



Salesforce App Developer Guide

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Discover both the declarative (point-and-click) and the programmatic (code-based) features of Salesforce. Learn how you can optimize existing features such as Visualforce pages and quick actions for the Salesforce mobile experience, as we walk you through the process of making an existing organization mobile-ready.

Salesforce App Developer Guide

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CHAPTER 1 Introduction

In this chapter ...

- [Introducing the Salesforce Platform](#)
- [Salesforce Platform Features](#)
- [Introducing the Salesforce App](#)
- [Getting Around in the Salesforce App](#)
- [What about the Other Mobile Apps?](#)

Mobile has become the new normal for staying connected in both our personal and professional lives. More and more, we're living our lives connected to the Internet, but instead of sitting at a desk, we're connecting on planes, in cabs, in between meetings, in hotels, or even in line for coffee. We follow friends, update status feeds, research local businesses, collaborate with colleagues, email suppliers, and much more—all tasks increasingly performed on the go.

And at the same time, every company is working harder and faster to innovate and stay ahead of the competition. The successful businesses of the future must embrace this mobile-first world and the freedom this mobility provides to get things done, regardless of where you are and what you're doing.

Salesforce solves the problems of lagging innovation and a lack of mobile specialists with a revolutionary approach to app development for the social and mobile-first world. Salesforce delivers breakthrough productivity for all users because it puts the customer—employees, partners, consumers, and devices—at the center of everything.

The result is a fast, connected mobile solution with the potential to be as disruptive as Software as a Service. It's time to build the future today!

Introducing the Salesforce Platform

Salesforce is a mobile app development platform for everyone. It gives ISVs, developers, administrators, and every user the freedom to innovate.

This approach to unlocking mobile app development for organizations is built for today's needs: mobile and social solutions delivered in days or weeks. Apps are driven by metadata and intelligently provide context to the user experience. These apps deliver information-based mobile device features: addresses can be plotted on maps, phone numbers can be dialed with a simple tap, feed-centric workflows can be created, and much more.

Business users and administrators can develop apps with clicks, not code, complete with powerful workflow rules, approval processes, and dynamic user interfaces. Unlike other solutions where business users often create independent applications in which IT has little visibility into their security or reliability, Salesforce gives administrators the tools to centrally manage apps without limiting the business's need to innovate.

Designed for scale with open APIs for extensibility and integration, and powerful developer tools, there's no limit to what developers and ISVs can build on the platform. Salesforce's flexible development models let every administrator or developer create custom apps that are supported by mobile back-end services and a unique, yet familiar, mobile user experience. ISVs developing on the Salesforce Platform can develop apps that take advantage of advanced packaging and version management controls, complete enterprise marketplace capabilities with the AppExchange, and feed-first discovery of their apps within the Salesforce Platform.

Salesforce Platform Features

The Salesforce Platform brings together Lightning Platform, Heroku, and ExactTarget Fuel into one incredibly powerful family of social, mobile, and cloud services—all built API first.

The Salesforce Platform delivers:

Social Data

The ability to share, follow, collaborate, and take business actions directly on data within Salesforce is at the core of the platform. Users can follow records and data with a single tap. They can be notified of changes in real time, and collaborate directly within the record feed. This feed-based approach to working lets users focus on what's most important to them.

By treating data as social and as an important participant in business, Salesforce allows data to share updates, trigger workflows, and be part of the collaboration process with workers, teams, partners, and

customers. The result is an unparalleled opportunity to create new business apps and processes for business productivity.

Declarative and Programmatic Development

IT departments have struggled to keep pace with the level of change required for businesses to remain competitive. Too often, IT is resource-constrained because they must manage existing on-premises systems while at the same time recruit and retain professional developers—especially those with mobile application development experience.

Salesforce solves this problem by providing intuitive drag-and-drop tools for storing and working with data, defining cloud-based logic with workflows, creating approval processes and formulas, and creating mobile-ready apps.

Professional developers can use the most popular open-source languages, tools, and standards to build completely custom apps and user interfaces. Unlike other platforms, Salesforce delivers a unique experience where developers and administrators create apps on the same platform, eliminating the effort required to build complicated integration solutions.

Action-Based App Model

Salesforce mobile puts the customer at the center of the development process. Rather than require complicated development cycles, apps can be declared through actions: create an order, set a delivery date, select a route, and so on. Administrators can define default values for actions to streamline apps down to the click of a mouse or a swipe of the finger.

Actions defined via the desktop are instantly available in context-sensitive menus on mobile devices. And, for developers building integrations with Salesforce, actions are automatically enabled with RESTful endpoints capable of accepting either XML or JSON data envelopes.

Connect to Everything with Open APIs

Salesforce provides the flexibility to create apps that connect to everything using efficient and scalable APIs that perform over 1.3 billion transactions a day. Every object or data entity is instantly REST-enabled.

Our APIs include bulk APIs for data loading, social APIs for ubiquitous collaboration anywhere, cutting-edge streaming APIs to support push notification integrations, and metadata APIs that describe every aspect of your app and business such as permissions, data access policies, field types, and user experience.

Introducing the Salesforce App

The Salesforce apps are Salesforce on the go! These enterprise-class mobile apps give your users real-time access to the same information that they see in the office, but organized for getting work done in those precious free moments when they're between customer meetings, waiting for a flight—even when they're in line for coffee.

You can get Salesforce in different ways:

- As an app for iOS from the App Store or an app for Android from Google Play.
- As mobile web experience that runs in supported mobile browsers. This option doesn't require anything to be installed.

In this book, we'll be working exclusively with the downloadable apps.

Requirements for Using Salesforce

The Salesforce app is available for most Salesforce editions and user license types. The app is supported on a variety of mobile platforms, with some minimum operating system and mobile browser requirements.

For current mobile platform requirements and the list of devices that Salesforce uses for testing, see [Requirements for the Salesforce App](#) in the Salesforce Help.

On most devices, Salesforce is supported in portrait orientation only. The one exception is when using the Salesforce for iOS on iPad tablets, where both portrait and landscape orientation are supported.

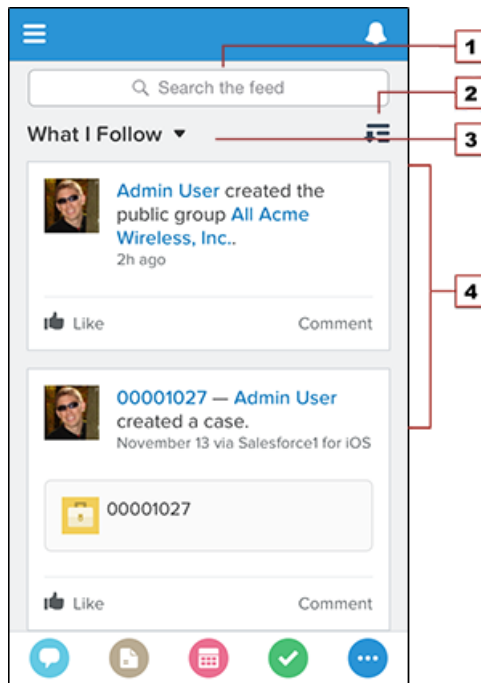
Getting Around in the Salesforce App

Let's take a tour of Salesforce.

When users log in to Salesforce, the first thing they see is a landing page. The first item in the navigation menu becomes a users' landing page by default. If your organization has Chatter enabled, and you haven't customized the navigation menu to change the first item in the menu to something else, the user's Feed will be their landing page.


The Feed

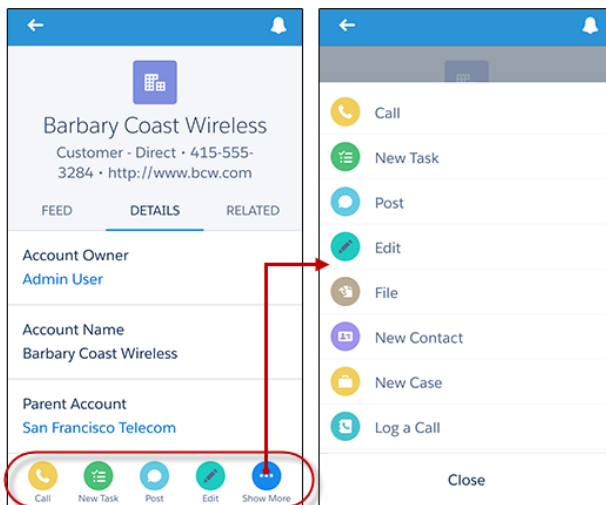
The Chatter feed shows users their updates, updates to records and people they follow, and updates in groups they follow. Tapping a feed item displays all of the item's details. Pulling down on the feed reveals the search bar (1), sort and filter options (2), the feeds drop-down menu (3), and feed items (4).



From the feed, record pages, and from elsewhere in Salesforce, users access actions from the action bar.



The Action Bar and Menu

Depending on which feed or record page users are viewing, they see different actions in the action bar and action menu. From the feed, for example, they see a set of global actions. From a record page, however, they see a mix of productivity actions, standard and custom buttons, standard Chatter actions such as Post and File, and global and object-specific actions that are assigned to the layout for that record type. Users can tap  from the action bar to open the action menu, which contains the full set of actions that are available for the object.

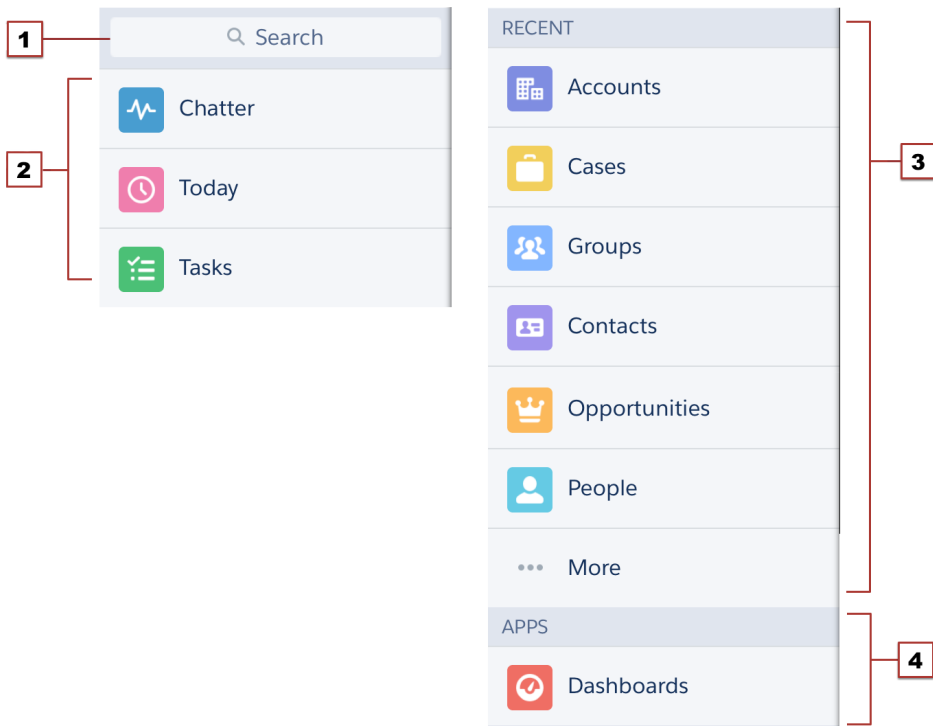


We'll go over creating and customizing actions in [Using Actions in the Salesforce App](#) on page 45.

Salesforce App Navigation Menu

Anywhere users see , they can tap it to access the navigation menu. If a user doesn't see , they can swipe left to right on the header bar to open the navigation menu.

What your users see in the menu is determined by how you, as the administrator, have configured it, what's available in your organization, and what users have access to, based on their user permissions and profile.



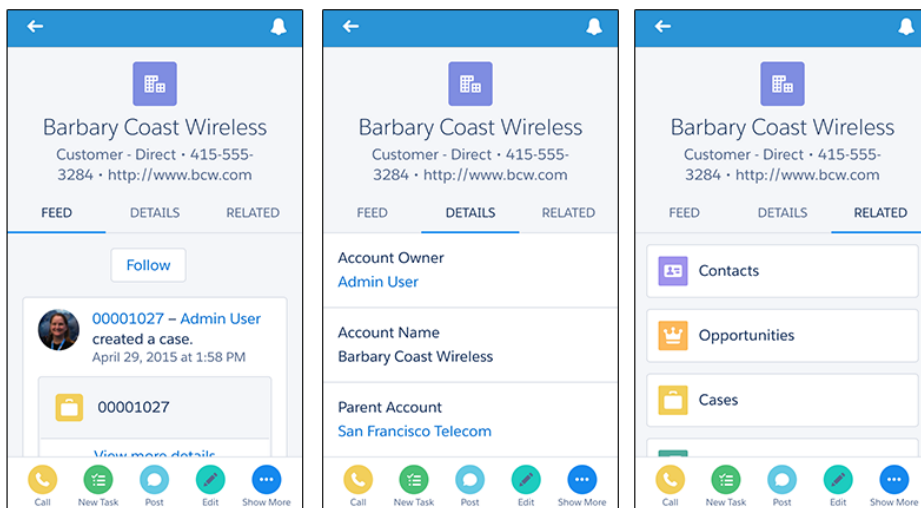
1. Search box
2. Menu items—any items you place above the Smart Search Items element when you customize the navigation menu
3. Smart Search Items—includes a set of recently-searched objects in the Recent section and a larger set of supported objects under the More link
4. Apps section—contains any items you place below the Smart Search Items element

From the navigation menu, users can access the feed, objects, apps, tasks, notes, and any other item you've added to the menu. We'll go over the components of the navigation menu in more detail in [About the Salesforce Navigation Menu](#) on page 24. But for now, let's take a look at records.

The Record View

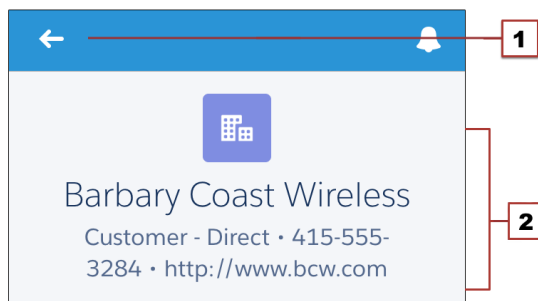
The record view is made up of the record feed, detail, and related information pages, which your users can swipe left and right to see. If your organization doesn't have Chatter enabled, the record view only includes the detail and related information pages.

Chapter 1 Introduction




At the top of each record page is the record highlights area. The icon for standard objects is predefined in Salesforce, and you can select the icon for a custom object using the custom object's tab style.

You can customize the fields displayed in the record highlights section by using compact layouts, which we'll look at in [About Compact Layouts](#) on page 39.



1. Back arrow—returns the user to the previous page
2. Record highlights—displays the first four fields that are assigned to the compact layout for the object

What else do I need to know?

From the top of most pages, users can access their notifications by tapping .

Users can create a new record by tapping **New** at the top of recent object pages, search pages, and related list pages. They can also create and update records by using actions in the action bar.

What about the Other Mobile Apps?

Wondering how the Salesforce app relates to the other Salesforce mobile products?

- SalesforceA gives administrators mobile access to essential organization management tasks. Use it to edit, unlock, freeze, and deactivate user accounts, reset passwords, and assign permission sets.

For more detailed information about the full suite of Salesforce mobile apps, see “Salesforce Mobile Product Comparison” in the Salesforce Help.

CHAPTER 2 About This Book

In this chapter ...

- [Who Is This Book For?](#)
- [How Do I Begin?](#)
- [About the Sample Scenario](#)
- [About Acme Wireless](#)

This book introduces you to both the declarative (point-and-click) and the programmatic (code-based) features of Salesforce.

To help you get familiar with the different pieces that make up the Salesforce Platform, and to show you how you can optimize existing features—such as Visualforce pages and actions—for the Salesforce mobile experience, this book walks you through the process of enhancing an existing organization to make it mobile-ready and mobile-friendly.

Who Is This Book For?

This book is broken up into two major sections. The first, *Salesforce App Administration*, is aimed at administrators, and takes you through the declarative Salesforce tools in Setup, where you can point-and-click your way through getting your organization ready for the Salesforce mobile experience. This includes how to optimize your page layouts for mobile, customize the navigation menu, create actions, and set up mobile notifications.

The second section, *Developing for the Salesforce App*, is for advanced administrators and developers who are comfortable working with code. To fully understand its chapters, you should be familiar with Visualforce and XML. We'll walk through optimizing your Visualforce pages for mobile and creating custom actions.



Tip: Point-and-click admins, don't let this deter you! We include code samples in most places, so even if you're not an experienced developer, you can still try the steps in each chapter and get a feeling for what can be done with Salesforce.

How Do I Begin?

It's up to you! You could begin by pointing-and-clicking your way through [Configuring the Salesforce App](#) and working all the way through [Using Actions in the Salesforce App](#). Then, put your developer hat on and create custom actions or add canvas apps to further enhance your users' Salesforce experience.

If you're a seasoned developer, you could jump into the deep end first with the [Welcome to Salesforce Platform Development](#) chapter.

About the Sample Scenario

The sample scenario for this book builds on the sample Warehouse data and code created in the *Force.com Workbook*. We took that data set and added some extras. We'll use what was built there as a launching point, then add more to bring our sample organization into the mobile world of Salesforce.

To do this, we'll walk through the steps as if we were someone with administrator privileges at a make-believe company called Acme Wireless.

About Acme Wireless

Let's find out a little bit about our fictional company.

Acme Wireless is a large company that repairs devices such as mobile phones, tablets, and gaming consoles. The company has a number of brick-and-mortar locations where customers can drop off devices for repair. In addition, these storefronts sell device accessories like tablet covers, mobile phone covers, power cords, rechargers, and so on.

Acme Wireless maintains a central warehouse where all the repair parts and accessories are stored. The storefront locations order parts from the warehouse so that they can keep some inventory on hand. When they need a special part that's not in stock, storefronts can special order it from the warehouse.

Acme Wireless is also expanding its repair services by doing on-site service. Mobile technicians will go to various customer locations to provide on-site service, including personal residences, hotels, small business offices, and conference centers.

How Acme Wireless Uses Salesforce

Acme Wireless uses Salesforce to track customers. These are often individuals who visit the storefronts, but can also be small businesses that have contracted with Acme Wireless for device support. Acme Wireless also uses Salesforce to track merchandise items and inventory in the warehouse, as well as to manage its billing and invoicing. They use two custom Web applications: one to track orders and process merchandise for shipment and one to track delivery of shipments to storefront locations.

Employees at Acme Wireless's storefronts and the main office use Chatter internally to communicate about inventory levels, customer accounts, and orders.

How Acme Wireless Wants to Use the Salesforce App

Acme Wireless wants to use the app to leverage its existing Salesforce organization and enable mobile technicians to access customer and merchandise data. The technicians should be able to see all their repair tickets for the day, locate a customer, look up inventory for any parts needed, order parts, check the status of orders, and so on.

Acme Wireless also wants to enable their truck drivers, delivering products from the warehouses to the storefronts, to track and update their deliveries for the day without having to use a separate app. They also want to give the warehouse workers the ability to track customer orders and process them for shipping.

Acme Wireless also wants to enable integration with legacy Web applications for order management.

CHAPTER 3 Setting Up Your Work Environment

In this chapter ...

- [Install the Enhanced Warehouse Data Model](#)
- [Download Salesforce](#)

To follow along with the exercises in this book, you'll need a Salesforce account and a Developer Edition organization. If you don't have a Developer Edition organization, go to <http://sforce.co/1om1gHf> and sign up for a free Developer Edition account. Developer Edition is a fully functional version of Salesforce that you can use to develop Salesforce apps. Since it's free, there are limits on the amount of users, bandwidth, and storage you're allowed, but it includes all the features in Salesforce.

After that, you'll need to install the enhanced Warehouse data model into your organization, and then download Salesforce, if you haven't already.

Install the Enhanced Warehouse Data Model

To prepare your developer organization for the exercises in this book, you need to import the Warehouse data model. You might be familiar with the Warehouse app if you've gone through the tutorials in the *Lightning Platform Workbook*. We took the Warehouse data from that guide and added a few extra things to it to help show you what Salesforce can do.

1. Go to www.salesforce.com and log in to Salesforce using your Developer Edition credentials.
2. Open a new browser tab or window, and navigate to <https://github.com/forcedotcom/Salesforce1-Dev-Guide-Setup-Package>.
Do this in the browser that you logged in to your developer organization with.
3. Open the README file.
4. Click the link in the README file.
This is the installation link for the enhanced Warehouse data package. You should be taken directly into your development organization to the Package Installation Details page.
5. Click **Install**.
6. Wait for the installation to finish.
7. From the Lightning Platform app menu, select Warehouse.
8. Click the Data tab.
9. Click **Create Data**.

All right! The last step is to download Salesforce, then we'll be ready to roll.

Download Salesforce

If you've already downloaded Salesforce, you can skip this step.

1. Go to www.salesforce.com/mobile/, and download Salesforce for your device.
You may be prompted to create a security PIN.
2. Open Salesforce.
3. Log in using your developer organization credentials.

SALESFORCE APP ADMINISTRATION

CHAPTER 4 Configuring the Salesforce App

In this chapter ...

- [Defining Which Users Can Use the Salesforce App](#)
- [About Notifications](#)
- [Try It Out: Enable Notifications](#)
- [About Offline Access in the Salesforce App](#)

The Salesforce app is automatically enabled for all organizations, except those that have auto-enabling turned off.

The app doesn't require much configuration at the beginning, but before your users get started, you should:

1. Define which users can access the Salesforce app.
2. Enable notifications.

Since we're in a developer organization, we don't need to worry about enabling users. Review the information about that in the next section, then we'll get started by enabling notifications.

Defining Which Users Can Use the Salesforce App

 **Important:** This information is for reference only. We won't be enabling users in this book, but this step is important when configuring the Salesforce app in your production organization.

Downloadable Apps

Salesforce for Android and Salesforce for iOS are connected apps. As a result, you can control the users who have access to the apps, as well as other security policies. By default, all users in your organization can log in to Salesforce for Android and iOS.

You can control security and access policies for Salesforce for Android and Salesforce for iOS using settings components that are installed from the managed Salesforce connected apps package. These components need to be installed in Salesforce:

- Salesforce for Android
- Salesforce for iOS

These components are automatically installed when one of your users installs Salesforce from the App Store or Google Play on a mobile device and authenticates with your organization by logging in to the mobile app.

Alternatively, you can manually install the [Salesforce and Chatter Apps connected apps package](#) so you can review and modify the default security and access settings before rolling out Salesforce for Android and Salesforce for iOS to your users.


When the Salesforce connected apps components are installed, they're added to the Connected Apps page. (From Setup, enter *Connected Apps* in the *Quick Find* box, then select the option for managing connected apps.) Here, you can view and edit the settings for each of the apps, including controlling user access with profiles, permissions, and IP range restrictions. An error message is displayed if a restricted user attempts to log in to Salesforce for Android or Salesforce for iOS.

Mobile Browser App

You can control whether users can access Salesforce mobile web when they log in to Salesforce from a supported mobile browser. By default, mobile web is turned on for your organization.

1. From Setup, enter *Settings* in the *Quick Find* box, then select **Salesforce Settings**.
2. Select *Enable the Salesforce mobile web* to allow all users in your organization to access the app. Deselect this option to turn off access to the app.
3. Click **Save**.

When this option is turned on, users who log in to Salesforce from a supported mobile browser are automatically directed to the Salesforce mobile web experience. Logging in from an unsupported mobile browser loads the Salesforce Classic full site, even when this option is selected.

 **Important:** Use of the Salesforce Classic full site in a mobile browser isn't supported. While you can disable Salesforce mobile web for your organization, and individual users can turn off mobile web for themselves, regular use of the full site in a mobile browser isn't recommended. Your users may experience problems that Salesforce Customer Support won't investigate.

It's not possible to access the Lightning Experience full site from any mobile browser.

About Notifications

Notifications let your users know when certain events occur in Salesforce. For example, notifications let users know when they receive approval requests or when someone mentions them in Chatter.

These types of notifications can appear to Salesforce app users.

In-app notifications

In-app notifications keep users aware of relevant activity while they're using the Salesforce app. By tapping the notification bell, a user can view the 20 most recent notifications received within the last 90 days.

If Salesforce Communities is enabled for your organization, users see notifications from all of the communities they're members of. To help users easily identify which community a notification came from, the community name is listed after the time stamp.

Push notifications

Push notifications are alerts that appear on a mobile device when a user has installed the Salesforce for Android and Salesforce for iOS but isn't using it. These alerts can consist of text, icons, and sounds, depending on the device type. If an administrator enables push notifications for your organization, users can choose individually whether to receive push notifications on their devices.

As the first task in our fresh new development organization, let's set up notifications for all the Acme Wireless mobile users.

