NETSUITE

The IT Buyer's Guide to Cloud ERP

Evaluating a SaaS Platform Against Development, Integration, Upgrades Security, Availability, Innovation and Ecosystem Requirements

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Executive Summary

As a leader of your organization's IT, you are constantly managing a growing global organization as your company expands into new markets, launches new products, implements new revenue models, introduces new routes to markets, and so on. As the cliché goes, the only constant is CHANGE! As a result of this constant evolution, one of the biggest technology cornerstones in your organization which is in a perennial state of flux is your Back Office or ERP system. Would it not be nice to remove IT completely from the critical path or at least minimize its footprint, as you go through these changes so that you can focus your attention and resources on projects more directly aligned with your corporate goals? Of course you would like to, and the good news is you have options.

One of the options is moving your ERP system to the cloud. You have already embraced the cloud in CRM and HCM, and have realized the benefits the cloud offers. And CIO's like you (and CFOs) are now comfortable with the knowledge that the cloud really does provide the guarantee that classic on-premise software vendors tout as their sole domain. So is it time to consider Cloud ERP especially after already investing millions on on-premise ERP solutions over the years? Absolutely! It has been documented that cloud ERP is faster, more economical, and more suitable for today's global businesses. It offers benefits that an on-premise ERP cannot and most importantly, cloud computing takes IT off the critical path for expanding businesses.

Of course, the first step in moving your ERP system to the cloud is an in-depth analysis of the pros and cons of cloud based ERP solutions. You need to make sure that the solution that you are considering offers the functionality you expect from an on-premise solution today and also has the capability to support your needs as your business evolves over the course of years and decades.

The features and benefits of cloud based ERP are documented on many research sites. This paper picks up after the basic cost-benefit analysis has been completed and you begin evaluating the various cloud based ERP solutions for your needs.

Even after you have made the decision to start moving some of your back office operations to the cloud, you realize that migrating from an on-premise solution means more than just turning off the switch on your servers and redirecting users to a URL on the Internet.

A very critical step is choosing an ERP solution with a complete development platform because you know that no ERP system comes ready to use, out of the box. You need to customize it to suite your specific business needs. In addition, you need to evaluate it against other criteria such as availability, scalability, SLAs, testing, etc. upon which you have a lot more control with an on-premise ERP system.

With that background, this paper provides an in-depth analysis of what to look for in a cloud ERP platform.

Introduction

Cloud applications are usually referred to as Software-as-a-Service (SaaS), while the platform may typically be called Platform-as-a-Service (PaaS). An off-the-shelf cloud ERP solution consists of applications such as accounting, human resources management, asset management, etc. customer relationship management (albeit not all under a single suite) just like its on-premise counterpart and these core applications are a baseline for all ERP implementations. Therefore, expecting these components is natural. However, there is more to managing a cloud ERP than realizing the benefits of the functionality it offers. For example, what about the related IT issues that come with a new ERP package, especially one that is residing somewhere outside your own datacenter? This paper addresses the following topics which are related to that aspect tied to the platform on which the ERP solution is delivered and should be a critical part of your process of choosing your next cloud-based ERP system:

Customizations. Most enterprises build custom extensions on top of their ERP platforms. In fact, as you know, there is no industrial strength ERP system that would work for every company out of the box. Therefore, customizations are a way of life. Ideally, you as CIO would like to choose a platform with superior extensibility that enables IT resources to easily transfer skills.

Integrations. Many organizations need to integrate standard ERP functionality with vertical industry applications, their internal legacy applications and other in-house apps. A cloud vendor must support a wide variety of integration options ranging from flat file import/export to dynamic web services and published APIs.

Upgrades. Upgrading an on-premise ERP package can be a multi-year endeavor (and sometimes a career-ending project!). One of the key benefits of SaaS delivery is that upgrades are applied automatically by the vendor in a manner designed to minimize disruption. Of course, it's not that easy! You need to explore the upgrade process and assess potential landmines and adaptations that may be required.

Security. One of the key roles of an IT department is that of enterprise data "gatekeeper." It falls on the CIO and possibly the chief security officer's team to administer ERP access. In choosing a cloud ERP vendor, one needs to verify the strength and flexibility of the security system. For example, does the platform support single sign-on and integration with operating system directories such as Active Directory or LDAP? Can the security model be extended to support custom applications and data integration?

