



Power seamless service with Pega Mashup

A PEGA WHITEPAPER

An accelerated guide for maximizing value

The business issue

Engagement is a constant battle. You often know what needs to be done, but customer preferences and technology change faster than you can react. Existing silos magnify this problem, reducing your ability to make efficient changes. The inability to deliver end-to-end experiences often results in limited consumer satisfaction, culminating in a decrease in brand loyalty. What if there were a way to engage quickly—adding functionality in a more effective manner?

The solution

To help ensure customer satisfaction, increased engagement, and seamless service, Pega Mashup embeds responsive design UI directly into your website or mobile app – no recoding required. This enables you to:

- Work seamlessly across websites, mobile web, and native mobile apps.
- Provide cross-browser support for mashup applications.
- Utilize the Pega's automation, AI, and authorization across all channels.
- Ensure processes and decisions are consistent and easy to change.

Contents

Mashup: a single solution, multiple benefits

- Building your mashup strategy – to web, mobile, and beyond.
- Starting with Pega® Web Mashup as a base for your mashup environment.

The Pega Mashup architecture

- Pega® Mobile Mashup: a win-win for you and your clients.
- Why the Mashup SDK is the way to go when extending existing mobile apps.
- Use case – a top five bank boosts its customer service with a Pega mashup app.

Extend existing systems with Pega's difference-making mashup functionalities

- Enhance existing Salesforce deployments with the Pega® Extender for Salesforce.com
- Migrate your Siebel Call Center to Pega® Customer Service.
- Enhance your sharing capabilities with Pega® Co-Browse.
- Boost your customer experience with Pega Self-Service Advisor.

Mashup: a single solution, multiple benefits

Mashups are key components within the architecture of the modern web. They are everywhere. Mashups are how we embed YouTube videos, Google maps, Twitter feeds, or Amazon ads into web pages. Organizations of all sizes use mashup technology to compliment and extend existing customer-facing websites and mobile apps, as well as their current employee applications.

The word mashup is a loose term for web-based applications that merge data and functionality from a variety of sources to create new perspectives and opportunities for their users. In practice, if you have an application that sources data from external websites and merges it together to provide integrated and coherent content, then you have a mashup. Rather than coding a custom user interface to display aggregate data, mashups leverage user interface capabilities from other systems. This reduces the time to create and deploy applications and allows them to evolve much faster.

Benefits of mashup include:

- Reuses powerful user interface elements and data capabilities rather than coding a custom user interface.
- Requires minimal development effort and does not need complex, monolithic portal architectures.
- Reduces time to create and deploy applications and eliminates update delays, while minimizing version control risks.
- Incorporates new features automatically, reducing cost of infrastructure to support an internal native application development.
- Has short delivery time due to business architects working together with software architects to focus on specific business needs.
- Runs on a controlled and secure platform behind the firewall.

Of course, Mashups aren't the only way to connect to your customer-facing application. For example, if all you need is a simple task like sending an ID to get a status update, then an API will do. If your goal, however, is to connect your digital experiences, and quickly, mashup technology opens a whole new range of possibilities.

Building your mashup strategy with Pega – to web, mobile, and beyond

Pega has invested in developing a one-of-a-kind mashup technology. Our unified technology - intelligence and automation – is your secret weapon for delivering awesome experiences.

Rather than custom-code the experience directly into each channel and end up doing a lot of redundant work when you rewrite business logic into each channel, why not try a different path? The value of our mashup is generally rooted in the ability to roll it out quickly and to reuse UI assets that have traditionally only been presented to back-office users.

By building a mashup strategy around the Pega Platform, you create a standardized and unified application environment for your business. Pega Mashup puts Pega's responsive UI – and all the automation, intelligence, and connectivity behind it – directly into your website or mobile app. You can brand your mashup to blend into your existing apps and website. Change is fast and easy, because a single alteration is instantly reflected everywhere.

Starting with Pega® Web Mashup as a base for your mashup environment

The Pega Platform offers you a couple of implementation options. You can run the Pega® Web Mashup on your own hosting environment (Figure 1) or on Pega Cloud (Figure 2).

Applications using Pega Mashup can be accessed via:

- A browser on a desktop or laptop device.
- A browser on a mobile device.
- An HTML5 app that is wrapped in a Cordova/Pega mobility client.

