IBM

Amplify2016
outthink ordinary

Integrate your IT

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IBM Commerce

Integrate your IT

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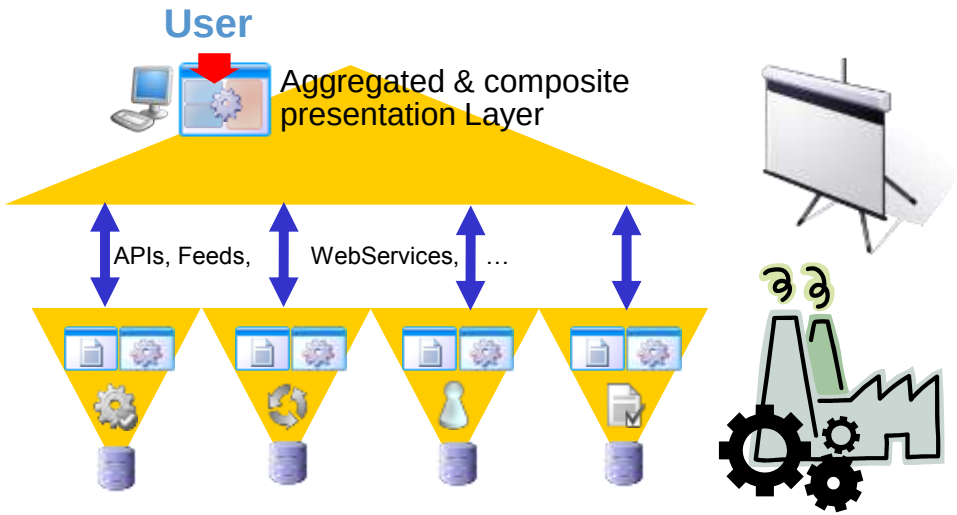
STSM, IBM Digital Experience

The traditional Portal Paradigma:
Consuming and Integrating heterogeneous Systems and Data

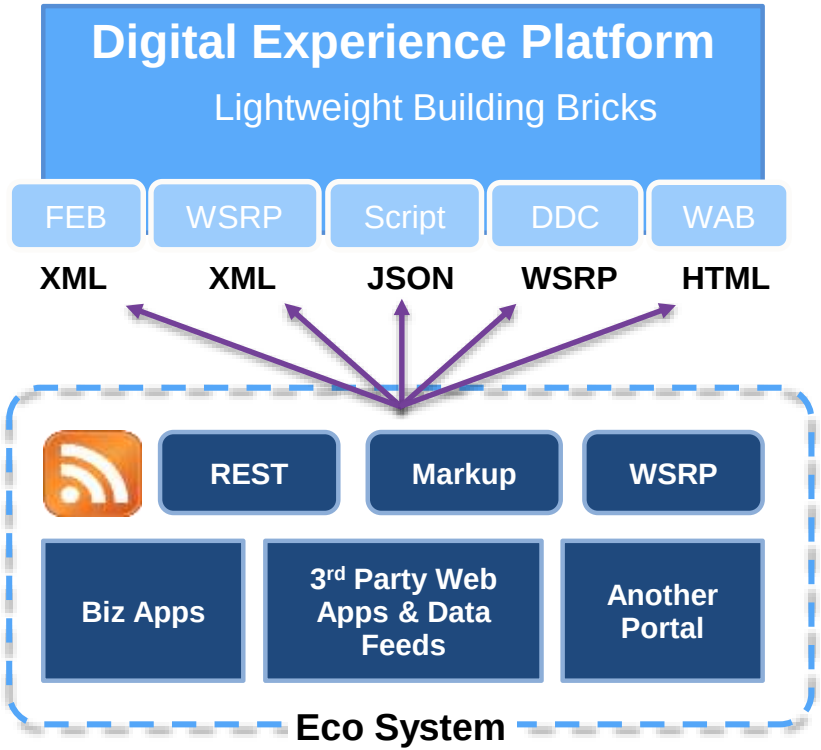


Role based
Context based
Process driven
Personalized
Composite

- Portal gives the illusion of a nicely integrated system!
- But it's aggregation, composition and federation of lightweight UI components and services
- Let Portal pick the right face for the result
- Let another tier own the business logic (controller) and the data (model)

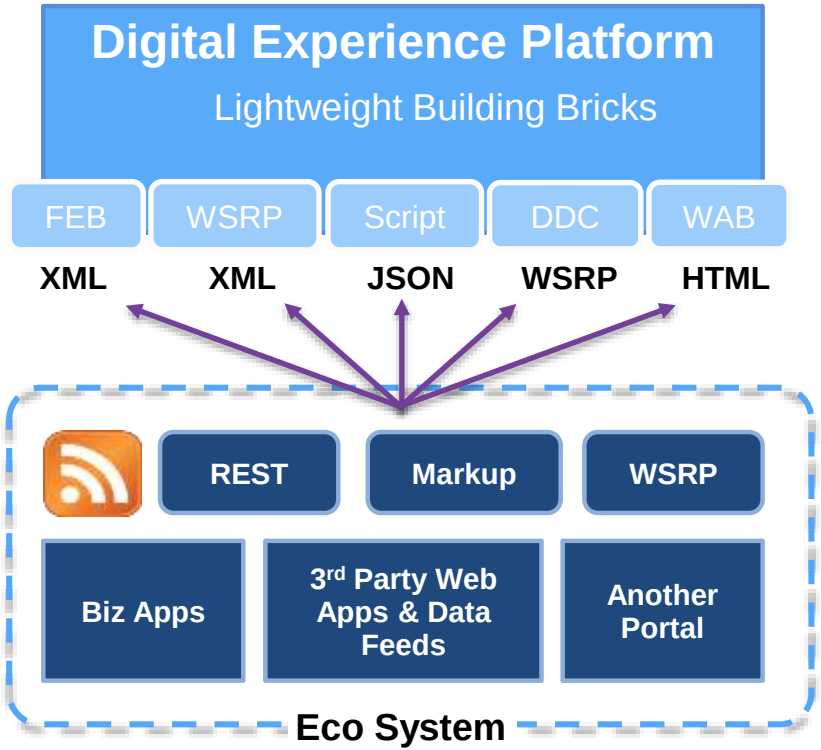
Application Integration Challenges

- Legacy Applications & IT Landscape
  - Unusual proprietary APIs
- Different 3rd Party Apps & Services
  - Different User Experiences & Interfaces
- Distributed business logic and data
- Latency & Scalability
- Multi-Channel Delivery
- Personalization & Targeting
- Access Control, single sign on and security patterns



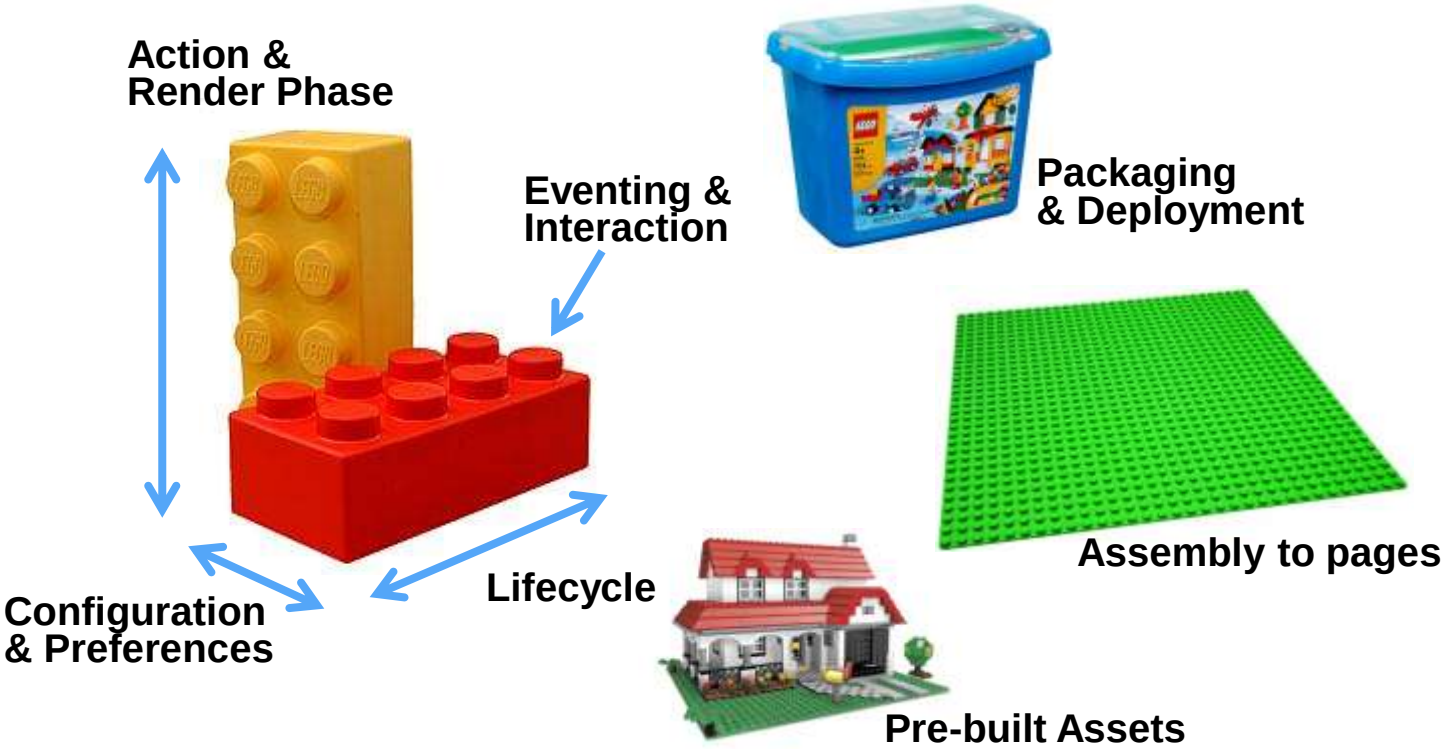
Simplified view on Integration Options

- Integrate
  - Data (XML, JSON, …)
  - or Markup (HTML, WSRP, …)
- Integration approach
  - driven by IT (J2EE, NodeJS…)
  - or driven by line of business (DDC, FEB, WAB, …)
  - or something inbetween (Script, …)
- Federation
  - rather than integration



IT driven Integration

Portlets: JSR 286



Re-usable Building Bricks

- Reusable Building Bricks, which communicate to any backend system
  - JSR 286 Portlets
  - Others (iWidgets, ...)
- Provide a rich set of such versatile building bricks for use by line of business
- Standardization on component level enables re-use, re-arrangements, re-factoring
- Traditional Software Development Process
- Examples
  - Unified task list
  - IBM Connections Portlets

JSR 286

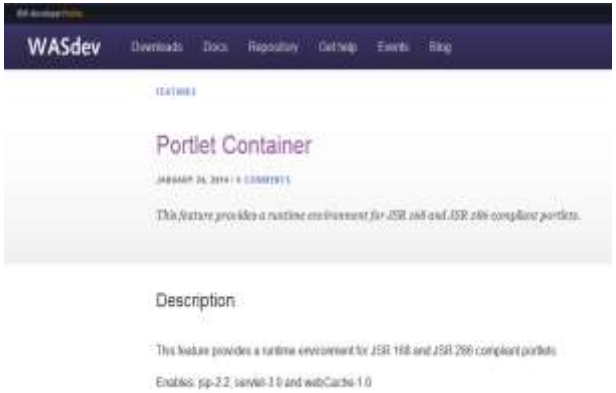
- Provides everything necessary to address the special considerations for Rich Internet Applications are already in WebSphere Portal today
  - Based on standard J2EE, HTML, plus JavaScript
  - Supports Client-Side Programming Model (AJAX, Javascript, Dojo, ….)
- Open Standards based (JSR 286)
  - Standardized eventing support
  - Added support for PortletFilters
  - Added support for ResourceRequests
  - Portlets can serve standalone content
- Works best when
  - Minimal session usage
  - Light to medium weight business logic
  - Push complex things into the back-end services layer
  - No other consumer

The new JSR 362 Portlet Specification

- The JSR 362 Expert Group was formed in April 2013
  - Participants: IBM, Oracle, Liferay, RedHat, Apache Foundation, Independents
- In accordance with the JCP process version 2.9, our work is public
  - JCP page for JSR 362: http://www.jcp.org/en/jsr/detail?id=362
  - Project web site: http://java.net/projects/portletspec3
  - Interested parties can subscribe to an observers mailing list at the site
  - JIRA Issue tracker: http://java.net/jira/browse/PORTLETSPEC3
  - Portlet API working docs: http://msnicklous.github.io/portletspec3/
- Focus
  - API Improvements
  - AJAX Support
  - JSF
- The Portlet Specification 3.0 Reference Implementation
  - Work will begin in 2014
  - Apache Pluto subproject of Apache Portals project

Portlet Container in Liberty

- Provides a runtime environment for JSR 168 & JSR 286 compliant portlets
- Required to develop and deploy portlets on IBM WAS Liberty Profile
- The feature enables
  - jsp-2.2,
  - servlet-3.0
  - webCache-1.0



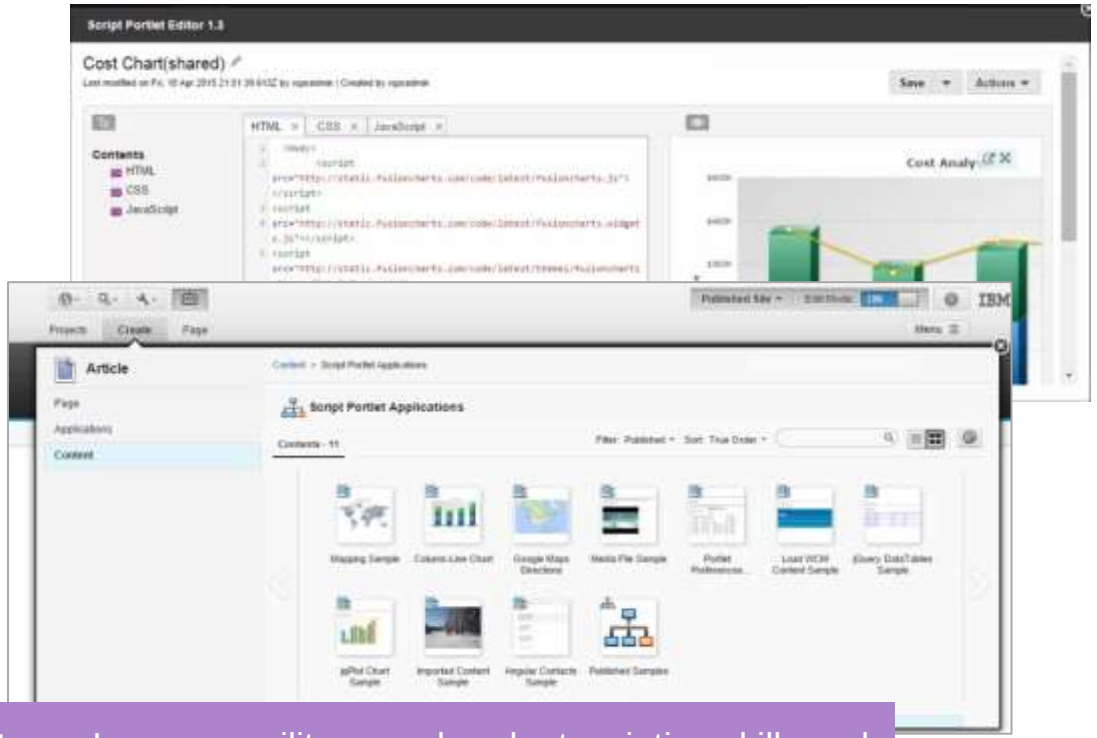
Download and more detailed step-by-step Instructions:
https://www.ibmdw.net/wasdev/repo/portlet-container/
https://developer.ibm.com/wasdev/docs/developing-portlet-applications-wdt-liberty-profile/

Line of business driven Integration

Script Applications In Digital Experience

Create applications using only JavaScript

- Command line support for creating new Script applications
- Support for storing Script applications in shared WCM libraries
- Ability for Script applications to be available on the toolbar for a convenient drag and drop addition to the page
- Picker for inserting WCM tags
- Resource aggregator support, for performance improvement of complex Script applications



Script Applications

Advantage: Increase agility, use abundant scripting skills and reduce need for custom deployed Java code

Script Applications: Benefits

- Applications are built with pure web technology: HTML, JS, CSS, images, etc.
- Application artifacts are stored and managed in Web Content Manager
  - No code deployment!
  - WCM features such as projects and workflow can be used to manage applications
- You can build applications from the browser with the Script Editor, or use your favorite editor/IDE
- Data access is done with REST services, typically using JSON data
- Many of Digital Experience's key value-add features are available
  - Eventing, portlet preferences, multi-channel delivery, responsive design, public render parameters, etc.

