



MobileTech
Conference 2015

Elmar Schraml | ARITHNEA GmbH

Mobile, Microservices und Multichannel –
warum Web-App-Architektur sich ändern muss



New Adventures in Architecture

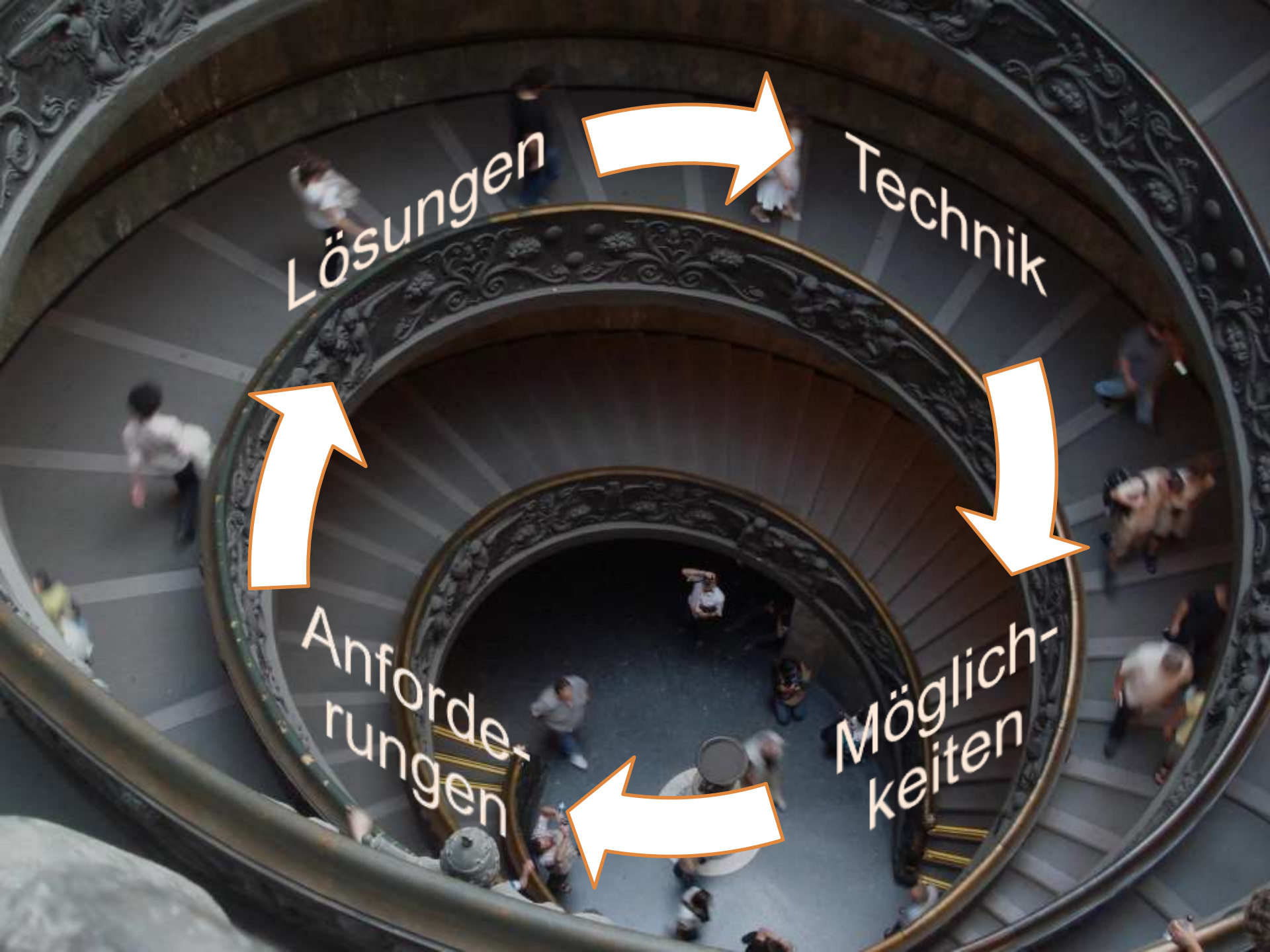
\$ > who am i

Entwickler
Consultant
Architekt
Java
ecommerce

MacBook Pro

The image features a large, semi-transparent circular graphic in the background. This graphic contains three labels: 'Anforderungen' (Requirements) at the bottom left, 'Möglichkeiten' (Possibilities) at the bottom right, and 'Lösungen' (Solutions) at the top left. Two large, light-gray curved arrows connect these labels in a clockwise cycle. In the center of this cycle is a bright orange, multi-pointed starburst shape with a blue outline. Inside this starburst, the word 'Technik' (Technology) is written in white, bold, sans-serif font. The entire composition is set against a dark, blurred background that appears to be an interior architectural space with people walking.

Technik



Lösungen

Technik

Möglich-
keiten

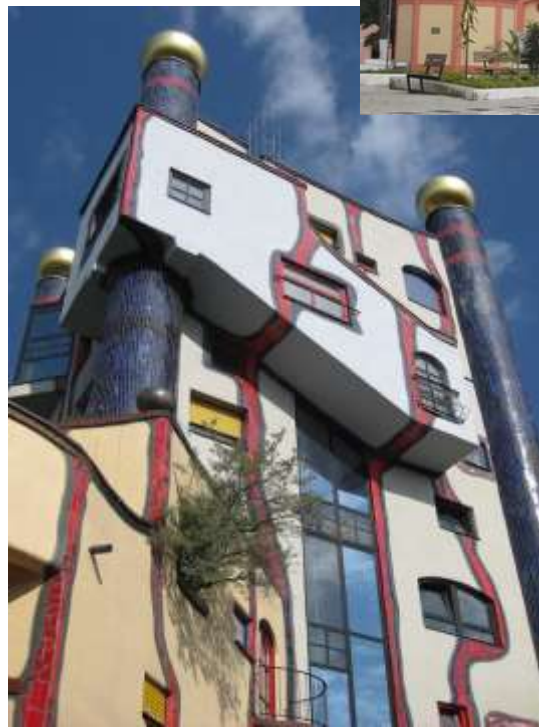
Anforde-
rungen



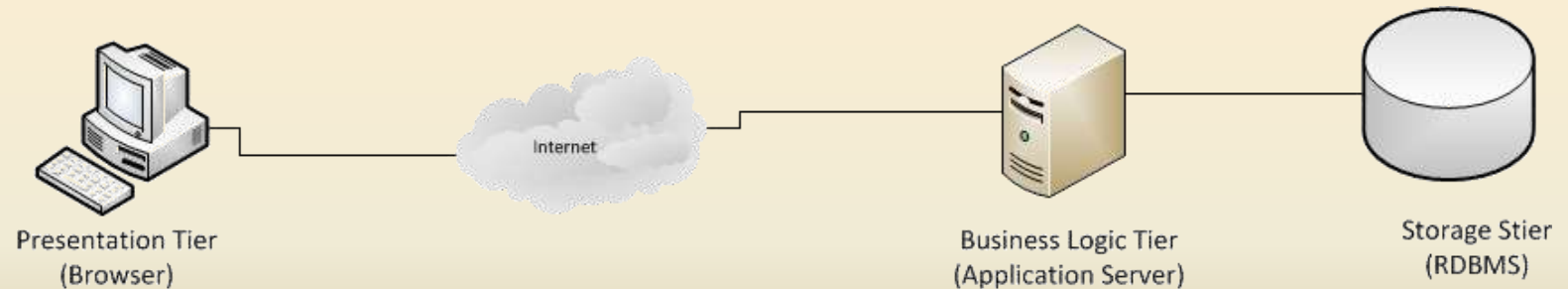
NoMVC



Not Only MVC!