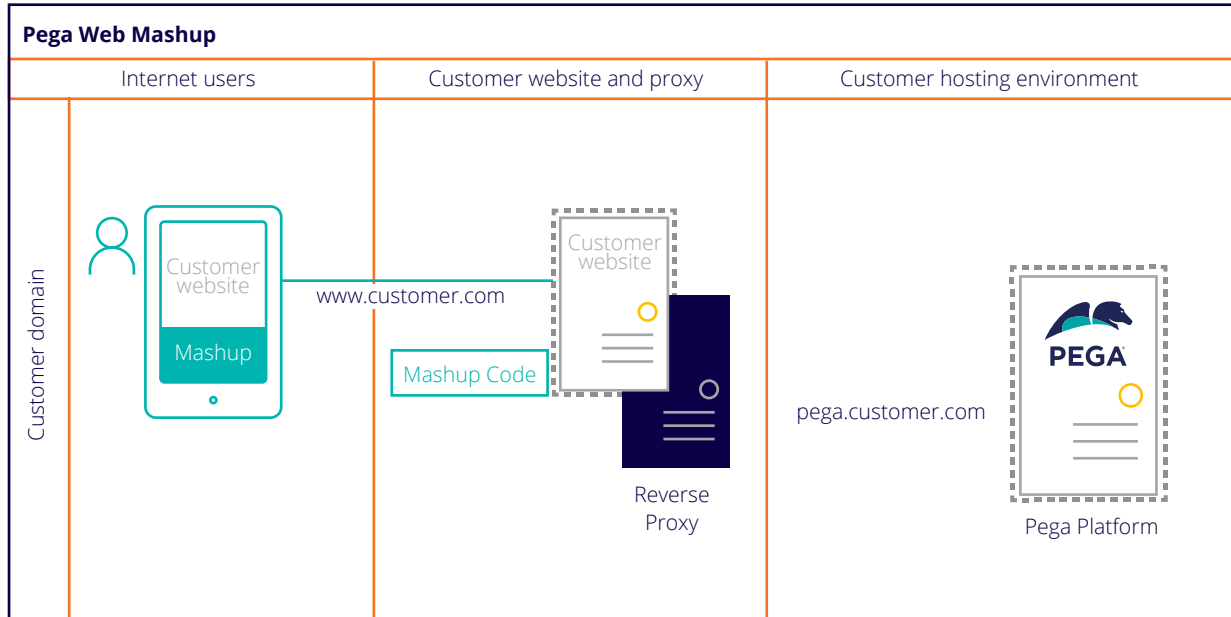


Figure 1: Pega® Web Mashup on hosting environment

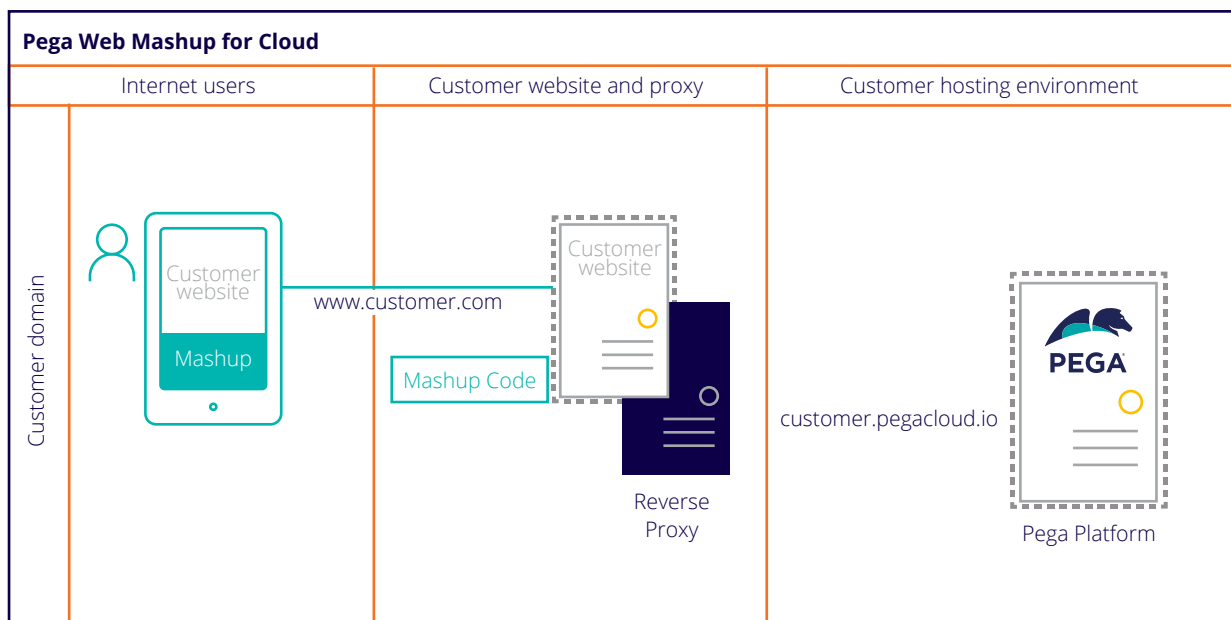


Figure 2: Pega® Web Mashup on Pega Cloud

The Pega Mashup architecture

Pega's Mashup works by embedding a hidden IFrame inside your existing web-page and then populating that IFrame with content from Pega. The pros of using this IFrame-based approach include:

- Separate DOM, CSS, JavaScript library: The biggest advantage of IFrame is not having to comingle the content inside the same DOM and CSS context, JavaScript library, or class structure, etc. Thanks to this, there are no collisions with JavaScript libraries.
- Fast and easy way to add real business value: IFrames bring the benefit of something that's already working and is probably richer in functionality than initially may meet the eye. For example, incorporating mashup using an IFrame could easily yield, and duplicate, a very rich form with a complex event model, security measures, data connections, multiple screens, complex validation, AJAX, etc. This ease would be completely lost if you were providing the markup inside a <div>, where the rendering and behavior are at the mercy of the containing page.
- Easy reuse of internal assets.

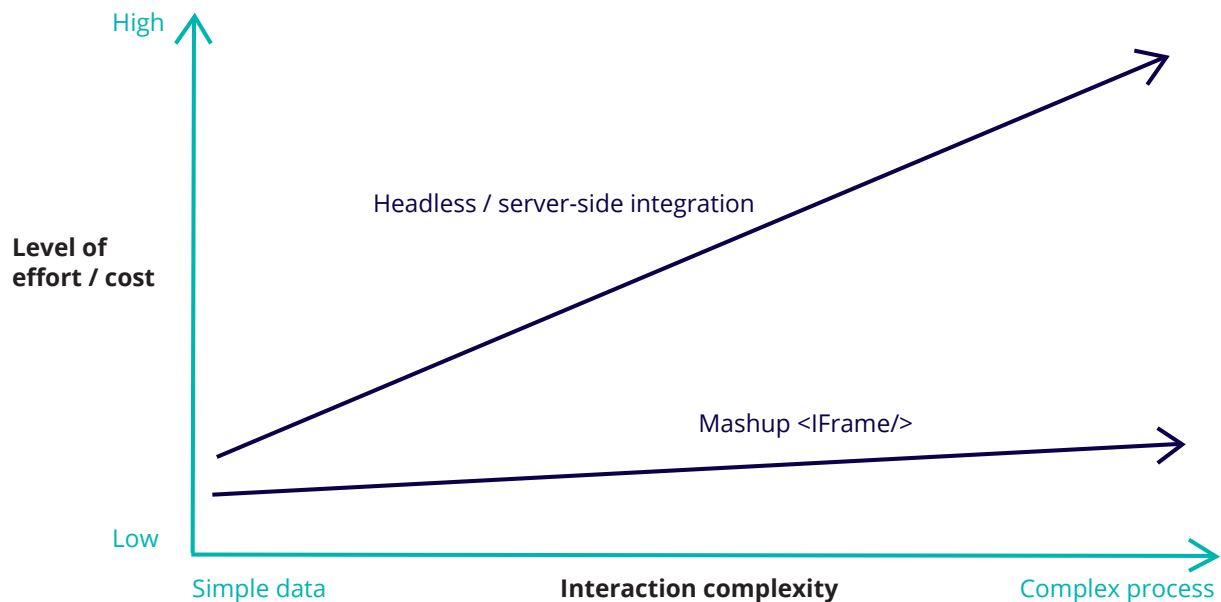


Figure 3: Server-side integrations can quickly require a lot of maintenance

There are also objections to an IFrame-based mashup. Pega has architected our solution to overcome these objections and potential challenges.