Try It Out: Enable Notifications

We want all the mobile users in the Acme Wireless organization to receive notifications about events happening in the full Salesforce site, such as approval requests, or when they're mentioned.

1. From Setup, enter *Connected Apps* in the *Quick Find* box, then select **Manage Connected Apps**.
2. If they're not already selected, select both **Enable in-app notifications** and **Enable push notifications**.
3. If you're authorized to do so for your company, select *Display full content push notifications*.
4. Click **Save**.



Note: Enabling in-app notifications is an all-or-nothing process. Either they're on for everyone, or off for everyone. Mobile users can't customize, enable, or disable in-app notifications for themselves.

Now that we've addressed notifications, let's look at offline access in the app.

About Offline Access in the Salesforce App

Offline access is available for Salesforce for iOS and Salesforce for Android users only. We won't be working with the app's offline mode in this book, but this information is important if you have any users who want to take advantage of it.

Your mobile users' productivity doesn't have to stop when there's no connectivity. When you enable caching and Offline Edit, users can keep working, unimpeded by a subway commute, FAA regulations, capricious cellular signals, or bunker-style buildings. Offline access is available for Salesforce for Android and Salesforce for iOS. The beta version of Offline Edit requires version 10.0 of Salesforce for Android or Salesforce for iOS.

Caching in the Salesforce app is enabled the first time someone in your org installs Salesforce for Android and Salesforce for iOS.

Salesforce Data / Salesforce App Element	Available for Offline Viewing	Available to Create, Edit, or Delete Offline (Beta)
Navigation Menu	Yes	n/a
Action Bar	Yes	Edit action: Yes Delete action: Yes Other actions: No
Global Search	Previous search results from current session	n/a
List Views	If viewed in current session	No

Salesforce Data / Salesforce App Element	Available for Offline Viewing	Available to Create, Edit, or Delete Offline (Beta)
Records for Recent Objects	Yes, recently accessed records for the first five objects (excluding Files) in the Recent section of the Salesforce app navigation menu	Yes, recently accessed records for the first five objects (excluding Files) in the Recent section of the Salesforce app navigation menu
Records for Other Objects	If viewed in current session	If viewed in current session
Related Records	If viewed in current session	If viewed in current session
Salesforce Today	Main page and mobile event records, if viewed in current session	No
Salesforce Events	If viewed in current session	Create: No Edit and Delete: If viewed in current session
Tasks	Most recently accessed tasks from the first page of My Tasks list only	Most recently accessed tasks from the first page of My Tasks list only (The simplified New Task form must be disabled)
Notes	If viewed in current session	Create: Yes Edit: If viewed in current session Delete: No
Files	If viewed in current session	No
Dashboards (Enhanced Charts)	Most recently accessed only	No
Dashboards (Legacy Charts)	No	No
Feeds, Groups, and People	If viewed in current session	No
Notifications	If viewed in current session	n/a
Approvals (submit, approve, or reject)	No	No
Visualforce pages	No	No

Chapter 4 Configuring the Salesforce App

Salesforce Data / Salesforce App Element	Available for Offline Viewing	Available to Create, Edit, or Delete Offline (Beta)
Canvas Apps	No	No
Lightning pages	No	No
Salesforce App Settings	Yes	n/a

A Salesforce app session is the time between logging in and logging out of the app. Switching away from Salesforce app doesn't end the session as long as the user doesn't log out.

All right! We've addressed notifications and offline access, now let's look at the navigation menu.

CHAPTER 5 Customizing the Salesforce App Navigation Menu

In this chapter ...


- [About the Salesforce Navigation Menu](#)
- [How the Navigation Menu Works](#)

Before you can send your users out on their mobile adventure, they need a map to point the way to their destination.

The Salesforce app navigation menu is that map. And it's up to you to draw it for them.


Help your mobile users get work done faster and more easily by configuring which items appear in the navigation menu and in which order.


About the Salesforce Navigation Menu

Anywhere your users see the  icon, they can tap it to access the menu. As an administrator, you can customize what the menu contains.

What You Can Include

Depending on how your organization is configured and what they have access to, your users could see multiple items in their navigation menu.

Menu Item	Description
Approval Requests	Displays a list of the user’s pending approvals. Users can tap an approval item and approve or reject it from within Salesforce. Available in Salesforce for iOS and mobile web.
Canvas apps	Appears for organizations that have enabled a canvas app to appear in the navigation menu.
Chatter	The user’s main feed. Appears for organizations that have Chatter enabled.
Dashboards	Availability depends on edition and user permissions. If you don’t add this item to the navigation menu, dashboards are automatically included in the set of Smart Search Items instead and the Dashboards item is available from the Recent section.
Events	Lists events owned by the user, that the user created for him- or herself, and that the user or a user’s groups are invited to. If you don’t add this item to the navigation menu, events are automatically included in the set of Smart Search Items instead and the Events item is available from the Recent section.
Forecasts	<div>Displays the Forecasts app, a helpful tool for every member of a sales team to keep track of forecast data and monitor progress towards quota. Available in Salesforce for iOS only.</div> <div> Note: Your org must have Collaborative Forecasts enabled. If your org uses Customizable Forecasts, the Forecasts item isn’t available to add to the navigation menu.</div>
Groups	Appears for organizations that have Chatter enabled. If you don’t add this item to the navigation menu, groups are automatically included in the set of

Menu Item	Description
	Smart Search Items instead and the Groups item is available from the Recent section.
Lightning component tabs	Only custom Lightning components that have a Lightning component tab associated with them can appear in the navigation menu.
Lightning pages	Custom app pages.
News	Displays the News app, a one-stop place for news and other insights about the user's accounts, contacts, leads, and opportunities.
Notes	Displays the Notes app. If you don't add this item to the navigation menu, notes are automatically included in the set of Smart Search Items instead and the Notes item is available from the Recent section.
Paused Flow Interviews	Displays a list of flow interviews that the user paused. An interview is a running instance of a flow. Users can tap an interview and resume or delete it. Available in Salesforce mobile web only.
People	Appears for organizations that have Chatter enabled. If you don't add this item to the navigation menu, profiles are automatically included in the set of Smart Search Items instead and the People item is available from the Recent section.
Reports	Availability depends on edition and user permissions. If you don't add this item to the navigation menu, reports are automatically included in the set of Smart Search Items instead and the Reports item is available from the Recent section.
Smart Search Items	<p>Adds standard and custom Salesforce objects to the Recent section in the menu. This item also adds a set of the user's recently accessed objects to the Recent section and adds the More item so users can access all the objects they have permission to use and that are supported. If you don't include this item in the navigation menu, users can't access any objects on the navigation menu.</p> <p> Note: Smart Search Items is required for users to get search results in Salesforce for Android. Users of Salesforce for iOS and the Salesforce mobile web are able to search for records if this option is omitted from the navigation menu.</p>

Menu Item	Description
	If your iOS downloadable app users don't yet have a history of recent objects, they initially see a set of default objects in the Recent section. For Salesforce for Android and Salesforce mobile web, the default set of objects match the Lightning Experience Navigation Bar that the admin has configured in the Lightning App. If the user doesn't have access or permissions to the Lightning App, they also see a default set of objects until the user's most frequently used objects are determined. It can take up to 15 days for the objects that users work with regularly in both the Salesforce app and the full Salesforce site to appear in the Recent section. To make objects appear under Recent sooner, users can pin them from the search results screen in the full site.
Tasks	Lists of a user's open and closed tasks and tasks that have been delegated. If you don't add this item to the navigation menu, tasks are automatically included in the set of Smart Search Items instead and the Tasks item is available from the Recent section.
Today	An app that helps users plan for and manage their day by integrating mobile calendar events with associated Salesforce tasks, accounts, and contacts. The app also allows users to instantly join conference calls, quickly log notes about events, and more. Available in Salesforce for Android and iOS only.
Visualforce page tabs	Only Visualforce pages with the <code>Available for Lightning Experience, the Salesforce app, and Lightning Communities</code> checkbox selected will display in the Salesforce app.

We won't get into Visualforce pages in these exercises, but to learn more about them and how they work in Salesforce, see [Extending the Salesforce App with Visualforce Pages](#) on page 79.

Try It Out: Configuring the Salesforce App Navigation Menu

1. From Setup, enter *Navigation* in the Quick Find box, then select **Salesforce Navigation**. Some items are automatically added to the menu.

The order in which you put the items in the Selected list is the order that they display in the navigation menu. Also, the first item you put in the list becomes your users' Salesforce app landing page. The Acme Wireless mobile technicians will probably be using the Today and Tasks menu items the most, so we want to put those at the top.

2. Using the **Up** or **Down** arrows, arrange the top items in the Selected list like so:


- Chatter
- Today
- Tasks
- Smart Search Items
- Dashboards

Now whenever a mobile technician logs in to Salesforce, the Today page will be the first thing they see.

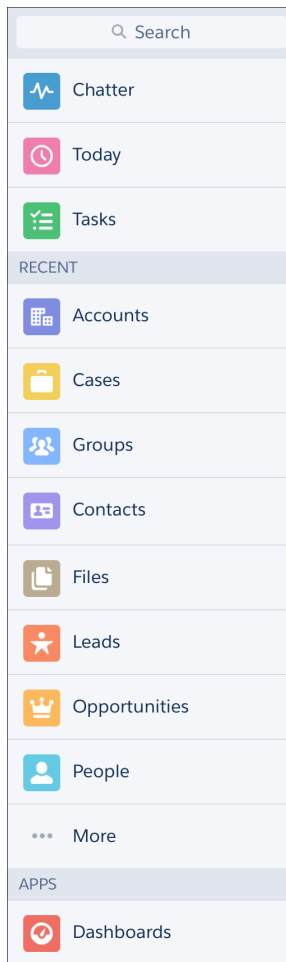
3. Click **Save**.

Let's go look at our changes.

Test Out the Salesforce App Navigation Menu

1. Open Salesforce on your mobile device.
2. Tap  to access the navigation menu.
3. Pull down and release the navigation menu to refresh it.
You should see the Chatter, Today, Tasks items at the top, and then the Recent section, which is created from the Smart Search Items element.
4. Scroll down to the Apps section.

This section contains any menu item that was put below the Smart Search Items element, whether it's really an "app" or not.



Now that we've addressed the navigation menu, let's look at configuring our data for mobile.

How the Navigation Menu Works

- The first item in the Selected list becomes your users' Salesforce app landing page.
- You can't set different menu configurations for different types of users.
- When organizing the menu items, put the items that users will use most at the top. The Smart Search Items element can expand into a set of eight or more menu items and it might end up pushing other

elements below the scroll point if you put it near the top of the menu. Anything you put below the Smart Search Items element appears in the Apps section of the navigation menu.

- Before you can include Visualforce pages, Lightning pages, or Lightning components in the Salesforce app navigation menu, create tabs for them. From Setup, enter *Tabs* in the *Quick Find* box, then select **Tabs**.
- Anything represented by a tab in Salesforce—such as standard and custom objects, Visualforce pages, the Chatter feed, People, or Groups—is visible for a user in the Salesforce app menu, based on the user's profile settings. For example, if a user is assigned to a profile that has the Groups tab set to Tab Hidden, the user won't see the Groups menu item in the Salesforce app, even though an administrator has included it in the menu.

Some objects are excluded from the Recent section in the navigation menu, even if you accessed them recently.


- People, groups, notes, dashboards, reports, tasks, and events, if these items were added directly to the navigation menu
- List views, which are shown only on object home pages, not in the navigation menu
- Objects that aren't available in the Salesforce app, including any objects that don't have a tab in the full Salesforce site

About the Dashboards, Reports, Notes, Tasks, Events, Groups, and People Menu Items

If you opt to add the Dashboards, Reports, Notes, Tasks, Events, Groups, or People items to the Selected list for the navigation menu, these items appear in the order you specify, just like Today and other individual menu items.

If you don't add these items to the navigation menu, however, they're automatically included in the Smart Search Items set of objects and show up in the Recent section of the navigation menu.

Pin an Object into the Recent Section

Users can customize the objects that appear in the Recent section of the navigation menu. If they search for an object in the full site, they can hover their mouse over the object name and click  to pin it to the top of the search results. The order of pinned objects in the full site determines the order of the objects that stick to the top of the Recent section of the navigation menu. However, pinning objects in this way causes the unpinned objects remaining in the Recent section to drop into the **More** element.

CHAPTER 6 Customizing How Your Data Shows Up in the Salesforce App

In this chapter ...

- [How Page Layouts Work in the Salesforce App](#)
- [About Compact Layouts](#)

We've done the basic configuration for the Salesforce app; now it's time to consider how we can optimize things in the full Salesforce site to give our users the best possible mobile experience. First, we'll customize how our Salesforce data shows up when presented in a mobile context.

Two factors affect how information is displayed in the Salesforce app. One has been around for a while: page layouts. The other is newer: compact layouts. You'll learn about both in this chapter.

How Page Layouts Work in the Salesforce App

Use the enhanced page layout editor to customize the layout of an object's record detail pages, configure actions, and adjust which fields and related lists appear in the Salesforce mobile app.

In the Salesforce mobile app, page layouts drive these areas of the mobile experience.

Record Related Information and Detail Pages

When you view a record in the mobile app, you see the fields, Visualforce pages, and related lists that are based on the record type and the user's profile. Related lists show up as single-line cards containing the name of the page or related list. Tapping the related list card displays its details.

Mobile Cards

You can add expanded lookups, components, canvas apps, and Visualforce pages to the Mobile Cards section of your page layout to have them show up as mobile cards in the mobile app. The elements you place in this section don't show up on a record's detail page in the full Salesforce site. They appear only on the record's related information page in the mobile app.

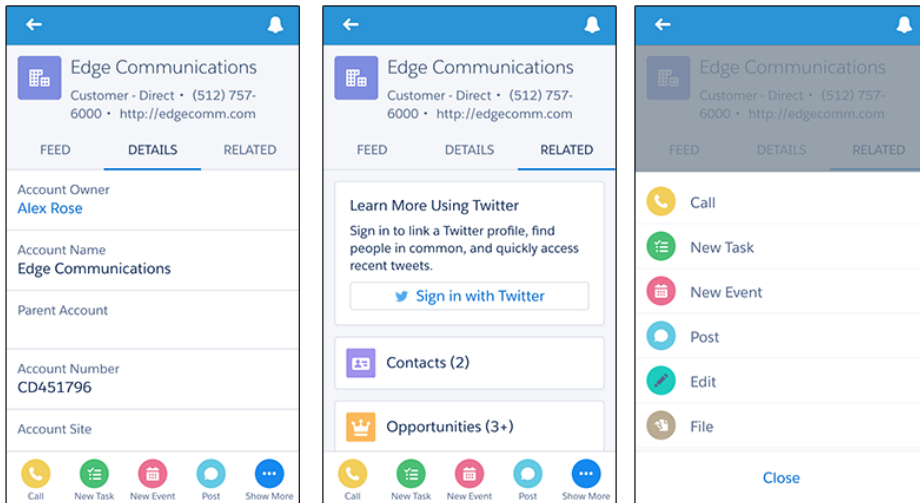


Note: In organizations that are created after Spring '14, the Twitter component is added by default to the Mobile Cards section of page layouts for objects that support it.

Actions

Actions in the Salesforce Mobile and Lightning Experience Actions section of a page layout appear in the action bar and action menu on the object's record pages.

Here are the record detail page, related information page, and action menu for a sample account, Edge Communications:




We'll cover actions in a later chapter. For now, let's focus on record pages and mobile cards.

Rethinking Your Page Layouts for Mobile

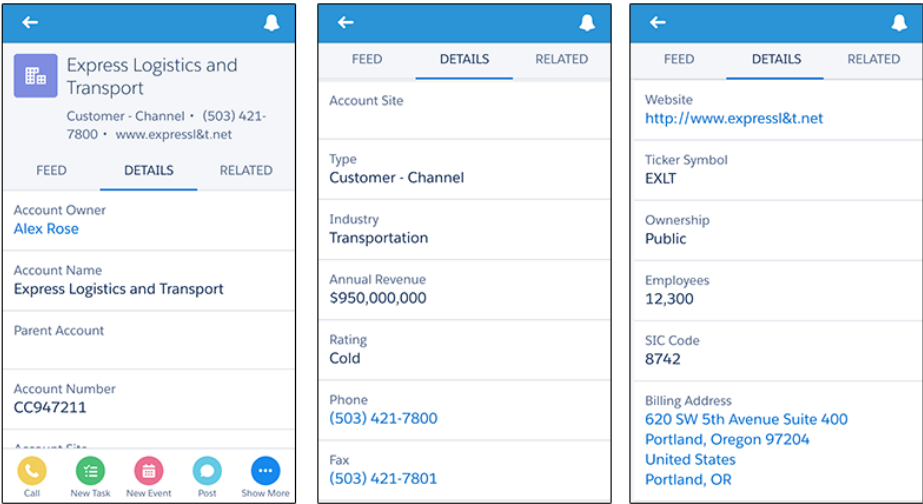
Page layouts containing dozens of fields and lots of related lists might be manageable when viewing records on a computer screen, but on a small mobile device, viewing that same record can be overwhelming. People accessing information using a mobile device are looking for a quick way to get what they need, and making your users sift through hundreds of fields and related lists just doesn't make sense.

For example, in our Warehouse data model, our custom page layout has 32 standard and custom fields. That may not seem like many, but in a mobile context, fields add up quickly. In the full Salesforce site, an account record detail page using the Warehouse Schema Account Layout looks like this:

Chapter 6 Customizing How Your Data Shows Up in the Salesforce App

Account Detail		Edit	Delete	Include Offline
Account Owner	 Admin User [Change]	Rating	Cold	
Account Name	Express Logistics and Transport [View Hierarchy]	Phone	(503) 421-7800	
Parent Account		Fax	(503) 421-7801	
Account Number	CC947211	Website	http://www.expressl&t.net	
Account Site		Ticker Symbol	EXLT	
Type	Customer - Channel	Ownership	Public	
Industry	Transportation	Employees	12,300	
Annual Revenue	\$950,000,000	SIC Code	8742	
Location				
Business Hours				
Time Zone				
Billing Address	620 SW 5th Avenue Suite 400 Portland, Oregon 97204 United States Portland, OR	Shipping Address	620 SW 5th Avenue Suite 400 Portland, Oregon 97204 United States	
Customer Priority	Medium	SLA	Platinum	
SLA Expiration Date	5/14/2013	SLA Serial Number	4724	
Number of Locations	150	Upsell Opportunity	Maybe	
Active	Yes			
Created By	Admin User , 10/16/2013 2:25 PM		Last Modified By	Admin User , 10/16/2013 2:25 PM
Description	Commerical logistics and transportation company.			
Custom Links	Billing			
Edit Delete Include Offline				

In the Salesforce app, the same account detail page looks like this:



We only show three here, but there were five pages of scrolling, and that’s from a page layout with only 32 fields! If you were a mobile user trying to find specific fields in a record detail with dozens of fields on

your phone, you'd have to scroll... and scroll... and scroll. It's not the best user experience and it's definitely not good for your users' productivity.

You have two options for handling page layouts for your mobile users: re-engineer your existing page layouts, or create new page layouts that are mobile-friendly from the outset.

We'll look at both options. First, we'll walk through creating a fresh mobile-friendly page layout, then we'll discuss tips and tricks for optimizing existing long layouts for a mobile audience.

Try It Out: Create a Custom Page Layout for the Mobile Technicians Profile

Users like the mobile technicians at Acme Wireless will spend the majority of their time accessing Salesforce from a mobile device. We can create a streamlined, mobile-optimized page layout assigned to the Mobile Technician profile, with only the items they need when on-site, and, voilà! Instant productivity boost.

In addition, using the specialized Mobile Cards section of the page layout, we can enhance the record's related information page by adding Visualforce pages and lookup cards.

1. From the object management settings for accounts, go to Page Layouts.
2. Click **New**.
3. Leave the Existing Page Layout drop-down list set to `–None–`.
We want to start with a clean slate for this page layout, so we're choosing not to clone an existing page layout.
4. Enter `Account Mobile Technician Layout` in the `Page Layout Name` field.
5. Click **Save**.
Required fields and "Always on Layout" fields are pre-populated onto the page layout. We just need to add a few more that are pertinent to the mobile technicians.
6. Drag these fields from the palette into the Account Detail portion of the page, below the existing fields.
 - Shipping Address
 - Business Hours
 - Phone
7. Click the Visualforce Pages category in the palette and drag Account Location into the Mobile Cards section.

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Account Location is a preconfigured Visualforce page that shows the user the location of the selected account on a Google map. In Salesforce, this will show up as a mobile card on the account record related information page.




Note: Only Visualforce pages with the `Available for Lightning Experience`, the `Salesforce app`, and `Lightning Communities` checkbox selected will display in the Salesforce app. Mobile-enabled Visualforce pages show up as slightly differently colored elements in the palette than their non-mobile-enabled counterparts. Hovering your mouse over a Visualforce page element in the palette shows whether the Visualforce page is mobile-enabled.

For more detailed information about using Visualforce in the Salesforce app, see [Extending the Salesforce App with Visualforce Pages](#) on page 79.

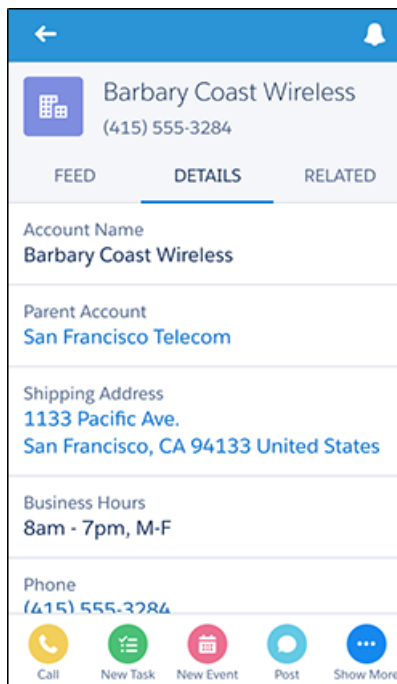
8. Click the Expanded Lookups category and drag `Parent Account` into the Mobile Cards section, above the Account Location mobile card.
`Parent Account` is a lookup field, and putting it into the Mobile Cards section makes it display as a related lookup card on the account's related information page.
9. Click the Related Lists category and drag the Cases and Contacts related lists to the Related Lists section.
Related lists show up on the record related information page in the Salesforce mobile app. When the mobile technicians navigate to an account's related information page, they'll see preview cards for the related lists that they can tap to get more information about the cases and contacts for that location.
10. Click **Save**.
11. Click **No** when asked if you want to override users' customized related lists.
12. Click **Page Layout Assignment**.
13. Click **Edit Assignment**.
In this step, you would normally assign the new mobile-optimized page layout to a user profile for the mobile technicians. However, since you're logged in as a system administrator, we're going to have you assign it to the System Administrator profile instead.
14. Click the System Administrator line item to select it.
15. Select Account Mobile Technician Layout from the Page Layout to Use drop-down list.
The System Administrator profile should now be assigned to the Account Mobile Technician Layout.
16. Click **Save**.

Now let's check out what we did.

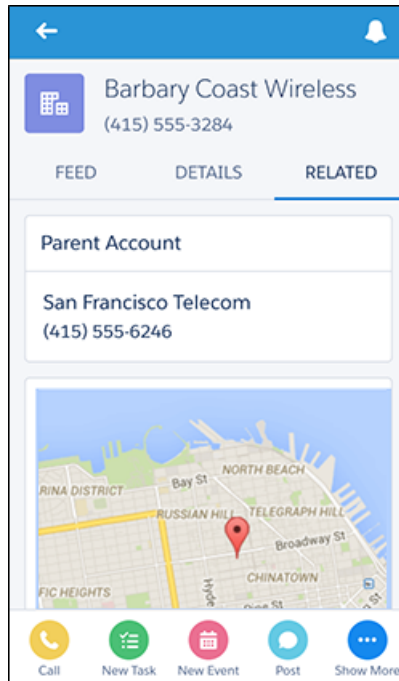
Test the Page Layout

1. Open Salesforce on your mobile device and log in.
2. Tap  to access the navigation menu.
3. In the Recent section, tap **Accounts**. You may have to tap **More...** to find it.
4. Tap the search bar.
5. Enter *Barbary*.
6. Tap **Search**.
7. Tap **Barbary Coast Wireless**.

You're on the Barbary Coast Wireless record detail page, which is the default view when accessing a record. Scroll down a bit, and you should see the same fields we added to the page layout, in the same order.



8. Tap **Related** to get to the related information page.
You should see the Parent Account lookup card and the preview card for the Visualforce page first.



Scroll down and you should also see the related lists that we added to the page layout. Tap a related list to see its details.

Now that we've created this specialized page layout and added the fields our mobile technicians will need, their jobs will be much easier when they go on site. When they visit an account record's related information page, they won't have to shuffle through a long list of unnecessary fields to find the ones they really want. And, since we added the Visualforce page as a mobile card, they'll be able to see the location of an account on a Google map.