Availability. A key factor to evaluate is the level of service promised by the cloud ERP vendor. Outages are costly, especially for customer-facing ecommerce applications. Drill into the vendor's service-level agreement (SLA), compensation amounts for outages, upgrade schedule and planned downtime, etc.

Ecosystem. Many enterprises have augmented their on-premise ERP environments with point solutions specific to their industry, business or target markets. For example such functions as résumé processing, recruiting, tax processing, ecommerce SEO integration and more. CIOs need to verify that third-party applications implemented in their current environment work with a cloud ERP solution, and size up the cloud vendor's partnerships with ISVs offering complementary applications.

Innovation. You know that choosing an ERP vendor means making a long term commitment. Tied closely with long term commitment is the need to make sure that the ERP vendor is committed to on-going innovation. This ensures that you in turn are able to take advantage of the latest and greatest technologies and thus keep pace with your competition.

For each of the topics listed above, this paper provides details on what to look for. Then it provides an in depth example of how one company has taken advantage of the underlying platform to extend native ERP functionality on the NetSuite ERP system to provide industry specific solutions.

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Customizations

Most enterprises build custom extensions on top of their ERP platforms. In fact, as you know, there is no industrial strength ERP system that would work for every company out of the box. Therefore, customizations are a way of life. Ideally, you as CIO would like to choose a platform with superior extensibility that enables your IT resources to easily and quickly leverage their skills.

Customizations may be relatively simple reporting and analytic functionality, custom workflow processes or even a completely new application. On-premise ERP solutions usually provide development languages, ranging from Oracle's PeopleSoft PeopleCode to SAP ABAP to Microsoft Dynamics GP Dexterity. Most (but not all) cloud ERP solutions also provide a development platform.

Let us now look at the various aspects of the development platform as they pertain to customizations.

Development Environment

ERP customization traditionally has been something to avoid due to the complexity of incorporating customized code into the upgrade process. When an upgrade was released for an on-premise ERP solution, a huge amount of effort went into analyzing the impact on any customizations.

Due to the architecture of cloud solutions, the upgrade process has been automated. IT departments are now free to create proprietary extensions within the cloud platform. However, the ideal development environment will provide the means to rapidly build applications from data model to user interface for the cloud. This minimal set includes:

- An advanced Interactive Development Environment (IDE) based on well-known environments such as Eclipse and that supports the full software development lifecycle, including both browser and server-side debugging, source code control and multi-file projects.

- Agile development concepts such as code refactoring, inspection, rapid prototyping, etc.

Development Language

Your IT team probably has deep experience with one if not several programming languages and development environments. You need to identify a best fit from a language perspective and watch out for *proprietary development languages offered by some cloud vendors*. However, some cloud vendors extend popular existing languages to fit their platform which enables developers to become productive relatively quickly. For example, NetSuite implements SuiteScript (based on JavaScript and thus extremely easy for developers to use with minimal learning curve) throughout the product and provides APIs in the form of SuiteScript functions to access all of the platform data and metadata.

In addition, standard HTML should be usable for UI enhancements. For example, NetSuite provides the ability to easily create dynamic web pages with an easy-to-use content management system, so an organization's web designers will feel comfortable adopting the platform for complete ecommerce functionality.

Reporting

Traditionally, IT has provided tools to business analysts to enhance their decision-making abilities without overwhelming them with data. This continues to be true in the cloud. For example, regular batch reports still need to be scheduled, report distribution needs to be managed and self-service tools provided to end-users. You will also want to evaluate dashboard capability, data inquiry support (without SQL knowledge) and spreadsheet interfaces.

Application Level Security

Security is a major factor for you. There are two levels of security. One is with respect to the platform itself and the other is related to the application security. In this section we discuss the latter. The former is discussed in a subsequent section. In addition, user security needs to be robust yet easy to manage. At a minimum, role-based security must extend across not only the core ERP application, but also any customized objects. Roles must be customizable. For example, there have to be easy mechanisms to enforce that an employee can only "request" a vacation while a manager should be able to "request" as well as "approve" vacation requests.

Workflow and Document Management

The cloud environment needs to provide a graphical toolset to define workflow processes. Workflow processes are common with ERP procurement (PO approval) and time and labor (time sheet approval), for example. Ideally, the tool will be intuitive enough that business analysts can maintain these workflows after IT has completed the original definitions. Yet the workflow system should be powerful enough that complex processes can also be modeled. For example, NetSuite's workflow design tool provides an easy-to-use graphical interface for basic process definitions, and is also built on top of the entire scripting library so that complex models can be generated.

