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Nexaweb Enhances the Delivery of Business Processes to Those Who Use Them

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Management Summary

The competitive nature of today's markets and the resulting need for constant innovation have turned the escalation of business requirements from a more-or-less decorous process into an extreme competition. Differentiation has become more than a matter of using industry applications well – it is a matter of leveraging that good use in the larger context of a business process and delivering it to workers wherever they are. These folks need to be productive whether they are online, off-line or flitting between zones of connectivity in an unpredicted fashion. They need their productivity whether they favor Java or Microsoft. They want the informational depth to make them appear brilliant. They want the data center to support the entire business process as a service to be delivered to them. Because, in the end, it is not doing work that it important. It is getting work done.

This is a tall order for many data centers. In many businesses, the information and process flow they need is in applications and business processes that have been used for decades. Any new tweak to the process must not affect the existing infrastructure. Frequently these business processes run across multiple platforms. Some have been Webified with HTML, but often they do not feed all the IT functionality that is needed to optimize the completion of a business process.

For that, Web 2.0 is needed – not the Web 2.0 of hype, but the useful, declarative-oriented tools like *AJAX (Asynchronous Java And XML)* that articulate input as requirements and output as a consumable service. This approach makes applications more easily presented, as a service, to a variety of clients across a campus or across the world in a way that satisfies the need of their business role. The other step that is needed to complete the transformation is to similarly componentize the client environments, and hook them to the edge of the data center with reliable messaging, so that the conditions workers find themselves in (their devices, their connectivity options) can be accommodated without conflicting with application expectations.

A company named Nexaweb, based in Burlington MA, has been working for years with big customers to expose legacy applications for Web and Intranet use. With the submission of portions of its basic client-side runtime to the Apache Foundation as *XAP (eXtensible AJAX Platform)*, and a fresh release of the Nexaweb Enterprise Web 2.0 Platform, they offer a full set of tools that let enterprise customers match their business applications and IT capabilities to how, when and where they do business. For more details, please read on.

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The Active Edges of Business

There can be many active edges of a business, depending on the nature of what it does. The folks who develop or source products or services, the sales, service, and support folks, and the Web presence of a business all play a large part in its success. Whether or not it has a brick-and-mortar physicality, the effectiveness of business process rests on the effectiveness of the information systems that support them. What kinds of capabilities do these people on the active edges of business need?

- **They need controlled, secure access** to existing business applications, including legacy systems, as well as access to new functionalities in a well-integrated way. The experience must be both familiar and efficient.
- **They need real-time events and data from a variety of sources** pushed to them and integrated into their business environment. Almost inevitably, they need a quicker browser refresh than the whole-page refresh that HTTP-based Webification will support.
- **As a group, they need this information on a variety of clients**. Businesses with mobile workers cannot presume client homogeneity, for business situations and network connections vary. Edge devices – a category that includes cell phones and PDAs - vary according to the role of the worker and when his last device broke, or was lost or stolen. Some workers need the ability to continue work off-line, while others do not.

The business enterprise has its own concerns.

- **The client devices that are used must not retain information in a way that exposes the business to undue risk**. If data is retained on the client for off-line use, some form of encryption may be warranted.
- **The workers need to be fully productive**. Those that are mobile should not have to come back to an enterprise campus to complete their work.
- **Connectivity is a significant expense** for enterprises living on constantly shrinking margins. While the workers need a solution that is adequately responsive, providing this in a way that uses less bandwidth is not just a goal – it is a requirement.

Basically, both parties want to have it both ways – like a hybrid car that can run on electricity around town, but still has the gasoline power to get up steep hills - and the cost saving to justify the duality.

Rich Internet Applications

Rich Internet Applications (RIA often involve some form of service-oriented application environment that allows applications to be enhanced by pieces, or services, from other applications. This can be based on remote procedure calls or CORBA, as well as on Web Services or SOA. The big RIA challenge usually involves the application users that are geographically dispersed and connected via the Internet. Rich clients[1] can give users the full experience they have become accustomed to in a way that can be centrally managed and administered. Software, in the form of a messaging bus, is used to arbitrate functionality and data exchange between a data center Web server and the client devices.

