



adaptTo()

APACHE SLING & FRIENDS TECH MEETUP
10-12 SEPTEMBER 2018

Application Integration

Alexander Berndt

About me – Alexander Berndt

Freelance IT Architect

- 10 years in large-scale projects (150-600 people), Accenture + TC
- Since 2011 CQ/AEM



https://www.xing.com/profile/Alexander_Berndt

What is an application?

What is an application?

- **Transaction Tools** (e.g. flight booking, online banking, appointments)
- **Interactive Content** (e.g. games, maps & routing)
- **Data Query Tools** (e.g. store finder)
- **Data Visualization** (e.g. data charts, 3d-viewer)
- **Usability Tools** (e.g. favorite list)
- **Configuration & Planning Tools** (e.g. car configurator, kitchen planner)
- **Calculators** (e.g. savings calculator)
- **Social Collaboration** (e.g. chat, product ratings)
- **Personalized Content** (e.g. recommendations)

Why is it complicated?

Why is it complicated?

- Abnormal Conditions



iStock.com/TT

Why is it complicated?

- Abnormal Conditions
- Unstated requirements



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Why is it complicated?

- Abnormal Conditions
- Unstated requirements
- **Steady scope increases**



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Why is it complicated?



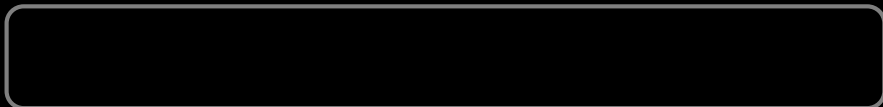
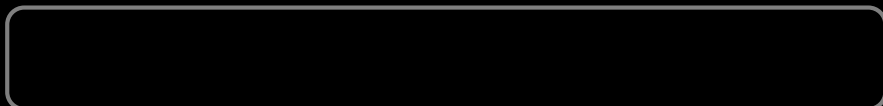
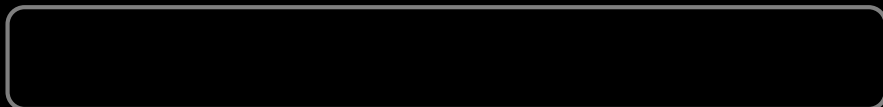
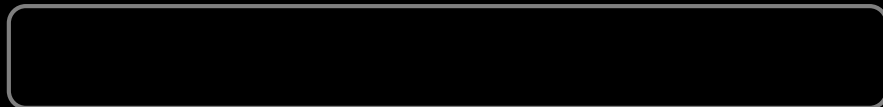
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- Abnormal Conditions
- Unstated requirements
- Steady scope increases

