Microsoft

Step by Step

Microsoft® Visio® 2010

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Learn at the pace *you* want.

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Scott A. Helmers

The smart way to learn Microsoft® Visio® 2010 —one step at a time!

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- Collaborate on diagrams with Microsoft SharePoint® 2010
- Customize diagrams with your own shapes and templates

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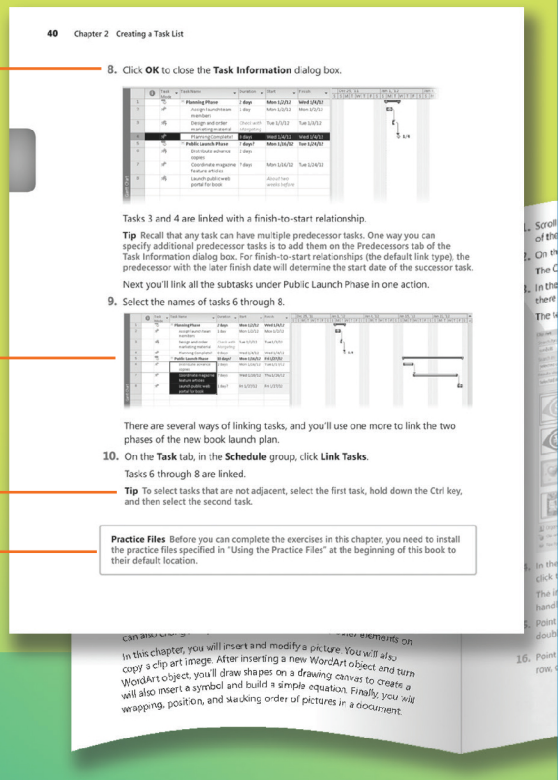
2 Use screenshots to check your work

3 Get helpful tips and pointers

4 Build your skills hands-on using ready-made practice files



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ISBN: 978-0-7356-4887-6

U.S.A. $29.99
Canada $34.99
[*Recommended*]

Microsoft Office/Microsoft Visio

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Microsoft® Visio® 2010

Step by Step

Scott A. Helmers

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978-0-735-64887-6

[2013-07-19]

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Introducing Visio 2010

Microsoft Visio 2010 is a bold new release. If you're new to Visio, your timing is excellent! This version of Visio is easier to use than ever before and yet the diagrams you create can have more impact and style, and can present more real-world data than in any previous version.

If you've used prior versions of Visio, you're in luck too. You'll find the features you love, but you'll see them presented with the new Visio ribbon. In addition, you'll discover that you can publish dynamically updateable diagrams to Microsoft SharePoint, where anyone can view them, even if they don't have Visio. You'll find new templates and stencils, faster methods for creating drawings, simple ways to add structure to your diagrams, improved integration with AutoCad drawings, diagram validation rules, and a wealth of other new features.

In short, whether you're a first timer or have been using Visio for years, this is the strongest and most exciting version of Visio yet.

Creating and Enhancing Diagrams More Easily

Quick Shapes, AutoConnect, AutoAdd, AutoDelete, AutoAlign, AutoSize… just the names of some of the new and enhanced features in Visio 2010 suggest that creating diagrams will be simpler. A few examples include the following:

- Want to add a new shape to the page? For commonly used shapes, there's no need to move the pointer to the stencil and drag a shape onto the page. Just point to a shape that's already on the page and the QuickShapes menu offers you four shapes. One click and you've not only added a new shape but it's already connected to the existing shape.
- Need to insert a shape between two existing shapes? Simply drop the new shape onto the connector between two existing shapes. Not only will AutoAdd insert the new shape but it will add a new connector. And if there isn't enough room for the new shape, Visio will even rearrange part of the diagram to make room.
- Want to delete a shape that's connected between two others? Just select the shape and press the Delete key. Self-healing connectors do the rest; the shapes on either side of the deleted shape will be connected to each other.

- Need to enlarge the drawing page and print the new diagram across multiple sheets of paper? Simply drag a shape into the space surrounding the drawing page and AutoSize will add a new page. That's it! No other adjustments or setting changes required.
- Don't like the way your shapes are aligned on the page? Click the Auto Align & Space button and Visio rearranges your diagram. Not quite happy with the result? Undo the changes, move a few shapes around, and then click Auto Align & Space again.
- Need to present your diagram to an audience but think the drawing is a bit boring? Open the Visio 2010 Themes gallery: one click applies a suite of coordinated colors, styles, fonts, line patterns, and effects to every shape. You can also apply predesigned page backgrounds or page borders by selecting one from a new gallery.

Visio 2010 also brings Live Preview to your diagrams. Many of the features listed above, along with most font, color, size, and style changes, take advantage of Live Preview to show you a potential change before you make it. Live Preview even extends to Visio ***Data Graphics***, letting you preview the dynamic presentation of the data behind your shapes.

Adding Structure to Visio Diagrams

Many types of Visio diagrams contain sets of shapes that are related to each other. In previous Visio versions, you could visually suggest the relationships by creating some combination of groups, colored background shapes, or borders.

Visio 2010 introduces a new type of shape called a *container* that provides more than just a visual grouping for a set of shapes. The container structure means that shapes in a container know they are contained, and the container knows the members that reside within it. Consequently, when you move, copy, or delete a container, all of the members go with it. However, unlike a group shape, the member shapes are accessible with a single click just as if the container were not there.

In most containers, you can place member shapes wherever you'd like. However, a *list* is a special type of container that maintains members in ordered sequence. Each list member knows exactly where it resides within the list.

Visio 2010 includes a third type of structured diagram component known as a *callout*. You still use new-style callouts to add annotations to other shapes, but both the callout and the target shape are aware of each other. Once again, this improves many user interface actions, but also allows Visio ***add-ins*** to work more intelligently with annotated shapes.

Containers, lists, and callouts are great for Visio users, but they also offer intriguing options to Visio developers for building location-aware shapes and for writing code that takes advantage of diagram structure.

Publishing to SharePoint

In Visio 2010, as in previous versions of Visio, you can save any Visio drawing as a set of webpages. This was, and is, a tremendously useful capability because it allows anyone with Windows Internet Explorer to view your web-published Visio diagram without needing Visio.

Although this publishing option has many advantages, it also has one fundamental drawback: the published drawings are static. If the diagram changes or the underlying data changes, you need to republish the drawing before users can see the changes.

The combination of Visio 2010 and SharePoint Server 2010 Visio Services introduces a new option that you can use to publish dynamically updateable Visio web drawings. You can publish drawings that contain live connections to external data sources and feature data graphics to visualize the data behind the diagram. When the underlying data changes, or certain aspects of the diagram change, Visio Services on SharePoint ensures that the web drawing is automatically updated.

You needn't stop with simply publishing a web drawing, either. You can create Web Parts to contain your Visio drawings and can even create interactions among Web Parts so that published Visio drawings interact with each other and with non-Visio Web Parts.

Managing Business Processes

The Premium edition of Visio 2010 adds several new templates that are specifically focused on business process and also adds a number of process-related features.

Using the Business Process Management Notation (BPMN) template, you can create process maps that conform to the BPMN 1.2 standard.

With the SharePoint Workflow template, you can create a visual layout of a SharePoint workflow, export it to SharePoint Designer for refinement and completion, and then execute the workflow in SharePoint. You can also bring a SharePoint Designer workflow back into Visio in order to see a graphical representation.

The Process tab in Visio Premium 2010 includes several new buttons for automatically creating and managing subprocesses within a process diagram.

Validating Diagrams

Visio 2010 validation rules, which are part of Visio Premium 2010, introduce a new level of quality to your Visio diagrams. You've always been able to create great looking diagrams with Visio, but now you can ensure that your diagrams meet a minimum set of predefined conditions before you publish or distribute them.

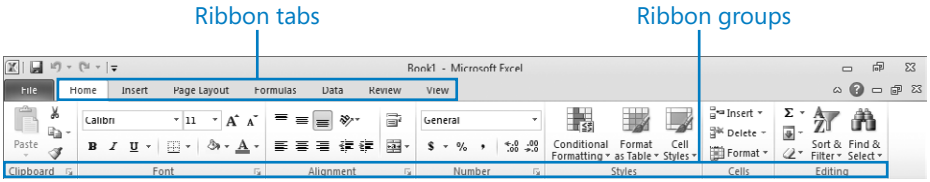
Four Visio 2010 templates—Basic Flowchart, Cross Functional Flowchart, Microsoft SharePoint Workflow, and Business Process Modeling Notation—include predefined validation rule sets that you can run in diagrams created from those templates. You can also import existing rule sets into other diagrams. For example, you can add the flowchart rules to a Visio 2003 flowchart to improve its quality. You can also create your own rules and rule sets to validate diagrams.

Summary

There's a lot to like about Visio 2010! This introduction has barely scratched the surface of some of the new features in the software. The exercises in this book will get you started with Visio 2010 and will give you hands-on experience with the best that Visio has to offer.

Modifying the Display of the Ribbon

The goal of the Microsoft Office working environment is to make working with Office documents, including Microsoft Word documents, Excel workbooks, PowerPoint presentations, Outlook e-mail messages, Access database tables, and Visio diagrams as intuitive as possible. You work with an Office document and its contents by giving commands to the program in which the document is open. All Office 2010 programs organize commands on a horizontal bar called the *ribbon*, which appears across the top of each program window whether or not there is an active document.



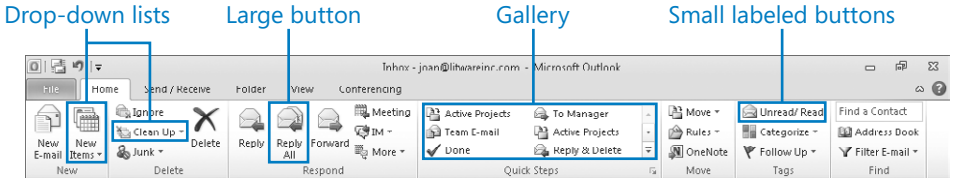
Commands are organized on task-specific tabs of the ribbon, and in feature-specific groups on each tab. Commands generally take the form of buttons and lists. Some appear in galleries. Some groups have related dialog boxes or task panes that contain additional commands.

Throughout this book, we discuss the commands and ribbon elements associated with the program feature being discussed. In this topic, we discuss the general appearance of the ribbon, things that affect its appearance, and ways of locating commands that aren't visible on compact views of the ribbon.

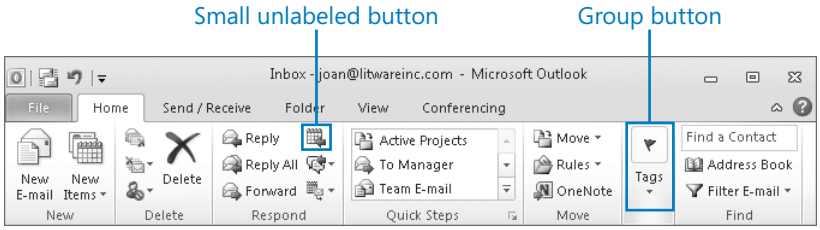
Dynamic Ribbon Elements

The ribbon is dynamic, meaning that the appearance of commands on the ribbon changes as the width of the ribbon changes. A command might be displayed on the ribbon in the form of a large button, a small button, a small labeled button, or a list entry. As the width of the ribbon increases or decreases, the size, shape, and presence of buttons on the ribbon adapt to the available space.

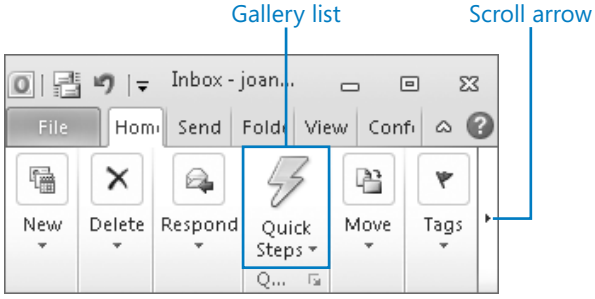
For example, when sufficient horizontal space is available, the buttons on the Review tab of the Word program window are spread out and you're able to see more of the commands available in each group.



If you decrease the width of the ribbon, small button labels disappear and entire groups of buttons hide under one button that represents the group. Click the group button to display a list of the commands available in that group.



When the window becomes too narrow to display all the groups, a scroll arrow appears at its right end. Click the scroll arrow to display hidden groups.



Changing the Width of the Ribbon

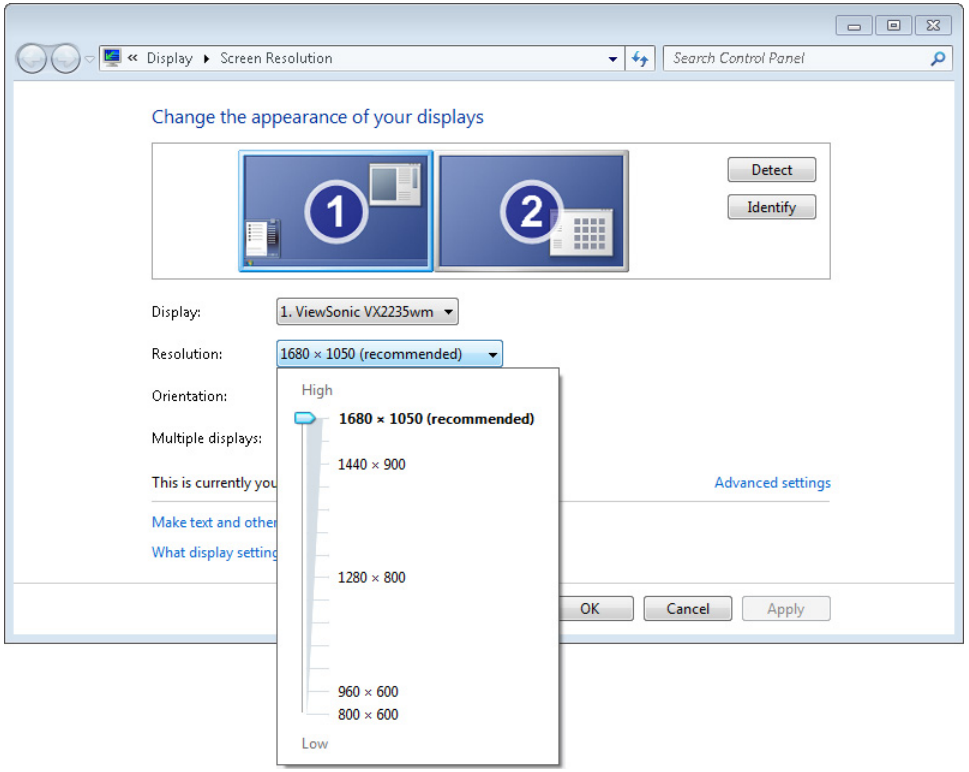
The width of the ribbon is dependent on the horizontal space available to it, which depends on these three factors:

- **The width of the program window** Maximizing the program window provides the most space for ribbon elements. You can resize the program window by clicking the button in its upper-right corner or by dragging the border of a nonmaximized window.

Tip On a computer running Windows 7, you can maximize the program window by dragging its title bar to the top of the screen.

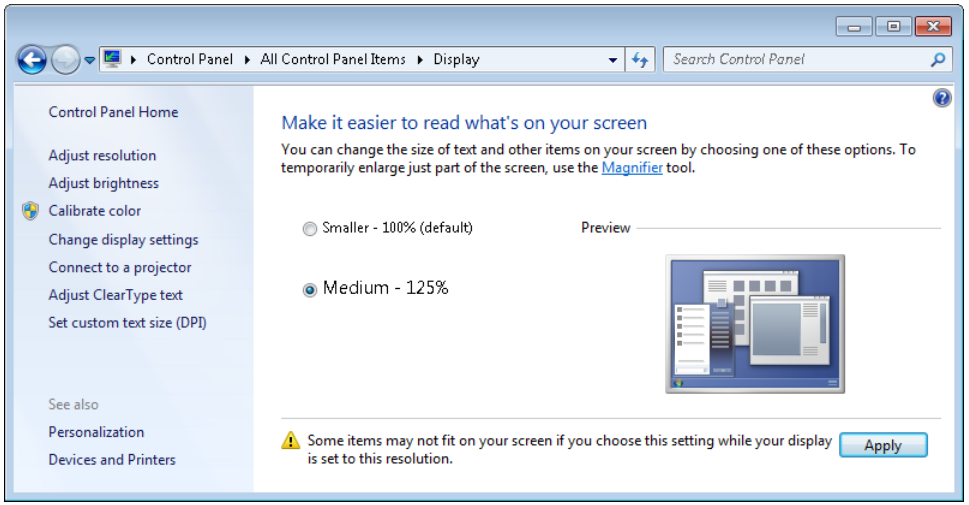
- **Your screen resolution** Screen resolution is the size of your screen display expressed as pixels wide × pixels high. The greater the screen resolution, the greater the amount of information that will fit on one screen. Your screen resolution options are dependent on your monitor. At the time of writing, possible screen resolutions range from 800 × 600 to 2048 × 1152. In the case of the ribbon, the greater the number of pixels wide (the first number), the greater the number of buttons that can be shown on the ribbon, and the larger those buttons can be.

  On a computer running Windows 7, you can change your screen resolution from the Screen Resolution window of Control Panel. You set the resolution by dragging the pointer on the slider.

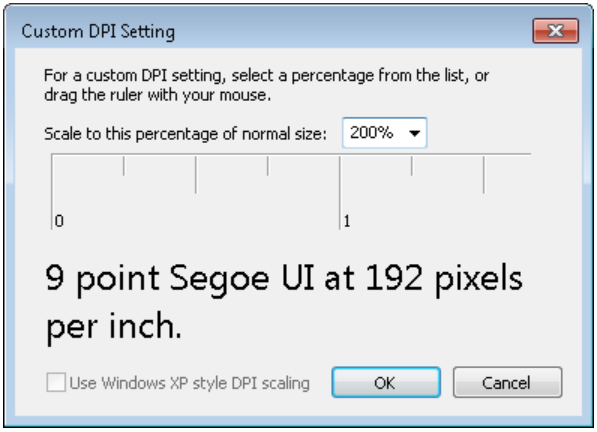


- **The density of your screen display** You might not be aware that you can change the magnification of everything that appears on your screen by changing the screen magnification setting in Windows. Setting your screen magnification to 125% makes text and user interface elements larger on screen. This increases the legibility of information, but means that less fits onto each screen.

On a computer running Windows 7, you can change the screen magnification from the Display window of Control Panel. You can choose one of the standard display magnification options, or create another by setting a custom text size.



The screen magnification is directly related to the density of the text elements on screen, which is expressed in dots per inch (dpi) or pixels per inch (ppi). (The terms are interchangeable, and in fact are both used in the Windows dialog box in which you change the setting.) The greater the dpi, the larger the text and user interface elements appear on screen. By default, Windows displays text and screen elements at 96 dpi. Choosing the Medium - 125% display setting changes the dpi of text and screen elements to 120 dpi. You can choose a custom setting of up to 500% magnification, or 480 dpi, in the Custom DPI Setting dialog box. The list allows you to choose a magnification of up to 200%. You can choose a greater magnification by dragging across the ruler from left to right.



See Also For more information about display settings, refer to *Windows 7 Step by Step* (Microsoft Press, 2009), *Windows Vista Step by Step* (Microsoft Press, 2006), or *Windows XP Step by Step* (Microsoft Press, 2002) by Joan Lambert Preppernau and Joyce Cox.

Adapting Exercise Steps

The screen images shown in the exercises in this book were captured at a screen resolution of 1024 × 768, at 100% magnification, and the default text size (96 dpi). If any of your settings are different, the ribbon on your screen might not look the same as the one shown in the book. For example, you might see more or fewer buttons in each of the groups, the buttons you see might be represented by larger or smaller icons than those shown, or the group might be represented by a button that you click to display the group's commands.

When we instruct you to give a command from the ribbon in an exercise, we do it in this format:

- On the **Insert** tab, in the **Illustrations** group, click the **Chart** button.

If the command is in a list, we give the instruction in this format:

- On the **Page Layout** tab, in the **Page Setup** group, click the **Breaks** button and then, in the list, click **Page**.

The first time we instruct you to click a specific button in each exercise, we display an image of the button in the page margin to the left of the exercise step.

If differences between your display settings and ours cause a button on your screen to look different from the one shown in the book, you can easily adapt the steps to locate the command. First, click the specified tab. Then locate the specified group. If a group has been collapsed into a group list or group button, click the list or button to display the group's commands. Finally, look for a button that features the same icon in a larger or smaller size than that shown in the book. If necessary, point to buttons in the group to display their names in ScreenTips.

If you prefer not to have to adapt the steps, set up your screen to match ours while you read and work through the exercises in the book.

Features and Conventions of This Book

This book has been designed to lead you step by step through all the tasks you're most likely to want to perform in Microsoft Visio 2010. If you start at the beginning and work your way through all the exercises, you will gain enough proficiency to be able to create and work with many types of Visio diagrams. However, each topic is self-contained. If you have worked with a previous version of Visio, or if you completed all the exercises and later need help remembering how to perform a procedure, the following features of this book will help you locate specific information:

- **Detailed table of contents** Search the listing of the topics within each chapter.
- **Chapter thumb tabs** Easily locate the beginning of the chapter you want.
- **Topic-specific running heads** Within a chapter, quickly locate the topic you want by looking at the running heads at the top of odd-numbered pages.
- **Glossary** Look up the meaning of a word or the definition of a concept.
- **Detailed index** Look up specific tasks and features in the index, which has been carefully crafted with the reader in mind.

You can save time when reading this book by understanding how the *Step by Step* series shows exercise instructions, keys to press, buttons to click, and other information.

Convention	Meaning
SET UP	This paragraph preceding a step-by-step exercise indicates the practice files that you will use when working through the exercise. It also indicates any requirements you should attend to or actions you should take before beginning the exercise.
CLEAN UP	This paragraph following a step-by-step exercise provides instructions for saving and closing open files or programs before moving on to another topic. It also suggests ways to reverse any changes you made to your computer while working through the exercise.
1 2	Numbered steps guide you through hands-on exercises in each topic, as well as procedures in sidebars and expository text.

Convention	Meaning
See Also	This paragraph directs you to more information about a topic in this book or elsewhere.
Troubleshooting	This paragraph alerts you to a common problem and provides guidance for fixing it.
Tip	This paragraph provides a helpful hint or shortcut that makes working through a task easier.
Important	This paragraph points out information that you need to know to complete a procedure.
Keyboard Shortcut	This paragraph provides information about an available keyboard shortcut for the preceding task.
Ctrl+B	A plus sign (+) between two keys means that you must press those keys at the same time. For example, "Press Ctrl+B" means that you should hold down the Ctrl key while you press the B key.
	Pictures of buttons appear in the margin the first time the button is used in a chapter.
Bold	In exercises that begin with SET UP information, bold type displays text that you should type; the names of program elements, such as buttons, commands, windows, and dialog boxes; and files, folders, or text that you interact with in the steps.

Using the Practice Files

Before you can complete the exercises in this book, you need to copy the book's practice files to your computer. These practice files, and other information, can be downloaded from here:

oreilly.com/catalog/9780735648876/

Display the detail page in your web browser and follow the instructions for downloading the files.

Important **The Microsoft Visio2010 program is not available from this website. You should purchase and install that program before using this book.**

The following table lists the practice files for this book.

Chapter	File
Chapter 1: A Visual Orientation to a Visual Product	Size & Position_start.vsd
Chapter 2: Creating a New Diagram	Autoconnect and Quick Shapes_start.vsd Basic shapes_start.vsd
Chapter 3: Adding Sophistication to Your Drawings	Background Exercises_start.vsd Corporate Diagram International_start.vsd Corporate Diagram_start.vsd International Office.jpg Starfish.jpg Text Exercises_start.vsd
Chapter 4: Drawing the Real World: Flowcharts and Organization Charts	HR Recuiting Flowchart_start.vsd Org Chart Data_start.xlsx
Chapter 5: Adding Style, Color, and Themes	HR Recruiting Flowchart with labels_start.vsd Org Chart by Hand with data_start.vsd Org Chart via Wizard with data_start.vsd
Chapter 6: Entering, Linking to, and Reporting on Data	HR Process Data_start.xlsx HR Process Map with data_start.vsd HR Process Map_start.vsd
Chapter 7: Adding and Using Hyperlinks	HR Process Map_start.vsd Human Resources Policy Manual.docx Sample PDF Document.pdf Sample presentation.pptx Sample Project file.mpp Sample spreadsheet.xlsx

Chapter	File
Chapter 8: Sharing and Publishing Diagrams: Part 1	HR Process Map for Chapter08_start.vsd
Chapter 9: Drawing the Real World: Network and Data Center Diagrams	Network Diagram (Basic) with data_start.vsd Network Diagram (Basic)_start.vsd Network Diagram (Detailed)_start.vsd Network Diagram (Organized)_start.vsd Network Diagram with Rack_start.vsd Network Equipment Data (Basic)_start.xlsx
Chapter 10: Visualizing Your Data	Casino Floor.vsd HR Process Map with data_start.vsd Sales Proposal Process TaskMap.pdf
Chapter 11: Adding Structure to Your Diagrams	Containers, Lists and Callouts_start.vsd
Chapter 12: Creating and Validating Process Diagrams	HR Recruiting Flowchart Validation_start.vsd RuleSets -- BPMN.html RuleSets -- CFF.html RuleSets -- Flowchart.html RuleSets -- SharePoint Workflow.html Theatre Ticketing Process_start.vsd Theatre Ticketing with Subprocess_start.vsd Visio 2007 Flowchart_start.vsd
Chapter 13: Sharing and Publishing Diagrams: Part 2	HR Process Map Save as Web2_start.vsd Theater Ticketing Diagram_start.vsd
Appendix: Looking Under the Hood	ShapeSheet_start.vsd

Companion Content

Bonus content for this book, including a list of all templates included with Visio 2010 and a selection of Visual Basic for Applications programs, can be found here:

http://aka.ms/648876/files

Please follow the directions for downloading.

