

IBM Commerce

**Fueling Cognitive,
Customer-Centric, IBM
Digital Experience with
API Economy**



Dr. Thomas Stober

IBM Digital Experience

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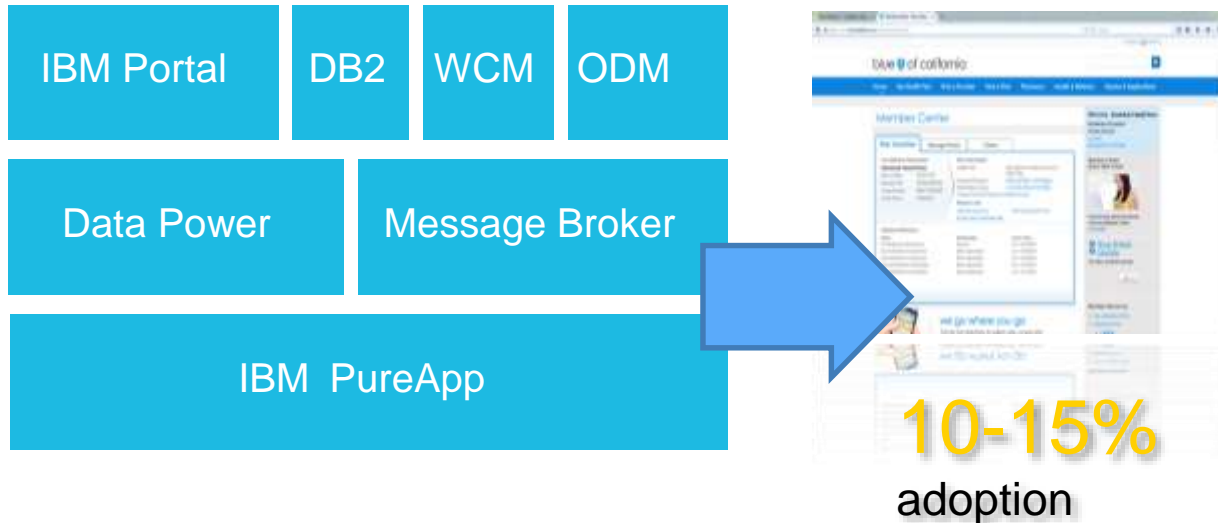
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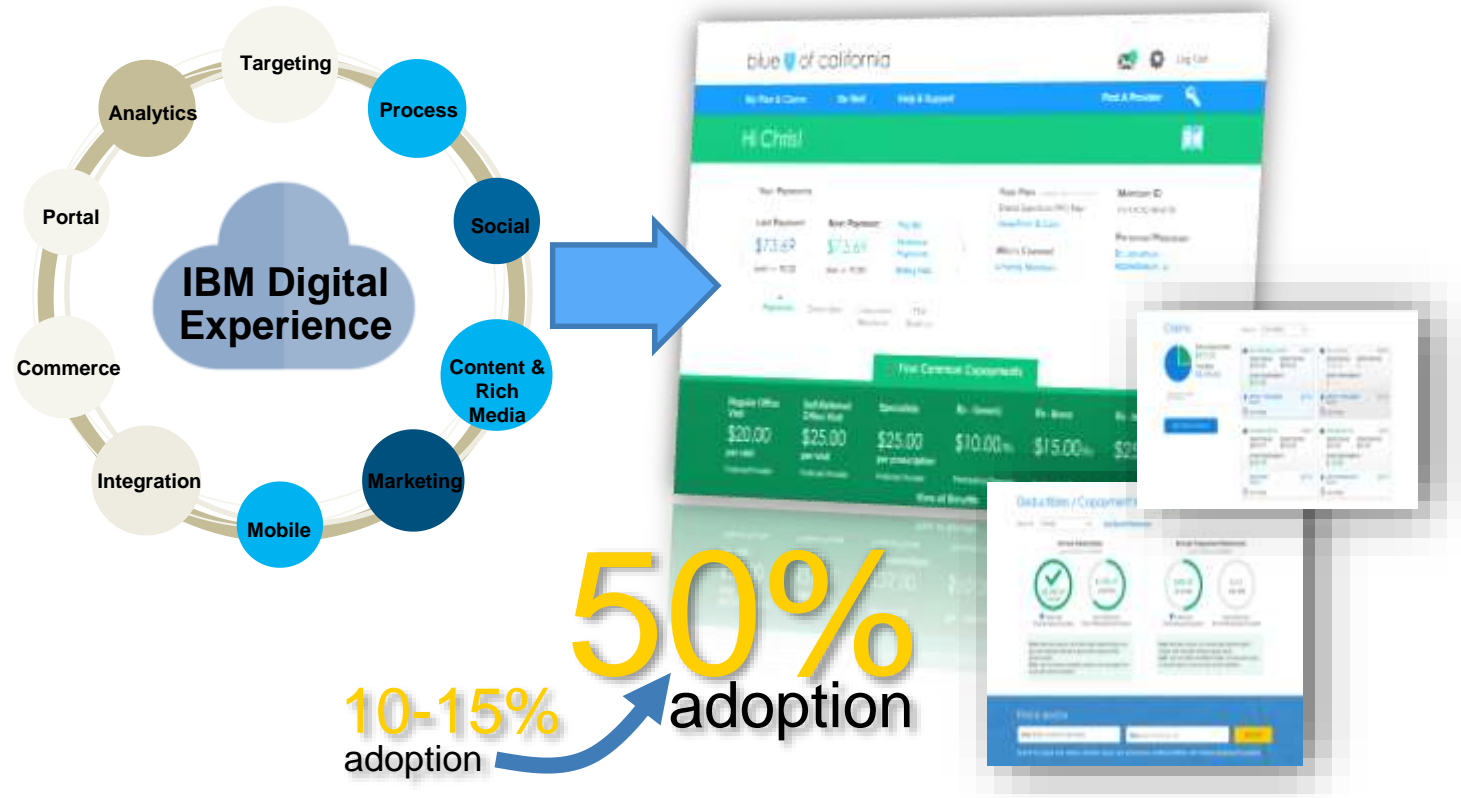
Setting the Scene

Example: Blue Shield of California Re-Architecting the Back-End IT

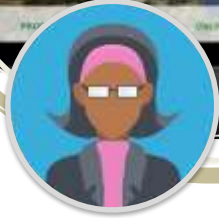
- Their Mission: Ensure all Californians have access to high-quality health care at an affordable price
- They invested to build a strong, flexible system of record with great optimization and cost savings for straight through processing....
- ... but their Systems of Engagement weren't delivering the users



Example: Blue Shield of California: Member Center Re-Design: Developing a Digital Experience



customer experience teams adaptive, personal relevant managed by the business



Greenwell

START YOUR EXPERIENCE NOW

Start your experience now

Start your experience now

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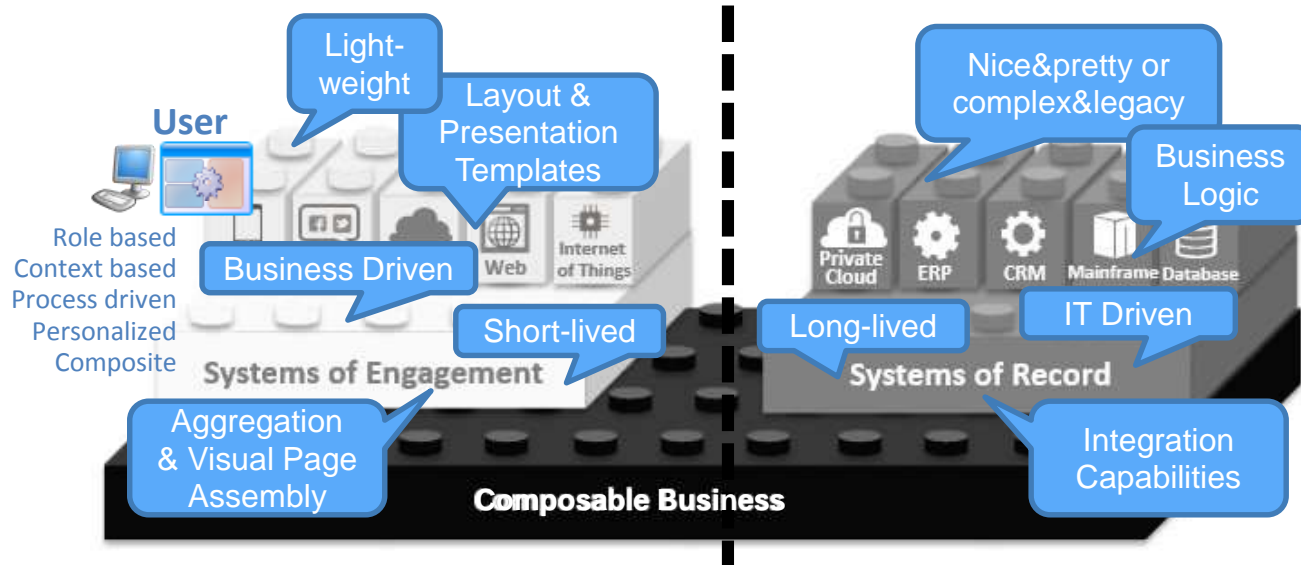


Simplicity

There's a lot of technology which enables Line of Business to deliver a great user experience.