**It's not that easy,
as it might look first!**

Integration Patterns

Integration Patterns



Side-by-side

a) Multiple Subdomains

- Demo

<https://www.thomascook.de>

Flights and Booking-Journey are independent Web-Apps

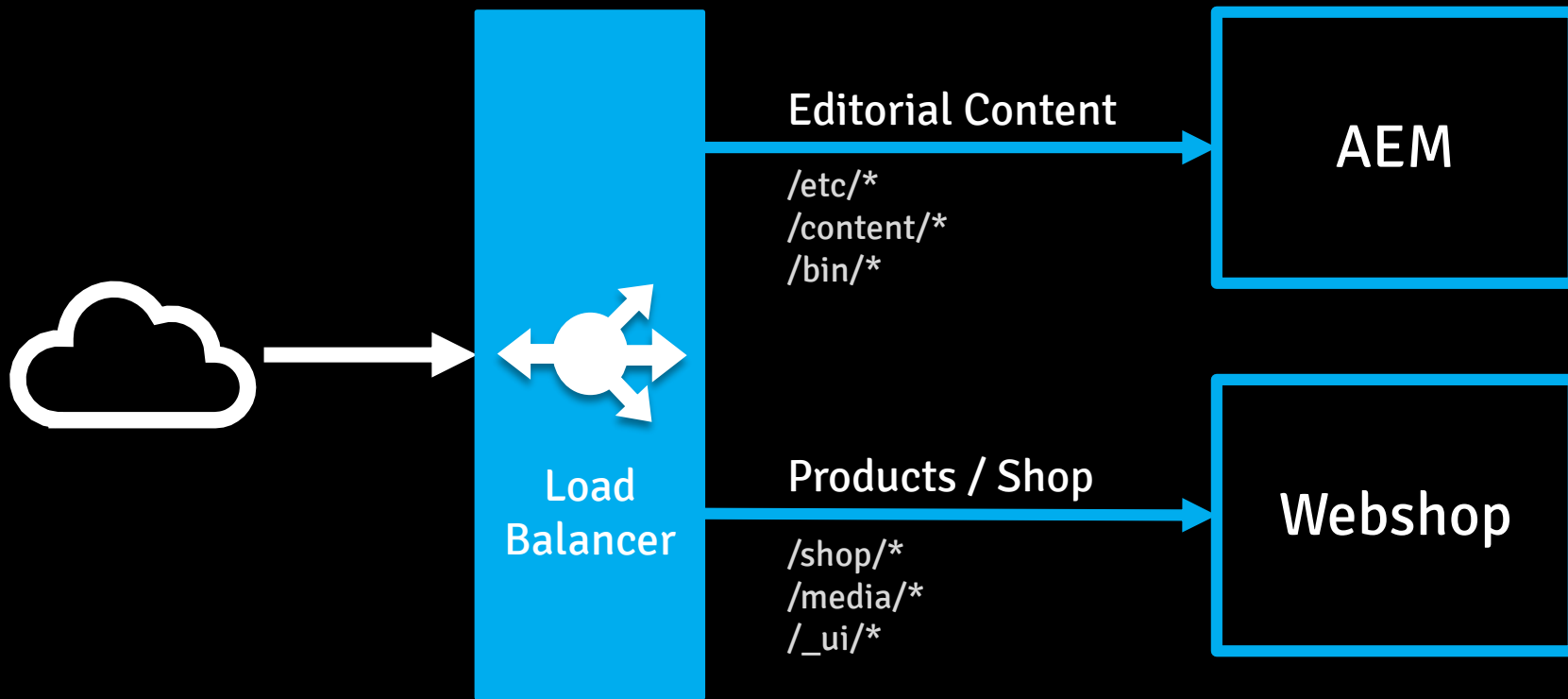
b) Path-based Routing

- Demo

<https://www.hilti.ch>

Web-Shop and AEM mapped into single domain

Path-based Routing



Evaluation: Side-by-side

Side-by-side

Development

Independence

-

Required skills

-

Operations

Root-cause analysis

+++

Independence

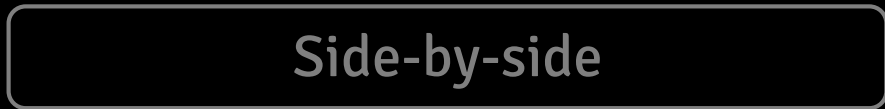
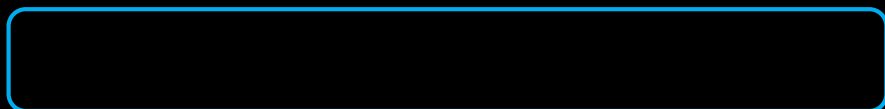
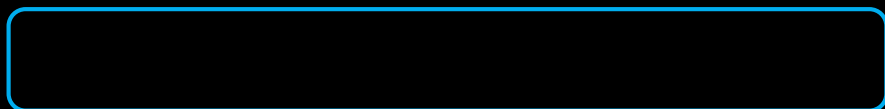
+++