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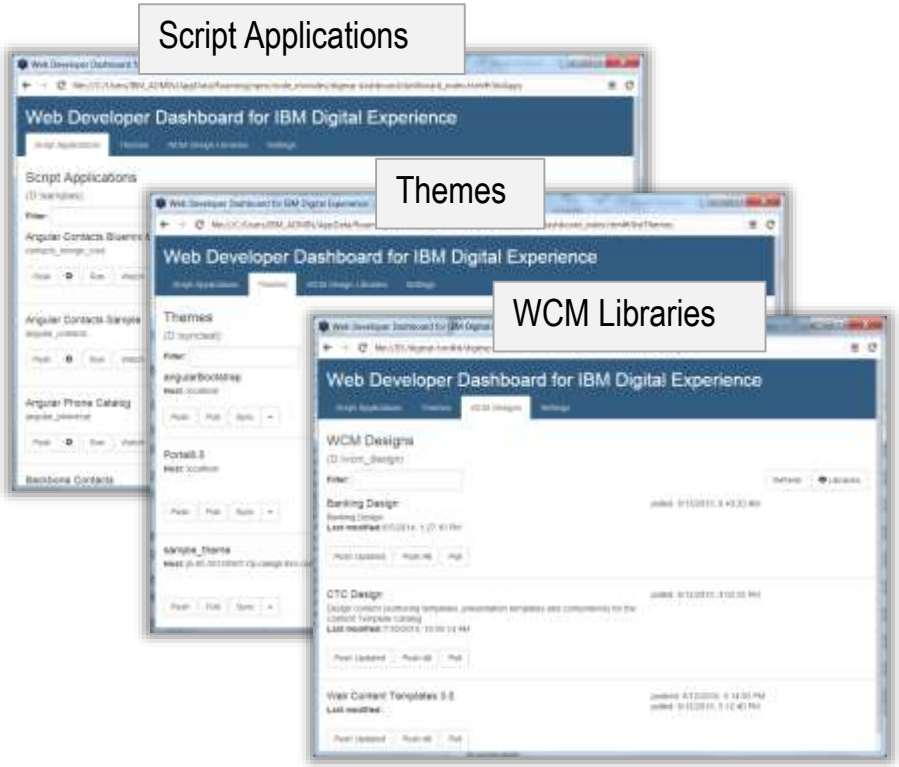
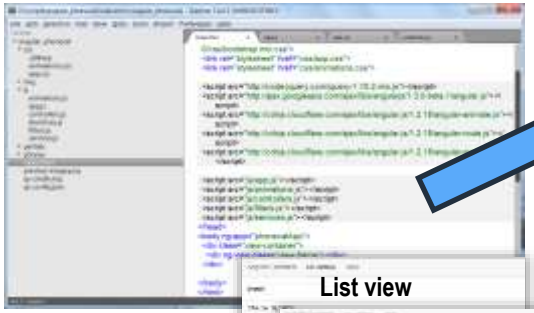
Script Applications: Development Toolkit

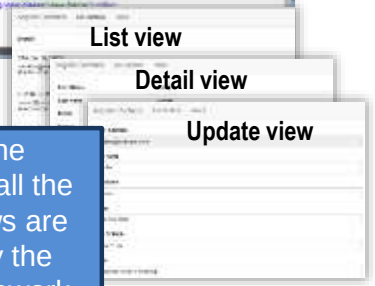
- Work with script applications, DX themes, and WCM design elements in a simple UI
- Click to push or watch/sync applications and designs to a local or remote server
- Select themes and WCM design libraries and pull from server
- Use a simple UI to work with theme modules and profiles
- Run script applications locally on a test server



Script Applications: Development Toolkit

Build applications with your preferred tools and frameworks

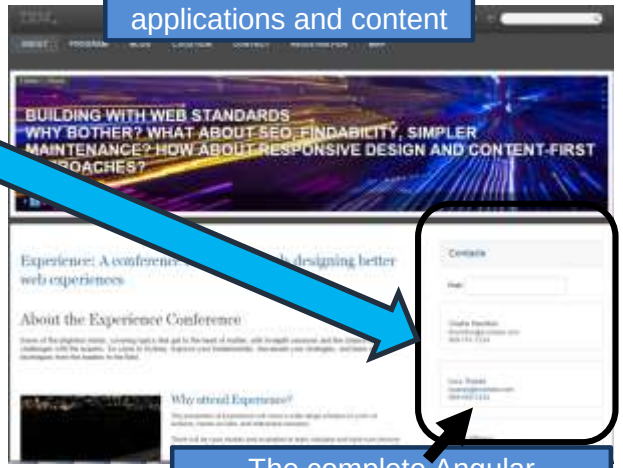




Test/run the application – all the dynamic views are managed by the Angular framework

Push to server to make application available on the site toolbar

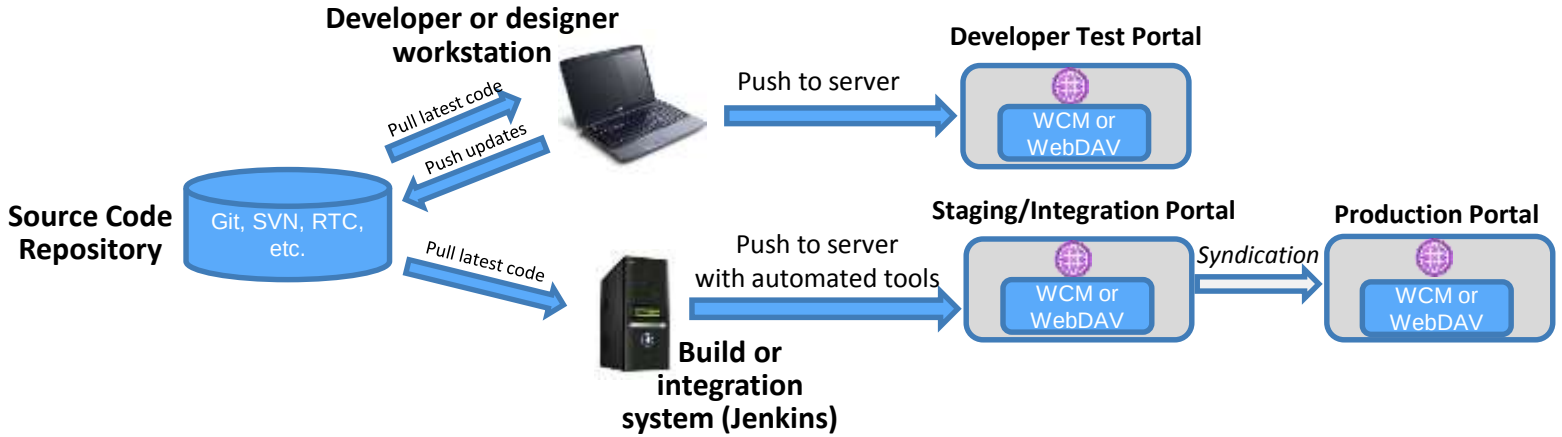
Add application to a site page alongside other applications and content



The complete Angular interactive application with multiple views runs in this component area

Script Applications: Test & Staging

- All the HTML/JS/CSS/etc. for Script applications, theme designs, and WCM designs can be maintained in a source code repository
- Command line or GUI tools can push files to a development or staging server
- Script applications and WCM designs can be syndicated from staging to production server



Single Page Applications and IBM Digital Experience

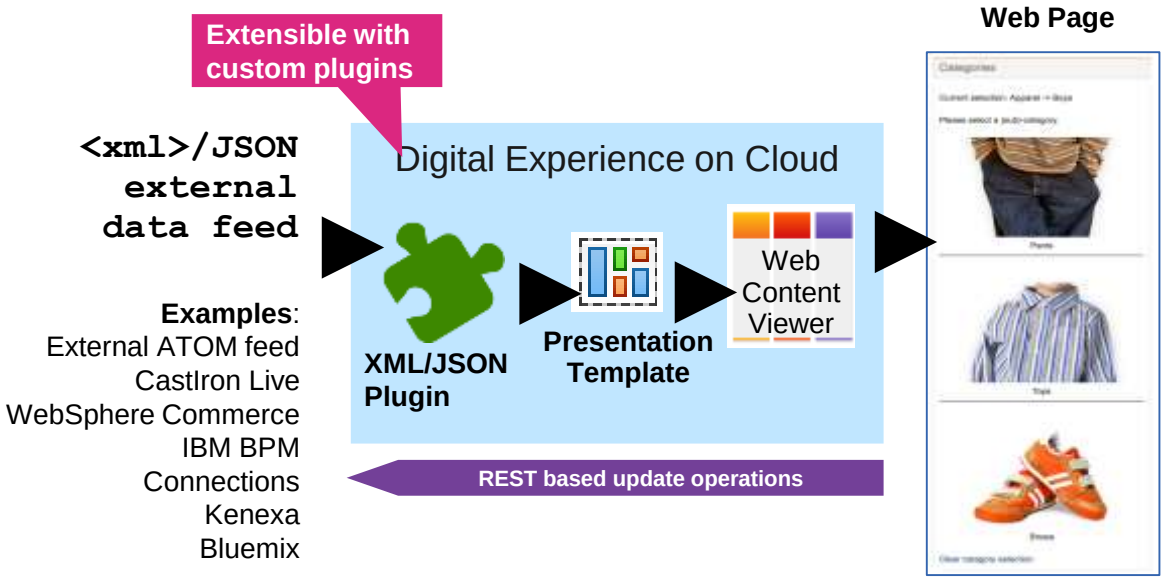
- Modern web applications use JavaScript frameworks to structure the application and provide valuable common functionality
  - Frameworks include features such as data binding, views, controllers, HTML templates, and storage
- The Single Page Application (SPA) model is used
  - A main HTML page provides the shell where all interaction takes place
  - JavaScript handles all dynamic interaction and accessing data from server

- With IBM Digital Experience a “single page application” runs as one component within a Web site
  - Don’t be confused by the terminology – the site still has many pages
- IBM Digital Experience complements JavaScript frameworks
  - Addresses typical shortcomings of JS framework
  - Supports a heterogeneous and short-lived world of UI technologies

Digital Data Connector

Use IBM Web Content Manager design components to render data being served from external systems

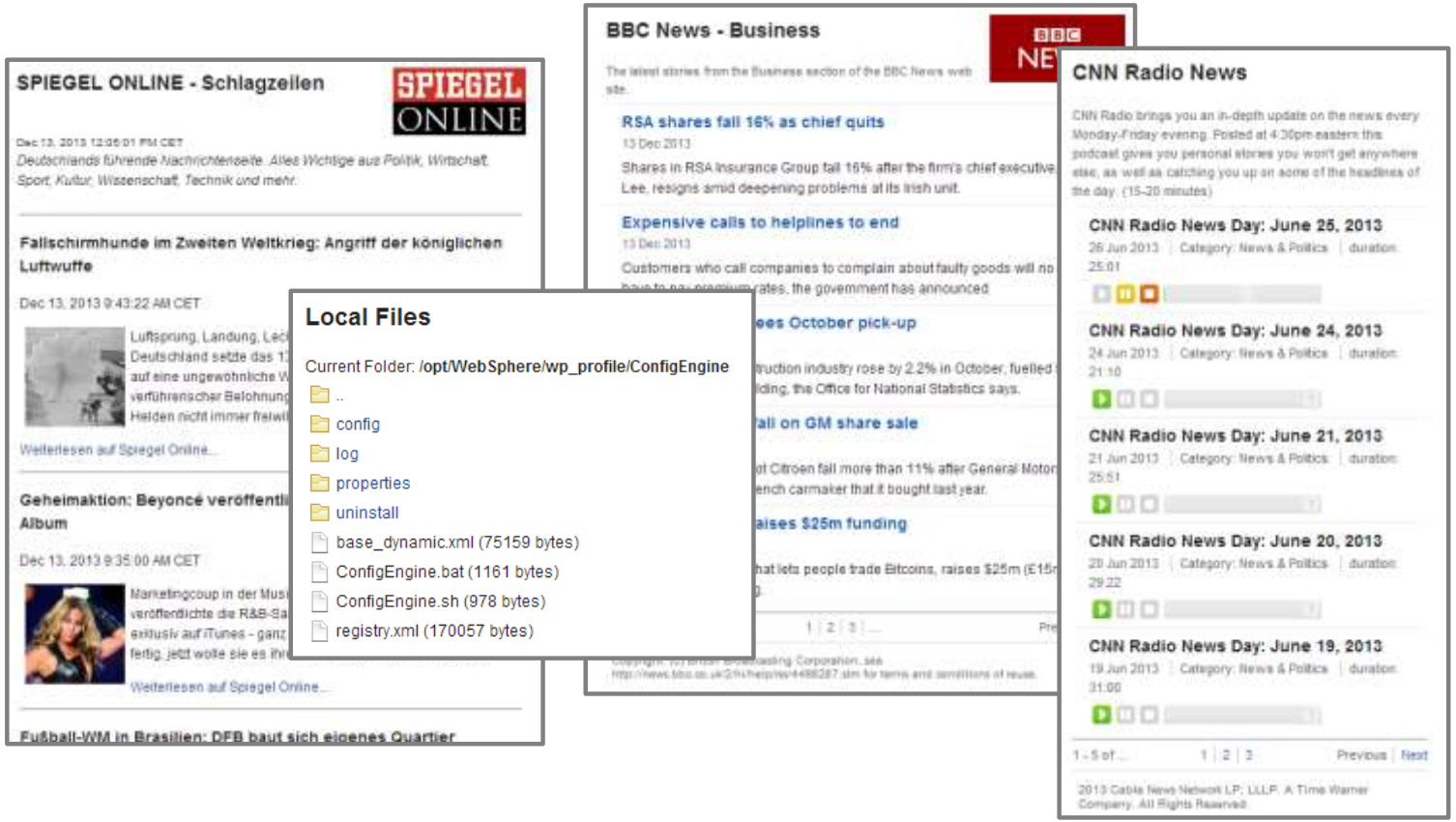
- Provides a public plug-point to allow integration of all kinds of data
- Uses WCM contents items to describe what data to include and what design component to use to render the data
- Support dynamic context overwrites of source and filter attributes using public render parameters



Digital Data Connector

Advantage: Make it easy integrate remote XML data via Web Content Templates. Avoid custom coding

Digital Data Connector: Samples



Digital Data Connector (DDC): Benefits

- WCM Designers have full control over list presentation
  → Resulting Lists can fit nicely into the visual design of customer site
- No coding skills required for consuming & rendering external data
- Easy re-branding due to clean separation of concerns
  - UI generation using WCM separate from back-end code
  - Site designers can provide consistent presentation components to the page editors
- List presentations and designs support workflow, projects, preview, versioning, syndication
- No code deployment on the application server in many cases
  - DDC solutions often consist only of WCM artifacts (HTML/CSS/JS, WCM tags…)
  - Deployment can be done using WCM syndication
- Generic and shared caching and data retrieval infrastructure

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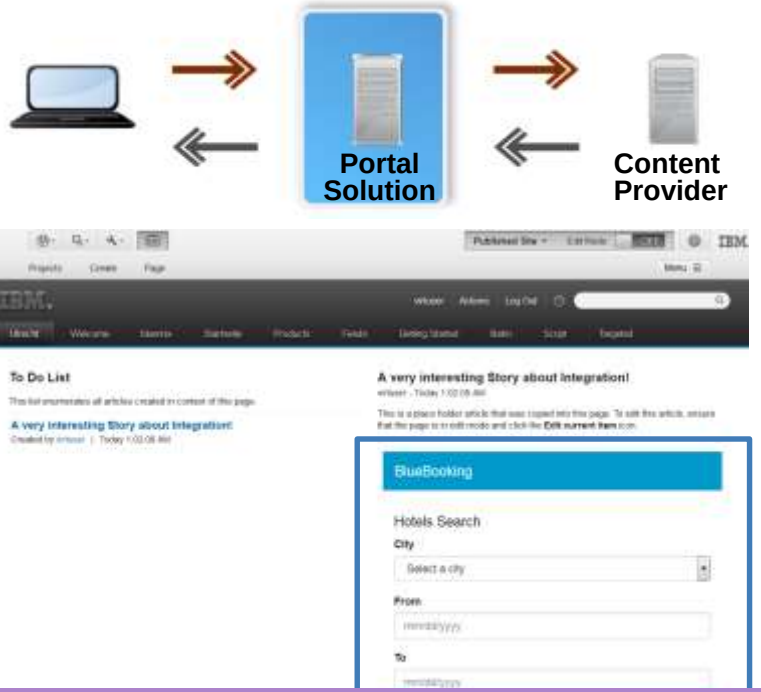
Integration: Web Application Bridge

- Reverse proxy to integrate web-based content providers within WebSphere Portal solutions
- A virtual Web application (Webdock portlet) is an abstract representation of existing Web content provided by an existing back-end service



Web Applications Bridge

Advantage: Easy and fast integration of existing web applications “as-is” (with no change to the app itself)

Web Application Bridge (WAB): Benefits

Use WAB to display markup provided by a Bluemix application

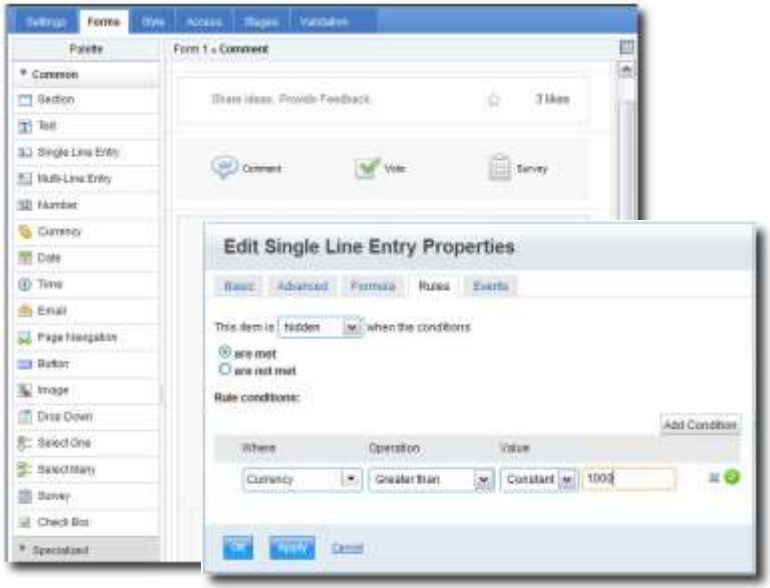
- WAB is based on iframes and a reverse proxy
- Supports authentication, auto mapping of cookies, and authorizations, either provided by application or by use of the Credential Vault, for loading credentials.
- Provides ability to transform the markup on each interaction
  - Plugin framework, to provide custom logic per target, for example, stripping banner, navigation, etc..
  - Ability to rewrite, clip, transform the markup
- Provides auto identification of all html input types, and makes them available for eventing to/from other applications without touching the application

Web Application Bridge: Rules of Thumb

- Just because a browser can get there doesn't mean that WAB can get there
  - Use server based browser, telnet or wget to determine if the portal server has access to the content provider
  - Plan to use SSO
    - Is Portal and the content providers in the same domain and sharing a user registry?
- Use Caution when
  - Network latency becomes relevant
    - Ping latency should be < 10 ms preferably < 1 ms
  - Content Provider content is to large
  - Redundant or unwanted navigation, header, footer, sidebars, etc.
  - Conflicting styles
- Consider delivering static content (CSS, Javascript and Images) via HTTP server
- Apply Filters when needed