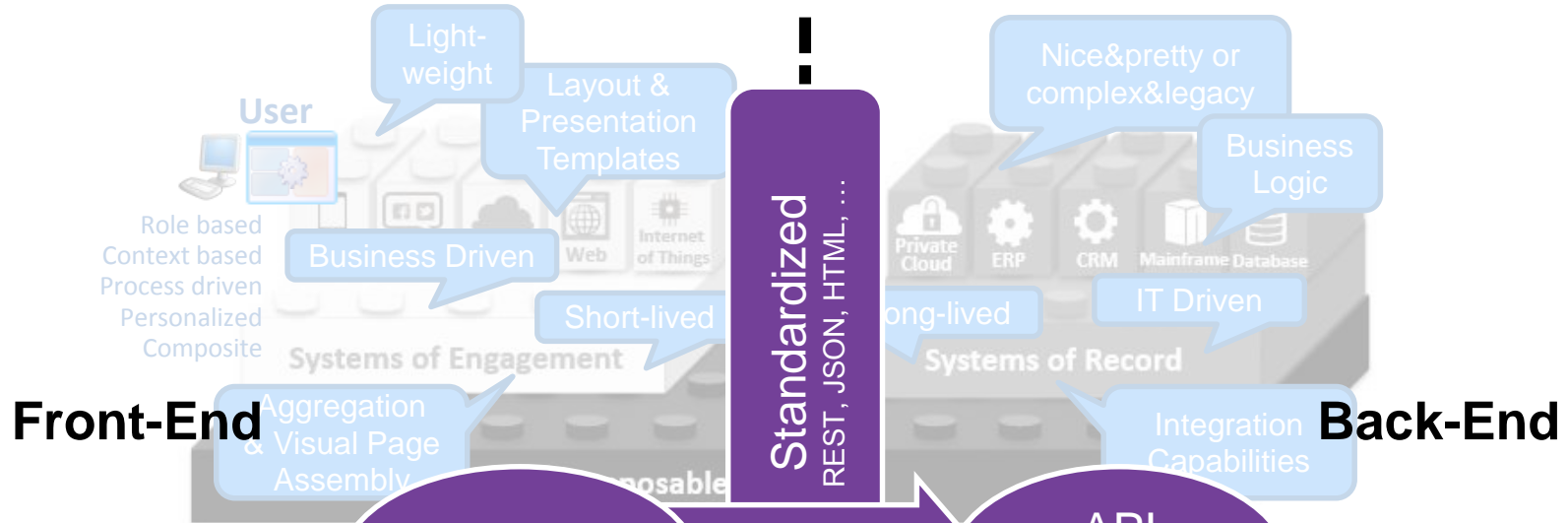
2-Speed Development

The traditional Portal Paradigma



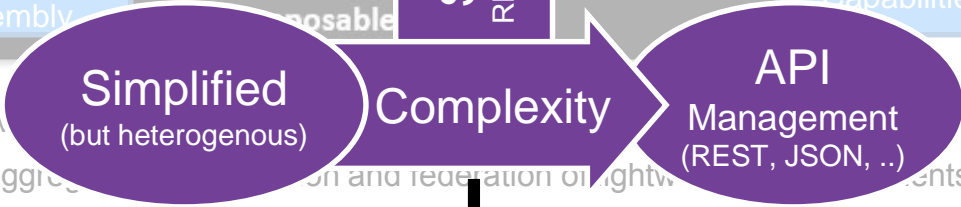
- Portal gives the **illusion** of a nicely integrated system!
- But it's aggregation, composition and federation of lightweight UI components and services
- Let Portal pick the right face for the result
- Let another tier own the business logic (controller) and the data (model)

The traditional Portal Paradigma



Front-End

Back-End



- Portal gives a simplified view of the complexity
- But it's aggregation, composition and federation of lightweight elements and services
- Let Portal pick the right face for the result
- Let another tier own the business logic (controller) and the data (model)

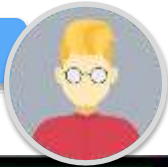
2-Speed Development (in a perfect world)

System of Engagement

- Lightweight Front-End Development
- Personalized, Ad hoc
- Focus on re-usable UI components
- Scripting, Web Content, Personalized Page Assembly

Line of Business

Front-End



XML, JSON, REST



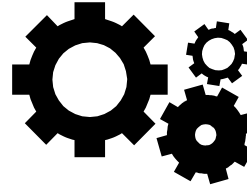
API Management

System of Record

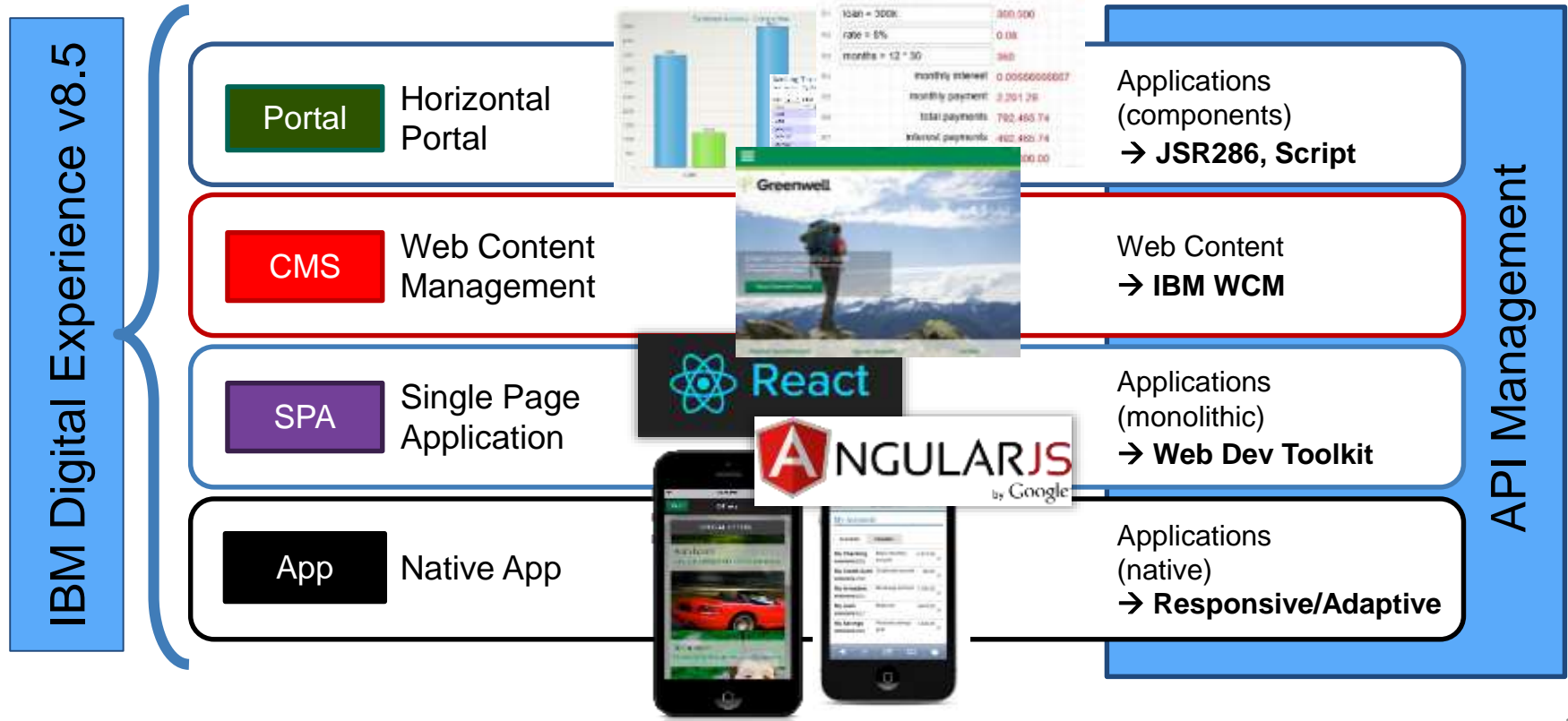
- „Serious“ Back-End Development
- Standardized, planned projects
- Focus on re-usable Business Logic
- J2EE, NodeJs,

IT

Back-End



Front-End Options (in a perfect world)



2-Speed Development (in reality)

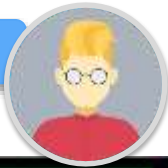
System of
Engagement

System of
Record

Bridging and Integration

- *API Interaction & Transformation*
(Strongloop, Castiron)
- *Front-End Integration*
(IBM Digital Experience)

Line of Business



Front-End



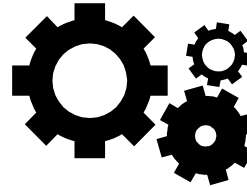
XML, JSON, REST

API Management

IT



Back-End



Bridging and Integration

API Interaction & Transformation

What do the Following Have in Common?