User Experience

Integration Features

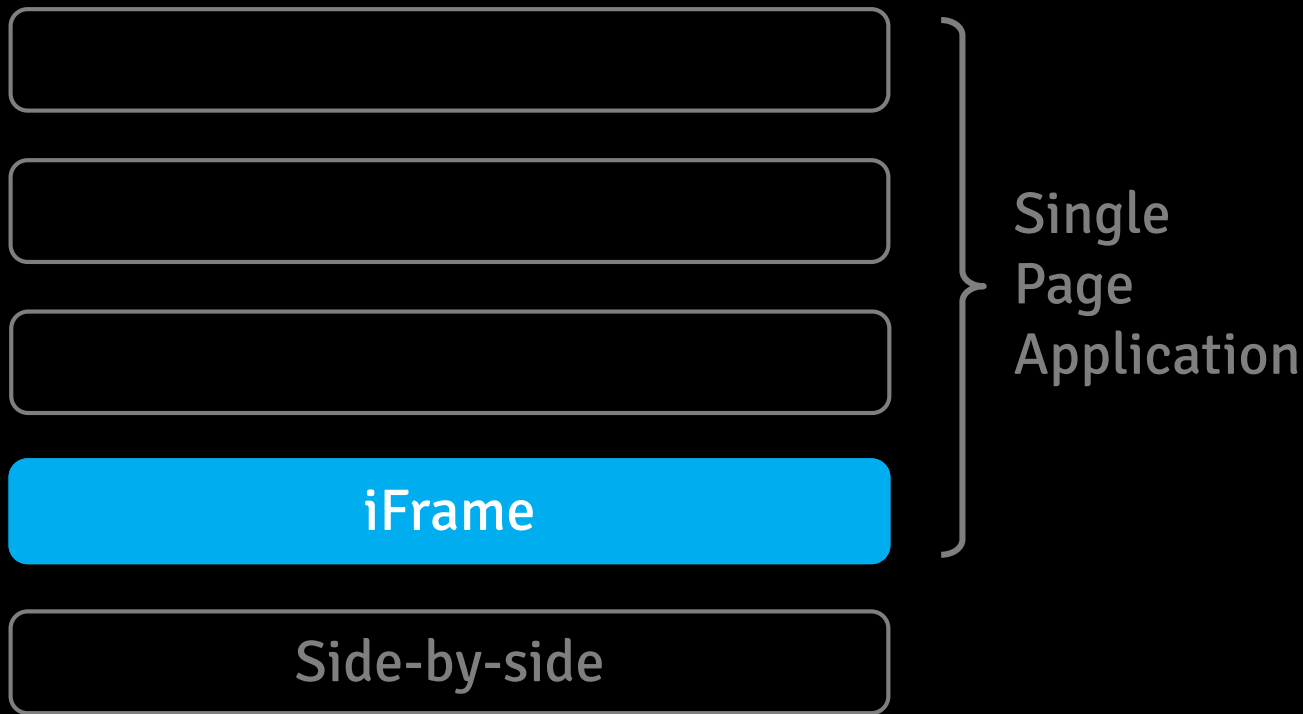
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Integration Patterns

