- Live connections to data sources to deliver up-to-date data.
- Quick sorting and filtering of tabular data.
- Safely exposing all or part of a workbook.
- Extensive charting including Column, Line, Pie, Bar, Area, Scatter, Stock, Surface, Doughnut, Bubble, Radar, and Histogram.
- Sophisticated conditional formatting including color scales, data bars, cell values, top or bottom ranked values, above or below average, and formula-based.
- Compact sparklines to help spot trends.
- Robust tools to process hierarchical data, including Pivot Tables, Pivot Charts, filtered searches, and slicers for attractive, coordinated filtering.
- Navigating large workbooks by URLs and the HYPERLINK function.

	Current	1 Year History		
		Trend	High	Low
All Departments	\$ 159.6		\$159.6	\$ 130.5
Women's Apparel	\$ 32.6	↑	\$ 32.6	\$ 30.2
Patio & Garden	\$ 16.2	→	\$ 16.9	\$ 15.1
Toys	\$ 15.7	↑	\$ 15.7	\$ 13.5
Electronics	\$ 14.9	↓	\$ 18.3	\$ 14.9
Baby Apparel	\$ 14.2	→		
Men's Apparel	\$ 13.5	→	\$ 13.2	\$ 12.8
Kid's Apparel	\$ 12.6	→	\$ 12.9	\$ 11.9
Furniture	\$ 11.4	→	\$ 14.5	\$ 8.7
Bed & Bath	\$ 11.1	↑	\$ 11.1	\$ 9.3
Kitchen	\$ 9.9	↑	\$ 10.1	\$ 2.3
Home	\$ 7.5	→	\$ 9.1	\$ 4.5

To enable and enhance a variety of SharePoint Composite solutions, the Excel Web Access Web Part is connectable, so you can also drive the results of your workbook by receiving values from other Web Parts, including and especially the List View, InfoPath, and Visio Web Access Web Parts. You can do the following:

Connection	Description
Get Workbook URL From	Display different workbook content based on the location of a workbook in a document library.
Get Named Item From	Get a value from another Web Part to control the portion of the workbook displayed, such as a chart or a named range.
Get Filter Values From	Get one or more values from a Filter Web Part or InfoPath Web Part.

Sample solutions and resources

- [Video: Analyze product sales with a PivotTable report](#)
- [Video: Explore Adventure Works in Excel by using an OLAP PivotTable report](#)
- [Case Study: Microsoft Closes Quarterly Books More Than 50 Percent Faster](#)

- [Solution: Creating an Excel Services and Bing Maps Mashup for SharePoint 2010 Using ECMAScript](#)
- [Case Study: Planning, Budgeting & Forecasting for the Office of Finance](#)
- [Solution: Record, approve, and manage employee expenses](#)

Self-service business intelligence

The combination of PowerPivot for Excel and SharePoint enables self-service business intelligence, which describes an accelerated way to create a shared business intelligence solution with lots of data and without the overhead involved in creating an enterprise-wide system.

PowerPivot for Excel (SQL Server PowerPivot for Excel Add-in)

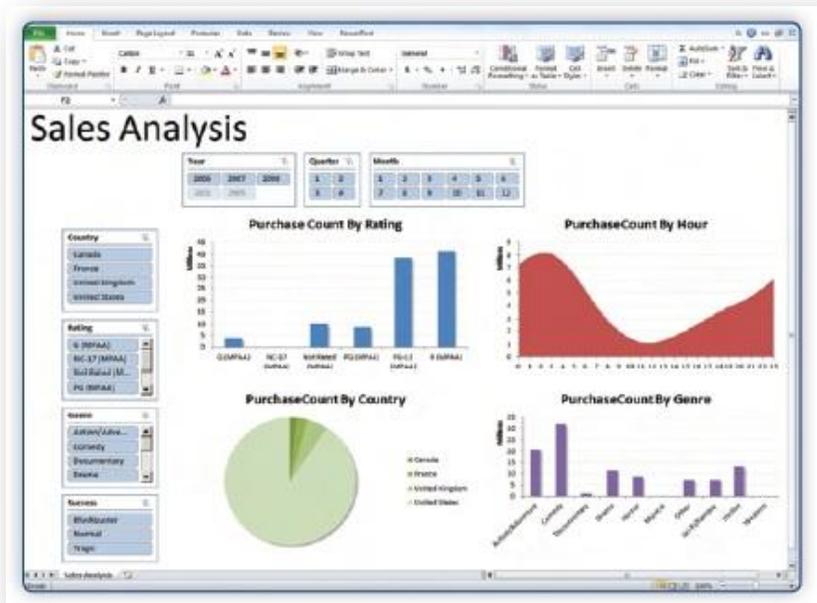
BoxOffice	Date	Geography	Media	Price	Purchase	Time
20070627	249	1567973	18828	13406	52	
20070627	249	1567973	18828	13406	52	
20070627	249	1567973	18828	13406	52	

PowerPivot gives business analysts a way to integrate data from outside of a corporate data warehouse, whether they are creating reports to support decision-making or prototypes that will eventually become part of a larger enterprise-wide business intelligence implementation. PowerPivot also enables the efficient storage and querying of large volumes of data within the workbook by using an in-memory data store and engine, called a VertiPaq, that compresses and manages millions of rows of data for

blazingly fast performance. This enables users to interactively explore and perform calculations on large data sets, and quickly manipulate millions of rows of data into a single Excel workbook for ad-hoc reports.

The process of using PowerPivot can be subdivided into three steps:

1. **Get the data** You can import the data into tables from an extensive number of data sources, including corporate databases, worksheets, reports, data feeds, and Web services.
2. **Prepare the data** You can do this in a number of ways including the defining of relationships between tables. You can also choose to enhance the data by changing columns and using calculated columns.
3. **Create a report or model** The end goal is to present your data in a summarized form by using at least one PivotTable or PivotChart. If you prefer, you can also convert a PivotTable to a collection of cube function formulas as a free-form layout of your data. Regardless of which layout you choose for the report, you can also add slicers to support interactive filtering.



Key advanced features include the following:

- **Create Linked Table** Because you cannot make changes to data in the PowerPivot window, a linked table is the quickest and easiest way to edit the data in a PowerPivot table. It's also a great way to try out different values in "what-if" scenarios or to use variable values in a calculation.
- **Data Analysis Expressions (DAX)** Add custom aggregations, calculations, and filters to your report. DAX is a new expression language for use with PowerPivot for Excel, and is similar to Excel formulas. However, rather than working with cells, ranges, or arrays as in Excel 2010, DAX works only with tables and columns.
- **Calculated Columns** Create an expression that you apply to a table column or another calculated column. For example, you can concatenate values from two separate columns to produce a single string value that displays in a third column. You can also perform mathematical operations, manipulate strings, look up values in related tables, or compare values to produce results in a calculated column.
- **Measures** Create a dynamic, aggregated calculation that is displayed in the value area of the PivotTable. Its value depends on the current selection of items in rows and columns and in the report filter. Measures differ from calculated columns in that the calculated column values persist in the PowerPivot data whereas Measures are calculated at query time and do not persist.
- **SQL Server Reporting Services integration** You can import an SQL Reporting Services report. You might find it beneficial to get some of your data integrated in a report first and take advantage of Reporting Services support for calculations, aggregations, data sources, and refresh schedules before you bring the data into PowerPivot.