With respect to Document Management, many line-of-business transactions involve unstructured data in the form of documents (scanned documents from paper, word processing attachments, PDFs, etc.) Users also commonly apply natural language notes to transactions in the system. The SuiteBuilder tool from NetSuite supports a document and notes repository with a click of a checkbox for any record in the system.

Integrations

Integrating disparate enterprise systems always ranks as one of IT's major challenges. For instance, ERP needs to connect to CRM and other legacy systems or to other cloud applications such as Google Apps. In addition, you might want to find a way to connect your subsidiaries to your Corporate ERP system.

Regardless of the type of integration, whether to a desktop application, another cloud solution or a legacy on-premise ERP system, the cloud platform needs to expose APIs for internal developers or third-party vendors to build the integrations. These could be flat file-based, XML-based, Web Services or REST-compliant. The more options available, the better for your department because the IT department will probably be responsible for integrating critical on-premise applications with the cloud ERP system, so verify that the platform meets connectivity and security requirements. In addition, you should also look to see if the cloud ERP platform has out-of-the-box connectors for such integration solution providers like Dell Boomi, Informatica, etc.

Upgrades

SaaS applications release major functionality to everyone on a preset schedule. This ranges from quarterly to annually depending on the cloud vendor. This schedule results in all business units/ divisions having access to latest and greatest version of the software. Therefore, you are never faced with a major upgrade project as the organization is always using the most current version of the software. However, you do have the responsibility to ensure that your organization is ready for the upgrade the day it occurs.

Some cloud vendors such as NetSuite provide a sandbox environment with one or more test accounts with configuration, data and customization identical to your production account. In addition, NetSuite supports custom software bundles to intelligently deploy an organization's code into production. Sandbox accounts provide ideal environments for:

• Testing customization elements before deployment

• Fixing issues with existing customizations

• Trying out third-party integration features like payroll or credit card processing

• Training employees in existing and new business practices in an environment identical to your production account

Actions you take in sandbox accounts, such as transaction entries, record deletions and form customizations should have no effect on your production account. You should be able to freely make changes in a sandbox account without altering your production data.

Security

As mentioned earlier, there are two levels of security. We already discussed application level security. In this section we focus on the security related to the ERP vendor's cloud infrastructure itself. In evaluating a cloud ERP solution, you should review the security audits and risk mitigation strategies utilized by the vendor and the certifications the vendor possesses.

You must get an assurance that the platform's physical data center is secure as well as its operating system level access, data access and source code. Demand a security audit report from the cloud vendor. This should highlight measures taken to mitigate risk at the data center, reports on potential data breaches, and ongoing security processes. Also, review the security product road map for biometric support, fob key password generators, etc.

Ideally, two-factor authentication should be available. Users should be alerted upon logins from other computers and be able to view a login history. Built-in audit trails for any changes to ERP data (including custom data objects) should be provided.

In addition, attention should be paid to make sure that the vendor has met a host of audit and security standards such as SSAE 16 (SOC 1), PCI-DSS and US-EU Safe Harbor framework. Further, the vendor must also have modeled its security and risk management processes according to National Institute of Standards and Technology (NIST) and ISO 27000 series of standards.

Availability and Scalability

When selecting a cloud provider, verify the transparency of the vendor's metrics. Ideally, the vendor will provide a monitoring tool available 24/7 for performance and uptime. For example, NetSuite provides the publicly available http://status.netsuite.com monitoring tool. Any downtime reported should provide details on the incident.

In addition, you should be able to get access to historical data on factors such as throughput, transaction volume, downtimes, etc. In addition, features like real-time performance indicators, historical trend charts, page rendering speed indicator, average service transaction speed indicator, etc. need to be part of a monitoring tool from the SaaS vendor:

Ecosystem

Cloud ERP platforms depend greatly on a community of partners, developers and innovators, as active development on the platform generates more ideas of ways to do things. The primary software vendors (and the IT department) have a limited amount of resources to bring enhancements to the platform. So the ecosystem can create a multiplier effect on innovation. Lack of a healthy ecosystem often indicates an immature SaaS offering and/or technical complexity that impedes growth.

In addition to a thriving developer community, the SaaS platform vendor should have an established base of partners as well, including system implementation service providers, integration technology partners and ISVs that can provide value-added software components to enrich and extend the environment with process- and industry-specific functionality.