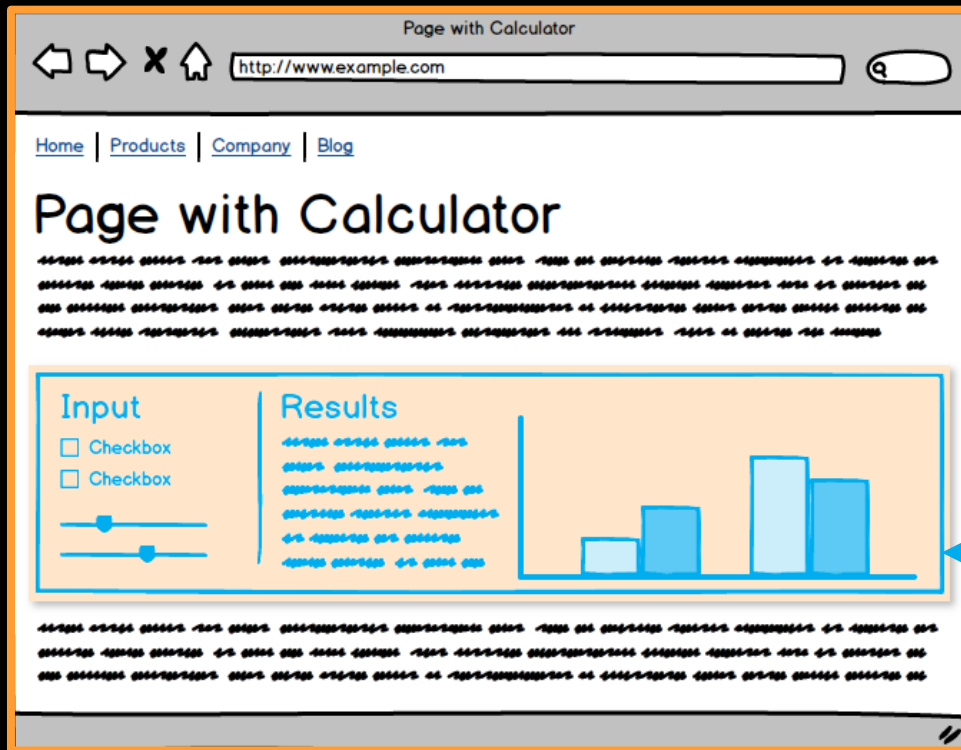


Single
Page
Application

Integration Patterns



iFrame – Integration Pattern



Content Page
with iFrame

AEM

HTML/JS

+ Static Resources
+ Dynamic Endpoints

Application

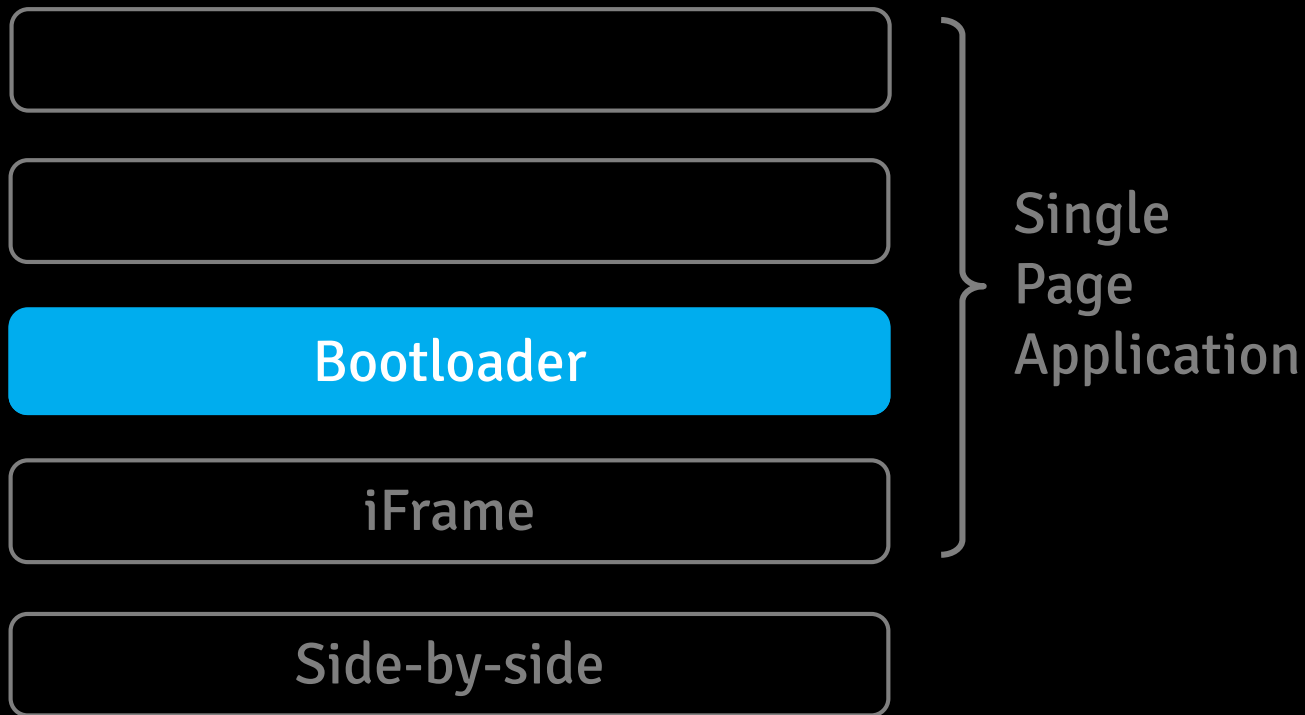
Example: iFrame of 123formbuilder.com

```
<iframe id="1535293493707_253331785549840"  
  src="//form.123formbuilder.com/js-form-username-18551.html?  
  _embedType_=embed.js&_iframeID_=1535293493707"  
  frameborder="0"  
  scrolling="no"  
  style="padding:0px; margin:0px; display:block; width:100%;  
  background-color:transparent; overflow:hidden;  
  height: 1289px;">  
</iframe>
```

Evaluation: iFrame

	Side-by-side	iFrame
Development		
Independence	-	+++
Required skills	-	+++
Operations		
Root-cause analysis	+++	+
Pro-active monitoring	++	---
Independence	+++	+++
User Experience		
Integration Features	--	--
Performance	++	--
Fall-back Mode	+++	---