PowerPivot for SharePoint (SQL Server PowerPivot for SharePoint Add-in)

To provide multiple users with centralized access to reports developed with PowerPivot for Excel, PowerPivot for SharePoint provides support for published PowerPivot workbooks by extending the capabilities of SharePoint and Excel Services. PowerPivot for SharePoint provides centralized management of the workbook, manages data queries, and provide the necessary infrastructure to manage, secure, refresh, and monitor these PowerPivot reports efficiently. PowerPivot for SharePoint also helps IT improve operational efficiencies by tracking PowerPivot usage patterns over time, discovering mission-critical applications, and improving system performance by adding resources.

PowerPivot for SharePoint consists of the following feature areas:

- **Ease of content management** Data and the presentation layout are kept in the same workbook. By storing workbooks in a library, you also reap the benefits of any document, including workflows, retention policies, versioning, approval workflow, and any other activities supported in a document library.
- **PowerPivot Gallery** This is a special document library, based on Silverlight, that you can use it to preview and open workbooks from a central location, and see worksheets in the workbook as thumbnails with current data and without even opening the workbook. There are also Theater and Carousel views, which are most useful when you want to highlight a small number of workbooks.
- **PowerPivot Management Dashboard** Several tools for configuring the Service application and monitoring usage are included in a management dashboard accessible to farm and service administrators in Central Administration.
- **SharePoint Services** Upon installation, two new SharePoint Services are created: the PowerPivot System Service that manages the application database, load balancing, usage data collection, automatic data refresh, and so on; and SQL Server Analysis Services, which runs the VertiPaq in-memory engine, loads the PowerPivot models in the Excel workbook stored in the SharePoint library, and manages the data within those workbooks so that they can be used by multiple users through a browser with Excel Services.
- **Schedule and refresh operations** To keep the workbook up to date and relevant, you can automate a refresh schedule for each data source in the workbook. When you enable data refresh, a timer job runs every minute. If the workbook is not checked out or in edit mode, the data refresh job saves the new data to the workbook.

- **Atom Data Feed Provider** You can import data from Atom data feeds into a PowerPivot workbook. A special type of document library is available for the storage of Atom data service documents (.svc). You can also create a data service document in the document library by specifying the URL request to the data service or Web application in Atom 1.0 format. Atom Data feeds can come from such data sources as, SQL Server 2008 R2 Reporting Services, SharePoint lists, ADO.NET Data Services and SQL Azure commercial datasets.
- **The PowerPivot Web Service** Another way to use a PowerPivot workbook as a data source is by using the PowerPivot Web Service to connect to the embedded data from another application. This way, you can reuse the data in multiple places without duplicate effort. An application that can connect to Analysis Services directly, such as PowerPivot for Excel, PerformancePoint Services, and Server 2008 R2 Report Builder 3.0, can use the PowerPivot Web Service. Instead of specifying an Analysis Services server name in the connection string of the provider, you would use the SharePoint URL for the workbook.

Sample solutions and resources

- [Solution: Review and track workbooks on a PowerPivot Gallery by using SharePoint approval workflows](#)

Enterprise-wide business intelligence

PerformancePoint Services is a set of features, components, and tools that collectively help you create enterprise-wide business intelligence solutions. In these solutions, users can do integrated analytics for monitoring, analyzing, and reporting on the business; make informed business decisions that align with company-wide objectives and strategy. Using PerformancePoint Services, you can build sophisticated key performance indicators (KPIs), filters, scorecards, reports, and dashboards, that bring together data from multiple data sources (including Analysis Services, SQL Server tables, SharePoint lists, Excel Services, and PowerPivot workbooks). Again, the key message is that you can do these sophisticated operations with little or no code.

A great place to start using PerformancePoint Services is the Business Intelligence Center. The Business Intelligence Center is a pre-built Web site, or site template, that is optimized to help you manage the all the working elements of business intelligence reporting. You can see examples, such as an Excel Services workbook for analysis, charts, and different kinds of dashboards. And to learn more about each example, you can click on conveniently located links that connect to articles with more information. In addition, special-purpose libraries are ready for you to use to create data connections, manage content for PerformancePoint Services, and store finished dashboards. You can customize a Business Intelligence Center site as much as you like, or you can just start by using its built-in tools.





PerformancePoint Services provides a wide variety of capabilities, and includes the following:

Key Performance Indicators (KPIs)

An essential element of a dashboard is a key performance indicator (KPI), which is a visual cue (such as up and down arrows, stop light signals, and colored circles) that communicates the amount of progress made toward an important business goal. A KPI is a quantifiable measurement, such as monthly gross profit or quarterly employee turnover, which is used to monitor an organization's performance. KPIs are valuable for teams, managers, and businesses to evaluate quickly the progress made against measurable goals and to make good decisions based on three fundamental questions: What am I ahead or behind on?, How far ahead or behind am I?, and What is the minimum I have completed?.

Each KPI has a goal, status, and trend. For example, a common KPI is department monthly sales. After careful planning, a quarterly sales goal (or target) is defined for each department. A dashboard or scorecard displays the weekly status of this goal, whether it is on track, ahead or behind, perhaps by using colors or company-defined, standard icons. The trends over the past years may also be summarized in a chart, and sometimes projected for the next year.

Filters

Filters enable users to interactively modify the view of a dashboard to get just the results they need. You often want to see specific departments, regions, or periods, top 10 or bottom 5 values, and values sorted in ascending or descending order. Because you are working with a lot of data when creating an enterprise-wide business intelligence solution, it's vital that you can create filters that are fast, flexible and re-usable between different dashboards. You can create many types of filters, including cascading filters, custom table, MDX query, member selection, and named set. And you can use different filter display methods including: list, tree, multi-select tree, and calendar control.

PerformancePoint Services is particularly adept at working with time through the use of Time Intelligence filters, which use formulas, functions, and date controls to provide a consistent and normalized reporting from multiple data sources. For example, it's easy to compare various periods against forecast or against the prior year.

