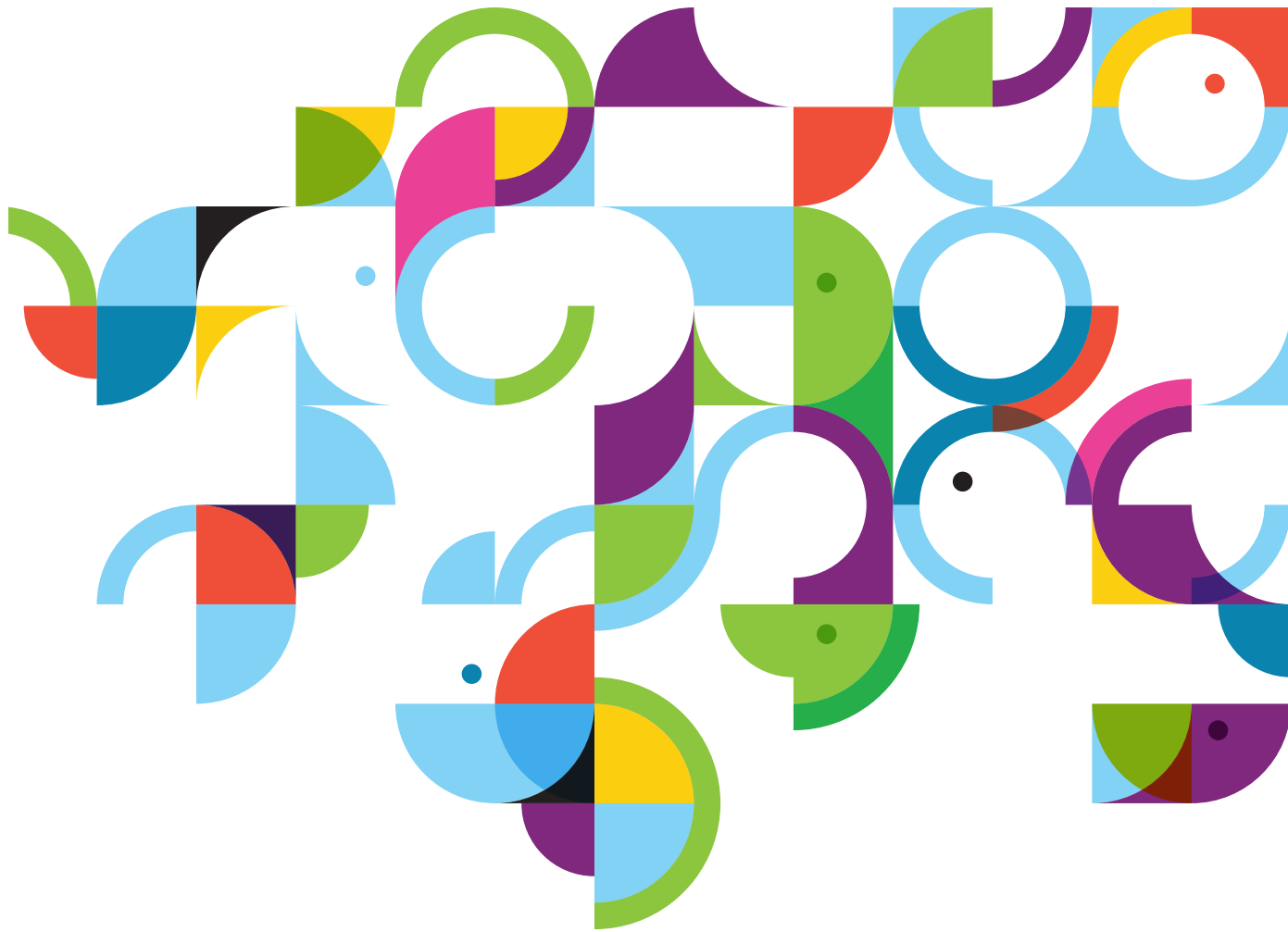


# Collaborative and business applications for the connected company

*Use the right development platform to take advantage of the latest cloud, analytics, mobile, social and secure technologies*



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## About this paper

As IBM collaboration products evolve, so do the ways for developers to build, deploy and integrate applications. What started as a platform for developers to rapidly build workflow applications that were accessed locally and/or remotely on a PC, now includes web, cloud, mobile and social capabilities. This whitepaper is intended as an overview of those capabilities with special focus on modernizing existing Notes and Domino applications. To gain a real-world perspective on modernizing applications, we brought in long-time partner, John Head, who has extensive experience evaluating and updating applications, as a co-author of this document.