The Nature of Rich Clients

If your business is built on right-time, right-place information, thin clients, and simple Web browsers may not have the quick response to empower all the people who use it - particularly mobile participants, for whom network availability can be a challenge. A richer client addresses this problem. Because of the perishable nature of Web access devices, this rich client must still be lightweight. Yet, in some situations, it also must be capable of supplying full functionality off-line. The switch-over between a client's connected and disconnected state must be unnoticeable to the user – and for this, some business logic on the client is needed. There is now a variety of choices. (See Exhibit 1, at the top of the next page.)

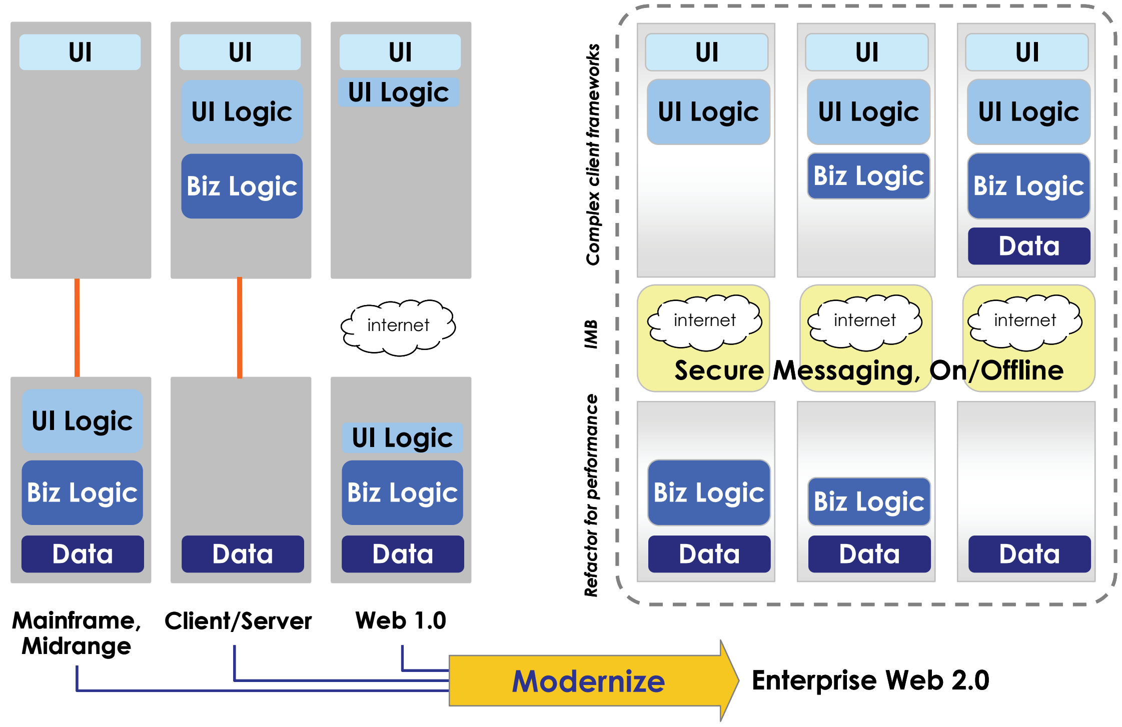
This is a matter of more than just a few clickable buttons. It must include the workflows to support business being closed, problems solved, and projects moved forward. This is a change of approach from the standard separation of concerns mandate of software. It is made possible by state awareness on the client and a messaging capability that lets the application session be automatically coordinated across both venues.