Reports

In PerformancePoint Services, the term report describes the many ways in which users can efficiently analyze data:

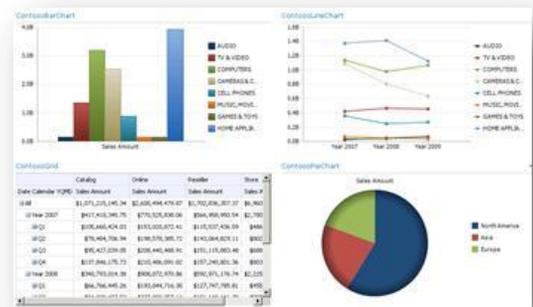
Scorecard

A scorecard is a special kind of report that provides a high-level snapshot of performance for a group or an organization. A scorecard resembles a table that usually has Target and Actual value columns and one or more key performance indicators (KPIs). Scorecards display a collection of KPIs and the performance targets for those KPIs to show progress toward achieving specific goals. A scorecard provides a visual representation of performance that can give you a summary of progress at a glance. Scorecards are as varied as the organizations they represent. A retail business might measure performance by reporting sales volume, for example, and a city government might track the number of citizens who attend community meetings. In addition, some scorecards might contain only one KPI, whereas other scorecards might contain multiple KPIs. Scorecards can even have “multiple actuals”, meaning that a single KPI can represent status that is based on data that comes from more than one measure and more than one data source, all in one row.

Sales Scorecard						
	Internet Sales Amt					
	QTD	QTD Target	% Growth	% Growth Target		
All Products	\$3,141,257	\$2,614,192	20%	16.76%	20%	-16%
Accessories	\$121,184	\$105,451	15%	14.69%	20%	-27%
Bikes	\$2,961,773	\$2,455,027	21%	17.25%	20%	-14%
Mountain Bikes	\$1,215,618	\$1,012,302	20%	32.40%	20%	62%
Road Bikes	\$950,219	\$782,804	21%	10.53%	20%	-47%
Touring Bikes	\$795,935	\$659,921	21%	4.39%	20%	-78%

Analytic Chart and Analytic Grid

Analytic reports are dynamic, visual representations of data that can be displayed as interactive line charts, bar charts, pie charts, and tables (which are called grids). Analytic charts and grids use data that is stored in SQL Server Analysis Services.



KPI Details

A KPI Details report is a view type that provides additional information about scorecard values and properties. As dashboard users click cells in a scorecard, the KPI Details report updates to display particular information about that value. For example, when dashboard users click a value in the target column, the KPI Details report displays details such as how performance is calculated, what banding settings are used, and what kind of indicator is used. You can create a single KPI Details report and then reuse it in multiple dashboards.

Product Margins Scorecard				KPI Details	
	Actual	Gross Margin	Target	KPI: Gross Margin	
All	\$6,813,155,491.12		\$7,001,336,183.84	97%	
AUDIO	\$63,968,842.52		\$71,781,913.18	92%	
TV & VIDEO	\$714,079,885.23		\$691,097,427.35	97%	
COMPUTERS	\$1,764,061,813.46		\$1,791,812,812.94	97%	
CAMERAS & CAMCORDERES	\$1,480,628,376.75		\$1,458,917,588.88	97%	
CELL PHONES	\$476,822,814.41		\$518,619,354.92	92%	
MUSIC, MOVIES & AUDIO BOOKS	\$17,101,208.54		\$38,362,554.55	44%	
GADES & TOYS	\$76,368,938.18		\$75,617,832.43	97%	
PHONE APPLIANCES	\$2,114,354,881.99		\$2,138,876,703.51	97%	

Measure	Value
Measure: Fixed Value	
Row Path: ALL\MUSIC, MOVIES & AUDIO BOOKS	
Column Path: Gross Margin/Target	
Actual	\$17,101,208.54
Variance	-97%
Calculation: $\frac{\text{Fixed Value}}{\text{Row Path}}$	
Banding Method: Band By normalized value of Actual/Target	
Source: $\frac{\text{Actual}}{\text{Target}}$	
Status Band: $\frac{\text{Actual}}{\text{Target}}$	
Status Band	Value
On Target	> 102.873,876.83
Slightly Off Target	102.873,876.83 to > 104.186,777.27
Off Target	< 104.186,777.27 or less

Reporting Services

SQL Server Reporting Services reports can be displayed in a Web Part and controlled with dashboard filters. Reporting Services reports can resemble tables or charts, and they can include their own filters, which are also known as parameters. Reporting Services reports are typically highly interactive. Depending on how the reports are configured, dashboard users can explore data by clicking, sorting, and scrolling through pages. In addition, users can perform the following kinds of tasks: Preview, adjust, and print one or more pages in the report; apply one or more parameters (built-in filters that are specific to the report) without having to rerun a query to the database; and export data as image files, Adobe PDF files, Web files, or other formats.

Excel Services

Excel Services reports are published, Excel workbooks that are displayed in a Web Part and controlled with dashboard filters. You can display a single item in the workbook, or the whole workbook in your PerformancePoint dashboard. You would typically use Excel Services reports to display PivotChart reports, PivotTable reports, and tables that contain conditional formatting or other custom formatting that is not available in analytic grids.

Web Page

A Web Page report is a report type that you can use to display a Web site in a dashboard. Web Page provides a lot of flexibility and can perform a redirect to another resource, include user interaction, and receive filter and scorecard values through the URL query string. You would typically use Web Page reports for purposes such as the following:

- Add a Web site, such as a financial news page that displays alerts, stock market activity, and news bulletins to a dashboard targeted at sales, marketing, or finance professionals.
- Display a report, such as a Visio Graphics Service report, an Access Services report, or a Project Server report that you cannot create by using Dashboard Designer.

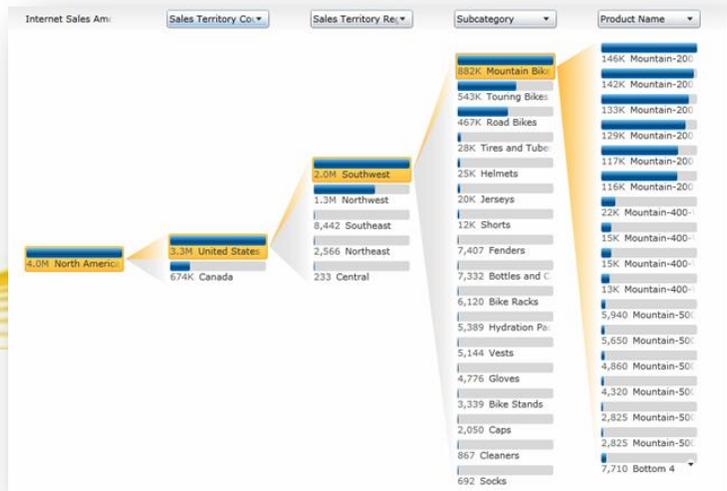
Strategy Map

A strategy map is a report view that can show relationships between objectives, goals, and key performance indicators (KPIs), coupled with a Visio diagram where the color of each shape in the diagram is determined by the indicator that is connected to it. For example, a scorecard might show that Asia is on target overall, off target for the Sales Amount measure, and on target for the Sales Quantity measure. In the Visio diagram, the shape for Asia is colored in green, the shape for Sales Amounts is colored in yellow, and the shape for Sales Quantity is colored in green. You can use any Visio diagram, but if you want the shape colors to update automatically, only a subset are available.