Die Antike (ca. 1995 A.D)



Lösungen

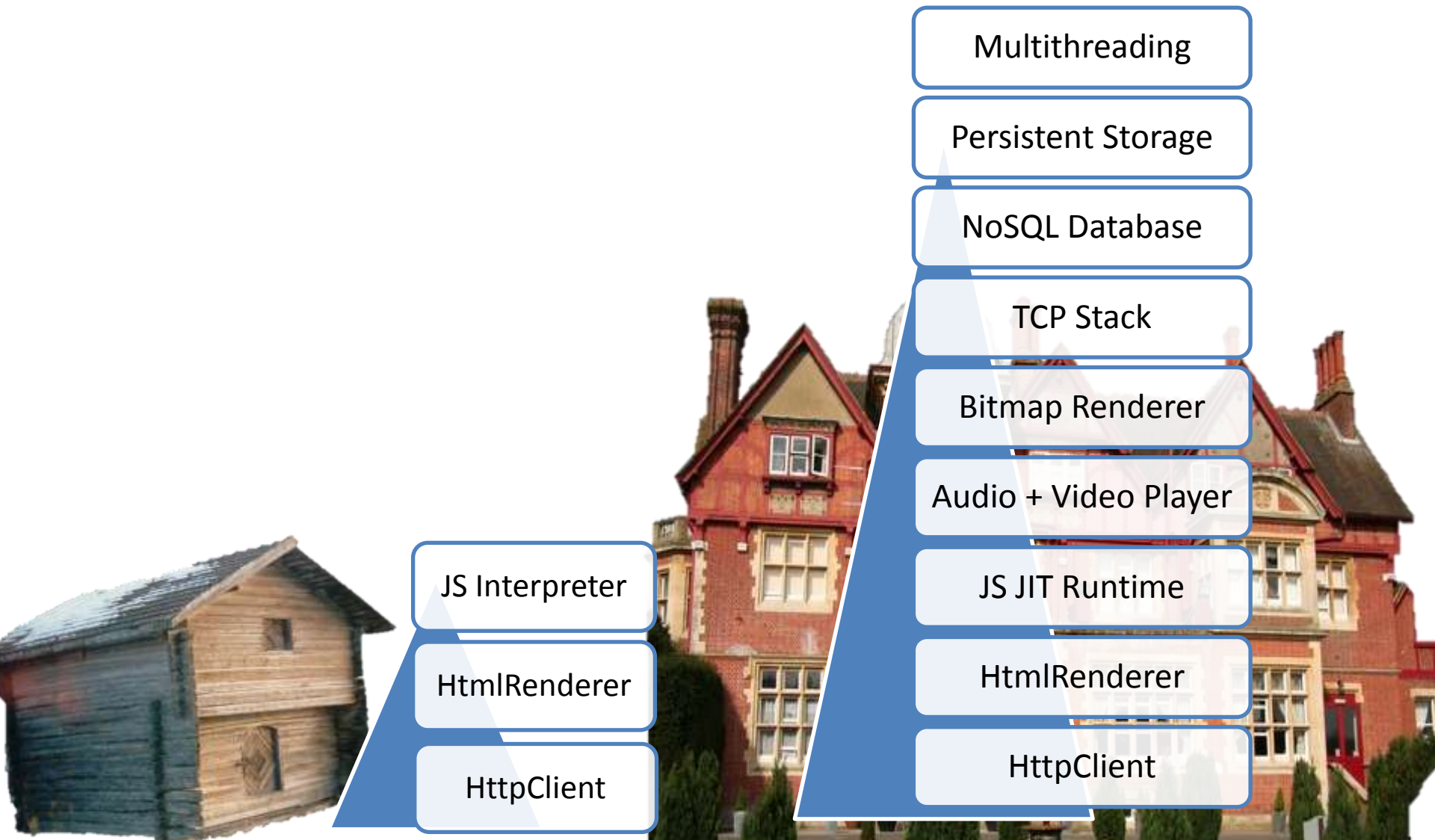
Technik

Anforderungen

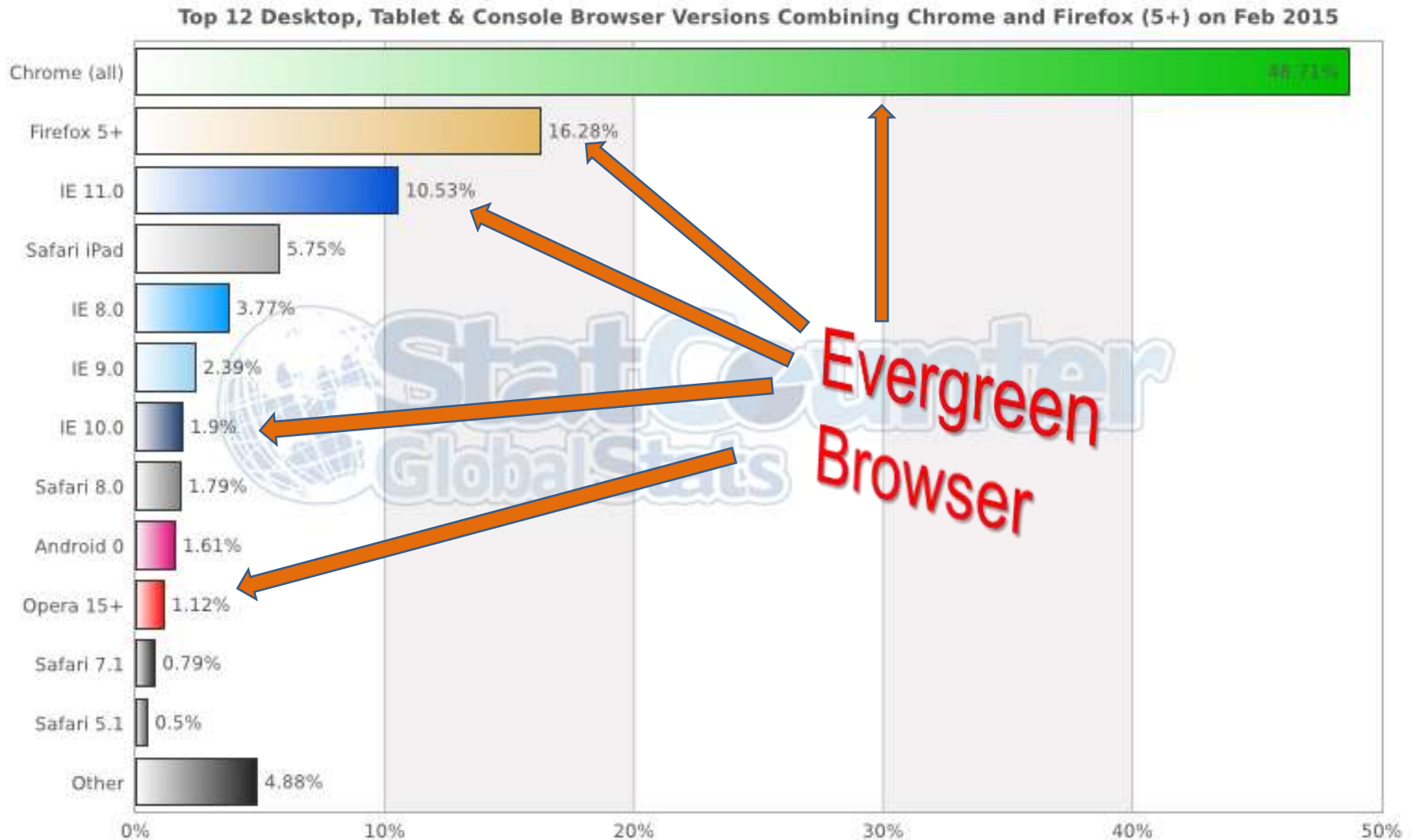
Möglichkeiten



Neue Möglichkeiten: Html5 als Plattform



Neue Möglichkeiten: Tod der Legacy-Browser



Caniuse: IE8, Blackberry 10, Opera 12, Mobile IE, Opera Mini

CSS Table display

CSS 2.1 selectors

CSS min/max-width/height

CSS inline-block

CSS Counters

CSS3 Text-overflow

JSON parsing

PNG alpha transparency

Caniuse.com: FF+, Chrome+, (Mobile) Safari 8, Android Chrome

CSS currentColor value CSS position:fixed

CSS Counters CSS 2.1 selectors

CSS min/max-width/height CSS inline-block

CSS Table display CSS outline

CSS Generated content for pseudo-elements

CSS3 Background-image options

CSS Repeating Gradients

CSS3 Multiple backgrounds @font-face Web fonts

CSS3 selectors CSS3 Box-shadow CSS3 Colors

CSS3 Media Queries

CSS3 Border-radius (rounded corners)

CSS background-position edge offsets

CSS3 Border Images CSS3 Transitions

CSS3 Text-shadow CSS Gradients

rem (root em) units CSS3 Opacity

CSS pointer-events (for HTML)

calc() as CSS unit value CSS3 Text-overflow

getComputedStyle SVG in CSS backgrounds

Text API for Canvas Canvas (basic support)

querySelector/querySelectorAll

DOMContentLoaded getElementsByClassName

async attribute for external scripts

classList (DOMTokenList)

defer attribute for external scripts matchMedia

Mutation Observer XMLHttpRequest 2

DOM Parsing and Serialization

contenteditable attribute (basic support)