Coffee company goes digital, builds \$1.6B payments business, drives 21% of transactions



Car company offers connected car, improves driving experience, sells vehicle data to partners



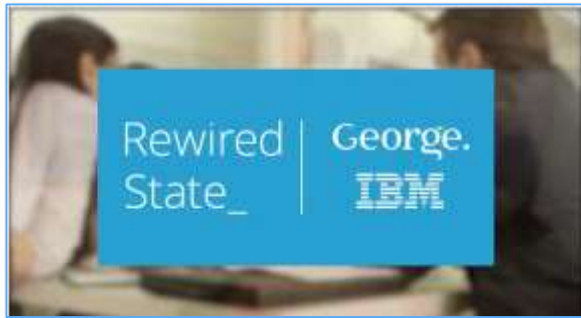
Bank spurs innovation by offering hackathons, integrates rewards program with retailer partners

Digital disruption fueled by API's

New approach to Innovation: Hackathons

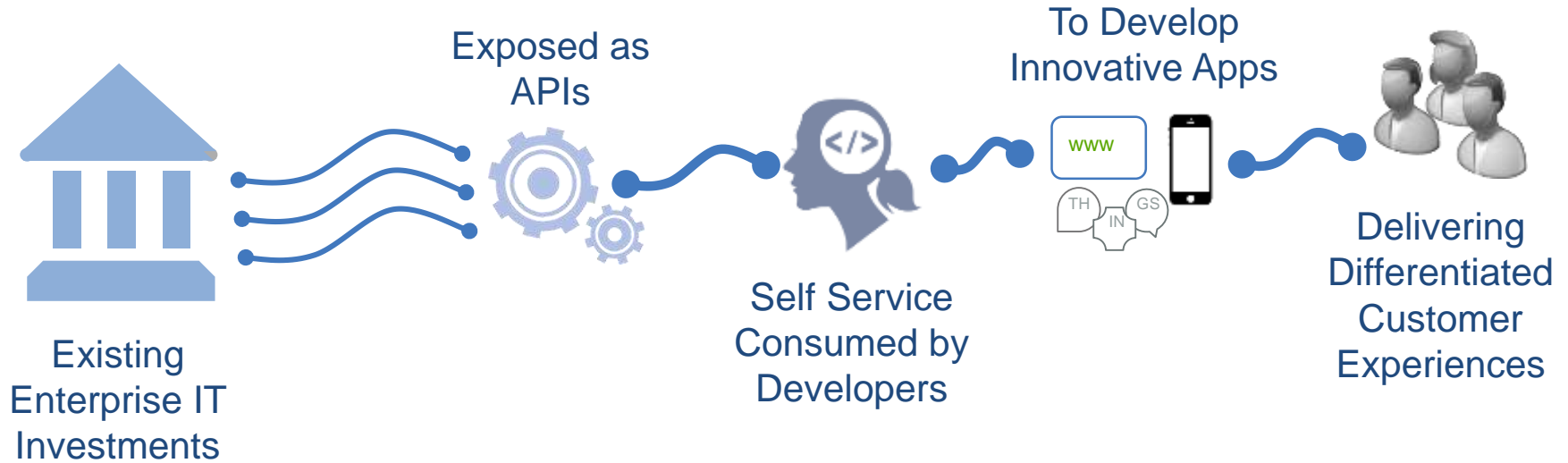


- Looking to transform the Digital Banking landscape:
 - Innovative mobile solutions & IoT/ Wearables
- 40,000 API calls from more than 100 different groups
- Prototype APIs allowing Developers to interact with fake accounts
 - Account Details (APR/Interest Rate, Available Credit, Payment Due Date, etc)
 - Customer Information (Name, Addresses, Phone Numbers, Email Addresses)
 - Payment Details (Scheduled payments, payment history, etc)
- IBM API Management on Cloud provided Developer Portal & secure access to APIs
- <https://citimobilechallenge.ciondemand.com/citimobilechallenge/pub/#/apis>



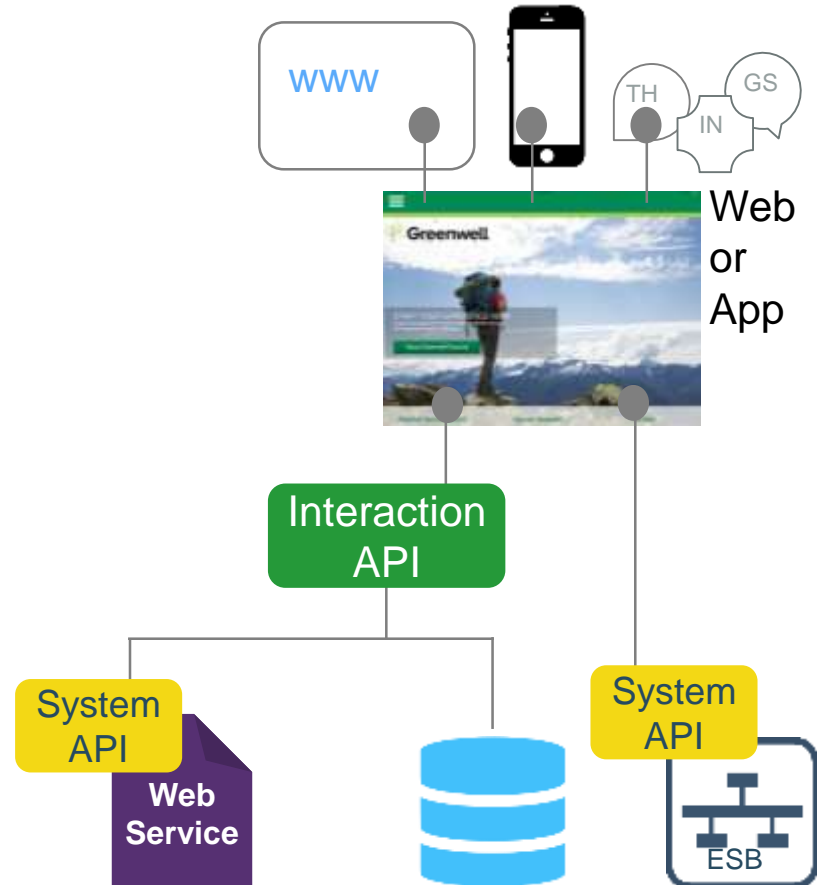
- 48 hours, 25 developers, over 400,000 API calls
- Impressive 13 pieces of Intellectual Property for ASDA
- Winning Ideas
 - “George Go!” - search application using multiple descriptors
 - “Clothing Shaker” - create your outfit by shaking your device
 - “Virtual Fitting Room” - use of Xbox Kinect and APIs
- IBM API Management on Cloud provided Developer Portal & secure access to APIs
- <https://www.youtube.com/watch?v=biTvnglh5x8>

Unleash Enterprise Investments to Disrupt Competitors

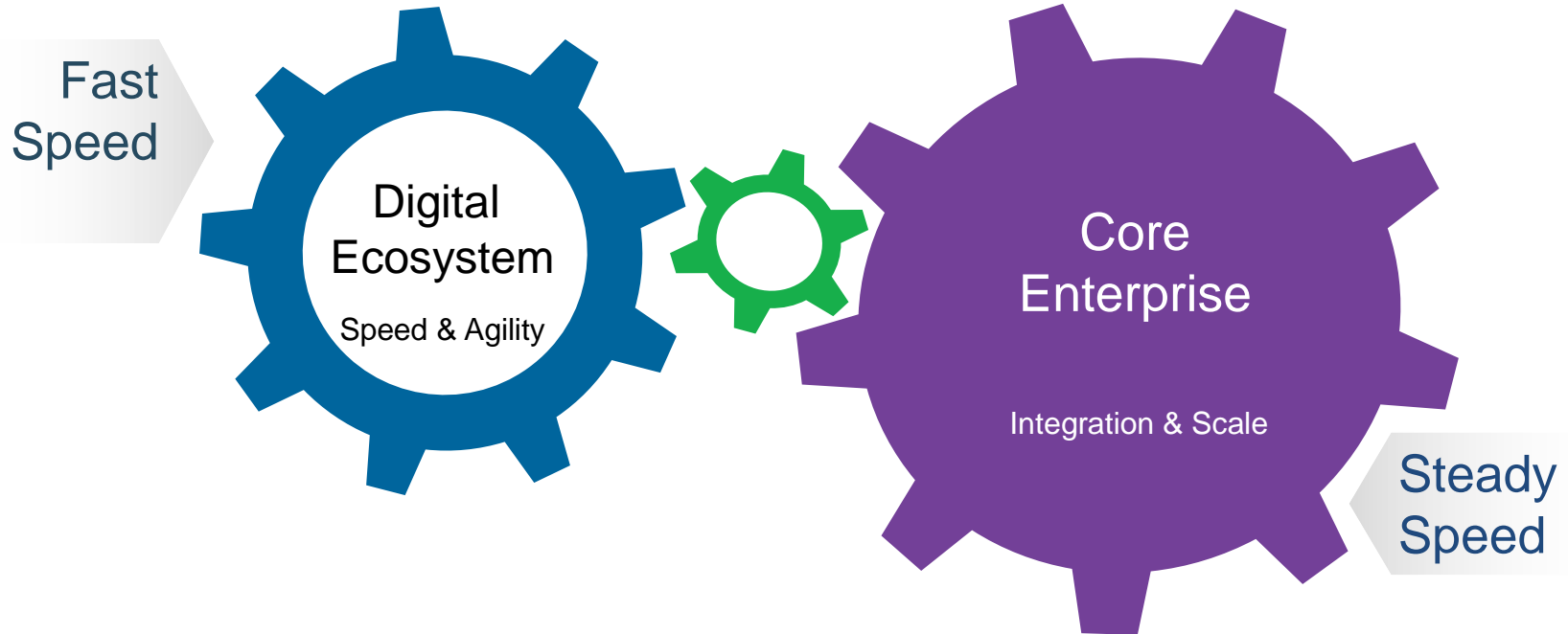


System & Interaction APIs

- **System APIs:**
 - APIs that pass through data from a system of record unchanged
- **Interaction APIs:**
 - Invoke one or more System API's or data sources, and manipulate the returned data with new logic
 - Promote reuse across new applications



Digital Transformation through Multi-Speed IT



How can the API Economy help you?