Ideally, the cloud vendor will have a broad range of systems implementation partners such as Deloitte, Accenture, etc. with expertise in not only deploying the cloud ERP solution but also integrating it with pre-existing on-premise solutions such as Oracle EBS and SAP. If an IT department needs to integrate multiple systems, it may be more productive to work with a company such as Dell Boomi, Informatica Cloud, IBM Cast Iron, Celigo or Pervasive Software that can provide integration solutions between cloud platforms such as NetSuite and other cloud or on-premise applications.

The vendor should also have a rich network of established ISV partners that offer complementary applications. For instance, ISVs in NetSuite's SuiteCloud Developer Network (SDN) partner program offer hundreds of pre-integrated solutions at www.suiteapp.com in a range of areas, from HR to shipping to EDI, analytics, mobility and more, as well as industry-specific applications.

Innovation

The last (but not least) aspect to consider when evaluating a Cloud ERP platform vendor is how good they are about investing in ongoing innovation. But how do you measure that. Here is a quick checklist of items to evaluate how innovative the cloud vendor is:

- Review the history of the cloud vendor's released features. Is the number of major features increasing or decreasing?

- Does the user interface look dated?

- Are standards out of support? Are the latest integration techniques being supported?

- Check which product versions are supported by partners. If partners are not maintaining releases, then the ecosystem may be declining.

- Check if SaaS product innovations are also part of the platform and available for you to leverage.

Leveraging the capabilities of a Cloud Platform: Case Study

As we saw in the previous sections, there are a lot of different criteria on which you should evaluate your cloud platform. And as we also said, there are many different ways you can leverage the platform to customize the out-of-the-box solution so that it best meets your business needs. In this section, we provide an example in which an independent solution provider Pyango leverages the platform to extend the NetSuite Financials with advanced accounting features such as real time encumbrance controls, self-balancing ledger support and grants management for non-profit organizations.

PyanGo is a NetSuite SDN partner. The following case study details how PyanGo leveraged the rich development flexibility in the NetSuite SuiteCloud development platform to build its products. However, you can use the same capabilities provided by the platform to simply extend or enhance your ERP functionality to suit your business requirements.

Developing on the Platform

Technical product design in NetSuite begins with modeling data—both custom objects as well as extending built-in data objects. Built-in NetSuite objects are grouped into transactions, entities and other object definitions. This grouping provides additional properties or methods based on the object types, making design more powerful than standard database tables. For example, a single custom field can be applied across multiple transactions by clicking on a few checkboxes.

Designing web pages (called custom forms) in NetSuite is also straightforward. A form can be automatically generated based on the data definition to include all standard navigation options (menus, links and favorites). Related fields can be grouped easily to make data entry more intuitive, and complex data relationships may be displayed on single forms. Standard forms can be customized easily to highlight industry or enterprise specific fields. Forms are integrated with security to govern access by role-based permission.

For example, PyanGo's Grants Management application delivers a complex inquiry form that provides a 360-degree view of all revenue and expenses related to a grant. This view is built on the same data object that is used to maintain the grant data. Only a few principal investigators in the non-profit would edit a grant, while many employees may inquire to see the current status. By applying different roles to these users, they see different data elements.

NetSuite provides a "graduated" web development model that ranges from point and click to full HTML generation. Prebuilt forms can be modified with a few clicks to change field labels, add new fields and rearrange data fields. If the default layout is not optimal for a specific page design, developers can place content wherever needed. The following screen shot details a pure HTML page (generated from JavaScript) and a hybrid NetSuite UI and HTML page.
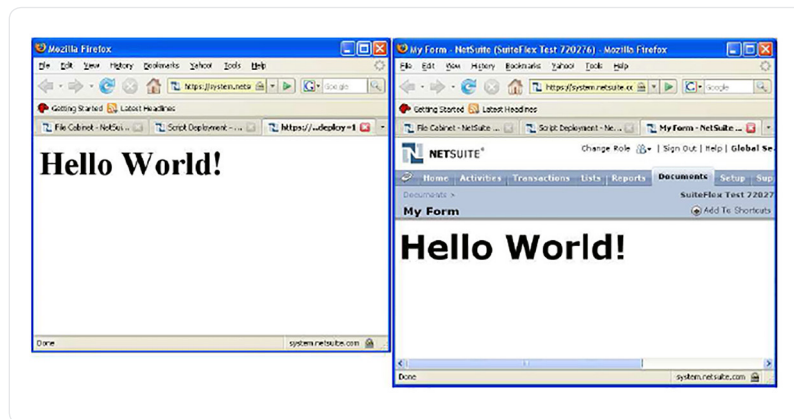
NetSuite has extended the open-source Eclipse IDE (called SuiteCloud IDE) to integrate with the cloud platform via a "perspective" that determines the visible actions and task orientation for code workspaces. Projects are defined within Eclipse that correspond to script folders in the platform. Scripts (collections of JavaScript functions) can be uploaded or downloaded as needed from the platform.