The Nature of Enriched Applications

As a business seeks to enhance its business model and derive new revenue streams, the integrity of basic operations and business processes has great value. The applications supporting these applications and processes have even greater value if they can be extended for use in new contexts. This is not a matter of changing what you do as much as presenting what you do in new ways, or doing what you do with new data sources or in new markets. Frequently, this involves wrapping them for proper presentation to remote workers, or to customers for self-service.

[1] Rich clients have more functionality than do thin clients, but are not much "fatter" than thin clients used to be, due to the magic of Web presentation.

Exhibit 1 – Business Logic Location Options



Source: Nexaweb

The most effective way to accomplish both the integration and the client-side presentation of these business capabilities is through the *loose coupling* given by declarative programming tools. AJAX, one of these tools, is often recognized for its ability to allow rapid, atomic refresh of information on Web pages. The use of declarative tools[2] more generally promotes integration and presentation of business applications to many kinds of client environments. Let's look at how Nexaweb does this.

The Business Value of Nexaweb

Nexaweb's componentization of the client-side of the IT infrastructure adds a welcome layer of flexibility to enterprise operations. This flexibility provides the basis for the deployment of secure, role – optimized environments that can travel with the work force.

It is Nexaweb's support of intelligent use of bandwidth that gives the hard dollar savings to Nexaweb customers. Most directly, its guaranteed messaging infrastructure moderates bandwidth use. Since its client domain is global in scope and heterogeneous in support, the use of Nexaweb's *Studio* can foster more universal use of fewer application versions. This allows the enterprise application inventory to be simplified, and often, reduced. The client-side automation, with its independence from the application domain, eliminates a whole realm of administrative headaches and permits easier client evolution – it is just another push. The persistent guaranteed messaging layer is what guarantees delivery and binds the whole environment together. Moreover, the Studio environment reduces development time and allows for the seamless integration of composite applications and enterprise mash-ups without affecting existing systems.

Nexaweb's Market Position

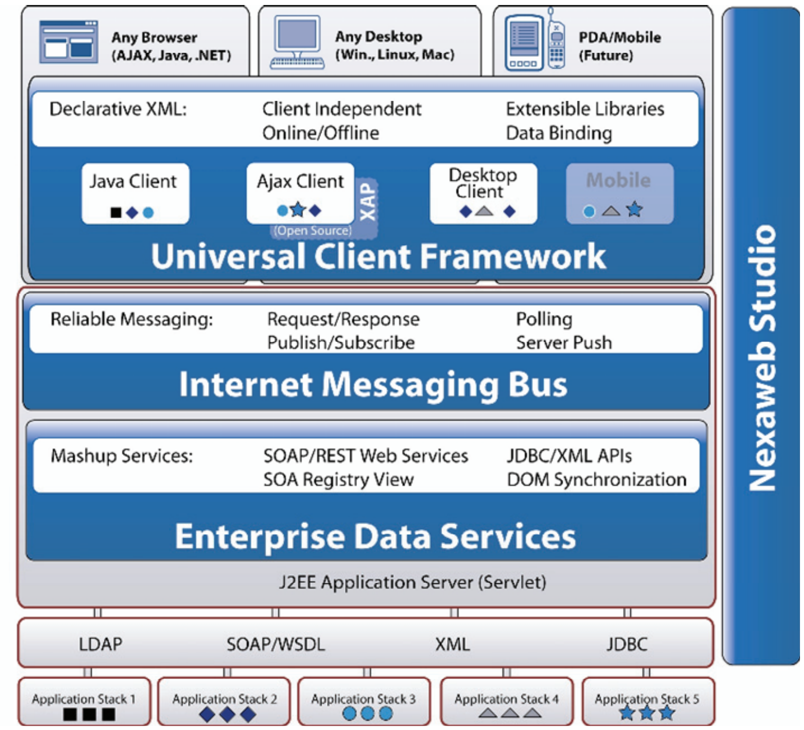
Nexaweb's customers are large, distributed enterprises that need to transgress their IT topography to support a dispersed business work force. At present, Nexaweb has over 5000 enterprise deployments. Customers include EMC, Hitachi, Thor (now part of Oracle), Siemens Sungard, Pepsi, Best Western, AFLAC, Ameripath, and Mizuho Bank. Nexaweb's *Enterprise Web 2.0 Platform* also is OEMed to technology vendors, who use it to integrate disparate application functionalities (such as acquired components) into a smooth composite with a single user interface.