In the [Actions chapter](#), we'll enhance this page layout with special actions we've created just for our mobile technicians. But for now, let's go over some recommendations for paring down existing page layouts to make them more mobile friendly.

Tips for Optimizing Page Layouts for Mobile



In many cases, creating a new mobile-only page layout may not make sense. Here are some tips and tricks to making your existing page layouts more mobile friendly.

When optimizing a page layout, consider:

- What are the important things to see at a glance?

- What are the important moments for your users when they're working in the Salesforce mobile app?
- What actions or processes can you automate so that your users don't have to manually do them?

The Key: Organize and Minimize Fields

- Use sections to organize information logically, putting the most important things at the top of the page so they show up first. Your users don't want to search for fields individually. Organizing similar fields in sections will help your users find what they need. They can then easily scroll down the page to the section they care about.
- For accounts, contacts, and leads, you don't need to put phone or email fields near the top. They're already quickly accessible via the  and  icons on each record page's action bar.
- You don't need to keep fields in one column, as the page will render dynamically based on the device that's viewing it. A phone will reorder the fields into a single column, and a tablet or desktop will show two columns.
- Put the most important fields into the compact layout—which drives record highlights and record preview cards in the mobile app—so they're available right up front, and so your mobile users don't have to drill into the record detail. We'll get into compact layouts in more detail soon.
- Keep the number of required fields to a minimum. Setting a field to required means it must appear on the detail page of all page layouts, so consider whether each field is truly required. You might have to convince stakeholders that a field isn't actually necessary for a record to be saved.
- If available in your organization, think about using record types so that fields that aren't common to all records don't have to appear on all records.
- To reduce the number of fields on a screen, consider using default values for new records instead of having the user enter the data.

We've gone over page layouts. Now let's get into another kind of layout, created especially for mobile: the compact layout.

About Compact Layouts

In the last section, we learned how page layouts affect the look and content of records in the Salesforce app. But page layouts aren't the only thing used to help customize how your Salesforce data appears in a mobile environment.

A compact layout displays a record's key fields at a glance in both the Salesforce mobile app and Lightning Experience.

In the full Salesforce site, a compact layout determines which fields appear in the Chatter feed item that appears after a user creates a record with a quick action.

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In the Salesforce mobile app, the first four fields that you assign to a compact layout appear in:

- An object record's highlights area
- Expanded lookup cards on a record's related information page

If a user doesn't have access to one of the fields that you assign to a compact layout, the next field on the layout is used.

The first four fields you assign to your compact layout populate the record highlights section at the top of each record view in the Salesforce app, so we'll put the fields we think our mobile technicians most want to see into the list.

Creating and customizing compact layouts for objects isn't required for the Salesforce app, because system defaults are provided out of the box. However, we recommend using compact layouts to put important fields into object record headers—and elsewhere—to help your mobile users get the information they need quickly. Let's give it a try.

Try It Out: Create a Compact Layout

As with page layouts, there are separate compact layouts for each object. By default, each object derives its record highlight fields, preview cards, and action-related feed items from the predefined set of fields in the object's read-only, system default compact layout. You can create custom compact layouts on an object-by-object basis. After you create one or more custom compact layouts, you set one as the primary compact layout for the object. The primary compact layout is then used as the new default for that object.

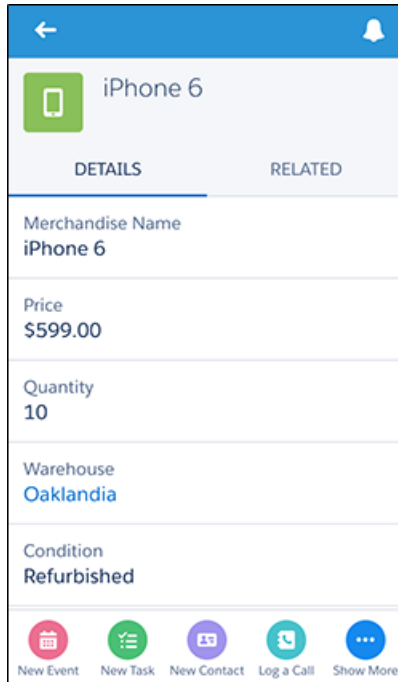
We'll create a custom compact layout, and then set it as the primary compact layout for the Merchandise object. Our new compact layout is used to render important merchandise record fields first in Salesforce for the Acme Wireless mobile technicians.

Before we can see compact layouts in action, though, we need a Merchandise record in our organization. Let's quickly create one.

1. From the app menu, select Warehouse.
2. Click the Merchandise tab.
3. Click **New**.
4. For *Merchandise Name*, enter *iPhone 6*.
5. For *Price*, enter *599*.
6. For *Quantity*, enter *10*.
7. Click the *Warehouse* lookup, then select **Oaklandia**.
8. Set the Condition to Refurbished.
9. Click **Save**.

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Currently, the Merchandise object uses its system default compact layout, which only has the Merchandise Name field assigned. Here's what our iPhone 6 record looks like:



Let's add more fields alongside that "iPhone6" so our mobile users can see more pertinent information right at the top of the Merchandise record pages.

1. Navigate to the Merchandise custom object in Setup. From the Compact Layouts related list, click **New**.
2. In the `Label` field, enter *Customized Compact Layout*.
3. Select these fields for the compact layout, and then click **Add**.

When on site, these are the most important fields for our mobile technicians to see. You can select and add them individually or select them as a group using CTRL-click.


- Condition
- Merchandise Name
- Price
- Quantity

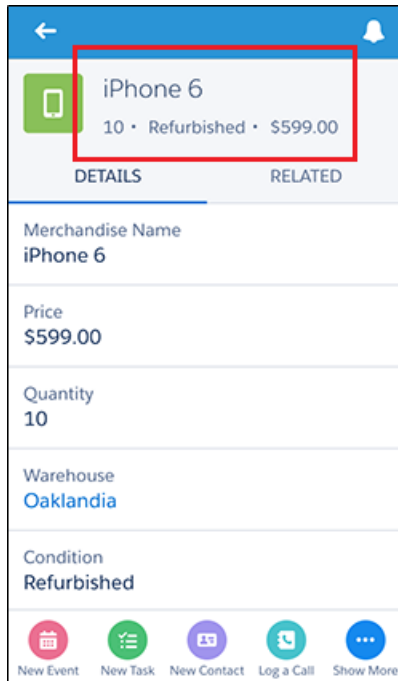
4. Using the **Up** or **Down** buttons, adjust the list so that the fields are in this order: `Merchandise Name`, `Quantity`, `Condition`, `Price`.
5. Click **Save**.
Now we need to set our compact layout as the primary.
6. Click **Compact Layout Assignment**.
You can see that the primary compact layout is set to the System Default here. We need to change that.
7. Click **Edit Assignment**.
8. Select the compact layout you just created to use as the primary compact layout.
9. Click **Save**.

We've customized a compact layout for the Merchandise object. Now let's see what its related information page looks like.

Test the Compact Layout

When you customize a compact layout and assign it as the default, as we just did, the changes are reflected in Salesforce immediately.

1. Open Salesforce on your mobile device.
2. Tap  to access the navigation menu.
3. In the Recent section, tap **Merchandise**. You may have to tap **More...** to find it.
4. Tap the **iPhone 6** item.



As you can see, the record highlights area has the fields from our newly-created custom compact layout. Instead of seeing just the merchandise name, as on the system default layout, the Acme Wireless mobile technicians can now see much more: that there are ten refurbished iPhone 6s in stock at the warehouse, and they cost \$599.00 each.

Tell Me More: Compact Layouts

We've gone over a lot about compact layouts, but here are a few more tidbits about how they work.

Compact layouts support all field types except:

- text area
- long text area
- rich text area
- multi-select picklist

If a user doesn't have access to one of the fields that you assign to a compact layout, the next field on the layout is used.

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Removing a field from a page layout doesn't remove it from the object's compact layout. The two layout types are independent.

Fields that aren't available in the SOAP API don't show up on compact layouts in the Salesforce app.

Compact Layouts and Record Types

If you have record types associated with an object, you can override the object's primary compact layout and assign different compact layouts to some or all of the record types. Each record type can have only one compact layout assigned to it. If you don't set any record type overrides, all record types use the object's primary compact layout by default.

To find out more about compact layouts and record types, see [“Assign Compact Layouts to Record Types”](#) in the Salesforce Help.

CHAPTER 7 Using Actions in the Salesforce App

In this chapter ...

- [Quick Actions](#)
- [Point and Click Your Way to Actions](#)
- [About Action Layouts](#)
- [About Predefined Values in Actions](#)
- [About Custom Actions](#)

As an administrator, you can enable valuable micro-moments for all of your users by creating unique actions. When thinking about what actions you might want to create specifically for the Salesforce app, ask your users what they wish they could do in the mobile context.

For example, an administrator at a food service company could create an "Emergency Order" action that allows their delivery drivers to immediately order extra or missing food items using their mobile phone while still at a customer site. Creating actions for the Salesforce app can drive adoption in your organization and make you a hero to your users!

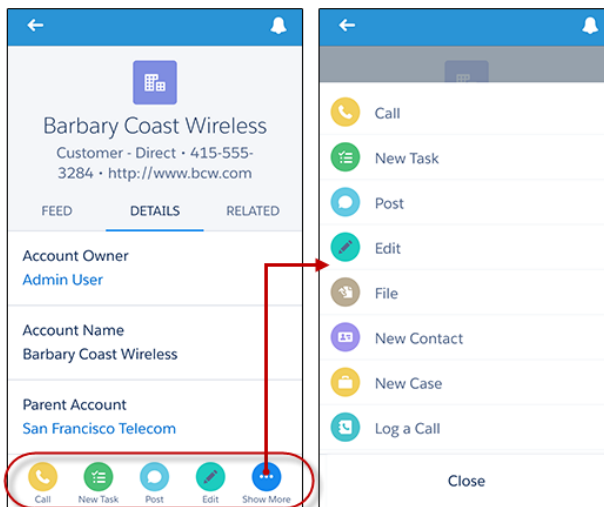
In this chapter, we'll learn about types and categories of actions, how to create and customize them in Salesforce using point-and-click tools, and how they can help mobile users get essential work done while away from the office.

Quick Actions

Create quick actions, and add them to your Salesforce Classic home page, to the Chatter tab, to Chatter groups, and to record detail pages. Choose from standard quick actions, such as create and update actions, or create custom actions based on your company's needs. In addition, actions have their own action layouts, which let you specify which fields are included in the action, and in which order.

Where Do Actions Appear?

In the Salesforce app, actions appear in the action bar and its action menu.



Actions also appear in an action bar on list items such as task lists and related record lists. This gives your mobile users the ability to work with records directly from lists and update records without having to open them. To access list item actions, navigate to the task list or open a related list from an object's related information page. Then swipe left on the desired record.

Object-Specific Quick Actions

Object-specific actions let users quickly create or update records, log calls, send emails, and more, in the context of a particular object. For example, you add an object-specific action on the Account object that creates contacts. If a user creates a contact with that action on the detail page for the Acme account, that

new contact is associated with Acme. You can only add an object-specific action to page layouts for that object.

Global Quick Actions

You can add global quick actions to almost any page that supports actions. Use global actions to let users log call details, create or update records, or send email, all without leaving the page they're on. Global create actions enable users to create object records, but the new record has no direct relationship with other records.



Note: Actions to create records for an object that is the detail object in a master-detail relationship must be object-specific, not global.

Quick Action Types

There are several types of object-specific and global quick actions.

- *Create actions* let users create records—like New Contact, New Opportunity, and New Lead. Global create actions enable users to create object records, but the new record has no direct relationship with other records. Object-specific create actions create records that are automatically associated with related records. They're different from the Quick Create and Create New features on the Salesforce Classic home page, because create actions respect validation rules and field requiredness, and you can choose each action's fields.
- *Update actions* let users make changes to a record.
- *Log a Call actions* let users record the details of phone calls or other customer interactions. These call logs are saved as completed tasks. Object-specific Log a Call actions let users enter notes about calls, meetings, or other interactions that are related to a specific record.
- *Custom actions* invoke Lightning components, flows, Visualforce pages, or canvas apps with functionality that you define. Use a Visualforce page, Lightning component, or a canvas app to create global custom actions for tasks that don't require users to use records that have a relationship to a specific object. Object-specific custom actions invoke Lightning components, flows, Visualforce pages, or canvas apps that let users interact with or create records that have a relationship to an object record.
- Object-specific Send Email actions, available only on cases, give users access to a simplified version of the Case Feed Email action in the Salesforce mobile app. You can use the case-specific Send Email action in Salesforce Classic, Lightning Experience, and the Salesforce mobile app.
- Global *Send Email actions* are supported only in Lightning Experience. You can't add them to the Cases layout or use them with cases.
- *Question actions* enable users to ask and search for questions about the records that they're working with.

Chapter 7 Using Actions in the Salesforce App

For create, log-a-call, and custom actions—which we’ll go over at the end of this chapter—you can create either object-specific quick actions or global quick actions. Update actions must be object-specific.

For a list of supported objects for object-specific and global actions, see "Object-Specific Actions" and "Global Quick Actions" in Salesforce Help.

Action Categories

Actions fall into several different categories. What you see depends on the age and configuration of your org.

Standard Chatter actions

Standard Chatter actions are actions that are included automatically when Chatter is enabled: Post, File, Link, Poll, and, in orgs that use work.com, Thanks. Standard actions can also include any actions that you created for your org using point-and-click methods, such as create or Log A Call actions.

Default actions

Default actions are sets of predefined actions to get you and your users started using actions in your org. Add default actions to publisher layouts to make them available to your users in the full Salesforce site and the action bar in the Salesforce mobile app. Default actions are sets of predefined actions to get you and your users started using actions in your org.

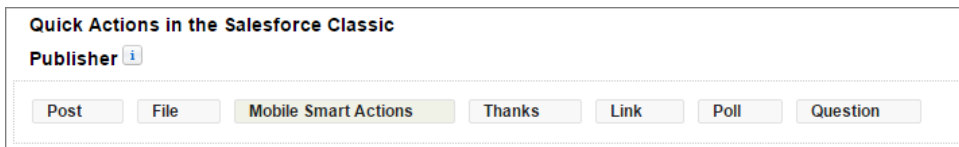
Because our Development org is new, it contains a set of default actions. You can check out the default global actions: From Setup, enter *Global Actions* in the Quick Find box, then select **Global Actions**.

For a list of which default actions appear on which object, see “Default Actions” in the Salesforce Help.

Mobile smart actions

Mobile smart actions are a set of preconfigured actions and are supported on the same list of objects as default actions. However, they appear in orgs created before Winter ’14 and are displayed only in the Salesforce app.

Mobile smart actions appear as a single action element in the page layout editor. In the Salesforce mobile app, the Mobile Smart Actions element expands to distinct create actions that enable users to create records directly from the action bar.



Mobile smart actions are populated with all your org's required fields on the relevant object, regardless of how many fields there are. For example, the New Case action in the mobile smart action bundle includes all required case fields. You can't edit the fields on mobile smart actions. The fields that appear change only if you change which fields on an object are required.

Mobile smart actions don't appear in the full Salesforce site, regardless of which page layouts you add them to. They appear only to users in the Salesforce mobile app.

For a list of what the mobile smart action element on each supported object expands to include, see "Mobile Smart Actions" in the Salesforce Help.

Custom quick actions

Custom quick actions are actions that you create and customize, such as Create a Record, Send Email, or Log a Call actions. Quick actions can also invoke Lightning components, flows, Visualforce pages, or canvas apps with functionality that you define. For example, you can create an action so that users can write comments that are longer than 5,000 characters. Or, you can create an action that integrates a video-conferencing application so that support agents can communicate visually with customers.

We'll touch briefly on custom actions later in [About Custom Actions](#), but you can find out much more about them in the [Adding Functionality with Visualforce Custom Actions](#) chapter.

Productivity Actions

Productivity actions are predefined and attached to a limited set of objects. Productivity actions include Send Email, Call, Map, View Website, and Read News. Except for the Call action, you can't edit or delete productivity actions.

Point and Click Your Way to Actions

In the next set of tasks, we'll create an object-specific action. But that's only the first step. There are a few things we need to do after that to make sure the action shows up where it's supposed to in both the Salesforce app and the full Salesforce site, and that it's optimized for a mobile experience.

These are the steps you need to follow when setting up actions. We'll go through all of them.

1. Create a global or object-specific action.
2. Customize the action's layout, choosing the fields users see when they use it.
3. If you created an object-specific action, add it to one or more of that object's page layouts. If you created a global action, add it to a global publisher layout.
4. Set predefined field values for required fields, where possible.

Let's get started!

Try It Out: Create an Object-Specific Action

Let's give the mobile technicians at Acme Wireless a way to quickly log a case while they're still on site with a customer. If we put a record create action on the Account object with Case as the target object, the technicians can browse to a customer account record on their mobile device. They can also log cases directly from there.

1. In the object management settings for accounts, go to Buttons, Links, and Actions.
2. Click **New Action**.
3. For Action Type, select Create a Record.
4. For Target Object, select Case.
5. For Label, enter *Create a Case*.
6. Click **Save**.

After saving, we're dropped directly into the action layout editor, where we can customize the fields assigned to the action. We'll get to action layouts shortly. But before we do, there's one more thing we need to do: assign the action to an account page layout.

Try It Out: Assign the Action to the Account Page Layout

Before the object-specific quick action can appear in the Salesforce mobile app, you need to add it to a page layout.

1. We're already in the **Buttons, Links, and Actions** area for accounts. Now navigate to Page Layouts.
2. Click **Edit** next to Account Mobile Technician Layout.

This layout is the one you created in the Page Layouts chapter. The Salesforce Mobile and Lightning Experience Actions section is empty, and a message says that Salesforce has predefined the actions on this layout. Because this page layout is for Acme Wireless mobile technicians, we want to customize the actions to match the work the technicians need to do when they're in the field.

3. In the Salesforce Mobile and Lightning Experience Actions section, click **override the predefined actions**.

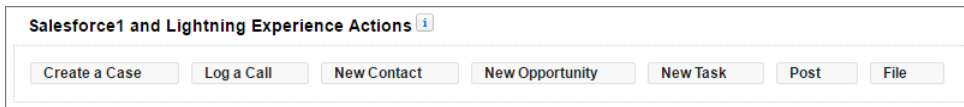


Tip: If you haven't customized the Salesforce Mobile and Lightning Experience Actions section of a page layout, the actions for that object default to a set of predefined actions. If you have customized actions in the Quick Actions in the Salesforce Classic Publisher section, and have saved the layout, the Salesforce Mobile and Lightning Experience Actions section inherits the actions from the Quick Actions in the Salesforce Classic Publisher section, plus any standard or custom buttons present on the layout, when you click to override.

4. Click the Mobile & Lightning Actions category in the palette and then adjust the actions in the Salesforce Mobile and Lightning Experience Actions section to match this list.

- Create a Case
- Log a Call
- New Contact
- New Opportunity
- New Task
- Post
- File

Because the Create a Case action is important to the mobile technicians, we put it first in the list so that they can access it directly from the action bar.



Notice there's also a New Case item in the palette. The New Case item is a global default action associated with the Account object. We're going to customize our object-oriented Create a Case action, so we don't need the redundant global action.



Tip: On object page layouts, the Mobile & Lightning Actions category contains all available types of actions for the object, including quick actions, productivity actions, Lightning component actions, and standard and custom buttons.

5. Click **Save**.

Our new Create a Case action appears in the action bar on account records in the Salesforce mobile app for all the mobile technicians.

Now that's all done, let's go over global actions. Then we'll revisit action layouts and customize our Create a Case action.

About Global Quick Actions

Global create actions enable users to create object records, but the new record has no direct relationship with other records. Actions tied to specific objects are only accessible from those objects' record pages; however, global actions can be added to any supported objects' page layouts as well as to global layouts, so they're very useful for quickly creating records.

Creating Global Quick Actions

You create global actions in a different place in Setup than you create object-specific actions. To create a global action, from Setup, enter *Actions* in the *Quick Find* box, then select **Global Actions**. They're called *global actions* because they can be put anywhere actions are supported.

The Global Publisher Layout

Global publisher layouts determine the global actions that appear in the various Salesforce interfaces. In Salesforce Classic and Lightning Experience, these layouts customize the actions on global pages (like the Home page) and on the Chatter page. Lightning Experience also uses these layouts to populate the Global Actions menu. And in the Salesforce app, these layouts drive the actions that appear in the action bar on the Feed and People pages. Global publisher layouts can include global actions only. You can assign different global publisher layouts to different user profiles to customize which actions users see by default on global pages.

In the Salesforce app, global actions appear in the action bar and action menu on pages to which the global publisher layout applies. Before our global action will show up either in the full Salesforce site or in the app, we need to add it to the global publisher layout.

Tell Me More: Actions

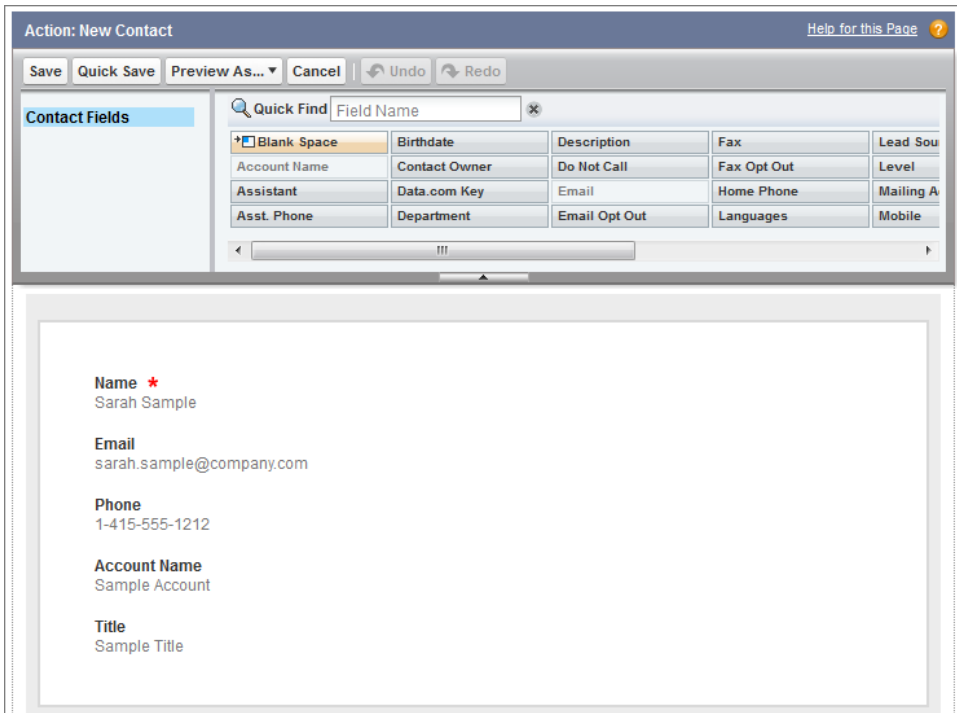
- If you add an action to a page layout, but a user assigned to the profile that uses that page layout can't see the action either in the full Salesforce site or in the Salesforce app, it might be because:
 - If it's a create action, the profile might not have access to create the record type of the action.
 - The user doesn't have both Read and Edit permission on the action's relationship field. The relationship field is the field that's automatically populated on the target object when a user creates a record using an action. For example, for an action on a case that lets users create child cases, the default relationship field is `Parent Case`. To be sure that users can see the Create Child Case action, check that they have both Read and Edit permissions on the `Parent Case` field.
- You can remove a required field from the action layout, but make sure that the field has a predefined value. Otherwise, users can't create records.

For more tips, see [Action Guidelines and Best Practices](#) on page 64.

About Action Layouts

Just as object record pages have page layouts that can be customized, actions have action layouts that can be customized. We do this in the action layout editor.

When you create an action, Salesforce populates its layout with a default set of fields. You can add, remove, or reorder fields on the action layout to present only the essential items your users need when they're taking the action.



The upper part of the action layout editor is the palette, and below the palette is the action layout. The palette contains fields from the action's target object that you can add to the action layout, except for the following unsupported field types:

- Record type fields
- Read-only field types such as roll-up summary, formula, and auto-number fields
- Read-only system fields such as `Created By` or `Last Modified By`

Inactive Fields

Fields that are already on the action layout still appear on the palette but are inactive. When you select an inactive field on the palette, Salesforce highlights the field on the action layout.

Field Type Conversion

If you convert a field's type from one that is supported for actions to a type that isn't supported, Salesforce removes the field from the action layout. If you convert the field back to a supported type

without changing the action layout, Salesforce automatically adds the field back to the layout. If you edit the layout, and then convert the field back to a supported type, add the field back to the layout manually.