Developing on the NetSuite platform involves extensive use of built-in APIs that are exposed as Java functions and allow the developer to access built-in data objects, custom data records, user information, session level context and more. In building its application, PyanGo developed complex scripts to validate purchase order amounts against existing budgets. This involved complex data manipulation of both standard objects and custom records.

After a script is developed, it can be deployed in several ways—as a user event trigger (before page load, before save and after save), a client action (similar to standard HTML/JavaScript events), scheduled script, mass data updates or as a Suitelet. Suitelets are similar to a web service in that they are invoked by HTTP, GET or POST requests to system-generated URLs in a request/response manner. Suitelets can be used to access server-side data objects as well as generate HTML. This is one way that NetSuite promotes code reuse.

NetSuite's development environment provides all the power of a client-based UI (such as Microsoft Visual Studio) along with the benefits of cloud storage and script maintenance. The SuiteCloud IDE also includes a built-in debugger that greatly increases developer productivity and speed of development.
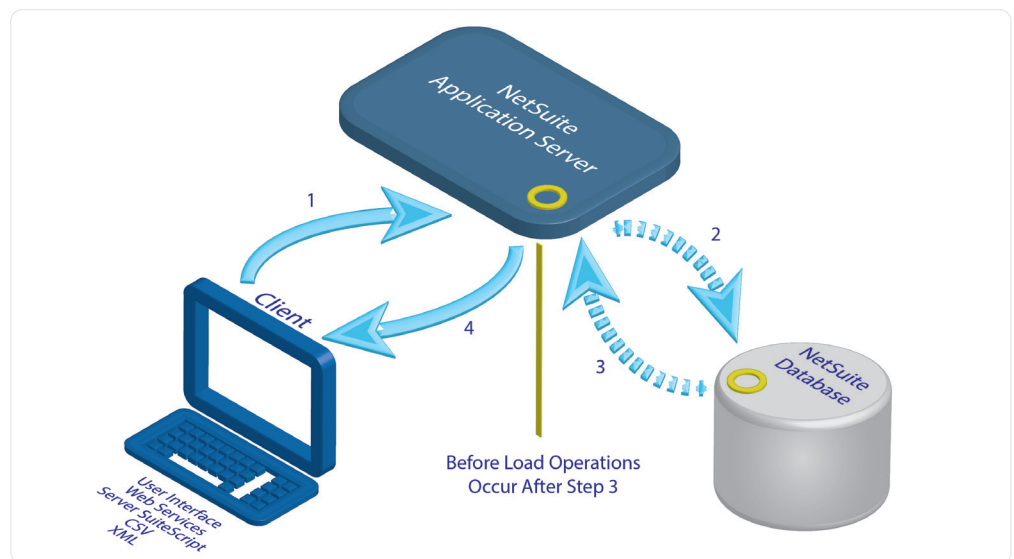
Integrating on the Platform

By definition, in a cloud-based ERP system, data is held somewhere in the 'cloud' which means it is not on an internal machine and thus cannot be readily accessed. And to be fair, it has been a point of contention for both IT staff as well as LOB owners.

One myth surrounding cloud ERP is that data in the cloud is not readily accessible. Yet in the case of NetSuite, most data objects are exposed through scripting and web services. In addition, any data grid can be exported to Excel, while flat file data can be imported to NetSuite. PyanGo leverages the flat file import tool on the platform to load budgets from Excel. These values are then used throughout the procurement process to calculate encumbrance and expensed amounts by account. The encumbrance data can then be published to budgeting tools such as Adaptive Planning via web services. NetSuite supports both SOAP and REST based web service protocols.

External applications can also publish data to the NetSuite platform via web services. Authentication is performed by leveraging the OAUTH standard and managing tokens between applications. Most of the data objects within NetSuite are exposed as web services. Updating applications via these web services invoke data validation functionality. This includes any custom or proprietary scripts that businesses implement. This increases data quality and reduces traditional data import validation scripts.