Getting Support and Giving Feedback

Errata

We've made every effort to ensure the accuracy of this book and its companion content. If you do find an error, please report it on our Microsoft Press site:

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3. Select your book from the search results.
4. On your book's catalog page, find the Errata & Updates tab

You'll find additional information and services for your book on its catalog page. If you need additional support, please send an email message to Microsoft Press Book Support at *mspinput@microsoft.com*.

Please note that product support for Microsoft software is not offered through the addresses above.

Getting Help with Visio 2010

If your question is about Visio, and not about the content of this Microsoft Press book, your first recourse is the Visio Help system. You can find general or specific Help information by clicking the Help button (labeled with a question mark) located in the upper-right corner of the Visio program window.

If your question is about Visio or another Microsoft software product and you cannot find the answer in the product's Help system, please search the appropriate product solution center or the Microsoft Knowledge Base at:

support.microsoft.com

You can post questions and search previously answered questions at the Microsoft Answers community-based forums at:

answers.microsoft.com

In the United States, Microsoft software product support issues not covered by the Microsoft Knowledge Base are addressed by Microsoft Product Support Services. Location-specific software support options are available from:

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To download your eBook, please see the instruction page at the back of this book.

Acknowledgments

First and foremost, my deepest thanks and love to Marilyn, Sara, and Julie for doing everything that I didn't do while I was in book-writing mode. It's over and I'm back!

A special thanks to my daughter Sara, who read every word of every chapter before it left the house for the first time. The end result is better for her effort.

Thanks to the Visio team at Microsoft for creating such an incredible product and for being such a welcoming and supportive group. I've had the pleasure of getting to know many team members over the last three years and look forward to continuing to work with them. Particular thanks to Stephanie Horn for getting answers to a long list of questions as I was writing the book.

The dozen or so Visio experts in the world who are part of the Microsoft Most Valuable Professional (MVP) program are an amazingly talented group, and it is a pleasure to count many of them as friends. In particular, thanks to: John Marshall for his astute and historically rich technical editing of this book; Chris Roth for maintaining the ever-useful collection of articles, ideas, and forums at the Visio Guy website (*www.visguy.com*); Al Edlund for advice on page scaling; and David Parker for the Rules Tools (*www.visiorules.com*) and for consultation on that subject.

Few people are more knowledgeable on the subject of BPMN than Dr. Bruce Silver (*www.brsilver.com*). I appreciate his candid review of, and improvements to, the BPMN sections of Chapter 12.

Thanks to the editorial teams at Microsoft Press, O'Reilly, and OTSI for their guidance and support throughout the development of this book. A very special thanks to copy editor Jaime Odell. It's difficult to imagine a more collaborative, professional, and yet downright pleasant editing experience. She's set the bar very high for the next book.

Thanks to eagle-eyed and thoughtful reader Wayne Dale for dozens of suggestions and corrections between the first and second printings of this book.

Finally, thanks to Kathy Brennan and Mike Cunningham. Our collective decision to build TaskMap as a Visio add-in started the journey of discovery that led to this book.

Chapter at a Glance

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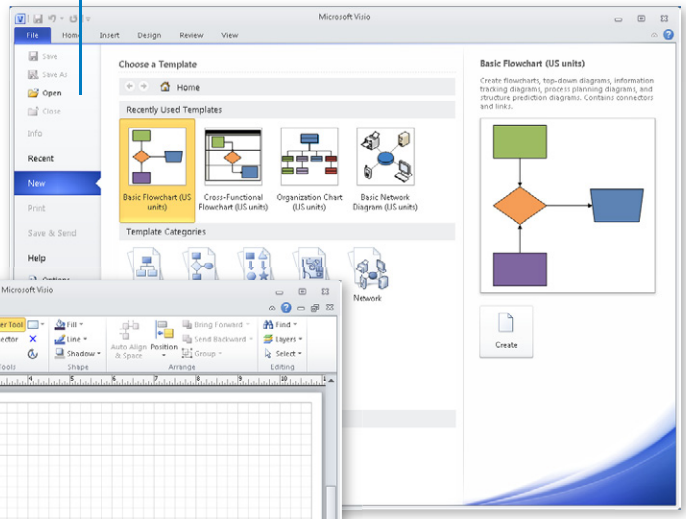

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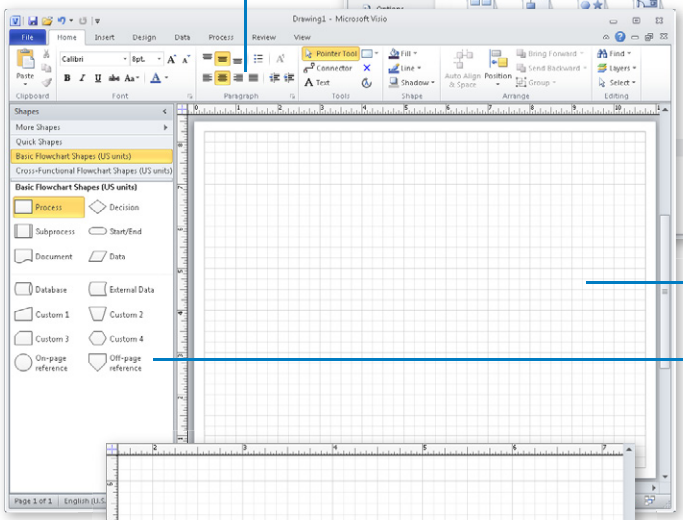

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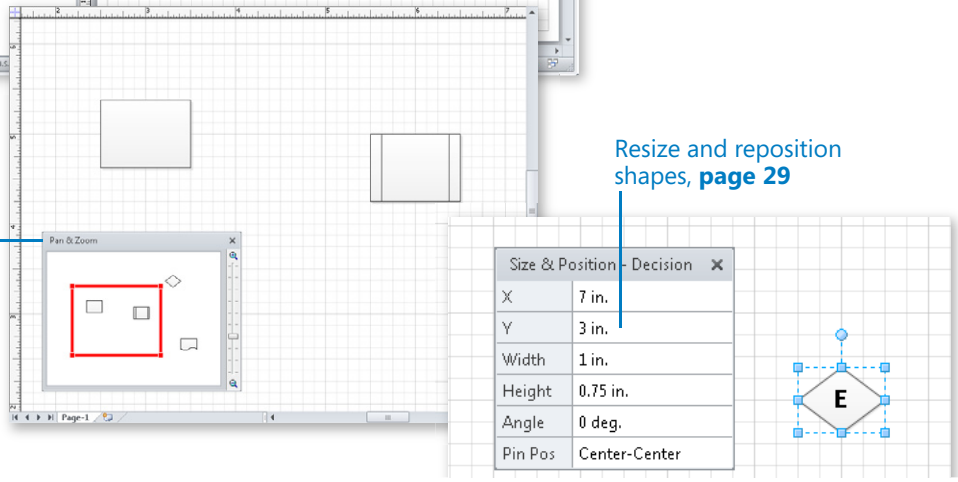
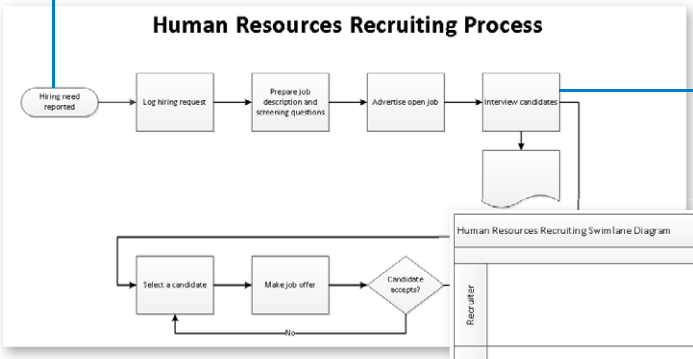
Resize and reposition shapes, **page 29**

Pan and zoom in Visio, **page 24**



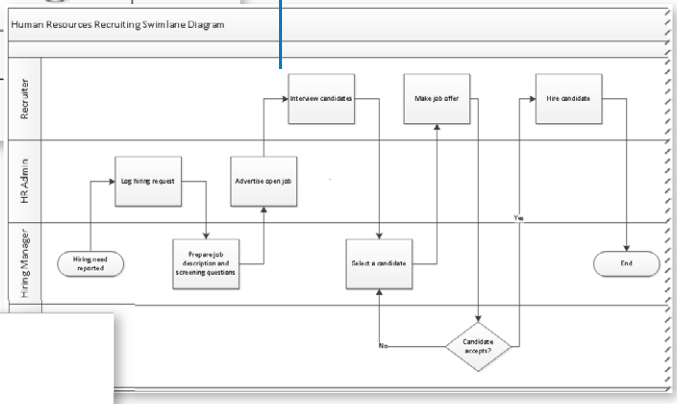
Chapter at a Glance

Create a flowchart, **page 114**

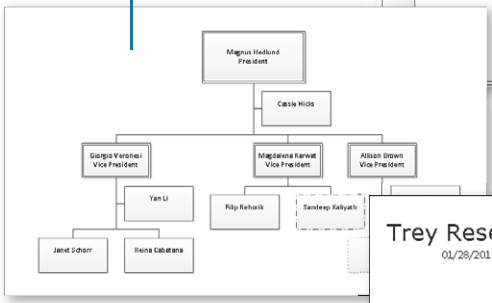


Add labels to a flowchart, **page 118**

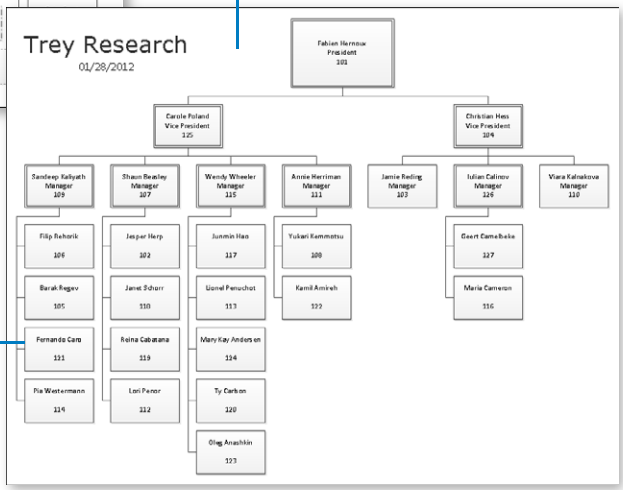
Create a swimlane diagram, **page 120**



Build an organization chart by hand, **page 126**



Use the Organization Chart wizard with existing data, **page 130**



Use the Organization Chart wizard with new data, **page 138**

4 Drawing the Real World: Flowcharts and Organization Charts

In this chapter, you will learn how to

- ✔ Select a flowchart type.
- ✔ Create flowcharts.
- ✔ Add labels to flowcharts.
- ✔ Understand and create swimlane diagrams.
- ✔ Understand organization charts.
- ✔ Build an organization chart by hand.
- ✔ Use the Organization Chart Wizard with existing or new data.
- ✔ Enhance org charts with pictures.

In the first three chapters, you learned many of the basic capabilities of Microsoft Visio 2010. In this chapter, you will apply that knowledge to creating real-world diagrams. There is no better place to start than with the humble ***flowchart***, because creating flowcharts is one of the most common tasks for which people use Visio. In fact, according to Microsoft, one-third of all Visio diagrams are based on templates from the flowchart category.

Whether the end goal is to diagram the logic of a current or future software module, or to document the way that a work procedure is, or could be, performed, Visio flowcharts are the standard. Visio is also used to create an alternative type of flowchart called a ***cross-functional flowchart*** or ***swimlane diagram***.

Another common application for Visio is to create ***organization charts***, often known as ***org charts***. You can create org charts manually by dragging the intelligent organization chart shapes from the Visio stencil onto the drawing page, or you can run the Organization Chart Wizard to automate the work of creating your drawing.

In this chapter, you will learn about different types of flowcharts and will create both conventional flowcharts and swimlane diagrams. You will also learn how to add text to Visio flowchart shapes. Finally, you'll learn how to build an organization chart by hand as well as by using the wizard, and how to enhance organization charts with pictures.

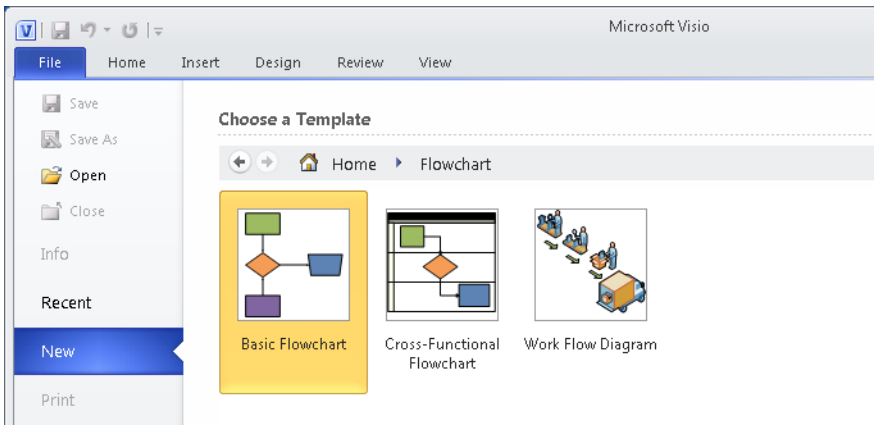
Practice Files Before you can complete the exercises in this chapter, you need to copy the book's practice files to your computer. The practice files you'll use to complete the exercises in this chapter are in the Chapter04 practice files folder. A complete list of practice files is provided in "Using the Practice Files" at the beginning of this book.

Selecting a Flowchart Type

Visio provides different flowchart templates, depending on the edition that you use.

Visio Standard

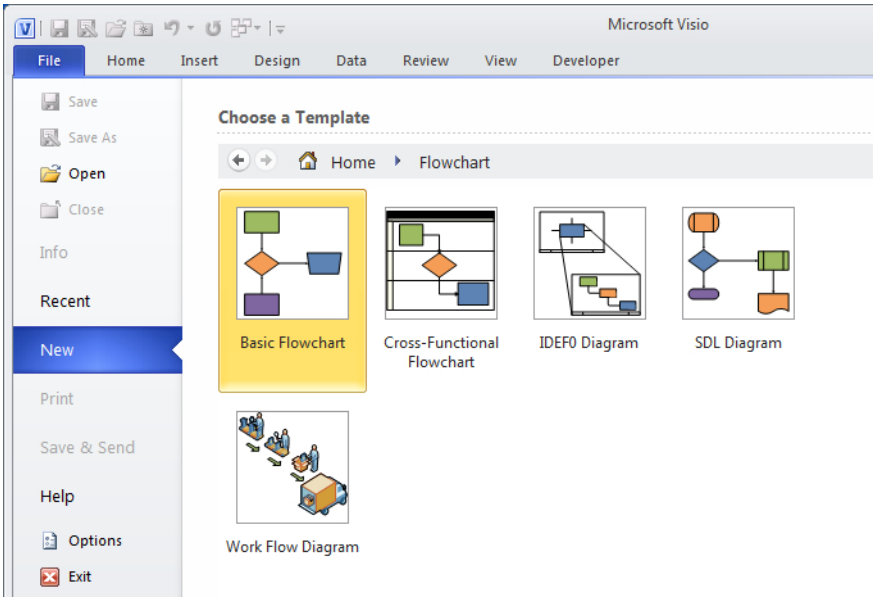
Visio Standard 2010 includes three flowchart templates, as shown in the following graphic. You will work with the Basic Flowchart and Cross-Functional Flowchart templates in this chapter.



Visio Professional

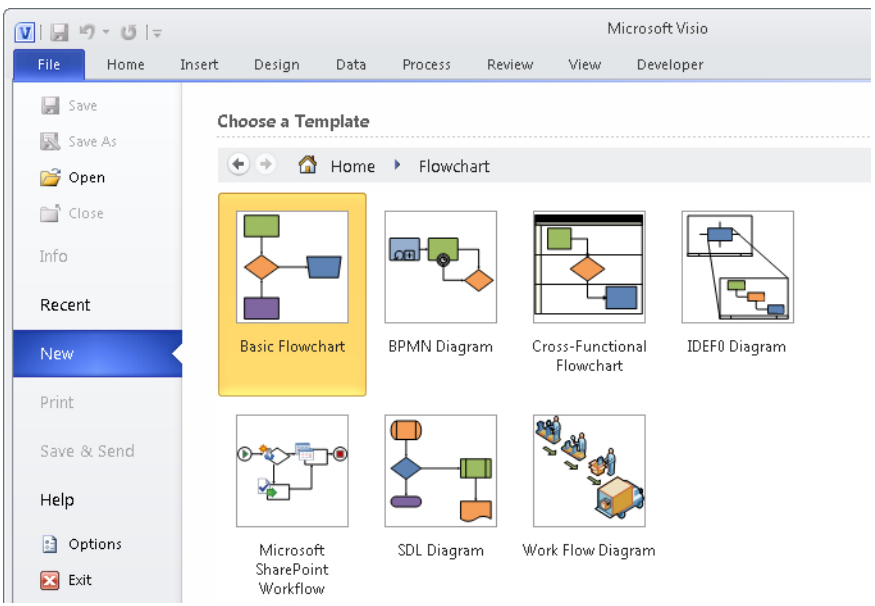
Visio Professional 2010 includes the same three flowcharts as the Standard edition but also includes two additional flowchart templates: IDEF0 and SDL Diagram.

See Also For additional information about IDEF0, go to *en.wikipedia.org/wiki/IDEF0*. For additional information about SDL, go to *en.wikipedia.org/wiki/Specification_and_Description_Language*.



Visio Premium

Visio Premium 2010 adds two workflow templates beyond those available with the Professional edition. You will learn more about the BPMN Diagram and Microsoft SharePoint Workflow templates in Chapter 12, "Creating and Validating Process Diagrams."



Vertical or Horizontal?

Should you draw your flowcharts with vertical (portrait) or horizontal (landscape) orientation? Vertical flowcharts, with tasks arranged from top to bottom, are probably more common, but there have always been advocates for the left-to-right, horizontal view.

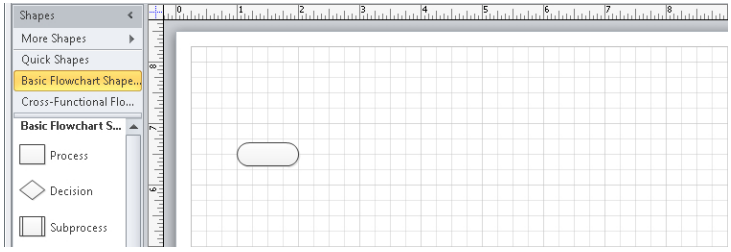
One interesting note if you have created flowcharts with previous versions of Visio: the Visio 2010 Basic Flowchart template defaults to horizontal orientation, whereas previous versions presented a vertical view by default. Although this may frustrate people with a long-standing preference for the portrait view, there is some logic to this choice because computer screens have grown wider over the years.

Creating Flowcharts

In this exercise, you will create a new flowchart for a simple human resources recruiting process. The flowchart will have seven process steps and one decision.

SET UP Start Visio, or if it's already running, click the File tab, and then click New. In the Template Categories section, click Flowchart, and then double-click the Basic Flowchart thumbnail. Save the new drawing as *HR Recruiting Flowchart*.

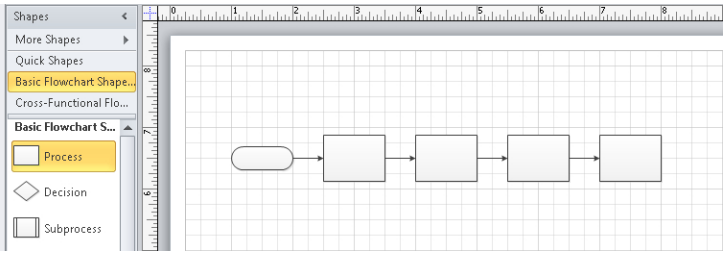
1. Drag a **Start/End** shape from the **Basic Flowchart Shapes** stencil onto the drawing page.



2. Click once on the **Process** shape in the stencil to select it.
3. Point to the start shape you added to the drawing page, and click the right-facing blue triangle that appears in order to add a **Process** shape from the pop-up **Quick Shapes** menu.

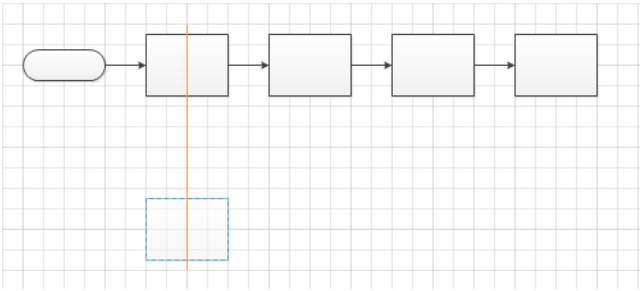
See Also For a refresher on using Quick Shapes, see "Using AutoConnect and Quick Shapes" in Chapter 2, "Creating a New Diagram."

4. Use the same technique to add three more **Process** shapes to the page.

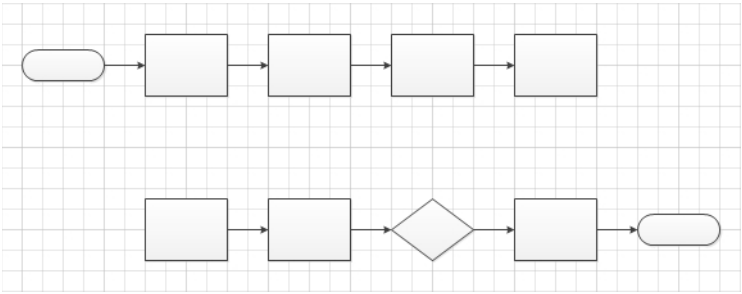


5. Drag a **Process** shape onto the drawing page. Then use the Dynamic Grid to position the new process shape below the left-most process shape.

See Also For more information about the Dynamic Grid in Visio, see "Using Basic Shapes and the Dynamic Grid" in Chapter 2.



6. From the **Quick Shapes** menu, add the following four shapes:
   - Another **Process** shape to the right of the one from Step 5.
   - A **Decision** diamond to the right of the previous process shape.
   - Another **Process** shape to the right of the decision diamond.
   - A **Start/End** shape to the right of the final process shape.



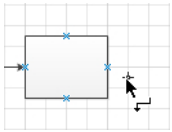
At this point, the flowchart is nearly complete with the exception of two connectors: one that links the end of the first row to the beginning of the second row, and one that links the decision diamond back to a previous step in the flowchart.


Connector

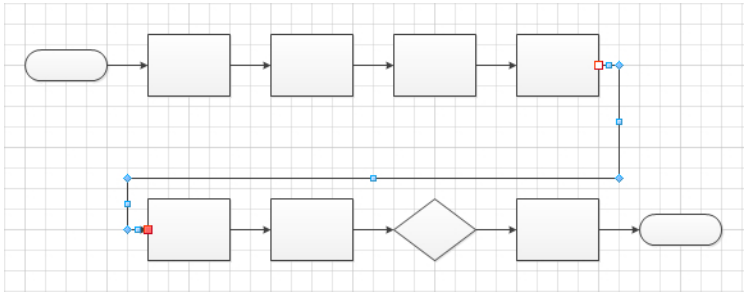
7. On the **Home** tab, in the **Tools** group, click the **Connector** button, and then move the cursor near the last shape in the first row.

   Notice two things:

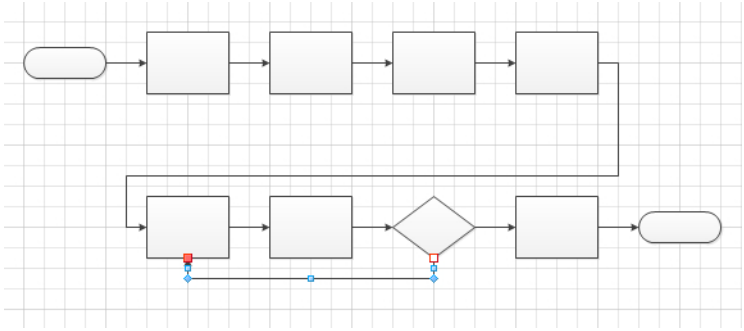
   - The cursor has changed from a white arrow with a black outline (the ***Pointer Tool***) to a black arrow with a connector beneath it (the ***Connector Tool***).
   - When you move the Connector Tool near a shape, small blue Xs, called ***connection points***, appear at various places on the shape.



8. Click the connection point on the right of the process shape, and then drag to the leftmost connection point on the first process shape in the second row.



9. Click the connection point on the bottom of the decision diamond, and then drag to the connection point on the bottom of the process shape two shapes to the left.

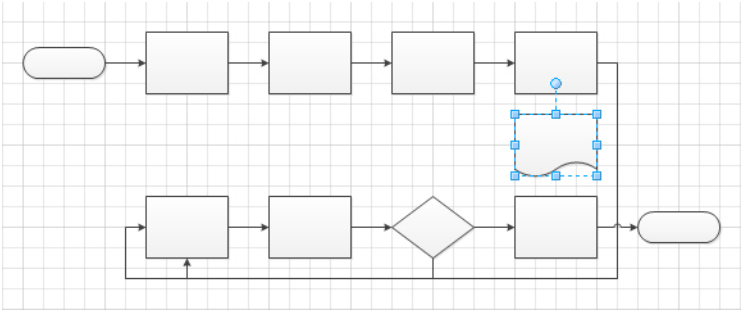



Pointer Tool

10. On the **Home** tab, in the **Tools** group, click the **Pointer Tool** button to return the cursor to its normal operating mode.
11. Drag a **Document** shape to just below the last process shape in the top row.