[2] By clearly defining expectations and deliverables, the declarative approach to programming removes many sources of dysfunction from applications environments. APIs and the move to more transactionally-oriented applications are other instances of this trend.

Exhibit 2 – Nexaweb Architecture

Nexaweb Suite:

- **Unified:** Technology and platform independent
- **Simplified:** WYSWYG, drag & drop, declarative XML GUI
- **Open:** Eclipse based plug-in supports J2EE development standards



Source: Nexaweb

Nexaweb has solutions for end user in Call Centers, Field Sales and Service, Financial Trading and Settlement, and Public Sector, providing rich functionality in a lightweight environment. All these areas give quick payback, in both time and money, for enhancements to end use environments, be they employees or customer-self-service.

The Competition

There are many thin client vendors who offer some form of off-line functionality, but they are often limited in the scope of applications they support, and in the variety of assets they can front. Software as a Service (SaaS) is similarly limited to an application, and creates a stovepipe whose integration on the screen of the client may be insufficiently responsive for quick completion of the task at hand, and too bandwidth-hungry for fiscal comfort. Nexaweb, by contrast, can address any application platform, be it Windows or Unix or mainframe. Its ability to include mainframe applications has brought a lot of business its way.

Many Rich Internet Application vendors focus on gaming and rapid rendering. Nexaweb focuses on a broader enterprise challenge of computationally challenging applications involving legacy systems. It specializes in situations with complex workflow components - situations that pervade the business-to-business and supplier or distributor-to-enterprise space. It also addresses the Intranet challenges of the single, but geographically-dispersed, enterprise.

There are also many makers of AJAX toolkits that are mostly focused on building user interfaces, AJAX pop-ups, and client-side components. Nexaweb addresses the wider challenge of both providing a usable, familiar interface and connecting with the application functionality needed. It provides what is in effect the invisible glue to make enterprise processes work as needed – wherever they are needed.

This matter of optimizing service consumption is crucial to any organization. As when environmental controls were introduced in cars, changing what an internal combustion engine looked like, the increasingly mobile workforce demands that IT service delivery be optimized for their new parameters. The inclusion of additional loose coupling to the route of IT delivery, Nexaweb gives the agility of an object-oriented model to application topographies that were not designed that way. Here is how they do it.

Nexaweb Enterprise Web 2.0 Platform

The *Nexaweb Enterprise Web 2.0 Platform* (see Exhibit 2, above) includes these elements.

Nexaweb Universal Client Framework (UCF)

Nexaweb offers Java and AJAX clients[3] as well as a Desktop client for offline use in its *Universal Client Framework*[4]. The Java (180 KB) and AJAX (50KB[5]) are download-once and centrally-managed, with no administration needed at the client site. All data resides in memory, and changes are pushed back to the datacenter. In the case of the desktop client for off-line use, the data is pushed to the client when connectivity is restored. The client can be encrypted to reduce further the security exposure.

The ideal client is thin enough to fit nicely in any host, be it a desktop, laptop, PDA, or cell phone. The ideal client is thick enough to hold the business logic needed to provide application functionality when disconnected from the network. The ideal client has state awareness to know the difference between the two options above.

Nexaweb clients have all these features. For any given composite application, a data center administrator can decide how much business logic to put on the client, based on the device involved and the user's role. The choice is like the sliding continuum of a dimmer, as opposed to an on/off switch.