Decomposition Tree

A Decomposition Tree report enables you to quickly and visually break down higher-level data values from a multi-dimensional data set to understand the driving forces behind those values. This report displays a tree-like structure that enables you to drill across the “branches”



to help you quickly find out why a KPI is performing the way it is. This is especially good for ad-hoc analysis. The Decomposition Tree is available in analytic grids, analytic charts, and scorecards that use Analysis Services data.

PerformancePoint Dashboards and PerformancePoint Dashboard Designer

You use PerformancePoint Dashboard Designer to create dashboards, and then publish them to a SharePoint site. Dashboard Designer is a free download that is part of PerformancePoint Services.

PerformancePoint dashboards can include features and functionality that set them apart from many other kinds of dashboards. For example, you can configure a PerformancePoint dashboard so that information is displayed depending on what you click in the dashboard. And, you can create dashboards that display information from a variety of sources, including reports that are hosted on other servers. Once you are done, it takes just one click to deploy and publish the dashboard.

When you create a PerformancePoint dashboard, you often follow these five basic steps:

- Plan your dashboard, including the goal and the type.
- Identify requirements, including the kinds of information, who the users are, and the user interface design.
- Plan data sources, including where the data is stored, data connections, and any constraints or limitations.
- Create components, including scorecards, reports, filters, and Web pages.
- Deploy the dashboard to the SharePoint site.



Sample solutions and resources

- [Video: Creating BI Dashboards Using SharePoint 2010 Without Programming](#)
- [Solution: Plan, design, and implement a PerformancePoint dashboard to show organizational performance](#)
- [Solutions and Case Studies: Business intelligence scenarios and solutions](#)
- [Solutions: Business Intelligence Scenarios](#)
- [Solution: Create a PerformancePoint dashboard to show performance](#)
- [Solution: Track and analyze sales by using a PerformancePoint dashboard](#)
- [Solution: Track project resource usage by using a dashboard built on Excel Services, PerformancePoint Services, and Project Server](#)

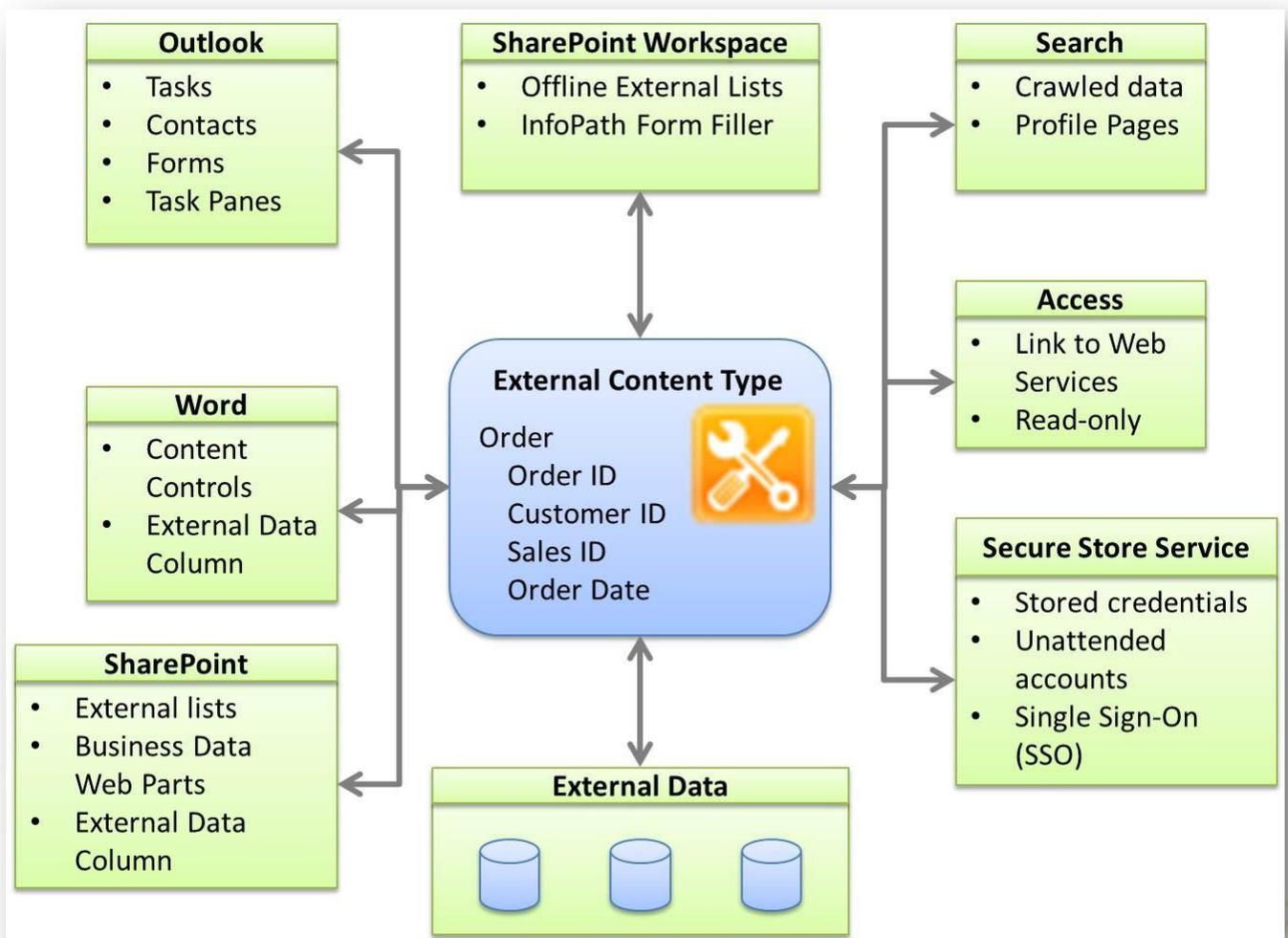
Line-of-Business data integration

One of the most powerful capabilities of SharePoint 2010 is the ability to connect external business data sources, such as SQL Server 2008, SAP and Siebel, Web services, and even custom applications, to SharePoint sites and Office 2010 products. This is done by using Business Connectivity Services (BCS), a SharePoint-based framework that provides standardized interfaces to existing business data and processes. BCS allows you to

unlock the value of your enterprise data, enable users to connect with enterprise systems, and interact with them in a familiar manner. For the developer, a general connector framework enables advanced external data access by using ADO.NET, WCF Web Services, .NET Connectivity Connector, and Custom connectors.

There are a broad area of product features and areas covered under the BCS umbrella including:

- External content types
- External lists and Business Data Web Parts
- External data search
- SharePoint Workspace 2010 and InfoPath 2010
- Word 2010 and external data columns
- Outlook 2010
- Access data connections
- Secure Store Service



Business Connectivity Services deeply integrates Enterprise data throughout SharePoint 2010 and Office 2010 products

External content types

The journey through BCS begins with SharePoint Designer 2010 and external content types, which are at the heart of any BCS solution. You first create an external content type, which represent the data and metadata in

the external data source using SharePoint Designer 2010. Once you create an external content type, you can surface that information in SharePoint 2010 and Office 2010 products in a variety of ways.

