

PROGRESS® PACIFIC™: THE FUTURE OF BUSINESS SOFTWARE

Platform-as-a-Service [PaaS] technology offers numerous potential advantages to business by enabling users to create new business applications quickly, without the hassle and investment of setting up IT infrastructure. PaaS accomplishes this by delivering a complete software development, application server and database stack in the cloud. PaaS adoption is growing as businesses seize it as a way to fast-track application projects. PaaS platforms can introduce challenges when it comes to sophisticated data integration and deployment options, the very features that

businesses need if they want to use cloud computing to differentiate and compete. Progress® Pacific™ PaaS, which merges the recently acquired Progress® Rollbase® PaaS with the highly-regarded Progress® OpenEdge® development platform, Progress® DataDirect Cloud™, and Progress® Corticon® products, brings PaaS into the realm of serious business software. Pacific combines the speed and agility of PaaS with the flexibility, rich data connectivity, and rules management that businesses need to be competitive with their applications.

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INTRODUCTION

Lines of business (LOB) managers have historically had an ambivalent relationship with information technology, especially enterprise software. It's essential. You can't do business without it. Good software can be a differentiator and lever of strategic advantage. At the same time, getting the highest level of business productivity from software can be challenging, costly, and time-consuming. On one level, enterprise software can be cumbersome to set up. Then, making users well-versed in the application may present obstacles to productivity. Cloud computing potentially changes this paradigm. Cloud-based Platform-as-a-Service (PaaS) enables users to create intuitive, browser-based business applications quickly by delivering a complete software development, application server, and database stack in the cloud. There's no investment of time and resources in setting up the underlying infrastructure. In most cases, the PaaS platform facilitates the creation of easy-to-use and easy-to-learn applications. There's a lot to like about PaaS for business.

Indeed, PaaS adoption is growing as businesses seize on it as a way to fast-track application projects. PaaS platforms can introduce challenges, though, when it comes to sophisticated data integration and deployment options. Not everyone is ready for 100% cloud-based applications today. Some may never be. The new Progress Pacific PaaS offering from Progress, which merges the recently acquired Progress Rollbase PaaS with the highly-regarded Progress OpenEdge development platform, Progress DataDirect Cloud and Progress Corticon products¹, brings PaaS into the realm of serious business software. Pacific combines the speed and agility of PaaS with the flexibility and rich data connectivity that businesses need to be competitive with their applications.

WHAT BUSINESSES REALLY NEED FROM APPLICATIONS

What do business managers truly expect from their applications? Having provided enterprise software to hundreds of businesses over the last thirty years, Progress is seeing a shift in expectations and requirements as market cycles accelerate. While businesses have always had to be agile and dynamic

in response to change, the last few years have seen a dramatic increase in a demand for speed in software development.

There are many reasons for this, including the mobile revolution, which introduces novel ways for consumers to connect with familiar brands at an extremely rapid pace. Customers expect new, interactive experiences, and they want them tailored to use cases and form factors that may not have even existed a year or two ago. For example, a program that scans business cards might be expected to connect to LinkedIn and Facebook automatically as it creates contact records. This requirement was not even on the horizon a few years ago.

In response, corporations are developing mobile apps and new interactive interfaces on a grand scale. A 2013 survey revealed a 43 percent increase in developers creating apps for business and 63 percent of developers reporting either "increased" or "greatly increased" demand for enterprise apps since the beginning of the year². Companies of all sizes have begun to act like "lean startups," rolling out quickly prototyped applications, getting feedback, and then pushing updated editions out within weeks.

This phenomenon is more active at the exterior edges of a business, where it interacts with customers, partners, and suppliers. The core business applications are also subject to frequent changes, but the pace can be a little more orderly. In contrast, the business professionals tasked with winning constant races to differentiate and compete have unique needs: They need simplicity in application development. They don't want to know (or pay for) deep technical skills. They need to connect to critical data held in a wide assortment of databases and repositories. They need to see models of applications before they are built. They want to show results right away – and they need to do it all without a long, expensive IT project.