John D. Head ([jhead@psclistsens.com](mailto:jhead@psclistsens.com)), director of Enterprise Collaboration at PSC Group, LLC ([www.psclistsens.com](http://www.psclistsens.com)), is a 20 year veteran of collaboration application development. He is a frequent speaker at technology events and works with companies to apply application modernization and mobilization to their business processes and applications. PSC Group, a professional services and information technology consulting firm, created the Application Modernization Center (AMC) to apply a methodology to invested platforms and applications and bring mobile, cloud, social and analytics to business process.

## Introduction

The speed of business continues to accelerate. People are “always on”, consuming, sharing and creating information at ever-increasing rates. In addition to these people-to-people interactions, the Internet of Things introduces people-to-machine and machine-to-machine interactions as well, exponentially increasing the creation and flow of information. Traditional business processes will need to combine this new data with data from their existing systems to provide always on, individualized experiences to users and customers, customized to the device from which they choose to access it.

Application development has changed to meet these needs. Social business combines the latest Web, mobile and social media technologies with business processes to create a more holistic experience. Agile development and design thinking have provided an iterative process that uses a more human approach to continuously generate new business value. DevOps creates an environment where software developers and IT are working closely to more rapidly produce applications. Cloud technologies provide platforms as a service and APIs to maintain availability while mobile application platforms do the heavy lifting associated with porting applications to mobile devices, natively. Citizen developers are joining the fray as a way to meet the need for department-specific applications.

While the requirements for line-of-business applications have increased, the budgets for them have not. This increases the importance of choosing the right enterprise application platform. When considering enterprise application platforms, it is wise to understand their propensities regarding security, flexibility, time to value, and multi-channels. IBM® Domino® has a proven track record as a leading development platform for business applications of all shapes and sizes, with an estimated millions of applications in production today.

IBM has always focused on embracing innovation while preserving customer investment in applications. This paper outlines the continued application development value of refreshed platforms like IBM Domino and IBM XPages technology, while also looking at how they take advantage of newer innovations, including: IBM Worklight Platform, IBM Connections and its open APIs, cloud innovations including IBM Domino Applications on Cloud, IBM Connections Cloud and IBM Digital Experience on Cloud. After reading this paper you will more fully understand:

- Companies have traditionally chosen IBM Notes and Domino for its rapid application development and deployment (RADD) capabilities. Independent software vendors (ISVs), enterprise application developers and citizen developers alike have been able to stand up workflow applications in a relatively short time.
- IBM XPages technology, as part of the end-to-end Domino platform that includes developer tools and runtime in a single package, can help developers and businesses create best-of-breed, self-contained web applications, or quickly modify or integrate existing applications or business logic. Users can interact with these applications from their favorite desktop device, mobile device, or web application. All this can be accomplished with a development environment that allows developers to build critical business applications on a Not Only SQL (NoSQL) Domino datastore, using standard web and mobile development skills.
- Additional support for the IBM Mobile First, including integration improvements with IBM Worklight, are designed to further enhance the ability to quickly and cost-effectively develop modern business apps for mobile devices like Apple iOS, Android, Microsoft and BlackBerry devices.
- IBM fully embraces the cloud. With Domino Applications on Cloud and Connections Cloud, developers and organizations can take full advantage of the cloud to reduce time to value, increase responsiveness, and decrease administration and other

overhead costs. And as the IBM Cloud evolves, so too will Domino and Connections, allowing organizations to fully embrace the composable business through advances in Infrastructure-, Platform-, Software-, and Business Process-as-a-Service.