A typical example of an external content type is the schema (the fields and field types) that defines a Customer or Order. But external content types can also have behaviors called operations associated with them, that determine whether people can create, read, update, and delete, or search for the data. Once created, you then publish the external content types to the Business Data Connectivity (BDC) Service, which auto-generates both an external list and all of the forms required by that external list. This entity model simplifies application maintenance since most changes made on external data sources only require updates in the external content type, rather than a change to every application or site that uses it.

External lists and Business Data Web Parts

An external list looks and behaves in many ways like a native SharePoint list but actually contains data from an external source. An external list makes it easy for people to read and write external data within the familiar experience of working with a SharePoint list. Creating an external list also creates views (using the XSLT List View Web Part) and forms (using the XSLT List Form Web Part) for the browser, along with a customizable Outlook form and an InfoPath form. The InfoPath form can be used instead of the default XSLT views and forms to view and edit data in the external list in the browser, and the Outlook form is used to display external data in Outlook 2010.

Business Data Web Parts are designed to work with external lists and include the following:

Web Part	Description
Business Data Actions	Displays a list of actions from the BDC.
Business Data Related List	Displays a list of items related to one or more parent items from a data source in the BDC.
Business Data Item	Displays one item from a data source in the BDC.
Business Data Connectivity Filter	Filters the contents of other Web Parts using a list of values from the BDC.
Business Data Item Builder	Creates a Business Data item from parameters in the query string and provides it to other Web Parts.
Business Data List	Displays a list of items from a data source in the BDC.

External data search

External data search enables searching for external data (that are defined as external content types) and viewing the results alongside SharePoint search results. Additionally, you can create profile pages which show detailed information about the selected external item and its relationship to other items. These profile pages are displayed when users search for external data, and can also be accessed from external lists and the Business Data Web Parts.

SharePoint Workspace 2010

After you create an external list, you can just click **Connect to SharePoint Workspace** on the ribbon to make that external list available in SharePoint Workspace 2010. In SharePoint Workspace 2010, you can view and edit the external data directly from the client, whether you're online or offline. BCS provides a cache and synchronization mechanism that is installed on the client computer and that keeps the data fresh and synchronized with the back-end system. SharePoint Workspace 2010 also provides error and conflict resolution. When you connect an external list to SharePoint Workspace 2010, InfoPath Filler forms are available for viewing and editing the data in SharePoint Workspace 2010 even if a user does not have InfoPath 2010 installed on the client computer.

Word 2010

After you create an external content type, you can add an external data column to a list or library. An external data column is associated with an external content type and represents a field from it. If a document library uses a Word document for its template, you can edit the template in Word 2010 by adding Quick Parts, which are content controls that you can bind to External Data Columns without using code. When people create a new document based on that Word template, external data is displayed inside the document in those content controls and can be used to create, read, update, and delete the data. The content controls automatically enable picking and resolving functionality for the external data.

Outlook 2010

You can also connect an external list to Outlook 2010. When you create an external content type in SharePoint Designer 2010, you can map it to a native Office item type such as a contact or task so that the external data looks and behaves just like a contact or task item in Outlook 2010. For example, suppose that your external data is a list of customers and you want to display that external data in Outlook 2010. Because the data for customers closely resembles contacts in Outlook 2010, you can map that external content type to the contact item in Outlook 2010. After you connect the external list to Outlook 2010, you can create, update, and delete the external data directly from Outlook 2010 just as you would create and update native Outlook contacts. An additional feature is the ability to work with Outlook forms and task panes, which requires coding.

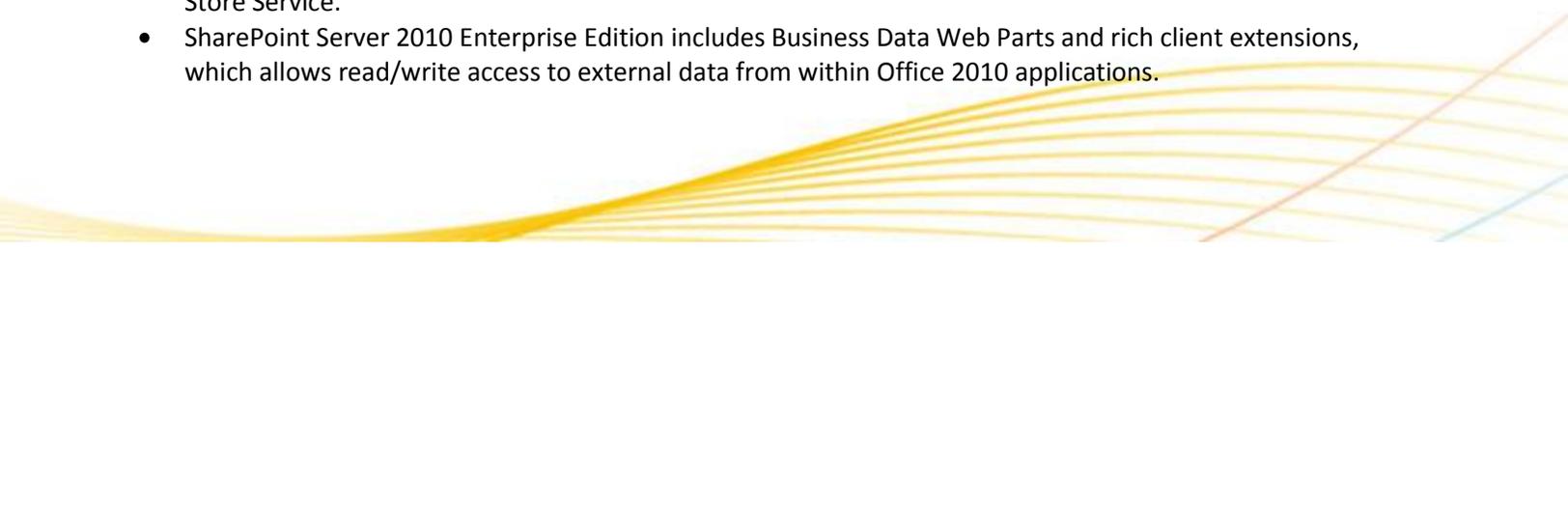
Secure Store Service

The Secure Store Service is a SharePoint Service application that provides storage and mapping of credentials such as account names and passwords. In general, it enables secure storage of data that provides credentials required for connecting to data sources and associating those credentials to a specific identity or group of identities. The Secure Store Service stores and map user credentials required by a data source through the use of single sign-on (SSO) authentication. For example, a SharePoint user account can be mapped to an external data source account so users get appropriate access to external data through SharePoint. Or, a particular group of users who do not have direct access rights can be granted access through the unattended Service Account.