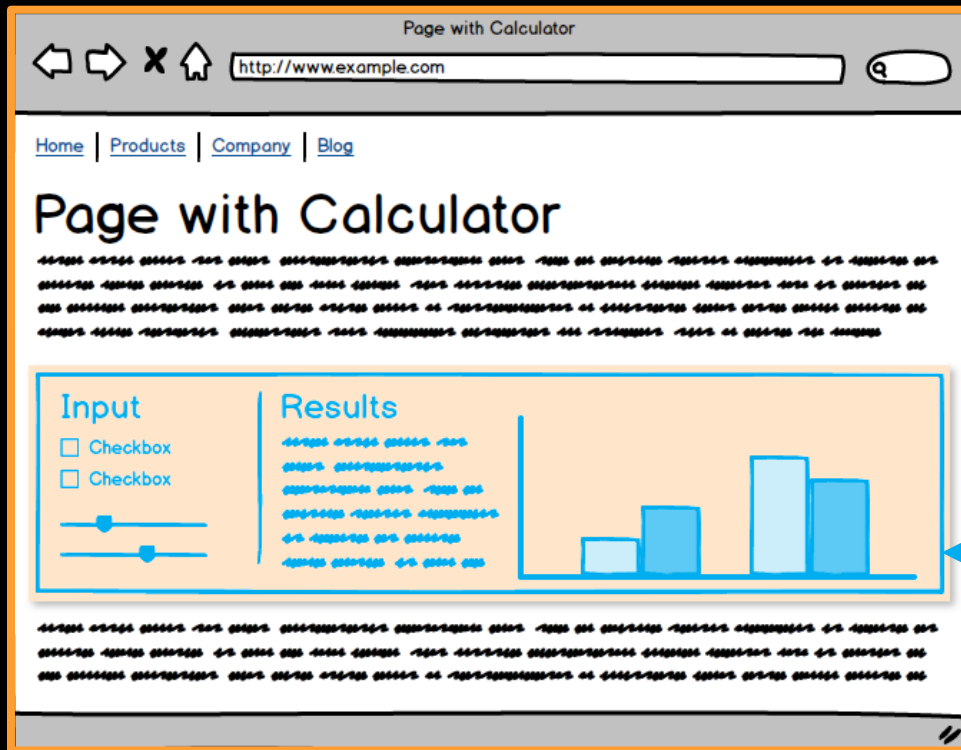
Integration Patterns



■ Example: Google Maps

```
<body>
<div id="map"></div>
<script>
  var map;
  function initMap() {
    map = new google.maps.Map(document.getElementById('map'), {
      center: {lat: -34.397, lng: 150.644}, zoom: 8});
  }
</script>
<script src="https://maps.googleapis.com/..." async defer></script>
</body>
```

Bootloader – Integration Pattern



Content Page
with Bootloader

AEM

JavaScript

+ Static Resources
+ Dynamic Endpoints

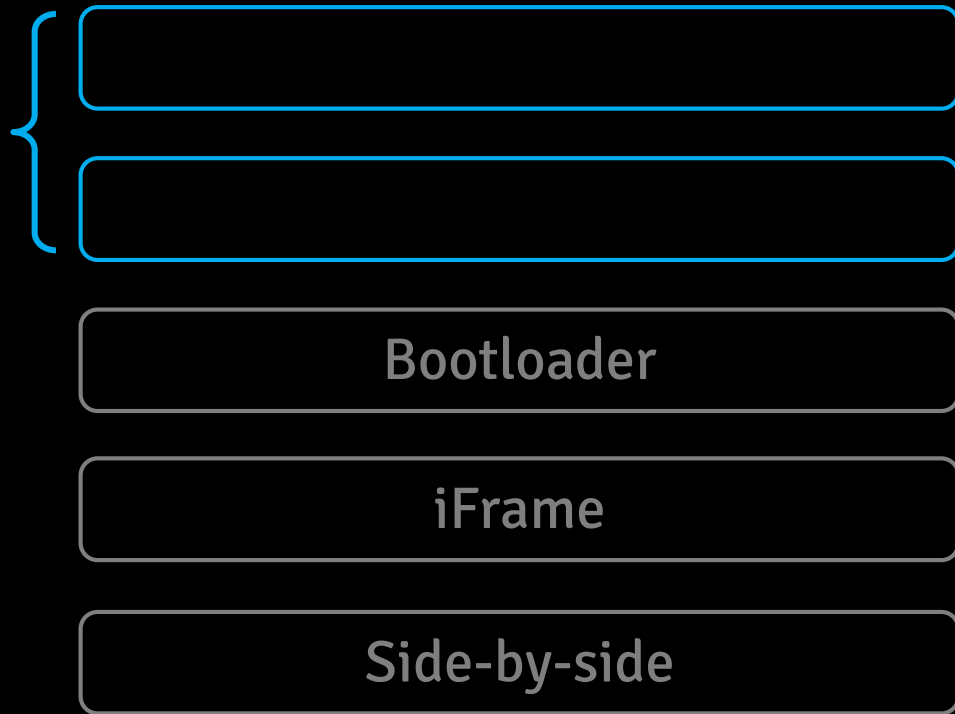
Application

Evaluation: Bootloader

	Side-by-side	iFrame	Bootloader
Development			
Independence	-	+++	++
Required skills	-	+++	+
Operations			
Root-cause analysis	+++	+	+
Pro-active monitoring	++	---	---
Independence	+++	+++	++
User Experience			
Integration Features	--	--	++
Performance	++	--	--
Fall-back Mode	+++	---	---