Layouts Used for Log a Call Actions

A Log a Call action takes the active task page layout except under the following conditions:

- Suppose that your organization has a custom Log a Call action for an object. The custom action takes the custom action layout defined for it.
- Now suppose that your organization has a custom Log a Call global action. That action takes the custom layout defined for it, unless you also have a custom Log a Call action for an object. (A custom action on an object overrides a custom global action.)

To display the simpler New Task form to Salesforce mobile app users, enable the form in Activity Settings and ensure that the layout used includes a subject field.

Layout Auditing

Salesforce tracks action layout customization in the setup audit trail history.

Try It Out: Customize an Object-Specific Action Layout

The first time you view the layout for an action you've created, certain fields are prepopulated: target object default fields, standard required fields, and any custom universally required fields. We're going to add more fields to the Create a Case action so the mobile technicians can put more information into the case for the Acme Wireless support reps.

1. In the object management settings for accounts, go to Buttons, Links, and Actions.
2. Click **Layout** next to our Create a Case action.

The action has four fields already set by default: `Contact`, `Name`, `Status`, `Subject`, and `Description`. The red asterisk next to the `Status` field shows that it's a required field. Let's add a few more fields.

3. Click and drag `Priority` into position right after `Status`.
4. Click and drag `Product` into position right after `Priority`.

This field lets the technicians indicate what product the customer is having trouble with.



Contact Name	Sample Contact
Status *	Sample Status
Priority	Sample Priority
Product	Sample Product
Subject	Sample Subject
Description	Sample Description

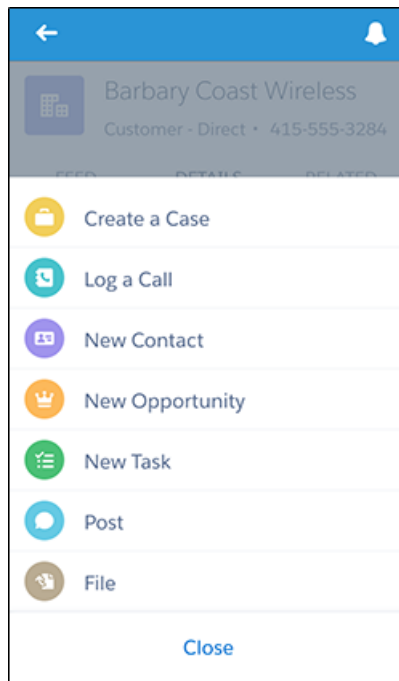
5. Click **Save**.

Now when the Acme Wireless mobile technicians view an account in the Salesforce app, they can create a case from any account record page. Let's give it a try.

Test Out the Object-Specific Quick Action

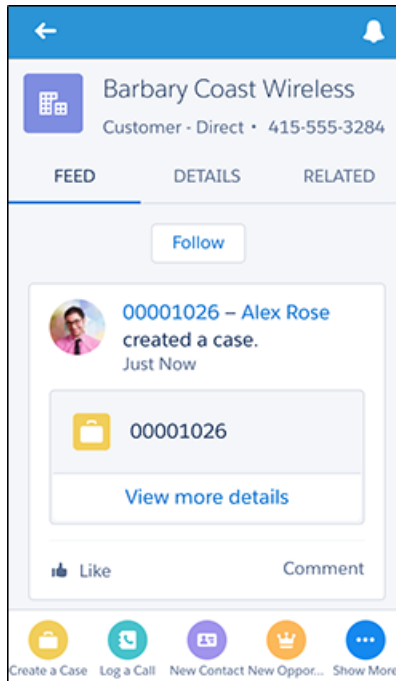
When you create an action, assign it to a page layout, and customize its action layout, as we did, the changes are reflected in Salesforce immediately.

1. Open Salesforce on your mobile device.
2. Tap  to access the navigation menu.
3. In the Recent section, tap **Accounts**.
4. Tap **Barbary Coast Wireless**.
5. In the action bar, tap  to access the action menu.
Create a Case, and the other actions we added, are now in the action menu.



6. Tap the Create a Case action.
7. Tap the **Contact Name** field.
8. Tap **Lloyd Benjamin** to assign him to the case.
9. Leave its status as New.
10. Assign the case a low priority.
11. Tap **Product**, and select the first one on the list.
12. Enter a subject and description.
13. Tap **Save**.

OK, we're back on the account record detail page. Tap **Feed**, and you should see a new feed item for the case you just created.



Nice work!

About Predefined Values in Actions

Setting up *predefined values* for certain fields on actions can increase your mobile users' productivity and optimize the action for the mobile environment at the same time.

When you configure action layouts, it's better to use fewer fields. Most users, especially mobile users, don't like to fill in a lot of required fields. They want to get things done and move on to their next task. A good way to use fewer fields in action layouts is to set predefined values for as many fields as possible. The more fields you can set predefined values for, the more you can remove from the layout and make the action easier and quicker to use. Balance ease of use with the need for required information. However, don't remove required fields from an action layout without setting a predefined value for those fields, or when a user applies that action, the record won't save properly.

If you set predefined values for fields on object records created through an action, you don't need to add those fields to the action layout. For example, when you configure an action that lets users create opportunities, set Prospecting as the predefined value for the Stage field. All new opportunities users

create through that action are automatically assigned to the prospecting stage. You can remove the Stage field from the action's layout, because the field is going to be assigned a value automatically.

You can set predefined values for any field available in the action layout editor, with these exceptions.

- Multi-select picklists
- Read-only field types like auto-number, formula, and roll-up summary fields

Predefined values for fields on actions are different from default values that you can set for fields on records. If a field is included in an action, it can have both a predefined value set for the action *and* a default value set. If a field on an action has both a predefined value and a default value set, the action uses the predefined value, not the default value.

Let's set a predefined value for one of the fields on our Create a Case action.

Try It Out: Set a Predefined Field Value on an Action

When we customized our Create a Case action, the `status` field was already present, because it's a required field for cases. Whenever Acme Wireless' mobile technicians are out in the field and have to open a case, the case status is always going to be "New" for them. Rather than require them to fill in the `status` field every time they open a case, let's set up a predefined field value for it as "New". Then we can remove it from the action layout, and whenever the Create a Case action is used to create a case, the status will automatically be set to "New".

1. In the object management settings for accounts, go to Buttons, Links, and Actions.
2. Click **Create a Case**.
3. In the Predefined Values related list, click **New**.
4. From the Field Name drop-down list, select Status.
5. Set its value to New.
6. Click **Save**.
Now we need to remove the `status` field from the action layout.
7. On the action detail page, click **Edit Layout**.
8. Click the `status` field on the layout and drag it up to the palette.





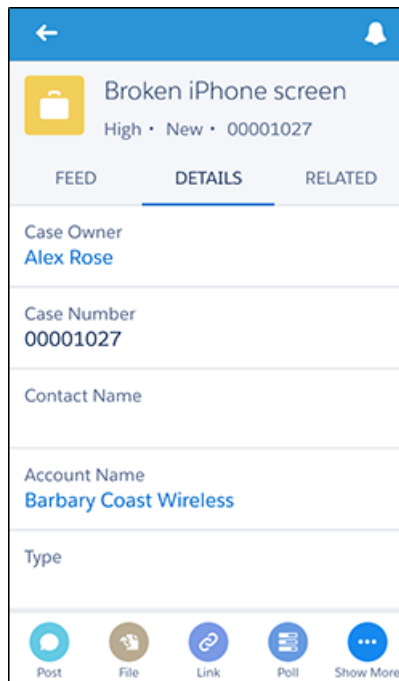
Tip: You can remove a required field from the action layout, but make sure that the field has a predefined value. Otherwise, users can't create records.

9. Click **Save**.

OK, now let's see it in action.

Test the Predefined Value

1. Open Salesforce on your mobile device.
2. Tap  to access the navigation menu.
3. In the Recent section, tap **Accounts**. You may have to tap **More...** to find it.
4. Tap **Barbary Coast Wireless**.
5. In the action bar, tap  to access the action menu.
6. Tap the **Create a Case** action.
Notice the `status` field is now gone.
7. Assign the case a High priority.
8. Tap **Product**, and select any of the products on the list.
9. Enter a subject and description.
10. Tap **Save**.
11. Tap **Feed**, and you should see a new feed item for the case you just created.
12. Tap the case number in the feed item, then tap **Details**.
In the record highlights area of the case record page, you'll see the subject, priority (High), status (New), and the case number. The `status` field was populated for us, thanks to our predefined value.



All right! We're almost done with actions. There's one more type, custom actions, that we'll go over briefly for now.

About Custom Actions

Object-specific custom actions invoke Lightning components, flows, Visualforce pages, or canvas apps that let users interact with or create records that have a relationship to an object record. The Visualforce page for an object-specific custom action must include the standard controller for the relevant object. For example, use the standard contact controller to create a custom action that lets users import a contact's Twitter profile and add that information to a contact record.

Use a Visualforce page, Lightning component, or a canvas app to create global custom actions for tasks that don't require users to use records that have a relationship to a specific object. Canvas apps that you want to use as custom actions require Publisher as a location. To call Lightning components from custom actions, you must have My Domain deployed in your org. Visualforce pages that you want to use as global custom actions can't use standard controllers. For example, you want a custom action that lets users enter a street address and see a map, the local time, and the local weather. For this action, create a Visualforce page that doesn't use any of the standard controllers, and add it as a custom global action.

We can't create custom actions with point-and-click, so we won't be working with them in our administrator exercises. If you want to find out more about custom actions, see [Adding Functionality with Visualforce Custom Actions](#) on page 93.

CHAPTER 8 Guidelines and Best Practices for Administrators

In this chapter ...

- [Action Guidelines and Best Practices](#)
- [Custom Icon Guidelines and Best Practices](#)

We've covered the primary places you can use point-and-click tools to optimize your organization for your mobile users. We enabled notifications, created page layouts and compact layouts, set up quick actions, and customized the navigation menu.

In this chapter, we'll cover some suggestions and best practices for actions and custom icons that can make your mobile users' experience that much better. And in case you missed it, don't forget to review the page layout guidelines in [Tips for Optimizing Page Layouts for Mobile](#) on page 38.

Action Guidelines and Best Practices

Actions are a great way to let your users get work done quickly. As an administrator, you're in a prime position to give them the exact actions that they need.

When considering what kinds of actions to create, or even when creating the actions themselves, keep these suggestions in mind.

- When customizing action layouts, consider what your users will do with them. Minimalism is key. Include only the fields that are necessary for them and for whomever handles the cases, calls, or records that result from those actions.
- Don't use actions for simple navigation shortcuts. They're designed to perform a function.
- Give your actions task-oriented names that tell your users what they do. Use terms such as New, Create, Share, Update, or Import. Keep names short and descriptive.
- Create a global action if you're contemplating something that your users need to do that isn't tied to a specific object and that you want to be accessible from anywhere.
- Use the `Description` field to create notes for yourself about each action. Notes are especially useful if you're creating several similar actions for different record types, for example. The description appears in the list of buttons, links, and actions for object-specific actions, or in the list of global actions, as well as on the detail page for the action. Your notes aren't visible to users.
- There is no hard limit to the number of fields you can add to an action layout. However, for optimum usability, we recommend a maximum of 8 fields. Adding more than 20 fields can severely impact user efficiency. To reduce the number of fields in your layout, you can [create predefined values](#) for the required fields, and then remove those fields from your layout. You can set predefined field values from the action detail page.

Custom Icon Guidelines and Best Practices

You can add custom icons to your actions or custom tabs if your organization has access to the Documents tab.

If you decide to create your own action or tab icon, upload it to a Documents folder and make sure `Externally Available Image` is selected.

When creating a custom icon, follow these image guidelines. The icon should:

- Be less than 10k in size
- Be 120 x 120 pixels
- Be a PNG with a transparent background

- Have a resolution of 72 dpi
- Not include a color background
- Not include outer shadows on the inner icon graphic

In addition, follow these visual guidelines.

- Center inner icon graphics within a 80 x 80 pixel area, leaving 20 pixels of spacing surrounding it in a 120 x 120 px final format.
- The icon graphic should be white, or lighter than the background color.
- Avoid heavy inner or outer shadows.
- Use simple and flat styling resembling the Salesforce icon family. See the [Salesforce App Style Guide](#) for examples.

You assign custom icons using the **Change Icon** link when you create the action or tab.

You can also customize the icon that is used in the navigation menu for canvas apps. See [Custom Icons for Canvas Apps](#) on page 145.

DEVELOPING FOR THE SALESFORCE APP

CHAPTER 9 Welcome to Salesforce Platform Development

In this chapter ...

- [Our Scenario](#)
- [Who This Part is For](#)
- [When to Use Declarative vs. Programmatic Tools to Create Salesforce Apps](#)
- [When to Use the Salesforce Platform vs. Creating Custom Apps](#)
- [Salesforce Platform Development Process](#)
- [Development Prerequisites](#)

Welcome to development for the Salesforce Platform. In Part I, Salesforce app Administration, you learned how to set up and configure your organization for the Salesforce app. You also learned how to customize Salesforce for mobile users by using declarative programming features. In this part, you'll learn how you can use the Salesforce Platform features to extend the Salesforce and add new functionality for your users with code.

Developing for mobile users in Salesforce means you can leverage your existing skills to extend and customize the app for your users. You can use the Salesforce Platform to extend your organization and then make those changes available to both mobile users and users of the full Salesforce site.

Our Scenario

We'll continue the business scenario of Acme Wireless and build functionality to meet the needs of their mobile technicians and warehouse workers.

You'll learn how to:

- Optimize the mobile experience for users by employing mobile-first user interface design.
- Implement Visualforce pages so that mobile users can access them from the navigation menu or action bar, from a record, or from the publisher in the full Salesforce site.
- Create a Visualforce custom action to make a Visualforce page available from the action bar or from the publisher in the full Salesforce site.
- Implement development best practices when extending the Salesforce app.

Who This Part is For

Part II of this book is geared towards all developers who need to customize the Salesforce app with code, from beginner to seasoned pro.

If you're familiar with programming in the Lightning platform or have done development using the Mobile SDK, then you should be able to easily make the jump to developing in the Salesforce Platform.

If you're new to the platform or have done mostly declarative programming, then don't worry. Each chapter takes you step-by-step through the process of implementing each feature for our fictitious business, Acme Wireless. This way, you can learn by doing. These sections are titled "Try It Out."

In each chapter you'll also find information about what the feature is, how it works, and when to use it. These sections are titled "Tell Me More." Go there to delve into the details of the feature.

When to Use Declarative vs. Programmatic Tools to Create Salesforce Apps

When developing functionality for your Salesforce mobile users, you can use declarative features (clicks) or programmatic tools (code). Here are some points to consider before you start coding.

Salesforce features built with declarative tools:

- Are usually faster and cheaper to build.
- Generally require less maintenance.
- Receive automatic upgrades when the tools are improved.

- Aren't subject to governor limits.

Common declarative tools you can use in your Salesforce apps include:

- Quick Actions
- Page layout customization
- Formula fields and roll-up summary fields
- Validation rules
- Workflows and approval processes
- Custom fields and objects

We know it's tempting to jump straight into coding. But just because you can doesn't always mean you should. Before you commit to developing a new feature using programmatic tools such as Visualforce, consider whether you can implement your feature with declarative tools instead.

Of course, some apps can't be built with declarative tools. Programmatic tools are often required for features that:

- Support specialized or complex business processes.
- Provide highly customized user interfaces or customized click-through paths.
- Connect to or integrate with third-party systems.

So which tool do you choose? There's no hard-and-fast rule for when to choose clicks over code. When choosing, consider the problems you're trying to solve and resources available to solve them.

When to Use the Salesforce Platform vs. Creating Custom Apps

When it comes to developing functionality for your Salesforce mobile users, you have options. Here are some differences between extending the Salesforce app and creating custom apps using the Mobile SDK or other tools.

Salesforce Platform

- Defined user interface.
- Full access to Salesforce data.
- Possible integrated experience in the Salesforce app.
- Inclusion of your own apps and functionality with quick actions.
- Customized with point-and-click or programmatic tools.

Chapter 9 Welcome to Salesforce Platform Development

- Programmatic functionality through Visualforce pages, Canvas apps, and the Lightning Component framework.
- Defined navigation points, since customizations or apps adhere to the navigation menu. For example, a Visualforce page can be called from the navigation menu or from a custom action in the action bar.
- Enables you to leverage existing Salesforce development experience, both point-and-click and programmatic.
- Included in all Salesforce editions and supported by Salesforce.

Custom Apps

Custom apps can be either free-standing apps you create with Salesforce Mobile SDK or browser apps using plain HTML5, CSS, and your choice of mobile-friendly JavaScript frameworks. With custom apps, you can have:

- A custom user experience.
- Access to Salesforce data using REST APIs in native and hybrid local apps, or with Visualforce in hybrid apps using JavaScript Remoting. In HTML5 apps, do the same using standard JavaScript APIs.
- A branded user interface, including a custom app icon, for increased exposure in customer-facing apps.
- Standalone mobile app, either with native APIs using Java for Android or Objective-C for iOS, or through a hybrid container using JavaScript and HTML5 (Mobile SDK only).
- App distribution through mobile industry channels, such as the Apple App Store or Google Play (Mobile SDK only).
- Control of complex offline behavior (Mobile SDK only).
- Push notifications (available for Mobile SDK native apps only).
- A custom security container using your own OAuth module (Mobile SDK only).


Other important Mobile SDK considerations:

- Access to open-source SDK, downloadable for free through npm installers and GitHub. No licensing required.
- Requires you to develop and compile your apps in an external development environment (Xcode for iOS, Eclipse or similar for Android).

There's no right or wrong answer when choosing between the Salesforce platform and the Mobile SDK. Base your choice on which features are most important for your app.

Salesforce Platform Development Process

The Salesforce app is designed to run on a mobile device, like a phone or tablet, but that doesn't mean you have to develop on one. Especially when you're working with Visualforce pages that will appear in both the app and the full Salesforce site, it's convenient to develop on your desktop. By accessing the Salesforce app in a device emulator, you can develop iteratively on your desktop, without having to pick up your device to test each change.

 **Important:** Running the Salesforce app in an emulator isn't supported for normal use, and it's not a substitute for full testing of your custom apps and pages on your organization's supported mobile devices. During development you should regularly test your app on *every* device and platform on which you intend to deploy.

To view your custom mobile pages and apps on a device emulator, download and install the appropriate SDK for your supported devices.

- Apple iOS Simulator for iPhone and iPad
developer.apple.com/library/ios/documentation/IDEs/Conceptual/iOS_Simulator_Guide/
- Android Virtual Device Emulator for Phone and Tablet
developer.android.com/tools/devices/emulator.html

You can't use the standard `https://<Salesforce_instance>/apex/yourPageName` URL to test Visualforce in the Salesforce app. You can only do that by accessing the page within the app.

Development Prerequisites

You'll need to have these before you can start these exercises.

- Access to a Developer Edition organization.
If you aren't already a member of the Lightning Platform developer community, go to <http://sforce.co/1om1gHf> and follow the instructions for signing up for a Developer Edition organization. Even if you already have Enterprise Edition, Unlimited Edition, or Performance Edition, use Developer Edition for developing, staging, and testing your solutions against sample data to protect your organization's live data.
- The "API Enabled" permission must be enabled for your Developer Edition organization. This permission is enabled by default, but might have been changed by an administrator.

- The Warehouse data model must be installed in your Developer Edition organization and the Salesforce app installed on a mobile device. If you haven't already set up these items, see [Setting Up Your Work Environment](#) on page 15.

Change the System Administrator Page Layout Assignment

We've created a custom page layout to help us illustrate some of the concepts in this book. Before we begin, let's switch the page layout assignment for our System Administrator profile to this new layout.

1. In Setup, enter *Profiles* in the **Quick Find** box, then select **Profiles**.
2. Select the System Administrator profile.
3. In the Page Layouts section, find Account, and click **View Assignment**.
4. Click **Edit Assignment**.
5. Click the System Administrator line item.
6. Select Warehouse Schema Account Layout from the Page Layout to Use drop-down list.
7. Click **Save**.

All right! Now we're ready to roll.

CHAPTER 10 Designing Mobile-First User Interfaces

In this chapter ...

- Design for Mobile
- Keep Navigation Simple
- Put Important Information at the Top
- Minimize the Number of Fields
- Use Field Defaults
- Minimize User Interface Text
- Tap Target Size

In this chapter, we'll learn about user interface design considerations to keep in mind when developing functionality for Salesforce mobile users.

Designing your user interface with mobile in mind is critical to the success of your app. If users find your functionality easy to use and in alignment with the experience they have with other mobile apps, they'll be much happier with the app. The user interface guidelines in this chapter address key differences in the mobile platform and the way users work in it:

- Mobile devices have smaller screens.
- Navigation is done with gestures like tapping and swiping.
- Users typically perform focused tasks from mobile devices like adding a new record.

Throughout the examples in this book, we demonstrate these best practices. As you develop and create your own customizations and apps using the Salesforce Platform, keep these guidelines in mind.

Design for Mobile

When designing a user interface for Salesforce mobile users, keep the smaller form factor and the way users work in mind from the start.

In the mobile paradigm, users work in quick bursts, spending not more than a minute or two on a task. So be sure to design your app for the way users work.

Avoid taking forms and workflow designed for the desktop environment and simply making them available. For example, it may be an acceptable user experience in a desktop Web browser to have a form with many fields and related lists on it. However, that same form probably won't provide a good user experience when used from a mobile device.

Users will have a much better experience with forms that follow these user interface guidelines and are designed specifically for the mobile environment.

Keep Navigation Simple

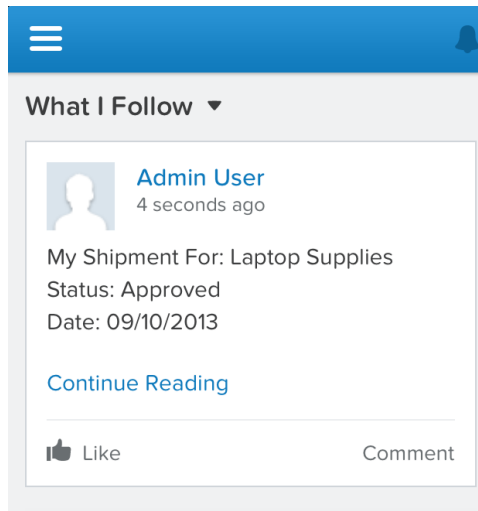
Design your customizations so that users can get to the screen quickly and know where they are within the app.

When creating forms, be sure that they have a simple, logical flow. This helps users to know where they are and keeps them from having to remember where they came from. For example, avoid creating a feed item that links to another form that then links to another form.

Put Important Information at the Top

Put the most essential information at the top of the screen so that it's immediately visible to the user and easy to access.

For example, on a screen that the mobile technician uses to see all their repair appointments, put the most important customer data such as name, address, and phone number at the top. For each screen, identify what the user's task is and what data they need to accomplish that task. Another example is if you're generating feed items, the text should be as concise as possible and the most important information should be at the beginning of the post, as shown in the following example.



Minimize the Number of Fields

When it comes to presenting fields on a screen, less is more. Give users only the fields they need to complete the task at hand.

For example, if you're creating a screen for adding a new warehouse, you might only want to surface the warehouse name field. This way the user can quickly add a new warehouse. If the user has collected more information, they can edit the new record and add it in the detail view.

This guideline is particularly important when displaying information that's for viewing only. For example, if you're creating a form that the mobile technician uses to look up a customer, the technician probably needs to see only the customer name, address, and a phone number. In our page to search for merchandise, only two fields are needed: the merchandise name and delivery distance.

Cancel Create Quick Order Save

Enter Search

MERCHANDISE NAME

iPhone

MAX DELIVERY DISTANCE (MILES)

10

Submit

Search Results

iPhone 5C Blue

Quantity on hand:1230
Big Tech Warehouse
San Francisco

iPhone 5C Green

Quantity on hand:1400
Big Tech Warehouse
San Francisco

To reduce the number of fields on a screen, consider using default values for new records instead of having the user enter the data.

Use Field Defaults

When you have fields on a screen that user must enter, create defaults for as many of them as you can.

For example, if you create a form with a multi-select picklist, consider defaulting the field to a particular value. This way the user can change it if necessary, but otherwise can simply accept the default for quicker workflow.

Minimize User Interface Text

Be mindful of device form factor and size, and keep labels and user interface text short and concise.