Connect BCS data to Access 2010

One final point worth mentioning, you can also surface BCS data in Access 2010. As we have discussed earlier, Access 2010 is *the* landing pad for data. Because Access 2010 supports creating an external data connection to a Web Service, you can create a data connection to the BDC and get business data. After you create the Web Service data connection, you can link to it as you would any other data source outside Access 2010.

Note The components of BCS are distributed across all tiers of SharePoint 2010 on-premise, but SharePoint Online does not currently support BCS (as of this writing):

- SharePoint Foundation 2010 includes BCS, BDC, the Connector Framework, external lists, business data columns, and offline synchronization of external lists with Outlook 2010 and SharePoint Workspace 2010.
 - SharePoint Server 2010 Standard Edition includes external data search and BCS integration with the Secure Store Service.
 - SharePoint Server 2010 Enterprise Edition includes Business Data Web Parts and rich client extensions, which allows read/write access to external data from within Office 2010 applications.
- 

Appendices

The Fabulous 40

The following application templates provide many useful examples of SharePoint Composite solutions. They will give you lots of great ideas and practical suggestions. It's important to note that these templates were created for Windows SharePoint Services 3.0, but have not been officially upgraded to SharePoint 2010. For more information on how to upgrade, see [Upgrade and the Fabulous 40 Application Templates](#).

Datasheet	Description
Clinical Trial Initiation and Management	Helps teams manage the process of tracking clinical trial protocols, objective setting, subject selection and budget activities. The site provides useful Office Word 2007 templates as well as the capability to create, track and assign tasks and issues related to a particular clinical trial.
Absence Request and Vacation Schedule Management	Helps employees manage requests for out of office days. Team members post days they will be unavailable and can use the system to assign their responsibilities to others during those days. The application template helps team leaders manage requests for vacation and provides dashboards showing which users are signed up for a set of responsibilities.
Board of Directors	Provides a single location for an external group of members to store and locate common documents such as quarterly reviews, shareholder meeting notes and annual strategy documents. The template also tracks tasks, issues and calendar items so board members have a single location to view information relevant to them.
Contacts Management	Helps teams manage contact information that needs to be shared among team members. The application template allows teams to enter contact information through a Web-based interface or through Outlook. When used in conjunction with Outlook, team members can subscribe to receive updated contract information whenever other users make changes to a contact.
Document Library and Review	Helps people manage the review cycle common to processes like new product specification, publication, knowledge management and project plan development. It combines the functionality of a version-tracking document library with a threaded discussion list to provide a feedback and revision system. This template is intended for teams that need a central location for document review, discussion, revision control and approval.
Request for Proposal	Helps manage the process of creating and releasing an initial RFP, collecting submissions of proposals and formally accepting the selected proposal from amongst those submitted. The site also helps simplify the process of notifying individuals about the status of the RFP and submitted proposals.
Sales Lead Pipeline	Helps teams manage the sales pipeline by tracking leads, opportunities, contacts, and accounts. Through role-based dashboards, team members can track sales information, assign open opportunities and gain visibility into the status of overall leads entered into the application template.
Team Work Site	Provides a place where project teams can upload background documents, track scheduled calendar events and submit action items that result from team meetings. The site also tracks the creation and purpose of sub-teams as well as enables discussion of topics created by members of the team.
Budgeting and Tracking Multiple Projects	Helps project teams track and budget multiple, interrelated sets of activities. The template provides project management tools such as project creation, assignment of new tasks, Gantt Charts and common status designators. It helps team members consolidate the status of multiple projects into a single view, tracking progress against a set project budget and timeline.

Datasheet	Description
Bug Database	Helps development teams collect and track information about bugs in their code. The template allows bugs to be logged with information such as reproduction steps, category, comments, priority and severity of the bug. Bug categories can specify category owners so users can quickly determine the appropriate bug owners.
Call Center	Helps teams manage the process of handling customer service requests. The application template helps teams manage service requests from issue identification to cause analysis and resolution. Role-based dashboards display relevant information for each service request and a knowledge base can help track related documents and items previously used to solve past call center issues. Management focused dashboards track performance with metrics such as average resolution time and service request performance history.
Case Management for Government Agencies	Helps case managers track the status and tasks required to complete their work. When a case is created, standard tasks and documents are created which are modified based on the work each case manager has completed.
Change Request Management	Helps users track risks associated with a design change. Team members can submit a change request, notifying stakeholders of the risks involved with the change. The application template allows a team member to approve or reject the request.
Classroom Management	Helps instructors and students organize and store information related to a particular class. The site includes document libraries to store assignments and lecture notes as well as calendars and announcement capability to enable communication from instructor to students.
Discussion Database	Provides a location where team members can create and reply to discussion topics. Discussions are organized by categories, which are created by a site manager, and can be linked to Office Outlook 2007 via an RSS feed.
Employee Activities Site	Helps manage the creation and attendance of events for employees. Activity owners use the site to review proposals for new activities and create event calendar items. Employees use the site to sign up as well as track which activities they've attended in the past.
Equity Research	Helps teams collaborate on researching stocks and other equities. It provides a central location for teams to store documents, post links, track news, and hold discussions related to the equities tracked by the site.
Event Planning	Helps teams organize events efficiently through the use online registration, schedules, communication and feedback. Role based dashboards offer specific information for various event members such as speaker, guest, staff, vendor, and delegate and attendee home pages.
Job Requisition and Interview Management	Demonstrates the power of collaboration by helping a recruiter streamline the process of filling job openings within a company. The template helps the recruiter manage requisitions, capture referrals and resumes and coordinate interviews. The application template enables people to input their candidate feedback centrally and track hire / no hire recommendations.
Knowledge Base	Helps teams manage the information that is resident within their organization. The template enables team members to upload existing documents or create new ones using Web-based content creation tools. Items are tagged with relevant identifying information so that others can more easily find the documents and learn from the collective knowledge in their organization. The template can be utilized in a top-down approach, where a centralized knowledge department pushes down relevant content to the rest of the business, or a bottom-up approach, where knowledge is captured and shared by all users as a normal part of doing business.