Important Do not drop the document shape on the connector line or Visio will break the connector in two and connect your document shape to both lines. This feature is called *AutoAdd* and is described in Chapter 2.

Notice that Visio automatically moved the connector line out of the way, which is generally good. However, because the new positioning isn't desirable for your flowchart, you will rearrange some of the shapes in the next step.



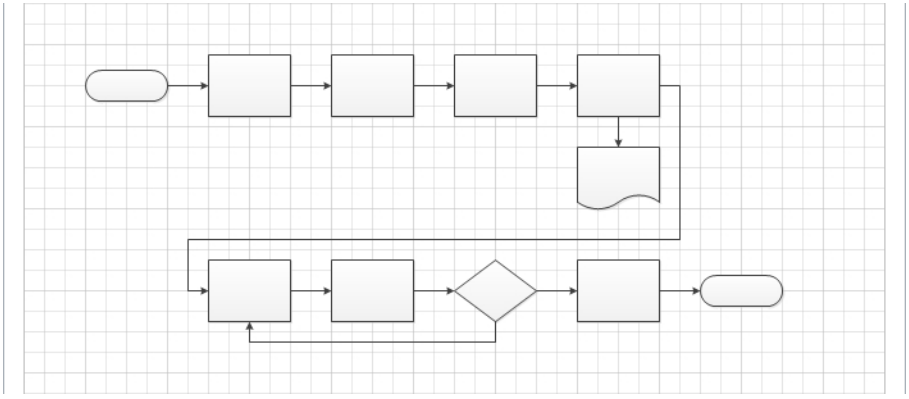
12. Drag a bounding box around all of the shapes in the bottom row. Then hold down the Shift key while you drag that row down to make more room.

Tip Holding down the Shift key constrains Visio to moving the selected shapes only vertically or horizontally, whichever is the first direction you move the cursor.

Once again, Visio will reposition the connector line to accommodate the new location of the bottom row.

13. Click the blue AutoConnect arrow under the upper-right process shape to connect it to the document shape.

The layout of your flowchart is now complete.



CLEAN UP Save your changes to the *HR Recruiting Flowchart* drawing but leave it open if you are continuing with the next exercise.

Adding Labels to Flowcharts

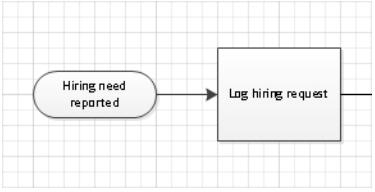
In the preceding exercise, you learned the mechanics of creating a flowchart, but your diagram isn't very useful yet because your shapes have no labels, data, or identifying information.

See Also For information about adding data to your shapes, see Chapter 6, "Entering, Linking to, and Reporting on Data."

In this exercise, you will add text labels to your flowchart shapes.

SET UP If you completed the preceding exercise, continue working with the *HR Recruiting Flowchart* drawing. If not, you need the *HR Recruiting Flowchart_start* drawing located in the Chapter04 practice file folder to complete this exercise. Open the drawing in Visio and save it as *HR Recruiting Flowchart*.

1. Double-click the start shape in the upper-left of your diagram, and then type **Hiring need reported**.
2. Double-click the first process shape in your flowchart, and then type **Log hiring request**.

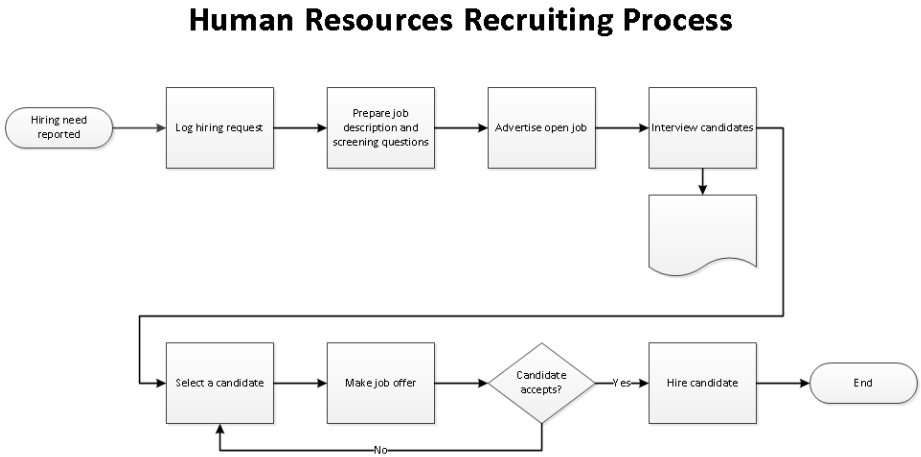


Tip You can also add text to most Visio shapes by clicking once to select the shape and then starting to type. That technique will work with the flowchart shapes.

3. Continue from left to right across the top row and add the following labels to the process shapes:
   - **Prepare job description and screening questions**
   - **Advertise open job**
   - **Interview candidates**
4. Double-click and type the following text into the five shapes in the bottom row, moving from left to right:
   - **Select a candidate**
   - **Make job offer**
   - **Candidate accepts?**
   - **Hire candidate**
   - **End**

5. Double-click the connector between the **Candidate accepts?** shape and the **Hire candidate** shape and type **Yes**.
6. Double-click the connector between the **Candidate accepts?** shape and the **Select a candidate** shape and type **No**.
7. Add a text box to the top of the page and type **Human Resources Recruiting Process** as a title for the flowchart.
8. Select the title text box, and then set the font size to **24 pt.** and make the text bold.

   Your finished flowchart should look something like the following graphic.



CLEAN UP Save your changes to the *HR Recruiting Flowchart* drawing, and then close it.

Understanding Swimlane Diagrams

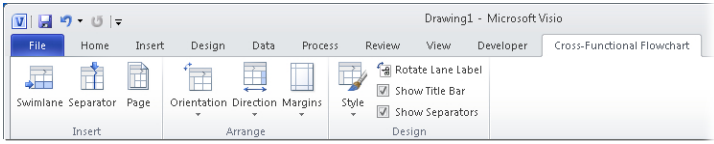
Swimlane diagrams are a popular variation on flowcharts because they correct one significant failing of flowcharts: very few flowcharts show who is responsible for each of the steps or who makes the key decisions.

A swimlane diagram, on the other hand, is specifically organized by role, function, or department. Each process step is placed into a specific lane based on who does the work or who has the responsibility for that process step. For example, a swimlane diagram with a focus on roles might include lanes marked *Accounts Payable Clerk*, *Accounting Supervisor*, and *Chief Financial Officer*. Similarly, a department-focused swimlane drawing might show lanes labeled *Sales*, *Marketing*, *Order Processing*, and *Manufacturing*.

Swimlane diagrams are also known as *cross-functional flowcharts* because they show work steps as they cross the functional boundaries in an organization. In this context, individual swimlanes are usually referred to as ***functional bands***.

Regardless of the terminology, swimlane diagrams can be laid out with horizontal or vertical lanes. Using Visio, you can choose the orientation you prefer, as you'll see in the exercise in the following section.

Tip Some Visio templates employ additional software, outside of Visio itself, to perform their functions. The cross-functional flowchart diagram is an example of this type of Visio add-in. And, as is typical for this type of add-in, cross-functional flowcharts present a custom tab on the ribbon. The ribbon shown in the following graphic includes the Cross-Functional Flowchart tab.



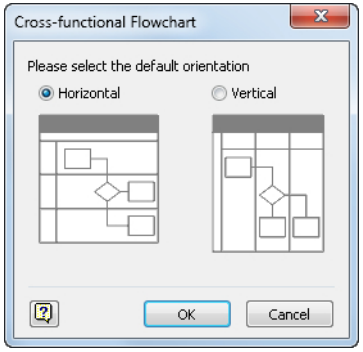
Creating Swimlane Diagrams

In the preceding exercises, you created a flowchart of a human resources recruiting process. However, the flowchart does not indicate who is responsible for each task.

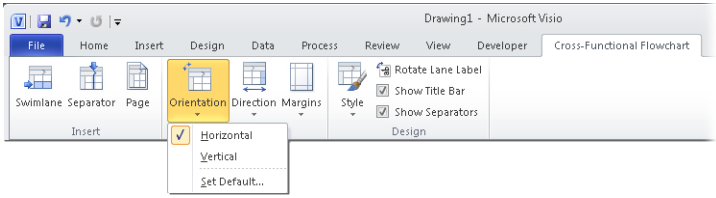
In this exercise, you will create a swimlane diagram of the same process. In doing so, you will organize the work steps into role-based lanes to make responsibilities clear.

SET UP Click the File tab, and then click New.

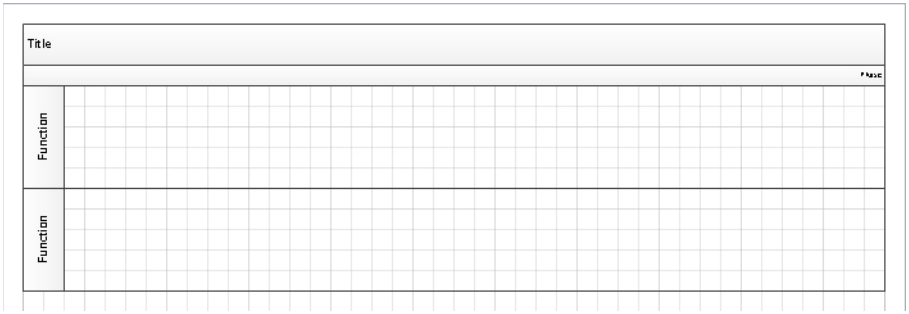
1. In the **Template Categories** section, click **Flowchart**, and then double-click the **Cross-Functional Flowchart** thumbnail. The orientation selection dialog box opens.



Tip If you have previously selected a default orientation, this dialog box will not appear again. However, you can still change both the orientation of a single diagram and the default for future diagrams. On the Cross-Functional Flowchart tab, in the Arrange group, click the Orientation button and make your selection.



2. Click **OK** to select a **Horizontal** layout. The swimlane add-in places a title band and two swimlanes onto the drawing page.




Swim Lane

3. On the **Cross-Functional Flowchart** tab, in the **Insert** group, click the **Swimlane** button twice to add two more lanes to your diagram.

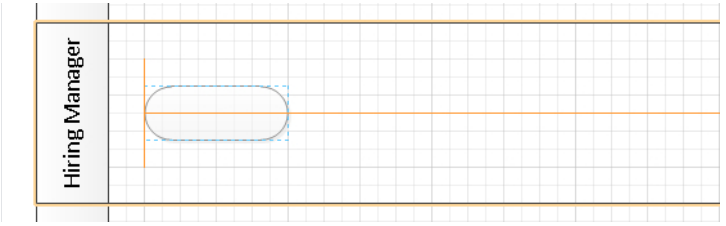
Tip There are three other ways to add swimlanes, each of which is useful at various times:

- Right-click the header of an existing lane, and Visio offers you a choice of adding a new swimlane above or below the one you've selected.
- Drag a Swimlane shape from the stencil and drop it on top of an existing lane.
- Point to the boundary between lanes, with the cursor just outside the swimlane structure, and click the blue insertion triangle. (You will learn about the final method in Chapter 11, "Adding Structure to Your Diagrams.")

You've probably already figured this out, but swimlane diagrams are so named because they resemble a swimming pool viewed from above.

4. Double-click the **Title** bar and type **Human Resources Recruiting Swimlane Diagram**.
5. Double-click the **Function** title bar for the top swimlane and type **Recruiter**.
6. Type **HR Admin** as the title for the second swimlane, **Hiring Manager** for the third swimlane, and **Candidate** for the bottom swimlane.

7. Drag a **Start/End** shape from the **Basic Flowchart Shapes** stencil onto the drawing page and use the Dynamic Grid to position it in the **Hiring Manager** lane.

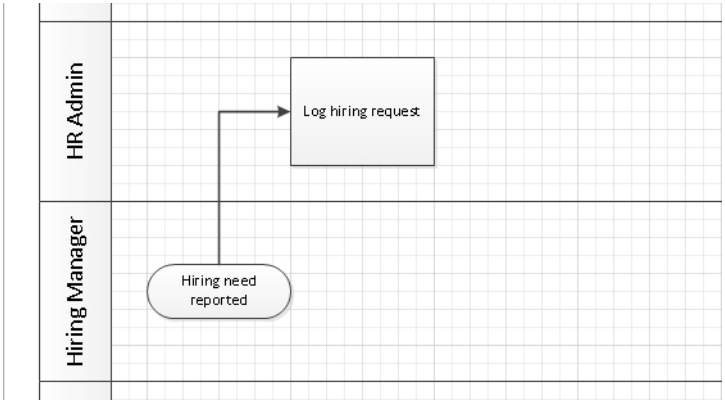


8. Click the start/end shape and type **Hiring need reported**.

9. Drag a **Process** shape into the **HR Admin** lane, dropping it to the right of the start/end shape, and then type **Log hiring request**.

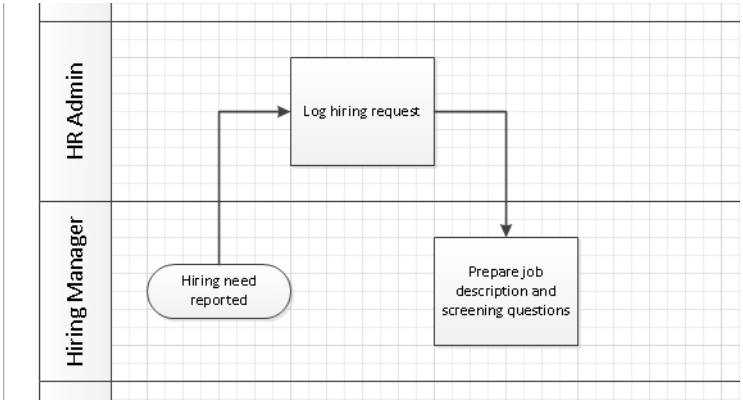

Connector

10. On the **Home** tab, in the **Tools** group, click the **Connector** button, and then draw a connector from the top of the **Hiring need reported** shape to the left side of the **Log hiring request** shape.



11. Drag a **Process** shape into the **Hiring Manager** lane, and then type **Prepare job description and screening questions**.

12. Use the **Connector** tool to link the previous process step to your new task.



13. Continue adding flowchart shapes to your diagram using the information in rows 4-10 of the following table. (Rows 1-3 represent the shapes you've already added.) As you add each shape, draw a connector from the previous row's shape to the new shape.

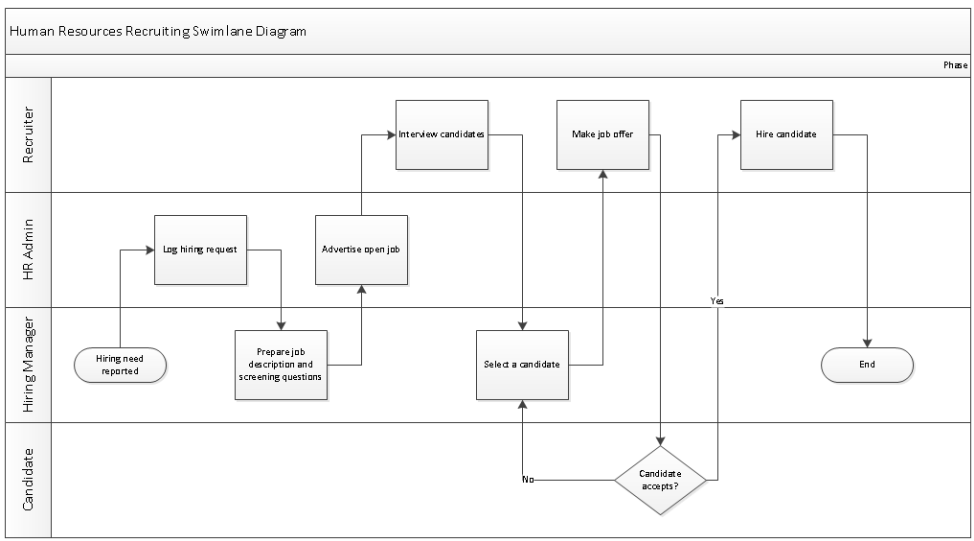
	Shape	Swimlane	Shape text
1	**Start/End**	**Hiring Manager**	**Hiring need reported**
2	**Process**	**HR Admin**	**Log hiring request**
3	**Process**	**Hiring Manager**	**Prepare job description and screening questions**
4	**Process**	**HR Admin**	**Advertise open job**
5	**Process**	**Recruiter**	**Interview candidates**
6	**Process**	**Hiring Manager**	**Select a candidate**

	Shape	Swimlane	Shape text
7	**Process**	**Recruiter**	**Make job offer**
8	**Decision**	**Candidate**	**Candidate accepts?**
9	**Process**	**Recruiter**	**Hire candidate**
10	**Start/End**	**Hiring Manager**	**End**

14. Add a connector from the bottom of the **Candidate accepts?** shape to the bottom of the **Select a candidate** shape.
15. Click the connector from the **Candidate accepts?** shape to the **Hire candidate** shape and type **Yes**.
16. Click the connector from the **Candidate accepts?** shape to the **Select a candidate** shape and type **No**.

Your swimlane diagram should look something like the following graphic. It's unlikely that your drawing will look exactly like this one because you probably made different decisions about placing and connecting shapes. However, after you have the general placement and connectivity correct, you can adjust and tweak your diagram to make it look the way you'd like.

If you think your diagram is too crowded, realize that the cross-functional flowchart template used the default paper size for your region. If you need more space, you can increase the drawing page size as described in Chapter 3, "Adding Sophistication to Your Drawings."



CLEAN UP Save the drawing as *HR Recruiting Swimlane*, and then close it.

One final note about the Visio 2010 take on cross-functional flowcharts: although the end result looks very much as it has in previous versions of Visio, the underlying structure is very different. In fact, structure is the operative word in the previous sentence. In Visio 2010, each swimlane is a ***container***, and the overall framework is a ***list***. Containers and lists are key components of Visio 2010 structured diagrams and are described in Chapter 11.

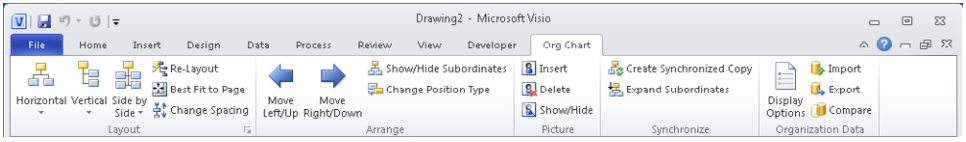
Understanding Organization Charts

An organization chart is typically used to reflect the structure of an organization by showing who reports to whom. The Visio organization chart solution is based on a hierarchical model in which each employee has one boss. Consequently, it doesn't lend itself to organizations that use a matrix or other nonhierarchical structure. However, it is well-suited for most organizations.

Some org charts are simple and unadorned, showing just names and titles. Other org charts are more sophisticated and might display additional departmental or personal information, including photographs. Like most Visio templates, the org chart template includes a set of intelligent shapes. However, the org chart shapes are assisted by add-in software that is packaged with Visio. The combination of the two simplifies the creation of org charts by handling nearly all of the sizing and spacing chores when you do things like drop an employee shape on top of a manager shape. In addition, the add-in software includes a wizard that you can use to import organization data from Microsoft Excel or other data sources.

The org chart add-in also displays an add-in tab on the Visio ribbon whenever an org chart is the active drawing.

See Also For more information about add-in tabs, see "Understanding Add-in Tabs" in Chapter 1, "A Visual Orientation to a Visual Product."



In the sections that follow, you will create a simple org chart manually and a more complex org chart by using data in an Excel workbook.

Building an Organization Chart by Hand

You will use the Organization Chart Wizard in the next two exercises, but it's important to understand first how easy it is to create org charts by hand.

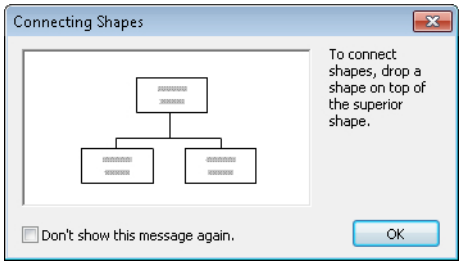
In this exercise, you will create a new org chart by dragging shapes onto the page and using the org chart template's auto-positioning features. You will also enter data for each shape in the chart.

SET UP Click the File tab and then click New. In the Template Categories section, click Business, and then double-click the Organization Chart thumbnail. Save the new drawing as *Org Chart by Hand*.

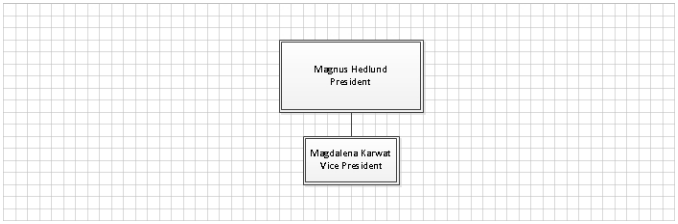
Tip The only difference between the template called Organization Chart and the one called Organization Chart Wizard is that the latter automatically starts a wizard when you open a new document. If you select the Organization Chart Wizard by mistake for this exercise, just cancel the wizard and you can continue.

1. Drag the **Executive** shape from the **Organization Chart Shapes** stencil to the top center of the drawing page.

   The org chart add-in presents an animated dialog box showing how to add additional shapes to the chart unless you have previously turned it off. You can select the check box in the lower-left of the dialog box to suppress future display of the animated help.

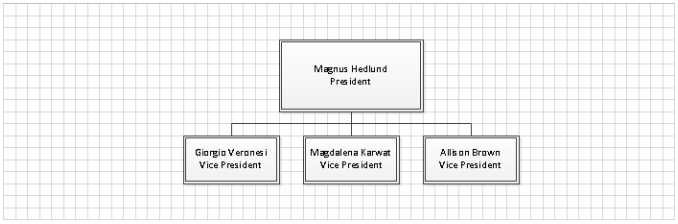


2. With the shape still selected, type **Magnus Hedlund**. Then press Enter and type **President** on the second line.
3. Drag a **Manager** shape onto the **Magnus Hedlund** shape. Then type **Magdalena Karwat**, press Enter, and type **Vice President**. Notice that the org chart software automatically positions the new shape below the *Hedlund* shape.

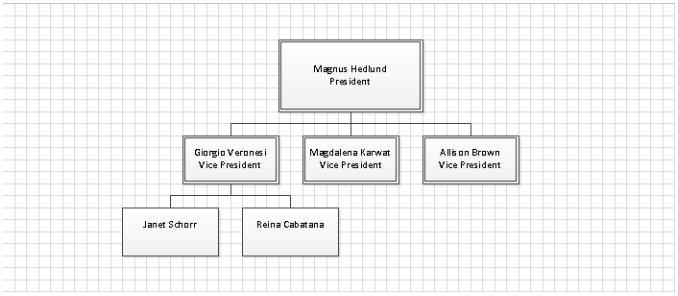


4. Repeat Step 3 and notice that the org chart add-in has positioned the second manager shape to the side of the first one. With the new shape still selected, type **Allison Brown**, press Enter, and then type **Vice President**.

5. Drag one more **Manager** shape onto the **Hedlund** shape. Type **Giorgio Veronesi**, press Enter, and then type **Vice President**.

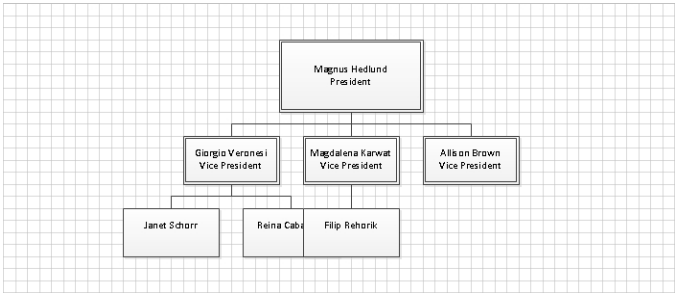


6. Drag two **Position** shapes onto the **Giorgio Veronesi** shape, then type **Janet Schorr** into the first one and **Reina Cabatana** into the second.



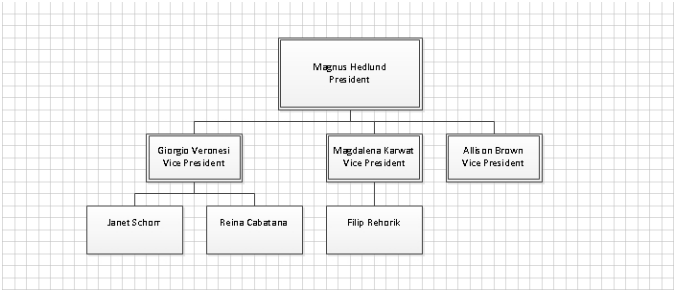
7. Drag one **Position** shape onto the **Magadalena Karwat** shape and type **Filip Rehorik**.

   The org chart's shape placement mechanism has hidden part of the Reina Cabatana shape behind the Filip Rehorik shape.