- Innovation in collaboration capabilities is supported not just through Domino advances like XPages, but also through extended collaboration platform integration with IBM Connections and IBM WebSphere Portal. Delivered on cloud or on premises, Domino, Connections and WebSphere Portal deliver the only end-to-end integrated digital collaboration experience for customers and employees, and the only end-to-end integrated platform for developers and administrators. Together, they cover enterprise social networking, mail, chat, online meetings, content management, and personalization optimized for mobile and web delivery.

## Customer and Developer Challenges

The accelerating speed of business has increased the need for an agile, iterative, development cycle where the “time to value” is expected move in tempo with the changing business needs. Application development platforms need to support this model with development environments and administrative tools for enterprise and citizen developers, alike.

In this era of big data, businesses have access to more information than ever before. Evolving technology is connecting new ideas to expertise inside and outside of the organization. Top performers are taking advantage of significant opportunities to engage, contribute and create. Business applications must harness power from collective intelligence and developers need to understand how this challenges the traditional enterprise application model.

Applications must be available when, where and with whom innovation happens. The combination of cloud, mobile devices, and social technologies make this possible. The cloud needs to be considered for all applications. Organizations need to weigh

the opportunity created by accessibility with serious subjects of data security and regulatory compliance. The social capabilities of enterprise applications is relatively new. Mining from and sharing with social networks adds a new dimension to applications, capturing ideas and extending their reach.

Integration with enterprise systems of record must also be taken into account. Can information from these systems be incorporated into the application? Can the application push data back into these systems? Eliminating existing systems from consideration can be a costly exclusion to fix.

Today's workforce is comfortable using smartphones and tablets to interact. They expect the applications that they use in their personal lives to be simple and sleek and these expectations are carried forward to the applications that they use to do their jobs. Consideration of the user experience and support for corporate mobility and bring your own device (BYOD) initiatives is imperative. Existing applications should be revisited to assess the value of modernizing the user interface and adding support for mobile devices. This "low hanging fruit" (the workflow having already been worked out) can produce a significant return on investment due to increased use and reduced need for support.

## **A practical application development strategy**

### **IBM Domino overview**

Improving time to value for business solutions is critical to being competitive in today's business environment. Whether it is an application or feature backlog in an enterprise IT department, or a business partner looking to more quickly deliver applications that solve thorny business problems, reducing the time and cost of developing, deploying and maintaining applications is a common objective. Return on investment and application success require a combination of factors, including developer tools, programming

models, application platforms, APIs, and administrative tools. Developers have long relied on Domino as an excellent, end-to-RADD package for business document and workflow applications in a single, easily deployed and maintained environment.

Domino gives developers a programming model, APIs and tools that enable them to deliver a rich user experience for the task at hand. Whether collaborating on a go-to-market initiative, handling workflows associated with an engineering change request, or providing a dashboard for managing projects, Domino delivers.

One of Domino's greatest attributes is that it is a comprehensive application platform that can deliver applications that work across web, mobile and rich clients. Other platforms require a number of add-on components, such as databases, web servers and security services, to achieve the same results. After installing Domino, developers have everything they need to run applications, configured to work together seamlessly.

At Domino's core is its proven Not Only SQL (NoSQL) database. In recent years, there has been a significant increase in the use of NoSQL databases to solve a number of programming challenges, in particular big data and real time web applications. Often, the data which is associated with these types of applications is complex in nature and does not fit well into a Structured Query Language (SQL) database's tabular format. Another consideration: how likely is it that my data model will change over time? SQL databases use a predefined schema which leads to a costly change down the road, whereas NoSQL unstructured or semi-structured data model means that they can adapt to data model changes on the fly. The Domino database was one of the first NoSQL databases available and is still one of the leading NoSQL databases today.

Domino uses a document data structure for its NoSQL database which can store various types of data, including rich data such as formatted text, images and file attachments. Due to the flexible nature of the Domino data store, applications can be modified quickly, allowing them to adapt to changing business needs. This means Domino is particularly well suited for document oriented applications as well as workflow-centric applications. The built-in ability to define document hierarchies means Domino is particularly well suited for collaborative applications as they require relationships between documents on a particular topic. Domino's gold-standard data replication capabilities make it optimal for distributed architectures where network bandwidth is at a premium, or for employees who want to work offline. Its replication services are at the heart of the built in clustering capabilities which support load balancing and failover.