Integration Patterns

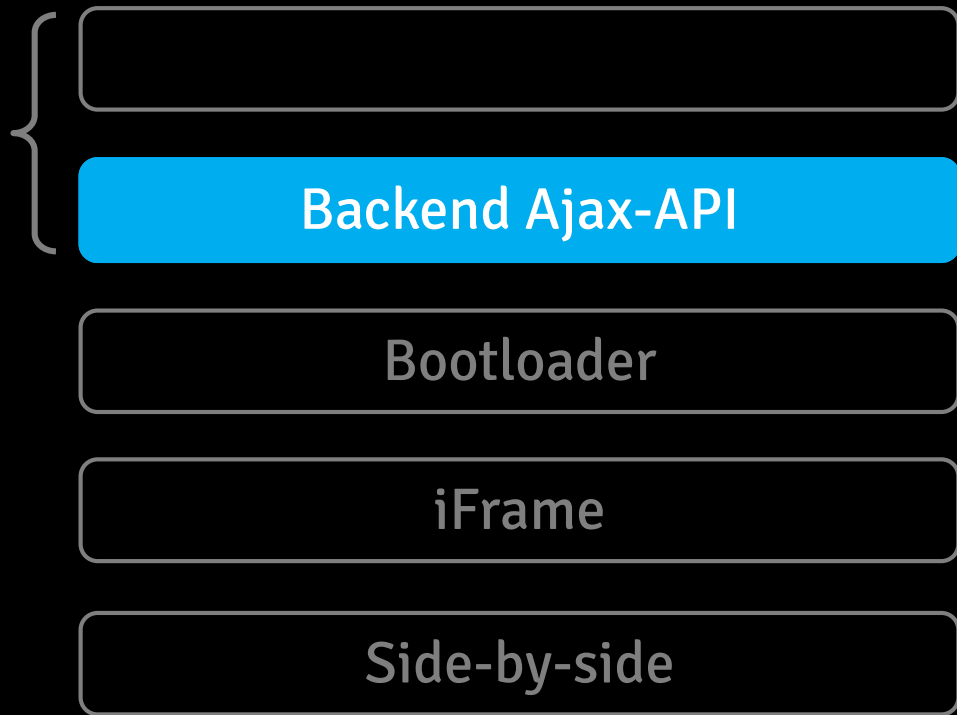
App as part of
Content Page



Single
Page
Application

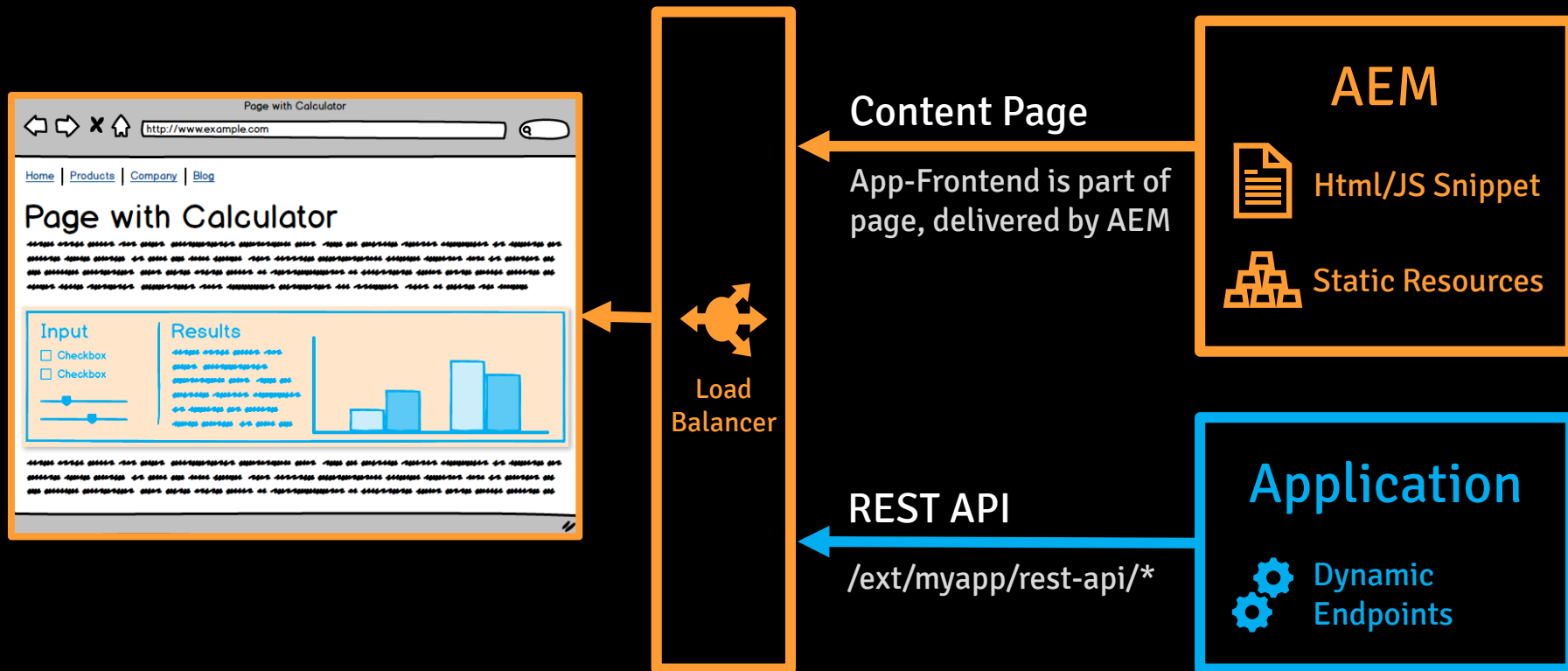
Integration Patterns

App as part of
Content Page



Single
Page
Application

Backend Ajax API

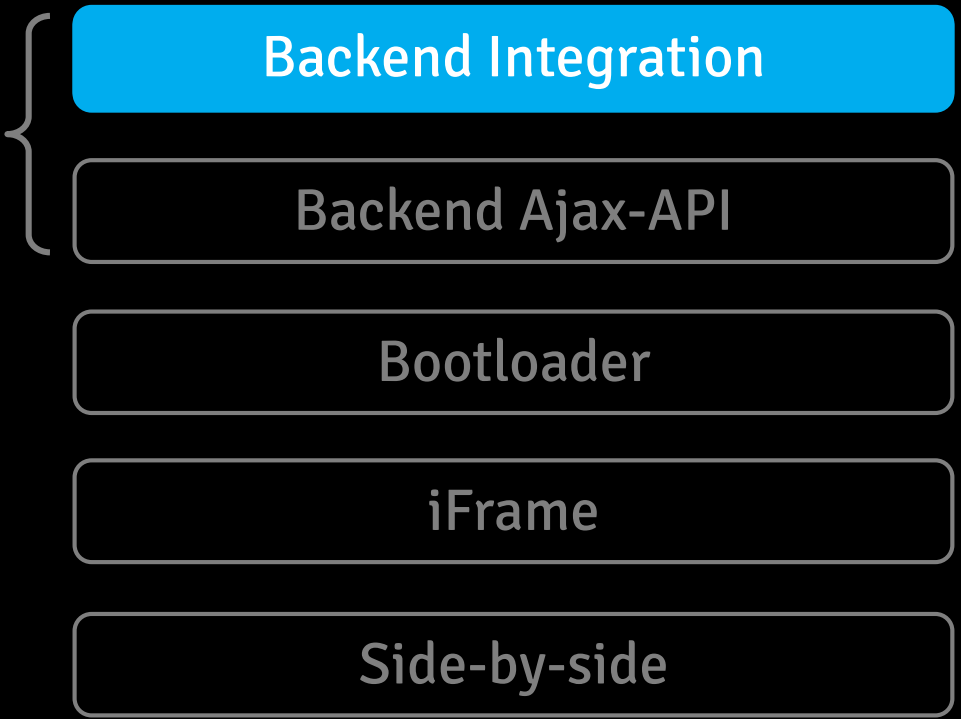


Evaluation: Backend Ajax API

	Side-by-side	iFrame	Bootloader	Backend Ajax API
Development				
Independence	-	+++	++	---
Required skills	-	+++	+	+
Operations				
Root-cause analysis	+++	+	+	++
Pro-active monitoring	++	---	---	++
Independence	+++	+++	++	---
User Experience				
Integration Features	--	--	++	+++
Performance	++	--	--	+++
Fall-back Mode	+++	---	---	++

Integration Patterns

App as part of
Content Page



Single
Page
Application

AEM



Content Page

Application



Single Html Page



Static Resources



Dynamic Endpoints

Development Time vs. Runtime

AEM



Content Page
+ HTML Snippet of App



Static Resources

Application



Single Html Page



Static Resources



Dynamic Endpoints

Potential Approaches

- ~~Copy & Paste~~ 
- ~~Maven Build~~ 
- ~~Reverse Proxy~~ 
- Backend Crawler

Backend Integration



- Query Instances
- Evaluate Context
- Load HTML Page
- Verify HTML
- Extract Html Snippet
- Extract Static Resources