Re-Layout

8. On the **Org Chart** tab, in the **Layout** group, click the **Re-Layout** button to solve the problem.



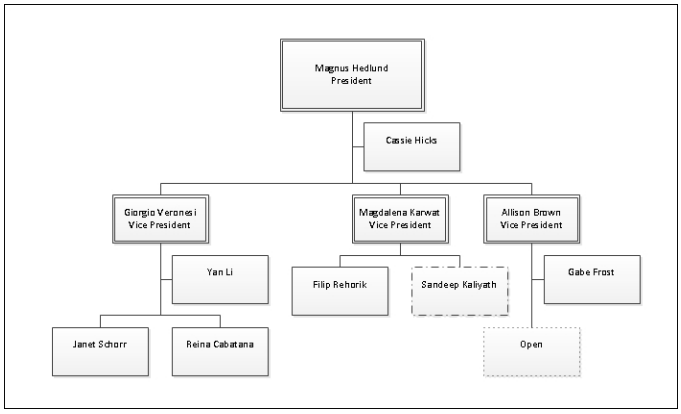
Tip There may be times when you don't like the changes made by the re-layout function. If that's the case, simply press Ctrl+Z or click the Undo button on the *Quick Access Toolbar*. No matter how extensive the changes, a single undo will return the diagram to its previous layout.

9. Drag a **Consultant** shape onto the **Magadalena Karwat** shape and type **Sandeep Kaliyath**. Notice that consultant shapes have a dash-dot outline.
10. Drag a **Vacancy** shape onto the **Allison Brown** shape and type **Open**. Notice that vacancy shapes have a dotted outline.
11. Drag an **Assistant** shape onto the **Allison Brown** shape and type **Gabe Frost**.
12. Drag an **Assistant** shape onto the **Giorgio Veronesi** shape and type **Yan Li**.
13. Drag an **Assistant** shape onto the **Magnus Hedlund** shape and type **Cassie Hicks**.
14. On the **Org Chart** tab, in the **Layout** group, click the **Re-Layout** button.

Tip You can also initiate page layout by right-clicking anywhere on the background of an org chart page and selecting Re-layout from the context menu.

The org chart add-in has rearranged your drawing to position all of your shapes. Take note of the dash-dot consultant, the dotted vacancy, and the placement of the assistant shapes under Magnus Hedlund, Allison Brown, and Giorgio Veronesi.

At this point, you've built a reasonably sophisticated organization chart by doing little more that dragging shapes and typing text.



CLEAN UP Save your changes to the *Org Chart by Hand* drawing, and then close it.

Altering Org Chart Shapes

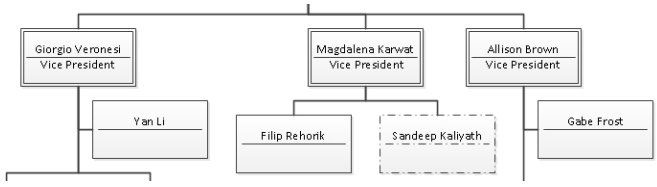
Whether you create an organization chart manually, as you've just done, or automatically using the wizard, you might want to modify the appearance and attributes of the org chart shapes after they're on the page. The Visio organization chart add-in provides a number of easy ways to make changes.

Type

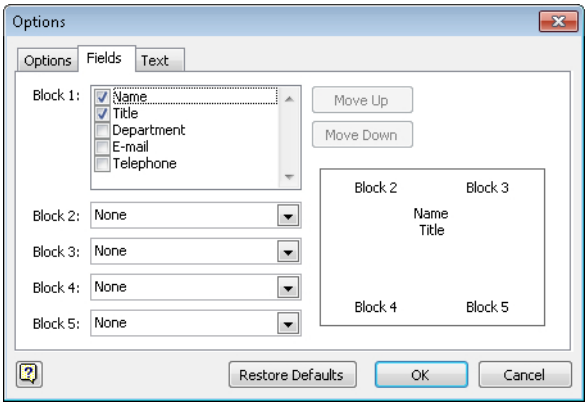
You can right-click any org chart shape to change its type. For example, in the organization chart you created in the preceding exercise, you identified a vacancy in Allison Brown's group, symbolized by a dotted outline around the position box. When Allison hires a person to fill that vacancy, simply right-click the vacant position shape, click Change Position Type, click Position, and then click OK.

Appearance

You can change the appearance of the org chart shapes by adding a dividing line between the position and the title. To do so, select some or all of the shapes on the page, right-click any of the shapes, and then click Show Divider Line.



You can also affect the appearance of org chart shapes by showing additional data on each shape. For examples of what is possible, on the Org Chart tab, in the Organization Data group, click the Display Options button. In the resulting Options dialog box, click the Fields tab to see your choices.



On the other tabs in this dialog box, you can change the size and spacing of org chart shapes and the size and formatting of the text.

See Also You can change the appearance of an organization chart quite dramatically by applying *themes*. For details and examples, see "Applying Themes to Your Diagrams" in Chapter 5, "Adding Style, Color, and Themes."

Using the Organization Chart Wizard with Existing Data

What if you already have your organization data available in electronic form? For example, you might have:

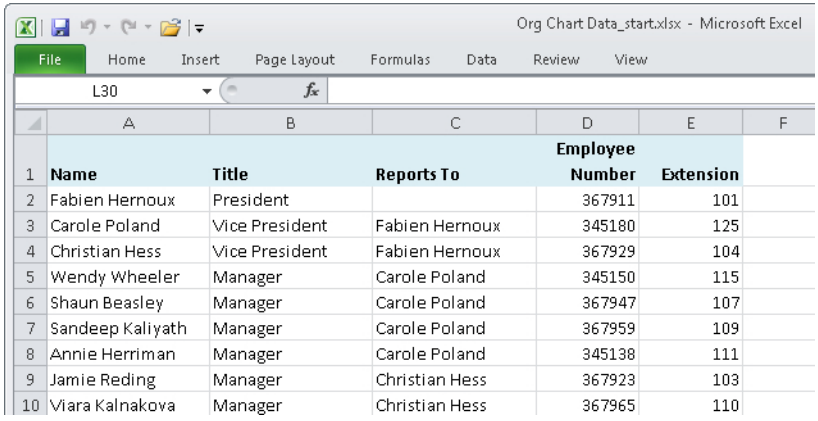
- An Excel workbook that already contains names and reporting information.
- A Human Resources or Enterprise Resource Planning (ERP) system that can generate an Excel file or a text file.
- Organization data in a Microsoft Exchange Server directory.
- Organization data in a Microsoft Access, dBase, or other database.

In all of those situations, the org chart wizard can help you to create your chart.

In this exercise, you will use data in an Excel workbook to build an organization chart.

SET UP You need the *Org Chart Data_start* workbook located in the Chapter04 practice file folder to complete this exercise.

1. Start Excel, open the *Org Chart Data_start* workbook, and save it as *Org Chart Data*. While the workbook is open, look at the data that will be used in this exercise. In particular, notice that there are columns for Name, Title, Reports To, Employee Number, and Extension.

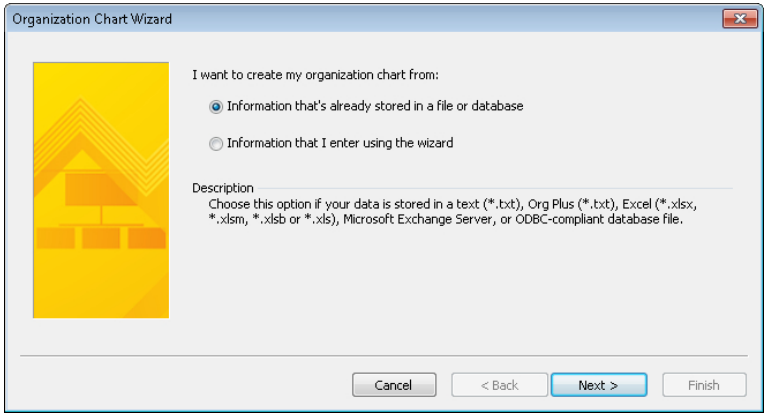


	A	B	C	D	E	F
1	Name	Title	Reports To	Employee Number	Extension	
2	Fabien Hernoux	President		367911	101	
3	Carole Poland	Vice President	Fabien Hernoux	345180	125	
4	Christian Hess	Vice President	Fabien Hernoux	367929	104	
5	Wendy Wheeler	Manager	Carole Poland	345150	115	
6	Shaun Beasley	Manager	Carole Poland	367947	107	
7	Sandeep Kaliyath	Manager	Carole Poland	367959	109	
8	Annie Herriman	Manager	Carole Poland	345138	111	
9	Jamie Reding	Manager	Christian Hess	367923	103	
10	Viara Kalnakova	Manager	Christian Hess	367965	110	

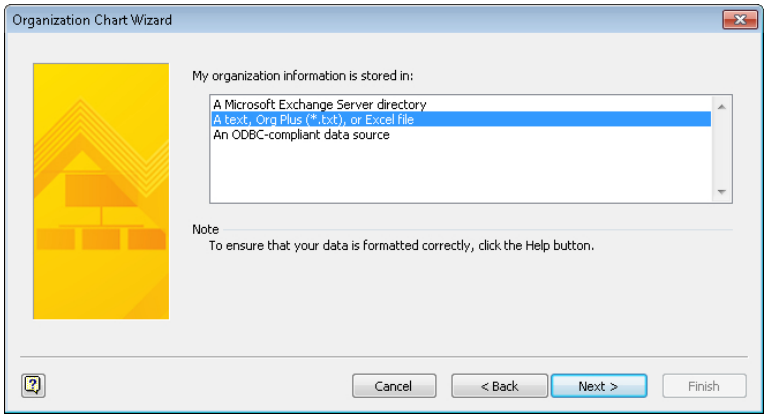
2. Close Excel, and then start Visio.
3. In the **Template Categories** section, click **Business**, and then double-click the **Organization Chart Wizard** thumbnail.

Tip The only difference between the template called Organization Chart Wizard and the one called Organization Chart is that the former automatically starts a wizard when you open a new document. If you select Organization Chart by mistake for this exercise, just click the Import button in the Organization Data group on the Org Chart tab to launch the wizard.

The first page of the wizard appears.



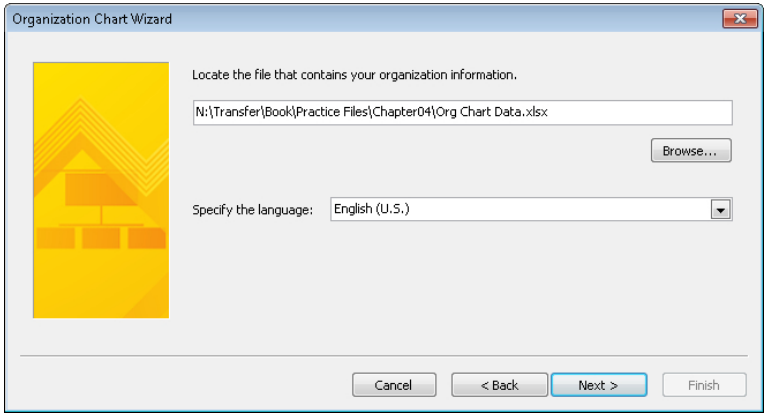
4. Click **Next**. The data source type page appears.



5. Click **A text, Org Plus (*.txt), or Excel file**, and then click **Next**. The file selection page appears.

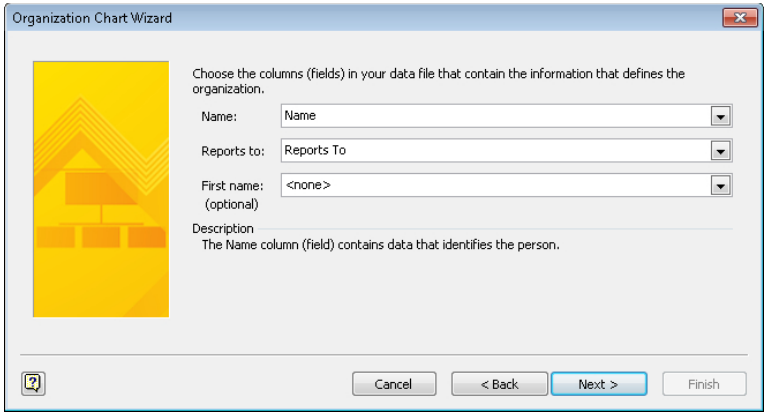
6. Click the **Browse** button on the file selection page, and then, in the resulting file open dialog box, navigate to the *Org Chart Data* workbook. After selecting the correct file, click the **Open** button.

   The file name you selected appears in the Locate The File That Contains Your Organization Information box.



7. Click **Next**. There is a slight pause as Visio opens and reads the data in your spreadsheet.

   The Organization Chart Wizard uses the column names, if any, in your spreadsheet to determine which columns hold the name and reporting structure information. It displays the column names that seem to be the best match in the next wizard page.

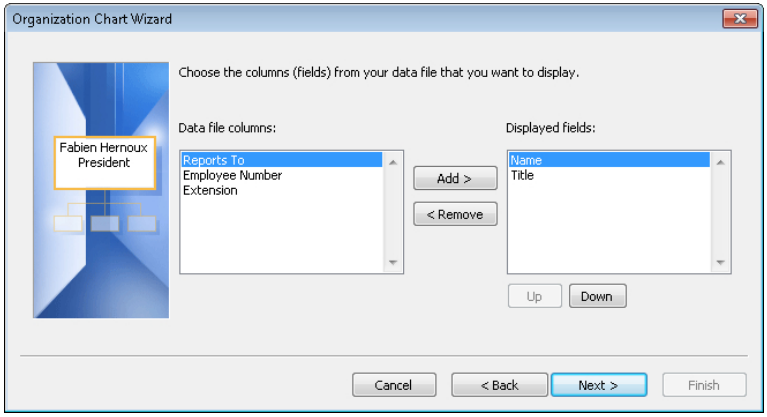


Because the *Org Chart Data* workbook contains columns called *Name* and *Reports To*, the assumptions made by Visio are correct as shown. If the assumptions are not correct, click the arrows to the right of Name and Reports To in order to select the correct columns.

Notice you can specify that a separate column contains employees' first names, if that is the case.

8. Click **Next**.

The next Organization Chart Wizard page provides an opportunity for you to select which employee data will be displayed on each shape in the chart. The wizard assumes that you want to display the name and title fields, so those fields are preselected on the right side of the page.

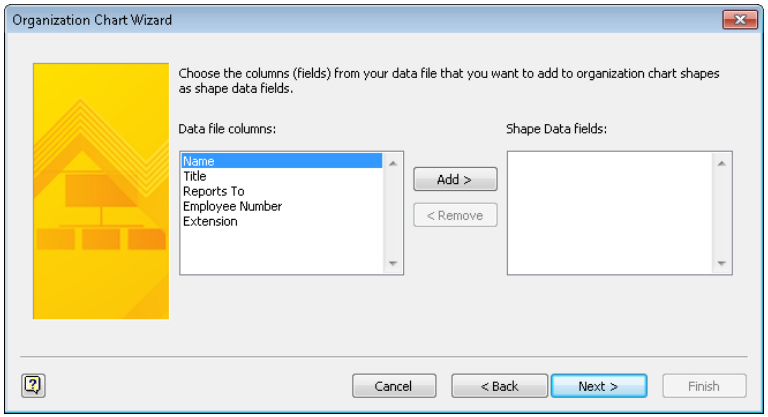


Tip You can control the vertical positioning of the data fields you've chosen with the Up and Down buttons below the Displayed Fields section of the page. The pane on the left side of the page provides a live preview of the data as it will be displayed in the org chart.

9. In the **Data file columns** section of the page, click **Extension**, and then click the **Add** button to move it to the **Displayed fields** section. Finally, click **Next**.

   On the wizard page that appears, you determine which spreadsheet data, if any, should be stored in each organization chart shape. This is a separate and unrelated decision from the one on the previous page. You can still display data on the org chart shapes even if you don't store data in the shapes.

   Tip The primary reason to store data in org chart shapes is to allow you to run reports or use the data in other ways without the need to revert to your original data source.

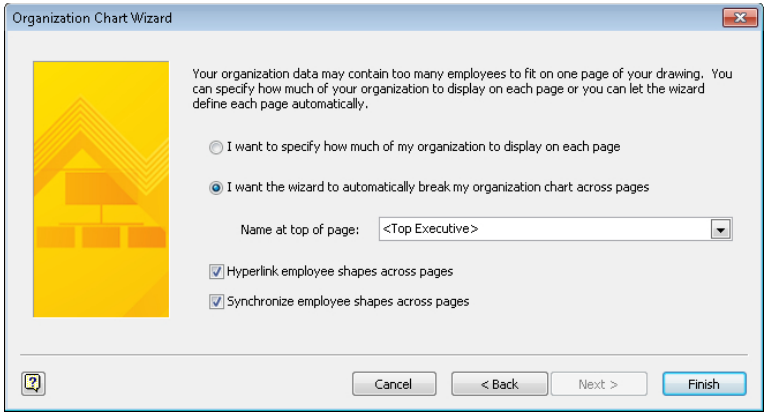


10. To add all fields to the shape, hold down the Shift key while clicking **Extension**, which selects everything in the **Data file columns** section, click **Add**, and then click **Next**.

    Tip You can use the standard Windows conventions for selecting multiple items in the Data File Columns section:

    - Hold down Shift and click to select everything from the current selection up to and including the item you click.
    - Hold down Ctrl and click to select noncontiguous items.

    On the final wizard page, you can choose among some of the Organization Chart Wizard's powerful layout options.



Accepting the default selection of I Want The Wizard To Automatically Break My Organization Chart Across Pages lets the wizard figure out how much to fit on each Visio page. The <Top Executive> option tells Visio to select the person who doesn't report to anyone else as the top shape on the first page of the org chart. If you prefer to select a specific person (like a department head), you can click the arrow to choose anyone in your list.

Clicking I Want To Specify How Much Of My Organization To Display On Each Page takes you to a wizard page not shown here, and allows you to control more directly how much to fit on each org chart page.

The Hyperlink Employee Shapes Across Pages check box specifies whether the wizard should add hyperlinks when org charts consist of multiple pages. For example, if a manager's direct reports don't fit on the page with the manager, the wizard will leave the manager shape on the original page and also place it on a subsequent page along with that manager's direct reports. A check mark in this option tells Visio to add links in both manager shapes, making page-to-page navigation simpler.

The Synchronize Employee Shapes Across Pages check box also applies to the scenario described in the preceding paragraph. A check mark in this option tells Visio to update the second shape if you change the data in the first one.

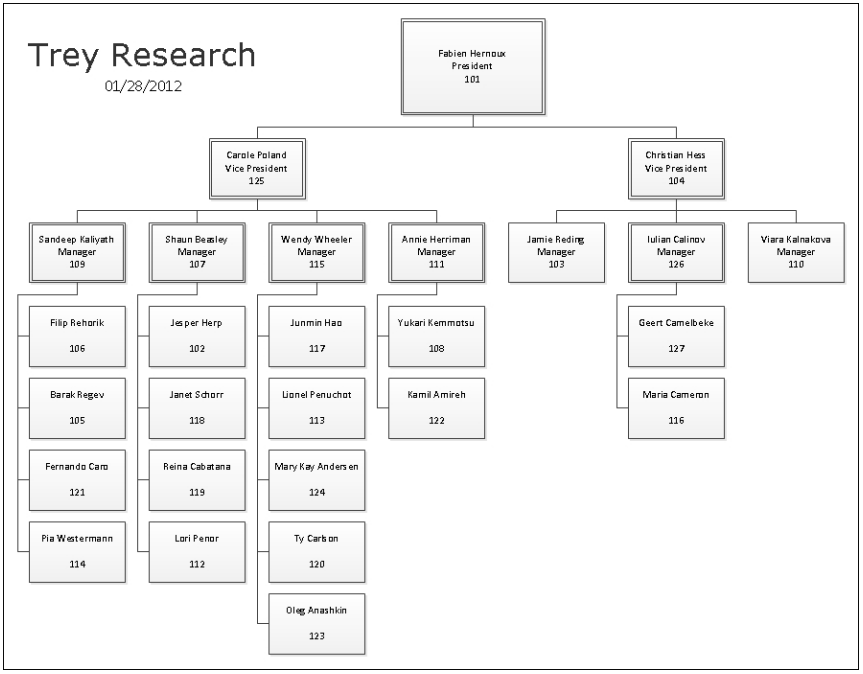
11. Click **Finish**. The completed organization chart appears in the Visio drawing window.

Tip The org chart wizard correctly connects each group of people to its respective boss, but you cannot control where the wizard places people on the page. You can relocate people and groups after the wizard has created the diagram; you just can't control how the wizard does the initial placement.

12. To finalize your organization chart, drag the **Title/Date** shape from the stencil into the upper-left portion of the drawing page.

13. Double-click the **Company Name** text box and replace *Company Name* with **Trey Research**. The resulting organization chart should look like the following graphic.

The wizard has chosen one particular style and layout for your organization chart. However, you can experiment with more than a dozen built-in layouts to change the look of your chart as described in the following sidebar.



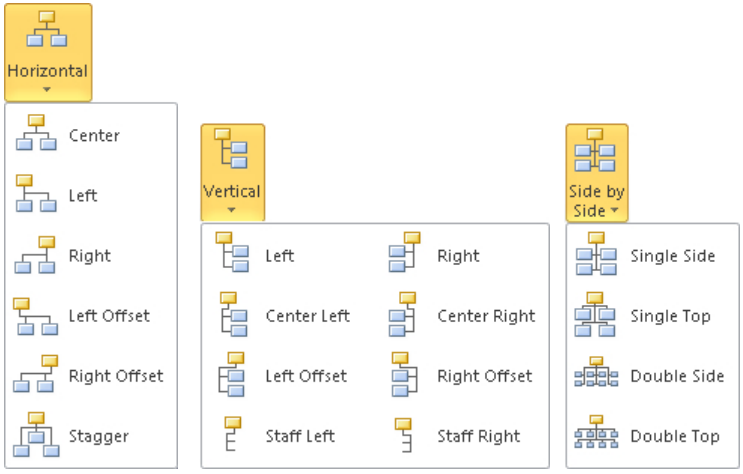
CLEAN UP Save your drawing as *Org Chart using Wizard* and then close it.

Altering Org Chart Layout

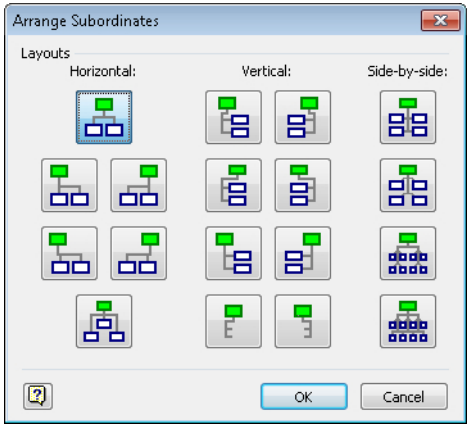
Although the org chart wizard has used a default layout for your chart, you can change the layout, move shapes and groups of shapes, and hide parts of the chart.

Rearrange

You can change the layout of an org chart by using more than a dozen predefined layouts supplied with Visio. On the Org Chart tab, in the Layout group, click Horizontal, Vertical, or Side By Side to select from a variety of options.



As an alternative, right-click any shape with subordinates, and then click Arrange Subordinates. Visio opens a dialog box showing all of the built-in layouts.



Tip If you don't like the results of any re-layout operation—no matter how radical the changes—you can restore the previous layout with a single undo.

Move

You can adjust the layout of an organization chart by moving shapes or groups of shapes left/right or up/down. Look for the Move buttons in the Arrange group on the Org Chart tab. For example, in the completed *Org Chart using Wizard* drawing from the preceding exercise, select the vice president named *Christian Hess*, and then click the Move Left/Up button to see the effect.

Hide

If you want to hide some sections of your org chart, click the Hide Subordinates or Show Subordinates options on a shape's shortcut menu or the Show/Hide Subordinates button in the Arrange group on the Org Chart tab.

Using the Organization Chart Wizard with New Data

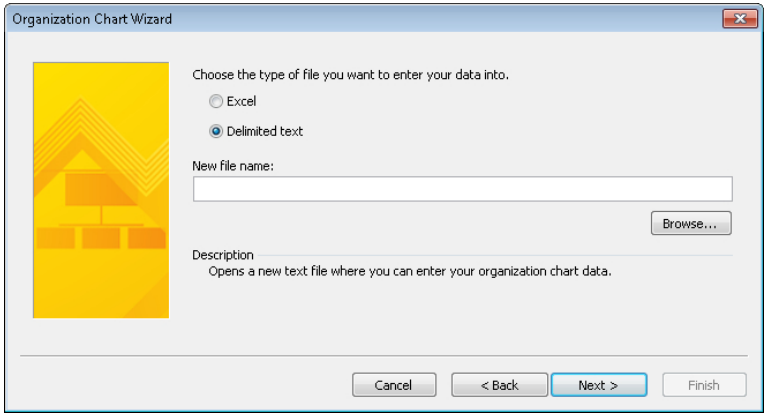
If your organization data is not in a format that Visio can read and you would like to type it into a spreadsheet but don't want to start from scratch, the Organization Chart Wizard can create a preformatted spreadsheet for you.

In this exercise, you will use the Organization Chart Wizard to create an Excel workbook into which you will enter your organization data.

SET UP Click the File tab, and then click New. In the Template Categories section, click Business, and then double-click the Organization Chart Wizard thumbnail.

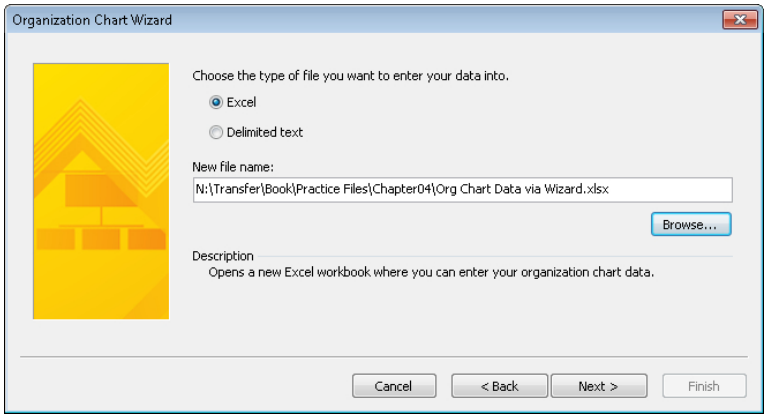
1. On the first page of the **Organization Chart Wizard**, click **Information that I enter using the wizard**.