THE PAAS SOLUTION

Cloud computing offers the basis for a speedy software development solution. With its ability to make infrastructure available on demand, as a service, the cloud cuts out some of the potentially slow and costly steps required to get software up and running.

¹ Full integration of OpenEdge, DataDirect Cloud, and Corticon with Pacific is expected to be completed in 2014.

² Parmy Olson, "Forget Angry Birds: More Developers Are Making In-House Apps For Companies," *Forbes*, June 26, 2013.

PaaS makes a complete software platform—including infrastructure, application servers, development tools, databases, and storage—available over the Internet. It's one of many “as a service” revolutions arising from the IT field's broader move to cloud computing. While Infrastructure-as-a-Service (IaaS) makes the foundation of cloud computing available to those who know how to build their own platforms, PaaS delivers complex and highly labor-intensive middleware technology patterns as a service. Typically, PaaS allows self-service and self-provisioning of resources to support a variety of cloud architectures. Through a browser, a user can switch on a fully-configured cloud platform without having to worry about standing up hardware or installing software. PaaS scales elastically. Whatever platform resources are needed, there's no practical limit to what can be delivered on demand. The introduction of PaaS, which can accelerate the creation of new software, takes the cloud even further.

PAAS SCALES ELASTICALLY. WHATEVER PLATFORM RESOURCES ARE NEEDED, THERE'S NO PRACTICAL LIMIT TO WHAT CAN BE DELIVERED ON DEMAND.

PaaS adoption is growing briskly. Technavio, the research firm, projects that the global PaaS market will top \$6 billion by 2016. The growth rate is projected to be over 48 percent per year for the next four years³. Gartner valued the worldwide PaaS market at \$1.2 billion in 2012, up from \$900 million in 2011. This may seem small considering that the global market for all hosted services, including SaaS, was \$109 billion in 2012⁴. Still, considering that it's a new technology, the size of the market and the projected growth rate speak to the potential of PaaS as a driver of business value.

PaaS is also evolving as a technology, blending with IaaS and spawning new platform options. There's integration PaaS (iPaaS), which offers a complete application integration capability in the cloud, business process management PaaS (bpmPaaS) which makes possible business process execution in the cloud, and application PaaS (aPaaS), which gives developers the ability to fast-track application development.

PaaS confers several business and IT management benefits. Though it's not a magic cure-all, PaaS enables the kind of lightning-fast application development that businesses need today. It can be a huge advantage for

certain types of in-house corporate projects and ISV commercial products. Organizations can write their own software with PaaS but delegate infrastructure and platform management to specialists, while concentrating on their core competency of developing applications. PaaS can facilitate cuts in IT overhead and capital expense by eliminating the conventional processes of acquiring and installing physical hardware, establishing or renting data center facilities, setting up servers, configuring, patching, maintaining, and so on. For early-stage companies, being able to operate on a lean basis can be an essential element of business viability.

A few “gotchas” can reduce the beneficial impact of PaaS, however. Some PaaS solutions create platform dependencies that cause rigid and unplanned licensing costs when an application scales. Others require deep knowledge of programming languages, which can slow down development cycles and necessitate the hiring of high level programmers. Data connectivity also looms as a challenge in many PaaS scenarios. Enterprise applications need robust, flexible, and fast connections to numerous sources of data both in the cloud and behind the firewall, or even multiple firewalls in some cases. These limitations sometimes restrict PaaS to a corner of IT reserved for small, non-critical projects: not quite ready for true enterprise-grade work.

THE PACIFIC APPROACH

Progress Pacific is a PaaS solution that is designed to deliver the full enterprise capabilities needed for business applications while overcoming some of the challenges inherent in current PaaS alternatives. Based on Rollbase, which Progress acquired in 2013, Pacific is envisioned as a PaaS solution that powers the rapid creation and deployment of powerful business applications that are driven by data and unlimited by device or cloud. That vision is being fulfilled today.

WHAT IS PROGRESS PACIFIC?