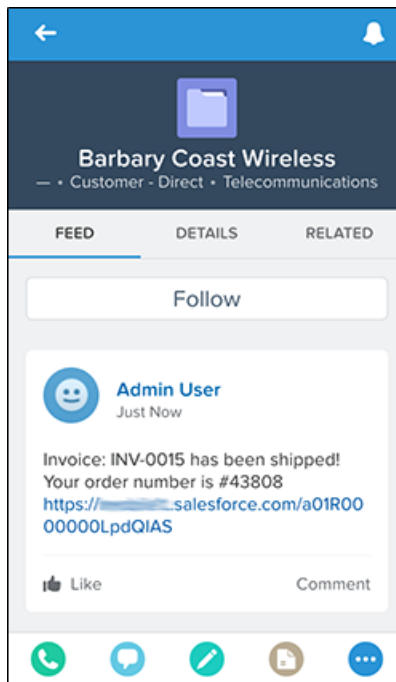
Keep field and menu labels as short as you can while still conveying enough meaning for users to understand what the field is for. Use intuitive icons or symbols whenever possible so users can quickly understand

your user interface. The goal with user interface text is to provide enough information so that users can understand what they need to do while at the same time keeping the user interface clean and simple.

A common best practice is to place labels above fields and to show only one column of fields instead of displaying fields side by side.

Any blocks of text should also be concise and to the point. For example, if you're automatically creating a feed item to be viewed, keep the text short and include only the necessary information.

In our warehouse scenario, when an order is fulfilled in the warehouse, a feed item appears in the customer account feed that shows the key information such as invoice number and order number, along with a short message and a link to the invoice.



Tap Target Size

Mobile users interact with the Salesforce user interface with their fingers, so be sure to design user interface elements to be the optimal size.

Chapter 10 Designing Mobile-First User Interfaces

Screen controls should be large enough for users to tap easily and take into account that every user's hands are sized differently. Controls that are too small means users will need to tap multiple times, a frustrating experience. But you don't want controls so large that users can accidentally tap one when they meant to tap another.

We recommend a minimum tap target size of 44 pixels wide by 44 pixels high. For more information about custom icons, see [Custom Icon Guidelines and Best Practices](#) on page 64.

CHAPTER 11 Extending the Salesforce App with Visualforce Pages

In this chapter ...

- [Try It Out: Create a Visualforce Page](#)
- [Tell Me More: Where Visualforce Pages Can Appear in the Salesforce App](#)
- [Tell Me More: About the Code](#)

You can use Visualforce to extend the Salesforce app and give your mobile users the functionality they need.

In this chapter, we'll extend the Acme Wireless organization and give mobile technicians a way to find nearby warehouses. For example, if the technician is out on a call and needs a part, they can use this page to look for warehouses within a 20-mile radius.

While you could take an existing Visualforce page and surface it in the Salesforce app, you should consider how that page will look and function on a mobile device. Most likely, you'll want to create a new page designed especially for a mobile experience.

For more information about where Visualforce pages can appear in the user interface, see [Tell Me More: Where Visualforce Pages Can Appear in the Salesforce App](#) on page 86.

Now, let's get started!

Try It Out: Create a Visualforce Page

Now we'll create a Visualforce page and make it available from the navigation menu.

This Visualforce page references these items.

- A static resource named `googleMapsAPI`
- An Apex class named `FindNearby`

These have been provided for you in the package that you downloaded and installed for this guide.

Also included in the package is the Visualforce page `FindNearbyWarehousesPage`. You can move on to the next step, [Create a New Tab](#) on page 83, if you want to use the page included in the package.

The code for this page uses the location of the current user and integrates with Google Maps to display a map with warehouses located within 20 miles. For each nearby warehouse, the map displays a pin along with the warehouse name, address, and phone number.

1. In the Salesforce application, from Setup, enter *Visualforce Pages* in the Quick Find box, then select **Visualforce Pages**.
2. Click **New**.
3. In the Label field, enter *FindNearbyWarehousesPage*.
The `FindNearbyWarehousesPage` page is included in the package you installed, so if you're copying this code to create a new page, you'll want to name your page something different.
4. Select the **Available for Lightning Experience**, **Lightning Communities**, and the **mobile app** checkbox.
Selecting this checkbox designates that the page is mobile-ready.
5. Copy and paste this code into the Visualforce Markup tab.

```
<apex:page sidebar="false" showheader="false"
  standardController="Warehouse__c"
  recordSetVar="warehouses" extensions="FindNearby">

  <apex:includeScript value="{!$Resource.googleMapsAPI}" />
  <!-- This API key needs to be set up for there to be
    no JS errors -->
  <!--http://salesforcesolutions.blogspot.com/2013/01/
    integration-of-salesforcecom-and-google.html-->
  <script type="text/javascript"
    src="https://maps.googleapis.com/maps/api/js?key=
      AIzaSyAVrfZm7_NhbLjHrFPd1242BYV1PBmDPqs
      &sensor=false">
```

```

</script>
<!-- Set up the map to take up the whole window -->
<style>
    html, body { height: 100%; }
    .page-map, .ui-content, #map-canvas
        { width: 100%; height:100%; padding: 0; }
    #map-canvas { height: min-height: 100%; }
</style>

<script>
    function initialize() {
        var lat, lon;

        // Check to see if the device has geolocation
        // detection capabilities with JS
        if (navigator.geolocation) {
            navigator.geolocation.getCurrentPosition(
                function(position){
                    lat = position.coords.latitude;
                    lon = position.coords.longitude;

                    //Use VF Remoting to send values to be
                    //queried in the associated Apex Class
                    Visualforce.remoting.Manager.
                    invokeAction(
                        '{!$RemoteAction.FindNearby.getNearby}',

                        lat, lon,
                        function(result, event){
                            if (event.status) {
                                console.log(result);
                                createMap(lat, lon, result);
                            } else if (event.type ===
                                'exception') {
                                    //exception case code
                                } else {

                                }
                            },
                            {escape: true}
                        );
                });
        } else {
            //Set default values for map if the device

```

```
//doesn't have geolocation capabilities
/** San Francisco */
lat = 37.77493;
lon = -122.419416;

var result = [];
createMap(lat, lon, result);
}

}

function createMap(lat, lng, warehouses){
//Grab the map div and center the map at
//the proper latitude/longitude
var mapDiv = document.getElementById(
    'map-canvas');
var map = new google.maps.Map(mapDiv, {
    center: new google.maps.LatLng(lat, lng),
    zoom: 12,
    mapTypeId: google.maps.MapTypeId.ROADMAP
});

//Set up the markers for the map using the
//variable we queried for in our controller
var warehouse;
for(var i=0; i<warehouses.length;i++){
    warehouse = warehouses[i];
    console.log(warehouses[i]);
    setupMarker();
}

function setupMarker(){
    var content='<a href src="/"'+ warehouse.Id +
        '" >'+
        warehouse.Name + '</a><br/>'+
        warehouse.Street_Address__c +
        '<br/>' + warehouse.City__c +
        '<br/>' + warehouse.Phone__c;

    //Create the callout that will pop up
    //on the marker
    var infowindow = new google.maps.
        InfoWindow({
            content: content
```



```

    });

    //Place the marker
    var marker = new google.maps.Marker({
        map: map,
        position: new google.maps.LatLng(
            warehouse.Location__Latitude__s,
            warehouse.Location__Longitude__s)
    });

    //Create an action to open the callout
    google.maps.event.addListener(
        marker, 'click', function(){
            infowindow.open(map, marker);
        });
    }
}

//Run the initialize function when the window loads
google.maps.event.addDomListener(
    window, 'load', initialize);

</script>

<body style="font-family: Arial; border: 0 none;">
    <div id="map-canvas"></div>
</body>
</apex:page>

```

6. Click **Save**.

Now that we've created the Visualforce page for finding warehouses, the next step is to create a tab for it. We'll then add the page to the navigation menu.

Create a New Tab

Now we'll create a new tab and add the Visualforce page you just created.

1. From Setup, enter *Tabs* in the Quick Find box, then select **Tabs**.
2. In the Visualforce Tabs section, click **New**.
3. In the Visualforce Page drop-down list, select *FindNearbyWarehousesPage*, or the page you created in the previous step.

Chapter 11 Extending the Salesforce App with Visualforce Pages

4. In the `Tab Label` field, enter *Find Warehouses*.
This label appears on the navigation menu.
5. Click into the `Tab Style` field, and select the *Globe* style.
The icon for this style appears as the icon for the page in the navigation menu.

New Visualforce Tab [Help for this Page](#)

Step 1. Enter the Details Step 1 of 3

Choose the page for this new tab. Fill in other details.

Select an existing page or [create a new page now](#).

Visualforce Page: FindNearbyWarehousesPage [FindNearbyWarehousesPage] ▼

Tab Label: Find Warehouses

Tab Name: Find_Warehouses ⓘ

Tab Style: Globe ⓘ

(Optional) Choose a Home Page Custom Link to show as a splash page the first time your users click on this tab.

Splash Page Custom Link: --None-- ▼

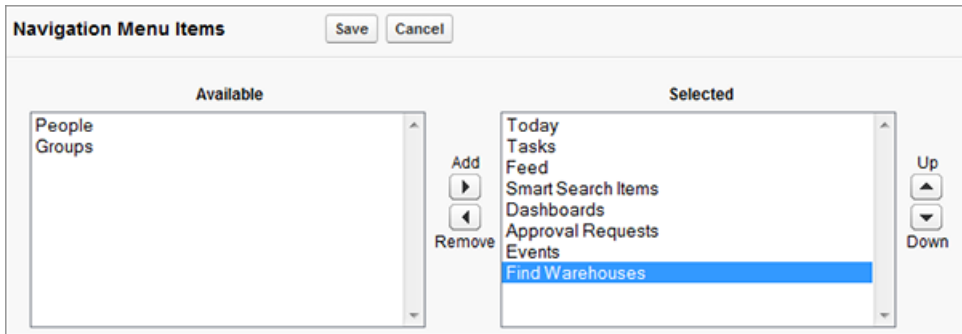
6. Click **Next**.
7. Click **Next** to accept the visibility defaults.
8. Deselect the **Include Tab** checkbox so that the tab isn't included in any of the apps in the organization. We only want this tab to appear when users are viewing it on their mobile device.
9. Click **Save**.

Now that you've created the Visualforce page and the tab, you're ready to add the new tab to the navigation menu.

Add the Tab to the Navigation Menu

In this step, we'll add the tab as a navigation menu item. It will instantly become available to Salesforce app users that have access to it.

1. From Setup, enter *Navigation* in the *Quick Find* box, then select **Salesforce Navigation**.
2. Select *Find Warehouses* and click **Add** to move it over to the *Selected* list.



3. Move the Find Warehouses item to just below the Smart Search Items menu item.




Note: Menu items that you put below Smart Search Items appear in the Apps section of the Salesforce navigation menu.

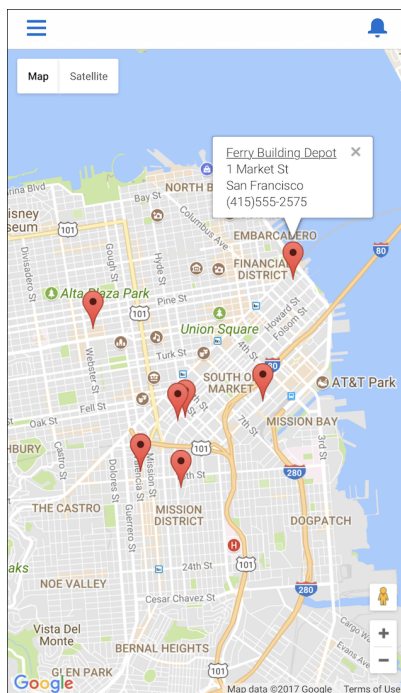
4. Click **Save**.

When your users log in, they'll see the Find Warehouses menu item in the navigation menu. Now let's test it out.

Test the Visualforce Page

Now you'll play the part of an Acme Wireless mobile technician and search for nearby warehouses on your device.

1. Open Salesforce on your mobile device.
2. Tap  to access the navigation menu.
You should see **Find Warehouses** under the Apps section.
3. Tap **Find Warehouses**.
4. Click **OK** when you see a prompt that asks to use your current location. A map that contains all the nearby warehouse locations within 20 miles appears.




The warehouses in our package sample data are all located in the San Francisco area. If you're testing this from another location, be sure to add a warehouse located within 20 miles. To add a new warehouse, choose **Warehouse** from the Lightning Platform app menu, click the Warehouses tab, and then click **New** in the Recent Warehouses section.

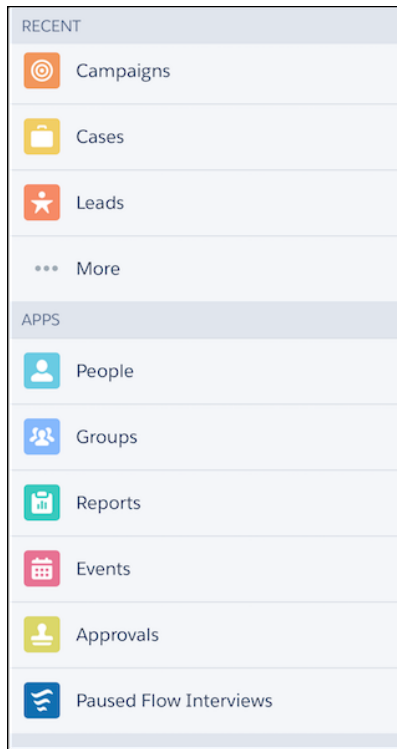
That's it! You can see how easy it is to make standard pages and tabs available to your mobile users.

For more information about development guidelines for Visualforce pages, see [Guidelines and Best Practices](#) on page 108.

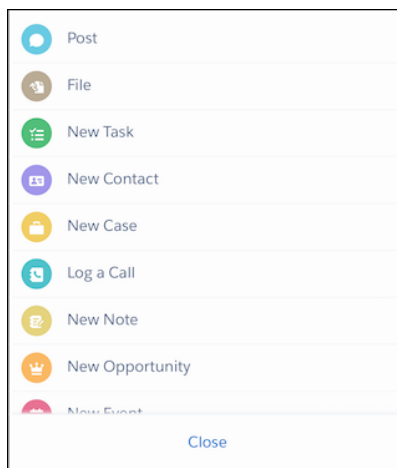
Tell Me More: Where Visualforce Pages Can Appear in the Salesforce App

When you create a Visualforce page, you can make it available from a number of places in the user interface.

- Navigation menu—available when you tap  from the mobile app

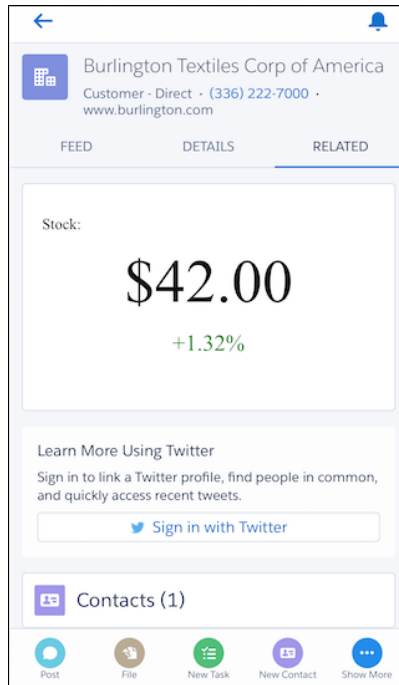


- Action bar and action menu—available from the bottom of any page that supports actions



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- Record related information page (as a mobile card)—available when you navigate to a record



You can also reference, and link to, another Visualforce page in your Visualforce markup using the supported navigation calls listed at [Navigation with the `sforce.one` Object](#). Be sure to select `Available for Lightning Experience`, `Lightning Communities`, and the mobile app for all pages in a multi-page process.

If a referenced page doesn't have `Available for Lightning Experience`, `Lightning Communities`, and the mobile app selected, it doesn't prevent the referencing, or parent, page from appearing. However, when a user tries to access the nonmobile enabled page, they receive an "Unsupported Page" error message.

Tell Me More: About the Code

Let's take a look at some of the code behind our Visualforce page that finds warehouses.

FindNearby Apex Class Query

This snippet is a dynamic SOQL query that uses variables passed in from the Visualforce page to find warehouses within 20 miles of the device accessing the page. This page works on any mobile device and HTML5-enabled desktop browser.

If the page is unable to obtain the location, the search is centered on San Francisco. If you test this from a browser, you might have to approve that the page can access your location depending on your device security settings.

```
String queryString =
    'SELECT Id, Name, Location__Longitude__s,
      Location__Latitude__s, ' +
    Street_Address__c, Phone__c, City__c ' +
    'FROM Warehouse__c ' +
    'WHERE DISTANCE(Location__c,
    GEOLOCATION('+lat+', '+lon+'), \'mi\') < 20 ' +
    'ORDER BY DISTANCE(Location__c,
    GEOLOCATION('+lat+', '+lon+'), \'mi\') ' +
    'LIMIT 10';
```

Visualforce Page `initialize` Function

The `initialize` function in the Visualforce page uses the HTML5 geolocation API to get the coordinates of the user. The browser gets the position without using any plug-ins or external libraries, and then uses JavaScript remoting to invoke the `getNearby` function in the Apex controller and passes in the coordinates.

```
function initialize() {
    var lat, lon;

    // Check to see if the device has geolocation
    // detection capabilities with JavaScript
    if (navigator.geolocation) {
        navigator.geolocation.getCurrentPosition(
            function(position) {
                lat = position.coords.latitude;
                lon = position.coords.longitude;

                //Use VF Remoting to send values to be
                //queried in the associated Apex Class
                Visualforce.remoting.Manager.invokeAction(
                    '{!$RemoteAction.FindNearby.getNearby}', lat, lon,
```

```
function(result, event){
    if (event.status) {
        console.log(result);
        createMap(lat, lon, result);
    } else if (event.type === 'exception') {
        //exception case code
    } else {

    }
},
{escape: true}
);
});
} else {
//Set default values for map if the device doesn't
//have geolocation capabilities
/** San Francisco */
lat = 37.77493;
lon = -122.419416;

var result = [];
createMap(lat, lon, result);
}
```

Visualforce Page Redirect Code

The page `FindNearbyWarehousesPage` uses the Google Maps JavaScript API v3 to plot the nearby warehouses on a map. We resize the map based on the records returned by the SOQL query and plot each record as marker on the map.

The most important piece of the code is where we determine whether or not the page is being viewed in the Salesforce app. If it is, the redirect link to the warehouse record must be coded slightly differently. If the page runs in the Salesforce app, we must use the `navigateToSObjectRecord` method to go to the record detail page but still stay in the app. We can check this with a simple try/catch construct, and then set the redirect link accordingly.

```
try{
    if(sforce.one){
        warehouseNavUrl =
            'javascript:sforce.one.navigateToSObject(
                \'' + warehouse.Id + '\')';
    }
} catch(err) {
```



```
console.log(err);  
warehouseNavUrl = '\\\' + warehouse.Id;  
}  
  
var warehouseDetails =  
    '<a href="' + warehouseNavUrl + '"' +  
    warehouse.Name + '</a><br/>' +  
    warehouse.Street_Address__c + '<br/>' +  
    warehouse.City__c + '<br/>' +  
    warehouse.Phone__c;
```


CHAPTER 12 Adding Functionality with Visualforce Custom Actions

In this chapter ...

- [Custom Actions Scenario](#)
- [Try It Out: Create a Visualforce Custom Action](#)
- [Tell Me More: About the Code](#)

Actions appear in the action bar and action menu in the Salesforce mobile app, and are a quick way for mobile users to access commonly used tasks or functionality.

We learned about standard actions that can be configured with point-and-click tools in [Using Actions in the Salesforce App](#) on page 45. In this chapter we'll look at custom actions, which are actions that you define. There are two types of custom actions:

- Visualforce—specifies a Visualforce page that's called from the Chatter publisher or the Salesforce app action bar.
- Canvas—specifies a canvas app that's called from the Chatter publisher or the Salesforce app action bar.

Custom actions aren't specific to mobile users, and appear in both the Salesforce app and in the full Salesforce site. In the Salesforce mobile app, custom actions appear in the action bar. In the full Salesforce site, custom actions appear in the Chatter publisher.

Custom Actions Scenario

In this chapter, we'll further extend the Acme Wireless organization and give mobile technicians a way to quickly create an order. We'll create a Visualforce page and make it available as a custom action from the action bar. That way, if the technicians are out at a customer site and they want to order a part, they can quickly navigate to the page.

The custom action enables the technician to enter the part name and a radius, and the Visualforce page searches all warehouses within the given radius for that part. Once a warehouse is located, the technician simply enters the quantity and taps a button to create the order. This is all done within the context of the customer account.

Try It Out: Create a Visualforce Custom Action

First, we'll create a Visualforce custom action that references a Visualforce page.

The custom action we're creating uses these elements from the package that you downloaded and installed for this guide.

- `QuickOrderPage` Visualforce page
- `QuickOrderController` Apex class
- `Mobile_Design_Templates` static resource used for styling the page

We'll take an in-depth look at the code later in this chapter. But first, we're going to create the action and try it out.

The Visualforce code for this page uses the location of the current customer account to find warehouses located within the specified distance (in miles) that also have a particular part in stock.

1. From the object management settings for accounts, go to Buttons, Links, and Actions.
2. Click **New Action**.
3. In the Action Type drop-down list, select Custom Visualforce.
4. In the Visualforce Page drop-down list, select `QuickOrderPage`.
5. In the `Label` field, enter *Create Quick Order*.

This is the action name that appears to the user in the action menu in the Salesforce app or in the publisher in the full Salesforce site.

Enter Action Information Save Cancel

Object Name ⓘ

Action Type Custom Visualforce ⓘ

Visualforce Page QuickOrderPage [QuickOrderPage] ⓘ

Height ⓘ

Label

Standard Label Type --None-- ⓘ

Name ⓘ

Description

Icon ⚡ [Change Icon](#) ⓘ

6. Click **Save**.

Now that we've created the custom action, we'll add the action to the Account page layout. This ensures that the custom action appears in the publisher when you go to the page for a customer account.

Add the Visualforce Custom Action to the Page Layout

Now we'll add the custom action to the Account page layout.



1. From the object management settings for Accounts, go to Page Layouts.
2. Click **Edit** next to the Warehouse Schema Account Layout.
3. Click the Mobile & Lightning Actions category in the palette.
4. In the Salesforce Mobile and Lightning Experience Actions section, click **override the predefined actions**.
5. Drag the Create Quick Order element into the Salesforce Mobile and Lightning Experience Actions section so that it appears as the first element on the left.

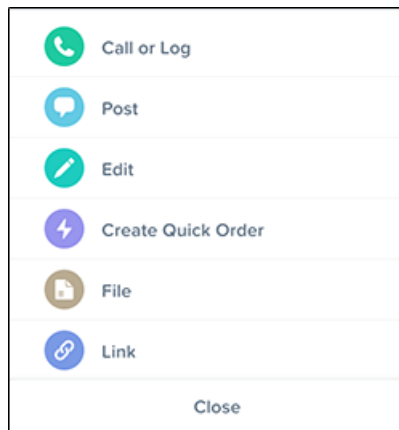
Our mobile technicians are going to use this custom action a lot, so we're putting it at the start of the list so it is one of the first actions they see in the action bar.
6. If it's present, drag the Mobile Smart Actions element out of the section and back to the palette.
7. Click **Save**.

Now that we've created the custom action and added it to the page layout, we're ready to see it in action.

Test Out the Visualforce Custom Action

Now you'll play the part of an Acme Wireless mobile technician on a customer call, and we'll test out the custom action in the Salesforce app.

1. Open the Salesforce app on your mobile device.
2. Tap  to access the navigation menu.
3. From the navigation menu, tap **Accounts** and navigate to an account.
4. In the action bar, tap  to access the action menu.
5. Tap the **Create Quick Order** action.



6. In the `Merchandise Name` field, enter the name of an item, such as `iPhone 5`.
7. In the `Max Delivery Distance (miles)` field, enter `10`.
8. Tap **Submit**.

Cancel Create Quick Order Save

Enter Search

MERCHANDISE NAME

iPhone

MAX DELIVERY DISTANCE (MILES)

10

Submit

Search Results

iPhone 5C Blue

Quantity on hand:1230
Big Tech Warehouse
San Francisco

iPhone 5C Green

Quantity on hand:1400
Big Tech Warehouse
San Francisco

9. In the Search Results section at the bottom, you'll see a list of merchandise that matches what you searched for. The list shows parts contained in warehouses within 10 miles of the current account. Tap iPhone 5S Gold.
10. In the `Quantity` field, enter `1`.



Tip: If you want to return to the search screen, be sure to use the **Back** button. If you tap **Cancel**, an invoice with no line items is created.

11. Tap **Save**.

The order has been created. Swipe to the Related screen, and you'll see the Invoices related list. Tap it, and you'll see the new invoice. You can tap the invoice, go to the Related screen, and then tap **Line Items** to see the line item that was created for the iPhone 5S Gold part.

Success! You've gone through the entire process of enabling a mobile technician to quickly search for a part in a warehouse and create an order.

For more information about development guidelines for Visualforce pages, see [Guidelines and Best Practices](#) on page 108.

Tell Me More: About the Code

There are two code objects behind our Visualforce custom action: the Apex class `QuickOrderController` and the Visualforce page `QuickOrderPage`.