Issue	Resolution with Pega
The embedded functionality is isolated, which can lead to style inconsistency between the hosting website and the embedded component.	<ul style="list-style-type: none"> Apps can be styled to meet any specification.
Security exposure (clickjacking)	<ul style="list-style-type: none"> You can control where the mashup components can be embedded by handling the domains that can embed them. Also, by using the X-Frame options HTTP header to limit the mashup only to xyz.com and not abc.com. Additionally, you can specify trusted origins in Pega to avoid clickjacking so that you are secured even if the user is on a browser that does not support X-Frame options.
Security exposure (cross-site scripting)	<ul style="list-style-type: none"> The Pega Gateway is the recommended deployment technique for Pega Mashups. Using the Gateway you can deploy it within the same domain as the containing page without having to stand up a full Pega node. Alternatively, this can be achieved with a simple reverse proxy. Enabling browser security to take over is possible because with Pega you can meet the same-origin approach and implement X-Frame-Options Allow-From header.
A question mark over reliability of external services being mashed up	<ul style="list-style-type: none"> Mitigated by using internal and established external providers.
Problems with SEO-friendliness	<ul style="list-style-type: none"> While in the past users could see the content in IFrames, today web crawlers usually travel with no problems between regular website content and IFrames. If the IFrame content is SEO-friendly, it may even improve SEO rankings. Pega helps you create IFrame content that robots can easily access and index.
Imperfect usability as users tab between fields	<ul style="list-style-type: none"> Tabbing order can be easily configured and controlled.
Load time (double-pump loading)	<ul style="list-style-type: none"> The IFrame part of your content cannot load until it hits the client – the page will render, and then the mashups will render, so there’s a double-pump situation. It can be mitigated by showing appealing messages to the user while the frame is loading using onBeforeLoad, onLoad, etc. Pega can help identify ways to mitigate performance issues.
Difficulties with maintaining duplicate JS and CSS libraries.	<ul style="list-style-type: none"> The downside of the walled garden approach is you have two sets of JavaScript libraries, CSS, etc. This translates to the cost that you will incur to maintain both. To help you solve this issue, Pega has its own version of jQuery, enabling you to have static content cached in a browser. Additionally, Pega assigns timeouts to content - all set indefinitely.
HTML 5 Compatibility	<ul style="list-style-type: none"> Pega runs HTML5 standards mode and can pass an HTML5 validator to ensure that your mashups are better with using semantic tags, etc. Furthermore, a number of tags have been deprecated in HTML 5, but Pega markup does not rely on those – anything related to an HTML5 markup, rendering, software function is to be covered in the maintenance agreement, and any issues will be fixed by Pega.

Pega® Mobile Mashup: a win-win for you and your clients

Today, to keep up with competitors, almost every enterprise needs to include mobile apps in its mashup strategy.

By partnering with Pega, you gain access to a unique mashup environment where, without any hassle and nearly in no time, you can develop your mobile apps based on your web applications. Pega gives you a choice between web mashup applications that run on your hosting environment or Pega Cloud, and a mobile app can also be built on top of any of the two.

As part of the Pega mobile solution, Pega provides a Mashup SDK. This is a software development kit comprised of an API and sample code for native mobile apps developers. The Mashup SDK works with both new and existing projects in your choice of integrated development environment (IDE) for the Android and iOS platforms.

Let's have a look at the side-by-side breakdown of what is available to you, and the benefits and features of the Pega-enabled mashups.

Web Mashup	Mobile Mashup SDK
<ul style="list-style-type: none">▪ Lets you easily embed Pega application functionality in your website, and quickly build composite web applications and mashups.▪ Fits into any website architecture, e.g., JSP, ASP.NET, PHP.▪ Provides cross-browser support.▪ Offers a rich mashup API.▪ Supports all auto-generated Pega application controls and features.▪ Uses Pega Platform authentication and authorization.▪ Does not use Pega gateway or Pega web node.▪ Enables you to generate the code directly from your case types in Pega Designer Studio.▪ Code and mashup pages are deployed on your website.	<ul style="list-style-type: none">▪ Enables you to embed a Pega app in your native mobile app native that contains at least one screen in which all or part of a Pega application is embedded in a WebView,▪ Offers a rich mashup API.▪ Supports many auto-generated Pega application controls and features.▪ It is available in both Android and iOS apps, and consists of a library that, when included in your native mobile app, can work with both new and existing projects in your choice of integrated development environment (IDE).

In the context of this white paper, the term "native mobile app" is interchangeable with "custom third-party app"

Why the Mashup SDK is the way to go when extending existing mobile apps

Many enterprises already have consumer-facing apps in the public app stores and their challenge is now one of driving adoption, increasing usage, and improving customer satisfaction. Best-in-class mobile apps provide an opportunity for consumers to take actions on their own behalf at the time and place of their choosing, without requiring human intervention from a customer service rep.

The list of mobile mashup benefits is long and includes convenient and fast delivery, reuse of assets, control and risk mitigation, and cost savings, among others. With the Pega Mashup SDK, you can not only reduce the amount of initial development time, but also any future work to extend or update the functionality.

Think about booking a hotel room, upgrading service, reporting a problem or purchasing tickets. Mobile users demand that this functionality be available to them on their devices. Frequently those actions require interfacing with some form of backend system (reservations, accounts, technical support, dispute resolution, etc.). When Pega powers the backend process, it's possible to insert that process into an existing app to enable customer self-service. This capability can greatly enhance the value of consumer-facing (B2C) apps, or broaden and deepen the capability of enterprise (B2E) apps.

The following is an in-depth look at how and why the Mashup SDK can become beneficial to your business, enabling you to achieve all these advantages.