But what good is storing all that data if it is not secure? While other platforms require extra components and programming to secure data, Domino was built with best-in-class security in mind. The Domino database can be encrypted at rest, or its data can be encrypted as it passes through the network. In addition, Domino allows you to control access to the database, and to control read and author access to individual documents as well as the fields within the documents.

Two core value propositions of Domino are investment protection and embracing technical innovation. In the many years Domino has been in market, IBM has continuously invested to embrace new technologies and deliver new capabilities. IBM has also invested in allowing backwards compatibility for applications, so that customers can confidently upgrade to new releases without having to go through a costly rip and replace. This means, that as technical innovation occurs, developers can incrementally enhance their applications with the new features at little to no development cost.

Domino 8.5 also moved IBM Domino Designer to an Eclipse-based IDE which improved developers' ability build web applications while providing more extensibility. Developers can now use standards-based web development skills (HTML, CSS and JavaScript) to deliver modern, compelling web and mobile experiences, and Java to develop back-end services for those applications.

XPages provides developers with a comprehensive library of rich web controls, built-in Ajax services, and the ability to do both client-side and server-side data validation. It also includes a set of dedicated controls for building mobile web applications. Domino packages the Dojo JavaScript framework with XPages, but many developers also utilize other frameworks such as jQuery, EXT JS, or Twitter Bootstrap to complement XPages. XPages gives Domino a rich web application development framework that makes your developers more productive.

The addition of XPages also drove an important architectural change for executing Java programs: XPages runs in the Open Service Gateway initiative (OSGi) framework, now part of Domino. OSGi provides an extensible and secure Java component framework for Domino. This means that IBM and developers can easily add Java-based services to Domino. For instance, IBM used this to implement a framework for Representational state transfer (REST) services in Domino 9.0. Developers can now easily integrate Domino data and services into external applications using HTTP and HTTPS protocols with body content in JavaScript Object Notation (JSON) format.

A vibrant application development community is crucial to any application development platform's success. XPages components, code snippets and utilities are available as open source through OpenNTF.org. OpenNTF is an open source community which allows customers and business partners to share and consume code assets which are made available under Apache or GNU licenses. These assets can help Domino developers speed up the development of applications either by reusing the code or learning from examples.

### Choice of deployment

Long-time customers know that the Domino server is both easy to run and maintain. It is simple for small companies while powerful and scalable enough for even the largest global enterprises. There are several deployment options that a customer should consider when making XPages a part of their application strategy.

#### Traditional on premises Domino Server

Domino Server can provide XPages services within an existing on premises installation using your on premises data center. This provides all of the services of Domino, including email and applications, and doesn't require you to make any additional changes to your existing installation. Operating System platform choice is one of the strengths of Domino, giving customers a choice of Windows, Linux, AIX or System i.

Domino has embraced the advent of cloud computing, with the ability to also deploy on premises, on a cloud-based infrastructure, or a combination of both.

#### IBM XWork Server

For new or returning customers, the IBM XWork Server license provides a low-cost method of serving XPages applications. It provides the exact same Domino server under the hood; the only difference is that it is licensed and paid for on a per-application basis, providing a more cost-effective solution for those customers needing only a few specific applications.

#### Hosted solutions

There are numerous IBM Business Partners that offer a hosted Domino or XWork Server. These companies can give you the exact level of control over your Domino server that you need. A partial listing of IBM Business Partners providing Domino and XWork hosting and other server options can be found at [http://www-10.lotus.com/ldd/dominowiki.nsf/dx/Lotus\\_Notes\\_and\\_Domino\\_Hosting\\_Providers](http://www-10.lotus.com/ldd/dominowiki.nsf/dx/Lotus_Notes_and_Domino_Hosting_Providers).

#### Domino Applications on Cloud

With the growth of the cloud, many companies are looking to move their application servers to cloud options. Domino Applications on Cloud provides an Infrastructure-as-a-Service (IaaS) option for Domino applications. Many customers are already running Domino application servers on the IBM SoftLayer® platform. Not only does this support stand-alone applications running on a global cloud-based infrastructure, it also allows customers to easily integrate their Domino applications with their SmartCloud Notes mail service for a hybrid on premises / cloud solution.