   Notice that the description text for this option confirms that you will be creating a new data source.

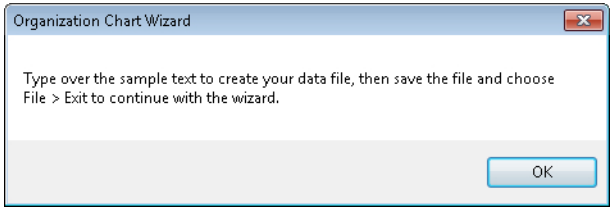


2. Click **Next**. The file type selection page appears.
3. On the file type selection page, click **Excel**, and then click the **Browse** button. In the resulting dialog box, select a folder in which to save the file, type **Org Chart Data via Wizard** in the **File name** box, and then click the **Save** button.

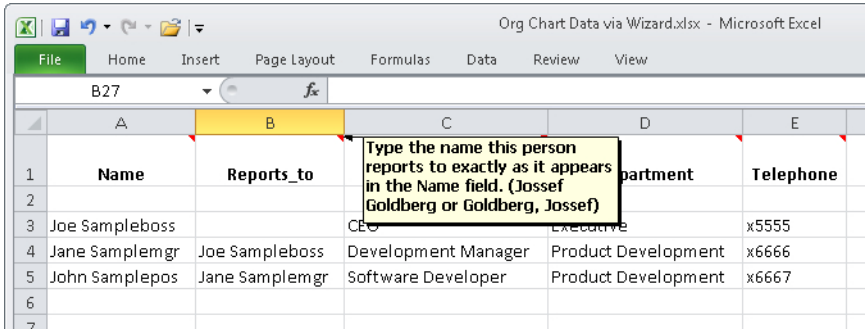
   The selected file name appears in the New File Name box on the next wizard page.



4. Click **Next**. Visio instructs you to type your data over the sample data provided in the Excel workbook it has created.



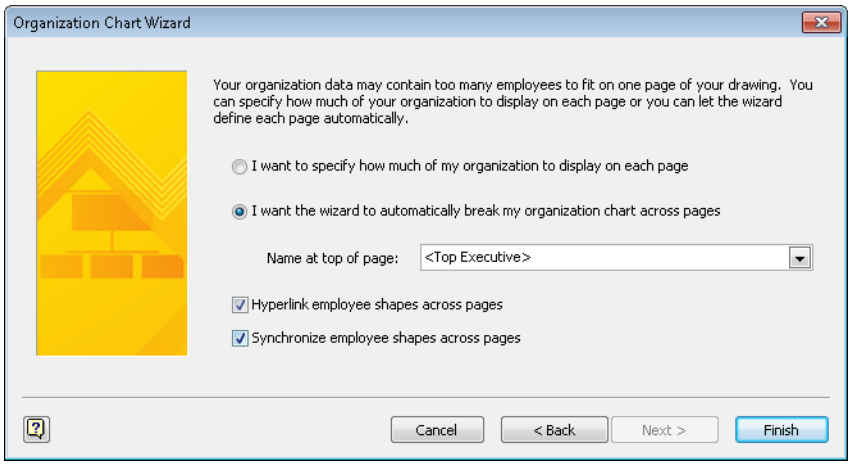
5. Click **OK**. Excel opens to display the formatted workbook. As shown in the following graphic, notice that each column heading includes a comment with instructions for entering data in that column.



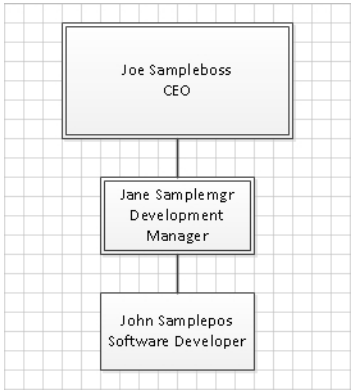
6. Ordinarily, you would type your data into the worksheet at this point; however, for this exercise you will use the sample data, so just close Excel.

   Important Closing the worksheet isn't sufficient; you must close the Excel application.

   When you close Excel, Windows returns the focus to Visio, where you will see the final page of the Organization Chart Wizard.



7. Click **Finish** to display your org chart.



CLEAN UP Save the sample file if you want to keep it.

Enhancing Org Charts with Pictures

Visio 2010, like previous versions, gives you the option to add images to organization chart shapes. You can right-click a shape to add a picture or you can click the buttons in the Picture group on the Org Chart tab.

However, Visio only allows you to add or delete pictures one shape at a time. If you would like to add pictures to multiple shapes at once, check out an article and code sample provided by Visio MVP John Goldsmith at *visualsignals.typepad.co.uk/vislog/2008/06/linking-org-chart-images.html*.

An Unconventional Use for Organization Charts

Occasionally, you find a use for a Visio template that its designers might not have envisioned. The author of this book and another Visio expert did exactly that with the org chart wizard by using it to display the folder structure on a Windows computer. After all, groups of people and folders on a disk drive are both organized hierarchically, so it seemed like a logical thing to do.

See Also To read an article about viewing the Windows disk drive as an "organization chart," go to *www.experts-exchange.com/viewArticle.jsp?articleID=2802*.

Key Points

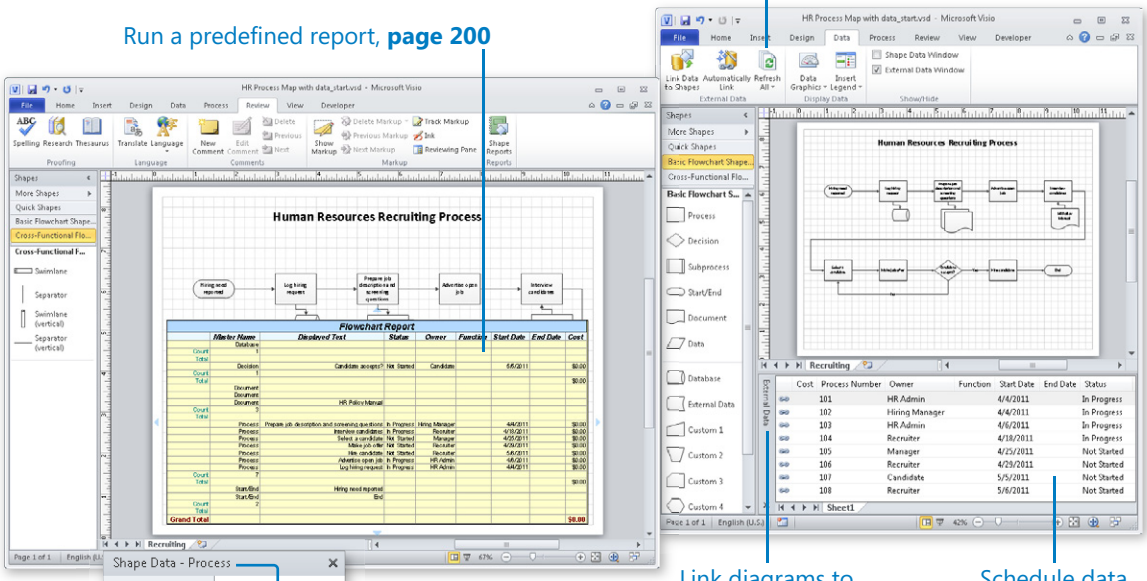
- Creating flowcharts is one of the most common uses for Visio. The built-in templates make it very easy for you to create both conventional flowcharts and swimlane diagrams.
- Swimlane diagrams, also known as cross-functional flowcharts, offer one key advantage over regular flowcharts: each process step resides in a swimlane that identifies which role, department, or function is responsible for that step.
- You can create organization charts manually by dragging shapes from the org chart stencil onto the drawing page.
- The Organization Chart Wizard automates most of the creation of org charts by letting you import data from Excel spreadsheets, text files, and databases. In addition, the wizard can provide you with a preformatted spreadsheet that you can use to enter your organization's data prior to running the wizard.

Chapter at a Glance

Link data to shapes automatically, **page 197**

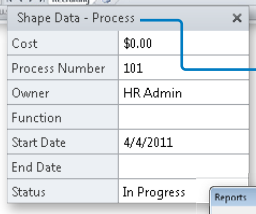
Refresh all or selected linked data in linked diagrams, **page 193**

Run a predefined report, **page 200**



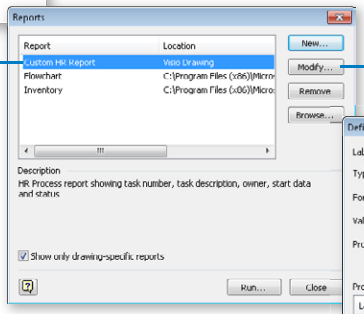
Link diagrams to external data, **page 186**

Schedule data refresh, **page 196**

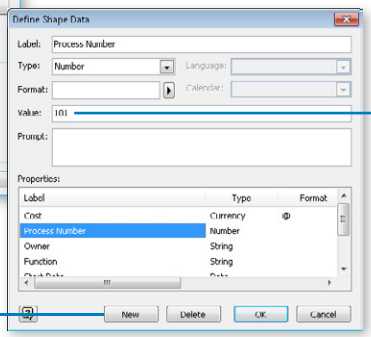


Edit shape data, **page 175**

Create a new report, **page 205**



Modify an existing report, **page 210**



Change shape data attributes, **page 179**

Create new shape data fields, **page 184**

6 Entering, Linking to, and Reporting on Data

In this chapter, you will learn how to

- ✔ Understand shape data.
- ✔ Edit shape data.
- ✔ View and change shape data attributes.
- ✔ Create new shape data fields.
- ✔ Link diagrams to external data.
- ✔ Refresh all or selected data in linked diagrams.
- ✔ Schedule data refresh.
- ✔ Link data to shapes automatically.
- ✔ Run a predefined report.
- ✔ Create a new report.
- ✔ Modify an existing report.

One of the most significant ways you can add value to your Microsoft Visio drawings is to store relevant data in the shapes on the drawing page. Although this capability has been a part of Visio since the beginning, Visio 2010 and Visio 2007 have added a significant level of sophistication to the program's ability to import, store, manipulate, visualize, and report on critical business data.

In this chapter, you will discover ways to make your drawings even more valuable by creating data-driven diagrams. You will learn how to use, create, and edit shape data fields. You will also learn techniques for linking shapes in a Visio drawing to data stored in spreadsheets, databases, and other sources. Finally, you will learn to extract data from a Visio diagram by creating, modifying, and running reports.

Practice Files Before you can complete the exercises in this chapter, you need to copy the book's practice files to your computer. The practice files you'll use to complete the exercises in this chapter are in the Chapter06 practice files folder. A complete list of practice files is provided in "Using the Practice Files" at the beginning of this book.

Understanding Shape Data

Many Visio shapes contain data fields, referred to collectively as ***shape data***, that you can use to quantify and describe various properties of the shape.

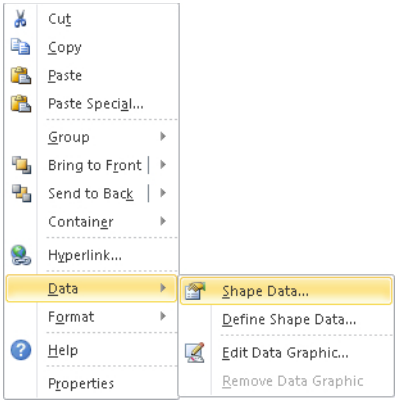
Tip The data fields that are called *shape data* in Visio 2010 and Visio 2007 were called *Custom Properties* in Visio 2003 and earlier.

Visio 2010 supports eight types of shape data:

- **String** Free-form text
- **Number** Any numeric data; can be restricted to integers or a specific number of decimal places
- **Fixed List** A drop-down list from which users can make a selection; users cannot add additional values to the list
- **Variable List** A drop-down list from which users can make a selection; users can add additional values to the list by typing in the text box
- **Duration** Time value expressed in one of five time units supported by Visio: seconds (es.), minutes (em.), hours (eh.), days (ed.), weeks (ew.); users enter a number followed by one of the time unit abbreviations shown
- **Date** Calendar date; users can either type a date or use a drop-down calendar to select a date
- **Currency** Currency value in currency units based on user's Region and Language settings in Windows
- **Boolean** True or False

Viewing Shape Data

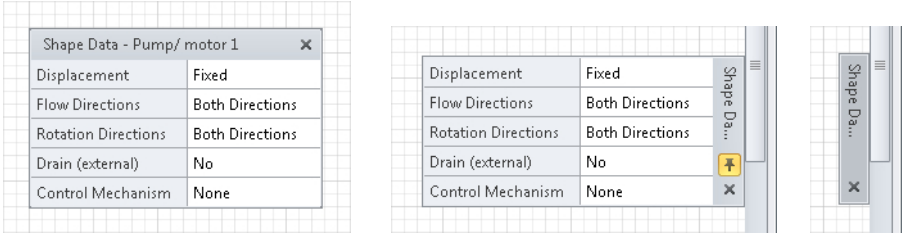
To view the shape data for any Visio object, right-click the shape, and click Data, which displays the data submenu. Then click Shape Data on the submenu.



The Shape Data window typically appears somewhere within the main Visio window, usually in whatever position it was located the last time it was opened. The following graphic shows the data associated with a pump/motor 1 shape from the Fluid Power template in the Engineering template that is provided with Visio.

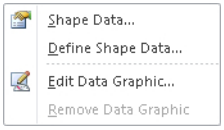
You can position the floating Shape Data window (shown on the left) wherever you would like it. Note that you can also resize the window or dock it in a fixed position by dragging it to an edge of the drawing window (shown in the center).

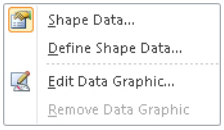
Tip The pushpin button in the docked window lets you turn AutoHide on or off for the docked window. If you turn AutoHide on, the window "rolls up" into the header when you're not using it (shown on right).



Tip If the Shape Data window is already open when you right-click a shape, click Data, and then click Shape Data, Visio will close it. This may not be what you expect, especially if you didn't notice that the window was already open and can't figure out why it didn't appear.

If you look closely at the following two graphics, you'll notice a subtle difference. It turns out that the Shape Data menu entry is actually a toggle that alternately shows and hides the window. In the graphic on the left, the window is closed so the icon to the left of Shape Data looks normal. However, in the one on the right, the icon is highlighted, indicating that the window is open.





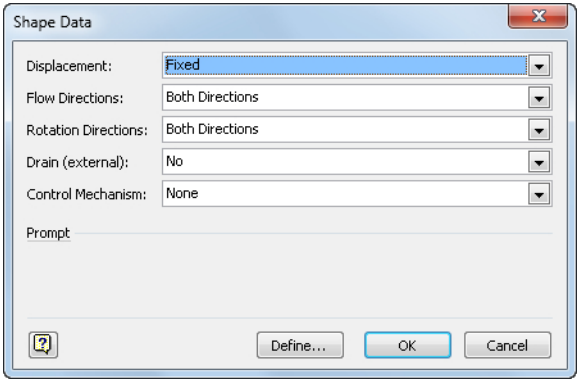
Other Ways to View Shape Data

Because shape data is so vital to Visio diagrams, there are several additional ways to view a shape's data.

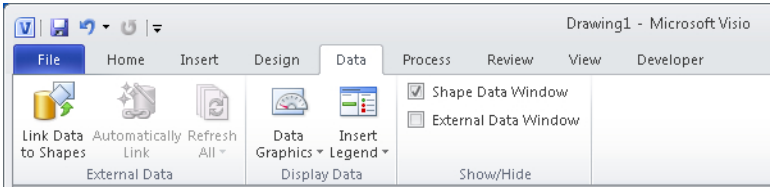
When you right-click some shapes, you can click Properties instead of Data. Although the Properties menu entry usually opens the same Shape Data window as the Data submenu technique, in some Visio templates, it opens a Shape Data dialog box instead. Although their appearance is a bit different, you can edit data in either one.

Tip The Properties entry is usually at the very bottom of the context menu.

For example, compare the following Shape Data dialog box for the Fluid Power pump/motor 1 with the corresponding Shape Data window, shown previously.



You can also open the Shape Data window from the Visio ribbon. On the Data tab, in the Show/Hide group, select the Shape Data Window check box.



Editing Shape Data

After you have the Shape Data window open, you can change a shape's data. As you do so, you'll notice that some shape data fields behave differently than others. Visio enforces various rules based on the data type and formatting applied to each shape data field.

See Also For a list of the shape data types supported by Visio, see "Understanding Shape Data" earlier in this chapter.

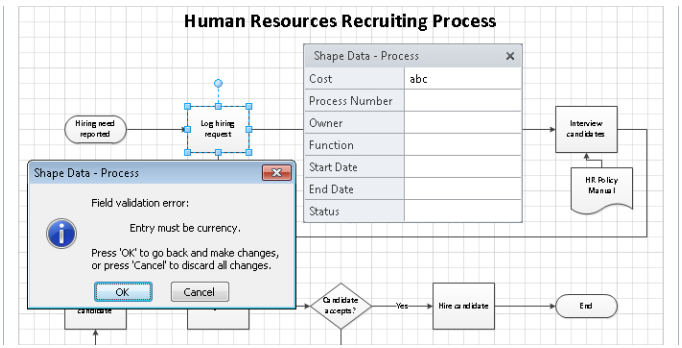
As a simple example, you cannot enter text into a number or currency field. Similarly, Visio prevents you from entering anything other than a number and one of the five valid time unit abbreviations in a duration field.

In this exercise, you will edit some of the data associated with the Human Resources Recruiting Process you worked with in Chapter 4, "Drawing the Real World: Flowcharts and Organization Charts." There are two differences between this map and the one from Chapter 4: the spacing between shapes has been expanded to open up the drawing; and additional shapes have been added to represent a database and several documents.

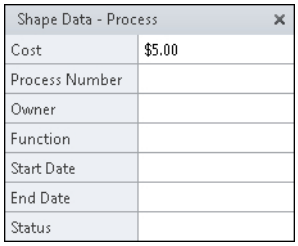
SET UP You need the *HR Process Map_start* drawing located in the Chapter06 practice file folder to complete this exercise. Open the drawing in Visio and save it as *HR Process Map*. Then open the Shape Data window.

1. Click on the shape labeled **Log hiring request**. Its data appears in the Shape Data window.
2. To see an example of data validation based on field type, type **abc** into the **Cost** field, and then press either the Tab or Enter key to move to the next field.

   Visio displays an error dialog box, indicating that your entry is not valid for this field because the Cost field expects a currency entry.

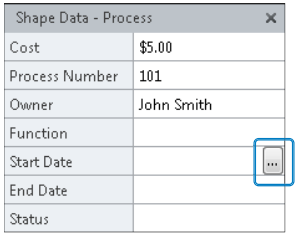


3. Click **OK** to close the error dialog box.
4. Type **5** and then press either the Tab or Enter key to move to the next field.



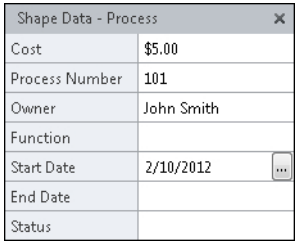
Tip Because the copy of Windows on which these graphics were made uses United States Region and Language settings, the currency amount appears in dollars. Your computer will display currency values based on your regional settings.

5. Type **101** in the **Process Number** field.
6. Press either the Tab or Enter key to move to the **Owner** field, and then type **John Smith**.
7. Click in the **Start Date** field. Notice that a browse button appears in the right end of the field.



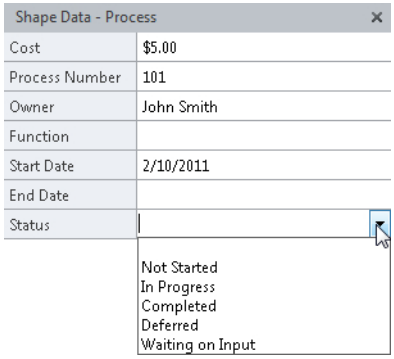
Tip In a Visio date field, you can either type a date or use the calendar field browse button to select a date.

8. Click the calendar field browse button and click a date in the pop-up calendar. The calendar closes and the selected date appears in the Shape Data window.



9. Click in the **Status** field. Notice that a down-arrow appears in the right end of the field. This is an example of a Visio list field.

10. Click the arrow to reveal the predefined choices for this list.



11. Click **In Progress** in the list.

Tip Visio supports two types of list fields: *fixed lists* and *variable lists*. In a fixed list field, you must select an entry from the list. In a variable list field, you have the option to select one of the list entries, or you can type your own text into the field if you prefer. If you type your own text, it gets added to the bottom of the list. The Status field in the preceding graphic is an example of a variable list field, so you can either select or type an entry in the field.

You can continue to enter or edit data for this process step, or you can select a different shape and edit its data.

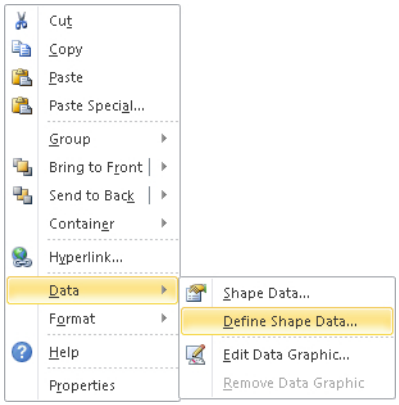
CLEAN UP Save your changes to the *HR Process Map* drawing but leave it open if you are continuing with the next exercise.

Tip Though it is not advertised in any obvious way, you can edit data for more than one shape at a time. If you select multiple shapes before opening the Shape Data window, the changes you make will be applied to *all* selected shapes. This feature can be very powerful or very destructive, so it pays to be cautious.

Note that if you do select multiple shapes prior to opening the Shape Data window, you will only see the fields that all selected shapes have in common.

Viewing Shape Data Attributes

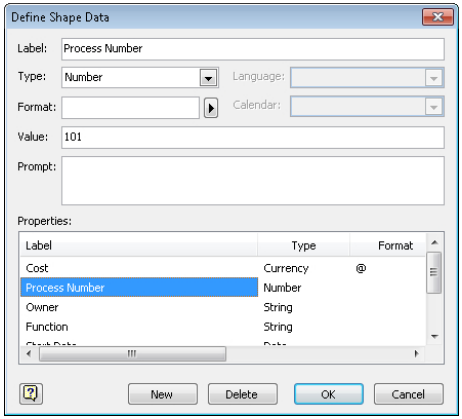
When you want to add data fields to a Visio shape, you need to open the Define Shape Data dialog box. To do so, right-click a shape, point to Data, and then click Define Shape Data.

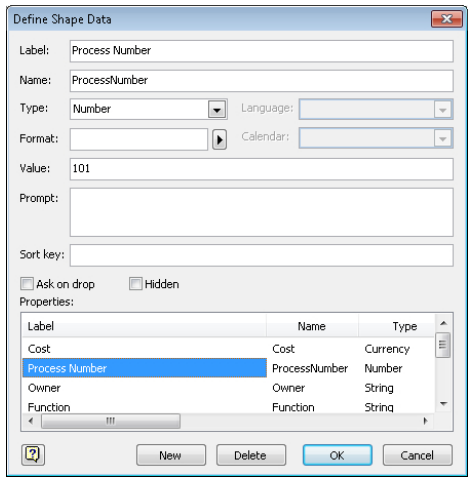


Tip You can also open the Define Shape Data dialog box by right-clicking anywhere in the Shape Data window and then clicking Define Shape Data.

The Define Shape Data dialog box looks like one of the following two samples. The one on the left appears for most Visio users. The one on the right appears if you are running Visio in developer mode, and offers several additional options.

See Also For information about developer mode, see the Appendix.





In both variations of the dialog box, notice that each data field has multiple attributes:

- **Label** Field name
- **Type** One of the eight types described in "Understanding Shape Data" earlier in the chapter
- **Format** Determines how data entered by the user will be presented; different field types have different format options

- **Value** The data value entered when a shape was defined or entered by the user
- **Prompt** Tooltip text that appears when the user points to the shape's name in the Shape Data window

In developer mode, you will see the additional attributes described in the following list. Although some of them are primarily for use by programmers, one or two may be of value even if you are not a programmer:

- **Name** An internal name used by Visio programmers; can be the same as Label except that Name cannot contain spaces or most special characters (an underscore character is OK).
- **Sort key** Visio uses the alphanumeric value in this field to determine the sequence in which fields will be presented in the Shape Data window.

  Important Visio treats the contents of the Sort key field as text even if you enter a number, which means that it arranges fields based on alphabetic sequence rather than numeric sequence. For example, if field A has a sort key of "1", field B has a sort key of "2", and field C has a sort key value of "10", Visio will place them in the Shape Data window in the sequence A, C, B, because the first character "1" in field C is less than the "2" in field B.
- **Add on drop** If selected, Visio opens the Shape Data dialog box whenever the user drops a shape containing this field onto a page.
- **Hidden** If selected, Visio hides this field; that is, the field does not appear in either the Shape Data window or Shape Data dialog box. Fields like this are often used by programmers to hold intermediate calculations or results that the user does not need to see.

Tip The shape data exercises that follow all use the regular Define Shape Data dialog box and not the developer version.