Extract HTML Snippet

```
<html lang="en" manifest="cache.manifest">
<head>
  <title>Sample Calculator Test Page</title>
  <meta name="keywords" content="Sample, Calculator, adaptTo()">
  <link rel="stylesheet" href="css/style.css" data-webapp="export">
</head>
<body>
  <h1>Sample Calculator Test Page</h1>
  <div class="sample-calculator" data-webapp="export">
    <!-- here is the calculator html! -->
  </div>
  <script src="js/jquery.min.js"></script>
  <script src="js/calculator-ui.js" data-webapp="export"></script>
</body></html>
```

Backend Integration



- Load Cache Manifest
- Load Static Resources
- Extract References
- Verify

```
# Files, to be cached = static resources
```

```
CACHE:
```

```
css/style.css
```

```
js/calculator-ui.js
```

```
img/background.png
```

```
# Only online
```

```
NETWORK:
```

```
rest-api/sendOffer
```

```
FALLBACK:
```

```
static.html
```

Backend Integration



- A/B Switch
- Clear Dispatcher Cache
- Calculate Overall Status
- Next Run

- Source Code

<https://github.com/alberndt/aem-app-integration>

Evaluation: Backend Integration

	Side-by-side	iFrame	Bootloader	Backend Ajax API	Backend Integration
Development					
Independence	-	+++	++	---	+++
Required skills	-	+++	+	+	++
Operations					
Root-cause analysis	+++	+	+	++	++
Pro-active monitoring	++	---	---	++	++
Independence	+++	+++	++	---	+++
User Experience					
Integration Features	--	--	++	+++	++
Performance	++	--	--	+++	+++
Fall-back Mode	+++	---	---	++	++

- External Content
- Multi-Page Applications
- POST Requests
- Structured Content Import (xml/json)

Questions

Appendix

Content Snippets

Shared Resources

Frontend JS-Libraries

Site Master Data

App.-Configuration

Application Rules

Product Page (Shop)

Editorial Page (Adobe AEM)

Exported Footer



- Use an export servlet!
 - Nicer API's
 - Content structure remains flexible
 - Entry point for mappings (e.g. UK vs. GB)

Export Content Snippets – Export Servlet

```
@Override
protected void doGet(SlingHttpServletRequest request, ...) {
    ResourceResolver resolver = resolverFactory.getServiceResourceResolver();
    SlingHttpServletRequestWrapper wrappedRequest =
        new SlingHttpServletRequestWrapper(request) {
            @Override
            public ResourceResolver getResourceResolver() {
                return resolver;
            }
        };
    RequestDispatcher dispatcher =
        wrappedRequest.getRequestDispatcher("/content/myproject/...");
    request.setAttribute(WCMMode.REQUEST_ATTRIBUTE_NAME, WCMMode.DISABLED);
    dispatcher.forward(wrappedRequest, response);
}
```

Outbound Patterns

Content Snippets

Shared Resources

Frontend JS-Libraries

Site Master Data

App.-Configuration

Application Rules

- AEM provides resources (=API)
 - Fonts
 - JS Libraries (e.g. jQuery, ...)
 - Icons, Images
 - CSS (careful!)

Outbound Patterns

Content Snippets

Shared Resources

Frontend JS-Libraries

Site Master Data

App.-Configuration

Application Rules

- AEM provides JavaScript-API's
 - Dynamic Layouting
 - Pop-ups, Flyouts, Layer, ...
 - Web-Analytics
 - Footnotes
 - Personalization
 - Navigation (forward/backward button)

Outbound Patterns

Content Snippets

Shared Resources

Frontend JS-Libraries

Site Master Data

App.-Configuration

Application Rules

- AEM provides back-end interface
 - Site master data
(countries, languages, domain-names, logo, ...)
 - Link API
 - e.g. Mercedes Benz:
BE → fr → E-Class → Configurator
CH → de → A-Class → Homepage

Outbound Patterns

Content Snippets

Shared Resources

Frontend JS-Libraries

Site Master Data

App.-Configuration

Application Rules

- AEM is “the” User Interface for Authors
- Property-files within the App are
“non-configurable”

Outbound Patterns

Content Snippets

Shared Resources

Frontend JS-Libraries

Site Master Data

App.-Configuration

Application Rules

- Mixing multiple Applications requires rules
- Example:
 - CSS Namespaces
 - JS Namespaces
 - ...

- **Service Management**
- **Platform Services**
- **Governance**