#### Integrate your apps with social, portals, SAP, Oracle, Microsoft and other business apps and process apps

Customers often have external applications they want to integrate with their Domino applications. This integration can mean either integrating data and services from the external applications into a Domino application, or exposing the Domino data and services to the external applications. Integrating with external applications could include things like storing manufacturing data on a relational database or storing customer collateral in a social business application. Examples of exposing data and services from Domino include accessing project management data stored in a Domino database and accessing Domino's calendar and scheduling service from a meeting management solution.

The addition of XPages to the Domino platform has opened up numerous avenues for integrating data from disparate systems into applications. Because XPages is based on OSGi, developers can use various Java libraries to integrate with systems. JDBC can be used to easily access data in relational database systems such as IBM DB2, Oracle or Microsoft SQL Server, so that it can be combined with data stored on the NoSQL Domino database.”

In addition, many platforms access application services and data using REST. XPages provides developers with controls that make it easy to consume REST services. This means that customers can integrate data from ERP systems such as SAP with their line-of-business Domino applications.

The majority of Domino applications are collaborative in nature, since they focus on content sharing and working together to accomplish a task. By definition, collaboration implies social interaction, so it makes perfect sense to integrate Domino applications with social business applications such as IBM Connections (whether on cloud or on premises). XPages developers can use the IBM Connections Cloud APIs to locate subject matter experts in Connections Profiles, share files using the Connections Files application, or contribute workflow notifications to activity streams.

To extend the reach of Domino application data and services to external applications, developers have a number of options. Domino now includes Domino Access Services, which is a REST framework for exposing Domino data and higher level services. In addition, Domino Data Access can perform create, read, update and delete operations against Domino data. There is also a calendar and scheduling service which allows access to calendar data.

Domino includes the ability to act as a web service provider, and has APIs for Java and C programming languages. It can also help when you need to synchronize and transfer data

between Domino's NoSQL data store and external systems. For instance, it can help when you want to utilize data from SAP in a line-of-business application, and want to take it offline with the Notes client. IBM Enterprise Integrator for Domino supports this use case with connectivity to major relational database systems and SAP.

### Modernization

The strength of IBM Notes and Domino has always been the application platform. This platform has evolved significantly with continued IBM investments over time, moving from simple spreadsheet-like @functions, to object-oriented BASIC, to low-level C, C++, and Java, to web, and finally to today's modern web APIs. Because of the explicit backward-compatibility, Domino continues to power millions of applications in thousands of companies worldwide. With a best-in-class security model and never-duplicated offline functionality via replication, the Notes application model became the model that so many others have tried to mimic.

Two recent shifts have had a significant impact on business applications. The first is that mobile devices are increasingly replacing traditional workstations. The second is the always-on, high-bandwidth Internet is now, essentially, ubiquitous. As a result, the need for a desktop-based rich client and offline applications has reduced. This shift represents a favorable combination of circumstances to revisit existing applications. Companies should take an inventory of their Domino applications and evaluate the opportunity to modernize the user experience and add support for mobile devices. A significant return regarding ease and frequency of use can be had for a relatively small investment.

## Updating your existing Notes and Domino applications for a new workplace

### Domino application audit and categorization process

In the Notes and Domino world, the first step in the modernization process is to complete an internal application audit. This audit is critical in order to prioritize those applications that are most critical to your business success, and focus those limited developer resources where they are most needed. You must know where you're starting from before you can decide what to do going forward.

The audit should include usage information such as client type (Notes, web, or mobile), offline use, development language, and complexity. IBM Domino Doublecheck is a free service which provides insight into a customer's Notes and Domino infrastructure. It not only shows application usage, but also helps determine a server consolidation road map and how consolidation will help customers run their environment more efficiently. Once you've completed the application audit, you can then break them out into categories.

Document libraries, Discussions, and Team Rooms are the most common Notes and Domino applications, which makes sense, as they are the most used and updated templates in the product. These are the applications that should either be updated with the modern version of those templates, or targeted for a shift to IBM Connections.

The second category is enterprise applications. These are applications that are built on top of Domino, and make more sense on an enterprise platform such as Java or .NET.