- **Web and Mobile**
 - What data/transactions would your own web and mobile apps need?
 - Is there data that is generic (e.g. business locations, rates, etc.)?
 - Is there data that is specific to existing customers that should be accessible via your app?
- **Partnering**
 - Is partner on boarding a long difficult process? Would self registration of partners be of value (e.g. more partners, wider geographic coverage)?
 - What data/transactions do you share between yourself and your partners?
- **Public Composite Apps**
 - What apps might others write that could use your data/transactions?
 - If there were a comparison app for you vs. your competitors would you want to be listed as an option?
 - What other industry sales might also use your products (e.g. car purchase needs bank loan)?
 - Think Mash-ups – what other APIs might make sense with yours? Mapping? Social?

An API Strategy To...

1

Speed application development

Via a self service library of reusable APIs



2

Securely expose systems of record

Apps and data to Mobile, IoT, & hybrid cloud apps



3

Publish APIs to expand brand reach

Tap into developer & partner ecosystems



4

Enable new business

Monetize existing and new data & algorithms



The Business of APIs



For Free

- Drives Adoptions of APIs
- Typically low valued assets
 - Drive brand loyalty
 - Enter new channels

Example:

facebook

Facebook Login API provides free authentication for any Web / mobile app



Developer Pays

- Business Asset must be of high value to the Developer
 - For example, marketing analytics, news,
- Capabilities such as credit checks

Example:



Amazon EC2 Web Services – APIs charge per usage to launch and manage virtual servers.



Developer Gets Paid

- Provides incentive for developer to leverage web API
 - Ad placements
- Percentage of revenue sold product or services

Example:



Google AdSense APIs pay developers who include advertising content into apps



Indirect

- Use of API achieves some goal that drives business model.
- E.g. Increase awareness of specific content, or offerings

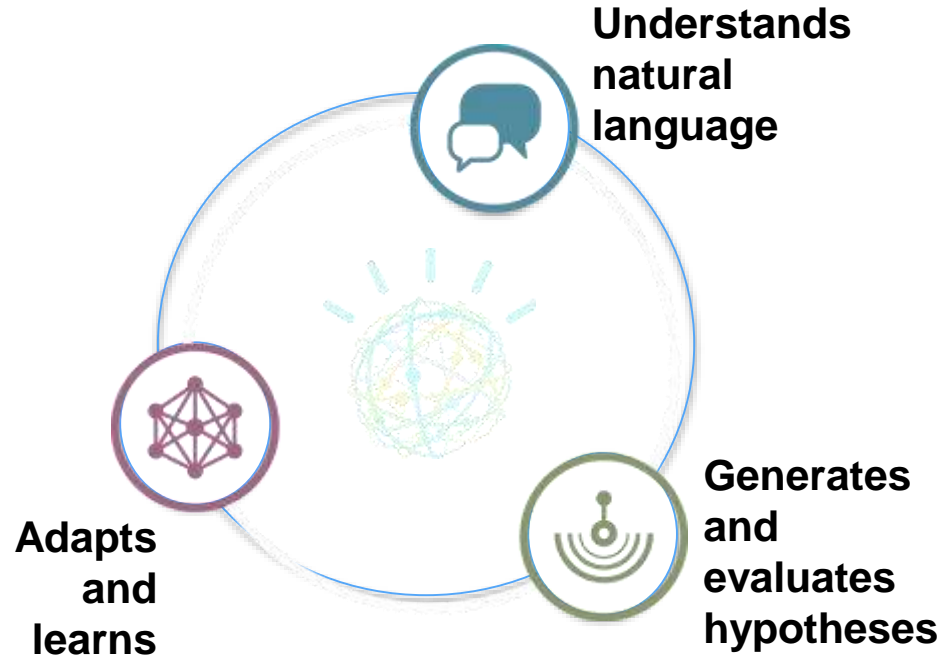
Example:



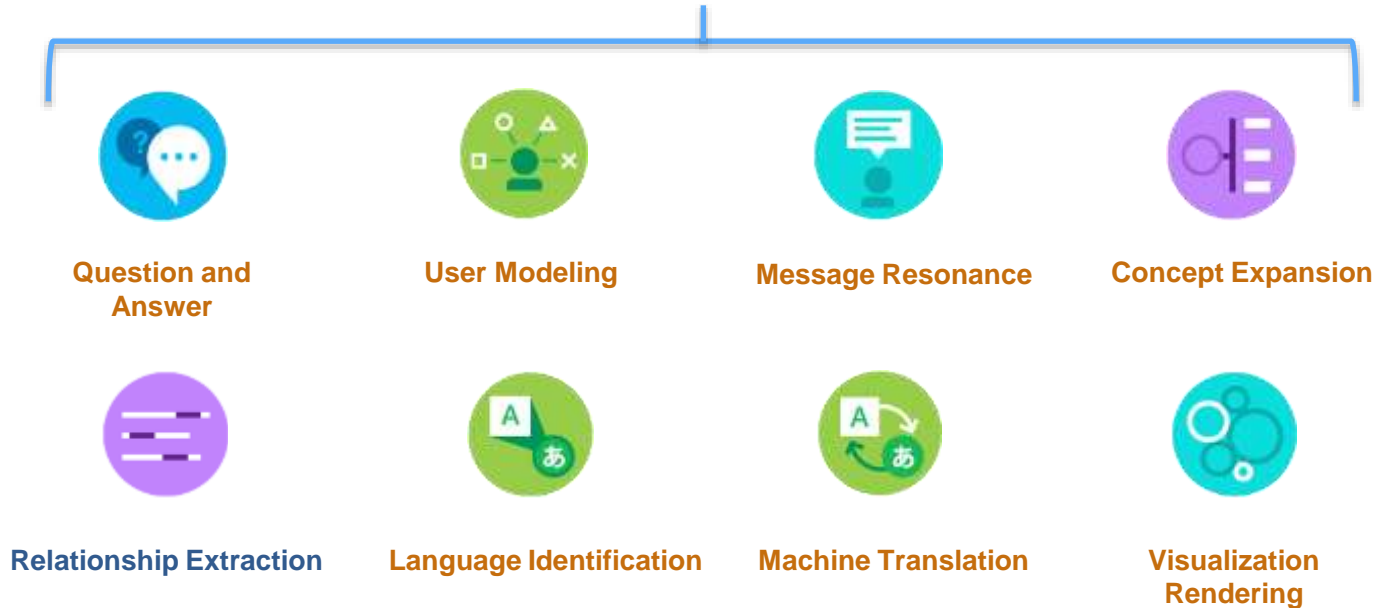
eBay Trading APIs offer developers access to trading services extending the reach of listings and transactions

Watson is cognitive computing

- Cognitive computing systems learn and interact naturally with people to extend what either humans or machine could do on their own.
- They help human experts make better decisions by penetrating the complexity of Big Data.