Although it is not advertised in any obvious way, you can create, edit, or delete shape data fields for more than one shape at a time. If you select multiple shapes before opening the Define Shape Data window, the changes you make will be applied to *all* selected shapes. This feature can be very powerful or very destructive, so it pays to be cautious.

Changing Shape Data Attributes

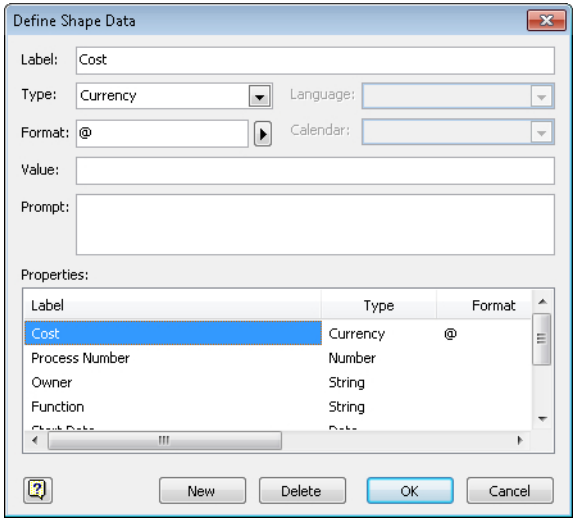
In previous sections of this chapter, you edited shape data and learned about the attributes that comprise each shape data field. In order to appreciate just how flexible and powerful the data features of Visio really are, it's helpful to do two more things: change the attributes of several existing data fields (this exercise), and create new data fields (the following exercise).

In this exercise, you will explore and change the attributes of the data fields in one of the process shapes in the Human Resources Recruiting Process map.

SET UP You need the *HR Process Map* drawing for this exercise. Either continue with the open copy from the previous exercise or open the *HR Process Map_start* drawing located in the Chapter06 practice file folder and save it as *HR Process Map*. Open the Shape Data window.

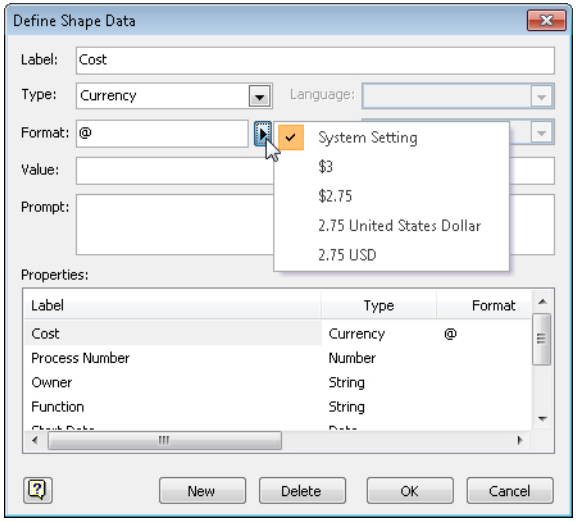
1. Click on the **Advertise open job** shape to view its shape data. Spend a moment looking at the names of the data fields for this shape.
2. Right-click in the **Shape Data** window, and then click **Define Shape Data**.

   Visio displays the attributes of the first data field, *Cost*. Notice that the Label field displays *Cost*, which is the label that appears in the Shape Data window. Notice, also, that the Type field is set to *Currency*.



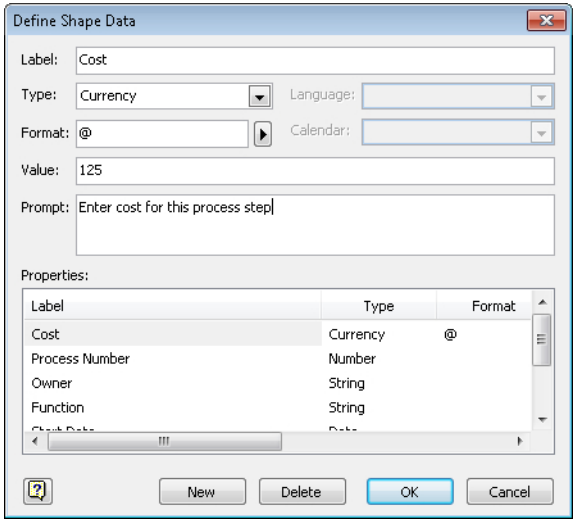
3. Click the right-facing arrow next to the **Format** field.

   Visio provides a list of alternate formats in which the currency value can be displayed. (The list you see depends on the Region and Language settings for your copy of Windows.) It usually makes sense to leave the format set to *System Setting*, especially if your diagram will be opened in countries that use other currencies than the one you use.



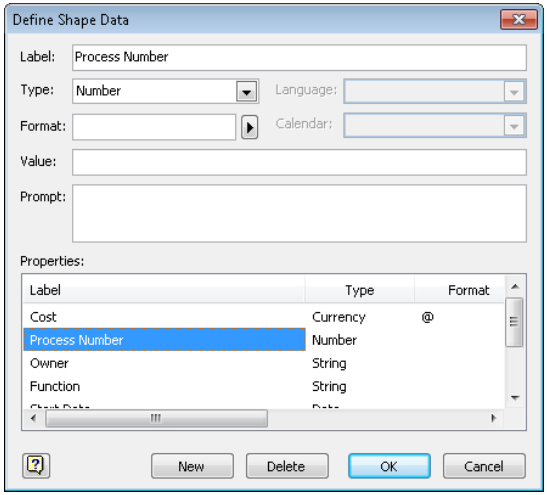
4. Click in the **Value** field and then type **125**. This value will appear as the default value for the Cost field the next time you open the Shape Data window for this shape. You can still change the value via the Shape Data window, but this provides a way for you to specify default values.

5. Type **Enter cost for this process step** into the **Prompt** field. These words will appear as a tooltip for this field later in this exercise.

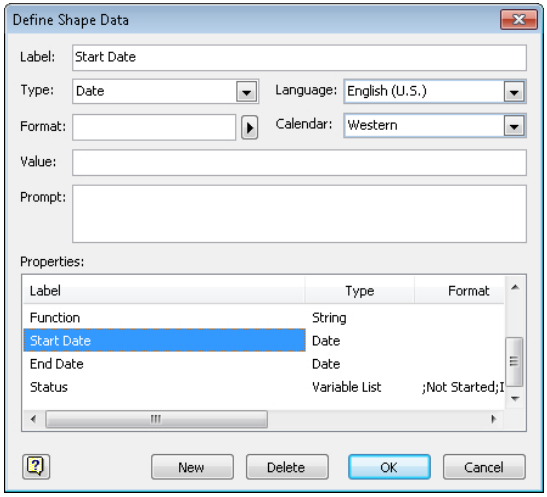


6. In the **Properties** section of the dialog box, click **Process Number**. Visio displays the attributes of this field in the upper half of the dialog box.

   Note that this is a *Number*-type field.



7. Click the arrow next to the **Format** field to explore the various formatting options Visio provides for numeric data.
8. Click **Owner** in the **Properties** section of the dialog box. Note that the Language field is now enabled, allowing you to specify the preferred language for this text field.
9. Click the arrow next to the **Format** field to explore the various formatting options Visio provides for text data.
10. Click **Start Date** in the **Properties** section of the dialog box. Note that this field has a Date type and that the Language and Calendar attributes are now enabled. These two settings allow you to change properties that affect the presentation of the date.



11. Click the arrow next to the **Format** field to explore the various formatting options Visio provides for date fields.

12. Click **Status** in the **Properties** section of the dialog box. Note that Status is a Variable List-type field.

    The Format field is used quite differently for Variable and Fixed List fields than for the other field types you've explored thus far. For list fields, Format holds a semicolon-separated list of values that will appear in the drop-down list in the Shape Data window.

    In the case of the Status field, the Format field holds the following string of characters:

    ;Not Started;In Progress;Completed;Deferred;Waiting on Input

    Important The semicolon at the very beginning of the list causes a null (blank) entry to appear at the top of the list. If you do not include a null entry, the user will not be able to leave the field blank after he or she has clicked something in the list. Both options may be appropriate in different situations: in some cases, a blank entry is not acceptable, so you want to force the user to select an entry from the list; in other cases, a blank entry is fine.

13. Type **;Waiting Manager Approval** at the end of the character string in the **Format** field.

    Important List entries are delimited by semicolons (";"). Be sure to type the semicolon before *Waiting Manager Approval* so that the new text becomes a separate entry in the list.

14. Type **In Progress** in the **Value** field.

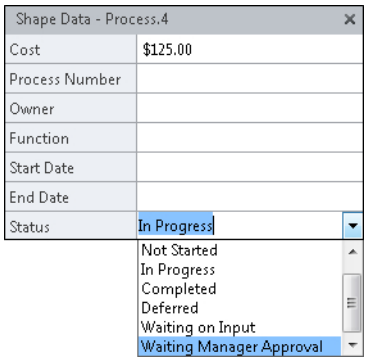
    Tip If you want a value from the list to appear as the default for this field whenever the Shape Data window is opened, type it in the Value field. Be sure that the entry you type exactly matches a list item in the Format field, including upper and lower case letters.

15. Click **OK**.

    The Shape Data window reflects the changes you made to the fields: there is a default dollar amount in the Cost field and the Status is preset to *In Progress*.

Shape Data - Process.4	
Cost	$125.00
Process Number	
Owner	
Function	
Start Date	
End Date	
Status	In Progress

16. Point to the label for the **Cost** field. *Enter cost for this process step* appears as tooltip text because you typed it in the Prompt field in Step 5 of this procedure.
17. Click in the **Status** field and then click its arrow to display the list. Note that Waiting Manager Approval appears at the end of the list.



CLEAN UP Save your changes to the *HR Process Map* drawing, but leave it open if you are continuing with the next exercise.

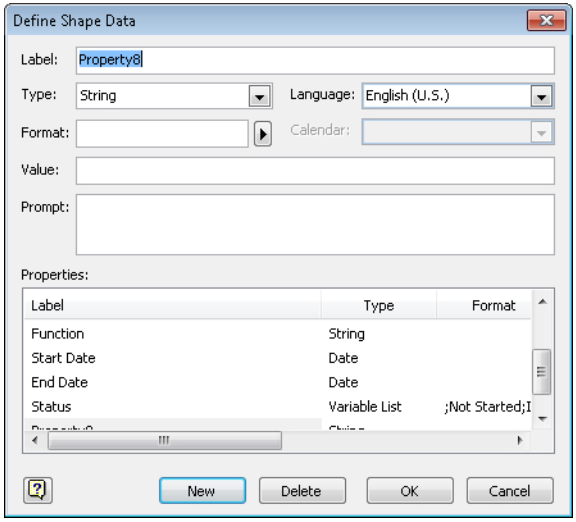
Creating New Shape Data Fields

Now that you have successfully modified data fields for Visio shapes, you are ready to create a new shape data field.

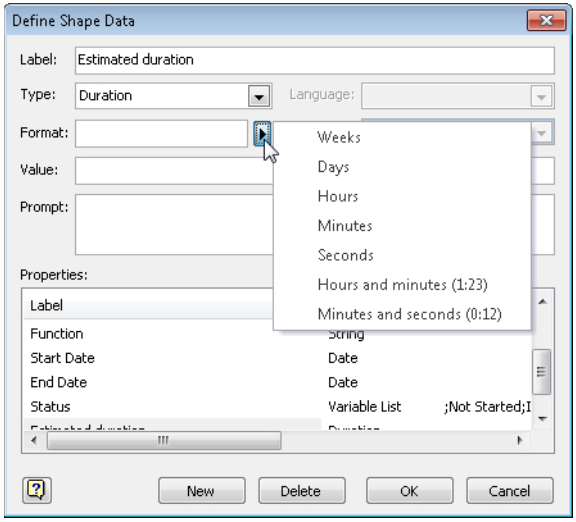
In this exercise, you will add a new field to a shape that already contains other data fields.

SET UP You need the *HR Process Map* drawing for this exercise. Either continue with the open copy from the previous exercise or open the *HR Process Map_start* drawing located in the Chapter06 practice file folder and save it as *HR Process Map*. Open the Shape Data window.

1. Click the **Advertise open job** shape to view its shape data.
2. Right-click anywhere in the **Shape Data** window, and then click **Define Shape Data**.
3. Click the **New** button at the bottom of the **Define Shape Data** dialog box. The focus shifts to the Label field, allowing you to type a label for this field.



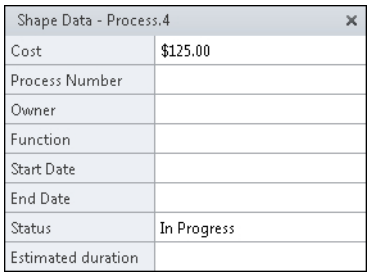
4. Type **Estimated duration**.
5. Click the down arrow to the right of **Type**, and then click **Duration**.
6. Click the right arrow next to **Format**.



7. Click **Days**.

Tip You can set the format for a duration field to display the time in any of the standard Visio durations, ranging from seconds to weeks, or you can display the duration in one of the two listed time formats.

8. Click **OK** to close the **Define Shape Data** dialog box and return to the **Shape Data** window. Note that the field you created has been added to the bottom of the window.



CLEAN UP Save your changes to the *HR Process Map* drawing, and then close it.

Tip In a similar manner that was described at the end of the section titled "Editing Shape Data" earlier in this chapter, you can add, edit, or delete data fields for more than one shape at a time. To do so, select multiple shapes before opening the Define Shape Data dialog box.

If you select multiple shapes prior to opening the Shape Data window, you will see only the fields that all selected shapes have in common.

Linking Diagrams to External Data

Important The information in this section applies only to the Professional and Premium editions of Visio 2010.

Earlier in this chapter, you learned how to add and edit shape data fields. It's convenient to be able to do so manually, but it's also easy to imagine situations in which you would like to populate your drawings with data from a spreadsheet or database or other external source.

Prior to Visio 2007, it was possible to link Visio shapes to external data, but it was rather cryptic, somewhat confusing, and the procedures often required programming or at least some technical knowledge.

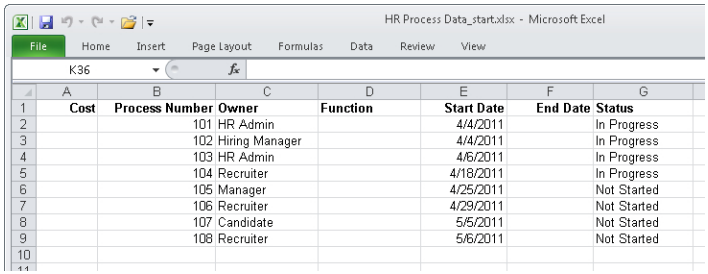
Visio 2007 Professional changed that, and both the Professional and Premium editions of Visio 2010 include the same ***data linking*** facility. In general, there are two steps involved in data linking:

1. Link the drawing to a data source.
2. Link the data to individual shapes.

In this exercise, you will link the process steps in the *Human Resources Process Map* drawing to data in an Excel spreadsheet.

SET UP You need the *HR Process Map_start* drawing and the *HR Process Data_start* workbook located in the Chapter06 practice file folder to complete this exercise. Open the drawing in Visio and save it as *HR Process Map with data*. Then open the *HR Process Data_start* workbook and save it as *HR Process Data*.

1. In the Excel workbook, examine the data it contains. In particular, notice the column headings.



	A	B	C	D	E	F	G
1	Cost	Process Number	Owner	Function	Start Date	End Date	Status
2		101	HR Admin		4/4/2011		In Progress
3		102	Hiring Manager		4/4/2011		In Progress
4		103	HR Admin		4/6/2011		In Progress
5		104	Recruiter		4/18/2011		In Progress
6		105	Manager		4/25/2011		Not Started
7		106	Recruiter		4/29/2011		Not Started
8		107	Candidate		5/5/2011		Not Started
9		108	Recruiter		5/6/2011		Not Started
10							


Data Graphics

2. In Visio, on the **Data** tab, in the **Display Data** group, click the **Data Graphics** button, and then clear the **Apply after Linking Data to Shapes** check box.

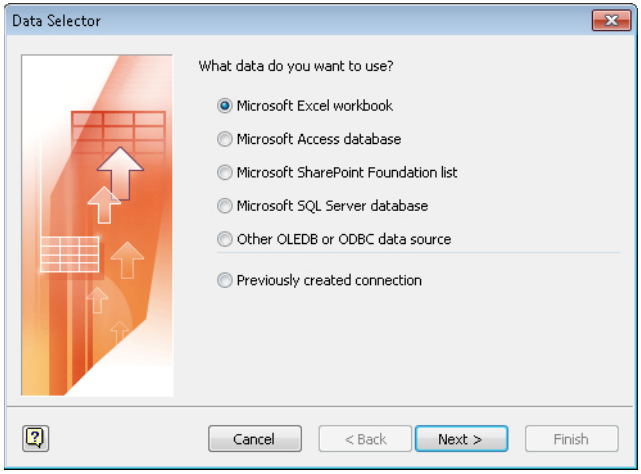
   Visio will not apply a data graphic to shapes after you link them to data later in this exercise.

   See Also You will learn about data graphics in Chapter 10, "Visualizing Your Data."

   Tip Although you are turning data graphic activation off for this exercise, in many situations, it is valuable to turn it on so you can immediately see the results of your data linking operation.


Link Data to Shapes

3. In Visio, on the **Data** tab, in the **External Data** group, click the **Link Data to Shapes** button. The first page of the Data Selector wizard appears.

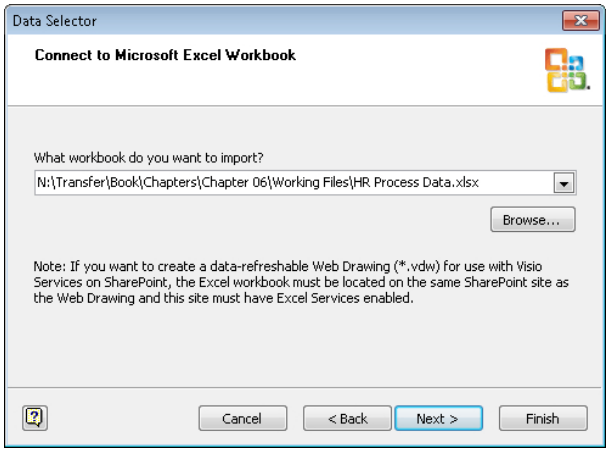


Tip The default data type on the first page of the Data Selector wizard is Microsoft Excel Workbook, which is the one you will use for this exercise. However, notice that you can link to data stored in Microsoft Access, Microsoft SharePoint,, Microsoft SQL Server, or almost any other database.

4. Click **Next**.

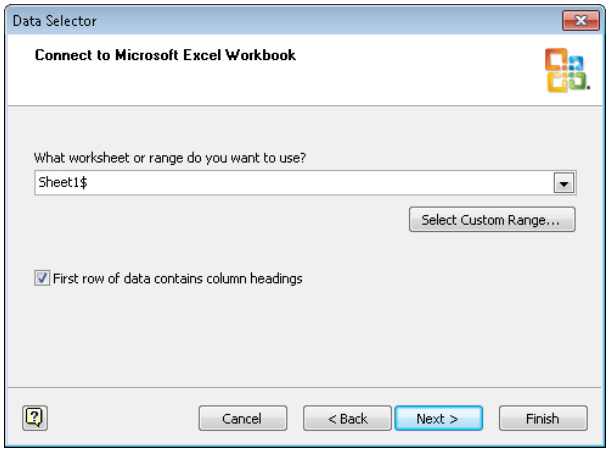
5. On the next **Data Selector** wizard page that appears, click the **Browse** button, and in the resulting file open dialog box, navigate to the **HR Process Data** Excel workbook. After selecting the correct file, click the **Open** button.

   The file name you selected appears in the What Workbook Do You Want To Import box.



6. Click **Next**.

   On this page of the wizard, you will choose which worksheet contains the data to which you want to link. The Data Selector wizard usually defaults to the first worksheet in the workbook (Sheet1$), which is correct for this exercise.

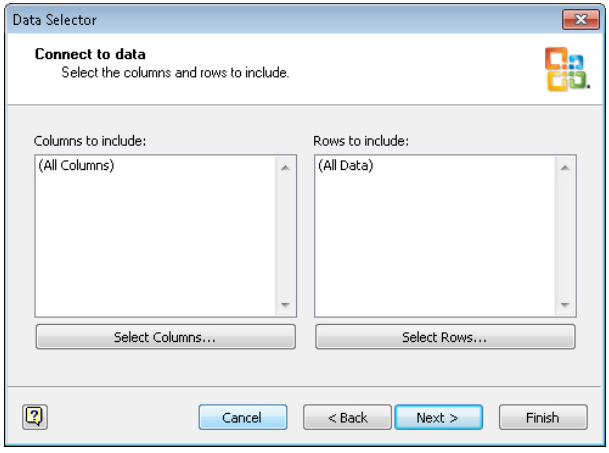


7. Select the **First row of data contains column headings** check box to indicate that the worksheet data includes column headings.

   Tip It is very helpful if your Excel workbook contains column headings, and if they match exactly to the names of the shape data fields in Visio. If the names match, Visio will know exactly how to map the data from the data source to the shapes.

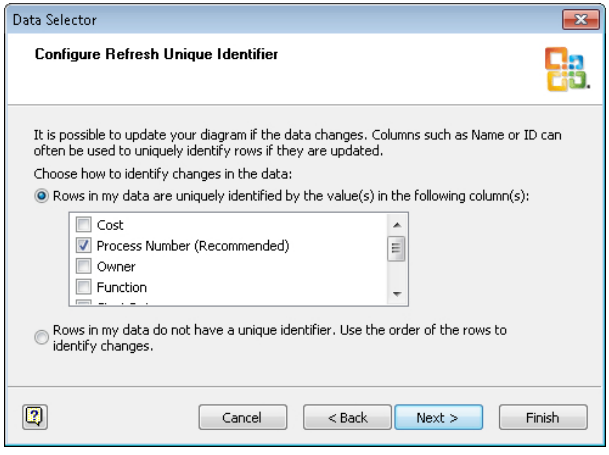
8. Click **Next** to accept the defaults for both settings on this page of the wizard.

   On the Connect To Data page of the wizard you can customize the columns and rows from the selected worksheet that will be linked. As you can see in the following graphic, the default is all columns and all rows, which works for this exercise.



9. Click **Next**.

   On this page, Visio recommends a field that appears to uniquely identify each row of data based on its analysis of your data. You can change to a different field if there is a better choice.

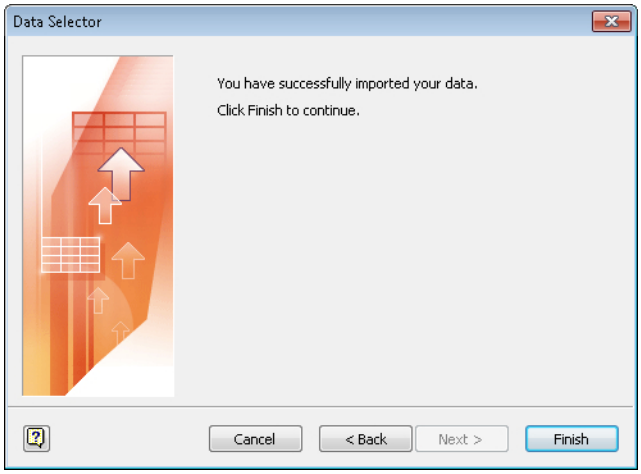


Tip You can select more than one field to constitute the unique ID if a single field is not sufficient.

The guesses Visio makes for the unique ID are generally pretty good. However, you should always think about the recommendation to determine whether there is a different field or combination of fields that is a better choice.

If your data does not contain a unique value for each row, you can click the option at the bottom of this page of the wizard to signify this, allowing Visio to use the sequence of the rows to identify them. Although this choice will work fine for reasonably stable data sets, be aware that using this option has potentially serious consequences later on if you reorder, add, or delete columns.

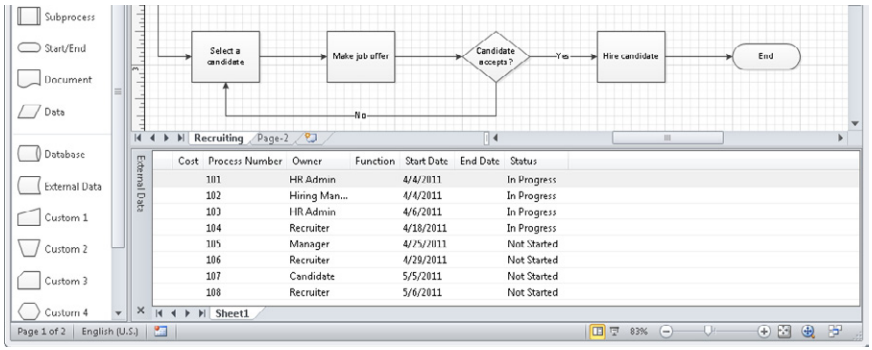
10. Click **Next** to display the final page of the wizard.



11. Click **Finish**.

Visio now displays the External Data window under the drawing pane. The External Data window contains one row for each row of data in your spreadsheet.

Tip In this exercise, you will link to only one Excel worksheet. However, it is possible to link a single diagram to more than one data source whether the sources are all of the same type or consist of a mix of databases, spreadsheets, and SharePoint lists.



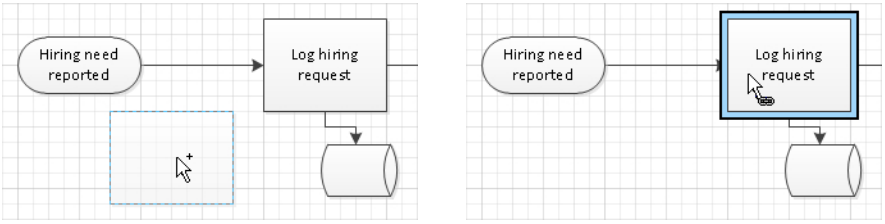
12. Drag data row **101** onto the **Log hiring request** process shape.