Progress Pacific is designed for the creation of serious business applications. The Rollbase PaaS, which forms the core of Pacific, enables rapid creation of business applications that require little or no actual coding. With Pacific, LOB managers and “citizen developers” are able to conceive and implement sophisticated business applications in the cloud without the help of highly specialized developer skills. Built on the “model-driven” approach to PaaS, Pacific lets users create functioning

³ Technavio, *Global Platform-as-a-Service Market 2012-2016*

⁴ Nancy Gohring, “Platform as a service heats up,” *ComputerWorld*, July 8, 2013.

business applications with drag and drop tools and preset templates. For advanced customizations, Pacific also supports standard languages such as JavaScript and Java. Pacific app dev technology then automatically generates the end-user interface.

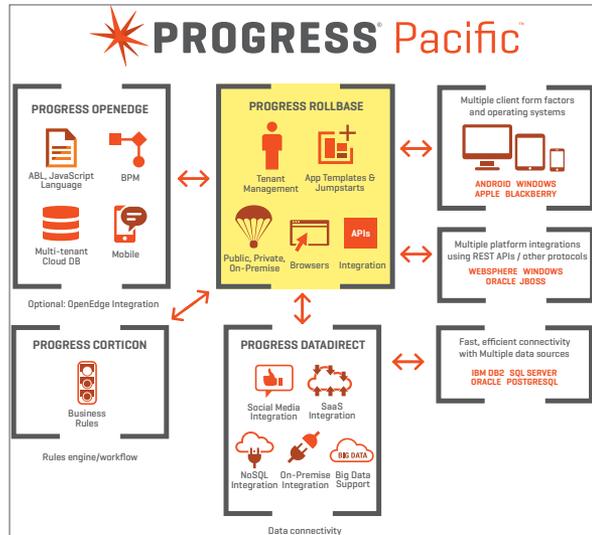


Figure 1. Reference architecture for Progress Pacific

Figure 1 shows reference architecture for Pacific. Progress Rollbase is the heart of the offering, with the model-driven development tools, multiple deployment options, and API management capability that enables Pacific to connect to virtually any third party platform. On the client side, Rollbase supports numerous operating systems and form factors. Extensive integration with the Progress OpenEdge platform is available, but not required.

Adding Progress DataDirect Cloud and Progress Corticon results in applications that have extensive data connectivity and sophisticated business process modeling and rules. DataDirect Cloud, which is widely viewed as the industry’s best data connectivity platform, links apps built in Pacific to data inside and outside the organization’s firewall. DataDirect Cloud uses a fast, efficient wire protocol. There is no need to keep up with multiple, ever-changing APIs; DataDirect Cloud allows you to access a multitude of datasources through a single SQL-based interface. Progress maintains the driver so that connectivity is constant and not dependent on updating drivers one at a time. This capability allows Pacific-based apps to interact with data sources and BI tools on the same robust basis as enterprise applications.

Progress Corticon is a Business Rules Management System (BRMS) that automates business decisions. It separates decisions from processes, a feature

that allows Pacific users to create or reuse business rules as well as create, improve, collaborate on, and maintain decision logic. Both DataDirect and Corticon functionality are distinctive and differentiating for users of Pacific.

Open deployment is a foundation of the Pacific vision. Pacific can be deployed on a public cloud, private cloud, or hybrid. Figure 2 shows five potential configurations. Being able to select who manages the infrastructure can be a big advantage for organizations with data governance or compliance policies that prohibit the use of public cloud, but could benefit from the rapidity and flexibility of a cloud-based application.

THE PROBLEMS THAT PACIFIC SOLVES

1		Pacific in the public cloud	
2		Pacific in a private cloud	DataDirect Cloud, Data Sources
3	On-Premise IDE and App server	Pacific in a private cloud	
4	On-Premise IDE and App server	Pacific in a private cloud	DataDirect Cloud, Data Sources
5	On-Premise IDE and App server	Pacific in the public cloud	

Figure 2. Some Progress Pacific deployment options

Pacific offers a new application development choice for IT and LOB managers who need to get applications into operation quickly. Pacific essentially balances the efficient, somewhat constrained world of preset, model-based PaaS with the expansive enterprise software environment. It makes possible the rapid realization of serious business applications with rich data connectivity and robust business rules, without requiring the level of investment or time needed for a conventional enterprise application. Examples include the following types of scenarios:

- ▶ An LOB manager has a specific operational need for an application but has a limited IT budget. However, this application would require accessing data from multiple sources, such as SQL, Microsoft Access, and Salesforce.com. Pacific allows a citizen developer in the department to quickly create, evolve, and customize an application that integrates data from multiple data sources.