Nexaweb Internet Messaging Bus (IMB)

The problem with the Internet is that people over which you have no control will use it, and bandwidth can be constrained by that use. The Nexaweb *Internet Messaging Bus (IMB)* guarantees message delivery at whatever bandwidth is available, and also when connectivity is restored if it is cut off. Think of it as an automatic shift on that hybrid car mentioned earlier – but one that can sense what kind of fuel source is appropriate. The IMB pushes information as needed to support the optimal user experience. Unlike a SOA Enterprise Service Bus, the IMB is entirely focused on the state of the clients and the network connecting them – the whole quality-of-service realm that system management products address holistically. Here, the dedicated focus of the IMB may make a lot of sense.

Nexaweb Enterprise Data Services (EDS)

Nexaweb's Enterprise Data Services are servlets that facilitate the flow from the presentation front end to the data center back end. These servlets are a front-side service-oriented architecture that lets you decouple the presentation specifics from the application – allowing both elements to evolve without undue distress on either side.

Nexaweb Studio, an Eclipse-based Development Environment.

Studio is Nexaweb's Eclipse-based design and development environment. CORBA, Web Services have taught business that applications can be wrapped, Webified, intermixed, and augmented by mash-ups. Nevertheless, these capabilities can also cause chaos. *Nexaweb Studio* lets enterprise developers wrap and Webify safely. The object orientation and declarative programming mode of *Nexaweb Studio* let new components be prototyped quickly, but Studio also supports the entirety of the application lifecycle with a WYSIWYG, drag-and-drop approach. The loosely-coupled nature of the architecture allows continuous updating. The use of a declarative approach, together with an awareness of the state of connectivity on the part of the client, allows client functionality to be optimized for the connectivity, or lack thereof. Developers can program in declarative XML as well as in Java and Java Script. They can define the behavioral logic of the client, and also easily link and bind application processes to data sources.[6] SOAP and REST can be used to set up and invoke Web Service calls. Nexaweb's SQL support allows declarative access to back-end databases. Studio has templates to get things started, and is integrated with other popular tools.

Version 4.5 of *Nexaweb Enterprise Web 2.0 Platform* includes support for Section 508 Compliance[7] by means of Java screen readers, an assistive technology that presents the content of a user interface as audio. It has focused on the *JAWS* screen reader offered by Freedom Scientific. This version also includes multilingual support and output in Braille

Apache XAP

Nexaweb has submitted parts of its basic client-

[3] More clients will be developed, including .Net and Ruby clients, when there is customer demand to support that development.

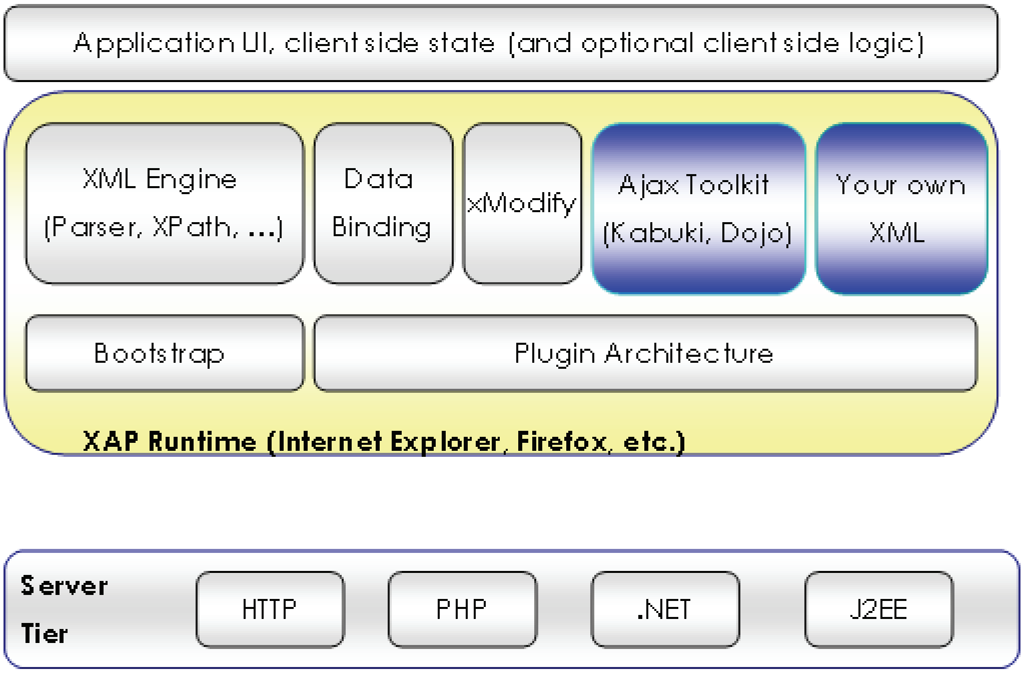
[4] The Nexaweb client contains client (business) logic, which is incrementally downloaded, instantiated and updated as needed in a fully managed and automated process. It includes a data layer for data binding, formatting and validation, as well as managing different data sources, WML processors, and an XModify engine to manage state.