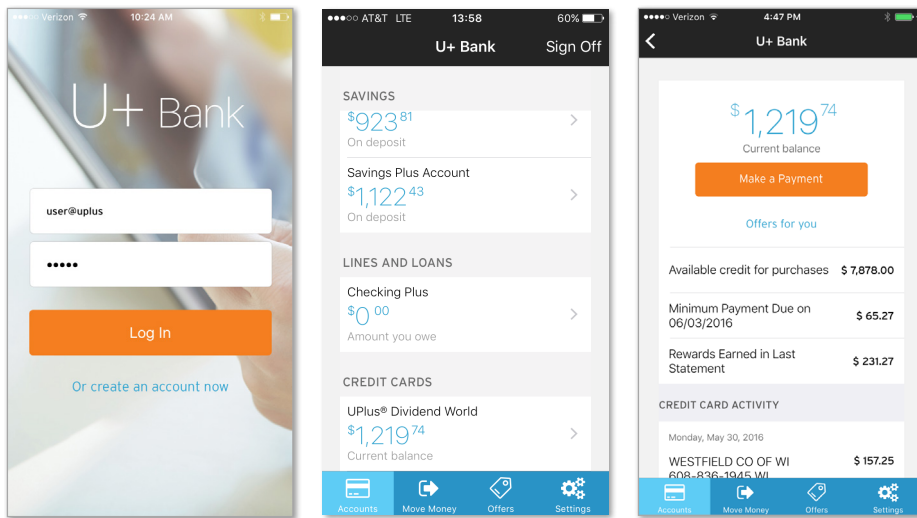
Mashup SDK benefits	Benefits explanation
Pega Mashup SDK vs. custom code development	<ul style="list-style-type: none"> ▪ Brings Pega desktop features to your mobile apps (i.e., in-the-model development vs. new code-written applications, while ensuring real-time updates to those applications). ▪ Same-team support for both your desktop and mobile, ensuring that desktop and mobile are always in sync. ▪ The Mashup SDK development team supports your mobile Pega app, enabling your staff to focus on other areas of business development.
Quick build and deployment possible in not even months but days	<ul style="list-style-type: none"> ▪ Enables you to insert your Pega application into your existing native app with a few lines of code added by the mobile development team. ▪ When the Pega application is done, it is ready to be used in your mobile app. ▪ In a non-mashup approach, your mobile development team would have to take the business requirements and then build out all of the screens to accomplish the Pega process.
Quick change in minutes not months	<ul style="list-style-type: none"> ▪ The Mashup SDK app gets updated as the Pega desktop application gets updated, minimizing the need of additional testing. ▪ In a non-mashup approach, when the Pega desktop application is changed, those changes need to be submitted to the mobile development team to update the mobile app.
Control of the Pega app	<ul style="list-style-type: none"> ▪ The Pega team applies changes within the Pega desktop application, so the next time your end users come into the mobile app, thanks to the Mashup SDK, your mobile app will automatically provide them with that latest version. ▪ In a non-mashup approach, when changes are required to the app or process, the Pega team makes the required changes to the desktop application. However, the changes to the mobile app need to be submitted to the mobile development team to update the mobile app.
HTML5 Compatibility	<ul style="list-style-type: none"> ▪ Using the Mashup SDK, which does the correct translation OOTB, you do not need any native code nor any change to the Pega section or control. ▪ The Mashup SDK constructs the URL OOTB just by taking Case ID or other simple metadata. This way, constructing the correct URL scheme for each Pega case does not require a native developer to know each URL scheme in Pega. ▪ With HTML5, there usually needs to be some type of communication between the WebView and native layer → the Mashup SDK has a very performance native-js bridge that is especially useful during large data exchange. ▪ No authentication nor logoff to consider for invoking and ending the case in the WebView because the Mashup SDK has an authentication module that includes all this.

Use case—a global bank boosts its customer service with a Pega mashup app

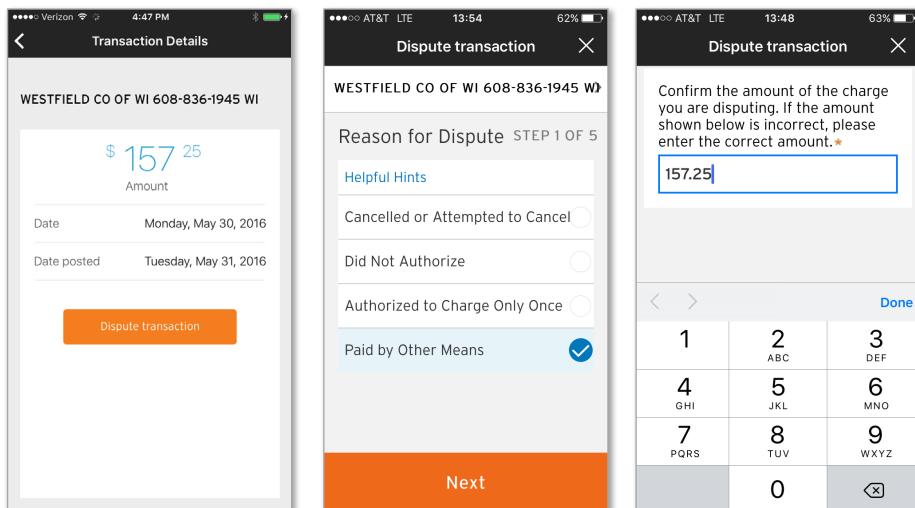
Using the Mashup SDK, you can build a bespoke app that matches all requirements and style guides for your existing mobile applications, e.g., colors or fonts, as well as meet the IT concerns regarding security, single sign-on, and integration. In fact, let's have a look at a case study of a global bank that turned to Pega for a mashup solution:

- A global bank uses the Mashup SDK to bring its credit card dispute transaction process – traditionally now handled with a Pega application – to the existing mobile application already used by the bank's customers today.
- By using Pega Mashup, the bank was able to quickly embed the complicated, multi-step, and dynamic dispute process directly into their mobile app. It rolled out the solution quickly without needing to recode the dispute process (and all its potential steps) into their mobile app.

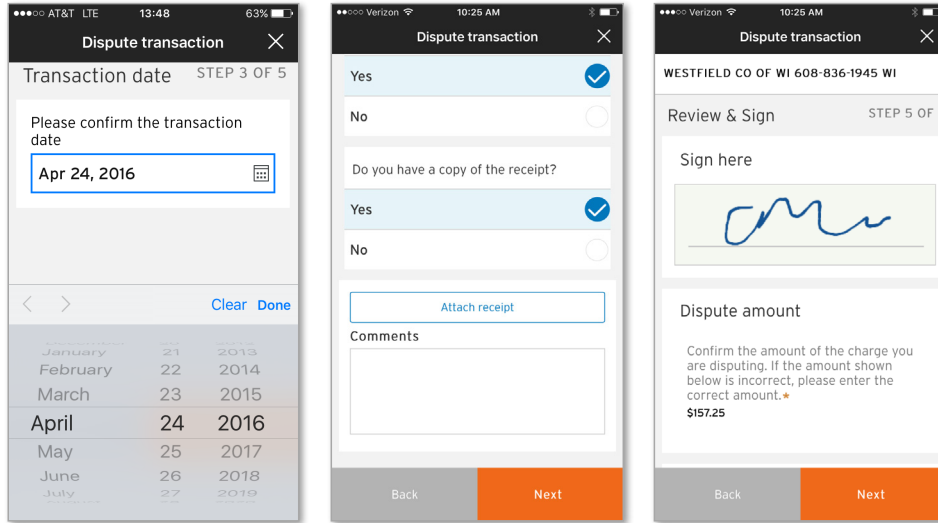
Customers start in the pre-mashup phase by signing in to the bank's native mobile app. The native UI uses the Pega API for authentication and data access:



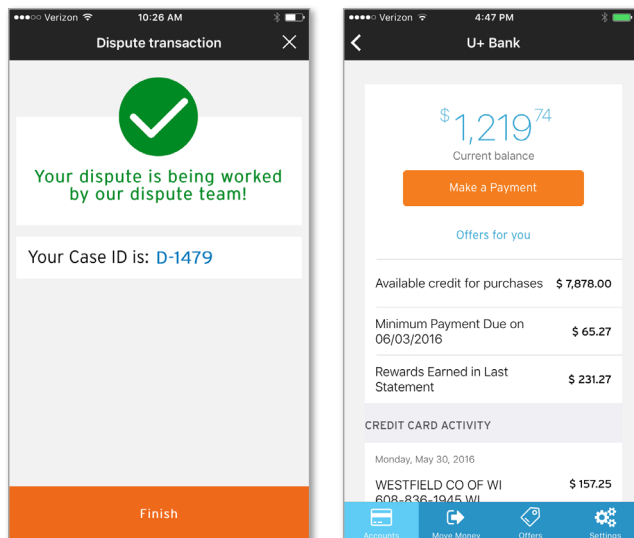
Upon noticing something unusual in their credit card record, customers can dispute a transaction, and then the mashup begins:



While working in the mashup mode, the Mashup SDK app takes advantage of the mobile device used to access the dispute process and utilizes the device's technical capabilities. Embedded cross-platform Pega-generated UI includes rich features like photo attachments or signature capture:



After customers go through all necessary steps and reach the end of the dispute transaction process, the Mashup SDK stops and takes users back to the bank's native app, without them even noticing that at some point they were using an app from an outside provider:



The Pega Mashup met all the requirements of the client technology teams, and allowed the organization to greatly improve its customer service. They deployed a powerful solution quickly in the customers' preferred channel while reducing the number direct contacts with the call center.

Extend existing systems with Pega's difference-making mashup functionalities

Pega® Extender for Salesforce.com

Like many businesses, yours most likely needs robust and secure integration with information systems hosted on the cloud or in your own data centers, including databases, systems of record, legacy systems, and enterprise applications.

The Pega® Extender for Salesforce.com uses mashup to embed Pega capabilities into the Sales Cloud and the Service Cloud, adding much needed automation and intelligence to your Salesforce deployments. In result, you gain even greater control of dynamic case management, business process management, and decision management.

The Extender component utilizes Pega® Web Mashup to present Pega gadgets and widgets, i.e., Pega UI harnesses and portals, in Salesforce web pages, either as full Salesforce tabs or as embedded elements within a tab of your Salesforce application. It also supports single sign-on for your Salesforce and Pega applications using SAML 2.0 web SSO or custom authentication configurations.

With the Extender, you can use Pega® Web Mashup technology to share data via the Pega API and Salesforce web services, while keeping Pega case data and Salesforce objects in synch through event triggers.

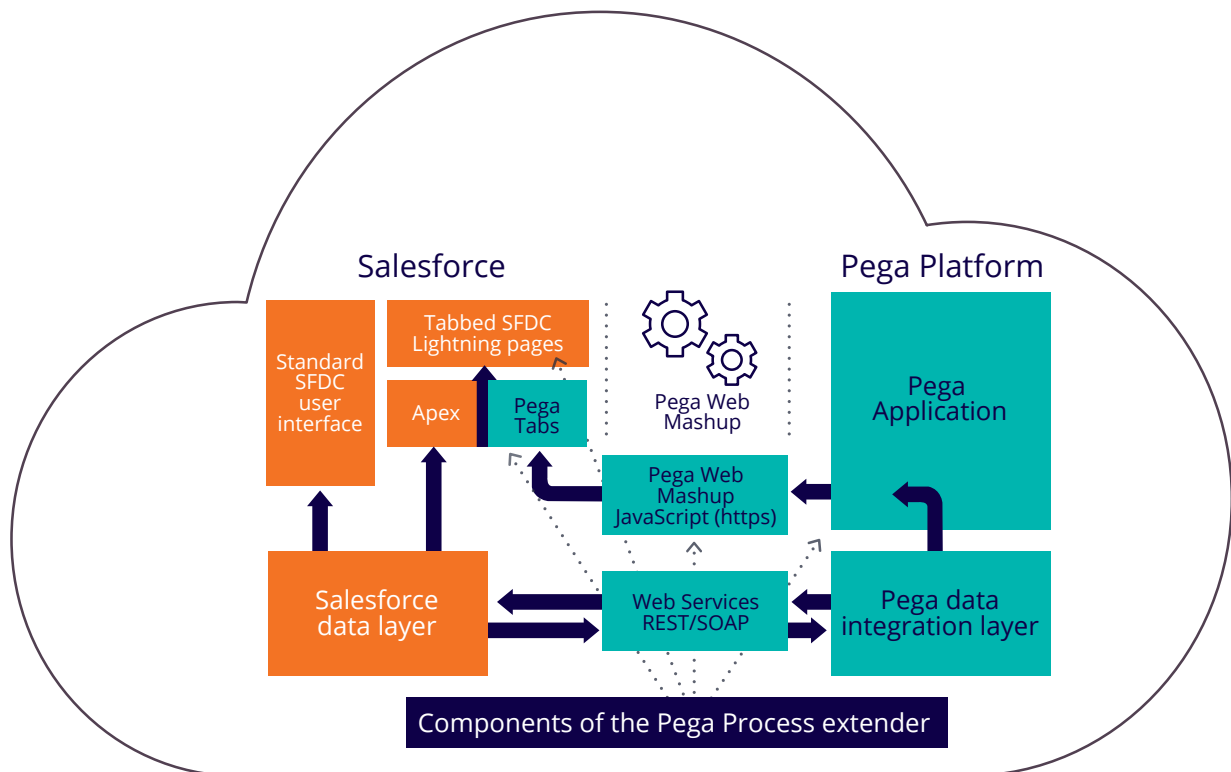


Figure 4: Pega® Extender for Salesforce.com structure

Pega applications can be deployed either on the Pega Cloud or in your datacenter via a secured network. The Extender connects to your Pega applications based on the configuration parameters you provide.