Forms Experience Builder

- Easy-to-use web based design tooling delivers powerful fill and submit experiences.
- Full set of web data capture items
- Flexible layout using grids & sections
- Graphical rules & formula editor
- Routing editor
- Rapid development
- Preassembled items with default values
- Automatic binding to data records
- Apply advance features quickly
- Familiar techniques
- Drag & drop design experience
- Easy discovery of item properties



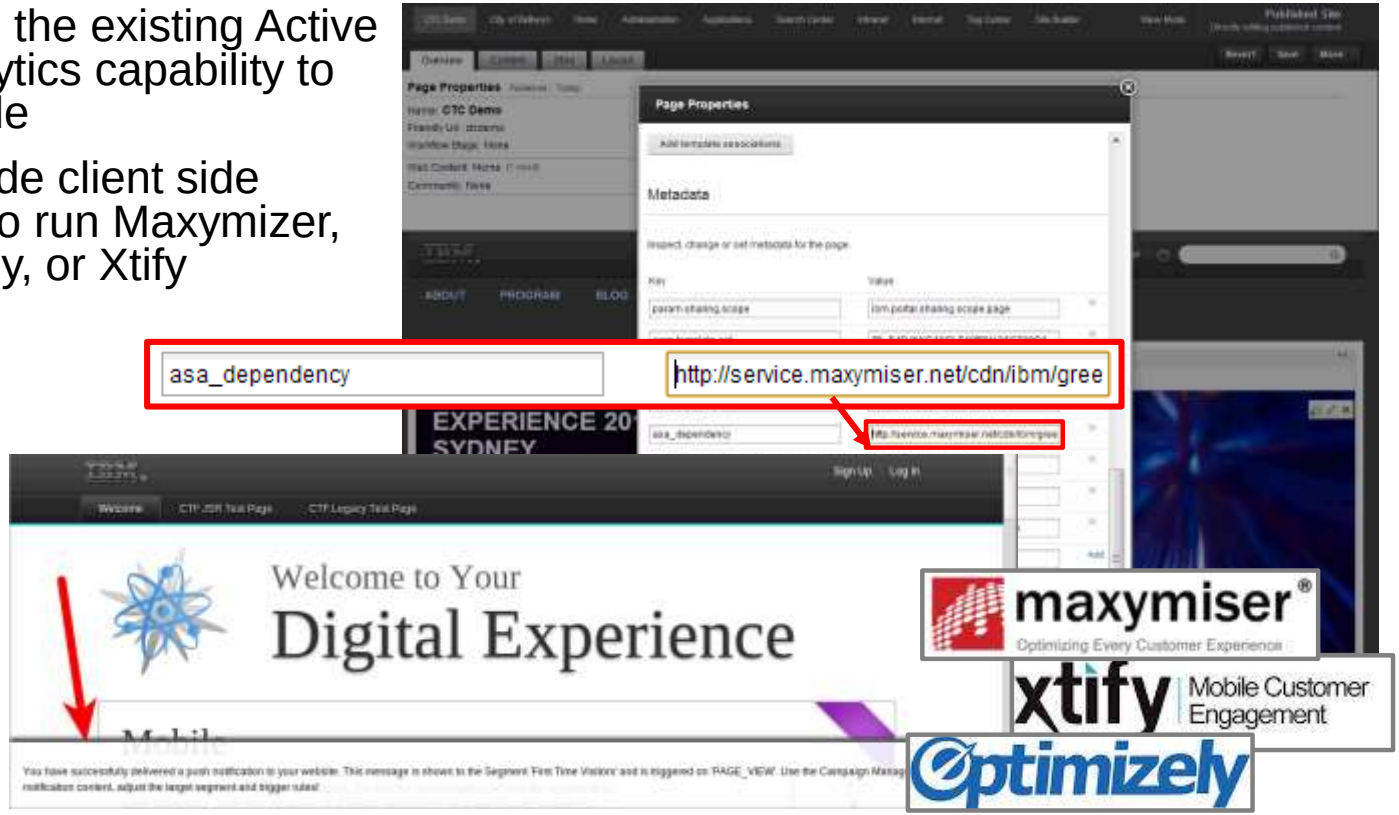
Forms Experience Builder

Advantage: Full data capture solution – simple to construct, easy to change, and quick to deploy.

Client-Side Integration Patterns

Leverage the existing Active Site Analytics capability to inject code

e.g. include client side libraries to run Maxymizer, Optimizely, or Xtify



Federation

Federation

- Federated Navigation
  - Setup: Add external URL pages into page hierarchy & Navigation which point to other web sites
- Web Application Integrator (WAI)
  - Share a common theme and navigation with other web sites
  - Setup: Add navigation jsp to other web sites

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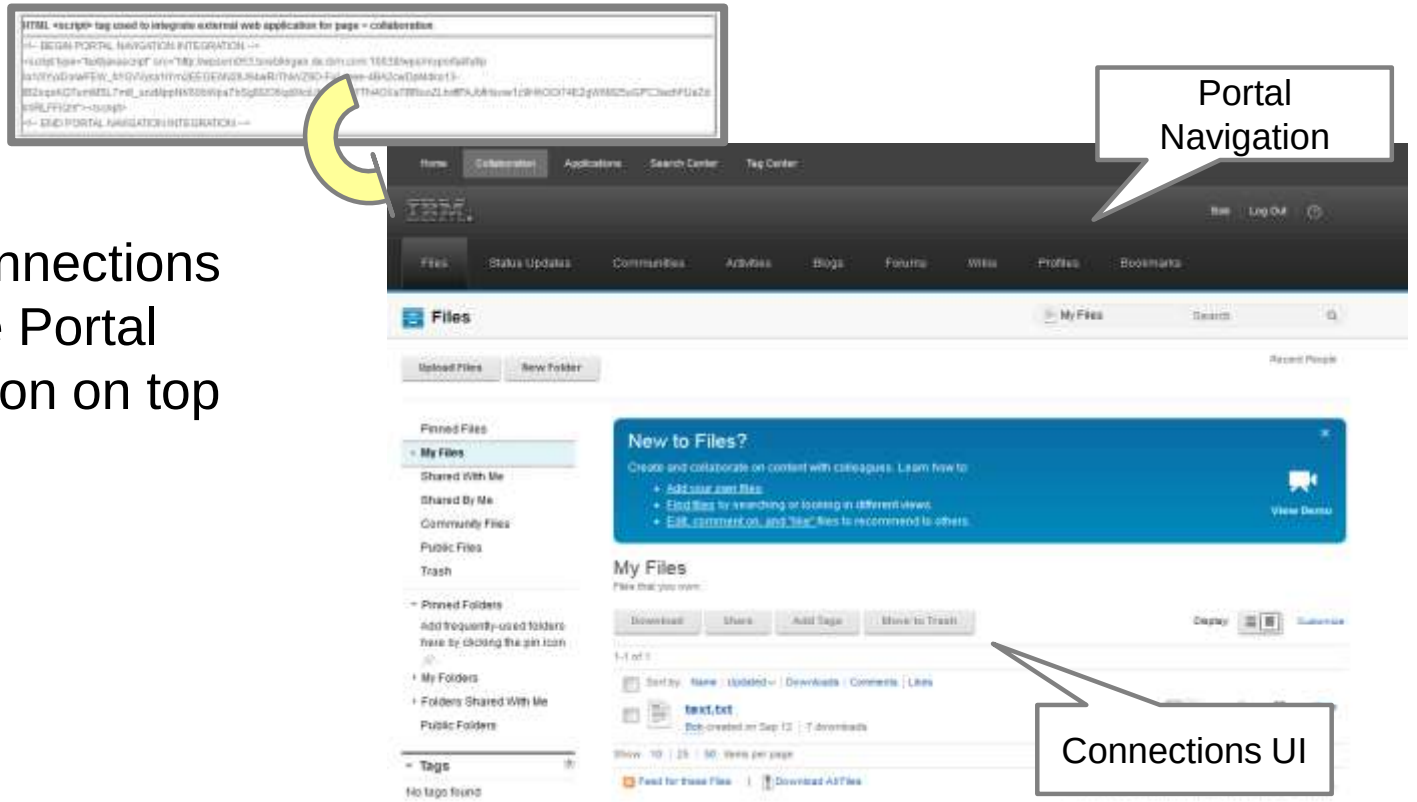
Web Application Integrator (WAI) Example

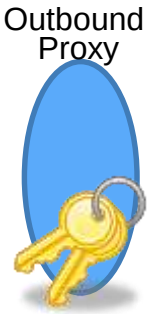
IBM Connections gets the Portal navigation on top

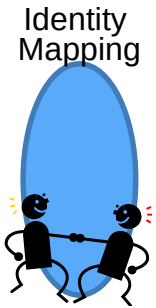


Security considerations

Security Considerations

- Outbound Connection
  - AJAX Proxy / Http Outbound
- Single Sign On
  - SAML
  - Credential Vault
- Identity Management (and Mapping)
  - TFIM





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HTTP Outbound

- Central control for outbound HTTP connections
- Functions for authentication and cookie handling
- Administration via model APIs or configuration tasks
- Custom outbound service filter possible
- Since 8.5

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Http Outbound Configuration for WAB

- Define a policy to allow for outbound connections through WAB
- Admin Portlet

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Htto Outbound Configuration for DDC

- Define a WAS Resource Environnment Provider variable to allow for outbound connections through DDC
- WAS Admin Console
- Resource environment providers > WP ConfigService > Custom properties

☐	wp.proxy.config.urlreplacement.digital_data_connector_policy.rss_cnn_general	http://rss.cnn.com/*
☐	wp.proxy.config.urlreplacement.digital_data_connector_policy.rss_cnn_edition	http://edition.cnn.com/*
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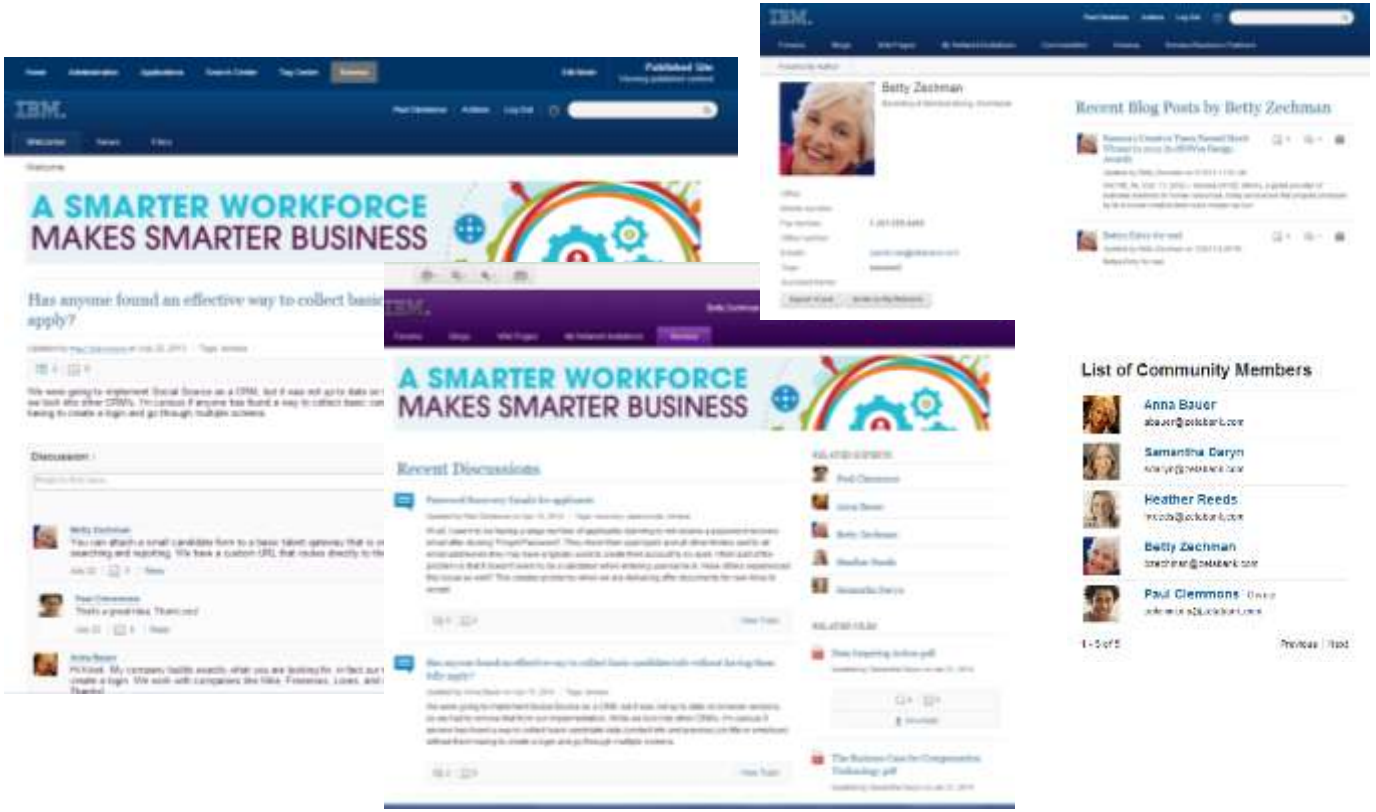
IBM Connections

Seamless Integration of IBM Connections



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Seamless integration of IBM Connections

- Allow users to discuss web content items:
  - The discussion itself is hosted on a remote IBM Connections server
  - Display of social information from IBM Connections via Social Rendering techniques
  - Posting of new information (e.g. replies) from WCM to IBM Connections
  - Automatic linking between WCM content items and discussion topics in IBM Connections
- Visual appearance can be fully controlled using WCM design components
  - Out of the box presentation templates include responsive design patterns supporting tablets and smart phones

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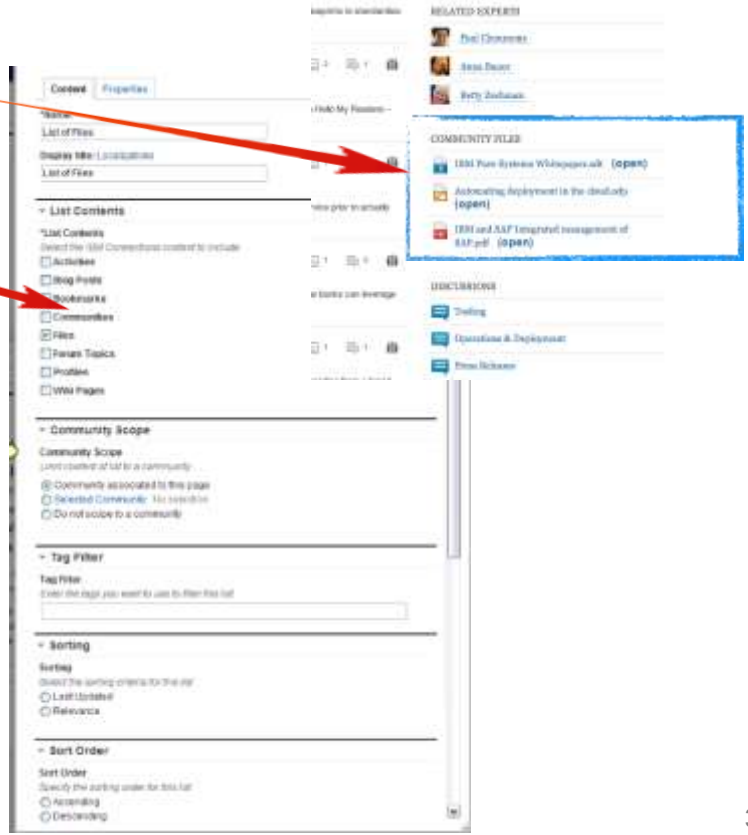
Seamless integration of IBM Connections

- Uses IBM WCM to query and render IBM Connections Content
- High flexibility, ease of use and ease of development for delivering exceptional web experiences:
  - Easy to customize queries, including ability to mix IBM Connections services like blogs, wikis, files and bookmarks
  - Easy to customize look and feel – with limited IBM WCM skills you can easily change markup and customize and extend the WCM social rendering capability.
  - Basic/Common Customization does not require deep development skills
  - Out of the box samples support Multi-channel capabilities



Seamless Integration of IBM Connections

Scenarios: IBM Connections and Digital Experience

Full User Interface of IBM Connections with all features and capabilities.

Only few options to customize the experience and single focus on the apps provided by IBM Connections

Federated Navigation using external URL pages. Combined Navigation gives access to IBM Connections apps plus other sites and apps.

Coherent look and feel.

Flexible customization of user experience, embedded into context of a Web site/Web content and community.

Reduced set of IBM Connections features.