- ▶ Alternatively, the application created by the citizen developer will need to leverage a private cloud architecture, which requires IT involvement to set up. IT can support the private cloud, but the business owners can still create and manage the application themselves.
- ▶ A business application was originally created in Force.com. However, the business owners want to broaden its distribution to regions that have potential data regulatory constraints that preclude using a public, US-based PaaS. Pacific makes it possible to export the application from Force.com and deploy it in Pacific private cloud configurations in multiple geographies so as to meet data privacy standards.

PACIFIC FOR ISVS

Independent Software Vendors (ISVs) are able to use Progress Pacific as a platform for expedited creation of new SaaS business applications with little or no programming skills. The multi-tenant platform offers ISVs the freedom to choose their hosting environments. Pacific includes many built-in services for ISVs, including tenant management, application directories, application management, end user and role management, and so on. The flexible deployment options, combined with powerful Progress DataDirect Cloud and Progress Corticon capabilities, give Pacific ISVs a competitive edge in the SaaS market.

OPENEDGE INTEGRATION

As a Progress service offering, Progress Pacific of course offers comprehensive integration with the complete Progress OpenEdge stack in multiple deployment configurations. Figure 3 shows a private cloud setup for Pacific and OpenEdge. On premise, the user has Progress® Developer Studio for OpenEdge® and Progress® OpenEdge® Mobile running on the Progress® OpenEdge® Application Server (AppServer). The OpenEdge AppServer and the Progress Pacific

Application Server both connect to an underlying instance of the Progress OpenEdge RDBMS. With this architecture, an application developed in Pacific can have complete access to the data and functionality contained in applications that are running on OpenEdge. DataDirect Cloud also opens up the application to myriad third-party data sources.

CONCLUSION

Progress Pacific lets LOB managers create their own business applications quickly and efficiently, but with the kind of power and reach that are needed for true operational impact. Building on the proven Progress Rollbase platform, Progress Pacific delivers a level of cloud-based business applications that surpasses what is currently on the market. Sophisticated rules functionality, multiple deployment options, template-based application development, and rich data connectivity all contribute to a powerful solution offering. Pacific empowers business managers and citizen developers to create the kind of sophisticated business applications that once required significant investments of time and resources. Now, these applications can be built quickly and on low budgets. Progress Pacific is a major advance in cloud-computing for business.

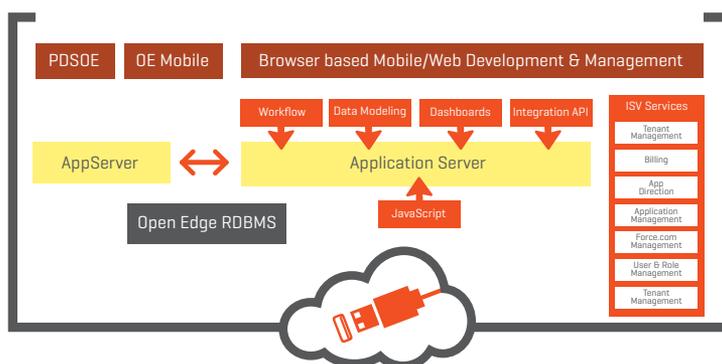


Figure 3. Reference architecture for OpenEdge-Pacific integration in a hybrid cloud deployment

IT'S ALL ABOUT CHOICE

At Progress, we're providing the choices businesses need. Progress Pacific provides an intuitive, easy-to-use platform where the complexities of application development and data access are removed, enabling developers and businesses to simply focus on solving their market and business problems.