Migrate your Siebel Call Center to Pega® Customer Service

The Salesforce Extender is not the only connector that the Page Platform has to offer. If you run your CRM operations using Siebel applications, you can migrate them to Pega's next-generation customer engagement platform. Siebel supports embedding Siebel views, applets and view-based applets into an external application, and mashing up Siebel screens into Pega is one of the approaches you can take.

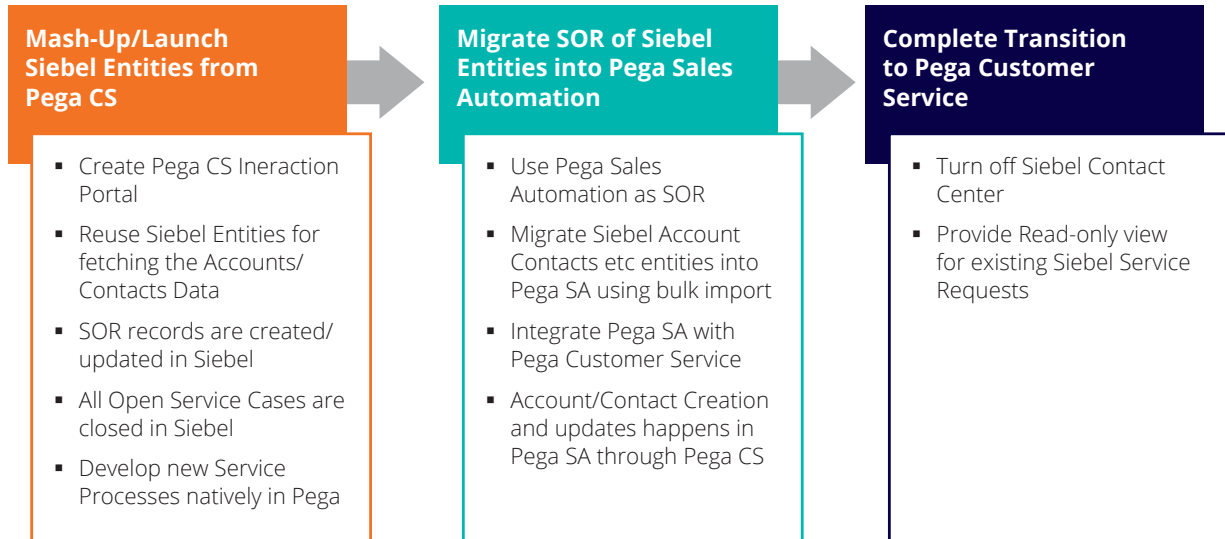


Figure 5: Transition of Siebel Contact Center Application to Pega® Customer Service

The mashup approach to migrating your Siebel screens into Pega follows the subsequent pattern:

- The Siebel system acts as the system of record (SOR) for accounts, contacts and open service requests.
- You develop new service request process in Pega.
- All existing service requests will be closed in Siebel using mashup.
- New service requests will be created in Pega.
- Any updates to SOR will happen in Siebel using mashup.
- All Siebel contact center entities are referenced using external table mappings.
- The combination of Siebel and Pega data enables a Customer 360 view.

To make the mashup approach possible, Siebel screens, which are made of views and applets, have to be externalized. This basically means that you can load Siebel screens in an IFrame hosted in an external web application. For example, Pega® Customer Service uses the Siebel mashup to add or update account information. The application includes the intent named "Modify Existing Account," which launches the Siebel screen that can assist in modifying the Siebel account.

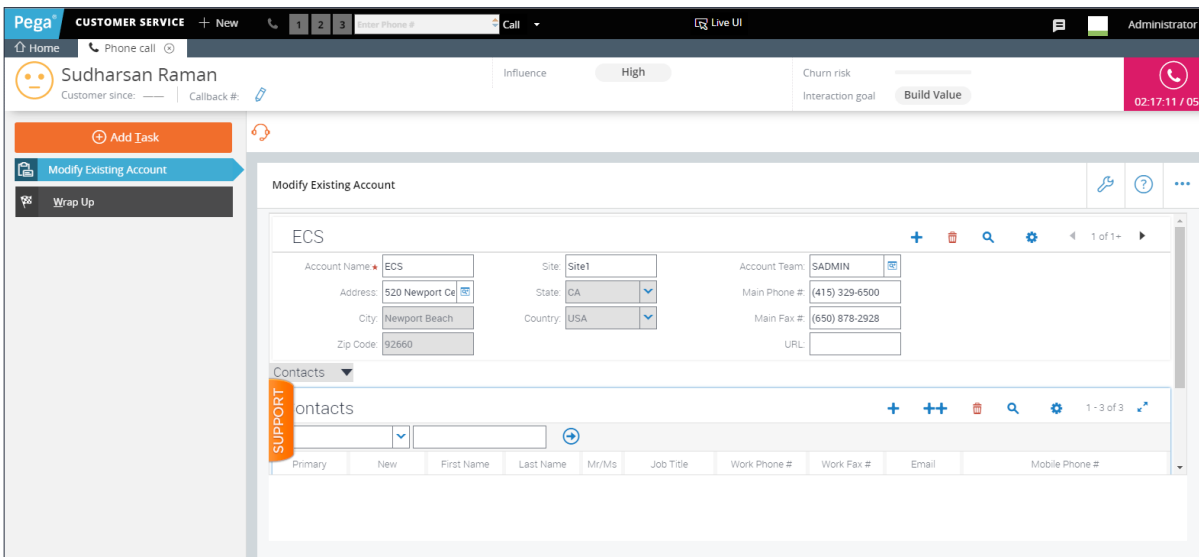
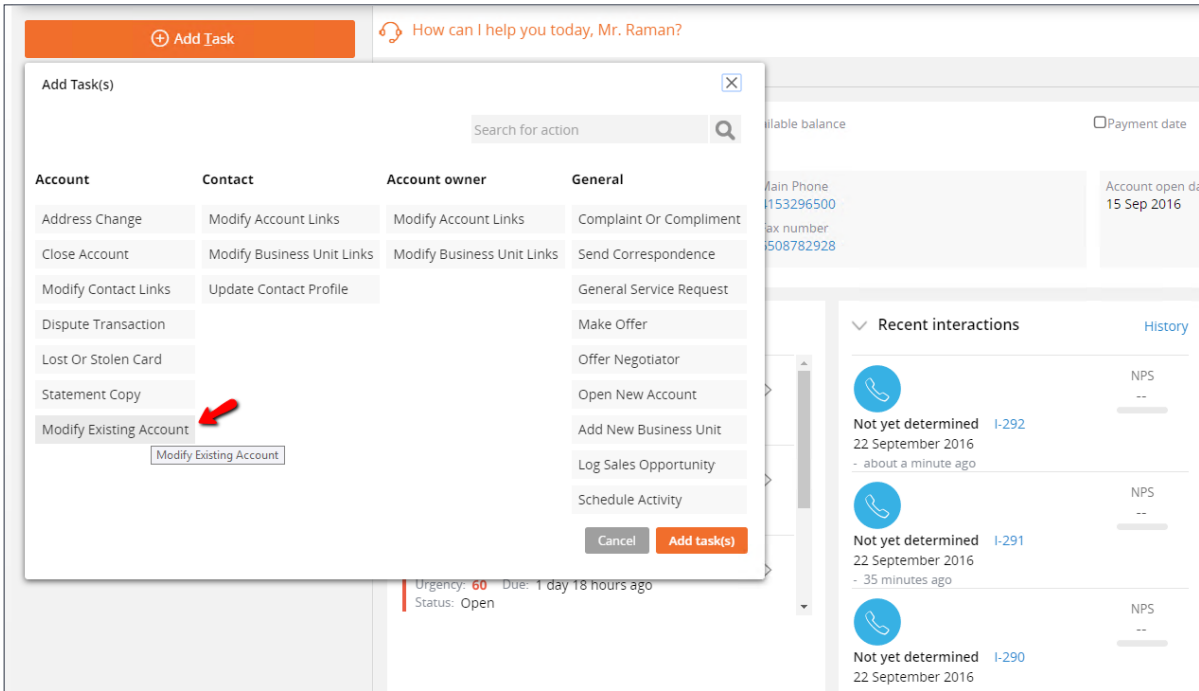