Datasheet	Description
Manufacturing Process Management	Helps teams to model and track manufacturing processes as well as tasks and issues that arise in the upkeep of these processes.
Physical Asset Tracking and Management	Helps teams manage requests and tracking of physical assets. An asset manager approves asset requests and manages the properties of the assets in the system, such as location, condition, manufacturer, model, current owner and estimated value.
Product and Marketing Requirements Planning	Enables teams to manage the process of collecting and documenting requirements for new products. The site provides several Office templates providing useful techniques for Marketing, Product and Steering committee actions as well as a template for meeting notes and financial information.
Room and Equipment Reservations	Helps teams manage the utilization of shared meeting rooms and equipment. The application template enables team members to identify times when specific rooms and/or equipment are available and place a reservation for a specified time.
Timecard Management	Helps teams track hours spent working on various projects. The site enables team members to punch in on a particular project and punch out when they cease work. The system automatically generates the time worked by project, and can show managers who is working on a particular project, total hours versus budgeted time and the details of who worked on each project entered into the site.
Business Performance Reporting	Helps organization managers track the satisfaction of customers through a combination of surveys and discussions. Surveys can be sent via Office InfoPath 2007 which are then consolidated by the template to give an overall response to a series of questions.
Competitive Analysis Site	Helps teams organize information about competitors and their products. The site provides useful Office documents to perform SWOT and other useful competitive analysis techniques. Links to industry, company and product news can also be included to provide a single location for all competitive information.
Compliance Process Support Site	Helps both teams and executive sponsors to manage compliance implementation endeavors. The site allows users to specify control tasks required to meet regulation requirements as well capture compliance issues as they arise. The application template contains document libraries used by team members to store related files as well as a calendar to track key audit dates.
Disputed Invoice Management	Helps accounts payable departments track open invoices including the potential savings associated with paying the invoice early. The site includes useful templates for analyzing the reasons invoices are being disputed as well as tracking who to contact for more information.
Employee Self-Service Benefits	Provides tools for an organization to inform employees about available benefits as well as enabling them to enroll for each benefit.
Employee Training Scheduling and Materials	Helps instructors and employees manage courses and related materials. Instructors can use the site to add new courses and organize course materials. Employees use the site to schedule attendance at a course, track courses they've attended and to provide feedback.
Expense Reimbursement and Approval Site	Helps manage elements of the expense approval process, saving time for approvers. Employees can enter expense information into the application template. Approvers can then review the information and manage the payment approval. Users monitor the status of their reimbursement request through a filtered view listing their outstanding requests.
Help Desk	Helps teams manage the process of handling service requests. Team members use the application template to identify a service request, manage identification of the root cause and track solution status. The application template provides role-based dashboards displaying information relevant to customer service representatives and managers, including performance history.

Datasheet	Description
Integrated Marketing Campaign Tracking	<p>Helps marketing managers track the implementation and success of outbound marketing activities. The template allows a manager to create marketing activities and track the results of those activities, such as responses generated and sales completed. The template contains multiple methods of analyzing the success of the campaigns including automated calculations and Office Excel 2007 templates for more detailed analyses.</p>
Inventory Tracking	<p>Helps organizations track elements associated with inventory. The application template helps managers track inventory levels by capturing manual input of updated inventory information. Users are notified when each part reaches the reorder quantity and helps these users manage customer and supplier information such as historical inventory levels.</p>
IT Team Workspace	<p>Helps teams manage the development, deployment and support of software projects. The application template allows users to update information on projects, tasks, issues, milestones and bugs. It also includes help desk functionality, making it easy for team members to guide service requests from initiation to resolution. Role based dashboards provide relevant information to team members, such as unassigned tasks and performance history.</p>
Lending Library	<p>Helps people manage the physical assets in an organization's library. The application template tracks general properties about the physical assets and which user has currently checked out the asset. It also provides a librarian dashboard to help identify currently available and overdue assets. Automated email notifications can be sent to borrowers who have an overdue item.</p>
New Store Opening	<p>Helps a team manage the opening of new store locations or re-modeling of existing store location. The site provides a single location to manage tasks, issues, and documents for all store opening processes, enabling end users to view relevant information and providing project manager's insight across the entire project.</p>
Project Tracking Workspace	<p>Helps small team projects manage project information in a single location. The application template provides a place where a team can list and view project issues and tasks. Functionality is provided to help drive project status reporting, including assignment of new tasks, Gantt Charts and common status designators.</p>
Sports League	<p>Helps an intra-company league administrator manage a baseball league. The site tracks team information, players, captains and scheduled team activities such as games, practices and social events. Team members can enter in game results and perform analysis at a team, game or individual player level. The site also enables discussions between league members through a League Discussion board.</p>

Summary of Web Parts

The following is a comprehensive list of all Web Parts that are available in SharePoint 2010. Keep in mind the following: the availability of a Web Part depends on the SharePoint tier you have installed, whether or not a SharePoint Feature or Service has been activated, and whether you are using SharePoint 2010 on-premise or online. Connectable Web Parts are displayed in yellow.

Web Part (Web Part Filename)	Description
Business Data	
Business Data Actions (BusinessDataActionsWebPart.dwp)	Displays a list of actions from the BDC.
Business Data Connectivity Filter (BusinessDataFilter.dwp)	Filters the contents of Web Parts using a list of values from the Business Data Connectivity.
Business Data Item (BusinessDataDetailsWebPart.webpart)	Displays one item from a data source in the BDC.
Business Data Item Builder (BusinessDataItemBuilder.dwp)	Creates a Business Data item from parameters in the query string and provides it to other Web Parts.
Business Data List (BusinessDataListWebPart.webpart)	Displays a list of items from a data source in the BDC.
Business Data Related List (BusinessDataAssociationWebPart.webpart)	Displays a list of items related to one or more parent items from a data source in the BDC.
Chart (MossChartWebPart.webpart)	Helps you to visualize your data on SharePoint sites and portals.
Excel Web Access (Microsoft.Office.Excel.WebUI.dwp)	Displays an interactive Excel workbook as a Web page.
Indicator Details (IndicatorWebPart.dwp)	Displays the details of a single Status Indicator. Status Indicators display an important measure for an organization and may be obtained from other data sources including SharePoint lists, Excel workbooks, and SQL Server Analysis Services KPIs.
Status List (KpiListWebPart.dwp)	Shows a list of Status Indicators. Status Indicators display important measures for your organization, and show how your organization is performing with respect to your goals.
Visio Web Access (VisioWebAccess.dwp)	Enables viewing and refreshing of published Visio diagrams.
Content Roll up	
Categories (CategoryWebPart.webpart)	Displays categories from the Site Directory.
Content Query (ContentQuery.webpart)	Displays a dynamic view of content from your site.
Relevant Documents (MSUserDocs.dwp)	Displays documents that are relevant to the current user
RSS Viewer (RssViewer.webpart)	Displays an RSS feed.
Site Aggregator (siteFramer.dwp)	Displays sites of your choice.
Sites in Category (CategoryResultsWebPart.webpart)	Displays sites from the Site Directory within a specific category.