Connections Front-End

Side-by-Side
(Simple Aggregation)

DX Front-End
(Unique User Experience)

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Integrated Social Media Publishing

Business Process Management

Scenarios: Business Process Mgmt and Digital Experience

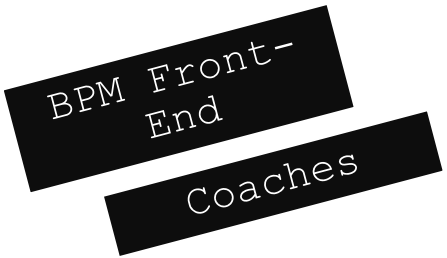
Process Worker

- Main Focus on process interaction and productivity
- Many complex processes and human tasks
- Internal Facing
- Pre-built or generated User Interfaces

Consumer/Employee

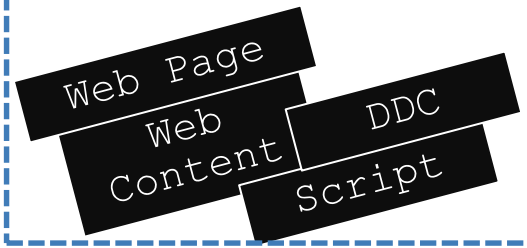
- Main Focus on attractive user experience and excitement
- Context and interaction with other kinds of applications
- For selected processes and human tasks
- Secure Web Site
- Customized/uniquely designed User Interfaces

BPM Front-End



DX Front-End
(Simple Aggregation)

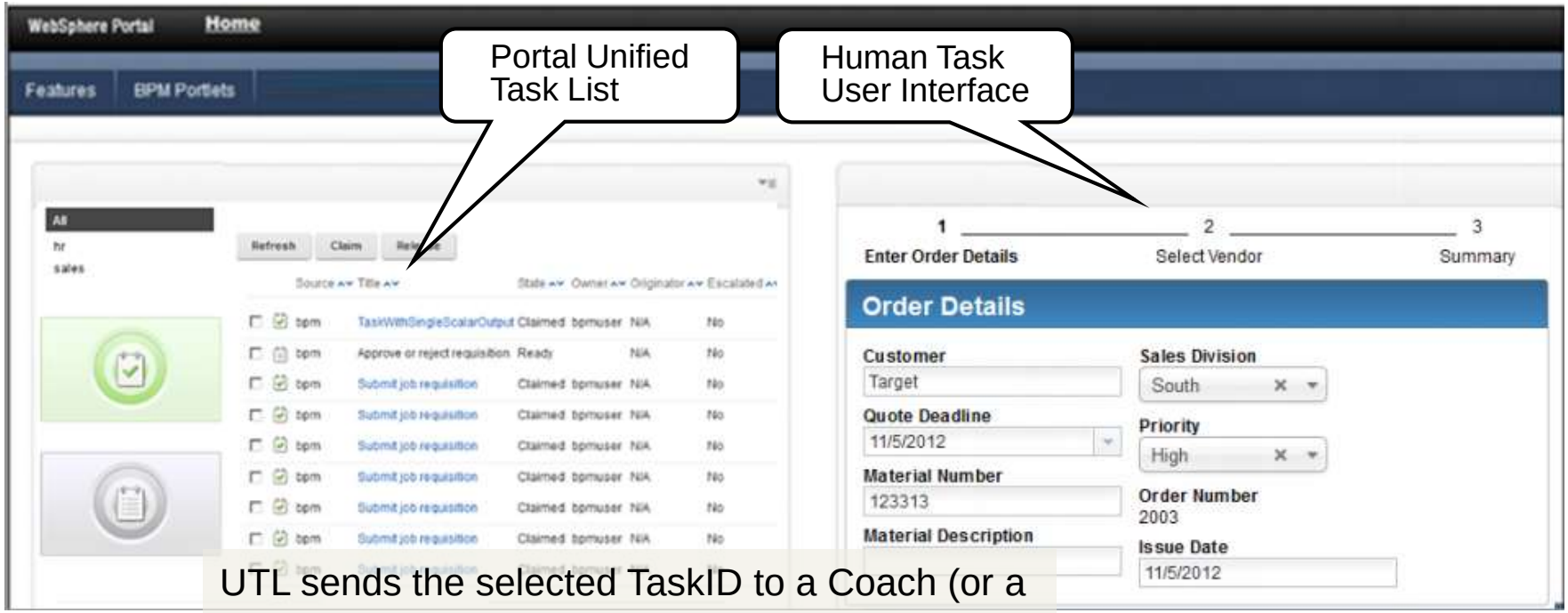
DX Front-End
(Unique User Experience)



BPM Front-End: “Coach”-UI

- Build UIs from coach views and human service flows
- As task UIs and “dashboards”

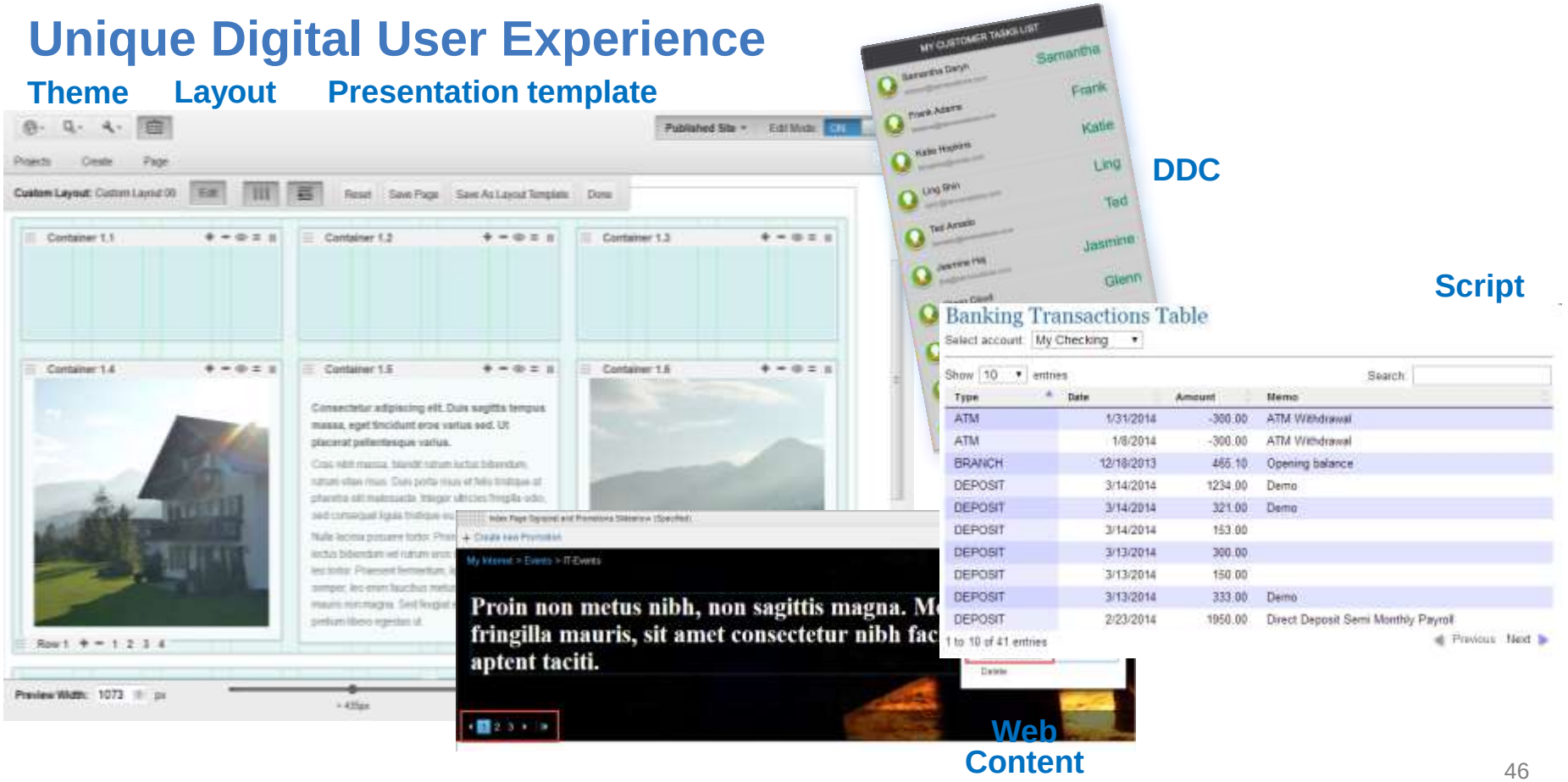
Simple Aggregation – Lists and Dialogs



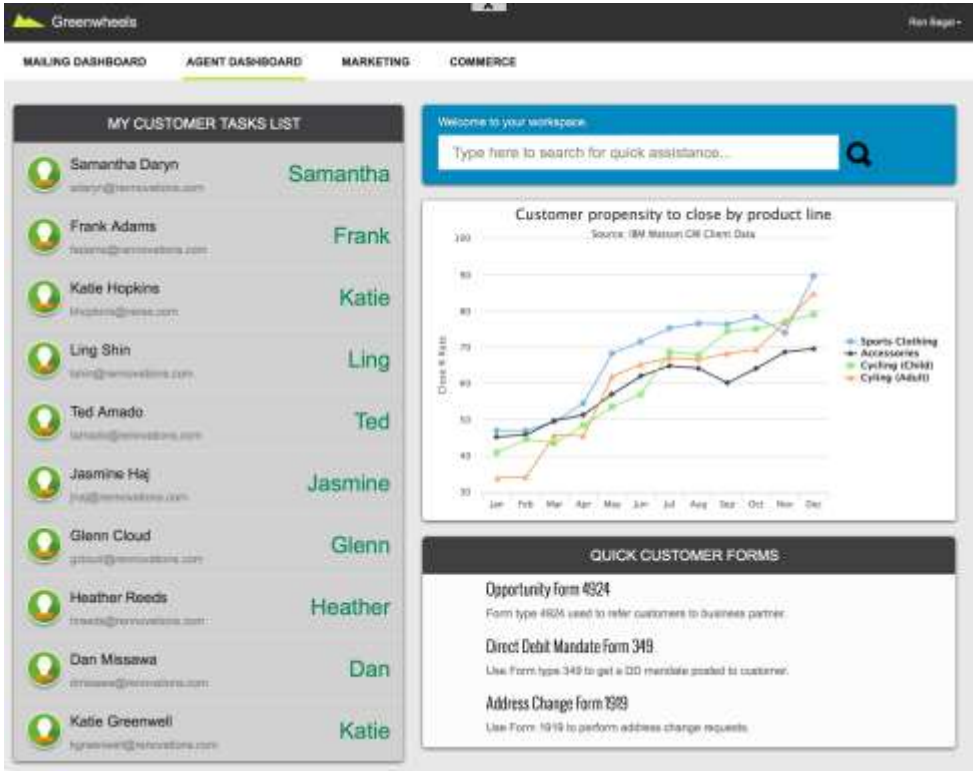
UTL sends the selected TaskID to a Coach (or a Dynamic Coach) portlet. This portlet is an iframe that displays in a Portal page a BPM coach as it has been designed

Unique Digital User Experience

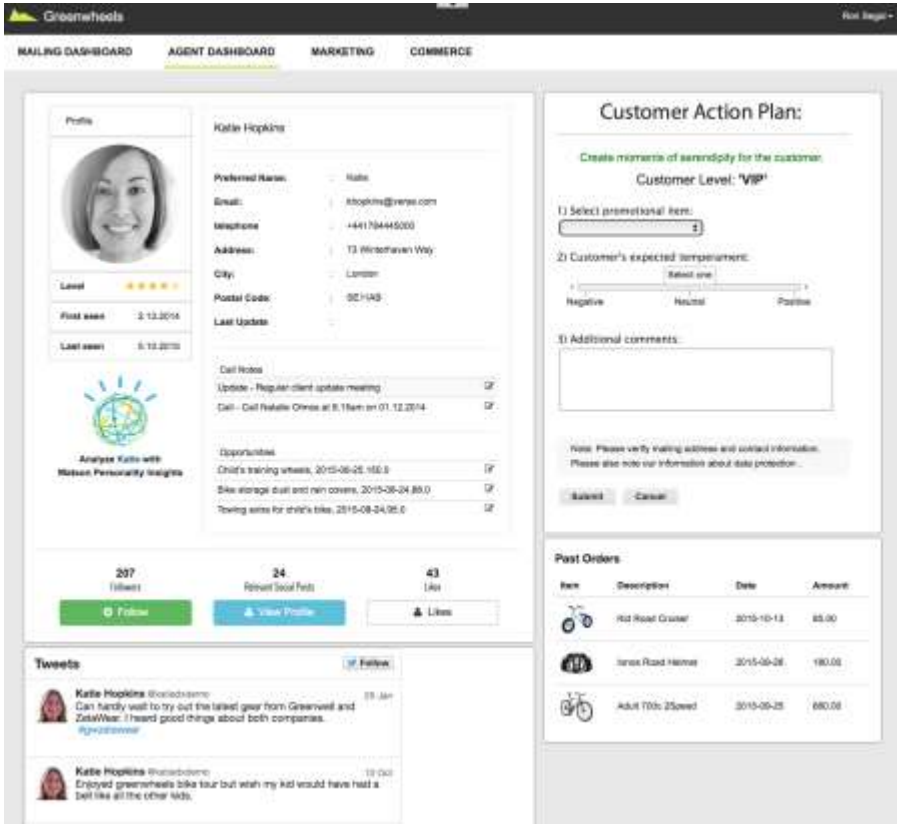
Theme **Layout** **Presentation template**



Digital Data Connector – Task List Portlet

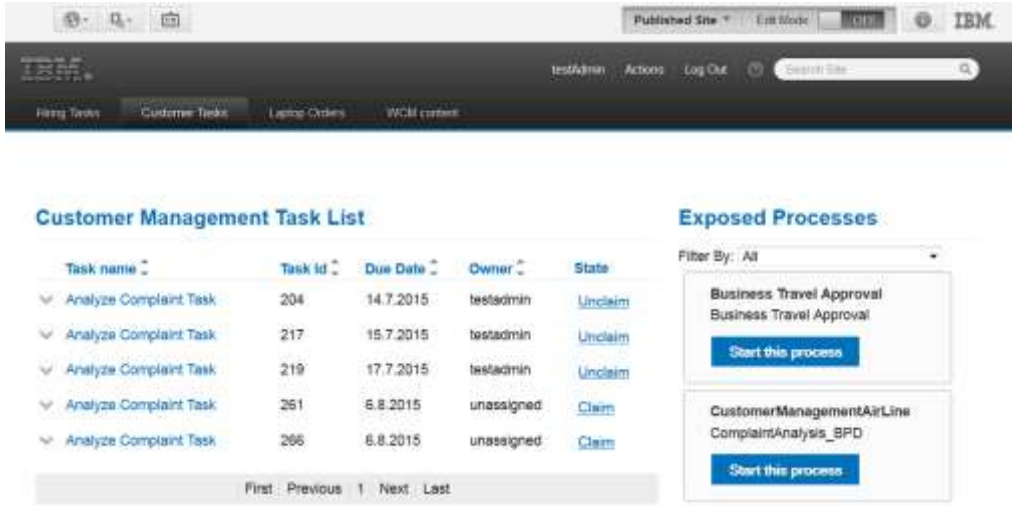


Digital Data Connector – BPM interaction



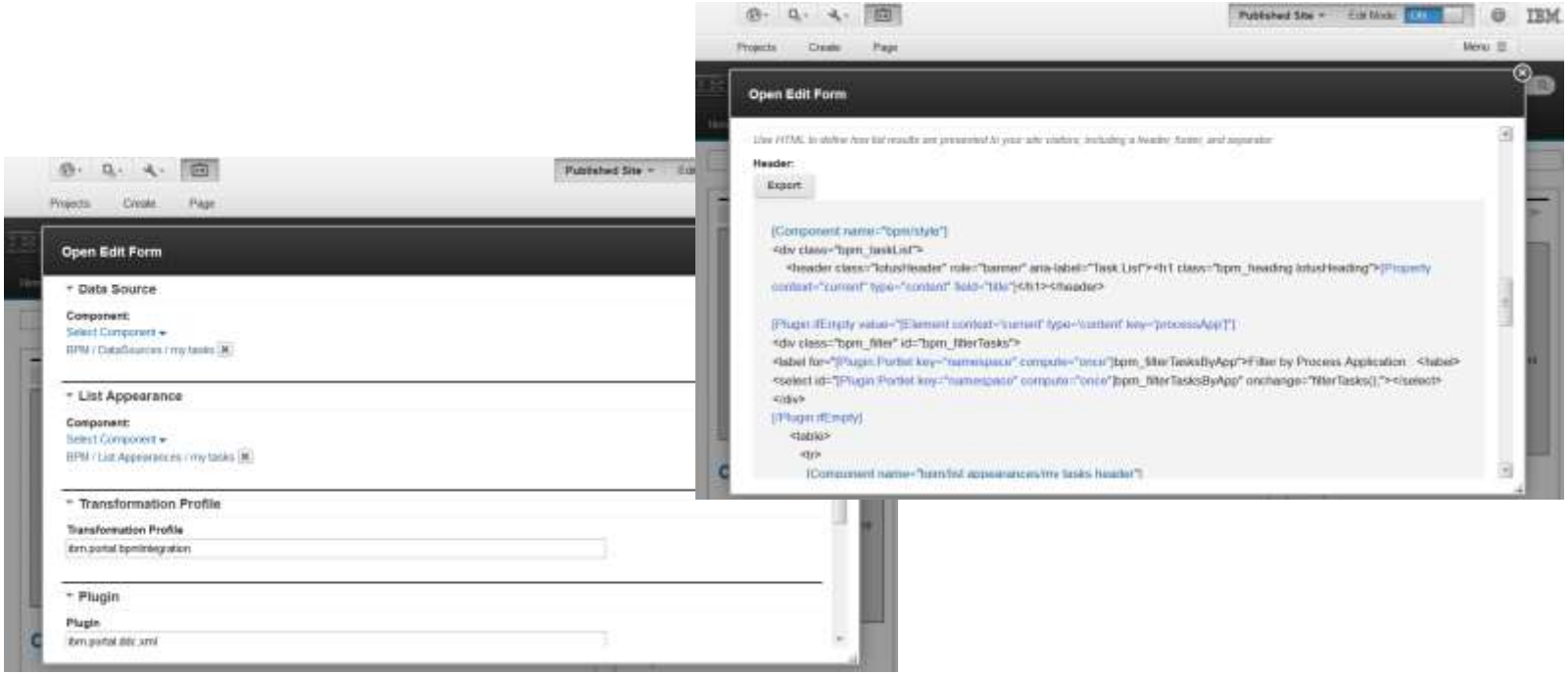
Digital Data Connector – Sample Process Interaction

- Apply DDC to visualize BPM data, e.g. task lists (accessed via REST)
  - Formatting is done by a editable WCM presentation template
  - Turns BPM data into versatile “web content”
- Demo available here:
  - http://openntf.org/main.nsf/project.xsp?r=project/Business%20Process%20Manager%20Sample%20for%20IBM%20Digital%20Data%20Connector%20in%20WebSphere%20Portal