The Apex class is the controller for the Visualforce page, and uses the `@RemoteAction` annotation on the methods. When you use this annotation, the Visualforce page wraps the logic in a JavaScript-friendly way. This is known as *Visualforce remoting*.

Visualforce remoting allows for quick and tight integration between Apex and JavaScript. This communication model works asynchronously as opposed to the synchronous model in the traditional Visualforce/Apex MVC paradigm. So after passing parameters into your controller, you can get the result from a response handler function, and write any additional client-side logic before doing any DOM manipulation or building your page with mobile templates or frameworks.

Visualforce remoting is ideal for mobile developers on the Salesforce Platform because it simplifies the direct server-side access to Salesforce objects and allows you to use Apex tools such as SOQL, Apex methods, and so on for rapid platform development. And, you don't have to deal with view state, which makes pages perform better.

Apex Class `QuickOrderController`

This class uses Visualforce remoting and contains the logic called by the Visualforce page to find warehouses and create orders and line items.

```
global class QuickOrderController{
    public static List<Merchandise__c> merchandise;
    public static Line_Item__c quickOrder;

    public QuickOrderController(ApexPages.
        StandardController controller){
    }

    @RemoteAction
    global static List<Merchandise__c> findWarehouses(String accId,
        String merchName, String warehouseDist){
        merchandise = new List<Merchandise__c>();
        String queryString = '';
```



```
String queryName = '%' + merchName + '%';

Account acc = [Select Location__Longitude__s,
Location__Latitude__s, Name, Id
from Account where Id =: accId];

//Finds warehouses nearby if you have location
//specified on the Account
if(acc.Location__Latitude__s != null &&
acc.Location__Longitude__s != null){
    queryString = 'SELECT Id, (SELECT Id, Name, Quantity__c,

        Warehouse__r.Name, Warehouse__r.Id,
        Warehouse__r.Street_Address__c,
        Warehouse__r.City__c '+
        'FROM Merchandise__r WHERE Name
        like :queryName) '
        + 'FROM Warehouse__c WHERE '
        + 'DISTANCE(Location__c, GEOLOCATION('
        + acc.Location__Latitude__s+', '
        + acc.Location__Longitude__s+')), \'mi\')';
    if(warehouseDist != null){
        queryString += ' <' + warehouseDist;
    }
}

//If no location defined on the Account, this will run
//query against the merchandise name only
else {
    queryString = 'SELECT Id, Name,
        Location__Longitude__s,
        Location__Latitude__s, '
        + '(SELECT Id, Name, Warehouse__r.Name,
        Quantity__c
        FROM Merchandise__r WHERE Name
        like :queryName) '
        + 'FROM Warehouse__c limit 25';
}

//This creates a list of merchandise
//to display in the search results
Warehouse__c[] warehouses = Database.Query(queryString);
for(Warehouse__c warehouse : warehouses) {
```

Chapter 12 Adding Functionality with Visualforce Custom Actions

```
        Merchandise__c[] merch =
            warehouse.getSObjects('Merchandise__r');
        if (merch != null) {
            for (Merchandise__c m : merch) {
                merchandise.add(m);
            }
        }
    }
    return merchandise;
}

//This remote action creates the invoice for the quick order
@RemoteAction
global static Line_Item__c createQuickOrder(
    String accId, String merchandiseId){
    Invoice__c newInvoice = new Invoice__c();
    newInvoice.Account__c = accId;
    insert newInvoice;

    quickOrder = new Line_Item__c();
    Merchandise__c m = [Select Id, Name from Merchandise__c
        where Id=: merchandiseId limit 1];
    quickOrder.Merchandise__c = m.Id;
    quickOrder.Invoice__c = newInvoice.Id;

    return quickOrder;
}

//This remote action creates the line item related to the
//invoice for the quick order
@RemoteAction
global static Boolean insertQuickOrder(String o, String q){
    try {
        Integer quantity = integer.valueOf(q);

        Line_Item__c order = new Line_Item__c();
        /* The order variable being passed in as a param is being
        passed in the form of a JSON object. You need to use
        the JSON deserialize method in Apex to convert it
        into a SObject */
        order = (Line_Item__c)JSON.deserialize(
            o, Line_Item__c.class);
    }
}
```

```

        order.Quantity__c = quantity;
        insert order;

//Need to requery for the name for the post to chatter
//since it wasn't explicitly specified
Line_Item__c li = [Select Name, Merchandise__r.Name, Id,
    Quantity__c, Invoice__c from Line_Item__c
    where Id =: order.Id];

    FeedItem post = new FeedItem();
    post.ParentId = aId;
    post.Body = UserInfo.getName() + ' just created a quick order';

    post.type = 'LinkPost';
    post.LinkUrl = '/' + li.Invoice__c;
    post.Title = li.Merchandise__r.Name + ': ' + li.quantity__c;
    insert post;
} catch(System.Exception ex) {
    system.debug(ex.getMessage());
}

    return true;
}

//This remote action handles deleting the invoice if
//the user doesn't want to insert the line item
@RemoteAction
global static Boolean goBack(String invoiceId){
    // Delete created invoice and return to original
    //search screen
    Invoice__c cancelledInvoice = [select Id from Invoice__c
        where Id=: invoiceId];
    delete cancelledInvoice;

    return true;
}
}

```



Note: Use static queries and binding variables to prevent a SOQL injection attack. For example, use `:queryName` instead of `\'%'+merchName+'%\'`. For more information, see “Security Guidelines for Apex and Visualforce Development” in the Salesforce Help.

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The Apex controller also has an `insertQuickOrder` method that creates a feed item about the new order in the account feed as shown in this code snippet. The feed item is a link post that links to the invoice.

```
FeedItem post = new FeedItem();
post.ParentId = aId;
post.Body = UserInfo.getName() + ' just created a quick order';
post.type = 'LinkPost';
post.LinkUrl = '/' + li.Invoice__c;
post.Title = li.Merchandise__r.Name + ': ' + li.quantity__c;
insert post;
```

Visualforce Page `QuickOrderPage`

This page calls the controller with the user input and then displays the merchandise and warehouse information to the user. If the user wants to create an order, this page also calls the controller to create the order associated with the customer account and add a line item. At the beginning of the page, the code also does some styling of the page using the Salesforce mobile design templates.

```
<apex:page standardController="Account"
    extensions="QuickOrderController" docType="html-5.0"
    standardStylesheets="false" showheader="false" sidebar="false">

    <!--Include stylesheets for the mobile look and feel -->
    <apex:stylesheet value="{!URLFOR(
        $Resource.Mobile_Design_Templates,
        'Mobile-Design-Templates-master/
        common/css/app.min.css')}" />
    <apex:includeScript value="{!URLFOR(
        $Resource.Mobile_Design_Templates,
        'Mobile-Design-Templates-master/common/js/
        jquery2.0.2.min.js')}" />
    <apex:includeScript value="{!URLFOR(
        $Resource.Mobile_Design_Templates,
        'Mobile-Design-Templates-master/common/js/
        jquery.touchwipe.min.js')}" />
    <apex:includeScript value="{!URLFOR(
        $Resource.Mobile_Design_Templates,
        'Mobile-Design-Templates-master/common/
        js/main.min.js')}" />

    <style>
        /* Default S1 color styles */
```

```
.list-view-header, .data-capture-buttons a {
    background: -webkit-linear-gradient(
        #2a93d5,#107abb);
    background: linear-gradient(#2a93d5,#107abb);
    box-shadow: 0 1px 3px rgba(0,0,0,.2),
        inset 0 1px 0 rgba(255,255,255,.21);
    color: white;
    font-weight: bold;
}

#resultPage, #searchPage {
    padding-bottom: 50px;
}
</style>
```

The `QuickOrderPage` also calls the Canvas SDK to enable the publisher **Submit** button and close the publisher window.

First, it includes a reference to the SDK:

```
<!-- This needs to be included so the publisher can be used
to submit the action -->
<script type='text/javascript'
src='/canvas/sdk/js/publisher.js'></script>
```

Then it calls the `setValidForSubmit` method to enable the publisher **Submit** button:

```
//This method will activate the publish button
//so the form can be submitted
Sfdc.canvas.publisher.publish({
    name: "publisher.setValidForSubmit",
    payload:"true"});
```

After the `setValidForSubmit` is called and the user clicks **Submit**, this `subscribe` method fires. This method invokes the final JavaScript function which uses JavaScript remoting to insert the line item (thus completing the quick order) and then post a feed item to the account:

```
<script type='text/javascript'>
    Sfdc.canvas.publisher.subscribe({name: "publisher.post",
        onData:function(e) {
            //This subscribe fires when the user hits
            //Submit in the publisher
            insertQuickOrder();
        }});
</script>
```

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Finally, after the callback from the remoting method returns successfully, this method closes the publisher window:

```
// Success - close the publisher and refresh the feed
Sfdc.canvas.publisher.publish({name: "publisher.close",
    payload:{ refresh:"true"}});
```

CHAPTER 13 Development Guidelines and Best Practices

In this chapter ...

- [When to Use the Navigation Menu or the Action Bar](#)
- [Guidelines and Best Practices](#)
- [Canvas Guidelines and Best Practices](#)


You've had a chance to learn the major concepts of developing for the Salesforce app, and to see how you can easily add customized functionality for your mobile users. This chapter focuses on some conceptual guidelines and specific best practices for developing advanced custom actions and pages using the programmatic tools available to all Salesforce Platform developers.

Whether you're creating Visualforce pages to add as custom actions or mobile cards, or creating or integrating canvas apps into the Salesforce app, these principles and practices will help you provide the best experience for your mobile users.

When to Use the Navigation Menu or the Action Bar

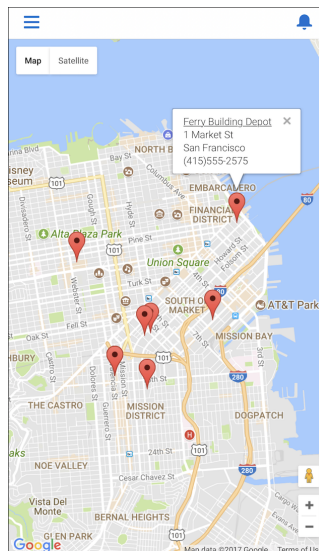
As we've seen throughout the examples in this book, you can extend and customize the Salesforce app and make your new functionality accessible to users from either the navigation menu or from the action bar. Here we'll look at when you should use one method over another.

Navigation menu

The navigation menu appears when you tap . This menu is available in the global context. For example, if users log in and are viewing items in the feed, they can tap and open the navigation menu, and it displays menu items. Typically, these menu items lead to more complex business processes that don't take place in the context of any particular object.

Menu items in the navigation menu should bring users to a fully functional page or app. So if you have a page or app that contains many fields through which the user would need to scroll and perform a more complex process, you'll want to make your page or app available from the navigation menu.

An example from this book is the Find Warehouses Visualforce page that we made available from the navigation menu in [Extending the Salesforce App with Visualforce Pages](#) on page 79. When the mobile technician taps the menu item, a page appears that contains a Google map and displays any nearby warehouses. The functionality of this page is global—not in the context of any particular object in our schema.



Action Bar

The action bar and its action menu appear on all pages that support actions. The action bar is for accessing custom functionality that displays small amounts of data and allows users to perform short, quick actions. If you have functionality that occurs in the context of an object, you'll want to add it as an action in the action bar.

An example from this book is the Create Quick Order action, available from the action bar within a customer account. While the mobile technicians are servicing a customer account, they can tap the action and then enter in just the merchandise name and distance to find warehouses with a part in stock. Then the technicians enter the quantity and a customer order is created. The functionality of this Visualforce page occurs within the context of a customer account. The user interaction with the page is quick, and it's a simple process to search and create an order because the action contains only a few fields.

Cancel Create Quick Order Save

Enter Search

MERCHANDISE NAME

iPhone

MAX DELIVERY DISTANCE (MILES)

10

Submit

Search Results

iPhone 5C Blue

Quantity on hand:1230
Big Tech Warehouse
San Francisco

iPhone 5C Green

Quantity on hand:1400
Big Tech Warehouse
San Francisco

Guidelines and Best Practices

Visualforce pages aren't automatically mobile friendly in the Salesforce app. The standard Salesforce header and sidebar are disabled in favor of the mobile controls, and a JavaScript API is available to make it possible for Visualforce pages to connect with mobile navigation management. In other respects the pages remain as they are and, although usable within the app, desktop focused Visualforce pages will *feel* desktop focused.

Fortunately, making your apps look great in the Salesforce app is straightforward. You can either revise your code so that your pages work in both the full Salesforce site and the app, or you can create mobile-specific pages.

In this chapter, you'll learn best practices for how to:

- Share Visualforce pages between mobile and desktop.
- Exclude Visualforce from mobile or desktop.
- Choose the best architecture for your Visualforce pages.
- Choose an effective page layout for your pages.
- Manage user input and navigation.
- Use Visualforce pages as custom actions.
- Tune your pages for the best performance.

Sharing Visualforce Pages Between Mobile and Desktop

Revise Visualforce pages that appear in both the Salesforce app and in the full Salesforce site to support both environments. This includes Visualforce pages used as custom actions, and Visualforce pages added to standard page layouts, except those added to the Mobile Cards section of a page layout.

Visualforce pages that need to work in both environments include:

- Pages used as custom actions. Custom actions appear in the action bar in the Salesforce app, and in the publisher menu in the full Salesforce site.
- Pages added to normal page layouts, when `Available for Lightning Experience, Lightning Communities, and the mobile app` is enabled for the page.
- Custom Visualforce buttons or links added to normal page layouts.
- Standard button overrides with Visualforce pages for the New, Edit, View, Delete, and Clone actions. Overriding standard list and tab controls isn't supported in the app. Button overrides won't appear in the app unless `Available for Lightning Experience, Lightning Communities, and the mobile app` is enabled for the page.



Note: Standard buttons that are overridden with a Visualforce page disappear from record detail pages and record lists in the app if `Available for Lightning Experience`, `Lightning Communities`, and the mobile app isn't selected for the Visualforce page that overrides the corresponding button.

Excluding Visualforce Pages from Mobile or Desktop

To display your Visualforce pages only in the Salesforce app, add them to the Mobile Cards section of your page layout. To add Visualforce pages to either the app or the full Salesforce site, use tab and navigation settings.

Visualforce pages that can be configured to be desktop-only or mobile-only include:

- Pages added as mobile cards on page layouts. These only appear in the Salesforce app.
- Pages added to normal page layouts, when `Available for Lightning Experience`, `Lightning Communities`, and the mobile app is disabled for the page. These only appear in the full Salesforce site.
- Pages used in Visualforce tabs. You add tabs to mobile navigation separately from adding them to the full Salesforce site navigation.

Choosing an Architecture for Visualforce Pages in the Salesforce App

There are several ways to design and structure Visualforce pages, each with different trade-offs with respect to development time, developer skill required, and how thoroughly you want your custom functionality to match the Salesforce app.

Use one of the following approaches for the structure of your pages:

- [Standard Visualforce Pages](#) on page 109
- [Mixed Visualforce and HTML](#) on page 111
- [JavaScript Remoting and Static HTML](#) on page 113

Standard Visualforce Pages

Normal Visualforce pages render well on mobile browsers, and can be used as-is, with a modest reduction of the user experience compared to mobile-optimized Web pages. Pages display as they would on the full Salesforce site, and won't visually match other Salesforce app features.

Limitations

Limitations to the user experience include:

- Tap targets—buttons, links, form fields, and so on—are optimized for mouse cursors, and can be difficult to hit accurately with a fingertip.
- The visual design is unchanged, and may not fit with the mobile-optimized, modern visual design of the Salesforce app.

If your development timeline is aggressive, you might find these limitations acceptable.



Example: Example of a Standard Visualforce Page

The following code provides a sample for a standard Visualforce page that allows a user to edit a warehouse record. The edit feature is provided by the standard controller for the object.

```
<apex:page standardController="Warehouse__c">

<apex:form>

    <apex:pageBlock title="{! warehouse__c.Name }">

        <apex:pageBlockSection title="Warehouse Details" columns="1">

            <apex:inputField value="{! warehouse__c.Street_Address__c
        }"/>
            <apex:inputField value="{! warehouse__c.City__c }"/>
            <apex:inputField value="{! warehouse__c.Phone__c }"/>
        </apex:pageBlockSection>

        <apex:pageBlockButtons location="bottom">
            <apex:commandButton action="{! quickSave }" value="Save"/>
        </apex:pageBlockButtons>

    </apex:pageBlock>

</apex:form>

</apex:page>
```

This page can be used in both the Salesforce app and the full Salesforce site. It displays as a standard desktop Visualforce page in both contexts.

Mixed Visualforce and HTML

Combine Visualforce tags for form elements and output text with static HTML for page structure to create mobile-friendly pages that more closely match the visual design of the Salesforce app. For mobile-only pages, you can quickly convert an existing Visualforce page, but this doesn't work as well for pages that are used in both the Salesforce app and the full Salesforce site.

Visualforce pages designed this way are still “standard” Visualforce, in that they use the standard request-response cycle, standard controller functionality, `<apex:inputField>` for form fields, POSTBACK and view state, and so on. The main difference from authoring pages for the full Salesforce site is the reduced or eliminated use of Visualforce tags to add structure to the page, in favor of static HTML. That is, replacing `<apex:pageBlock>`, `<apex:pageBlockSection>`, and so on, with `<div>`, `<p>`, ``, and so on.

This approach also requires creating CSS stylesheets to manage the look-and-feel of the page elements, instead of using the built-in, automatically applied styles provided when you use the Visualforce components. While this can take some time, it allows you to much more closely match the visual design of the Salesforce app. This also means that pages designed this way *won't* match the full Salesforce site visually.

Applying this Approach to Your Visualforce Pages

To use this approach for creating pages to use in the Salesforce app, follow a few general rules.

- Don't use the following Visualforce tags:
 - `<apex:pageBlock>`
 - `<apex:pageBlockButtons>`
 - `<apex:pageBlockSection>`
 - `<apex:pageBlockSectionItem>`
 - `<apex:pageBlockTable>`
- Use `<apex:form>`, `<apex:inputField>` or `<apex:input>`, and `<apex:outputLabel>` for forms.
- Use `<apex:outputText>` or Visualforce for non-editable text.
- Use your preferred HTML to construct the structure for the page: `<div>`, ``, `<h1>`, `<p>`, and so on.
- Use CSS styling to apply your preferred visual design.

Advantages and Limitations

The advantages of this approach include:

- Reasonably fast development time, and you use the normal Visualforce development tools and processes.
- It's reasonably easy to repurpose existing pages.
- You can more closely match the Salesforce app's look and feel.

Some limitations to keep in mind:

- This approach makes the usual Visualforce request round trips, with larger data payloads, compared to a fully mobile-optimized approach using JavaScript remoting.
- It's extra work to add CSS styles that replace the styles automatically added by `<apex:pageBlock>` and related components.



Example: Example of a Mixed Visualforce and HTML Page

The following code sample shows a mixed HTML and Visualforce page that allows a user to edit a warehouse record. The edit feature is provided by the standard controller for the object.

```
<apex:page standardController="Warehouse__c">

<style>
    html, body, p { font-family: sans-serif; }
</style>

<apex:form >

    <h1>{!Warehouse__c.Name}</h1>

    <h2>Warehouse Details</h2>

    <div id="theForm">
        <div>
            <apex:outputLabel for="address" value="Street Address"/>

            <apex:inputField id="address"
                value="{! warehouse__c.Street_Address__c}"/>
        </div>
        <div>
            <apex:outputLabel for="city" value="City"/>
            <apex:inputField id="city"
                value="{! warehouse__c.City__c}"/>
        </div>
    </div>
</apex:form>
```

```

        <div>
            <apex:outputLabel for="phone" value="Phone"/>
            <apex:inputField id="phone"
                value="{! warehouse__c.Phone__c}"/>
        </div>
    </div>

    <div id="formControls">
        <apex:commandButton action="{!quickSave}" value="Save"/>
    </div>

</apex:form>

</apex:page>

```

This page can be used in both the Salesforce app and the full Salesforce site. It displays as a standard page on the full Salesforce site, but without the full Salesforce styling for the form. In the Salesforce app, it displays roughly matching the Salesforce app's visual style. With additional styles, the page can approximate the visual style for both versions.

JavaScript Remoting and Static HTML

Combine JavaScript remoting and static HTML to offer the best user experience, with the best performance and user interface match to the Salesforce app. This architecture avoids most Visualforce tags in favor of rendering page elements in JavaScript. This option requires the most developer expertise, and can take a little longer to set up than standard Visualforce or mixed Visualforce and HTML. Use the Salesforce Mobile Packs for a fast start and to work with the very latest in mobile Web application technology.

Visualforce pages designed this way eschew many of the automatic, simplified features of standard Visualforce, in favor of taking more control over the request-response cycle, and performing page updates using JavaScript instead of page reloads. This can substantially improve the performance of the page, especially over the lower bandwidth, higher latency wireless network connections that make mobile devices so, well, mobile. The downside is that there is more code to write, and you need expertise in JavaScript, JavaScript remoting, HTML5, your mobile toolkit, and CSS, in addition to Apex and Visualforce. The upside of the downside is that you're working with the latest, most advanced tools for mobile development, and the pages you can build are the best, most complete way to "snap in" custom functionality that fully integrates with the app.

You can build desktop Visualforce pages using this approach as well as pages for the Salesforce app. It's even possible to share such pages between the two environments by customizing the styling, though it's a challenge to closely match the full Salesforce site look and feel. Most importantly, the pages you design can be fully responsive, adapting and working across a range of devices and form factors.

Applying this Approach to Your Visualforce Pages

To use this approach for creating pages for the Salesforce app, follow this general process:

1. Install your preferred [Salesforce Mobile Pack](#) (available on Salesforce) into your organization as a static resource.
2. Set your page's docType to `html-5.0`. Strongly consider disabling the standard stylesheets and header. For example:

```
<apex:page standardController="Warehouse__c"
  extensions="WarehouseEditor"
  showHeader="false" standardStylesheets="false"
  docType="html-5.0">
```

3. Add scripts and styles from your chosen mobile toolkit to the page using Visualforce resource tags. For example:

```
<apex:includeScript
  value="{!URLFOR(
    $Resource.Mobile_Design_Templates,
    'Mobile-Design-Templates-master/common/js/
    jquery2.0.2.min.js'
  ) }"/>
```

4. Use HTML5 and your mobile toolkit's tags and attributes to create a page skeleton.
5. Add JavaScript functions to the page as handlers to respond to user interaction. Use JavaScript remoting to call Apex `@RemoteAction` methods that retrieve records, perform DML, and so on.
6. Add additional JavaScript functions to handle user actions and page updates. Perform page updates by constructing HTML elements in JavaScript, and then adding or appending them to the page skeleton.