input placeholder attribute Audio element

hidden attribute sandbox attribute for iframes

Range input type Offline web applications

dataset & data-* attributes New semantic elements

Video element Session history management

Hashchange event Inline SVG in HTML5

JSON parsing Blob URLs Typed Arrays File API

requestAnimationFrame FileReader API

Geolocation Cross-Origin Resource Sharing

Base64 encoding and decoding Web Workers

Web Storage - name/value pairs Blob constructing

Web Sockets

XHTML served as application/xhtml+xml

WebVTT - Web Video Text Tracks

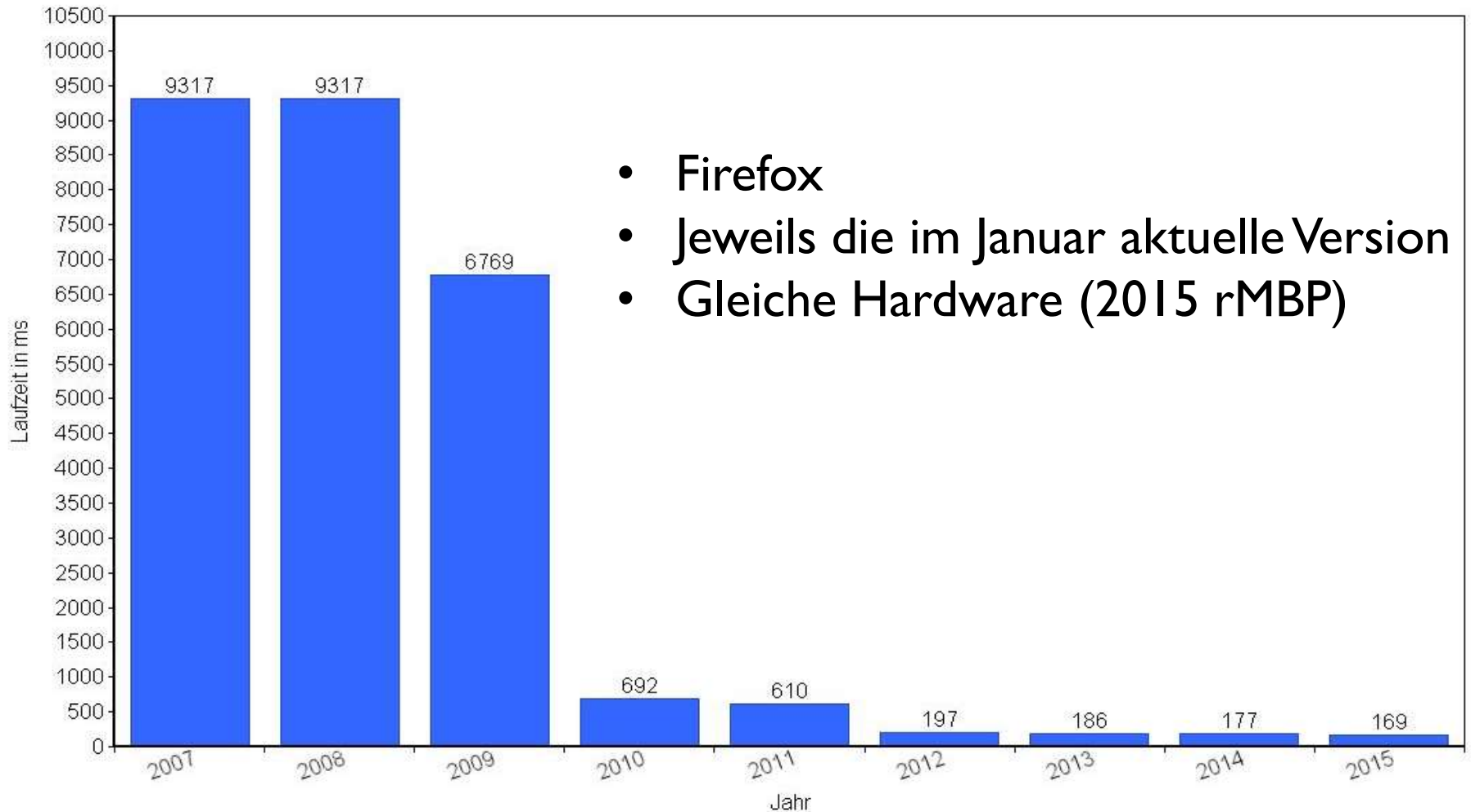
ECMAScript 5 Strict Mode

WOFF - Web Open Font Format

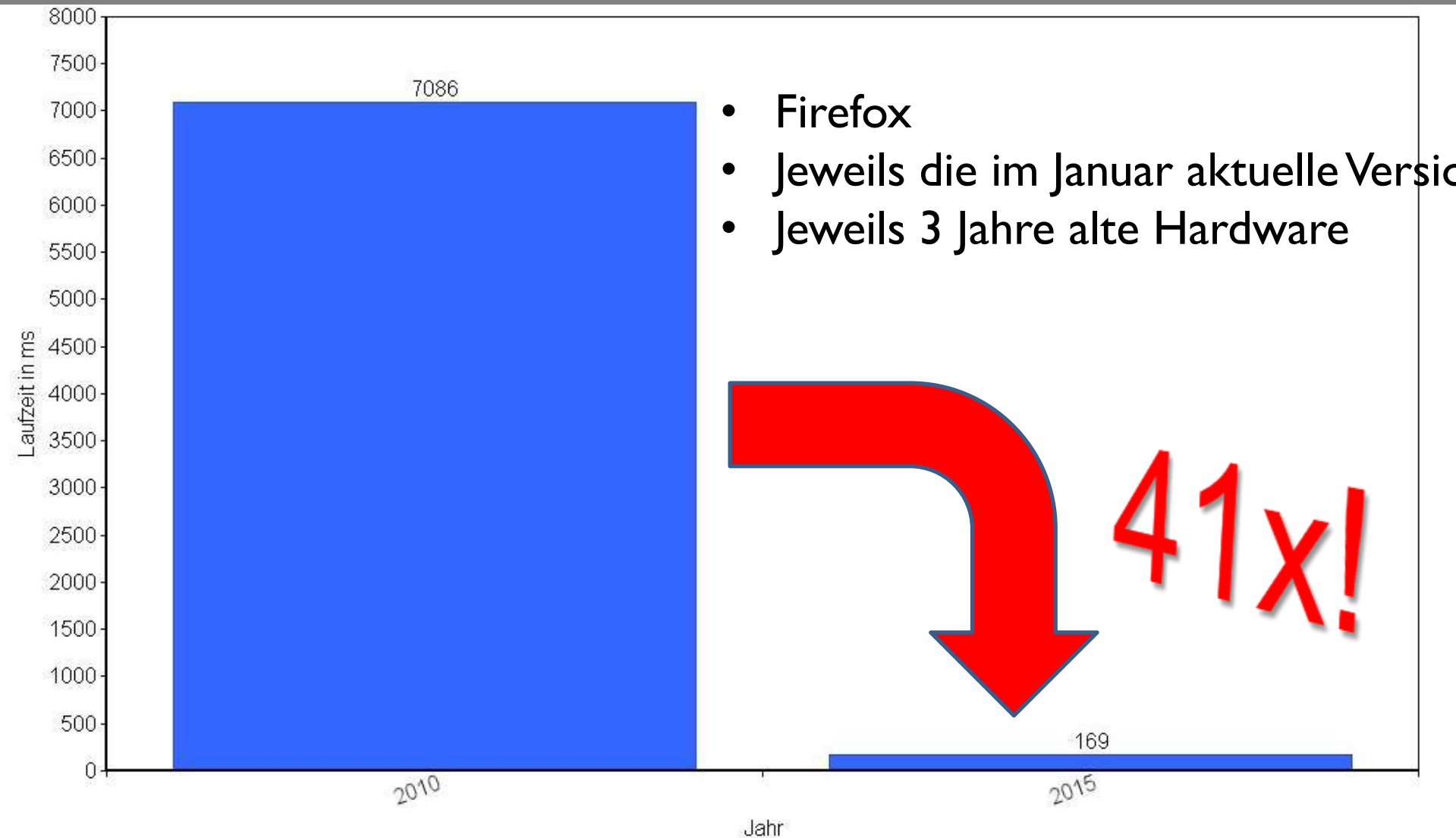
PNG alpha transparency SVG in HTML img element

SVG filters SVG (basic support)

Neue Möglichkeiten: Javascript Performance



Neue Möglichkeiten: Javascript Performance



Neue Möglichkeiten: Cloud Deployments

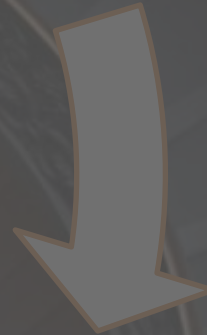


Lösungen

Technik

Anforderungen

Möglichkeiten



Anforderungen: Mobile

- Mobilversion kein Goodie mehr, sondern Pflicht
 - API
- verschiedene Ansätze für mobile:
 - responsive web app
 - wrapped web app
 - hybrid-app
 - native app mit json-services
- Architektur vielschichtiger