The final category is the business application. These make up about one-third of all Notes and Domino applications. They include line-of-business applications, and in many cases, are mission critical and unique to the organization. They utilize custom workflows, and are built on top of the Domino ACL and Reader and Author field security model. These are the applications that typically fail when migrated to another platform. They also provide the highest potential return on investment for application modernization using XPages functionality.

### Updating Existing Domino Applications with XPages

When IBM added XPages to Domino 8.5, it was embraced as a modern approach to web development within the Notes and Domino ecosystem. For years, Domino developers used pass-through HTML to mimic functionality on other platforms, such as Linux, Apache, MySQL, and PHP (LAMP). With the explosion of the Web 2.0 application development model, developers added HTML5, CSS, and JavaScript libraries such as jQuery and Sencha. This allowed them to build great applications. However, more was needed to improve the overall development experience.

Building Domino Designer on the Eclipse.org framework provided that better development experience. In the years since XPages was released, the web development world has shifted again, with the move away from Eclipse, and towards open source NoSQL databases such as CouchDB and MongoDB, the explosion of frameworks such as Twitter Bootstrap and Node.js, and the platform shift from internally run servers to cloud-based platforms such as Heroku, Amazon Web Services, and the newly launched IBM Bluemix.



What is unique about this new shift is that the power of the XPages framework allows developers to keep up with the shift, without the need for IBM (or developers) to make massive changes. XPages is extensible, so when a new framework comes out, it only takes the developer a bit of extra work to include that new framework.

XPages has all the characteristics required of a modern web development platform: it plays well with the MongoDB, Express, Angular.JS, Node.JS (MEAN) stack and other common web platforms such as Python and PHP. XPages also allows IT teams to build REST services that can be consumed by Angular.JS or Backbone.JS, turning Domino into a powerful application services server running on premises or in the cloud.

#### **User experience, design, and application modernization**

Unlike many other developer frameworks, XPages starts from a design framework and not technology. One of the core strengths of XPages is the ability to design essentially any business process from scratch, and quickly turn it into an application with a simple-to-use development structure.

The idea of creating compelling user experiences through good design has been around for years. However, today's users place a much higher premium on the user experience, making the old business application paradigm of "business process and data first, users second" obsolete. Design therefore becomes one of the key factors in both new application development and application modernization. IBM has elevated design thinking in the industry with the creation of the IBM Design Studio, an internal digital design agency that will help inform the future of IBM software development. The Digital/Web Experience methodology that underpins the IBM Design framework and that highlights the power of IBM WebSphere Portal, applies equally well to XPages: application planning and development now starts at the whiteboard. Instead of detailing system architecture, designers focus on building screen mockups and themes, working through user experience patterns and personas, and quickly deploying, testing, and iterating for an ever-increasingly demanding user.

The entire interface of an application can now be prototyped before a single line of code is written. The prototype is then transferred from the designer to the developer, and the underlying technology is added to fill in the prototype. This keeps user experience as the primary goal throughout the development process.

#### **The benefits of modernization over re-platforming**

The idea of application modernization involves more than just taking an application that works in a rich client and giving it a web user interface. Application modernization is defined by improving the entire application experience, including:

- User interface
- Security
- Business impact
- Workflow
- Development language
- Development platform
- Delivery model (on cloud, on premises, hybrid)

A "modern" application must also include mobile, social, and cloud capabilities. What makes XPages so powerful is that it allows you to get all of those capabilities without leaving the platform. Instead of spending the application budget on data migration, you can focus on adding the new functionality that your business needs. The combination of XPages and other IBM solutions simplifies that process as well.

IBM Connections Cloud offers the simplest method of injecting social functionality into your business. While competing platforms like SharePoint, Heroku, Azure and AWS allow you to access social content, they also require you to assemble the request envelope, make the requisite REST call, parse the returned JSON, and then format the results. IBM Connections Cloud and XPages does a lot of this work for you. In addition, you can host it on Domino Applications on Cloud, reducing the total cost of ownership of the application.