For Progress OpenEdge customers, Progress Pacific can help you extend the business logic you've invested in and take it forward into today's cloud-enabled, mobile-delivered environments. Pacific brings together all of the benefits you've come to expect from Progress—rock solid reliability, flexibility in rapid development, and stable, reliable connections to critical data—all under one powerful platform. All delivered with an amazing user experience. For more information, visit

www.progress.com/pacific.

PROGRESS SOFTWARE

Progress Software Corporation [NASDAQ: PRGS] is a global software company that simplifies the development, deployment and management of business applications on-premise or in the cloud, on any platform or device, to any data source, with enhanced performance, minimal IT complexity and low total cost of ownership.

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APPENDIX: PROGRESS PACIFIC TECHNICAL OVERVIEW

Progress Pacific is composed of three basic application components, as diagrammed in Figure 4. A data model allows users to create objects with custom fields and relationships. The UI components enable citizen developers and other non-specialists to create custom views of data, web pages, portals, charts, and reports. The business logic layer provides functionality for workflows and actions of various kinds based on triggers defined by the user. Many of the components are available in pre-assembled form in ready-to-go application templates.

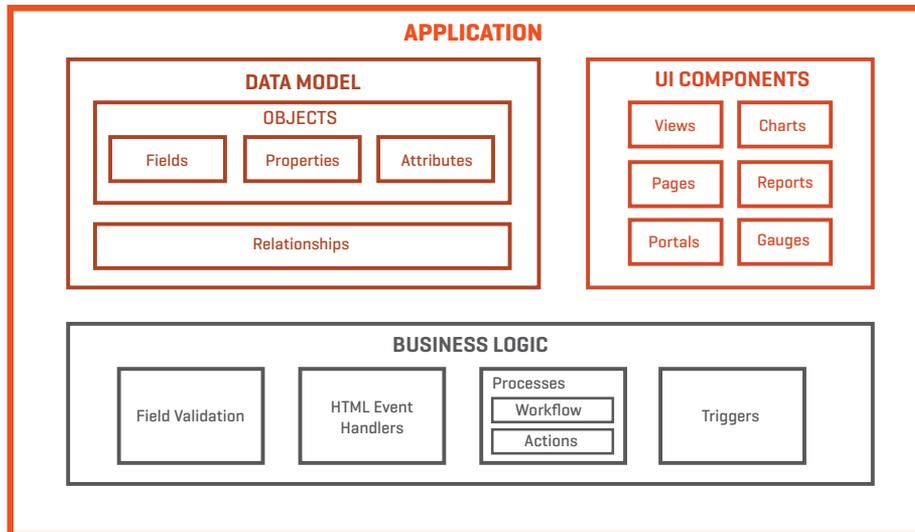


Figure 4. Progress Pacific application components

PROGRESS PACIFIC DATA MODEL

The data model starts with objects, a basic building block that can represent any sort of business data or business entity. For example, in an application that manages corporate contact information, you could have separate objects for customers, employees, and products. Or, if you are building a project management application, an object might be projects. In a customer management application an object might be cases that customers are submitting. Records are specific instances of the objects inside the application. If you have an object called employee, each record would represent an actual employee in your company as you start entering data.

There are various components of an object, as shown in Figure 5. Fields, which are like columns in a spreadsheet, hold specific attributes of the object for storing data. Progress Rollbase provides different field types, including standard numeric text date-type fields as well as advanced deal types that allow you to attach files to your records. Objects also have properties and attributes. Properties define the characteristics and the basic behavior of the record. Attributes also control the specific behavior, and sometimes can contain a default set of fields. You also have the ability to assign smart attributes to an object. For example, if you had an object for "contacts," it might also contain locations and related tasks. You could configure the object to add a Google Map to the contact.

There are two ways to create objects. One is from scratch, in which you create your object and define everything about that object. You can also base an object on external data. For example, Rollbase gives you the opportunity to import a Microsoft Excel spreadsheet. From there, you can extract all the data and use it to create an object. The external data can also come from a database or another cloud data source, such as Salesforce or Eloqua. Connectors in Pacific support this.