Securing the Platform

NetSuite delivers many out-of-the-box security roles that map to typical business roles such as controller, procurement manager and sales rep. PyanGo utilizes these roles throughout the procurement process to enable administrators to, for example, implement role-based permissions for data inquiry versus data modification. These roles can be further customized according to the organization's needs.

NetSuite plays well with external application security models through robust single sign-on protocols. The platform supports three options for single sign-on:

- **NetSuite-based OpenSSL tokens.** OpenSSL encryption keys produce encrypted tokens used by custom applications. A mapping between each user's external credentials and NetSuite credentials is created, either through a web services operation or through the user's login to NetSuite on their first single sign-on access.

- **SAML single sign-on.** Supports inbound single sign-on access to NetSuite using authentication from a SAML v2.0-compliant third-party identity provider.

- **OpenID single sign-on.** Supports inbound single sign-on access from Google Apps to NetSuite, relying on Google OpenID as the trusted system of authentication.

Reporting on the Platform

In the non-profit industry, various regulations impose stringent reporting requirements, and basic financial statements can vary significantly from traditional commercial enterprises. Here are several examples in which PyanGo leveraged the NetSuite platform to deliver reporting capabilities unique to the non-profit industry:

- **Encumbrance control.** Procurement processes must be monitored so that expenses do not exceed budgets. Non-profits typically apply hard limits to budgets in the form of funds (restricted, donations, general, etc.) PyanGo created several inquiries (called Saved Searches in NetSuite parlance) that can be accessed as links from a user's dashboard. This allows a CFO or controller to see what purchases are encumbered or expensed and determine what is left available to spend from a budget. These Saved Searches can also be presented in pivot table format. Finally, results can be exported to spreadsheets with a single click.

- **Traditional report customization.** Data reports and customization remain one of the most popular IT support requests. NetSuite delivers many "canned" reports including all of the standard financial statements. The platform also supports extensive report configuration, including new data columns, data filters, summary and grouping levels. PyanGo's Fund Accounting solution converted the standard balance sheet financial statement into a statement of financial position. It also changed the income statement into a statement of activities report. Each of these reports displays financial results by fund classification as separate columns (which is not required for commercial enterprises).

- **External reporting tools.** Of course, many enterprises have already implemented business intelligence (BI) tools for data analysis. NetSuite provides ODBC access to most data objects (including all custom records) for these tools. For example, one could use Microsoft SQL Server data analysis services to read data from NetSuite to perform advanced statistical analysis.

- **Quick wins.** Dashboards (charts and data lists) are very easy to create within NetSuite. Inquiries (such as the encumbrance control) can be repurposed as a chart for display on a user's home page. Inquiries can be used to determine key performance indicators (KPIs). The platform supports standard KPI graphics such as meters (gauges), trend charts and scorecards. Scorecards can include Excel-like formulas with KPIs and functions in their definitions.

Enabling Business Processes

NetSuite provides a full workflow definition environment. One of the most common business processes using workflow technology is approval of purchase orders, which typically get routed through various levels of management approval. PyanGo leverages NetSuite workflows to manage the encumbrance "buckets." When a PO is approved, it means funds are committed to be expensed. So the approval step triggers the code to manage the actual purchase order amounts versus budget estimates. The following diagram depicts the standard PO approval process enabled in NetSuite.