As you drag the data row, notice that the cursor appears to be dragging an outline of a shape across the page (see the following graphic on the left). Also, notice that the cursor is accompanied by a plus sign (+). This is the method Visio uses for letting you know that you are dragging the data for a specific shape type across the page.

Tip If you are dragging a data row onto a shape that is already on the page, as you are in this exercise, it doesn't matter whether the shape under the cursor matches the target shape. Visio will add the data to the existing shape.

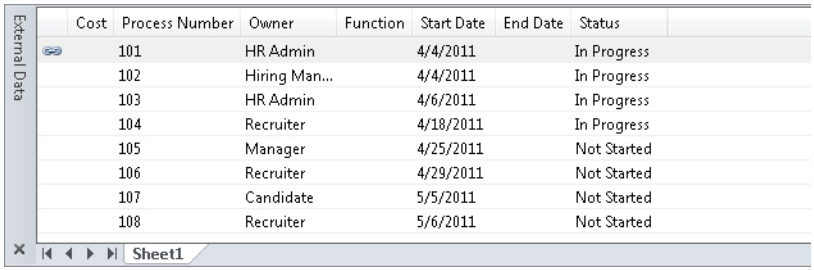
In addition to dragging data rows onto existing shapes, you can create new shapes by dragging a data row onto a blank area of the drawing page. To do this, click once on the desired master in the stencil to select it, and then drag a data row onto the page. The shape under the cursor will reflect the master you've selected.

As the cursor moves onto the target shape, the plus sign is replaced by a linking symbol. In addition, the outline shapes take on a thicker, blue border (see the graphic on the right).



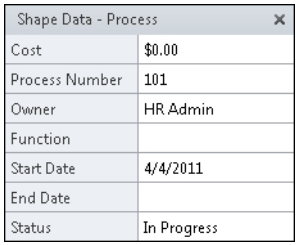
The end result of the drag and drop doesn't change the appearance of the shape on the page but you'll notice the addition of a linking symbol at the left end of the top data row, as shown in the following graphic.

Tip If you need to know which row is linked to which shape, right-click on the row, and then click Linked Shapes to see the answer. If you need to remove the link between a data row and a shape, right-click on the row, and then click Unlink.



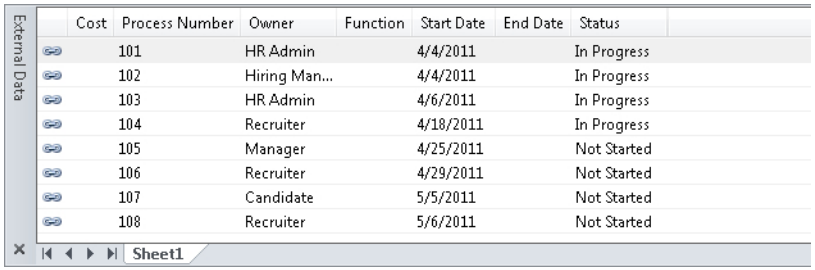
13. Open the **Shape Data** window for the **Log hiring request** shape.

As you can see, the data from the Excel spreadsheet now resides in the Visio shape. And even more important, potentially, is that this is a live link, as you'll see in the next section.



14. Drag the remainder of the data rows onto the shapes on the page. Shape 102–104 are left-to-right in the top row, and shapes 105–108 are left to right across the bottom row. (The End shape does not have a data row.)

The final result is a fully linked set of data rows.



Tip The name on the tab at the bottom of the External Data window is the name of the worksheet in the linked Excel workbook. If you will be linking a diagram to more than one worksheet or even to worksheets in more than one workbook, it is useful to give each worksheet a unique name.

CLEAN UP Save your changes to the *HR Process Map with data* drawing in Visio and save your changes to the *HR Process Data* workbook in Excel. Leave both files open if you are continuing to the next exercise.

Tip When you populate shapes with data from the External Data window, Visio matches the external data column names with the names of the shape data fields in the target shape. If there are no matching shape data fields, Visio creates new shape data fields to accommodate the external data.

Refreshing All Data in Linked Diagrams

Important The information in this section applies only to the Professional and Premium editions of Visio 2010.

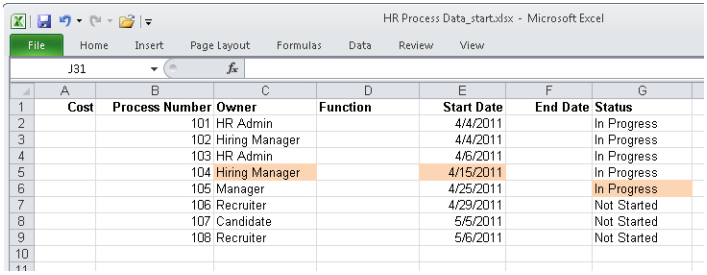
After you have linked data to a Visio drawing, there is a live connection between the two files. In fact, you can make changes to the data source and have those changes appear either manually or automatically in the Visio drawing. This is true whether the drawing is linked to a single data source or to multiple sources.

In this exercise, you will update cells in the Excel data source and see those changes in the Visio shapes.

SET UP If they are not already opened, open the *HR Process Map with data* Visio drawing and the *HR Process Data* Excel workbook that you created in the previous exercise.

1. In the Excel spreadsheet, type **Hiring Manager** in the **Owner** cell for process number **104** that currently contains **Recruiter**.
2. Type **4/15/2011** in the **Start Date** cell for process step **104** that currently contains **4/18/2011**.
3. Type **In Progress** in the **Status** cell for process step **105** that currently contains **Not Started**.

   The following graphic highlights the three changes you've just made.



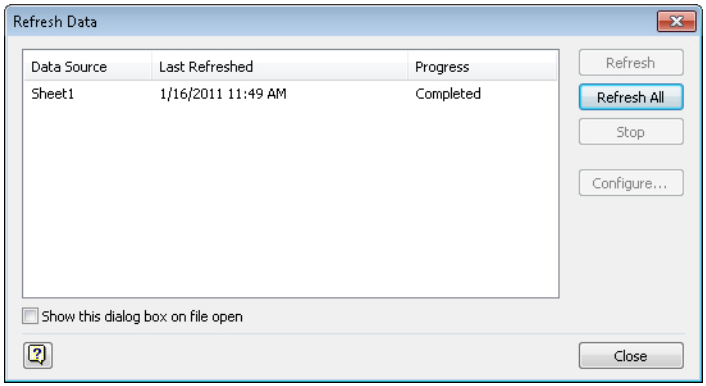
	A	B	C	D	E	F	G
1	Cost	Process Number	Owner	Function	Start Date	End Date	Status
2		101	HR Admin		4/4/2011		In Progress
3		102	Hiring Manager		4/4/2011		In Progress
4		103	HR Admin		4/6/2011		In Progress
5		104	Hiring Manager		4/15/2011		In Progress
6		105	Manager		4/25/2011		In Progress
7		106	Recruiter		4/29/2011		Not Started
8		107	Candidate		5/5/2011		Not Started
9		108	Recruiter		5/6/2011		Not Started
10							


Refresh All

4. Switch to Visio. Then on the **Data** tab, in the **External Data** group, click the **Refresh All** button (do not click the arrow).

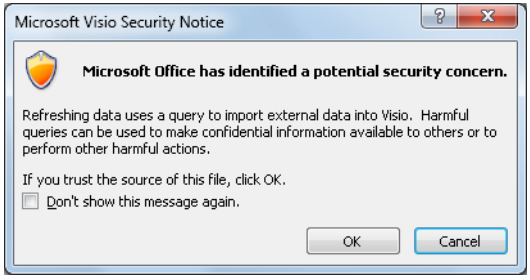
   Tip As an alternative, you can also right-click in the External Data window and click Refresh Data.

Visio reads data from all linked data sources and shows the result in the Refresh Data dialog box.



Tip It is not necessary to close the spreadsheet or other data source in order to update the Visio drawing.

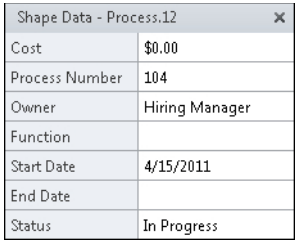
Occasionally, Visio may display the following dialog box. If you know that the data links in your drawing are correct and safe, click OK. You can prevent future display of this dialog box by selecting the Don't Show This Message Again check box.



5. In the **Refresh Data** dialog box, click **Close**.

   Compare the data in the External Data window with the spreadsheet in Step 3 and you can see that the changes have been applied to the data in the drawing. For final proof, you should examine one of the shapes whose data you've changed.

6. Open the **Shape Data** window for the shape titled **Interview candidates**. The shape correctly reflects the new data in the Excel workbook.



Shape Data - Process.12	
Cost	$0.00
Process Number	104
Owner	Hiring Manager
Function	
Start Date	4/15/2011
End Date	
Status	In Progress

CLEAN UP Save changes to the *HR Process Map with data* drawing and the *HR Process Data* workbook but leave them open if you are continuing with the next exercise.

Important The data linking mechanism of Visio is designed for one-way data transfer, that is, for importing data *into* a Visio diagram. The opposite does not work. In other words, you can refresh the data in a drawing after making changes in a linked data source, but you cannot make changes to data in Visio and then push those changes to the linked data source.

Refreshing Selected Data in Linked Diagrams

Important The information in this section applies only to the Professional and Premium editions of Visio 2010.

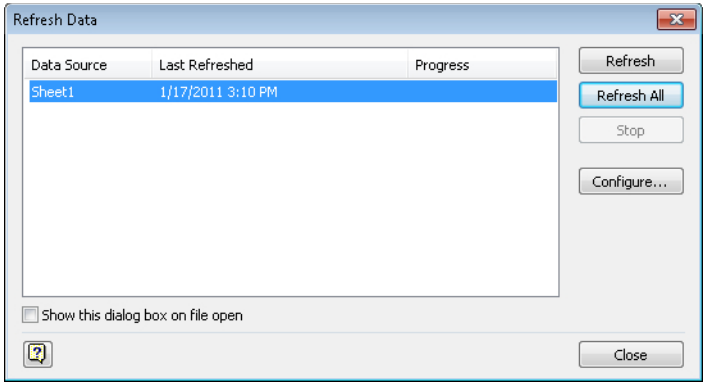
The procedure in the previous exercise automatically refreshes data from all linked data sources. Many times, this is exactly what you want to do. However, if your Visio diagram is linked to several data sources, there may be times when you want to update the drawing from a subset of the linked repositories.

In this exercise, you will refresh data from some but not all active data sources.

SET UP If they are not already opened, open the *HR Process Map with data* Visio drawing and the *HR Process Data* Excel workbook that you worked with in the previous exercise.

Refresh All

1. In Visio, on the **Data** tab, in the **External Data** group, click the **Refresh All** arrow (below the button), and then click **Refresh Data** to open the **Refresh Data** dialog box.



2. Select one or more data sources.

   Tip There is only one data source in this exercise, but if you've linked a drawing to more than one, they will all be listed in this dialog box.

3. Click the **Refresh** button, and then click **Close**.

CLEAN UP Save changes to the *HR Process Map with data* Visio drawing and the *HR Process Data* Excel workbook but leave them open if you are continuing with the next exercise.

Scheduling Data Refresh

Important The information in this section applies only to the Professional and Premium editions of Visio 2010.

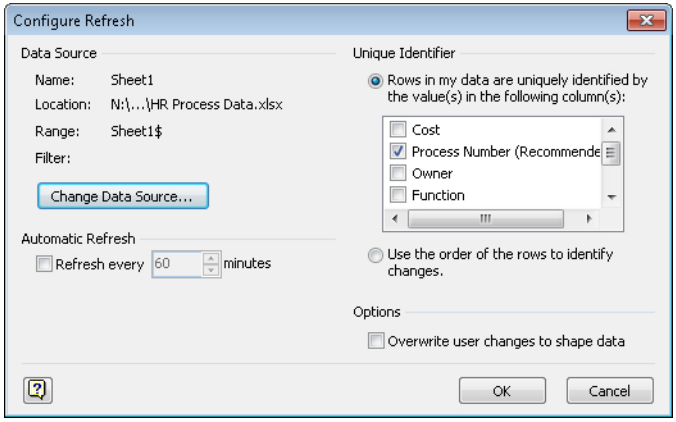
The preceding two exercises showed you how to manually update the data in your diagram by rereading the data sources. It's easy to imagine situations in which you would like to have Visio update the data without manual intervention. Each scenario in the following list would be a good candidate for this feature:

- A network or rack diagram that is used to display near real–time network and server status
- A call center seating chart that shows which agents are on the phone and which are available
- A process map that shows up-to-date task status
- A factory floor plan that displays production statistics, performance threshold warnings, and safety issues

In this exercise, you will set a schedule so Visio will refresh your drawing automatically.

SET UP If they are not already opened, open the *HR Process Map with data* Visio drawing and the *HR Process Data* Excel workbook that you worked with in the previous exercise.

1. In Visio, right-click anywhere in the **External Data** window, and then click **Configure Refresh** to open the **Configure Refresh** dialog box.



Tip As an alternative to Step 1, you can open the Refresh Data dialog box shown in the previous two sections, select one or more data sources, and then click the Configure button.

2. In the **Configure Refresh** dialog box, select the **Refresh every nnn minutes** check box.
3. Type **10** or use the spinner control to set the desired refresh interval, and then click **OK**.

   From this point forward, whenever your drawing is open, the data will refresh automatically at the specified time interval. The data will not refresh when the drawing is closed.

CLEAN UP Save and close the *HR Process Map with data* Visio drawing and the *HR Process Data* Excel workbook.

Linking Data to Shapes Automatically

Important The information in this section applies only to the Professional and Premium editions of Visio 2010.

After completing Steps 12-14 in the section titled "Linking Diagrams to External Data" earlier in this chapter, you were probably thinking "There must be a better way to link data to shapes!" Fortunately, there is. Visio includes an automatic linking facility that

works very nicely when both the data and the shapes contain matching unique identifiers. The key to the automatic linking facility is in the previous sentence: the shapes on the drawing page and the data in your spreadsheet or other data source must have matching IDs.

In this exercise, you will first prepare your drawing by adding IDs to the shapes, and then you will automatically link the data to the shapes.

SET UP You need the *HR Process Map_start* drawing located in the Chapter06 practice file folder for this exercise. Open the file in Visio.

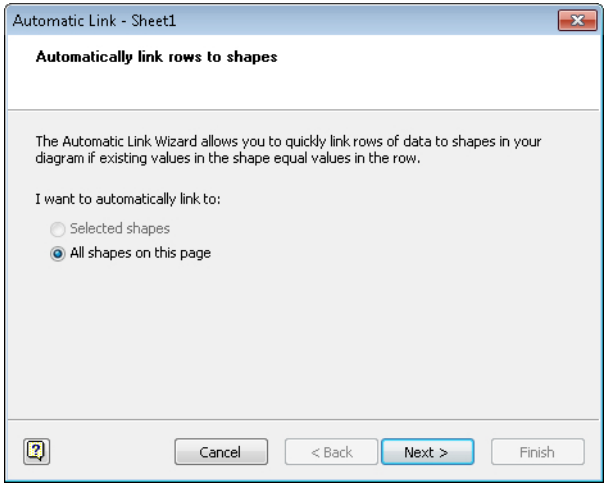
1. Click the **Log hiring request** process shape.
2. In the **Process Number** field, type **101**.
3. Click the **Prepare job description and screening questions** process shape.
4. In the **Process Number** field, type **102**.
5. Continue assigning sequential numbers to the process and decision shapes in the flowchart, numbering from left to right in the top row and then the bottom row.
6. Save the drawing as **HR Process Map with IDs**.

   Now that you've prepared the drawing, it is easy to link data to shapes automatically.
7. Follow Steps 2–11 in the section "Linking Diagrams to External Data" earlier in this chapter. This will connect your drawing to the spreadsheet and open the External Data window.


Automatically Link

8. On the **Data** tab, in the **External Data** group, click the **Automatically Link** button.

   If you did not select specific shapes before performing this step, you will see the following page of the wizard exactly as shown. If you did select one or more shapes before performing this step, the Selected Shapes option will be available so that you can automatically link just those shapes.



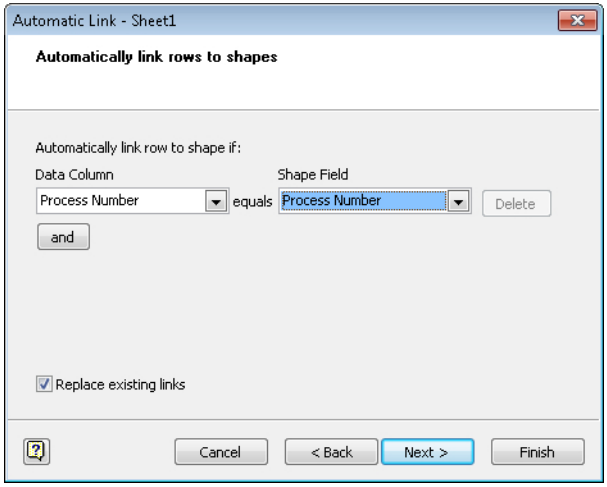
9. Click **Next**.

   On this page of the wizard, you tell Visio how to match data with shapes by indicating the column name in the data and the field name in the shapes that are equivalent.

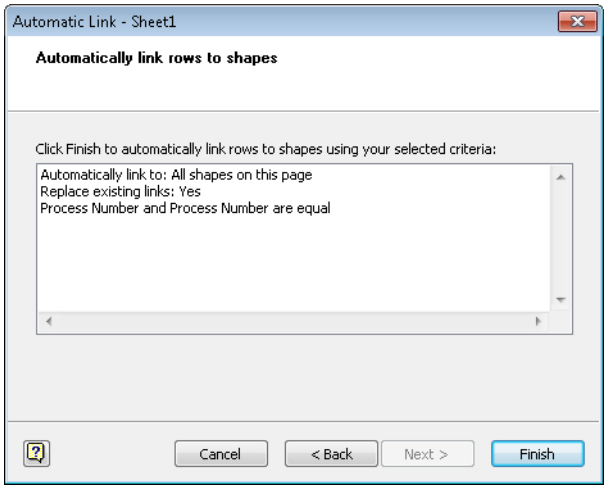
10. Under the **Data Column** heading, click **Process Number** in the list.

11. Under the **Shape Field** heading, click **Process Number** in the list.

Tip If you need to specify multiple conditions for matching data to shapes, click the And button and enter additional conditions.

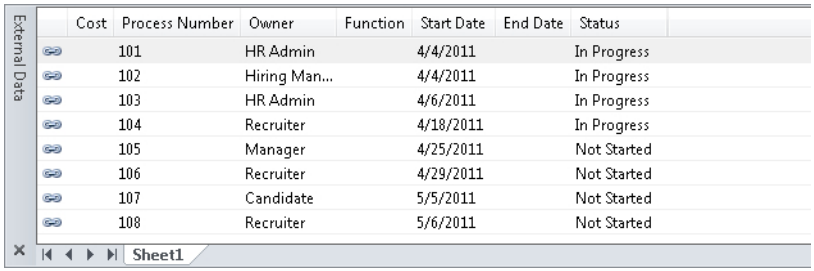


12. Click **Next**. The final wizard page summarizes your choices.



13. Click **Finish**.

The data has now been linked to all matching shapes as you can see from the link symbols in the External Data window.



CLEAN UP Save your changes to the *HR Process Map with IDs* drawing, and then close it.

Running a Predefined Report

Now that you know how to use and modify existing data fields and how to create new fields, the next logical step is to explore ways to use all of that data.

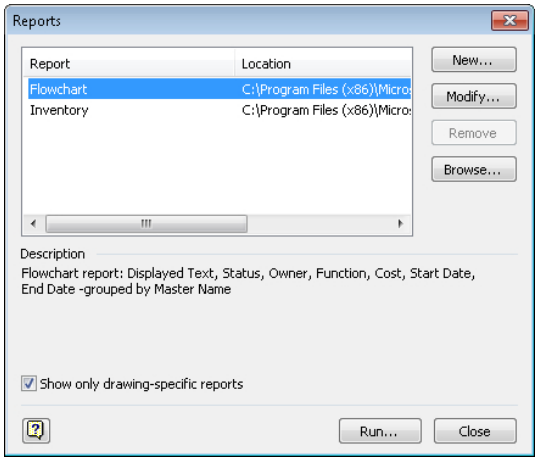
Visio 2010 provides a reporting facility that lets you extract data in a variety of ways in order to summarize and present it. Many of the built-in Visio templates include pre-defined reports. You can also design your own reports by stepping through the provided report definition wizard.

In this exercise, you will run one of the built-in reports.

SET UP You need the *HR Process Map with data_start* drawing located in the Chapter06 practice file folder to complete this exercise. Open the drawing in Visio and save it as *HR Process Map Reports*.


Shape Reports

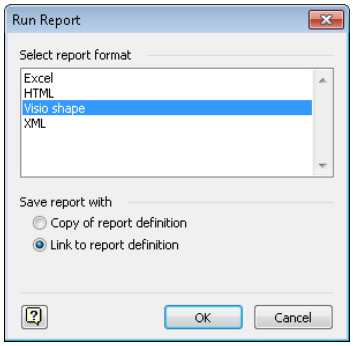
1. On the **Review** tab, in the **Reports** group, click the **Shape Reports** button. The Reports dialog box opens.
2. In the **Reports** dialog box, click once on **Flowchart** in the list of reports.



At the top of the Reports dialog box, there are two predefined reports: Flowchart and Inventory. The Flowchart report is part of the flowchart template in Visio and will appear whenever you create a diagram using that template. The Inventory report is a generic Visio report that counts shapes and is present every time you open the Reports dialog box.

Because you selected the Flowchart report, notice that there is a description of the report in the center of the dialog box.

3. Click **Run**. The Run Report dialog box opens.



The Run Report dialog box offers four different report output options:

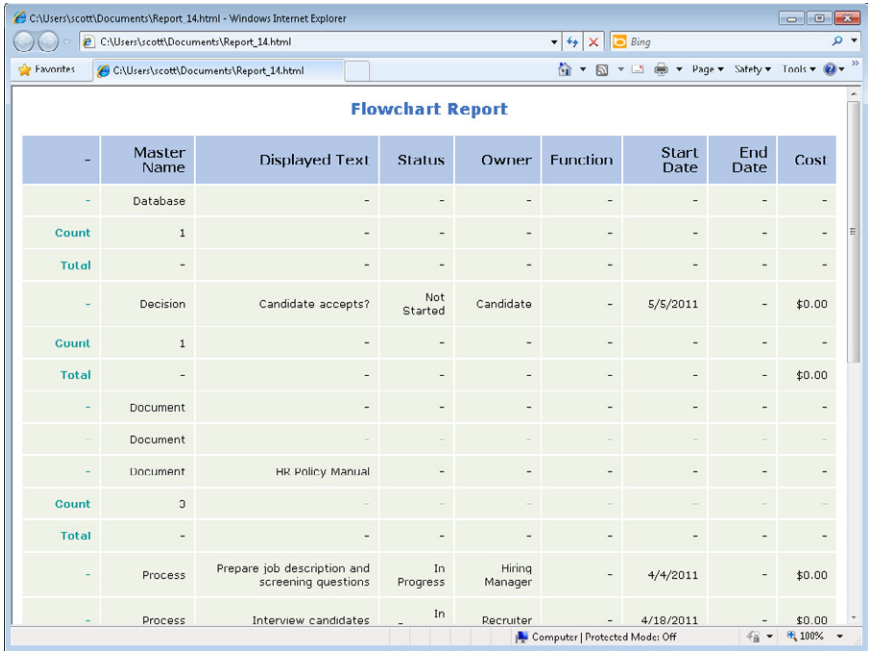
- **Excel** Drops the formatted report data into Microsoft Excel. The report data can be edited.
- **HTML** Drops the report into Windows Internet Explorer. This report format is read only.
- **Visio shape** Creates a new Visio shape that contains the report data. (For the technically inclined: this shape is actually an embedded Excel object, so after creating it, you can double-click the report shape and edit the data as though you were using Excel.)
- **XML** Creates an XML file containing the formatted report. The report data can be imported into an XML-aware application or can be edited.

4. Click **Excel**, and then click **OK** to open the Flowchart report.

Tip This report includes subtotals for each entry in the Master Name column.

	A	B	C	D	E	F	G	H	I
1			Flowchart Report						
2		Master Name	Displayed Text	Status	Owner	Function	Start Date	End Date	Cost
3		Database							
4	Count	1							
5	Total								
6		Decision	Candidate accepts?	Not Started	Candidate		5/5/2011		$0.00
7	Count	1							
8	Total								$0.00
9		Document							
10		Document							
11		Document	HR Policy Manual						
12	Count	3							
13	Total								
14		Process	Prepare job description and screening questions	In Progress	Hiring Manager		4/4/2011		$0.00
15		Process	Interview candidates	In Progress	Recruiter		4/18/2011		$0.00
16		Process	Select a candidate	Not Started	Manager		4/25/2011		$0.00
17		Process	Make job offer	Not Started	Recruiter		4/29/2011		$0.00
18		Process	Hire candidate	Not Started	Recruiter		5/6/2011		$0.00
19		Process	Advertise open job	In Progress	HR Admin		4/6/2011		$0.00
20		Process	Log hiring request	In Progress	HR Admin		4/4/2011		$0.00
21	Count	7							
22	Total								$0.00
23		Start/End	Hiring need reported						
24		Start/End	End						
25	Count	2							
26	Total								
27	Grand Total								$0.00

5. On the **Review** tab, in the **Reports** group, click the **Shape Reports** button. Then click **Flowchart** and the **Run** button in the **Reports** dialog box to run the Flowchart report again.
6. In the **Run Report** dialog box, click **HTML**, and then click **OK**. Internet Explorer opens and displays the report.