**The total cost of ownership argument for application modernization**

Many companies with existing Domino applications, are faced with a decision to modernize them using Domino technologies or create them again on a different platform. Re-architecting, rebuilding, and re-deploying your many applications is a costly and time-consuming undertaking with little to no upside. Bear in mind that Platform as a Service (PaaS) offerings are general-purpose web development environments that have to cater to a wide variety of scenarios, and therefore don't provide optimal application development environments.

Domino Designer also makes it easy to get up and running quickly with features like the mobile application wizard, which can create a fully functional mobile app with navigation in just a few clicks. This process requires considerably more effort with the development tools used by our competitors.

With very little effort, XPages developers can create a single application that can run across mail clients, browsers, and mobile devices. This pervasiveness also extends to offline situations: XPages applications can use Domino replication or HTML5 local caching to ensure that everything runs smoothly, even when the user is working offline. Creating an application that is both responsive and able to work offline takes a considerable amount of effort using other development platforms.

Finally, XPages benefits from tight integration with IBM Connections. IBM Connections Cloud APIs and corresponding components make it simple to access and manipulate social content. Adding social content to applications provides context for users without having to create anything new.

In summary, Domino Designer with XPages significantly lowers the level of skill required to create attractive, usable, and functional web applications. It also enhances the productivity of your developers by providing easy-to-use tools and components that save a lot of time, so they can focus on solving business problems, rather than worrying about how to format the output.

**Mobile disruption, and how XPages fits into a mobile-first strategy**

In 2014, the worldwide penetration of smartphones hit 1.75 billion,<sup>1</sup> or 1 out of every 5 people on the planet. In addition, 80 percent of time spent on these mobile devices is spent using applications.<sup>2</sup>

It is clear that mobile applications are a priority for organizations of all sizes, as the IBM Institute for Business Value report "The 'upwardly mobile' enterprise"<sup>3</sup> demonstrates. Users want not only the same access to their work from their mobile and desktops, but want to see changes in one naturally reflected in the other. The last thing a user wants is to have two completely separate application experiences that don't talk to one another, especially when it is the same data store. A responsive design approach is critical to meeting users' shifting needs for mobile applications. Responsive design presents information using fluid, proportion-based grids such that a web page is optimized for the form factor on which it is being viewed. There are a number of front-end frameworks available that take responsive web design into consideration, making it easier for the developer to adopt a mobile-first strategy.

<sup>1</sup> <http://www.emarketer.com/Article/Smartphone-Users-Worldwide-Will-Total-175-Billion-2014/1010536>

<sup>2</sup> Source: <http://www.corvallisadvocate.com/2013/0523-more-people-have-cell-phones-than-clean-water/>

<sup>3</sup> 2013 IBM Institute for Business Value Study <http://www.ibm.com/mobilefirst/us/en/bin/pdf/ibv.pdfz>

There are three different types of applications users can interact with on their mobile devices: web applications (especially through responsive design), native applications, and hybrid applications. XPages can help bring your company's applications to mobile devices in all three formats.

### **Responsive design and XPages**

Unlike many competing development platforms, Domino (with XPages) makes it easy to get a mobile website up and running, with a mobile application wizard that creates a functional site with navigational elements and data integration in just a few clicks. Creating an equivalent mobile site in SharePoint would require a developer to manually lay out mobile-specific pages. Similarly, creating mobile pages for a web application running on server platforms like PHP, Python, or Node.js would require developers to manually create the mobile pages and embed JavaScript with JQuery Mobile to make it interactive. Compared with the simplicity of XPages mobile development, this is a time-consuming and expensive process. Recently, Twitter Bootstrap has become the dominant method for building responsive XPages applications. After buying a Bootstrap theme for a reasonable price, an XPages developer can build a mobile-ready application quickly.

The ability to build a single application that runs in a browser, rich client, tablet, or phone with very little specific development for each platform is incredibly beneficial, and sets XPages apart from many of its competitors. Competitors require separately

developed applications for rich clients, browsers, and mobile devices. XPages applications can also use Domino replication or HTML5 local caching to ensure that everything runs smoothly, even when offline. This takes considerable programming effort to achieve in competing environments.

### **XPages and hybrid: Harness the power of an application services layer**

The other option for including XPages in your mobile application strategy is using XPages REST services to turn Domino into an application services server. The server can then be used by developers building native or hybrid applications on mobile platforms, such as IBM Mobile First. Adding the power of Notes and Domino to these toolkits and applications allows mobile applications to be rapidly processed without migrating data or applications.