Workflow Summary
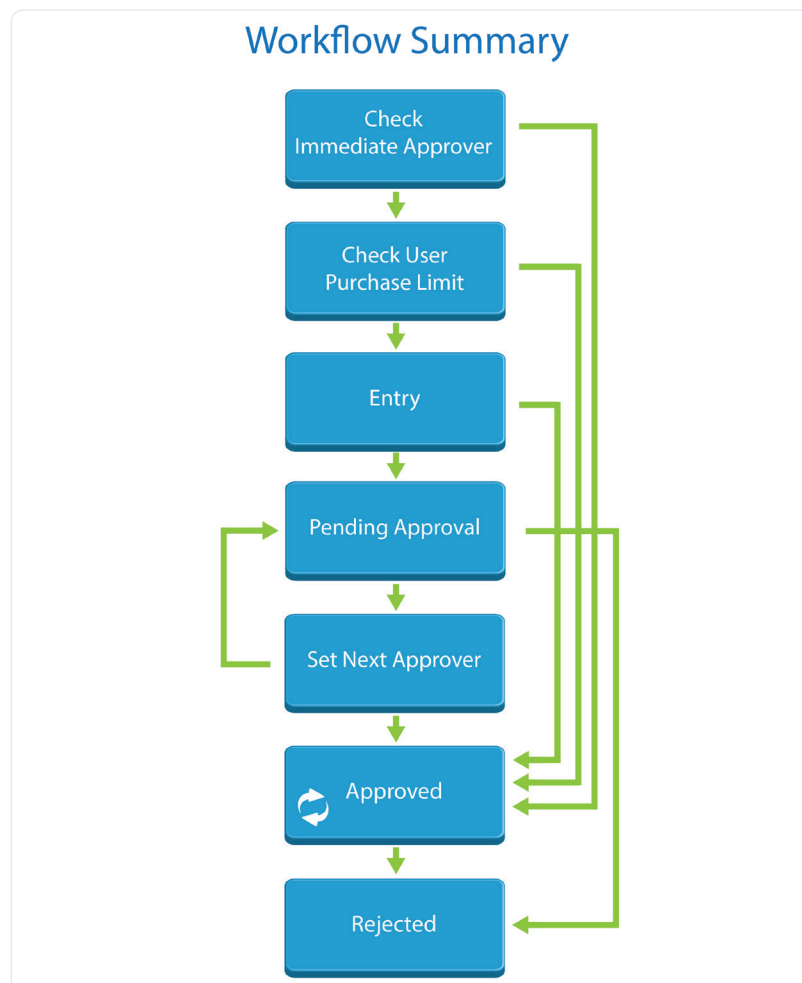
The workflow tool also supports the ability to nest or invoke workflows within a workflow. The following figure shows an alternative PO approval process that invokes the standard process.

Workflow Summary
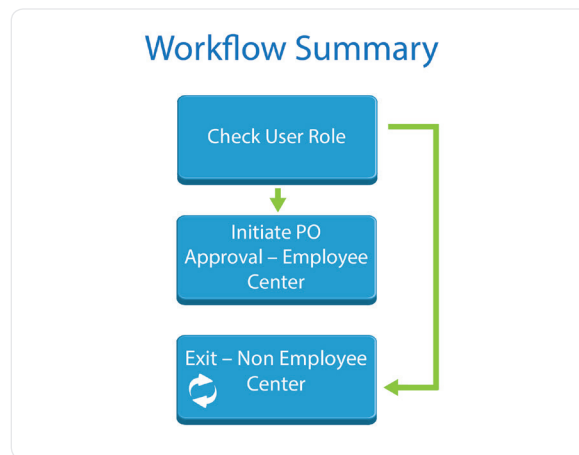
For non-profits, another example is grants management processes. From initiated, to pending, to waiting on decisions, to awarded, each grant travels through a lifecycle. At each point, certain actions such as email follow-ups, task assignments and project definitions need to be completed. Workflows can trigger these activities and also provide an audit trail of who completed what when.

Summary

Selecting a cloud ERP vendor can be challenging, but making the right decision for your business is a key to successful ERP implementation. Beyond an evaluation of the functionality offered by the ERP solution, a thorough evaluation is required in order to make sure that the technical aspects of the cloud vendor pass muster. This paper has proposed several evaluation criteria including support for customizations to security, upgrades, availability, infrastructure, integration and innovation.

ERP implementations are successful when both business users feel their needs are being met and IT departments can easily adopt, manage and extend the new technology. As an IT leader, you would like to avoid situations where developers create workarounds to solve problems that should be supported in the platform.

Ideally, you would like to match the platform's technical features with your organizations' skill set. In addition, the platform must satisfy security levels via audit and verification. The platform integration capability should be sufficient to meet both on-premise and cloud connectivity. Since there is a good chance you will be working with others in the cloud, make sure that the software vendor's ecosystem is vibrant and responsive to new participants.

About NetSuite

NetSuite (NYSE: N) is the world's leading provider of cloud-based business management software. NetSuite helps more than 16,0000 organizations manage core business processes with a single, fully integrated system covering ERP/financials, CRM, ecommerce, inventory and more. NetSuite provides the SuiteCloud platform, which with its infrastructure can be leveraged to build the kinds of customizations, integrations mentioned as key requirements of a true "platform for the cloud." For more information on SuiteCloud, please visit http://www.netsuite.com/portal/platform/main.shtml.