Example: Example of a JavaScript Remoting and Static HTML Page

The following code sample shows a remoting + HTML Visualforce page that allows a user to edit a warehouse record. The edit feature is provided by a controller extension with `@RemoteAction` methods that respond to JavaScript remoting requests.

```
<apex:page standardController="Warehouse__c"
  extensions="WarehouseEditor"
  showHeader="false" standardStylesheets="false"
  docType="html-5.0" applyHtmlTag="false" applyBodyTag="false">
```



```

<!-- Include Mobile Toolkit styles and JavaScript -->
<apex:stylesheet
    value="{!URLFOR($Resource.Mobile_Design_Templates,
        'Mobile-Design-Templates-master/common/css/app.min.css')}" />

<apex:includeScript
    value="{!URLFOR($Resource.Mobile_Design_Templates,
        'Mobile-Design-Templates-master/common/js/jquery2.0.2.min.js')}" />

<apex:includeScript
    value="{!URLFOR($Resource.Mobile_Design_Templates,
        'Mobile-Design-Templates-master/common/js/jquery.touchwipe.min.js')}" />

<apex:includeScript
    value="{!URLFOR($Resource.Mobile_Design_Templates,
        'Mobile-Design-Templates-master/common/js/main.min.js')}" />

<head>
<style>
    html, body, p { font-family: sans-serif; }
    input { display: block; }
</style>

<script>
    $(document).ready(function(){
        // Load the record
        loadWarehouse();
    });

    // Utility; parse out parameter by name from URL query string

    $.urlParam = function(name){
        var results = new RegExp('[\\?&]' + name + '=(^&#)*')
            .exec(window.location.href);
        return results[1] || 0;
    }

    function loadWarehouse() {
        // Get the record Id from the GET query string
        warehouseId = $.urlParam('id');
    }

```

```
// Call the remote action to retrieve the record data
Visualforce.remoting.Manager.invokeAction(
    '{!$RemoteAction.WarehouseEditor.getWarehouse}',
    warehouseId,
    function(result, event){;
        if(event.status){
            console.log(warehouseId);
            $('#warehouse_name').text(result.Name);
            $('#warehouse_address').val(
                result.Street_Address__c);
            $('#warehouse_city').val(result.City__c);
            $('#warehouse_phone').val(result.Phone__c);
        } else if (event.type === 'exception'){
            console.log(result);
        } else {
            // unexpected problem...
        }
    });
}

function updateWarehouse() {
    // Get the record Id from the GET query string
    warehouseId = $.urlParam('id');

    // Call the remote action to save the record data
    Visualforce.remoting.Manager.invokeAction(
        '{!$RemoteAction.WarehouseEditor.setWarehouse}',
        warehouseId, $('#warehouse_address').val(),
        $('#warehouse_city').val(),
        $('#warehouse_phone').val(),
        function(result, event){;
            if(event.status){
                console.log(warehouseId);
                $('#action_status').text('Record updated.');
```

```
            } else if (event.type === 'exception'){
                console.log(result);
                $('#action_status').text(
                    'Problem saving record.');
```

```
            } else {
                // unexpected problem...
            }
        });
}
```

```

    }

</script>
</head>

<body>

<div id="detailPage">
    <div class="list-view-header" id="warehouse_name"></div>
    <div id="action_status"></div>

    <section>
        <div class="content">
            <h3>Warehouse Details</h3>
            <div class="form-control-group">
                <div class="form-control form-control-text">
                    <label for="warehouse_address">
                        Street Address</label>
                    <input type="text" id="warehouse_address" />
                </div>
                <div class="form-control form-control-text">
                    <label for="warehouse_city">City</label>
                    <input type="text" id="warehouse_city" />
                </div>
                <div class="form-control form-control-text">
                    <label for="warehouse_phone">Phone</label>
                    <input type="text" id="warehouse_phone" />
                </div>
            </div>
        </div>
    </div>
</section>

    <section class="data-capture-buttons one-buttons">
        <div class="content">
            <section class="data-capture-buttons one-buttons">
                <a href="#" id="updateWarehouse"
                    onClick="updateWarehouse();">save</a>
            </section>
        </div>
    </section>
</div> <!-- end detail page -->

</body>

```

```
</apex:page>
```

The static HTML provides the shell of the page, including empty form fields. JavaScript functions load the record, fill in the form fields, and send updated form data back to Salesforce.

Although this page can be used in the full Salesforce site, it's designed as a Salesforce app page and looks very different than a normal Visualforce page.



Example: Example of a JavaScript Remoting and Static HTML Controller

Unlike the other two approaches to creating mobile pages, the remoting + HTML approach doesn't use standard controller functionality to retrieve data from and save data to Salesforce. Instead, you create a controller extension, or custom controller, to add any `@RemoteAction` methods your page requires. Here's a simplified controller extension that supports the above page.

```
global with sharing class WarehouseEditor {

    // Stub controller
    // We're only using RemoteActions, so this never runs
    public WarehouseEditor(ApexPages.StandardController ctl){ }

    @RemoteAction
    global static Warehouse__c getWarehouse(String warehouseId) {

        // Clean up the Id parameter, in case there are spaces
        warehouseId = warehouseId.trim();

        // Simple SOQL query to get the warehouse data we need
        Warehouse__c wh = [
            SELECT Id, Name, Street_Address__c, City__c, Phone__c

            FROM Warehouse__c
            WHERE Id = :warehouseId];

        return(wh);
    }

    @RemoteAction
    global static Boolean setWarehouse(
        String whId, String street, String city, String phone) {

        // Get the warehouse record for the Id
```

```

        Warehouse__c wh = WarehouseEditor.getWarehouse(whId);

        // Update fields
        // Note that we're not validating / sanitizing, for
simplicity
        wh.Street_Address__c = street.trim();
        wh.City__c = city.trim();
        wh.Phone__c = phone.trim();

        // Save the updated record
        // This should be wrapped in an exception handler
        update wh;

        return true;
    }
}

```

Visualforce Components and Features to Avoid in the Salesforce App

Most core Visualforce components (those components in the `apex` namespace) function normally within the Salesforce app. Unfortunately, that doesn't mean they're optimized for mobile, or that every feature works with the app. You can improve the mobile user experience of your Visualforce pages by following some straightforward rules.

In general, avoid structural components, like `<apex:pageBlock>` and child components, and other components that mimic the Salesforce look and feel, such as `<apex:pageBlockTable>`. If you must use these components, set them to one column, using `<apex:pageBlockSection columns="1">`, instead of the default of two columns.

Avoid wide, non-wrapping components, especially `<apex:detail>`, `<apex:enhancedList>`, `<apex:listViews>`, and `<apex:relatedList>`, which are all unsupported. Keep device width in mind when creating tables with `<apex:dataTable>`.

Avoid using `<apex:inlineEditSupport>`. Inline editing is a user interface pattern that works well for mouse-based desktop apps, but it's difficult to use on a touch-based device, especially on phones where the screen is small.

Using `<apex:inputField>` is fine for fields that display as a basic input field, like text, email, and phone numbers, but avoid using it for field types that use an input widget, such as date and lookup fields.

Don't use `<apex:scontrol>`. sControls aren't supported anywhere in the Salesforce app.

PDF rendering, by setting `renderAs="PDF"` on `<apex:page>`, isn't supported for pages in the Salesforce app.

Unsupported Visualforce Components

Here's a list of Visualforce components that aren't supported in the Salesforce app, and shouldn't be used in Visualforce pages that will be used with the Salesforce app.

- `<analytics:reportChart>`
- `<apex:detail>`
- `<apex:emailPublisher>`
- `<apex:enhancedList>`
- `<apex:flash>`
- `<apex:inputField>` for field types that use a widget for input, instead of a basic form field
- `<apex:listViews>`
- `<apex:logCallPublisher>`
- `<apex:relatedList>`
- `<apex:scontrol>`
- `<apex:sectionHeader>`
- `<apex:selectList>` for picklist fields
- `<apex:tabPanel>` (and, as a consequence, `<apex:tab>`)
- `<apex:vote>`



Warning: Embedded Visualforce pages—that is, those added to a page layout—that contain an `<apex:enhancedList>` component may cause the Salesforce app to crash on iOS.

Standard components outside the `apex` namespace, for example, `<liveagent:*>`, `<chatter:*>`, and so on, aren't supported in the app.

Custom components can be used in Visualforce in the app, as long as they themselves don't use unsupported components.

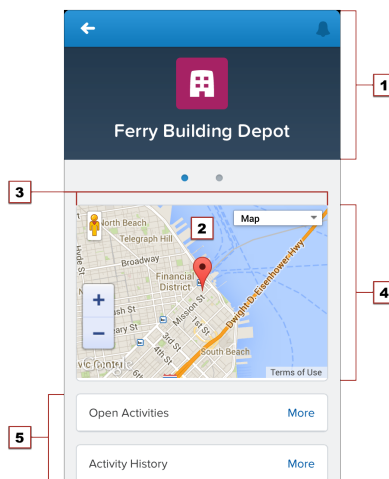
Choosing an Effective Page Layout

Design Visualforce pages that look good and work well within the Salesforce app by using a page layout appropriate for the context that the page is used in. Pages added as main navigation tabs or as custom actions in the action bar can use nearly the full screen of the device, and can scroll vertically, while Visualforce added to an object's page layout has to fit within a specific, limited space.

In general, Visualforce added to page layouts works best if it's read-only, at-a-glance information. Put features that require user interaction, like multi-field forms, on full screen pages by adding them as tabs in the main navigation, or as custom actions from the action bar.

Mobile Card Layout

Mobile cards have the most limited layout, both in size and placement. Visualforce pages added as mobile cards on an object's page layout appear on the related lists page for the object in the Salesforce app, as the first items on the page, below the header.



1. The record header displays when an record is loaded, but can be scrolled up and off the screen by the user. When on screen, it's 158 pixels high on all devices, and takes the full width of the screen. You can't control the display of the record header.
2. Mobile cards display above all of the related items on the record.
3. Set the width to 100%; the element sizes automatically, minus some padding on either side. The content of mobile cards can't be scrolled, so make sure it fits in the space you provide to it.
4. Control the height of the mobile card by setting the height in pixels in the page layout editor. The mobile card area uses exactly that height, even if the mobile card's content is shorter. In that case, the extra area is blank. If the card's content is taller, the content is clipped. As a best practice, don't create mobile cards taller than the smallest device screen you intend to support. Be sure to set the height of screen elements relevant to your environment.
5. The record's related items are displayed after all mobile cards.

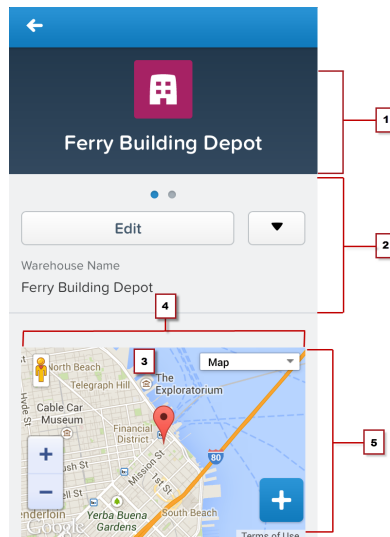
While you can add multiple mobile cards, it quickly becomes a user experience challenge to scroll past them to the related lists. It's a best practice to add only one or two. If you need a full screen to display your page, consider moving it to a custom action on the object instead.

The normal Salesforce header and sidebar are automatically removed from Visualforce pages added as mobile cards. You may find it useful to explicitly turn them and the full Salesforce site stylesheets off while you're developing the page. Additionally, if your page uses the Google Maps API, Google recommends using an HTML5 doctype. Here's an `<apex:page>` tag that does all of these things:

```
<apex:page standardController="Warehouse__c"
  docType="html-5.0" showHeader="false" standardStylesheets="false">
```

Visualforce on a Page Layout

Visualforce pages added to an object's page layout display on the record details page. Unlike mobile cards, you can control the Visualforce element's placement on the mobile record details screen, putting fields and other record details above and below it, by changing its placement on the object's page layout. Visualforce pages added this way follow the same rules for ordering that fields and other elements do.



1. The record header displays when an record is loaded, but can be scrolled up and off the screen by the user. When on screen, it's 158 pixels high on all devices, and takes the full width of the screen. You can't control the display of the record header.
2. Record controls and details, automatically generated by the Salesforce app.

3. A Visualforce page added to the object's page layout.
4. Set the width to 100%; the element sizes automatically, minus some padding on either side.
5. Control the height of the Visualforce page's area by setting the height of the item in pixels in the page layout editor. The Visualforce element uses exactly that height, even if the content is shorter. In that case, the extra area is blank. If the page's content is taller, the content is clipped. As a best practice, don't set inline Visualforce pages to be taller than the smallest device screen you intend to support.

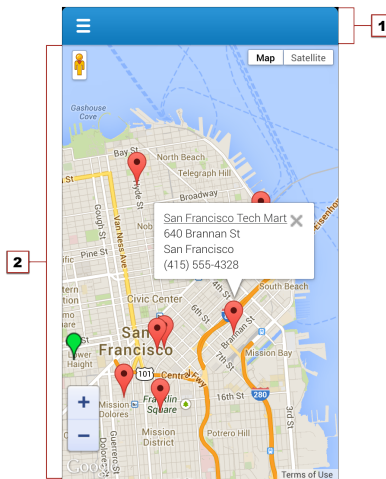
As is the case with multiple cards, although you can add multiple inline Visualforce pages to a page layout, it quickly becomes a user experience challenge to scroll past them to see the rest of the page. It's a best practice to never add more than two Visualforce page elements in a row; separate Visualforce elements with a regular page element, such as a field. If you need a full screen to display your page, consider moving it to a custom action on the object instead.

Visualforce pages added to page layouts automatically have the normal Salesforce header and sidebar removed. You may find it useful to explicitly turn them and the full Salesforce site stylesheets off while you're developing the page. Additionally, if your page uses the Google Maps API, Google recommends using an HTML5 doctype. Here's an `<apex:page>` tag that does all of these things:

```
<apex:page standardController="Warehouse__c"
  docType="html-5.0" showHeader="false" standardStylesheets="false">
```

Full Screen Layout

Visualforce pages added to the Salesforce app navigation menu, or as custom actions to the action bar, can use almost the entire screen, allowing more information, and more complex user interfaces.



1. The Salesforce header, which provides access to the main navigation menu, is 42 pixels high. The contents of the header can't be changed.
2. The rest of the device screen is dedicated to your Visualforce page.

When displayed in the Salesforce app, the standard Salesforce header and sidebar are automatically removed, like Visualforce pages used as mobile cards or added to page layouts. However, Visualforce pages used as custom actions in the action bar are shared with the full Salesforce site, and pages added to the navigation may or may not be shared. Pages shared with the full Salesforce site shouldn't have the standard Salesforce header and sidebar explicitly removed unless removing the header and sidebar is the standard practice for all Visualforce on your site.

User Input and Interaction

Use `<apex:input>`, the `type` attribute, and pass-through HTML attributes to create mobile-friendly forms and user interfaces that are efficient and take advantage of native mobile browser features.

Without a keyboard and mouse, standard HTML forms can be difficult for users to fill out and interact with on mobile devices, especially phones. For Visualforce pages that don't use JavaScript remoting to make requests, choose Visualforce components for form input with an eye towards mobile users. No other change you can make to your Visualforce pages will have a larger usability impact than taking advantage of new HTML5 and mobile browser features to improve your forms and user interface controls.

Choose Efficient Input Elements

Use `<apex:input>` to get user input whenever possible. `<apex:input>` is an HTML5-ready, mobile-friendly, general-purpose input component that adapts to the data expected by a form field. It's even more flexible than `<apex:inputField>` because it uses the `type` attribute to allow client browsers to display type-appropriate user input widgets, such as a date picker, or use a type-specific keyboard that makes entering input on a mobile device much easier.

You can also use `<apex:inputField>` to create an HTML input element for a value that corresponds to a field on a Salesforce object. `<apex:inputField>` adapts the HTML generated to correspond with the data type of the underlying sObject field. Usually this is what you want, but if it isn't, use the `type` attribute to override the automatic data type detection. However, be aware that `<apex:inputField>` generates a lot of HTML, and requires additional resources to load, which means it's not the most efficient component to use over a mobile wireless connection.

Use the `type` Attribute to Create Mobile-Friendly Input Elements

Set the `type` attribute on `<apex:input>` components—and `<apex:inputField>`, if you're using it—to display data-type-specific keyboards and other input user interface widgets that are easier to use on touchscreens. The value is passed through to the generated HTML `<input>` element, for display in the Salesforce app.

As users step through form elements, the input method for that form element adapts for the type of data expected. Text fields show the standard keyboard, email fields show an email-specific keyboard with characters like the "@" sign and ".com" assigned to keys, date fields show a date picker, and so on.

Here's an example of a form that illustrates how this works:

```
<apex:form >

    <apex:outputLabel value="Phone" for="phone"/>
    <apex:input id="phone" value="{!fPhone}" type="tel"/><br/>

    <apex:outputLabel value="Email" for="email"/>
    <apex:input id="email" value="{!fText}" type="email"/><br/>

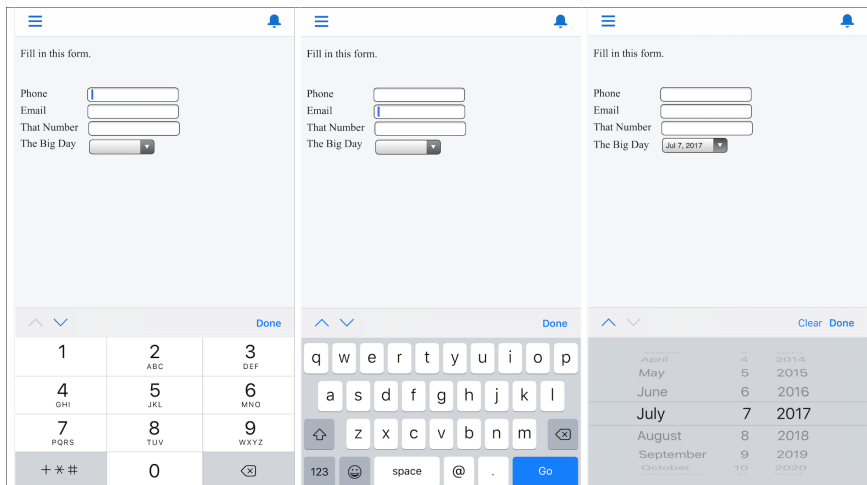
    <apex:outputLabel value="That Number" for="num"/>
    <apex:input id="num" value="{!fNumber}" type="number"/><br/>

    <apex:outputLabel value="The Big Day" for="date"/>
    <apex:input id="date" value="{!fDate}" type="date"/><br/>

</apex:form>
```

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As the user moves through the form fields, either by tapping into them or tapping the **Next** button, the keyboard changes to match the expected data for the field.



These type-specific keyboards make filling in forms much easier for people using their mobile devices.

`<apex:input>` allows the following explicit `type` values to be set:

- `date`
- `datetime`
- `datetime-local`
- `month`
- `week`
- `time`
- `email`
- `number`
- `range`
- `search`
- `tel`
- `text`
- `url`

You can also set `type` to `auto`, and the data type of the associated controller property or method is used.

The HTML `type` attribute, including new HTML5 features, is a standard part of HTML. For additional details about the `type` attribute, what you can use it for, and how it relates to mobile development, see

[WHATWG's list of input type attribute values and descriptions](#). Not all values are supported on Visualforce input components. If you want to use a value not supported by Visualforce, use static HTML instead of a Visualforce tag.

Use HTML5 Pass-Through Attributes for Client-Side Validation

Set pass-through attributes on your `<apex:input>` and other Visualforce components to enable other HTML5 features, such as client-side validation. By performing basic validation on the client side, you can avoid sending a request to the server and waiting for a response, when there are easily-corrected errors on a form.

Attributes prefixed with `html-` are passed through to the generated HTML, with the prefix removed. To enable client-side validation, set an `html-pattern` attribute on the `<apex:input>` tag to match expected form values. This will add a `pattern` attribute to the generated `<input>` tag, enabling client-side validation for that field.



Note: Client-side validation requires that the Visualforce page be set to API version 29.0 or later, and the page `docType` be set to `html-5.0`.

Validation patterns are regular expressions. Form input is checked against the expression, and if it matches, the field input is considered valid. If it doesn't match, the input is considered invalid; an error message is displayed, and the form won't be submitted to the server. Here's an example of a field that requires an email address from a specific domain:

```
<apex:input id="email" value="{!fText}" type="email"
  html-placeholder="you@example.com"
  html-pattern="^[a-zA-Z0-9._-]+@example.com$"
  title="Please enter an example.com email address"/>
```

Other useful HTML5 attributes that can be set as pass-through attributes include:

- `placeholder` (set using the `html-placeholder` attribute)—adds ghost text to the field to show sample input to the user.
- `title` (set using the `title` attribute on `<apex:input>`, and the `html-title` attribute on components without a `title` attribute)—adds an error message to use if the field fails client-side validation.

For inspiration for how you can use attributes to enhance the usability of HTML `<input>` elements, [HTML5 Forms Introduction and New Attributes](#) is a good survey of the new features in HTML5. For further details, especially for mobile users, and details of client-side forms validation, see [Client-side form validation](#) and [Improving the user experience on mobile devices](#) in WHATWG's [HTML: The Living Standard](#).

Managing Navigation

The Salesforce app manages navigation using events. The navigation event framework is made available as a JavaScript object that provides a number of utility functions that make creating programmatic navigation that “just works” a breeze. The advantage is a navigation experience that’s more natural for a mobile context. It also makes creating post-completion navigation, such as redirecting to an order page after the order is successfully submitted, easier for Salesforce developers.

In the Salesforce app, programmatic navigation for Visualforce pages generally works something like this:

1. A user invokes a Visualforce page, usually from the navigation menu, or from an action in the action bar.
2. The Visualforce page loads and runs, including any custom controller or extension code called by the page.
3. The user interacts with the page in some way: for example, to fill in some form values.
4. The user submits the form, or performs some other action on the page that commits a change.
5. Controller or extension code runs, saving the changes to Salesforce, and returning the results of the action.
6. The Visualforce page, using JavaScript response handlers, receives the results of the action, and when successful, responds by redirecting the user to a new page that shows the results of their action.

This scenario is easily handled by the app’s navigation framework.

Another common use case is simply adding links or other user interface controls to a page, which move from that Visualforce page to another page in the app. This navigation is also easily managed by the app’s navigation framework.

In these cases, navigation is handled by a special utility JavaScript object, `sforce.one`. The `sforce.one` object is automatically added to all Visualforce pages when they run inside the Salesforce app. This object provides a number of functions that trigger navigation events when they run. To use these functions, you can call them directly from your page’s JavaScript code, or you can attach calls as click handlers to elements on the page.

Here’s a JavaScript function that creates markers to add to a Google map.

```
function setupMarker() {  
  
    // Use JavaScript nav function to determine if we are  
    // in the Salesforce app and set navigation link appropriately  
    var warehouseNavUrl =  
        'sforce.one.navigateToSObject(\'' + warehouse.Id + '\')';  
}
```

```

// Wrap the warehouse details with the link to
// navigate to the warehouse details
var warehouseDetails =
    '<a href="javascript:' + warehouseNavUrl + '">' +
    warehouse.Name + '</a><br/>' +
    warehouse.Street_Address__c + '<br/>' +
    warehouse.City__c + '<br/>' +
    warehouse.Phone__c;

// Create a panel that will appear when a marker is clicked
var infowindow = new google.maps.InfoWindow({
    content: warehouseDetails
});

// ...
}

```

The very first line builds a string, *warehouseNavUrl*, that, when used as a JavaScript URL, navigates to the detail page for the warehouse. The link is created around the warehouse name, and appears in the information panel (put together in the *warehouseDetails* string) that appears when you click a marker. Clicking the warehouse name takes you to the detail page for that warehouse (the omitted part of the function code deals with the Google Maps API calls to create a marker and add it to the map).

If you have JavaScript code or HTML markup that runs inside of the Salesforce app, keep these considerations in mind:

- Don't directly manipulate the browser URL using `window.location.href`. This doesn't work well with the app's navigation management system.
- Don't use `target="_blank"` in navigation URLs; you can't open new windows inside the app.

Navigation Methods within the Canvas Framework

If you're using Canvas, there's a simpler way to control navigation around canvas apps and canvas personal apps in the Salesforce app.

You can use Lightning Platform methods to control navigation in the app. These methods within the Canvas framework are events that reside in the JavaScript library. When you call one of the navigation methods from your canvas code, you send an event into Salesforce that reads the payload and directs the user to the specified destination.

Reference the navigation method as an event variable, with name and payload. For example:

```

var event = {name:"s1.createRecord", payload: {entityName: "Account",
recordTypeId: "00h300000001234"}};

```


For more information about using the new methods, see [Salesforce App Navigation Methods for Use with Canvas Apps in the Canvas Developer Guide](#).

Navigation and Messaging with the `sforce.one` Object

The Salesforce Platform includes an event mechanism for navigation and messaging. This is exposed in Visualforce as a JavaScript object called `sforce.one`. It's available in any page that appears in the Salesforce app.

The `sforce.one` object provides the following functions. Reference the function using dotted notation from the `sforce.one` object. For example: `sforce.one.navigateToSObject(recordId, view)`.

Further details of the underlying events fired by these functions can be found in the [Lightning Aura Components Developer Guide](#).

Function	Description
<code>back([refresh])</code>	<p>Navigates to the previous state that's saved in the <code>sforce.one</code> history. It's equivalent to clicking a browser's Back button.</p> <p><code>refresh</code> is optional. By default, the page doesn't refresh. Pass <code>true</code> to refresh the page if possible.</p>
<code>navigateToSObject(recordId[, view])</code>	<p>Navigates to an sObject record, specified by <code>recordId</code>. This record "home" has several views, which in the Salesforce app are available as slides that the user can swipe between.</p> <p><code>view</code> is optional and defaults to <code>detail</code>. <code>view</code> specifies the slide within record home to display initially.</p> <p> Note: Record IDs corresponding to ContentNote SObjects aren't supported.</p> <p>The possible values are as follows.</p> <ul style="list-style-type: none"><code>detail</code>: the record detail slide<code>chatter</code>: the Chatter slide<code>related</code>: the view of related slide
<code>navigateToURL(url[, isredirect])</code>	<p>Navigates to the specified URL.</p> <p>Relative and absolute URLs are supported. Relative URLs are relative to the Lightning domain, and retain navigation history. External URLs—that</p>

Function

Description

is, URLs that are outside the Lightning domain—open in a separate browser window.



Note: Depending on the user's device platform, device settings, version of Salesforce, and authentication requirements for the external URL being opened, the separate browser window might require authentication or re-authentication.

Use relative URLs to navigate to different screens within your app. Use external URLs to allow the user to access a different site or app, where they can take actions that don't need to be preserved in your app. To return to your app, the separate window that's opened by an external URL must be closed when the user is finished with the other app. The new window has a separate history from your app, and this history is discarded when the window is closed. This also means that the user can't click a Back button to go back to your app; the user must close the new window.