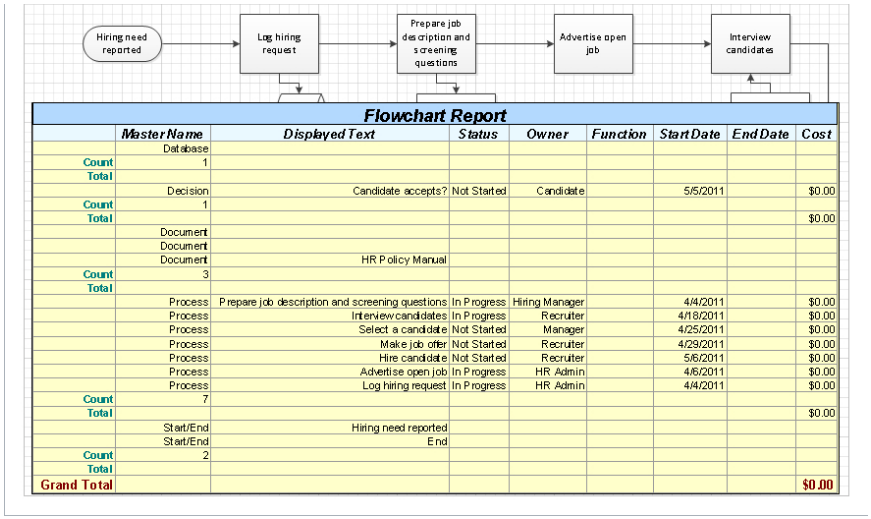


Flowchart Report

-	Master Name	Displayed Text	Status	Owner	Function	Start Date	End Date	Cost
-	Database	-	-	-	-	-	-	-
Count	1	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-
-	Decision	Candidate accepts?	Not Started	Candidate	-	5/5/2011	-	$0.00
Count	1	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	$0.00
-	Document	-	-	-	-	-	-	-
-	Document	-	-	-	-	-	-	-
-	Document	HR Policy Manual	-	-	-	-	-	-
Count	3	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-
-	Process	Prepare job description and screening questions	In Progress	Hiring Manager	-	4/4/2011	-	$0.00
-	Process	Interview candidates	In	Recruiter	-	4/18/2011	-	$0.00

7. On the **Review** tab, in the **Reports** group, click the **Shape Reports** button. Then click **Flowchart** and the **Run** button in the **Reports** dialog box to run the Flowchart report again.

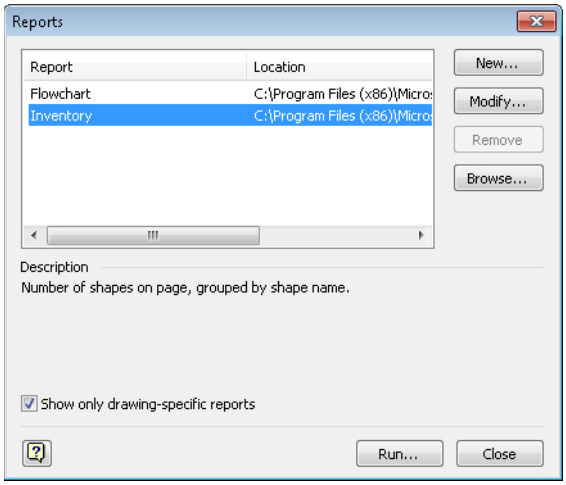
8. In the **Run Report** dialog box, click **Visio shape**, and then click **OK**. As you can see in the following graphic, the new shape object can be quite large, depending on the amount of data in your drawing, so you'll probably want to cut and paste it onto a separate page.



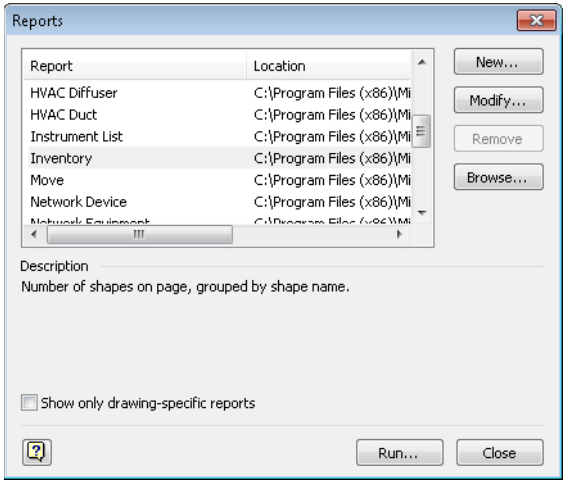
Flowchart Report

	Master Name	Displayed Text	Status	Owner	Function	Start Date	End Date	Cost
	Database							
Count	1							
Total								
	Decision	Candidate accepts?	Not Started	Candidate		5/5/2011		$0.00
Count	1							
Total								$0.00
	Document							
	Document							
	Document	HR Policy Manual						
Count	3							
Total								
	Process	Prepare job description and screening questions	In Progress	Hiring Manager		4/4/2011		$0.00
	Process	Interview candidates	In Progress	Recruiter		4/18/2011		$0.00
	Process	Select a candidate	Not Started	Manager		4/25/2011		$0.00
	Process	Make job offer	Not Started	Recruiter		4/29/2011		$0.00
	Process	Hire candidate	Not Started	Recruiter		5/6/2011		$0.00
	Process	Advertise open job	In Progress	HR Admin		4/6/2011		$0.00
	Process	Log hiring request	In Progress	HR Admin		4/4/2011		$0.00
Count	7							
Total								$0.00
	Start/End	Hiring need reported						
	Start/End	End						
Count	2							
Total								
Grand Total								$0.00

9. On the **Review** tab, in the **Reports** group, click **Shape Reports**.
10. In the **Reports** dialog box, click **Inventory**. Notice the description of this report—essentially, it just counts all occurrences of every shape on the page.

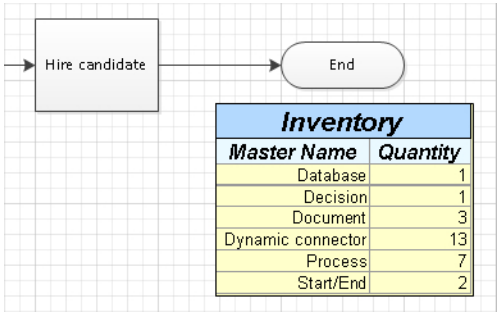


Tip The Show Only Drawing-Specific Reports option at the bottom of the dialog box is selected by default. Generally, this is a good thing because it prevents Visio from showing you a list of extraneous reports. However, if you're looking for a report that doesn't appear on the list when this option is selected, you can clear it. Doing so for the previous dialog box produces a long list of reports.



11. Click **Run**.
12. Double-click **Visio shape** in the **Run Report** dialog box to execute the report and create a new Visio shape.

    In the portion of the drawing page shown in the following graphic, the inventory report displays a simple count of each shape type.



CLEAN UP Save your changes to the *HR Process Map Reports* drawing but leave it open if you are continuing with the next exercise.

Creating a New Report

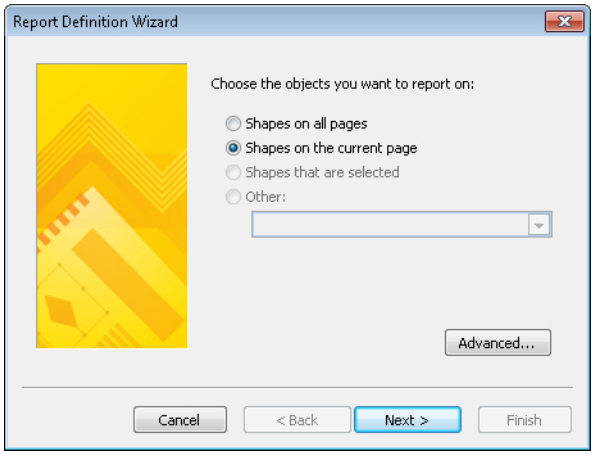
Visio provides a Report Definition wizard so you can create new reports or modify existing reports. In this exercise, you will create a new report for the Recruiting Process.

SET UP You need the *HR Process Map Reports* drawing for this exercise. Either continue with the open copy from the previous exercise or open the *HR Process Map with data_start* drawing located in the Chapter06 practice file folder and save it as *HR Process Map Reports*.


Shape Reports

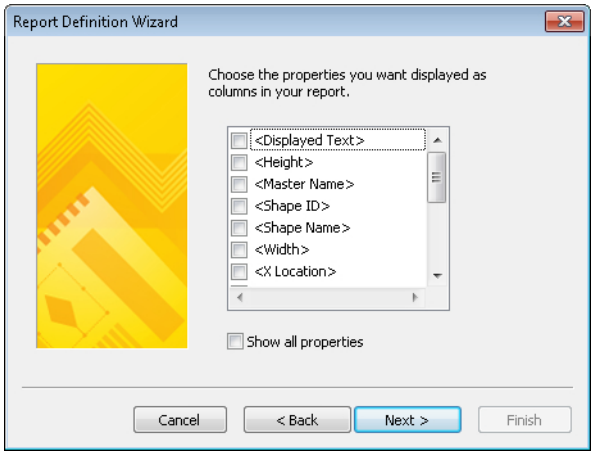
1. On the **Review** tab, in the **Reports** group, click the **Shape Reports** button. The Reports dialog box opens.
2. In the **Reports** dialog box, click the **New** button. The Report Definition Wizard opens.

   The Report Definition Wizard lets you select a set of shapes to include in the report.



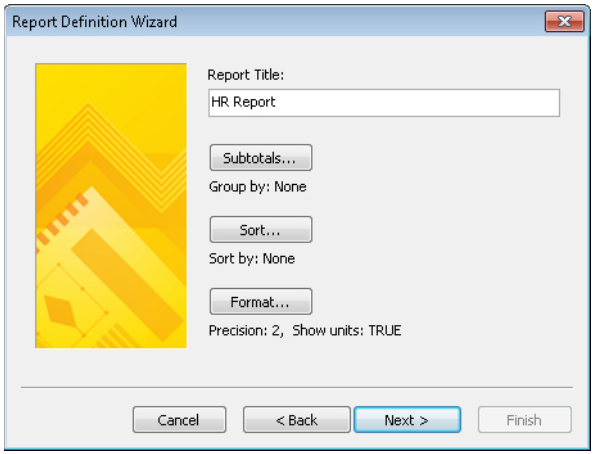
3. Click **Shapes on the current page** if it's not already selected, and then click **Next**.

   This page of the Report Definition Wizard shows the fields that you are most likely to want in your report. If you don't see the field you're looking for, select the Show All Properties check box.

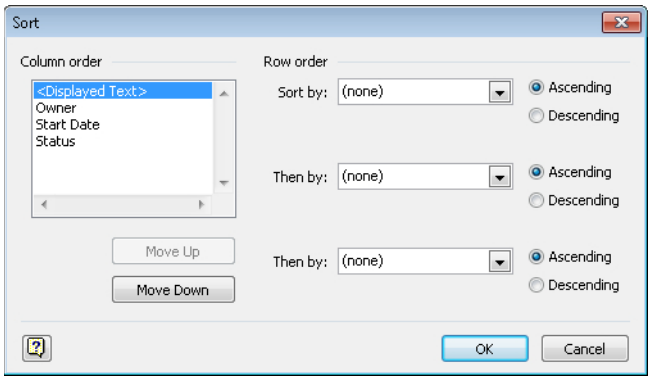


4. Select the **<Displayed Text>** check box, scroll down and select the check boxes for **Owner**, **Process Number**, **Start Date** and **Status**, and then click **Next**. The next wizard page opens.

5. Type **HR Report** in the **Report Title** text box.



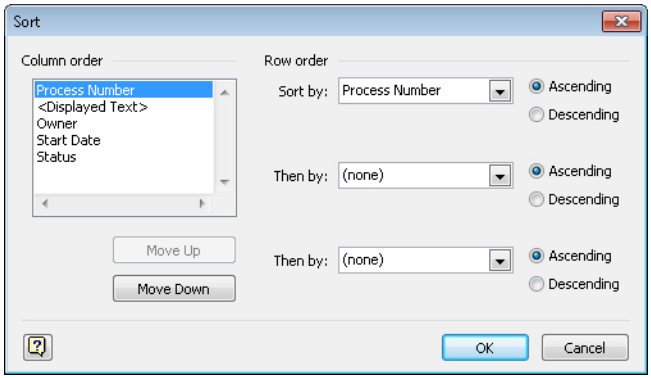
6. Click the **Sort** button so you can specify the order in which you want the data to appear in the report.



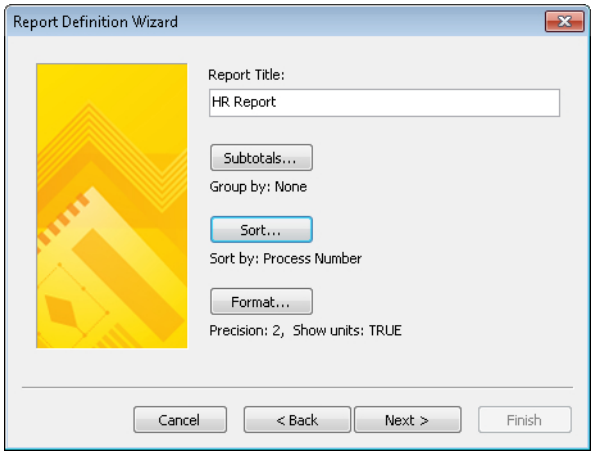
7. In the **Sort** dialog box, in the **Row Order** section, click the arrow next to **Sort by**, and then select **Process Number**.

Tip You can sort by as many as three fields in the Row Order section.

8. In the **Column Order** section, click once on **Process Number**, and then click the **Move Up** button twice to set the column sequence as shown in the following graphic.



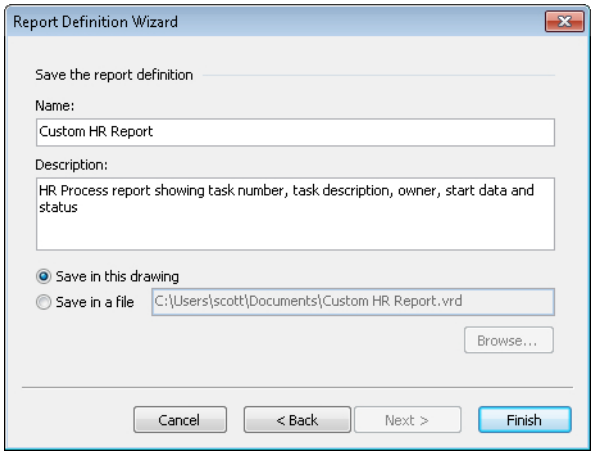
9. Click **OK** to close the **Sort** dialog box.



Tip The text under the Sort button identifies the sort field(s) you selected.

Be sure to note the Subtotals and Format buttons that allow you to customize the report output in additional ways beyond what you will use for this sample report.

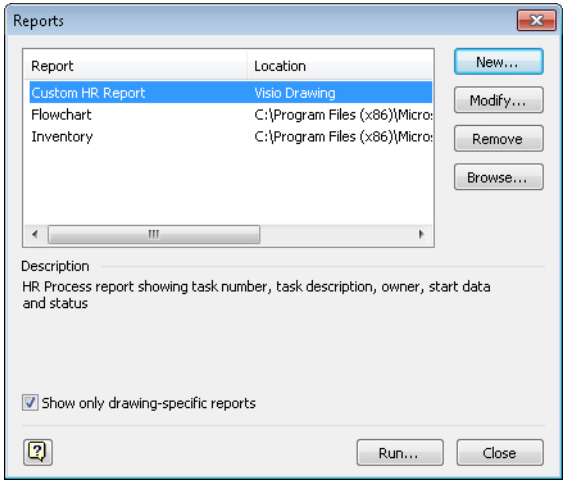
10. Click **Next** to open the final page of the **Report Definition Wizard**.
11. Type **Custom HR Report** in the **Name** text box.
12. Type **HR Process report showing task number, task description, owner, start data and status** in the **Description** text box.



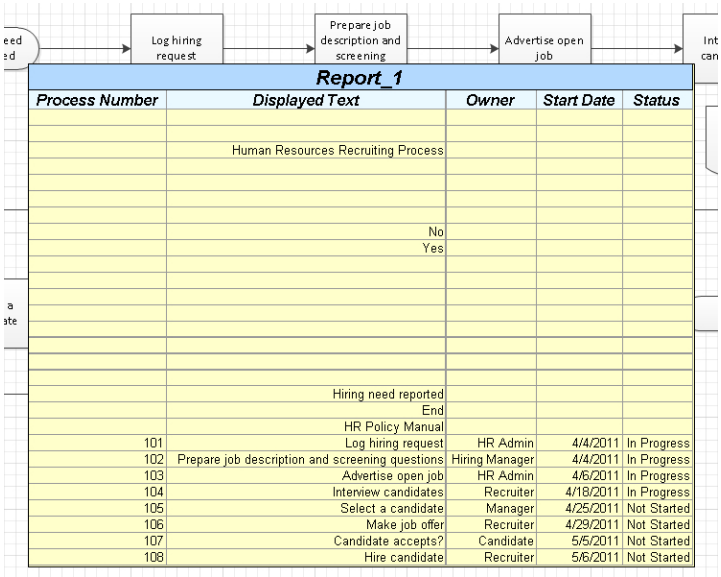
You can save the report definition in the current Visio drawing, which is the default, or you can save it to an external file.

Tip Save the report definition to an external file if you think you'll want to use it with multiple drawings. If you do, you can retrieve the report definition by clicking the Browse button in the Reports dialog box shown in the following graphic.

13. Click **Finish**. Your report appears in the list of available reports in the Reports dialog box and you can run it in the usual way.



14. Click **Run** in the **Reports** dialog box.
15. Double-click **Visio shape** in the **Run Report** dialog box. Your custom report appears on the drawing page.



Report_1

Process Number	Displayed Text	Owner	Start Date	Status
	Human Resources Recruiting Process			
	No			
	Yes			
	Hiring need reported			
	End			
	HR Policy Manual			
101	Log hiring request	HR Admin	4/4/2011	In Progress
102	Prepare job description and screening questions	Hiring Manager	4/4/2011	In Progress
103	Advertise open job	HR Admin	4/6/2011	In Progress
104	Interview candidates	Recruiter	4/18/2011	In Progress
105	Select a candidate	Manager	4/25/2011	Not Started
106	Make job offer	Recruiter	4/29/2011	Not Started
107	Candidate accepts?	Candidate	5/5/2011	Not Started
108	Hire candidate	Recruiter	5/6/2011	Not Started

When you save the changes to this file, your report definition will be saved with your drawing.

CLEAN UP Save your changes to the *HR Process Map Reports* drawing but leave it open if you are continuing with the next exercise.

The report you've just created is interesting, but needs some fine tuning. For example, there are blank rows because some shapes on the page, the arrows, do not contain any data. To modify the report, continue reading in the next section.

Modifying an Existing Report

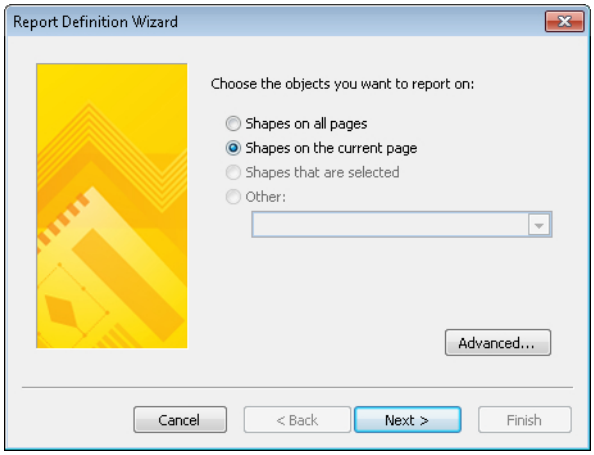
Whether you are using a predefined Visio report or one you've created, there are times when you want it to produce different output.

In this exercise, you will modify the HR Report you created in the previous section to eliminate the blank rows.

SET UP Open the *HR Process Map Reports* drawing that you saved in the previous exercise, if it is not still open. If the HR Report is still on the drawing page, click it once to select it, and then press Delete.


Shape Reports

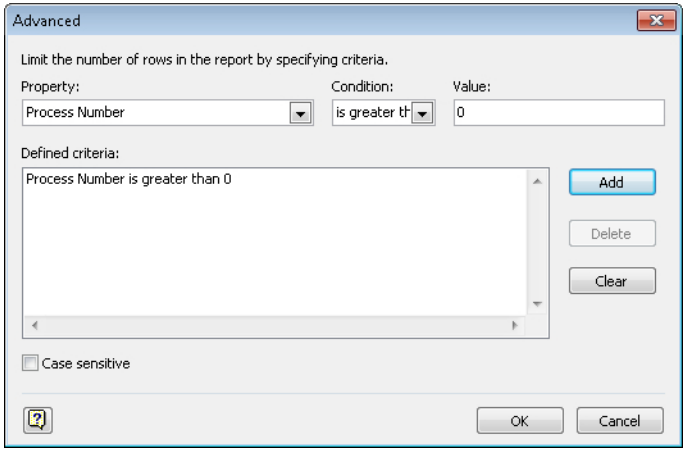
1. On the **Review** tab, in the **Reports** group, click the **Shape Reports** button.
2. In the **Reports** dialog box, click **Custom HR Report** in the list of reports.
3. Click the **Modify** button. The Report Definition Wizard appears.



4. On the first page of the **Report Definition Wizard**, click the **Advanced** button. The Advanced dialog box opens.

   In the Advanced dialog box, you can limit the number of rows in the report by setting selection criteria.

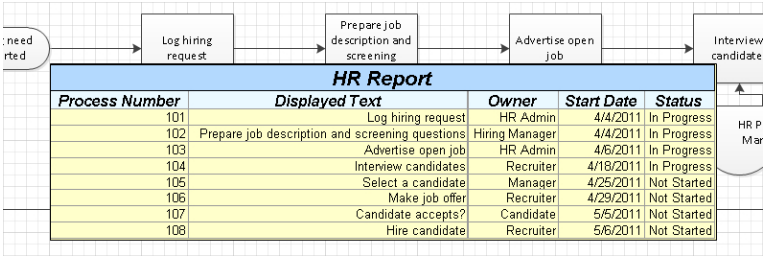
5. Under the **Property** heading, click the arrow, and then click **Process Number**.
6. Under the **Condition** heading, click the arrow, and then click **is greater than**.
7. Under the **Value** heading, type **0**.
8. Click the **Add** button to add your selections to the **Defined criteria** list.



9. Click **OK**.
10. Click **Next** three times in the wizard, and then click **Finish** to save the updated report definition.
11. In the **Reports** dialog box, click **Run**.

12. Double-click **Visio shape**.

The modified version of the report appears without any blank rows. Compare this report to the one at the end of the preceding exercise.



HR Report

Process Number	Displayed Text	Owner	Start Date	Status
101	Log hiring request	HR Admin	4/4/2011	In Progress
102	Prepare job description and screening questions	Hiring Manager	4/4/2011	In Progress
103	Advertise open job	HR Admin	4/6/2011	In Progress
104	Interview candidates	Recruiter	4/18/2011	In Progress
105	Select a candidate	Manager	4/25/2011	Not Started
106	Make job offer	Recruiter	4/29/2011	Not Started
107	Candidate accepts?	Candidate	5/5/2011	Not Started
108	Hire candidate	Recruiter	5/6/2011	Not Started

CLEAN UP Save and close the *HR Process Map Reports* drawing.

Tip It would be a good idea to experiment with the other buttons and option settings in the Report Definition Wizard while everything is fresh in your mind. There are many other ways that you can customize Visio reports.

Key Points

- Shape data exists in, or can be added to, any shape on a Visio drawing page. A growing percentage of Visio drawings are valuable not just because they are attractive pictures, but because they are visual representations of real-world data.
- Visio diagrams do not need to exist in isolation. You can link your drawings to personal or organizational data repositories of almost any type, ranging from simple spreadsheets to SharePoint lists and almost any kind of database.
- The data in a linked Visio drawing can be updated manually or you can schedule updates to occur at a preset time interval.
- Many Visio templates include predefined reports that you can run to export summarized data to webpages, Excel files, and other formats. In addition, the Visio Report wizard steps you through editing existing reports or creating your own.

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About the Author

Scott A. Helmers is a Microsoft Most Valuable Professional (MVP) for Microsoft Visio and is the primary Visio expert at Experts-Exchange.com. He has helped companies create custom Visio add-ins to enhance organizational efficiency and employee productivity, and has taught thousands of people how to use technology more effectively.

He is Vice President of Product Planning and Support at the Harvard Computing Group (HCG), a software and consulting firm that assists organizations with understanding relevant technologies and making decisions about business applications and processes. Scott is a co-inventor of TaskMap (*www.taskmap.com*), a Visio add-in that allows anyone to document all of the important aspects of any business process.

Scott has worked with clients in Afghanistan, Egypt, India, Ireland, Jordan, Malaysia, Saudi Arabia, Singapore, Canada, and the United States on projects involving knowledge management, specification of new IT systems, process mapping and redesign, and technology training. He is the author of *Data Communications: A Beginner's Guide to Concepts and Technology* (Prentice-Hall) and has been an Adjunct Professor at both Northeastern and Boston Universities.

When not working or spending time with his family in Andover, Massachusetts, Scott can usually be found on his bicycle or working with a local community theater company.

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