IBM Watson: Mix and Match Services



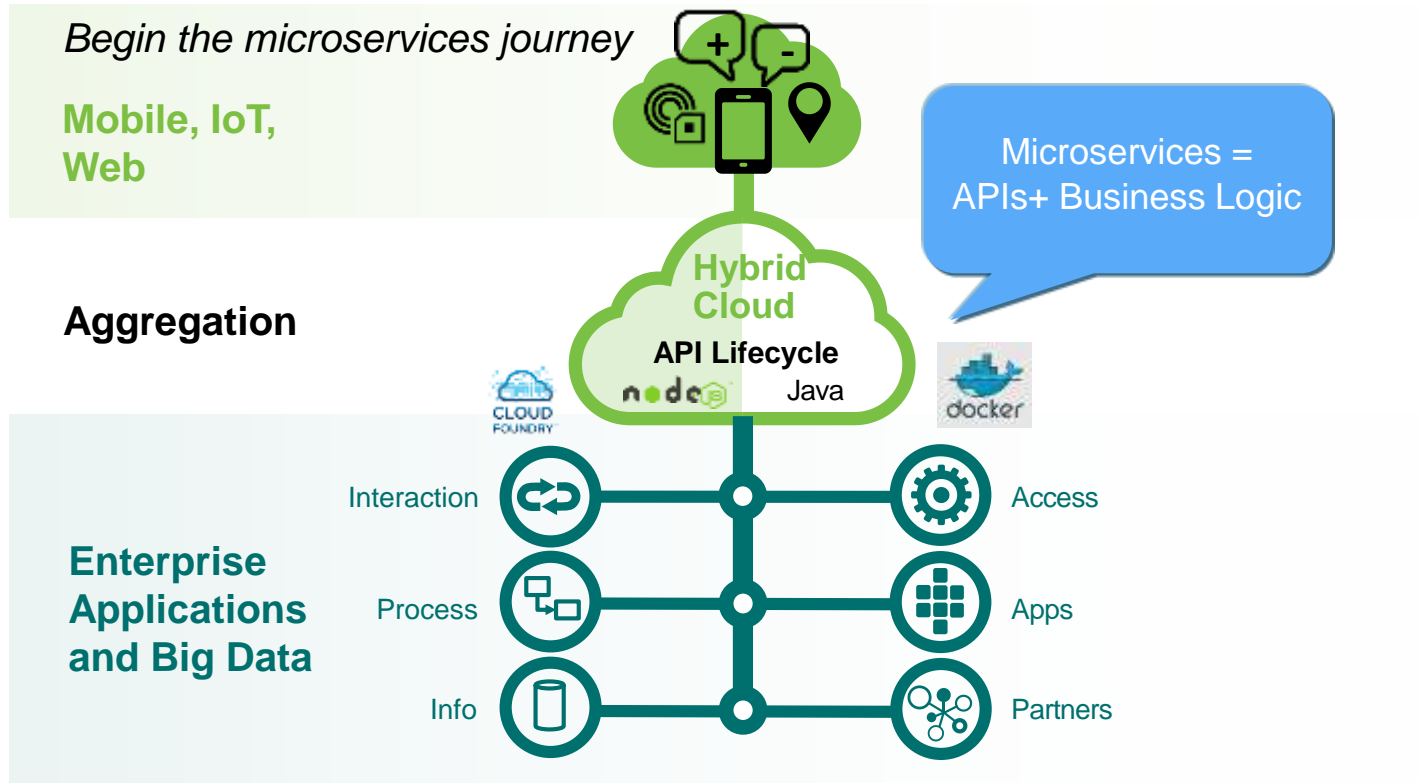
Introducing: StrongLoop

- A leading provider of Enterprise Node.js solutions
- Node.js is the emerging standard for creating APIs and microservices that power mobile, IoT and web applications
- Together, IBM and StrongLoop will:
- Offer a comprehensive platform to enable companies to build scalable APIs and microservices for Hybrid Cloud.
- Provide ongoing support and investment in the open Node.js developer community.
- Help clients in the midst of digital transformation extend enterprise application investments. Unite Java and Node.js communities for developer innovation.
- Provide availability on IBM Bluemix with “quick start” projects from the IBM Bluemix Garage.

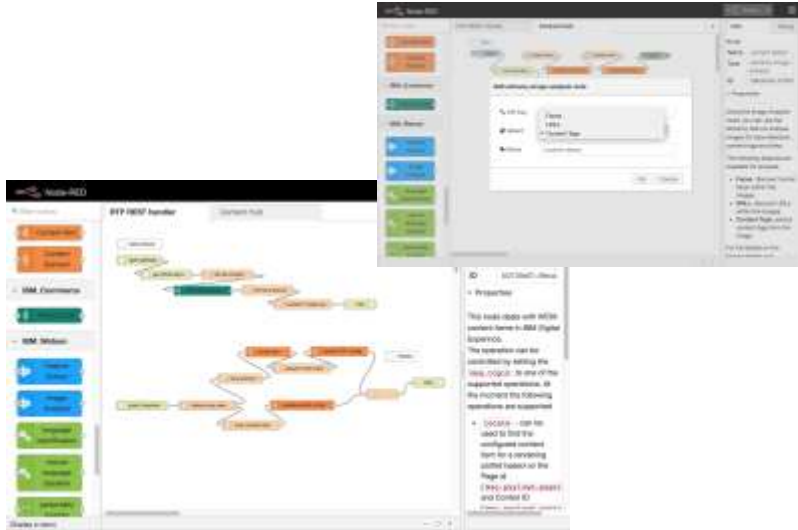
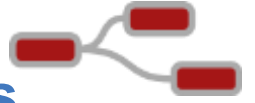


**Enterprise Node to
Power the API Economy**

A Hybrid Cloud Architecture for Digital Transformation



Node-RED: Building business logic based on Web APIs



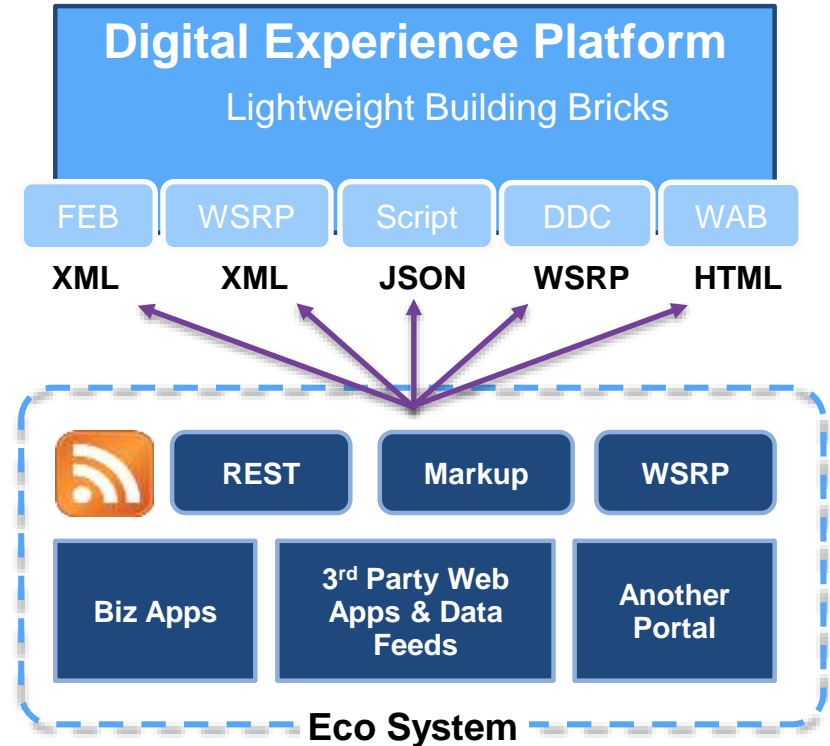
- Supports visual flow editing
- Node.js based
- Many integrations available
- Flows can be shared
- Allows rapid prototyping

Bridging and Integration

Front-End Integration

Application Integration Challenges

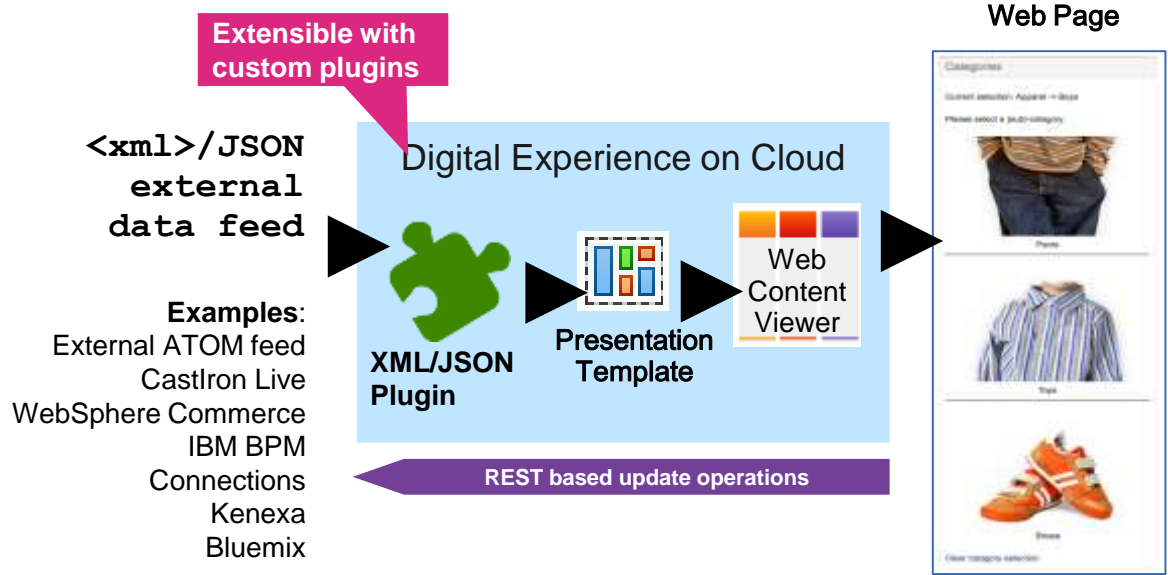
- Legacy Applications & IT Landscape
 - Unusual proprietary APIs
- Different 3rd Party Apps & Services
 - Different User Experiences & Interfaces
- Distributed business logic and data
- Latency & Scalability
- Multi-Channel Delivery
- Personalization & Targeting
- Access Control, single sign on and security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