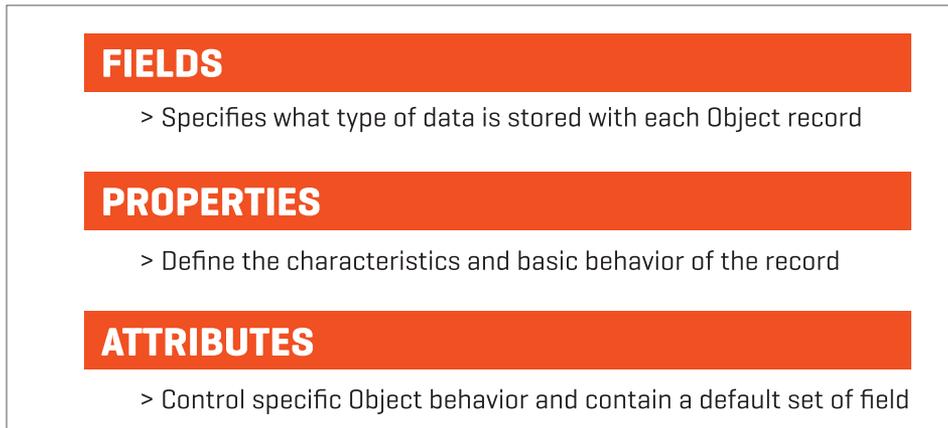


Figure 5. Components of an object in Progress Pacific

UI COMPONENTS

Pages in Pacific are web-based, as is the development environment. When you're developing your application, you can see changes immediately in the web UI as you make them. You can see how new features will be represented in the final application. This is possible without having to change environments for build and deploy. The changes you make will be live and deployed in real time so you can even invite people to start giving feedback as you are developing your application. This allows you to iterate over time.

Figure 6. Components of an object in Progress Pacific

Pacific pages are built in HTML. Pacific provides a drag-and-drop interface to allow you to define your pages. Once you have defined your pages and saved them, Pacific generates the code in the background. Pacific comes with standard interactions, but you can also customize them. You can add fields and drag them and drop them around on your pages.

You can also add in JavaScript, to override some of the look and feel of the application or add some interaction. You can accomplish that by simply dragging and dropping a script element onto that page. When the page loads in the application on the on-load event, it will run your script and enter it onto that data. Not only do you have access to the standard pages that make up