Anforderungen: Multichannel



- Online-Shop

- Mobile

➤ API

- Print

- Point of Sales

➤ API

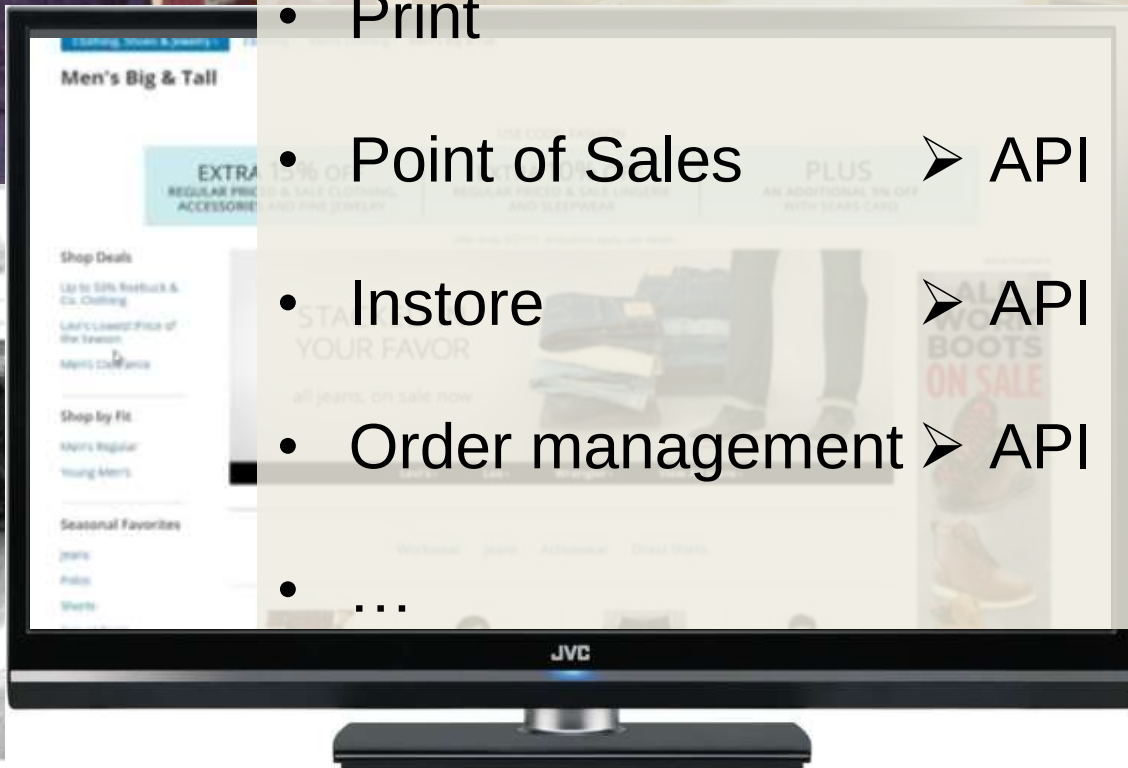
- Instore

➤ API

- Order management

➤ API

- ...

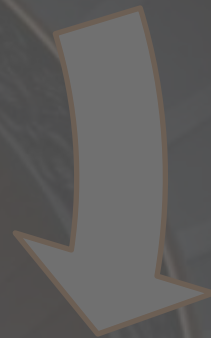
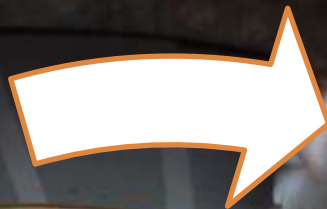


Anforderungen: Microservices

- 1 Projekt == 1 Anwendung -> Fail
- Web Scale
- Leichtgewichtigere Integration
- Sammlung unabhängiger Services statt Monolith
 - Komplexität in der Integration statt im Service
- unabhängige Services -> unterschiedliche Sprachen, Persistenz, Frameworks,...
 - Technologie-Zoo

Lösungen

Technik



Anforde-
rungen

Möglich-
keiten



"Lösungen": Single-page applications

- 
- Immer noch MVC
 - Immer noch App + dumb storage
 - SEO? -> PhantomJS?
 - Downloadzeiten? -> FastBoot?
 - Accessibility?
 - Varianz der Performance
 - productivity vs media

Neue Ansätze: Isomorphic Applications

- Javascript auf client und server
 - kein duplizierter code
 - Funktionalität verschiebbar
- MEAN stack
- Meteor
- „Middle End“

Neue Ansätze: Reactive Apps

- reactivemanifesto.org
- 4 Prinzipien
 - Responsive ➤ Async
 - Scalable ➤ Stateless
 - Resilient ➤ Distributed
 - Event-driven
- mindset, not architecture



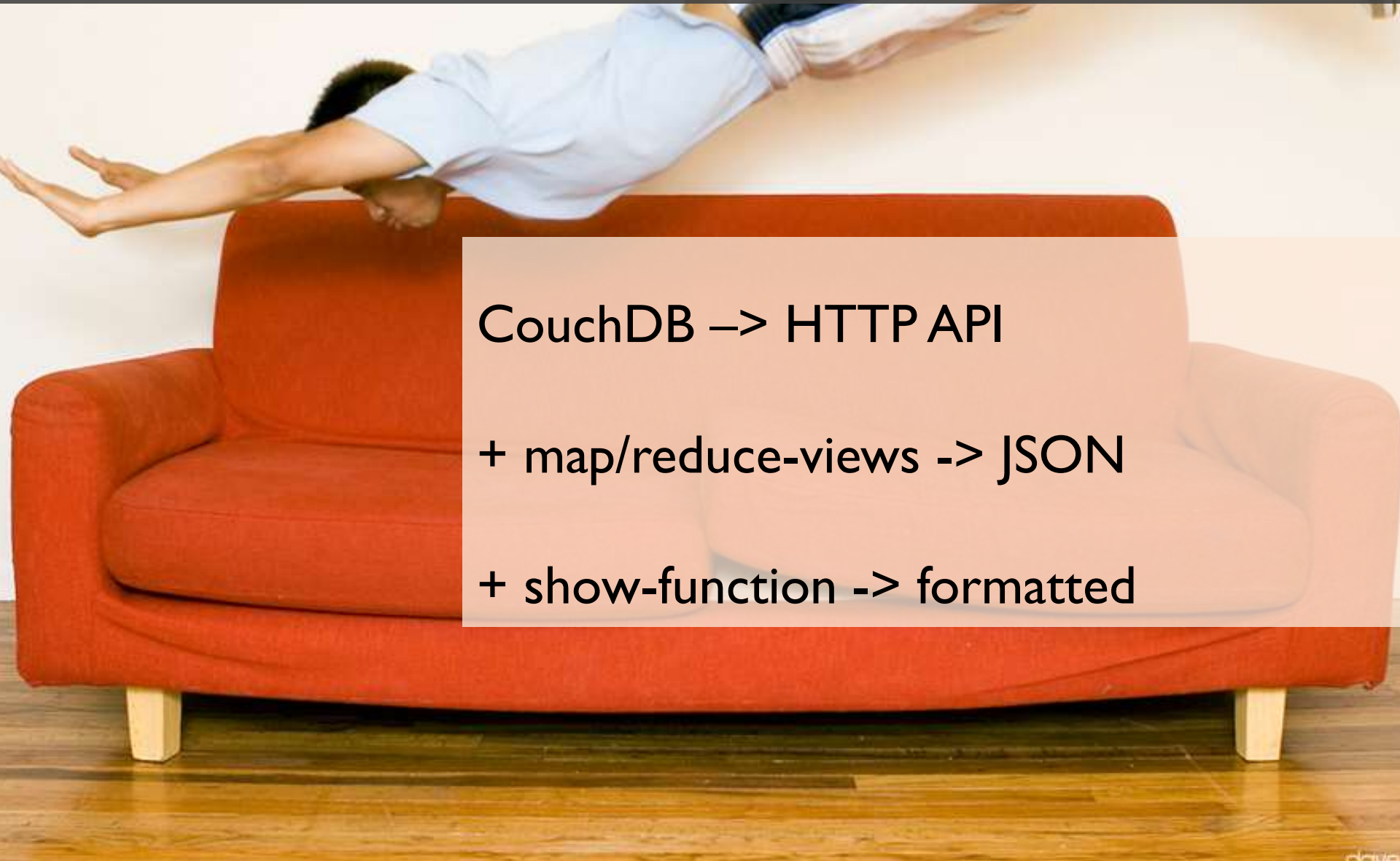
Neue Ansätze: Self-contained systems

- Domänenspezifisch im Sinne von DDD
- Benutzt $n+$ Microservices
- Eigene Persistenz
- Eigene GUI und/oder API

Neue Ansätze: "Persistence with UI" JCR

- Java Content Repository:
 - Baumstruktur für content nodes
- Apache Sling framework
 - requests -> content + skript + template