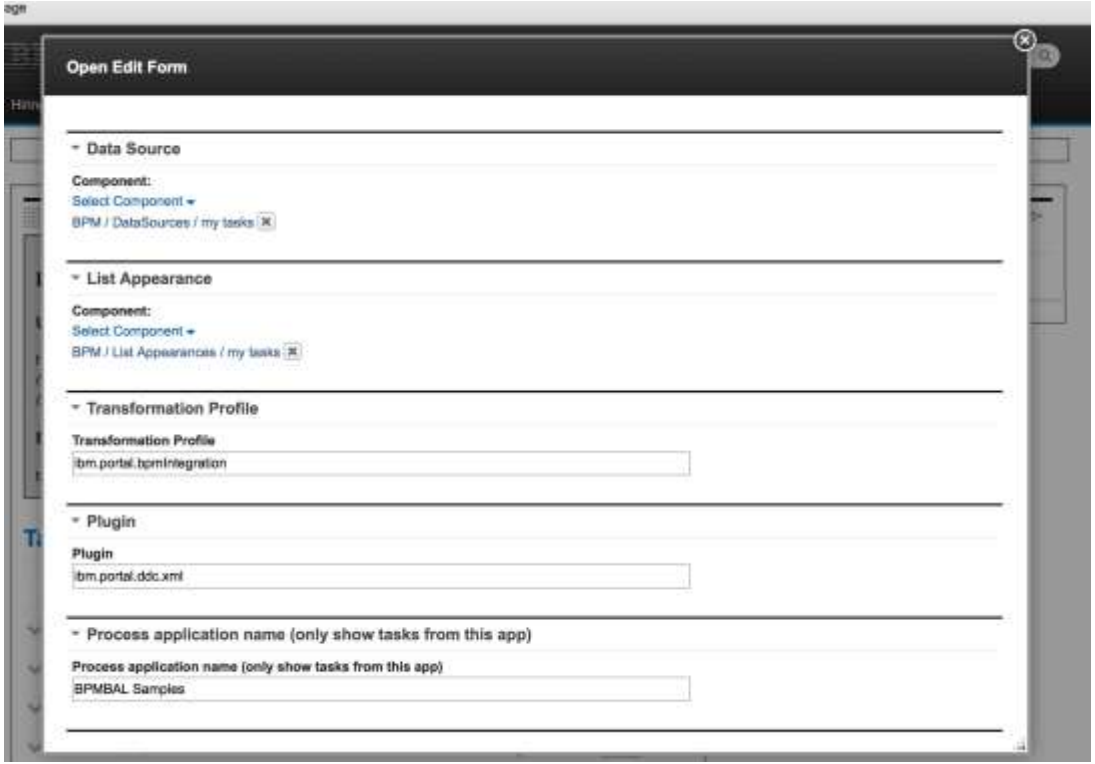


Digital Data Connector – Authoring Experience

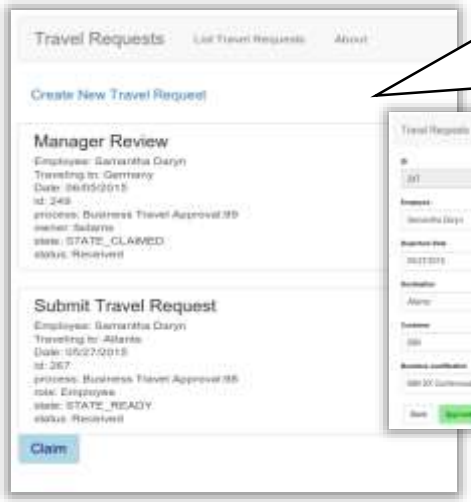
Adjust desired “look and feel” by modifying the Presentation Template



Digital Data Connector – Authoring Experience



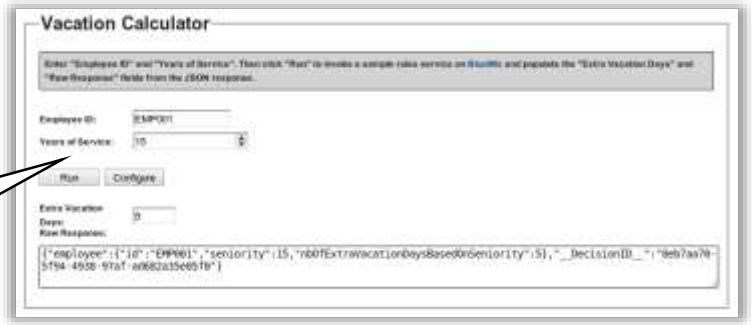
Script Portlet Applications



Angular/Bootstrap Script Portlet calling BPM services

Script Portlet calling Bluemix Workflow

Script Portlet calling Bluemix Business Rules



Samples running at
https://developer.ibm.com/digexp/docs/docs/script-portlet/business-process-manager-sample-ibm-script-portlet-websphere-portal/

IBM Bluemix

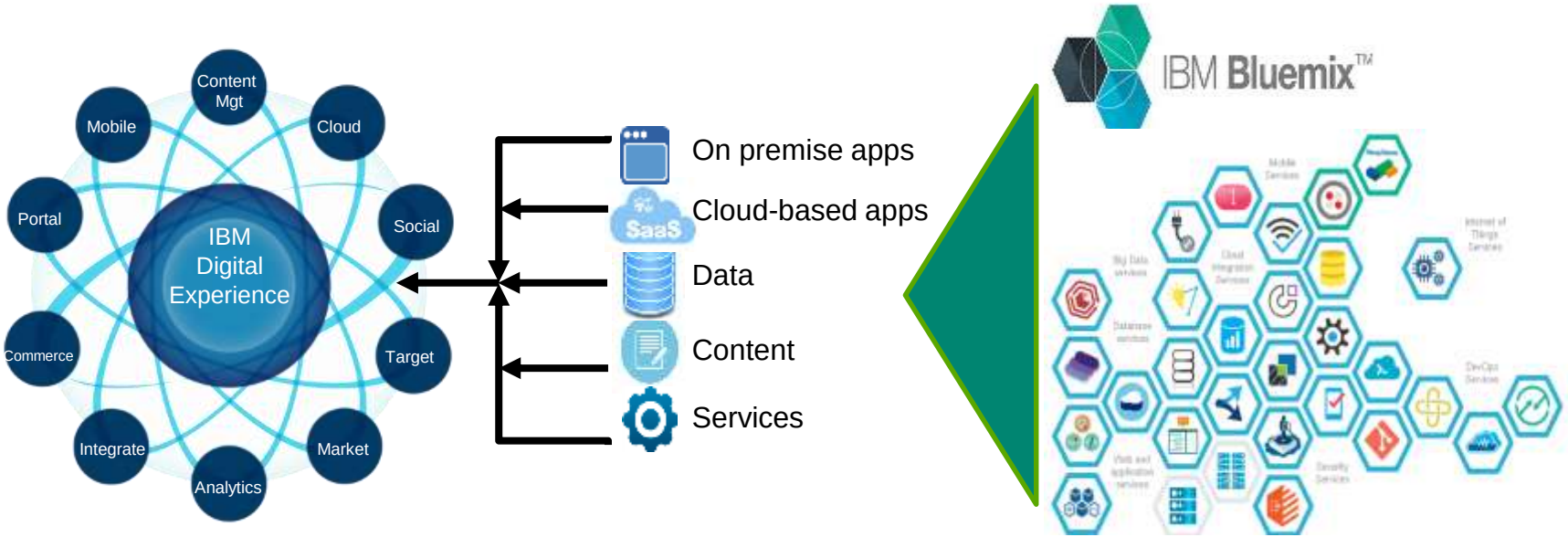
IBM Bluemix

- BlueMix is a Platform as a Service offering
- A cloud-based platform for rapidly building, managing and running applications of all types (web, mobile, big data, social, ...).
- Allows developers to use capabilities (services) from IBM or ecosystem partners in a pay-as-you-go model in the cloud.
  - Running on IBM SoftLayer infrastructure (IaaS)
  - Based on open-standards (OpenStack, CloudFoundry)

SOFTLAYER®
an IBM Company

Digital Experience is a natural extension of IBM Bluemix

The Bluemix ecosystem contains both headless and visual services – which form a subset of an overall experience “on the glass”



IBM DX and Bluemix Value Proposition

- IBM Digital Experience (DX) focuses on building personalized user experiences by aggregating applications, services, data, and persuasive content
- IBM Bluemix is a platform for “born on the cloud” solutions with a set of runtimes and services provided by IBM and partners that enable developers to quickly build and operate new services and applications
- Our value proposition with Bluemix is three-fold:
  - Enable line of business users to integrate and consume Bluemix services and apps into a personalized user experience through prescribed patterns
  - Opportunistically produce discrete services of the IBM DX platform via Bluemix that can be discovered and consumed by new applications (e.g. adaptive web content)
  - Natively run DX components within Bluemix , i.e. Portlets (based on Liberty Runtime)

Topologies

- Combining IBM Bluemix and IBM Digital Experience
- Ditalal Experience can
  - consume from IBM Bluemix
  - can run within IBM Bluemix
  - can produce into IBM Bluemix

Produce

Why would I combine Bluemix and MACM?

IBM Bluemix

- Many cool services can be easily combined to cool applications (e.g. Translation, datastore, mobile push, …)
- Different programming languages are possible (e.g. NodeJS)
- Application is nicely isolated within a cloud-based runtime

IBM Digital Experience / MACM

- Powerful web content management system (authoring user experience)
- Governance based on a review and publishing workflow
- Content can be easily embedded in any kind of application
- Clean seperation of code/development and content/authoring

Why would I run Portlets within Bluemix?

IBM Bluemix

- Application is nicely isolated within a cloud-based runtime
- Quickly accessible development environment - No install necessary
- Flexible licensing model for developers (pay as you go)
- Developed deliverables can
  - either be consumed directly by other systems
  - or be exported to a production environment

Portlet Programming Model

- Best practice to develop re-usable UI components
- Standardized „Contract“ defined component behavior (life-cycle, packaging, cross-component eventing, customization, …)

Why would I use Bluemix Apps in a Portal?

Consume

IBM Bluemix

- Application/Component is nicely isolated within a cloud-based runtime
- Application can be developed independetly of other applications and of ist consuming web sites

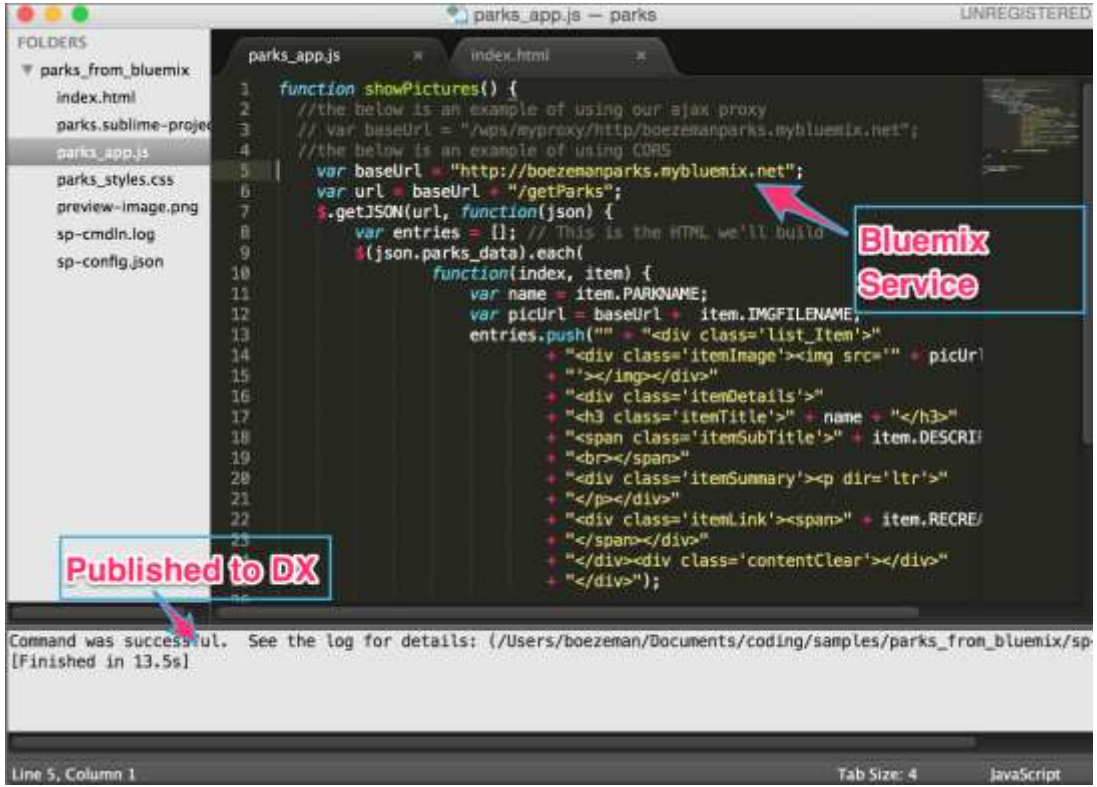
IBM Digital Experience

- Powerful framework to aggregate re-usable UI components, data sources and web content
- Strong integration capabilities
- Personalized web UI
- Secure front-end
- Business user facing tooling for visual web page assembly and inline editing of content of other application artifacts

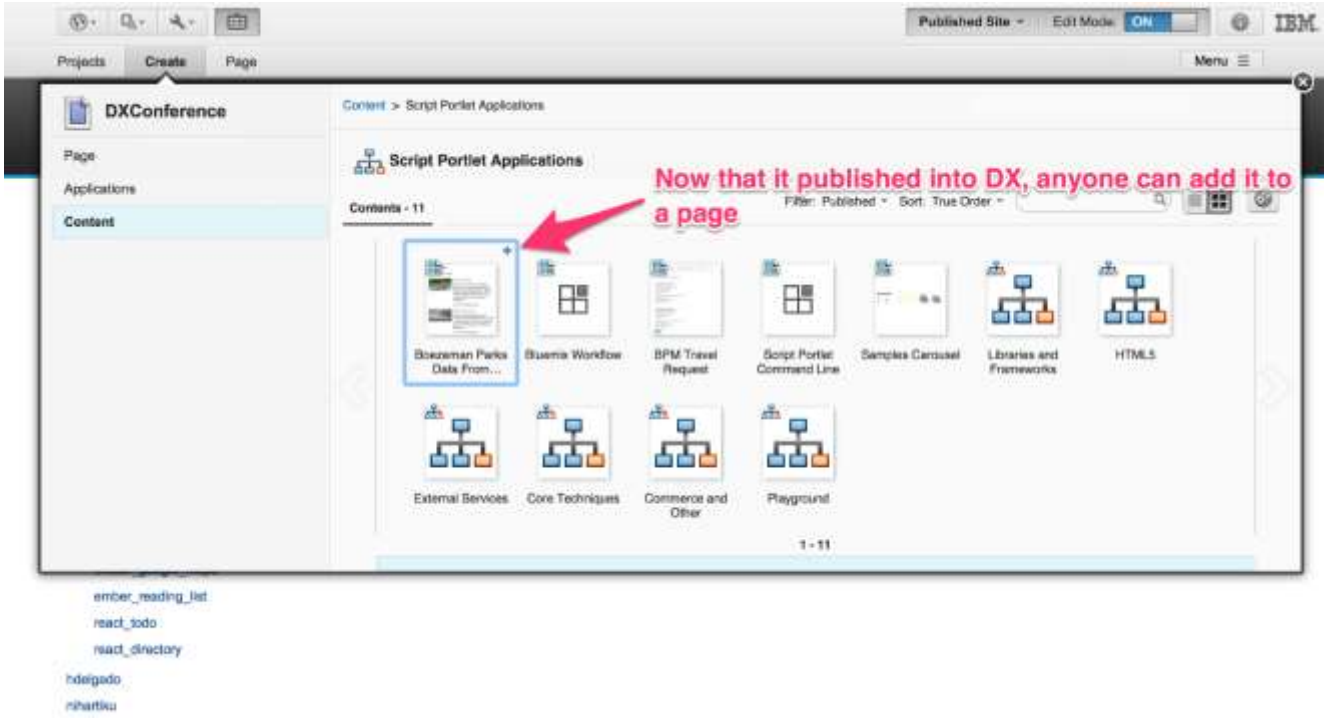
Retrieving JSON Data from a Bluemix Service


```
{ "parks_data":
   [

     {
     "POSTALCODE": "95120-6099",
     "PHONE": "408-927-1080",
     "CITY": "San Jose",
     "LONGITUDE": "-121.805421",
     "PARKNAME": "San Jose Park",
     "DESCRIPTION": "Down by the bay you will find plenty to do at the Bayside Park,
     featuring multiple sports related fields,
     sailing and fishing, along with barbeque and restroom facilities.",
     "COUNTRY": "US",
     "IMGFILENAME": "/parks/images/MB1BeachMarshHiking.jpg",
     "ID": "1336143856675",
     "STATE": "CA",
     "ADDRESS2": "",
     "LATITUDE": "37.212379",
     "ADDRESS1": "650 Harry Road",
     "RECREATIONFACILITIES": "bbq,restrooms,hiking,biking,running"
     },

     {
     ……
```