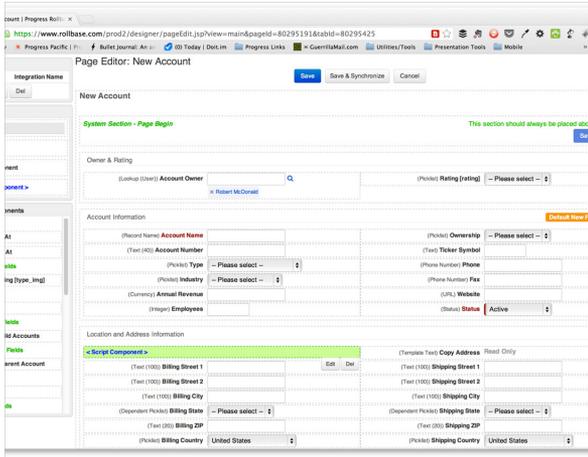


Figure 7. Pacific Page Editor screen

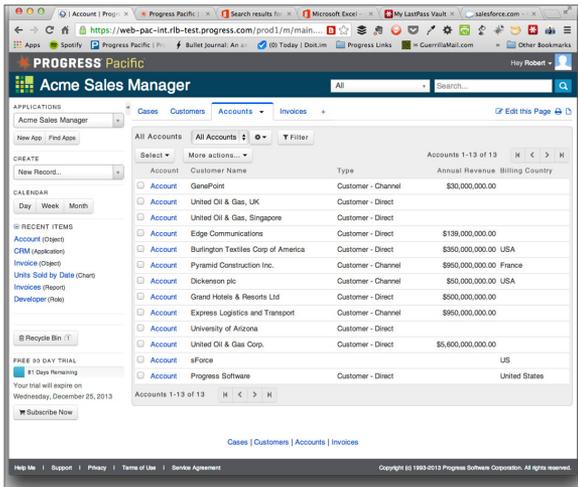


Figure 8. Pacific Data View page

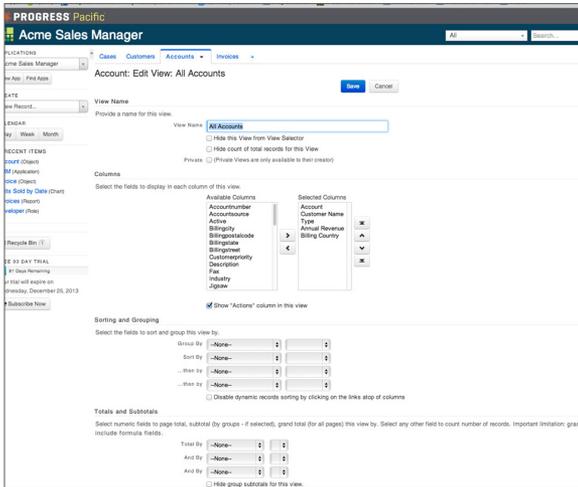


Figure 9. Editor for Data View page

a Rollbase application—for example, view record pages, edit record pages, and add record pages—you also have the ability to create any number of generic pages as well. You have full control over the workflow as well as the look and feel of the application.

Pacific lets you display data in the standard tabular format, as shown in Figure 8. You can make use of multi-level grouping or define totaling and subtotaling. With numeric data, it's possible to roll-up or aggregate within this view while writing the HTML. Or, you can provide connections to the database.

The drag-and-drop interface allows you to define what columns you want to display, and how they're displayed. As shown in Figure 9, you can add sorting and grouping criteria, with drop downs to define what you want to sort. You can also provide some levels of filtering, so the data that you present can be filtered in the way that you want. For instance, you might have some support cases you wish to display. You can show the ones in this view that were created in the last seven days.