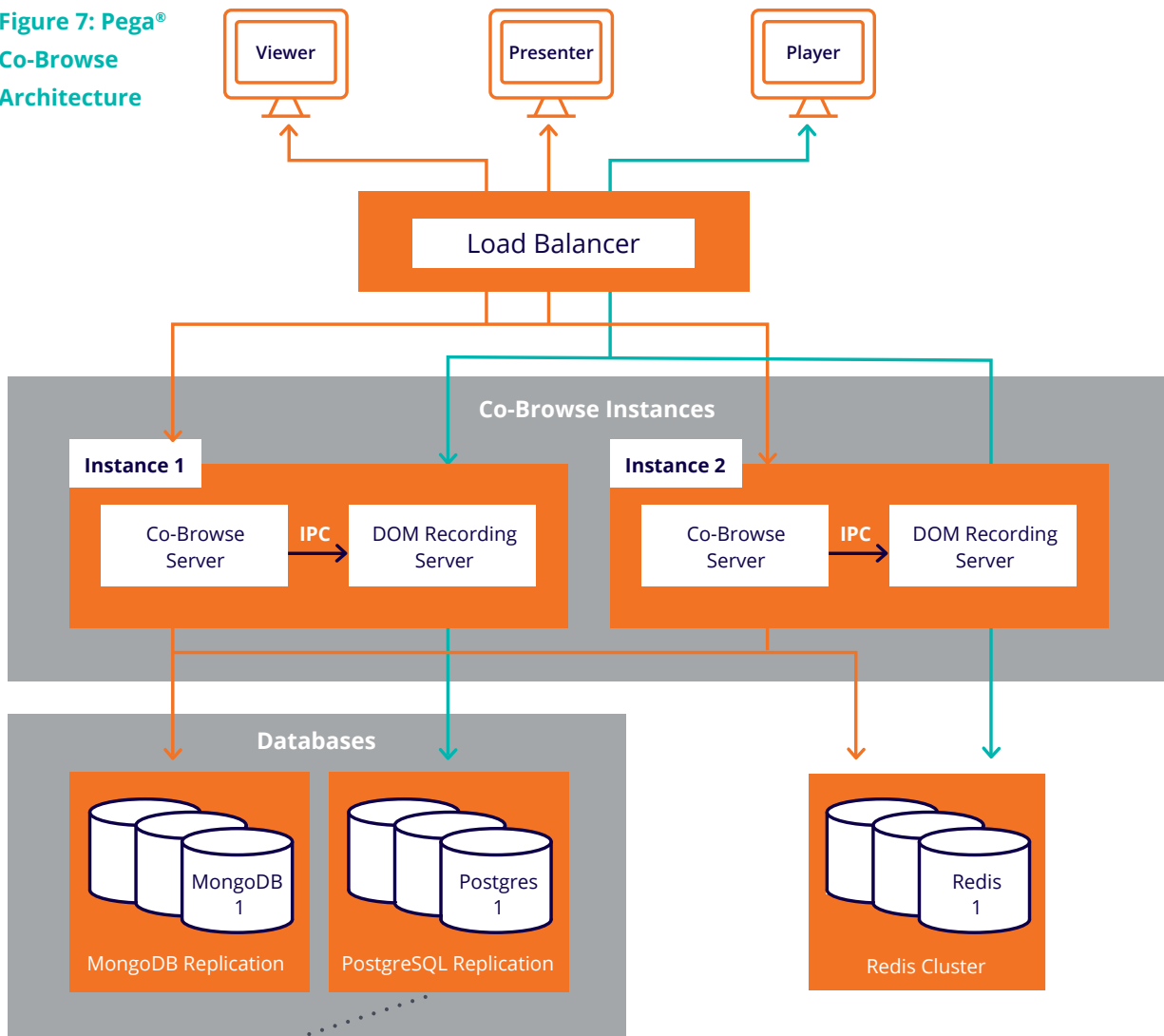
Figure 6: Adding or updating account or contact information in Siebel

Enhance sharing capabilities with Pega® Co-Browse

With the increasing globalization across practically all sectors and industries, screen sharing has become a standard way for companies to better communicate during online meetings. Being well aware of this now common trend, Pega accommodated the need of a reliable screen-sharing tool that can facilitate real-time co-browsing.