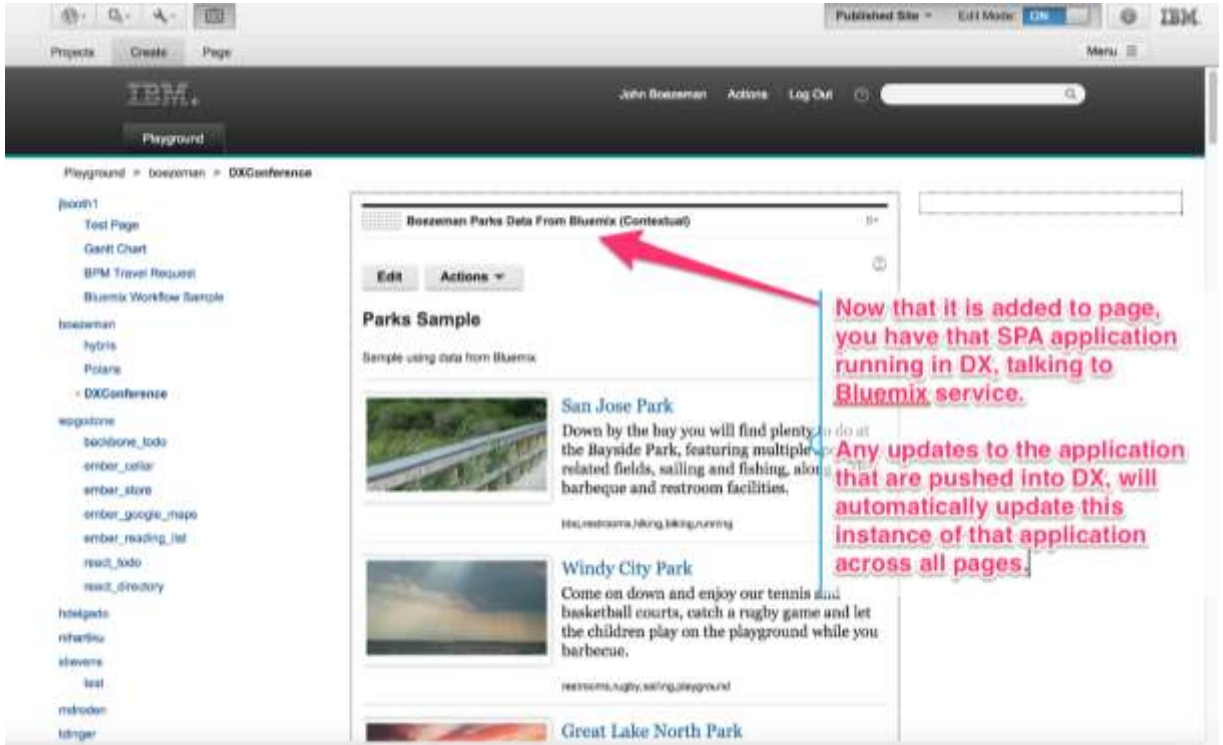
Sample Script to access a Bluemix Service



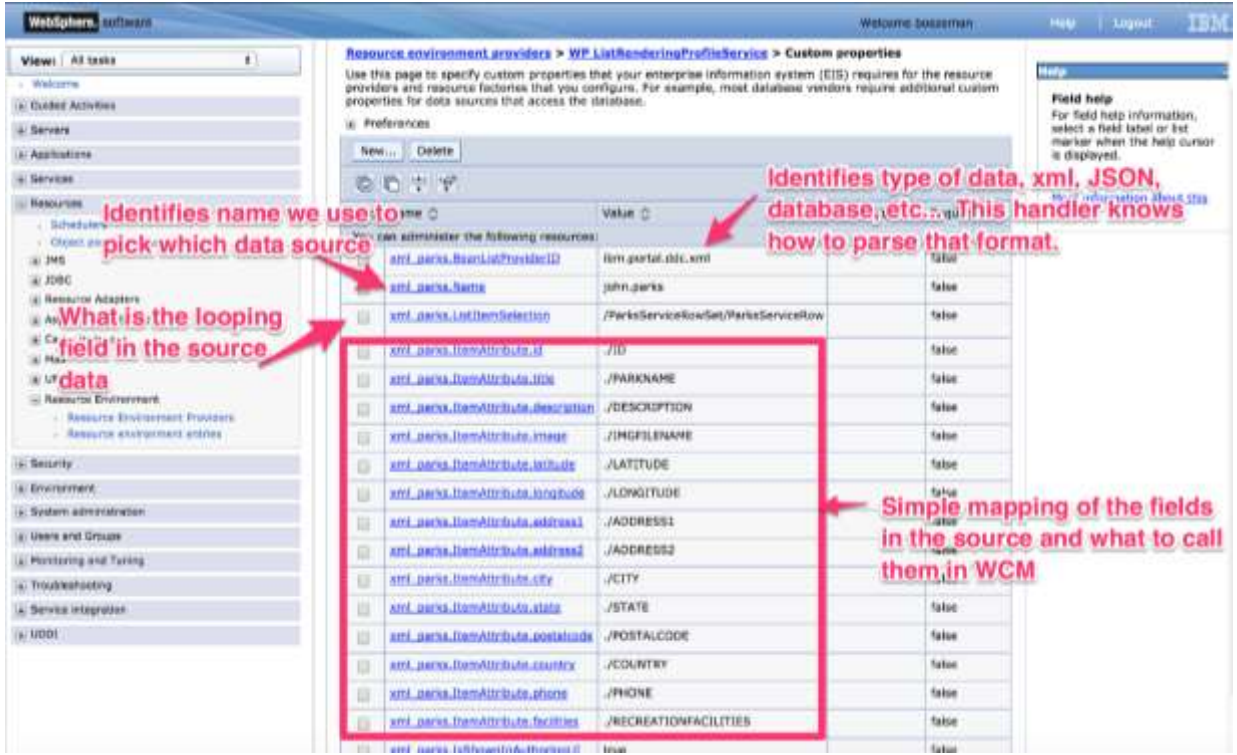
Using a Script Portlet (I)



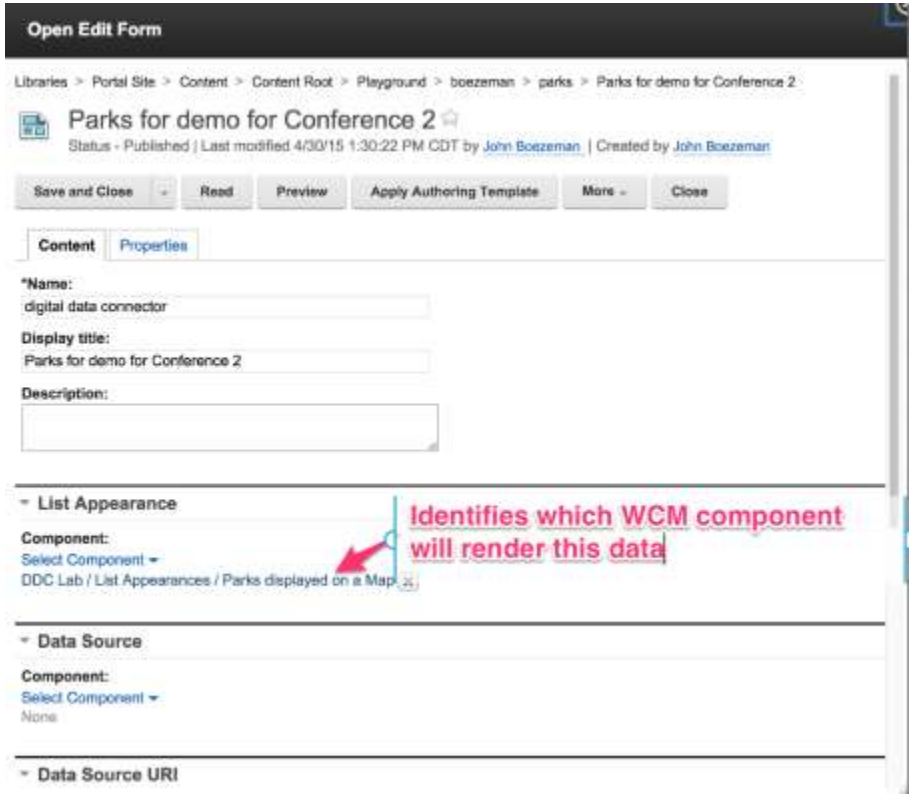
Using a Script Portlet (II)



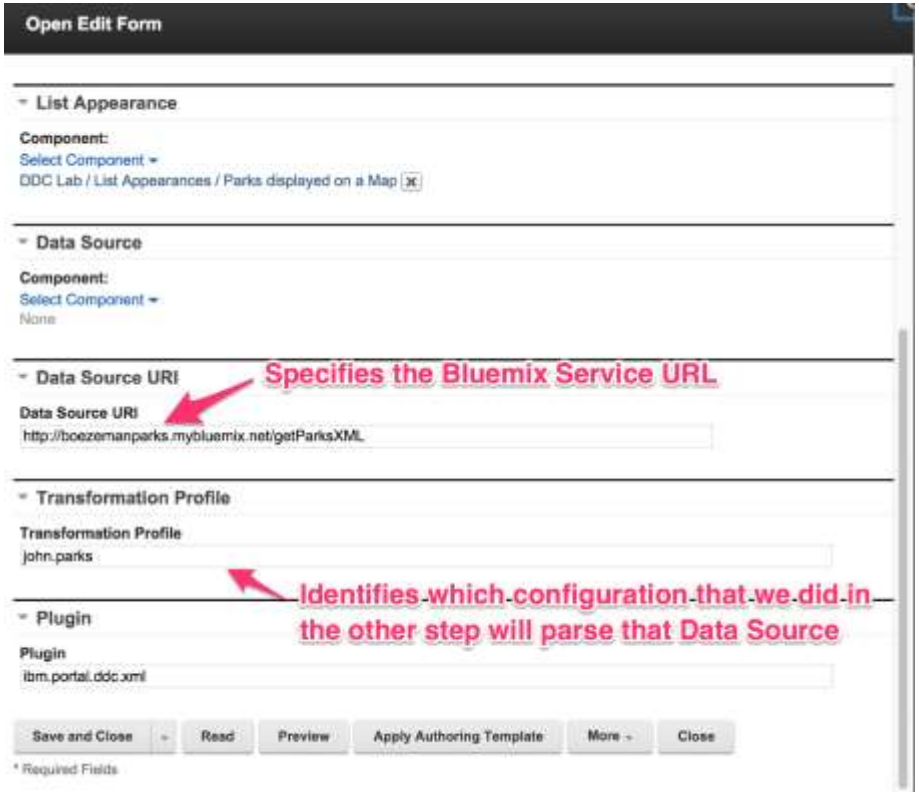
Consuming Bluemix Service via DDC



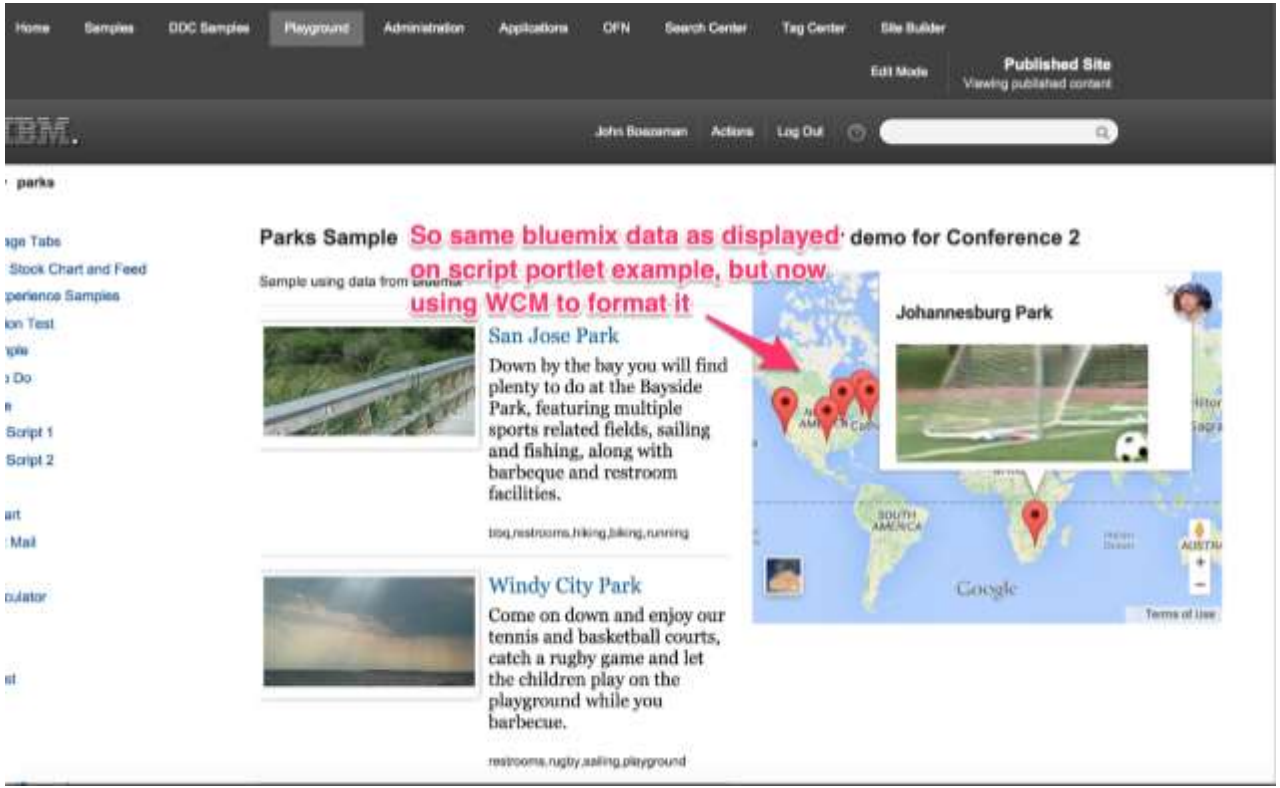
Consuming Bluemix Service via DDC



Consuming Bluemix Service via DDC



Consuming Bluemix Service via DDC



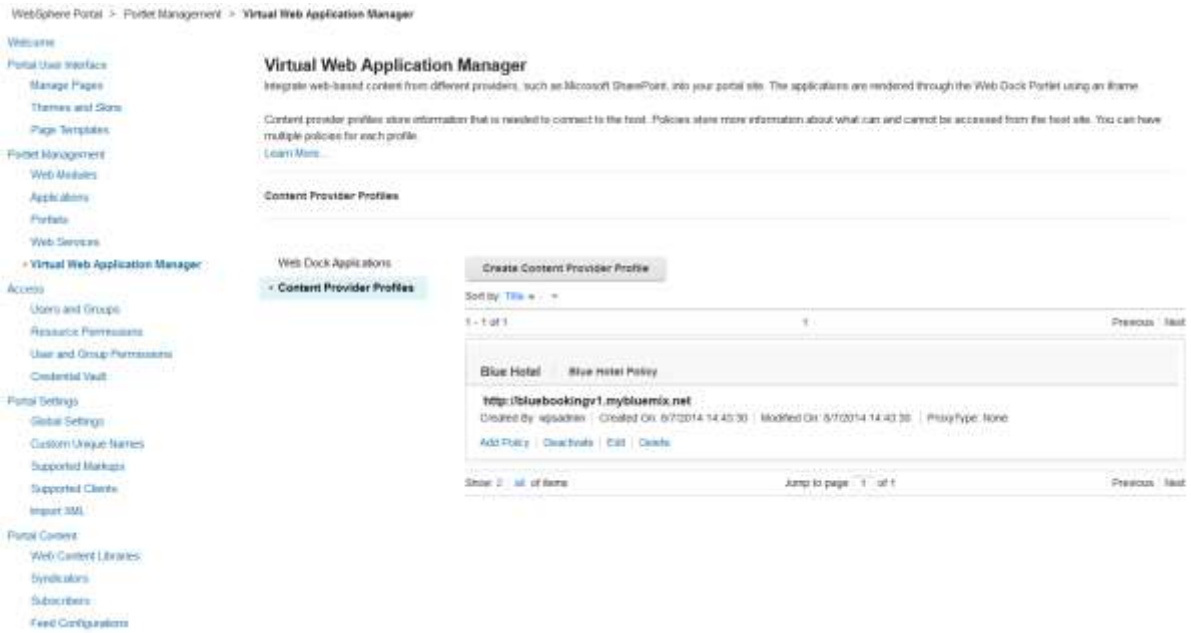
Consuming Bluemix Markup via WAB

http://www.ibm.com/developerworks/cloud/library/cl-hotel-rules-app/index.html

“This sample booking application shows the possibilities of integrating the Rules service with a Node.js application in the cloud, while also taking advantage of the ease of deployment and the scalability of the Bluemix platform.”