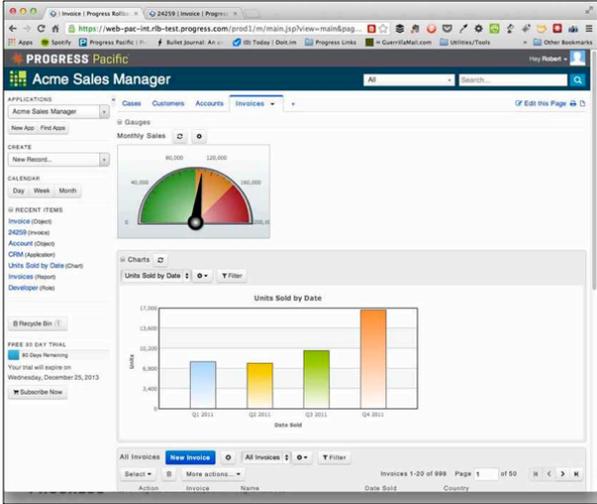


Figure 10. Example of chart and gauge page in Pacific

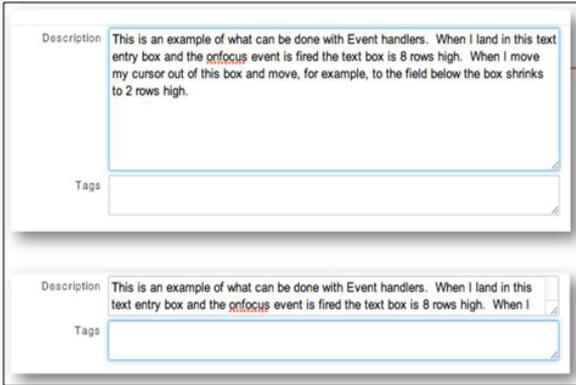


Figure 11. Example of field event handler

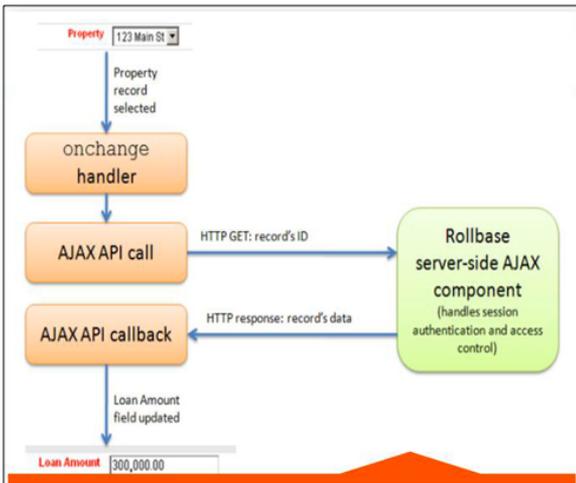


Figure 12. AJAX API event handler

Pacific provides visualization tools that allow you to do charting and add some gauges. The gauges can be set to refresh at an interval of time. Figure 10 shows an example of a page containing a chart and gauge.

BUSINESS LOGIC

Pacific offers out-of-the-box business logic that's fully customizable with JavaScript. Event responses are a simple example of a logical function you can set up in Pacific. Pacific lets you customize the behavior of fields based on event inputs, such a click-ons.

For example, you can add a very simple JavaScript line to a field that says, "On focus, expand this text box" so users can fill in the text box when that action is taken. Then, as soon as the user moves to the next field, the text box will shrink back down. Figure 11 shows what this looks like in the Pacific interface.

You have full control over the interaction on your pages. If you want to create more advanced functionality, you have the ability to use the Ajax API. As shown in Figure 12, you could use the API to provide some logic to pull information in from an external record. That way, if the user is making changes to a record, Pacific can be programmed to go out and find a related record once the user is finished making the change. It can then pull some data from the related record.

STATUSES AND ACTIONS

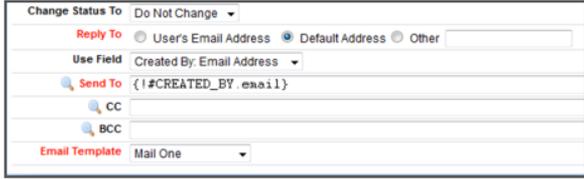


Figure 13. Example of an Action in Pacific

Statuses indicate the current state of a record. The Status is an Object property that you can set to enable workflow on an Object. Once you pick a Status from a drop-down, you can assign a workflow Action or Trigger to make something happen in the application. The action can be triggered or manually performed based on that Status. Figure 13 shows an Action in Pacific.

Once you have a Status and a workflow, and have assigned an Action to that Status, it will allow you to do some Actions inside of your application. An Action is an operation that a user can perform on a record. Actions are typically done to, for example, change workflow status. For example, if you have a project management application, and you have a task, and you set that task percentage complete to 100%, it may change the Status to Completed for you automatically. This, in turn may begin another Action.

PROCESSES

Processes serve as a container for a set of Statuses and Actions that make up a whole workflow. You can define an Object as a workflow, though you also get one by default. However, you're not limited to just one workflow. You can define multiple workflows. For example, you may want to have one flow for small orders, and another one for large orders.



Figure 14. Example of custom process flows that can be programmed in a Pacific application

TRIGGERS

Triggers are a way to enable automatic workflows. Triggers are Actions that occur automatically throughout the system, based on an action that a user takes in the process of using the application. When configuring a Trigger, you set the timing option—for example, based on before a new record is created, or after the record is created; before or after an update to a record; before and after a delete; and so on. All Triggers can be conditional. For example, an Action can be triggered if a value is higher than a given threshold. Actions include:

- ▶ Automated validation
- ▶ Programmatic validation
- ▶ Notification
- ▶ Data manipulation and other activities

TIMING OPTIONS
Before/After Create
Before/After Update
Before/After Delete
On Finalize
On Login
On Logout