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



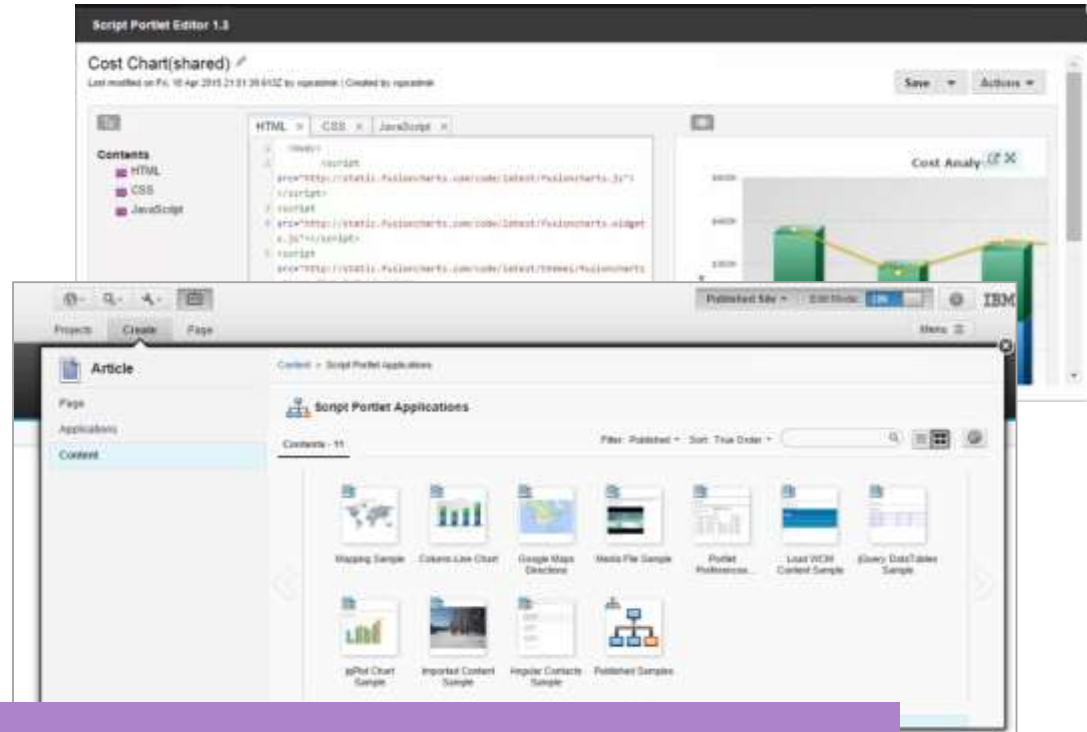
Digital Data Connector

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

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

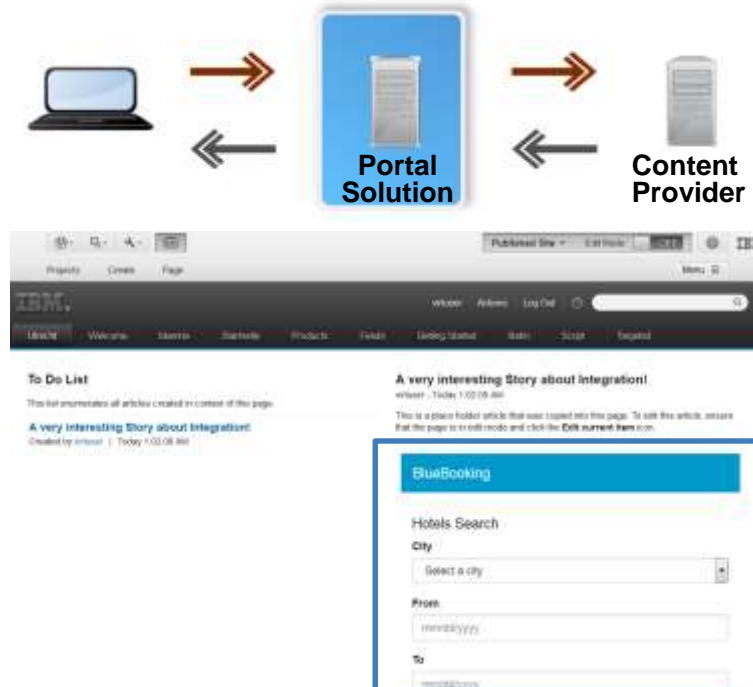


Script Applications

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

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



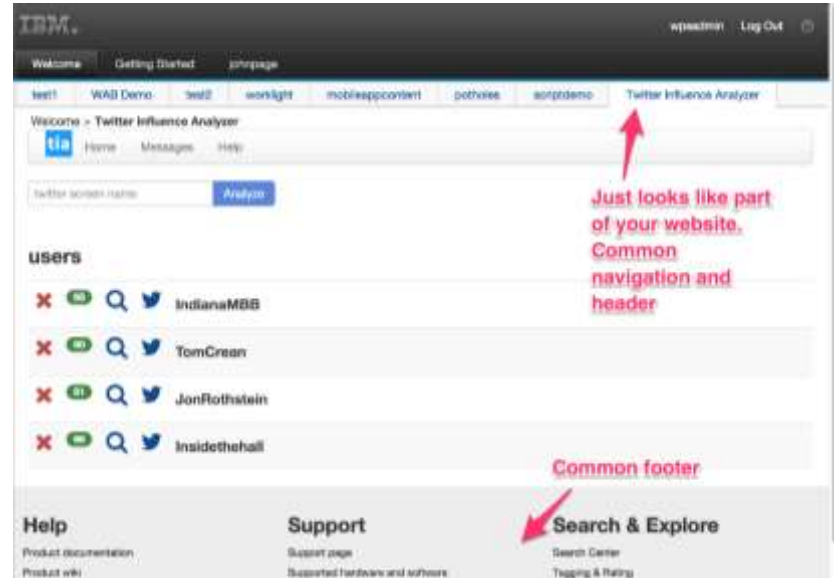
Web Applications Bridge

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

Web Application 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.