Both the Pega® Web Mashup and the Mashup SDK allow you to use Pega® Co-Browse – an advanced and convenient screen-sharing application supported across such platforms as Mac, PC, iPhone, iPad, and Android. Pega® Co-Browse is supported in stand-alone mode as well as within a Pega Platform application, and you can install it on premises or on Pega Cloud.

Figure 7: Pega® Co-Browse Architecture



It is possible to use the same MongoDB used for Co-browse Data Storage to store Recordings. In that case PostgreSQL will not be required.

- Arrows shows the path that HTML takes when the data being sent between presenter and viewer browser
- Arrows shows the path that HTML takes when the DOM data being sent between Recording Server and DOM playing browser
- Arrows shows the Inter Process Communication from Co-browse server to Recording server - carries the DOM data

Pega® Co-Browse enables a remote viewer to connect to a presenter's browser instantly and show sections of the website by highlighting different elements of the page. The viewer can click links or fill out forms remotely, all without requiring any downloads, installations, or plugins by either party.

What's more, the application shows only what is on the presenter's web page. Other open tabs and applications remain invisible to the viewer. To start a session, the presenter can use any of the following methods:

- A button or link in a Pega Platform application.
- A Pega Chat window.
- A single-use directed link that they receive from the customer service representative (CSR) via any supported channel, including email.

Pega® Co-Browse offers the following use cases:

- Traditional: A CSR can see what the customers see on their screen, enabling quick issue resolution, reducing case management, and promoting self-service.
- Customer to Customer: Initiated from a single-use directed link that establishes the co-browsing session, enabling an individual to share his or her browser session with another individual.

Boost your customer experience with Pega Self-Service Advisor

A business without customers is like a forest without trees – nonexistent. It goes without saying that you want your own customers engaged and satisfied. You also want to keep them well informed by using all available communication channels. Pega® Web Mashup and the Mashup SDK can help you infuse contextual digital self-service into your existing web and mobile site, so that your customers won't leave it too soon.

If your website is not intuitive enough or your customers are not able to find information they are looking for, they are forced to contact the call center. With Pega Self-Service Advisor, you can significantly decrease the number of inbound calls and make sure that your customers' issues get solved without them having to call.

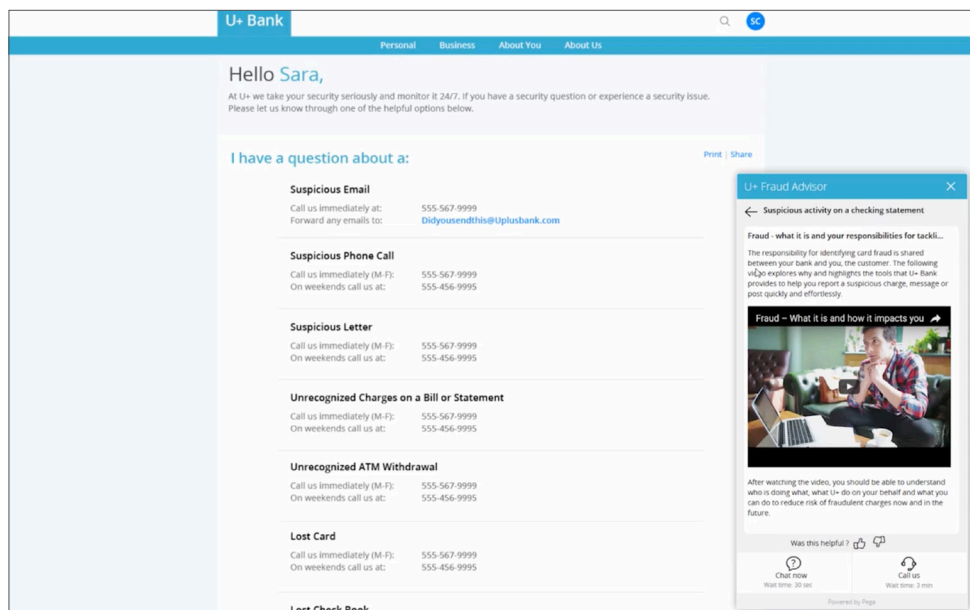


Figure 8: Pega Self-Service Advisor dynamic screen overlay

Pega Self-Service Advisor uses Pega's proven artificial intelligence engine to surface the information. Your customers' needs are analyzed in real time, based on their past engagement history and current site movements. The application also allows the website users to simply click a "Need Help" button from any page to access a dynamic screen overlay with customized links and possible actions. This increases customer experience and shortens the issue resolution time.

Depending on your business needs, you can use the Self-Service Advisor Configuration Portal to build one consolidated set of self-service advisors or multiple discrete advisors. You can fully customize the look, feel, and behavior of an advisor so it is coherent and aligned with your company's profile. All you need to do is select categories that are inherited from Pega Knowledge and specify channels to display. In result, a fully configured advisor is generated, and the JavaScript becomes available to a web developer responsible for deploying it to the target website.

What's next?

Mashup solutions empower you to embed dynamic experiences into existing web applications and mobile apps, allowing you to stay ahead of competitors and deliver engaging customer experiences.

With the Pega Platform, you can obtain a groundbreaking and technology-agnostic mashup solution that is fast in development and implementation, user-friendly, easy to control, and allows for cost savings while enabling productivity gains.

Using Pega Mashup, our clients empower customers to enter credit card disputes within a mobile app, open new accounts online, and co-browse with experts. They deliver game-changing experiences fast. Don't get left behind.

Whether you need mashup technology for complex business processes or APIs for less complicated operations, you've already taken the first step. Don't stop here. Join the group of satisfied Pega customers and reap the benefits of mashup with the Pega Platform.



ABOUT PEGASYSTEMS

Pegasystems Build for Change® Platform is the heart of Better Business Software®. It delivers business agility and empowers leading organizations to rapidly close execution gaps and seize new opportunities. Pegasystems leverages its recognized leadership in Business Process Management (BPM), Multi-Channel Customer Relationship Management (CRM), Business Rules, and Adaptive Analytics to uniquely give its clients the power to engage customers, simplify operations and Build For Change®. For more information, please visit us at www.pegasystems.com.

For more information, please visit us at WWW.PEGA.COM

© Copyright 2017 Pegasystems Inc. All rights reserved. All trademarks are the property of their respective owners. The information contained in this press release is not a commitment, promise, or legal obligation to deliver any material, code or functionality. The development, release and timing of any features or functionality described remains at the sole discretion of Pegasystems. Pegasystems specifically disclaims any liability with respect to this information.