`mailto:`, `tel:`, `geo:`, and other URL schemes are supported for launching external apps and attempt to "do the right thing." However, support varies by mobile platform and device. `mailto:` and `tel:` are reliable, but we recommend that you test any other URLs on a range of expected devices.

`isredirect` is optional and defaults to `false`. Set it to `true` to indicate that the new URL should replace the current one in the navigation history.



Note: Be careful when using `navigateToURL` within the `onClick` handler of an `<apex:commandButton>` or any `<button type="submit">` or `<input type="submit">`. Even if `isredirect=true`, the default click action of the command button is a form post. In this scenario, the command button performs a form post and a `navigateToURL` action, requiring the user to click the back button twice to navigate to the previous page. To prevent the default click action, configure the `onClick` handler to either call `event.preventDefault()` or return `false`.



Note: URLs corresponding to ContentNote SObjects aren't supported.

Function	Description
<code>navigateToFeed (subjectId, type)</code>	<p>Navigates to the feed of the specified <code>type</code>, scoped to the <code>subjectId</code>. For some feed <code>types</code>, the <code>subjectId</code> is required but ignored. For those feed <code>types</code>, pass the current user's ID as the <code>subjectId</code>.</p> <p><code>type</code> is the feed type. The possible values are as follows.</p> <ul style="list-style-type: none">• BOOKMARKS: Contains all feed items saved as bookmarks by the context user. Pass the current user's ID as the <code>subjectId</code>.• COMPANY: Contains all feed items except feed items of type <code>TrackedChange</code>. To see the feed item, the user must have sharing access to its parent. Pass the current user's ID as the <code>subjectId</code>.• FILES: Contains all feed items that contain files posted by people or groups that the context user follows. Pass the current user's ID as the <code>subjectId</code>.• GROUPS: Contains all feed items from all groups the context user either owns or is a member of. Pass the current user's ID as the <code>subjectId</code>.• NEWS: Contains all updates for people the context user follows, groups the user is a member of, and files and records the user is following. Contains all updates for records whose parent is the context user. Contains every feed item and comment that mentions the context user or that mentions a group the context user is a member of. Pass the current user's ID as the <code>subjectId</code>.• PEOPLE: Contains all feed items posted by all people the context user follows. Pass the current user's ID as the <code>subjectId</code>.• RECORD: Contains all feed items whose parent is a specified record, which could be a group, user, object, file, or any other standard or custom object. When the record is a group, the feed also contains feed items that mention the group. When the record is a user, the feed contains only feed items on that user. You can get another user's record feed. Pass the record's ID as the <code>subjectId</code>.• TO: Contains all feed items with mentions of the context user. Contains feed items the context user commented on and feed items created by the context user that are commented on. Pass the current user's ID as the <code>subjectId</code>.

Function	Description
	<ul style="list-style-type: none"> TOPICS: Contains all feed items that include the specified topic. Pass the topic's ID as the <code>subjectId</code>. This value is supported in Salesforce for mobile web only. Topics aren't available in Salesforce for iOS or Salesforce for Android.
<code>navigateToFeedItemDetail(feedItemId)</code>	Navigates to the specific feed item, <code>feedItemId</code> , and any associated comments.
<code>navigateToRelatedList(relatedListId, parentRecordId)</code>	Navigates to a related list for the <code>parentRecordId</code> . For example, to display a related list for a Warehouse object, the <code>parentRecordId</code> is <code>Warehouse__c.Id</code> . <code>relatedListId</code> is the API name or ID of the related list to display.
<code>navigateToList(listViewId, listViewName, scope)</code>	Navigates to the list view that's specified by the <code>listViewId</code> , which is the ID of the list view to be displayed. <code>listViewName</code> sets the title for the list view. It doesn't need to match the actual name that's saved for the list view. To use the saved name, set <code>listViewName</code> to null. Set <code>scope</code> to the name of the sObject in the view, for example, "Account" or "MyObject__c".
<code>createRecord(entityName[, recordTypeId[, defaultFieldValues])</code>	Opens the page to create a record for the specified <code>entityName</code> , for example, "Account" or "MyObject__c". <code>recordTypeId</code> is optional and specifies the record type for the created object. Calling <code>createRecord</code> without providing a <code>recordTypeId</code> may result in an error. <code>defaultFieldValues</code> is optional and, if provided, prepopulates fields on a record create panel, including fields not displayed on the panel. Users must have create access to fields with prepopulated values. Errors during saving that are caused by field access limitations don't display error messages.
<code>editRecord(recordId)</code>	Opens the page to edit the record specified by <code>recordId</code> .
<code>showToast({toastParams})</code>	Shows a toast. A toast displays a message below the header at the top of a view. The <code>toastParams</code> object sets the attributes for the toast.

Function	Description
	Use any attribute available for the <code>force:showToast</code> Aura event. For example: <pre>sforce.one.showToast({ "title": "Success!", "message": "The record was updated successfully." });</pre>

Keep the following in mind when using the `sforce.one` object:

- Calls to `sforce.one.navigateToURL` may result in an “Unsupported Page” error if the URL references standard pages for objects or Chatter pages. To avoid this error, ensure that the URL begins with a forward slash (`/_ui` instead of `_ui`).
- The `sforce.one.createRecord` method doesn’t respect Visualforce overrides on the standard action.
- Developers can use the `pageReference` class to control navigation for the Salesforce mobile app. Some actions and their associated `pageReference` URLs are not yet fully supported. For example, `standard_recordPage` with actions clone or edit may not work as expected. Full support is planned for future releases.

How `sforce.one` Handles API Versions

The `sforce.one` object is frequently improved in new releases. To maintain backward compatibility, `sforce.one` provides version-specific behavior, and you can use a specific version of `sforce.one` in your apps.


By default, `sforce.one` uses the same version as the API version of the requested Visualforce page. For example, if a Visualforce page has an API version of 30.0, JavaScript on that page that uses `sforce.one` by default uses the API version 30.0 of `sforce.one`.

This means that when a Visualforce page is updated to a new API version, the page automatically uses the updated version of `sforce.one`. In the preceding example, if that Visualforce page is updated to API version 31.0, app functionality that uses `sforce.one` uses the API version 31.0 of `sforce.one`.

If updated behavior in a new API version of `sforce.one` causes compatibility problems with the page’s features, you have three options for correcting the problem.

- Revert the Visualforce page’s API version to the prior version. This action requires no code changes.

- Update the code for the page's features to fix the problem. This solution is best, but it might require some debugging, and it will definitely require code changes.
- Use a specific version of `sforce.one`. This solution often requires minimal code changes.

 **Note:** `sforce.one` was added in Winter '14 (API version 29.0) and wasn't versioned until Summer '14 (API version 31.0). All versions of `sforce.one` earlier than version 31.0 are identical to version 31.0. You can specify a version of `sforce.one` for any version that's valid for Visualforce, that is, from version 15.0 to the current API version.

Using a Specific Version of `sforce.one`

To use a specific version of `sforce.one`, use the `sforce.one.getVersion()` function and provide it with the API version and a callback function that needs to use a specific version of `sforce.one`. The appropriate versions of `sforce.one` are automatically loaded by this call.

The signature for `sforce.one.getVersion()` is:

```
sforce.one.getVersion(versionString, callbackFunction);
```

`versionString` is the API version that your application requires. It's always two digits, a period, and one digit, such as "30.0". Calls with invalid version strings fail silently.

`callbackFunction` is a JavaScript function that uses a specific version of `sforce.one`.

`sforce.one.getVersion()` operates asynchronously, and your callback function is called when it finishes loading the requested version of `sforce.one`. Your callback function receives a single parameter, an `sforce.one` object for the specified API version. Use the object passed in instead of the global `sforce.one` to make calls to `sforce.one` that conform to the API version that your app requires.

Examples of Using a Specific Version of `sforce.one`

The next examples all add a Create Account function to the following input button:

```
<input type="button" value="Create Account" onclick="btnCreateAccount()"
  id="btnCreateAcct"/>
```

Defaulting to the Visualforce Page's API Version

App code that should use the default version of `sforce.one`—the version that corresponds to the Visualforce Page's API version—doesn't need to ask for a version. Using that version happens automatically, and the code is straightforward.

```
<script>
  function MyApp() {
```

```
        this.createAccount = function() {
            sforce.one.navigateToURL("/001/e");
        };
    }

    var app = new MyApp();

    function btnCreateAccount() {
        app.createAccount();
    }
</script>
```

App functionality is created in a `MyApp` object, and then an event handling function calls the app function when that event, a button click, occurs. Separating application functionality from application event handling is a best practice, and it sets you up for using version-specific versions of `sforce.one`.

Using a Specific `sforce.one` API Version (Simple)

To use a specific version of `sforce.one`, get and save a reference to a versioned instance of the object. Then use this object to make `sforce.one` calls. The simplest way is to save it in the `MyApp` object. In the next sample, references to the versioned instance of `sforce.one` are in bold.

```
<script>
    function MyApp(sfone) {
        this.createAccount = function() {
            sfone.navigateToURL("/001/e");
        };
    }

    var app30 = null;

    function btnCreateAccount() {
        // Create our app object if not already defined
        if(!app30) {
            // Create app object with versioned sforce.one
            sforce.one.getVersion("30.0", function(sfoneV30) {
                app30 = new MyApp(sfoneV30);
                app30.createAccount();
            });
            return;
        }
        app30.createAccount();
    }
</script>
```

In the preceding example, the event-handling function is expanded from the first example to include the creation of a version-specific instance of `sforce.one`. If your app needs to mix multiple versions, you can create multiple `MyApp` instances with appropriate versions and names. More than one or two, though, are cumbersome to manage. We recommend the next approach instead.

Using a Specific `sforce.one` API Version (Best)

A better way to organize your app code is to create version-specific instances of `sforce.one` in an app initialization block of code so you can keep the event handling separate.

```
<script>
  function MyApp(sfone) {
    this.createAccount = function() {
      sfone.navigateToURL("/001/e");
    };
  }

  var app30 = null;

  // Initialize app: get versioned API, wire up clicks
  sforce.one.getVersion("30.0", function(sfoneV30) {
    // Create app object with versioned sforce.one
    app30 = new MyApp(sfoneV30);

    // Wire up button event
    var btn = document.getElementById("btnCreateAcct");
    btn.onclick = btnCreateAccount;
  });

  // Events handling functions
  // Can't be fired until app is defined
  function btnCreateAccount() {
    app30.createAccount();
  }
</script>
```

In this sample the app initialization is separated only by white space and comments, but you can separate it into functions for better encapsulation.

Using a Specific `sforce.one` API Version (Synchronous)

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You can trigger a synchronous mode for `sforce.one` by manually including the specific version of `sforce.one`'s JavaScript on your page. The format for the URL to the library is: `/sforce/one/sforceOneVersion/api.js`. Here's an example:

```
<script src="/sforce/one/30.0/api.js"></script>
<script>
    function MyApp(sfone) {
        this.createAccount = function() {
            sfone.navigateToURL("/001/e");
        };
    }

    var app = null;

    sforce.one.getVersion("30.0", function(sfoneV30) {
        app = new MyApp(sfoneV30);
    });

    // Events handling function
    // Can't be fired until app is defined
    function btnCreateAccount() {
        app.createAccount();
    }
</script>
```

Although some situations require synchronous mode, the asynchronous version is preferred. If you forget to manually include the correct versions of the `sforce.one` library, your code will contain bugs that are difficult to diagnose.

Using Visualforce Pages as Custom Actions

If your Visualforce page is used as a custom action, design it so that it either acts upon a single record provided by a standard controller, or finds and acts upon a record, or records your custom controller code retrieves.

Custom Actions on an Object

A Visualforce page added as a custom action on an object is invoked in the context of a record of that object type. The custom action is passed a specific record ID—the record the user was looking at when the user clicked the custom action. Design the page to act on that specific record type.

Visualforce pages used as custom actions on an object must use the standard controller for that object. Use controller extensions to add custom code, including `@RemoteAction` methods you can call using JavaScript remoting.

Your custom code could do more than make updates to the originating record. For example, the Create Quick Order custom action searches for matching merchandise. It then creates an invoice and line item, all as part of creating an order for a part. That logic occurs in the context of the originating account record—the invoice is associated to the account record where the quick order action was invoked.

When you redirect to a URL internal to your org, the action dialog closes upon completion or programmatically navigating away. If you set up the redirect to point to an external URL, the behavior can vary because an external URL opens in a new browser tab.

Custom Global Actions

Visualforce pages used as global actions can be invoked in many different places and don't have a specific record associated with them. They have complete "freedom of action," which means it's up to you to write the code.

More specifically, Visualforce pages used as global actions can't use *any* standard controller. You must write a custom controller to handle the page. Your code might create one or many records, modify found records, and so on.

When a global action completes, the user should be either redirected to a parent record created as part of the action or returned to where they started.

Creating Visualforce Pages That Work in Mobile and Desktop

Create Visualforce pages that work well in both the Salesforce app and the full Salesforce site by writing code that adapts to the context it's running in.

The Salesforce app provides a framework for handling various navigation controls and events. That framework isn't available to Visualforce pages when they run on the full Salesforce site, because the `sforce` object is injected onto pages only inside the app. This means that, for pages shared between the Salesforce app and the full Salesforce site, you'll want to write code that uses the `sforce` object when it's available, and standard Visualforce navigation when it's not.

For example, here is a bit of JavaScript that runs after a JavaScript remoting request successfully returns from the `@RemoteAction` method that creates a quick order. This code is from a Visualforce page that's used as a custom action, which adds it to the action bar in the Salesforce app and the publisher

menu in the full Salesforce site. It needs to work in both places. The intent of the code is to navigate to the detail page for the account for whom the order was placed:

```
// Go back to the Account detail page
if( (typeof sforce !== 'undefined') && sforce && (!!sforce.one) ) {
    // Salesforce app navigation
    sforce.one.navigateToSObject(aId);
}
else {
    // Set the window's URL using a Visualforce expression
    window.location.href =
        '{!URLFOR($Action.Account.View, account.Id)}';
}
```

The `if` statement checks to see if the `sforce` object is available and usable. This is only true if the page is running inside the app. If `sforce` is available, the mobile navigation management system is used to go to the account's detail page.

If the `sforce` object isn't available, trying to use it to navigate anywhere results in a JavaScript error, and no navigation. So, instead, the code sets the window's URL using a Visualforce expression that returns the URL for the account's detail page. You don't want to do this in the app because the navigation event will be lost by the framework, but it's required in normal Visualforce.



Note: It's a best practice to factor out common tests like this one into their own helper function. You could add something like the following to a JavaScript static resource, and then just call `ForceUI.isSalesforce1()` in your `if` conditions. Then, if the detection logic changes, you only have to update it in one place.

```
(function(myContext) {
    myContext.ForceUI = myContext.ForceUI || {};

    myContext.ForceUI.isSalesforce1 = function() {
        return((typeof sforce !== 'undefined') && sforce &&
            (!!sforce.one));
    }
})(this);
```

Performance Tuning for Visualforce Pages

Performance is an important aspect of mobile Visualforce pages. Visualforce has a caching mechanism to help you tune the performance of your pages.

To enable caching for a page, use this statement:

```
<apex:page cache="true" expires="600">
```

The parameters for page caching are:

Attribute	Description
cache	Boolean value that specifies whether the browser should cache the page. If not specified, defaults to <code>false</code> .
expires	Integer value that specifies the period of cache in seconds.

For more information, see [Force.com Sites Best Practices](#) on Developerforce

More Resources

Here are some more resources to help you tune the performance of your Salesforce apps:

- [Inside the Force.com Query Optimizer](#) (webinar)
- [Maximizing the Performance of Force.com SOQL, Reports, and List Views](#) (blog post)
- [Force.com SOQL Best Practices: Nulls and Formula Fields](#) (blog post)

Canvas Guidelines and Best Practices

There are some additional best practices and guidelines to keep in mind when exposing your applications as canvas apps and making them available to mobile users.

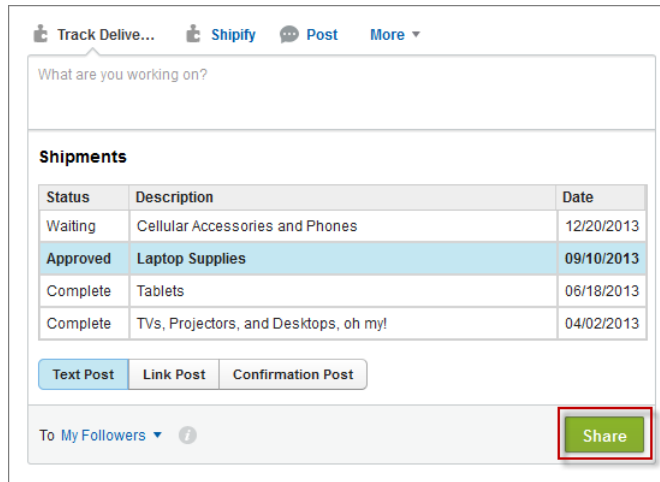
Canvas makes it easy for you to integrate Web applications with the Salesforce app at the user interface level. However, the user experience in the app is different than in the full Salesforce site. You'll want to make sure you design your canvas apps for mobile users and be sure to test them in the mobile environment.

Canvas Apps in the Chatter Publisher and Salesforce App Action Bar

Keep these best practices and guidelines in mind when making your canvas apps available in the publisher and action bar.

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- When you access a canvas app from the publisher in the full Salesforce site, the user interface is different than when you access a canvas app from the action bar or action menu in the Salesforce app. For example, in the feed in the full Salesforce site, the Share button is at the bottom of the feed item.



The screenshot shows a Salesforce feed item. At the top, there are icons for 'Track Delive...', 'Shipify', 'Post', and 'More'. Below this is a text input field with the placeholder 'What are you working on?'. The main content is a table titled 'Shipments' with three columns: 'Status', 'Description', and 'Date'. The table contains five rows of data. Below the table are three buttons: 'Text Post', 'Link Post', and 'Confirmation Post'. At the bottom, there is a 'To' field with a dropdown menu set to 'My Followers' and a 'Share' button highlighted with a red box.

Status	Description	Date
Waiting	Cellular Accessories and Phones	12/20/2013
Approved	Laptop Supplies	09/10/2013
Complete	Tablets	06/18/2013
Complete	TVs, Projectors, and Desktops, oh my!	04/02/2013

Text Post Link Post Confirmation Post

To My Followers ? **Share**

In the Salesforce app, the Share button is at the top of the screen.

Cancel
Track Deliveries
Share

What are you working on?

Shipments

Status	Description	Date
Waiting	Cellular Accessories and Phones	12/20/2013
Approved	Laptop Supplies	09/10/2013
Complete	Tablets	06/18/2013
Complete	TVs, Projectors, and Desktops, oh my!	04/02/2013

Text Post
Link Post
Confirmation Post

- When creating a canvas custom action, the height available for that action in the full Salesforce site is much greater than the height for that action in the app. Use the Dimensions object in the Canvas SDK to render your canvas app in the correct size.
- Keep the labels for canvas custom actions concise. Longer labels may not fully display in the publisher.
- When you access a canvas app from the publisher, the *What are you working on?* pane appears above the canvas app. This pane remains fixed, even if your canvas app scrolls.
- When the request comes into your Web application that's exposed as a canvas app, you can determine the type of device that's making the request. Use this information to render your app based on the requesting device for a better user experience. For example, you can add logic so that if the request comes from a mobile phone, only four lines of text are displayed; if the request comes from a tablet, ten lines of text are displayed.
- In most cases, you'll want to specify 100% for the canvas app height and width in your CSS. This ensures that the canvas app takes up the maximum available screen space.
- Canvas apps appear in an iFrame, so you can format the app appearance as you would any standard iFrame.

Canvas Apps in the Feed

Keep these best practices and guidelines in mind when making your canvas apps available in the feed.

- On a mobile device, the link text and description for a feed item display fewer characters than in the full Salesforce site. Keep this in mind when programmatically creating feed items.
- When a canvas app is contained in a feed item, the feed item appears with a link to the canvas app. On a mobile device, the canvas app doesn't appear in the feed; instead, a new page opens and displays the canvas app.
- In Salesforce for mobile web, the screen changes if the device is rotated. Your canvas app should support rotation, if possible, to maintain a seamless user experience. Note that Salesforce for iOS and Salesforce for Android doesn't rotate.
- If your canvas app appears as a feed item, keep in mind that it will display in the feed on a mobile device so you'll want to render a mobile-friendly user interface.

Canvas Apps Context

When you display a canvas app inside the Salesforce app, keep these considerations in mind.

When you display a canvas app inside of the feed or publisher, the canvas context you receive (either from the signed request or from the `getContext` call) contains information specific to the Salesforce app publisher.

- You can verify you're on either the feed or publisher by looking at the `displayLocation` value in the environment section. For publisher, `displayLocation` is set to ***Publisher***. For the feed, `displayLocation` is set to ***ChatterFeed***.
- When creating a canvas feed item, you can specify a `JSON` string as the parameter's value. When the context is sent, any value in the parameter's field on the feed item is sent in the parameters of the environment section of the context.
- As with any canvas app, the context contains information about the app dimensions. Since the Salesforce app is designed for mobile, the sizes we provide are different than for the full Salesforce site.
- For a single-finger touch scrolling experience:
 - Ensure that the outermost `div` elements contain the following properties:
 - `min-height: 250px;`
 - `overflow: scroll;`
 - `width: 100%;`
 - `-webkit-overflow-scrolling: touch;`
 - `-webkit-transform: translated(0%,0px,0px);`

- Set the `height` attribute to the `clientHeight` value delivered in the signed request. For example:

```
//Where sr is a parsed signed request object
var h = parseInt(sr.context.environment.
    dimensions.clientHeight, 10);
Sfdc.canvas.byId('divElementId').style.height = h;
```

- The `clientHeight` value can be very small, particularly in a phone's landscape mode, and users may not be able to see any content. Use `min-height` set to the desired height in pixels to ensure a good user experience.

Custom Icons for Canvas Apps

Keep these best practices and guidelines in mind when you add custom icons to your canvas apps.

You can customize the icon that is used in the Salesforce navigation menu. You set this icon in the Icon URL entry in the Basic Information section of the connected app settings for your canvas app. From Setup, enter *Apps* in the *Quick Find* box, then select **Apps** and click **Edit** for your connected app. The icon URL must be a secure HTTPS URL that points to an icon image file. The image file must be in the GIF, JPG, or PNG file format. For the Salesforce navigation menu, the icon cannot be larger than 60 pixels high by 60 pixels wide.

The custom icon that is used in the Salesforce navigation menu is also used in the Chatter tab and the Canvas App Previewer. If your canvas app will be shown in the navigation menu, we recommend that you use a 60x60 pixel size icon and let Salesforce automatically resize the icon to the smaller size that is needed for the Chatter tab and the Canvas App Previewer.

You can also customize the icon that is used in the action bar for a canvas app. The action bar uses the custom icon set for the action that accesses the canvas app, not the custom icon that is associated with the connected app. See [Custom Icon Guidelines and Best Practices](#) on page 64 for more guidelines on custom action icons.

CHAPTER 14 Learning More

In addition to this guide, there are many resources available to help you in your Salesforce Platform development journey.

Admin Resources

Salesforce Help & Training Portal

A site devoted to the help documentation for Salesforce. Get help for what you're working on, find answers to your questions, and download tip sheets and other guides.

Salesforce Trailblazer Community

Home to a set of extremely useful tools to help you get your Salesforce work done. Connect with Salesforce customers, partners, product specialists and employees to learn, get answers to your questions, and share new ideas.

Salesforce Developers Website

Our premier developer site is a one-stop shop for all things related to Salesforce Platform development. On [Salesforce Developers](#) you'll find documentation, code samples, tools, articles, discussion boards, and other resources to help you get started with mobile development.

Developer Documentation

You'll find all these guides and more on our developer site at <http://developer.salesforce.com/docs>.

Quick Actions Implementation Guide

Learn about the default actions, how to create object-specific actions, and how to configure publisher layouts. Find out how you can extend the Chatter publisher and the Salesforce mobile action bar with Visualforce custom actions and Canvas custom actions.

Mobile App Developer Guide

Learn about native iOS and Android, HTML5, and hybrid mobile development. This guide also includes information about more advanced topics such as authentication, geolocation, and distributing your mobile apps.

Lightning Platform REST API Developer's Guide

Learn to use the REST-based API to retrieve, create, update, and delete data in Salesforce. You'll learn how to get up to speed quickly with quick starts, about the available REST API resources, and how to make calls and work with data.

Visualforce Developer's Guide

Learn how to use Visualforce to customize and extend the Salesforce user interface.

SOQL and SOSL Reference

Learn how to use SOQL and SOSL to build powerful queries and text searches.

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