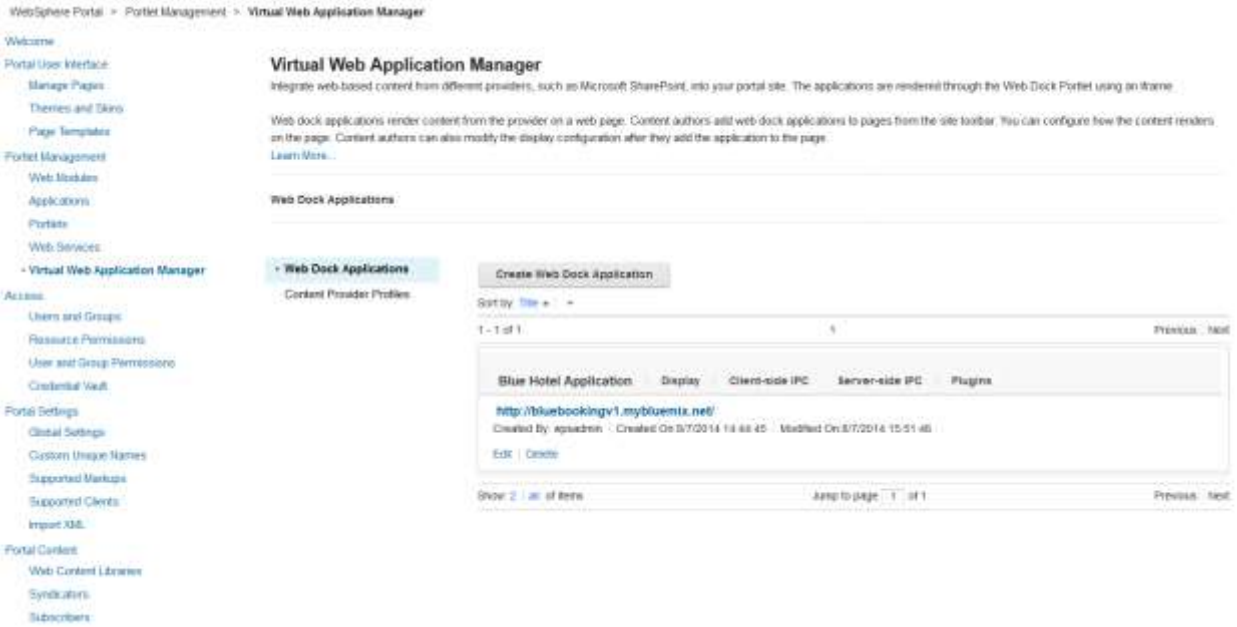
Use the Web Application Bridge to insert your Bluemix App into your Web Site (Step 1)

Configure a Content Provider Profile for the application which is exposed by Bluemix as `bluebookingv1.mybluemix.net`



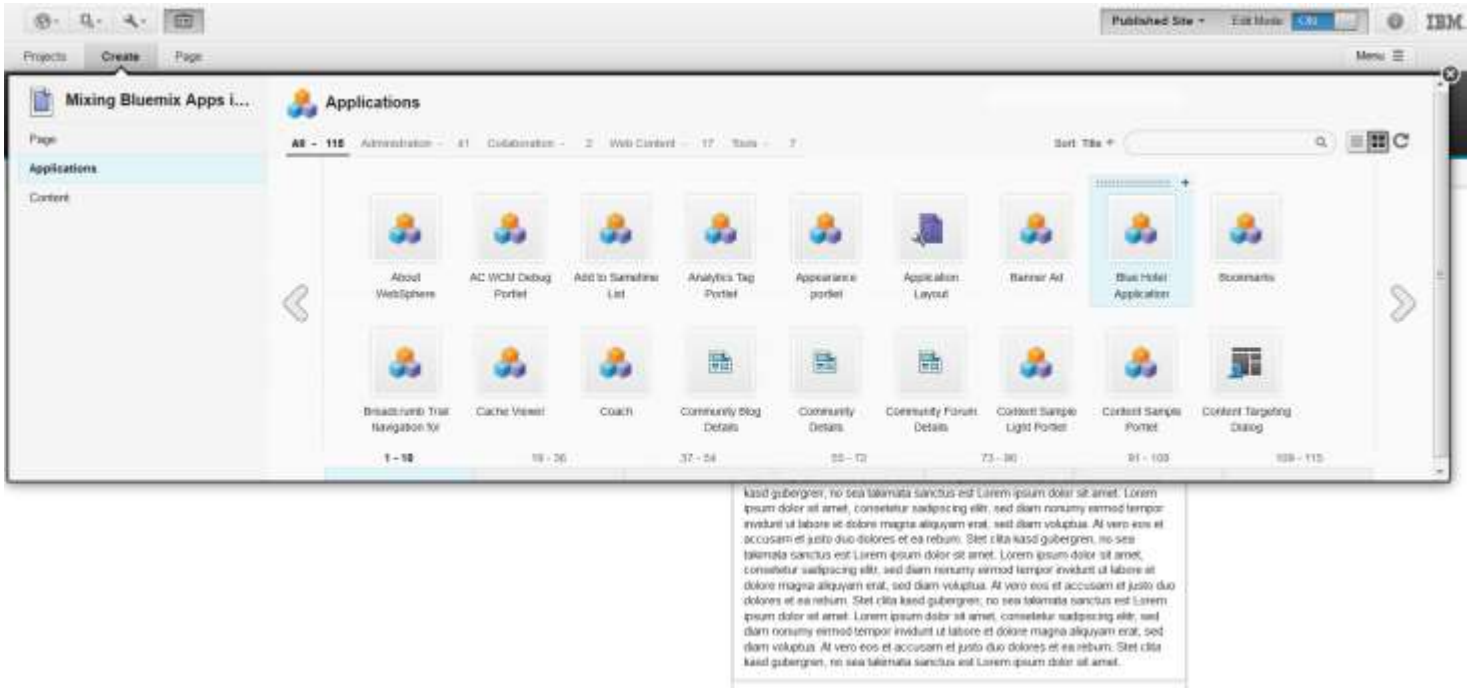
Use the Web Application Bridge to insert your Bluemix App into your Web Site (Step 2)

Configure a Web Dock Application, which exposes the Bluemix Hotel Application as a re-usable „Lego Brick“ inside the Portal world.



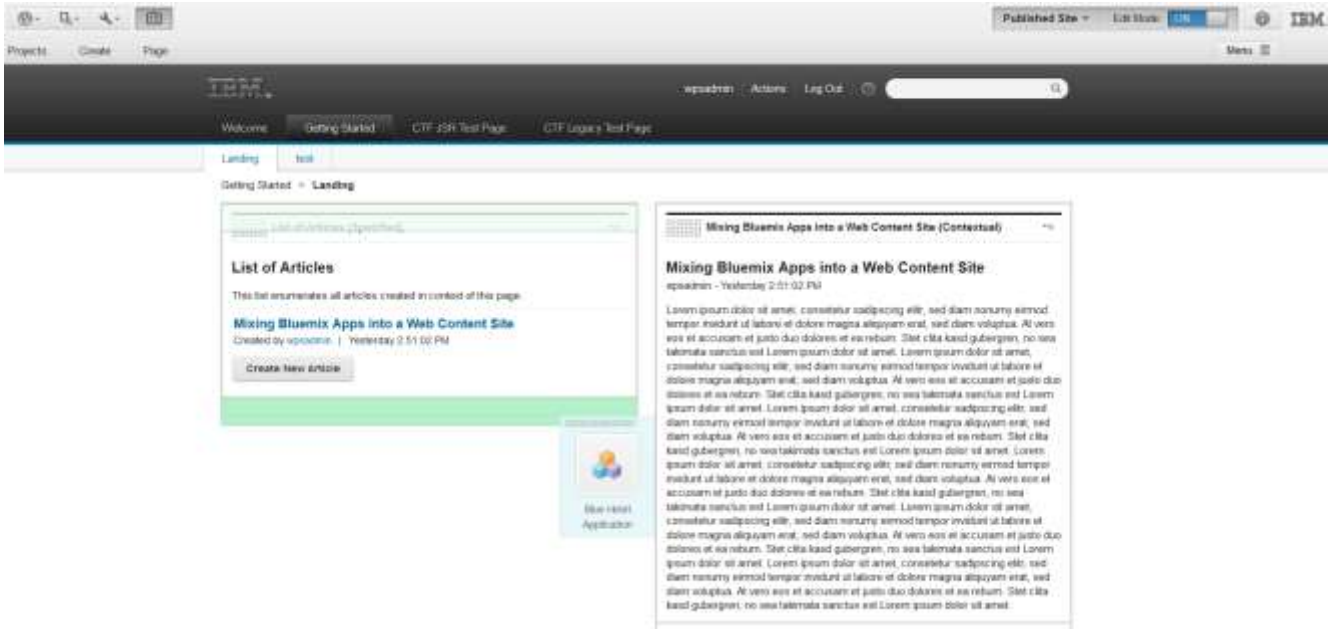
Use the Web Application Bridge to insert your Bluemix App into your Web Site (Step 3a)

Drag and Drop the Bluemix Hotel Application from the Toolbar ...

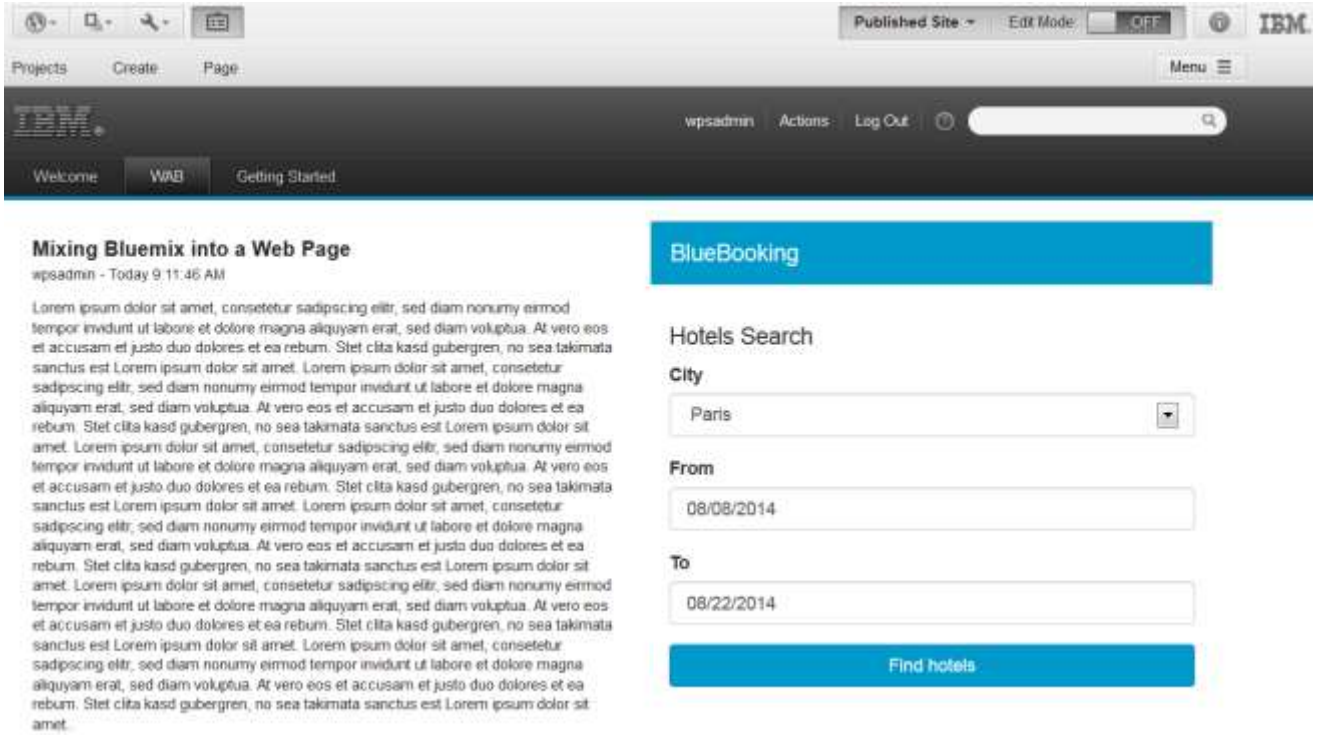


Use the Web Application Bridge to insert your Bluemix App into your Web Site (Step 3b)

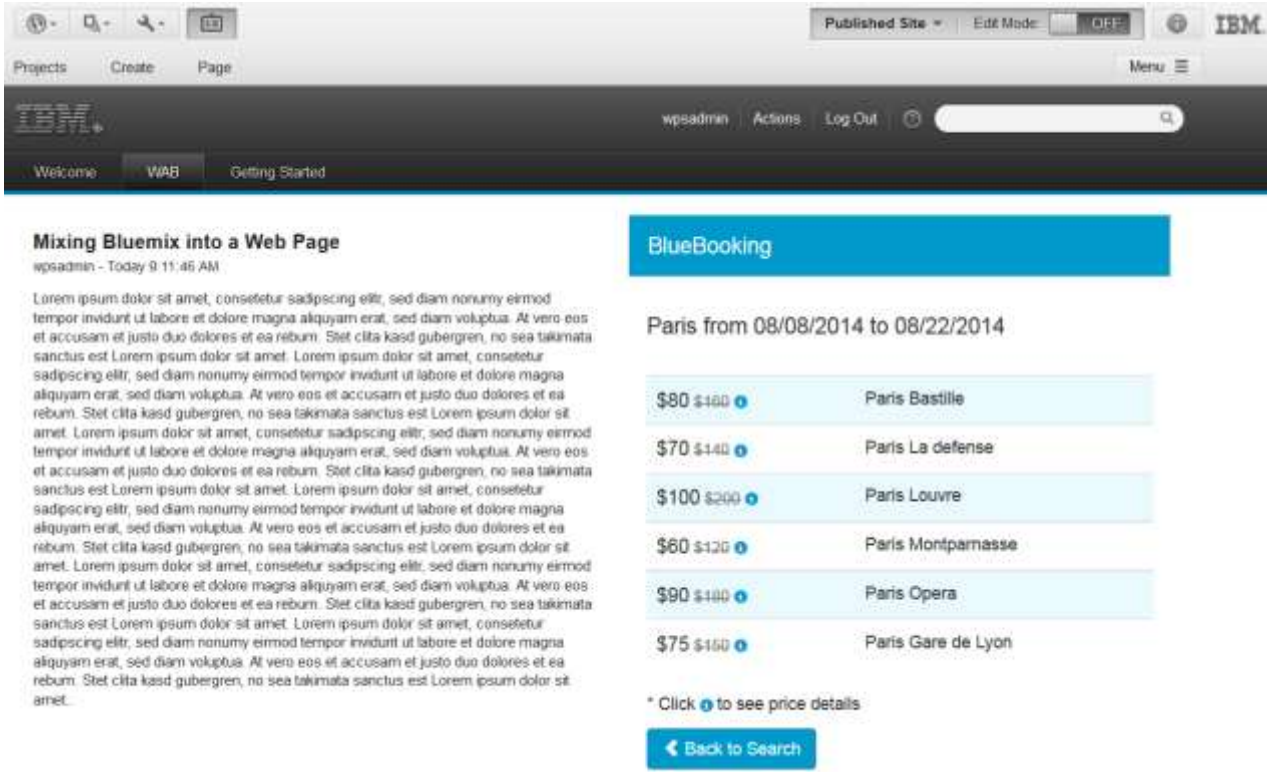
... to its place within the target Portal Page (along with any other application or web content, which the page author might like to add)



And we are: Ready to be published ....



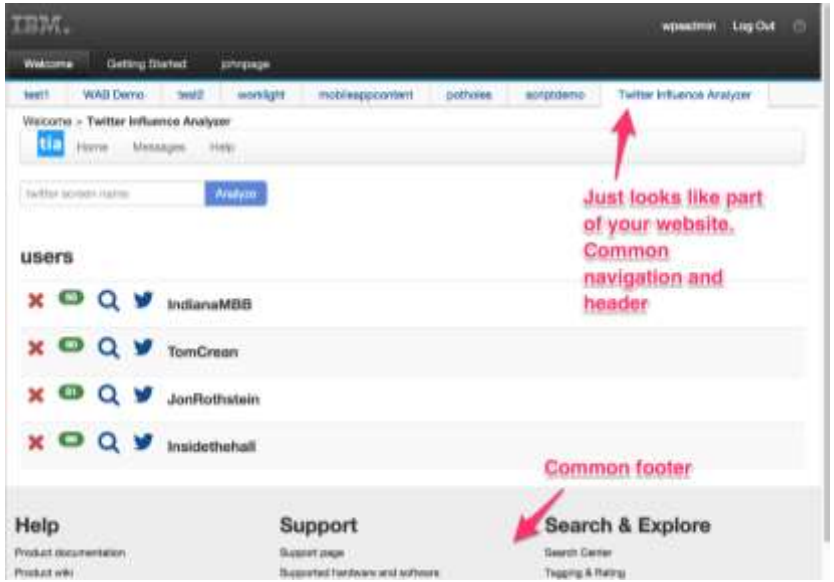
.... And ready to be used



Web Application Integrator (WAI)

Display portal navigation inside a Bluemix application

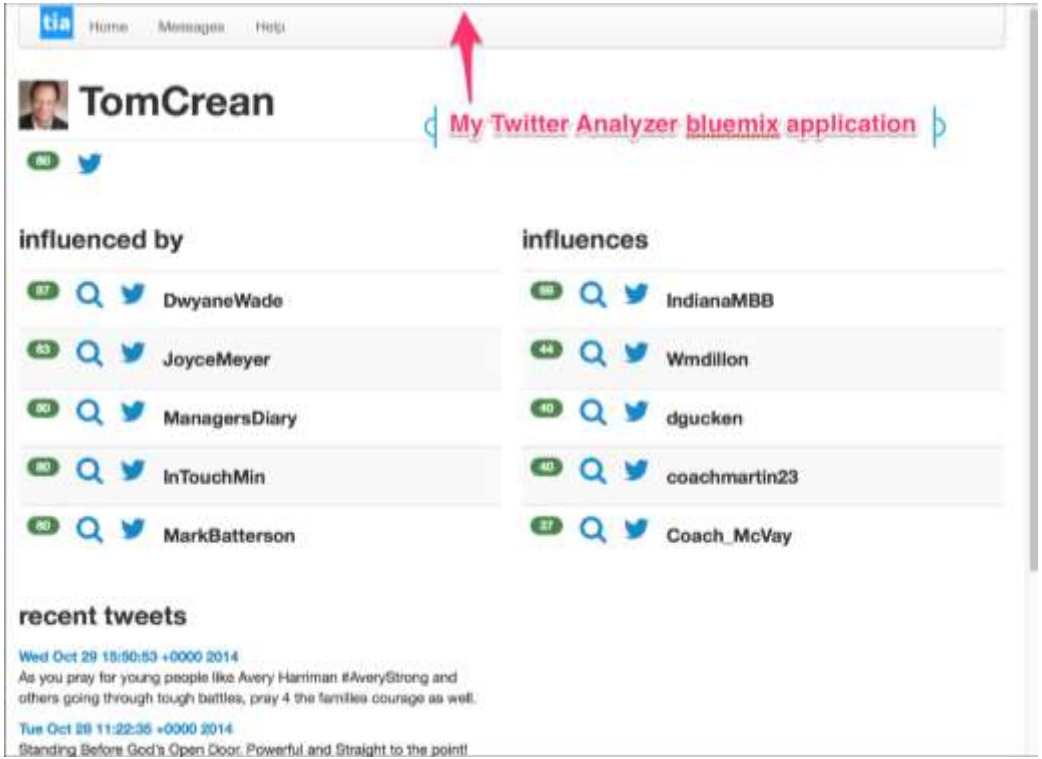
- Simplicity of iFrames without the drawbacks – No double header or dual navigation
- HTML <script> tag executes and can “inject” markup for portal navigation, launch menu, and page breadcrumbs into web app
- Clicking on any DX specific navigation tab will take you back into DX website. Clicking on any DX URL page tab will hit the underlying URL.