Web Part (Web Part Filename)	Description
Summary Links (SummaryLink.webpart)	Allows authors to create links that can be grouped and styled.
Table of Contents (TableOfContents.webpart)	Displays the navigation hierarchy of your site.
Web Analytics (WhatsPopularWebPart.dwp)	Displays the most viewed content, most popular search queries, or most popular clicked search results as reported by Web Analytics for the site or site collection.
WSRP Viewer (WSRPConsumerWebPart.dwp)	Displays portlets from web sites using WSRP 1.1.
XML Viewer (MSXml.dwp)	Transforms XML data using XSL and shows the results.
Memberships (memberships.dwp)	Displays your site and distribution list memberships.
My Links (quicklinks.dwp)	Use to display your links.
My Workspaces (myworks.dwp)	Displays sites created under your My Site.
Personal Documents (mydocs.dwp)	Use to display documents authored by you on sites where you are a member and sites of your choice.
SharePoint Documents (membershipdocs.dwp)	Displays documents authored by the user where the user is a site member.
Filter	
Choice Filter (AuthoredListFilter.webpart)	Filters the contents of Web Parts using a list of values entered by the page author.
Current User Filter (UserContextFilter.webpart)	Filters the contents of Web Parts by using properties of the current user.
Date Filter (DateFilter.dwp)	Filter the contents of Web Parts by allowing users to enter or pick a date.
Filter Actions (FilterActions.dwp)	Synchronizes the display of two or more Filter Web Part results.
Page Field Filter (PageContextFilter.webpart)	Filters the contents of Web Parts using information about the current page.
Query String (URL) Filter (QueryStringFilter.webpart)	Filters the contents of Web Parts using values passed via the query string.
SharePoint List Filter (SpListFilter.dwp)	Filters the contents of Web Parts by using a list of values.
SQL Server Analysis Services Filter (OlapFilter.dwp)	Filters the contents of Web Parts using a list of values from SQL Server Analysis Services.
Text Filter (TextFilter.dwp)	Filters the contents of Web Parts by allowing users to enter a text value.
Form	
HTML Form (MSSimpleForm.dwp)	Connects simple form controls to other Web Parts.
InfoPath Form (Microsoft.Office.InfoPath.Server.) BrowserForm.webpart	Displays an InfoPath browser-enabled form.

Web Part (Web Part Filename)	Description
List, Library, Document Sets	
List View (NA)	Displays a list or library view.
Document Set Contents (DocumentSetContents.dwp)	Displays the contents of a Document Set.
Document Set Properties (DocumentSetProperties.dwp)	Displays the properties of the Document Set.
Media and Content	
Content Editor (MSContentEditor.dwp)	Allows authors to enter rich text content.
Image Viewer (MSImage.dwp)	Displays a specified image.
Media (Media.webpart)	Embed media clips (video and audio) in a web page.
Page Viewer (MSPageViewer.dwp)	Displays another Web page in an IFRAME.
Picture Library Slideshow (MSPictureLibrarySlideshow.webpart)	Displays a slideshow of images and photos from a picture library.
Silverlight (Silverlight.webpart)	Displays a Silverlight application
Outlook Web App	
My Calendar (owacalendar.dwp)	Displays your calendar.
My Contacts (owacontacts.dwp)	Displays your contacts.
My Inbox (owainbox.dwp)	Displays your inbox.
My Mail Folder (owa.dwp)	Displays your mail.
My Tasks (owatasks.dwp)	Displays your tasks.
PerformancePoint	
PerformancePoint Filter (FilterWebPart.webpart)	Displays PerformancePoint filters that can be linked to other Web Parts to provide an interactive dashboard experience.
PerformancePoint Report (ReportViewWebPart.webpart)	Displays PerformancePoint reports that can be linked to other Web Parts to create an interactive dashboard experience.
PerformancePoint Scorecard (ScorecardWebPart.webpart)	Displays a PerformancePoint scorecard that can be linked to other web parts, such as filters and reports, to create an interactive dashboard experience.
PerformancePoint Stack Selector (StackWebPart.webpart)	Displays the PerformancePoint Stack Selector so that all PerformancePoint Web Parts, such as filters and reports, contained in the same zone will be automatically stacked and made selectable.
Reports	
Report Viewer (ReportViewer.dwp)	Displays SQL Server Report Server reports (.rdl).

Web Part (Web Part Filename)	Description
Search	
Advanced Search Box (AdvancedSearchBox.dwp)	Displays parameterized search options based on properties and combinations of words.
Dual Chinese Search (DualChineseSearch.dwp)	Searches Dual Chinese documents and items at the same time.
Federated Results (SummaryResults.webpart)	Displays search results from a configured location.
Find by Document ID (DocIdSearchWebPart.dwp)	Finds a document by its Document ID.
People Refinement Panel (PeopleRefinement.webpart)	Refines people search results.
People Search Box (PeopleSearchBox.dwp)	Searches for people.
People Search Core Results (PeopleSearchCoreResults.webpart)	Displays people search results and the properties associated with them.
Refinement Panel (Refinement.webpart)	Refines search results.
Related Queries (QuerySuggestions.webpart)	Displays related queries to a user query.
Search Action Links (SearchActionLinks.webpart)	Displays search action links on the search results page.
Search Best Bets (SearchBestBets.webpart)	Displays high-confidence results on a search results page.
Search Box (SearchBox.dwp)	Displays a search box that allows users to search for information.
Search Core Results (SearchCoreResults.webpart)	Displays the search results and the properties associated with them.
Search Paging (searchpaging.dwp)	Display links for navigating pages containing search results.
Search Statistics (searchstats.dwp)	Displays the search statistics such as the number of results shown on the current page, total number of results, and time taken to perform the search.
Search Summary (searchsummary.dwp)	Displays suggestions for current search query.
Search Visual Best Bet (VisualBestBet.dwp)	Displays Visual Best Bet.
Top Federated Results (TopAnswer.webpart)	Displays the Top Federated result from the configured location.
Social Collaboration	
Contact Details (contactwp.dwp)	Displays details about a contact for this page or site
Note Board (SocialComment.dwp)	Enable users to leave short, publicly-viewable notes about this page.
Organization Browser (ProfileBrowser.dwp)	Displays each person in the reporting chain in an interactive view optimized for browsing organization charts.

Web Part (Web Part Filename)	Description
Site Users (MSMembers.dwp)	Displays a list of the site users and their online status.
Tag Cloud (TagCloud.dwp)	Displays the most popular subjects being tagged inside your organization.
User Tasks (MSUserTasks.dwp)	Displays tasks that are assigned to the current user.
What's New (whatsnew.dwp)	Displays new information from specified lists and libraries.
Whereabouts (Whereabouts.dwp)	Displays Whereabouts information.
Ask Me About (askmeabout.dwp)	Shows a list of keywords that others can ask me questions on.
Colleagues (Colleagues.dwp)	Provides a list of all colleagues a user has shared with others and an entry point for the profile owner to manage the list of colleagues.
In Common Between Us (Incommon.dwp)	Displays what is in common between you and the user.
Recent Activities (activitytracker.dwp)	Displays my recent activities.
Recent Blog Posts (LatestBlogPostsPublic.webpart)	Displays the most recent blog posts for the user.
What's New (contactlinks.dwp)	Displays a list of your colleagues and their recent changes. In SharePoint 2007, this Web part was called Colleague Tracker. Note that this web part is different than the general What's New Web Part (whatsnew.dwp).