Creating a native or hybrid mobile app for SharePoint or ASP.NET/Azure would require a developer to create the app using the requisite tools—Visual Studio with Windows Phone SDK, Eclipse with Android Development Toolkit, or XCode with iOS SDK—to code the app, and then make calls using the appropriate API (REST or JavaScript CSOM). The organization would need developers skilled in all three native mobile development approaches, and each team would have to design their own approach to data access and display. The IBM Mobile First platform obviates this need, saving considerable resources.

## Case Studies

### **SMC Corporation boosts its ROI in collaborative technology**

SMC Corporation of America specializes in pneumatic control products and engineering services to support industrial automation. They are using IBM Domino Designer and IBM XPages technology to help the development team modernize existing interfaces and build compelling new social and mobile business applications. For example, SMC developed an XPages front end to an existing workflow application to improve both the usability and performance of the application.

#### **Read more about the SMC Corporation of America story at:**

[http://www.ibm.com/common/ssi/cgi-bin/ssialias?subtype=AB&infotype=PM&appname=SWGE\\_LO\\_LN\\_USEN&htmlfid=LOC14415USEN&attachment=LOC14415USEN.PDF](http://www.ibm.com/common/ssi/cgi-bin/ssialias?subtype=AB&infotype=PM&appname=SWGE_LO_LN_USEN&htmlfid=LOC14415USEN&attachment=LOC14415USEN.PDF)

### **IBM's mobile technology improves construction management at VCC**

VCC, LLC is a general contracting and construction management firm with more than USD6 billion in construction projects and eight national and international locations. VCC developed a construction management system called Endeavour based on IBM Notes and Domino software. To make it more useful, VCC mobilized the application using XPages. Now, real-time information from the Endeavour mobile app allows staff to process information three to four times faster than before.

#### **Read more about the VCC story at:**

<http://public.dhe.ibm.com/common/ssi/ecm/en/loc14364usen/LOC14364USEN.PDF>

### **Hendricks Regional Health builds apps to meet high standards**

Hendricks Regional Health (HRH) is a nonprofit healthcare system in Indiana with a medical staff of 250 physicians in over 45 specialties. HRH has developed numerous applications using XPages technology to improve responsiveness for Physicians, Emergency Medical Technicians and staff. One of the applications is a provider portal which gives a consolidated cross-system views of patients' clinical information. To do this, they use XPages to integrate data from relational database systems into a common user interface.

#### **Read more about the Hendricks Regional Health story at:**

<http://public.dhe.ibm.com/common/ssi/ecm/en/loc14323usen/LOC14323USEN.PDF>

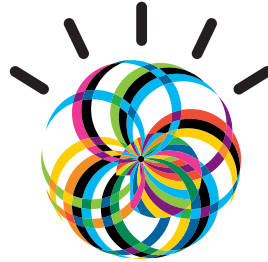
## Conclusion

Tens of thousands of companies have chosen IBM Notes and Domino as the platform for their line of business applications for the last 25 years. The built-in workflow, security and directory services have provided the means for rapid application development and deployment, helping clients to achieve significant improvements in time to value. Integration with popular systems of record has produced a multitude of mission-critical applications that help run companies around the world, from small and medium businesses to the Fortune 500. These applications can be delivered from on premises servers, from the cloud, or a combination of both, to PCs, tablets and smart phones.

IBM has continuously enhanced its application development story by adding support for new APIs, languages, runtimes and clients. Adding support for open standards has made application development accessible to the majority of programmers, making it easier to find relevant expertise. The XPages framework is the perfect bridge between traditional Domino applications and today's web-based applications. It provides a way for existing customers to leverage the investment that they have made without sacrificing a modern user experience.

IBM is committed to enhancing this application development story, with focus on design thinking, responsive design and cloud. Announcements regarding Apple and Softlayer are evidence of the commitment to bring enterprise grade applications with enterprise grade availability to the device of choice for years to come.

*This whitepaper is dedicated to Tim Tripcony, without whom the XPages community would not be what it is today.*



**IBM**

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