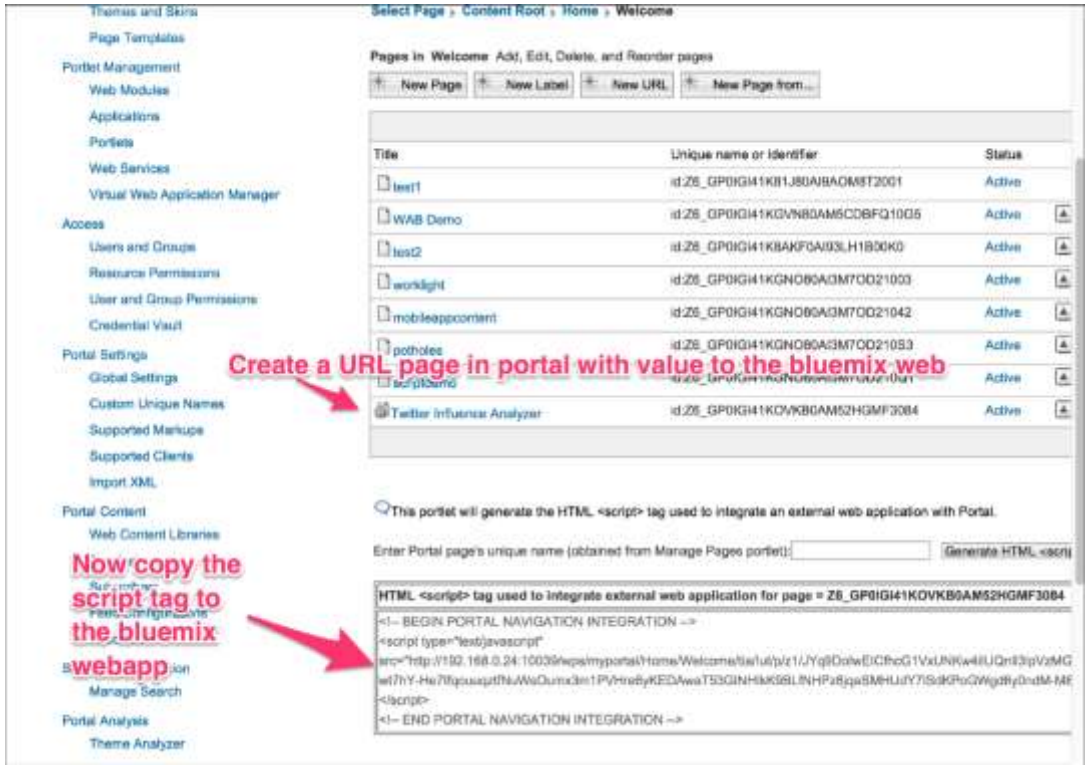
Web Application Integrator

Advantage: Federation of different web applications/sites with a common navigation/theme provided by IBM DX

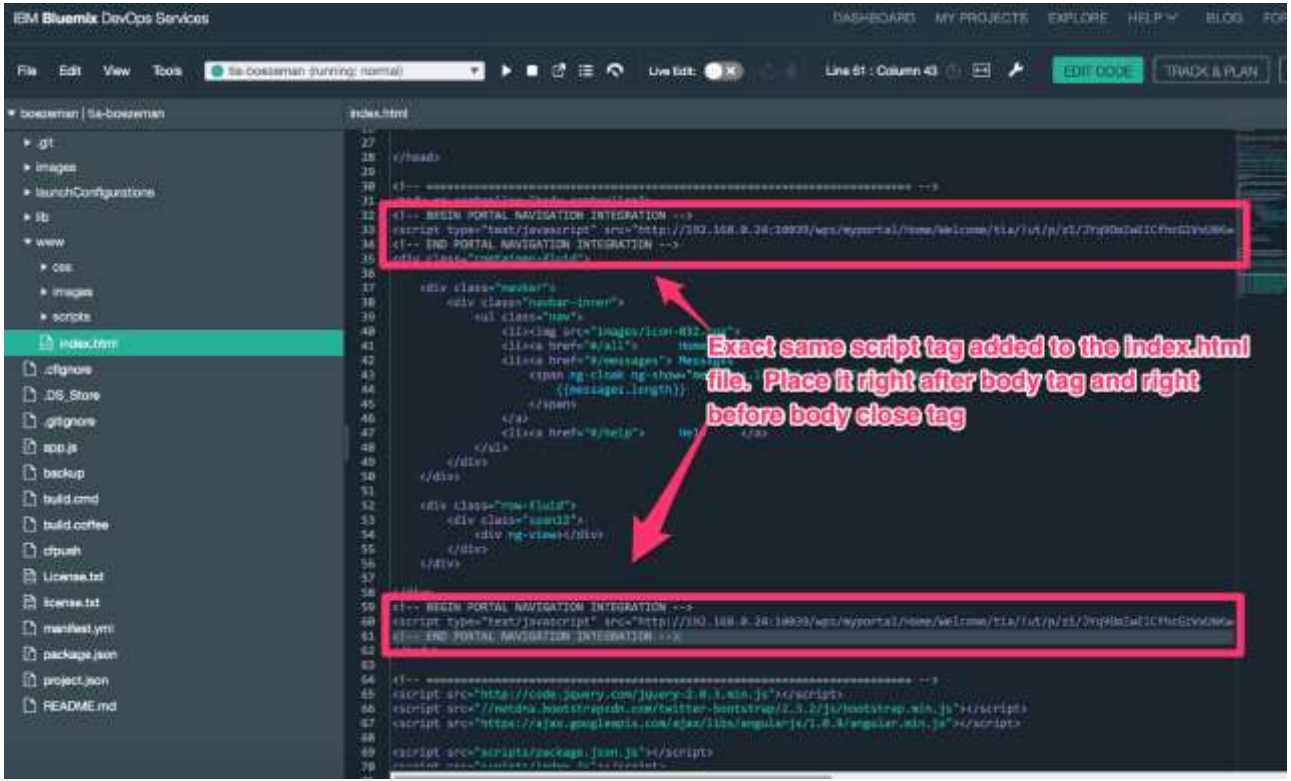
A WebSite built within Bluemix



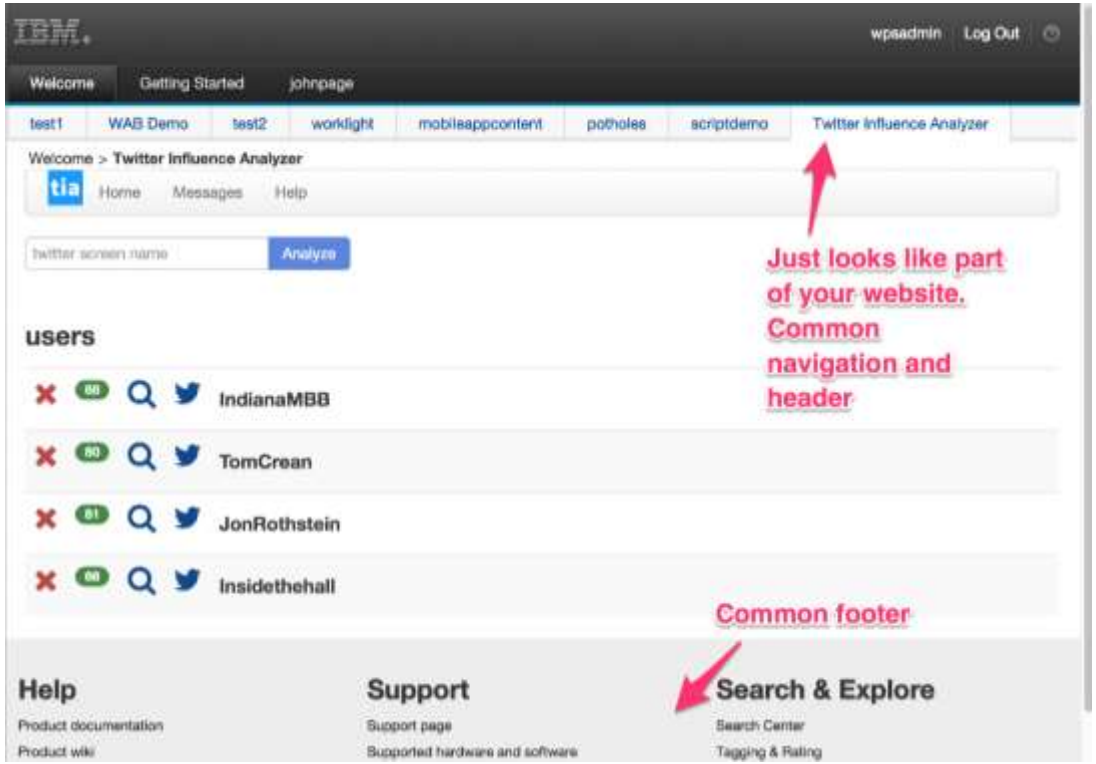
Preparing access to the Portal Navigation



Integrating Bluemix Application seamlessly with Portal



Integrating Bluemix Application seamlessly with Portal



Single-Sign-On: Using CORS on Bluemix

- Cross-origin resource sharing (CORS), allows resources to be requested from another domain outside the domain of the main page request. See for more info: http://en.wikipedia.org/wiki/Cross-origin_resource_sharing
- Supported only by modern browsers
- Works against any of the bluemix backends (Ruby, Node.js, PHP, Python, Liberty)
- The whitelist controls what hostnames your bluemix service will allow to access your service. You can specify wildcard, if you want your service to be accessed from any host
- For the Node.js demo, we will use the CORS module

Single Sign On

Advantage: Single Sign-On for users across multiple sites/web applications

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Single-Sign-On: Using Ajax Proxy with Bluemix

- DX provides an Ajax Proxy out of box
  - Provides a server side proxy, to tunnel ajax requests to other domains through the current domain
  - No requirement on the browser, like CORS As a result this works across all browsers and versions
  - Admin control of policies(urls) that are allowed to passthru. Any combination of wildcard, sub-domain, and specific url are supported.
  - Admin control of http methods that are allowed, like get, post, etc..
  - Support for service mapping to credential vault slot. This allows auto-authentication from stored credential to a service.
  - Requires admin rights to update configuration
  - Does add load on server to proxy the go-between the browser and bluemix service

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Single-Sign-On: Using Ajax Proxy with Bluemix

- Create bluemix_proxy.xml

```
<?xml version=”1.0″ encoding=”UTF-8″?>
<proxy-rules xmlns:xsi=”http://www.w3.org/2001/XMLSchema-instance”
xsi:noNamespaceSchemaLocation=”http://www.ibm.com/xmlns/prod/sw/http/outbound/proxy-config/2.0″>
<policy url=”http://mt-nodejs-boezeman.mybluemix.net/*” name=”bluemix”>
<actions>
<method>POST</method>
</actions>
</policy>
</proxy-rules>
```

- Update configuration in the server by calling ConfigEngine command
  - ConfigEngine.sh create-outbound-http-connection-config -DConfigFileName=bluemix_proxy.xml

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Digital Experience on Cloud

Reduce time to market and delivery risk

We set up and configure IBM Digital Experience, so your project can deliver sooner.

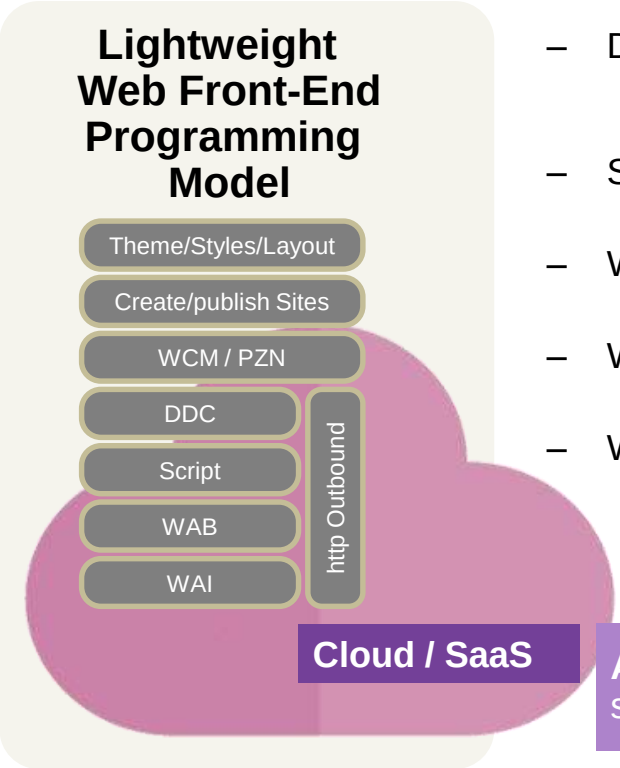
Lower your costs

Eliminate the need to procure servers, hire an operations team or purchase supporting software.

Focus on your customers

Robust IBM SaaS capability frees you from day-to-day operations and lets you focus on your customers

Taking Advantage of a Digital Experience on Cloud Offering



- Digital Data Connector (DDC)
  - CRUD-operations on XML based services, rendered via WCM rendering portlet (and formatted via WCM presentation templates)
- Script Portlet
  - Author script code artifacts within a WCM based scripting portlet (managed by WCM)
- Web Application Bridge (WAB)
  - Display 3rd party markup within a reverse proxy portlet („webdock portlet“)
- Web Application Integrator (WAI)
  - Display remotely executed portlets within a WSRP consumer portlet
- WSRP consumer
  - Display remotely executed portlets within a WSRP consumer portlet

Advantage: IBM Hosted SaaS solution to build entire web sites, including web content and integration patterns

Summary

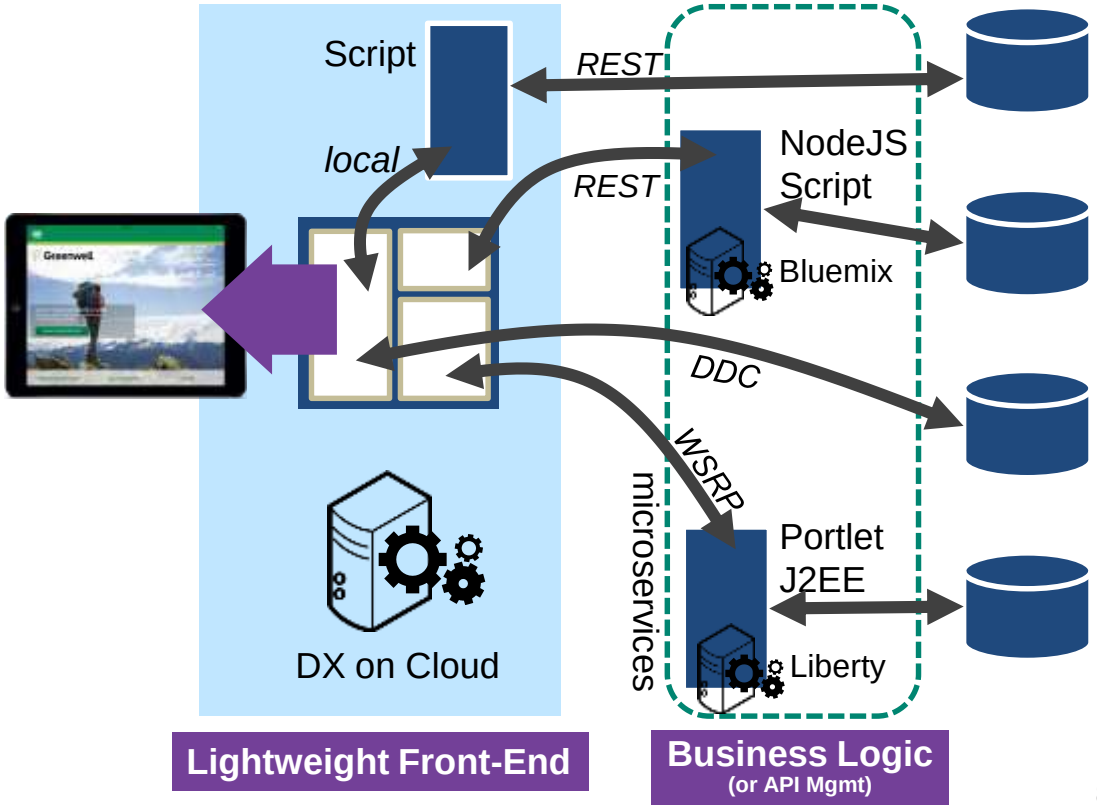
Summary: Programming and Integration

Line of Business Driven Integration Options

Programming Options

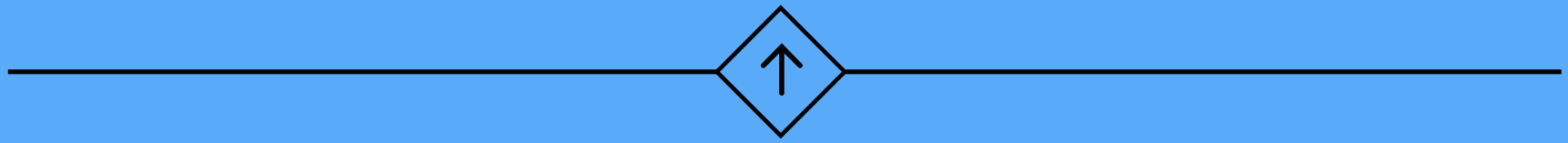
Trend: Distributed hybrid systems

- Mix and match Runtimes
- Node, J2EE, ….
- Connect cloud and on-premises deployments to a modern hybrid topology
- Microservices architecture
- Takes advantage of DX integration capabilities
- DDC, Script, WAB, WSRP, …



Good Reading …

Vielen Dank



For Additional Information

IBM Digital Experience Solutions

http://www-01.ibm.com/software/collaboration/digitalexperience

WebSphere Portal and IBM Web Content Manager Information Center Wiki

http://www-10.lotus.com/ldd/portalwiki.nsf/

IBM Digital Experience Demonstrations:

http://www.youtube.com/user/IBMXWebX

IBM Digital Experience Developer

http://developer.ibm.com/digexp

IBM Software Business Solutions Catalog

https://greenhouse.lotus.com/catalog/

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