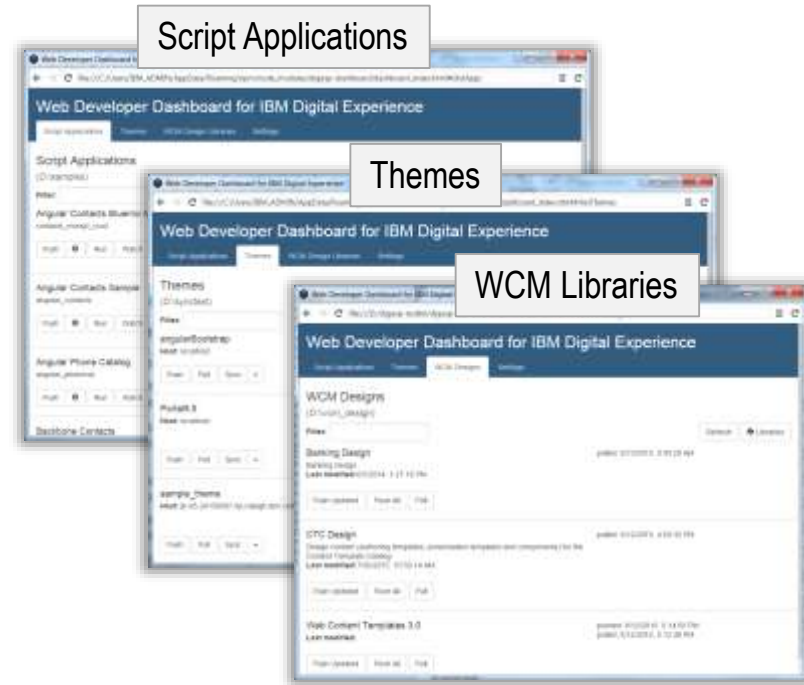
Web Application Integrator

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

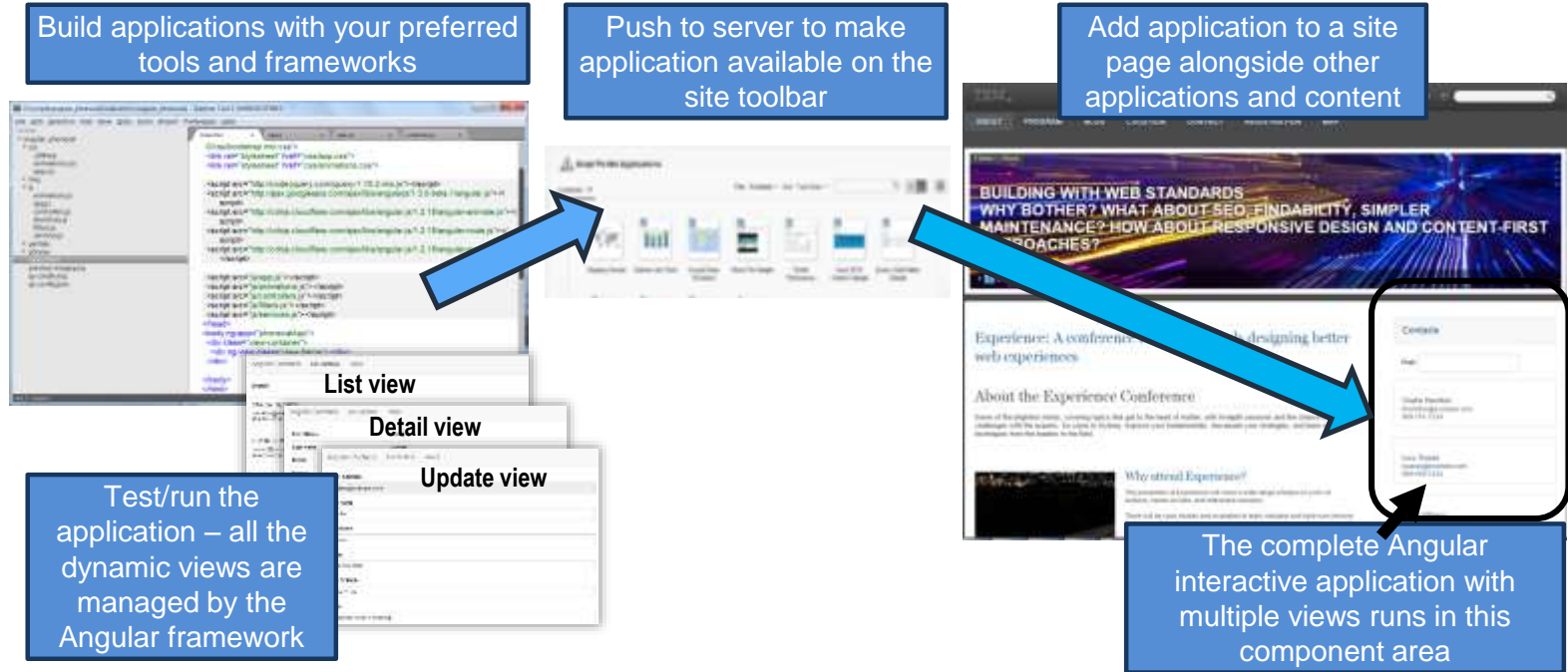
Lightweight Programming Approaches

Script / Web Development: Dashboard

- 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 / Web Development: Overview



Script / Web Development: Programming tools

Set up application project using npm, yeoman, and bower

```
0: script@for: c:\code> npm install yeoman-generator@1.0.1 bower@1.3.1
0: script@for: c:\code> bower install --ui //github.com/angular/bower-angular-route@1.4.7
0: script@for: c:\code> bower install --ui //github.com/angular/bower-angular-route@1.4.7
0: script@for: c:\code> bower install --ui //github.com/angular/bower-angular-route@1.4.7
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0: script@for: c:\code> bower install --ui //github.com/angular/bower-angular-route@1.4.7
```

Edit application code



A screenshot of a code editor showing application code. The code includes various directives and controllers for an Angular application, such as `ng-controller`, `ng-view`, and `ng-model`.

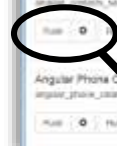
Use gulp/grunt script to check code quality, compile to CSS, and optimize code

```
17:00:20] Starting 'build-css'...
17:00:20] Finished 'build-css' after 100 ms
17:00:20] Finished 'build-css' after 100 ms
17:00:20] Finished 'build-css' after 100 ms
17:00:20] Starting 'build-wit'...
17:00:20] Finished 'build-wit' after 100 ms
```

Test locally with Express server



Run gulp/grunt from command line or from Dashboard UI to build application and push to server