[5] Nexaweb also offers a minimum profile AJAX client at 47 KB that only enables incremental HTML page updates.

[6] Because all the Nexaweb Studio elements adhere to a MVC (Model-View-Controller) pattern, developers can design their client to suit their need – declaratively specifying data sources (via REST, SOAP, SQL, etc.) bind the sources, format and validate or specify the increment of data update. Or they can eschew all the Nexaweb finery and just use HTML where that is sufficient.

[7] This dictates allowances that must be made for users with disabilities in certain industries.

Exhibit 3 – XAP Architecture


Application UI, client side state (and optional client side logic)
XML Engine (Parser, XPath, ...)
Data Binding
xModify
Ajax Toolkit (Kabuki, Dojo)
Your own XML
Bootstrap
Plugin Architecture
XAP Runtime (Internet Explorer, Firefox, etc.)
Server Tier
HTTP
PHP
.NET
J2EE

Source: Nexaweb

side runtime architecture to the Apache Foundation, where it is a podling project known as *XAP*. XAP (see Exhibit 3, at the top of the next page) supports a declarative AJAX runtime as well as declarative data binding and UI modification. It plugs into existing AJAX toolkits *Kabuki* and *Dojo*.[8]

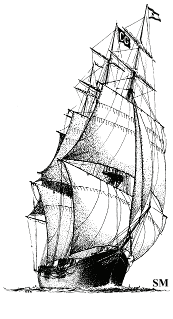
Services

Nexaweb offers services across the application lifecycle. *Strategy services* cover the work required from the initial survey of the situation to the production of a reference architecture. *Design services* address the specifics of application architecture, user interface design and prototype development. *Implementation services* include Application Development, Migration, Enablement, and Performance Tuning. *Modernization services* are available to cover all of the above, to provide a complete solution. *Support services* include Tech and Migration Support, Maintenance, Online Training, and Developers Forums.

As report writers made relational databases easier to use, so Nexaweb makes business processes and the applications that support them more easily consumed. Going forward, Nexaweb's declarative, object-oriented approach may allow the development of more client-side filters to address the glut of information facing the user in a way that removes that burden (and source of unexpected loads) from the application server tier.

Conclusion

If you have built a business on your experience, processes, and knowledge base, and want to let customers and users use these assets better, Nexaweb offers a number of ways to give the road to good quality of service a better foundation. By doing so, Nexaweb enlarges the scope of what is possible for any business. If you want to change the IT service delivery vehicle you have into the one that your enterprise truly needs, consider Nexaweb.



[8] Nexaweb is also active in W3C's Web Application Format Group, which is defining declarative XML for applications and user interfaces. Declarative XML, like other declarative programming approaches, specifies the input and output, but not the process. This is a key concept to making plug-and-play business process functionality and enhancements work.

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