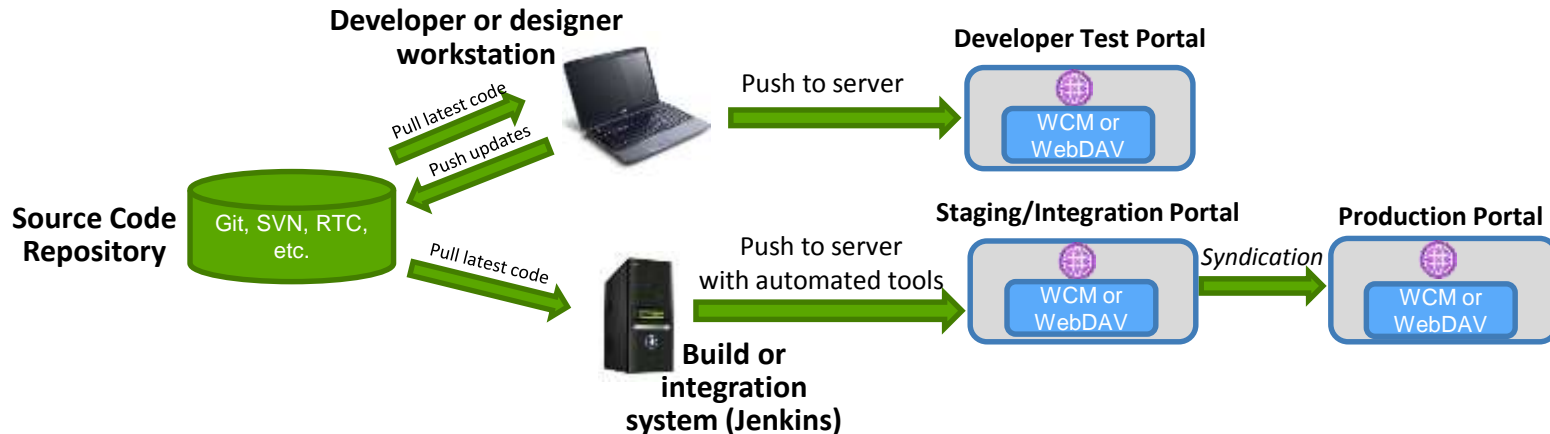


Application runs on DX site page

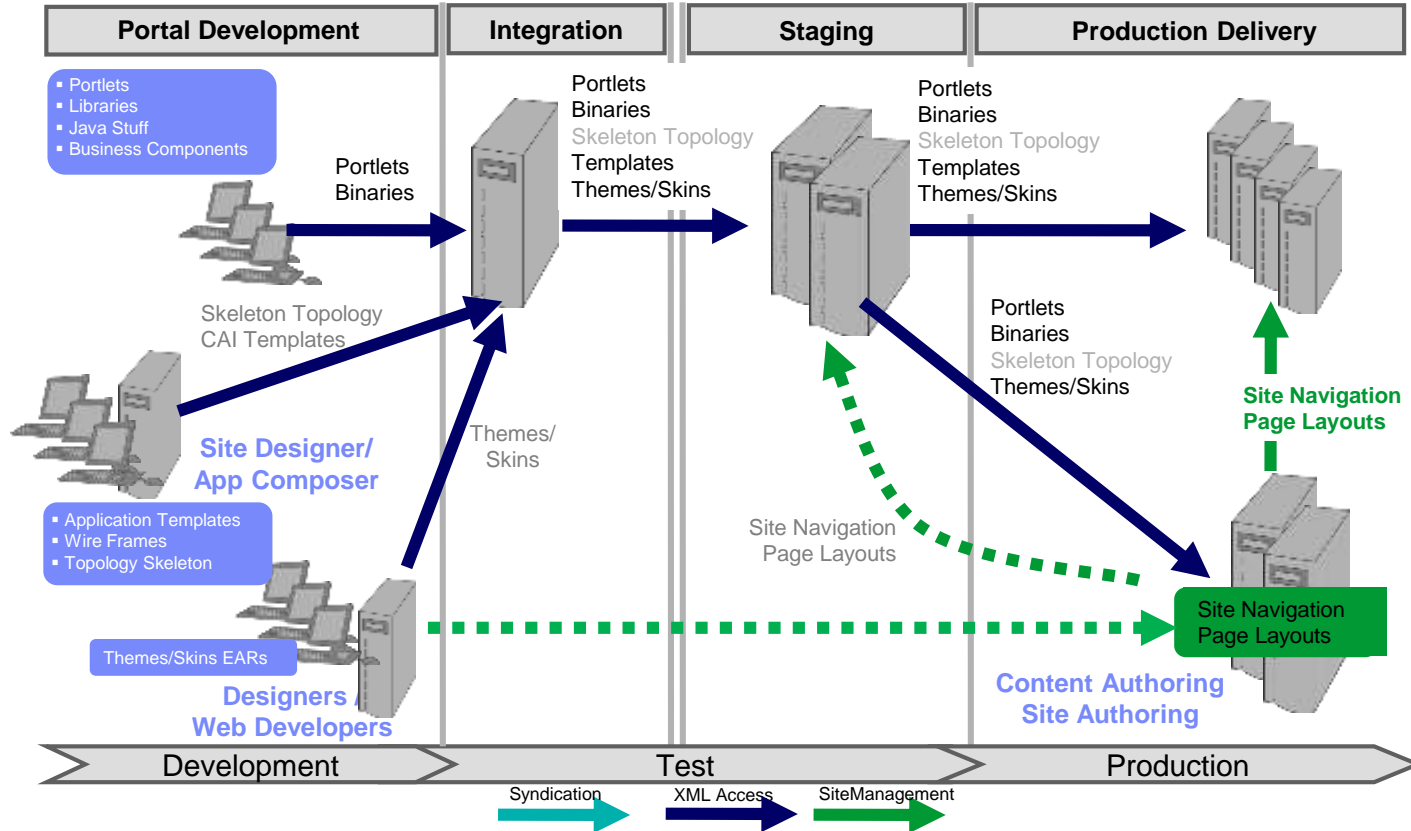


Script Applications: Test & Staging

- 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



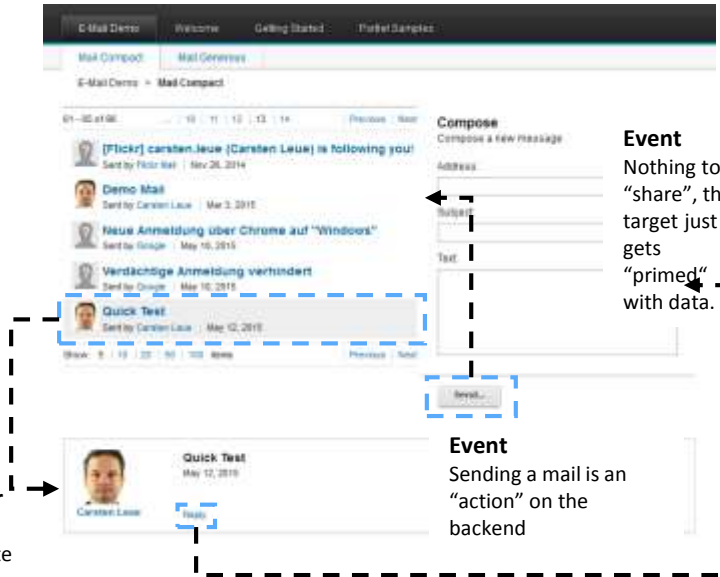
Staging & Publishing Procedure



Events/Coordination between UI Components

- Portlets communicate with the runtime and with each other
 - Independent of UI frameworks
 - Mediated by the portlet container
- Key concept: state handling
 - Private render parameters
 - Public render parameters
 - Portlet Eventing

Public Render Parameter
Selected message is only context“, no server side state changes.



Stateful AJAX Support – JSR 362



*Sample code
Available now!*

- State handling concept remains identical to JSR 286
 - Based on Private and Public Render Parameters
- State changes without full page refreshes
 - Client side JavaScript Library “PortletHub” maintains and coordinates state
 - Portlets participate by registering JS call-backs
- Actions and Events remain server side
 - No page refresh required
 - Business logic remains encapsulated on the server
- Asynchronous Markup refreshes
 - built on top of the existing resource serving
- Sample Implementation for WebSphere Portal
 - Full support for back and forward button
 - Bookmarkable URLs
 - Works also via WSRP!
- Limitations
 - Requires A+ Promises, so no IE support, unless polyfilled

Client Side versus Server Side

- Aggregation of components on the server side
 - all components can access all information, which is necessary to produce personalized, contextual and targeted web pages (e.g. user profile, rules, dynamic pages, ...)
- Rendering of each individual component within a page allows a rich client side interaction/client-side logic.
 - smart UI controls, extensive Javascript code, including partial page refresh, flexible AJAX patterns
 - load data asynchronously into the page whenever necessary
→ hybrid mode
- Pure client side aggregation has a lot of drawbacks and risks
 - browser incompatibilities,
 - performance due to many client side requests,
 - Security concerns
 - limitations for mobile devices,
 - complexity of code/debugging, ...

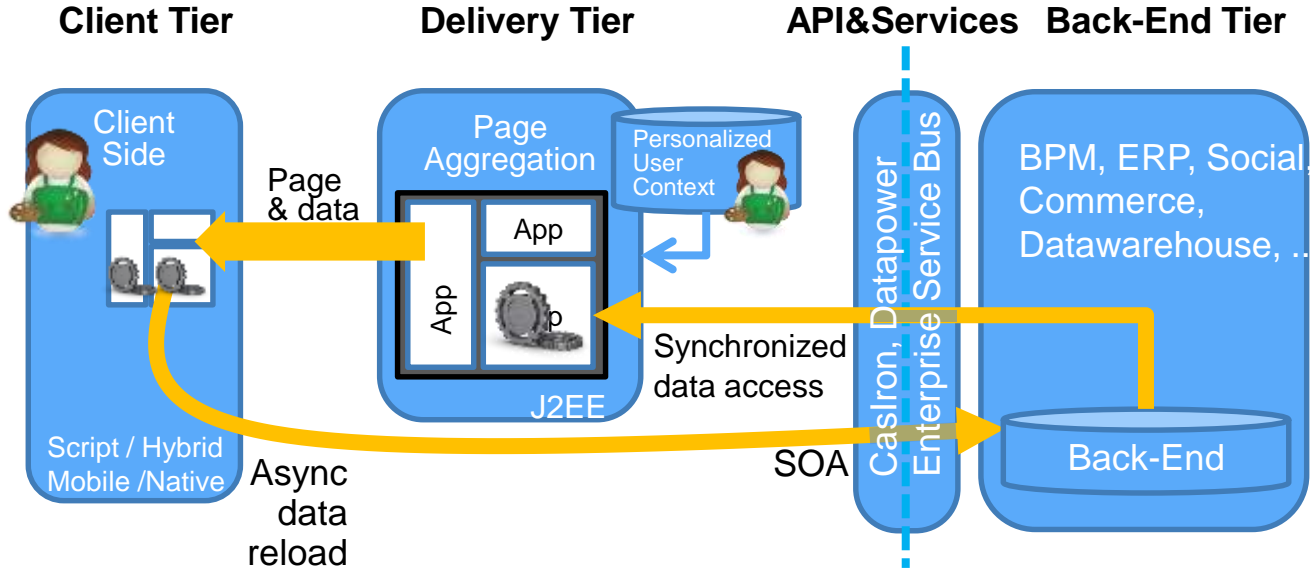
Single Page Applications and IBM Digital Experience

- 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

Summary

Building a Customer Experience

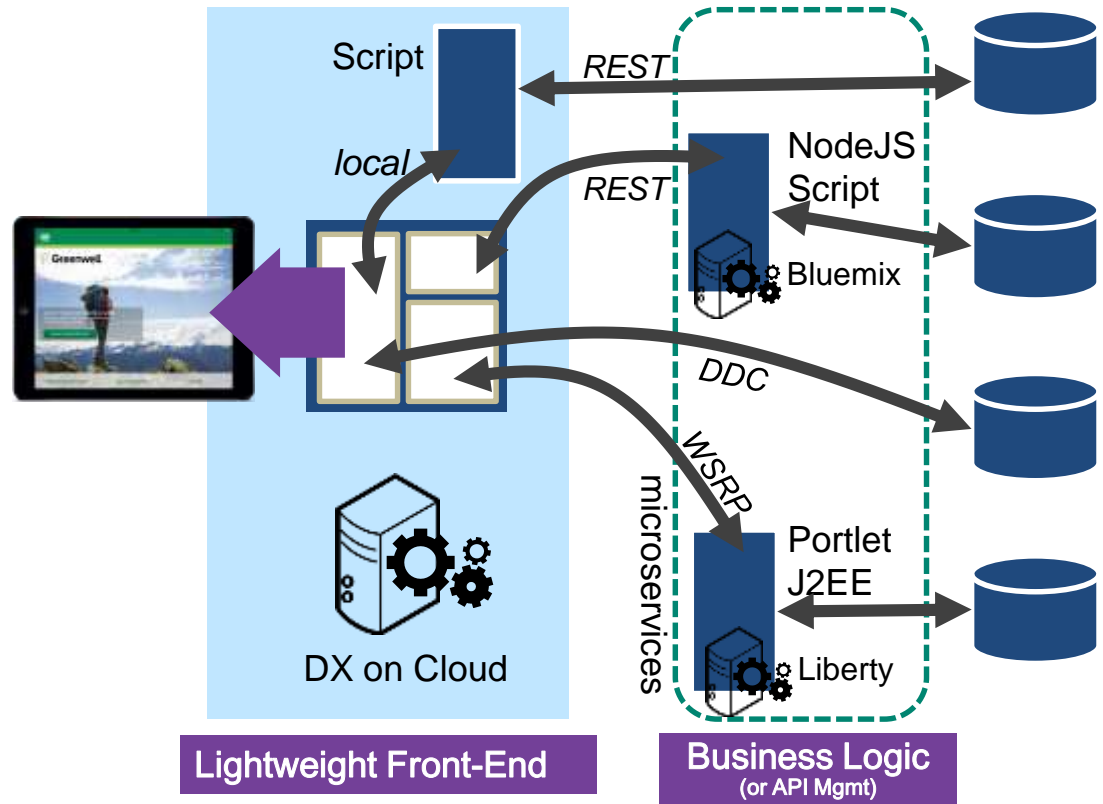
4-Tier Delivery Architecture



- Execute client-side libraries (AngularJS, Dojo, JQuery) or implement as Native App (iOS/Android)
- AJAX calls / updates without page refresh
- Access backend data / SOA Layer directly via REST
- Execute server-side code (Java, JSP, J2EE)
- Aggregate personalized page for current user context and role
- Access backend data / SOA Layer from server-side code

Trend: Distributed 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, ...



Vielen Dank