Neue Ansätze: "Persistence with UI" Couch Apps

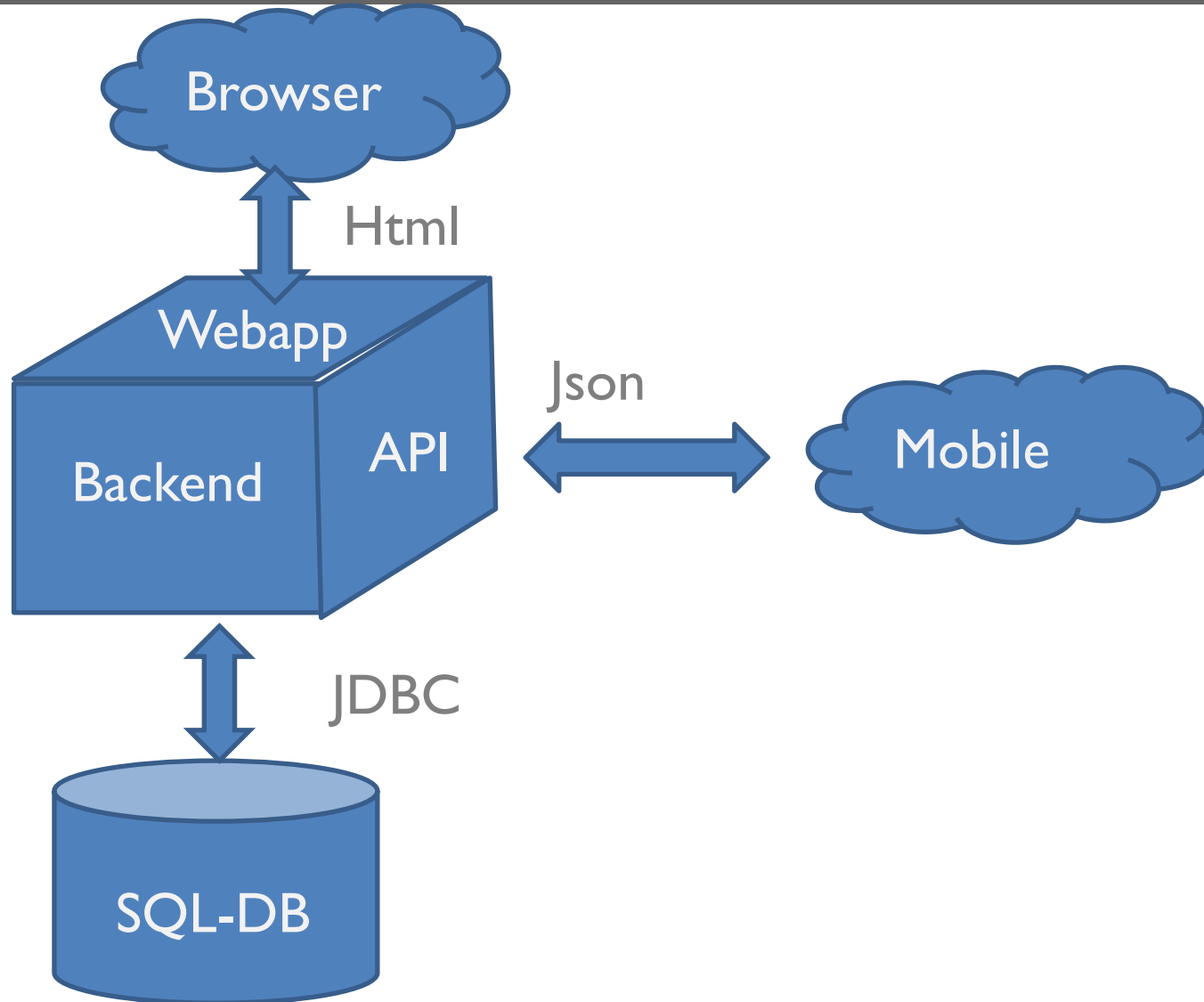


CouchDB → HTTP API

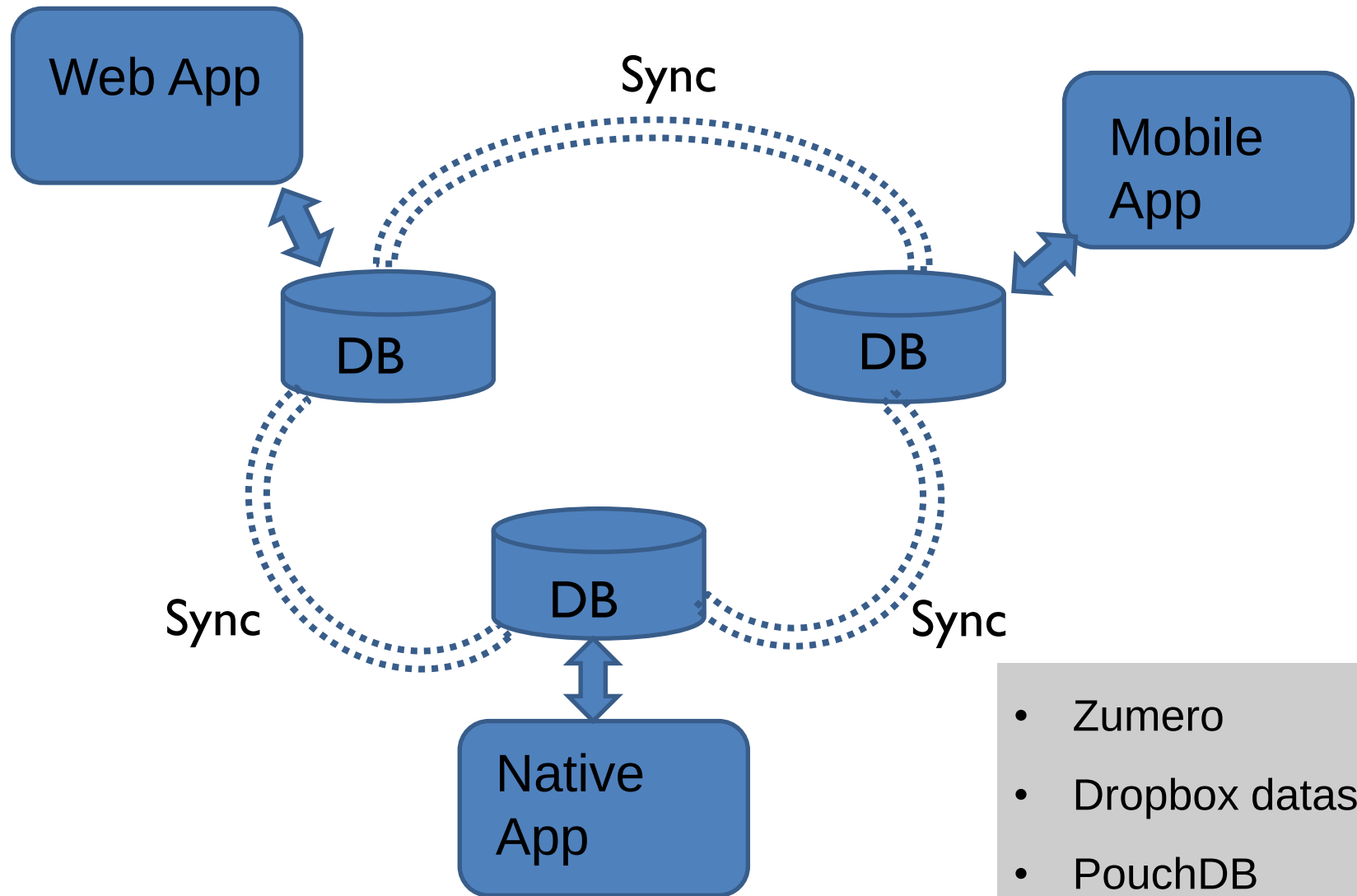
+ map/reduce-views → JSON

+ show-function → formatted

Neue Ansätze:



Neue Ansätze: Native Applications, Persistence-level Sync



Frontend

Suche

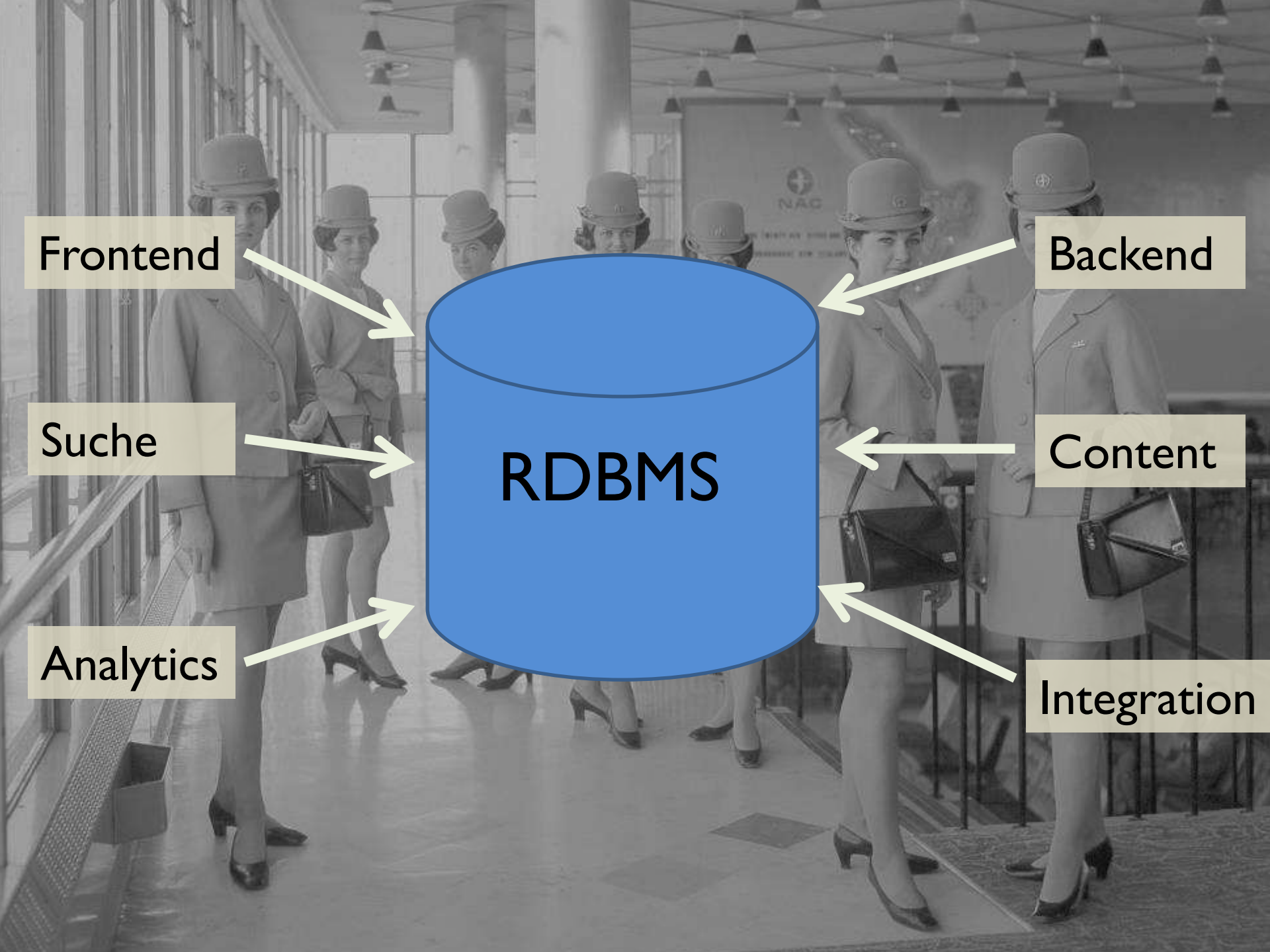
Analytics

RDBMS

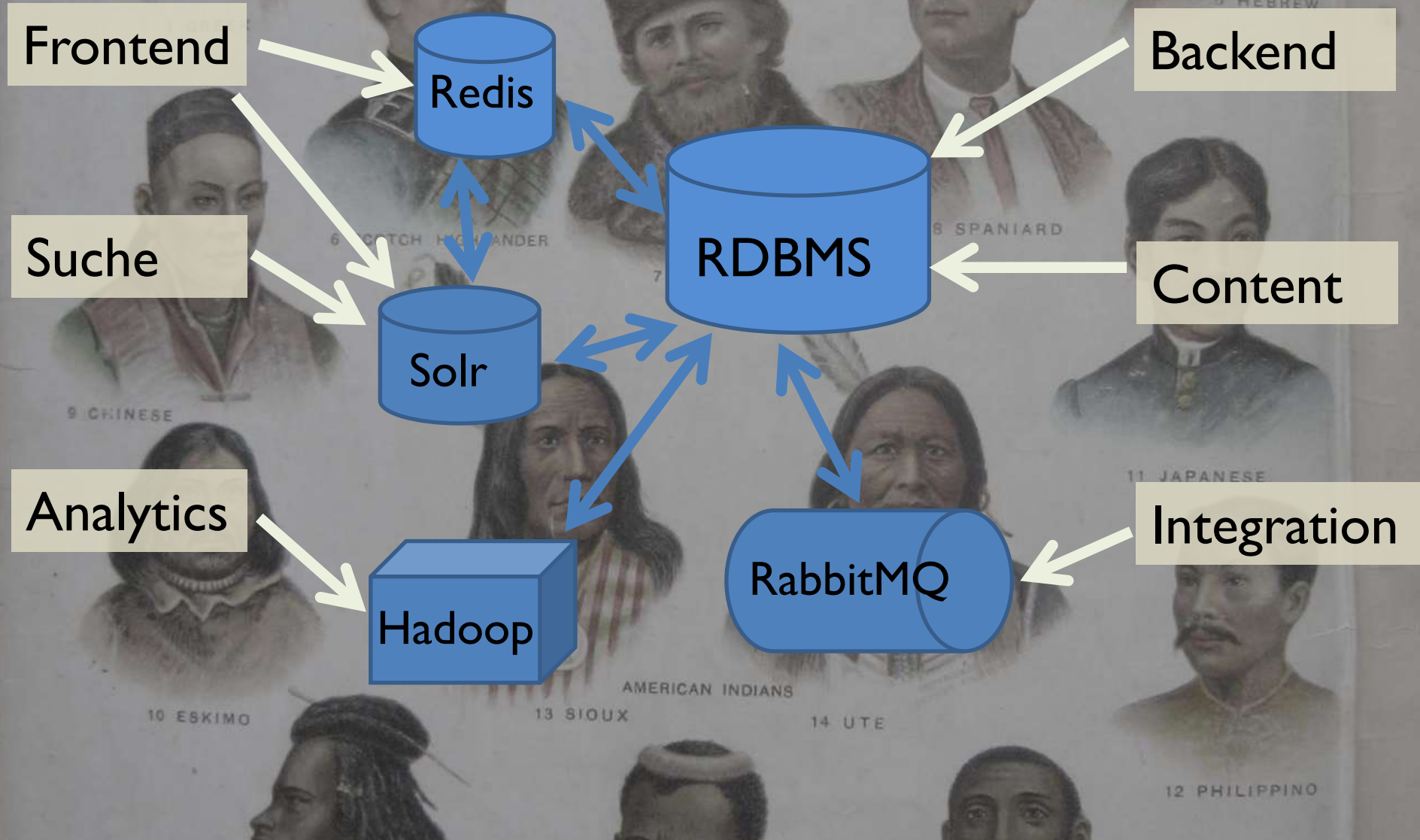
Backend

Content

Integration



Neue Ansätze: Polyglot Persistence

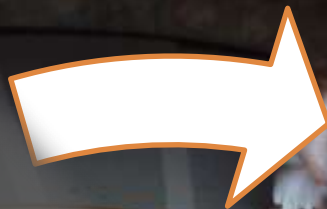


Lösungen

Technik

Anforderungen

Möglichkeiten



Technik: React

- One-way databinding
 - Shadow DOM
 - JSX
 - React Native
-
- Nur das V in MVC
 - technologie-unabhängige View-Definition
 - "html as the assembly of views"

Technik: Packaged Apps

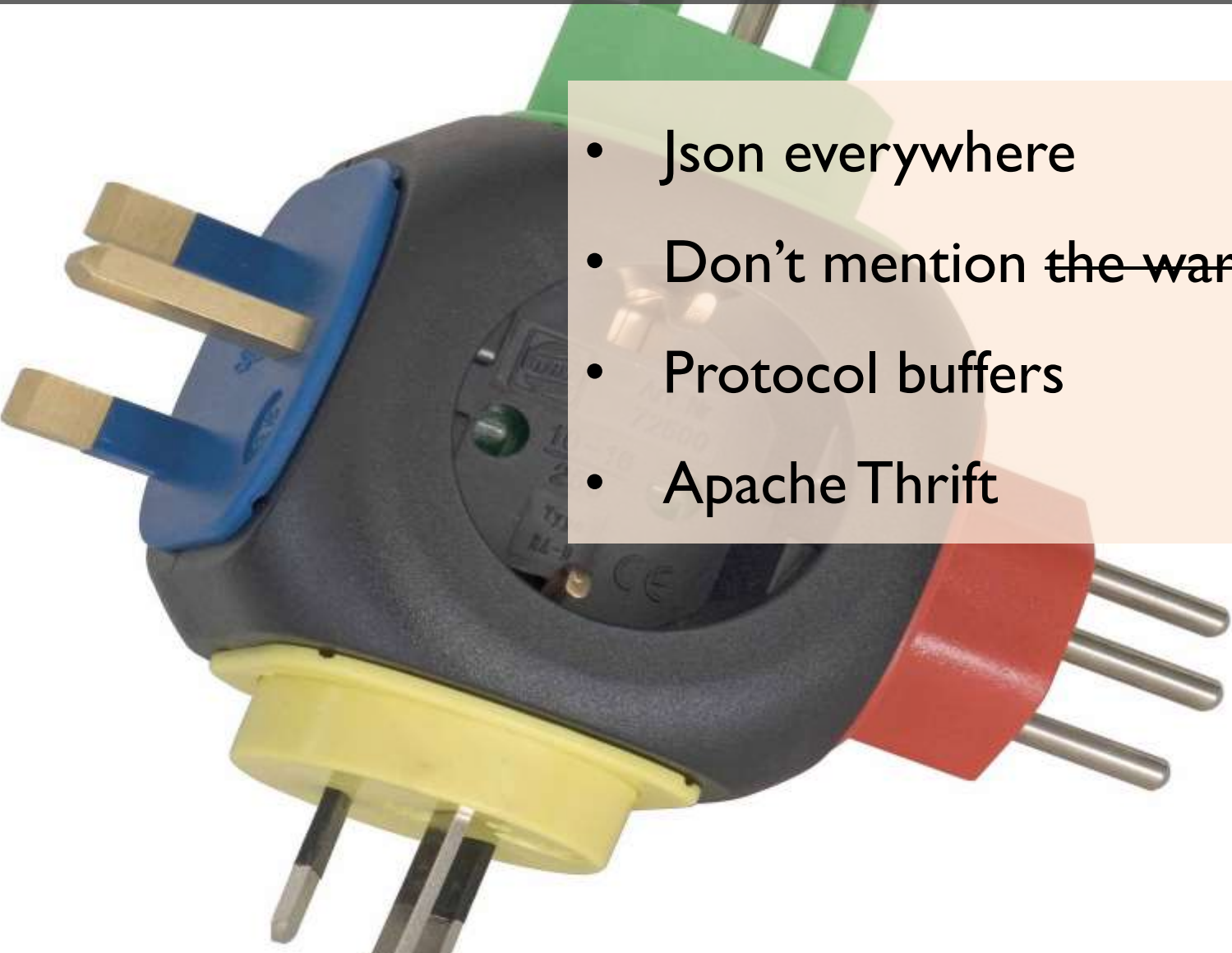


- Embedded server
- Single file
- interne Konfiguration
- Bsp Framework: Dropwizard
- Bsp PaaS: AppEngine
- Bsp Deployment: Docker

Technik: Service Composition

- 
- A photograph of a conductor in a dark suit, standing on a podium and gesturing with his right hand towards the orchestra. The background is dark, with some musicians and instruments visible in the shadows.
- ~~lframes~~
 - ~~Portal server~~
 - Links
 - BigPipe
 - ESI (edge-side includes)
 - Compoxure

Technik: Polyglot Integration

- 
- Json everywhere
 - Don't mention ~~the war~~ CORBA
 - Protocol buffers
 - Apache Thrift

Technik: Distributed Application Patterns

- Circuit breaker (hystrix)
- Resilience test (Chaos Monkey)
- Finagle RPC system
- Traceable services (Dapper/Zipkin)

Ausblicke in die Zukunft



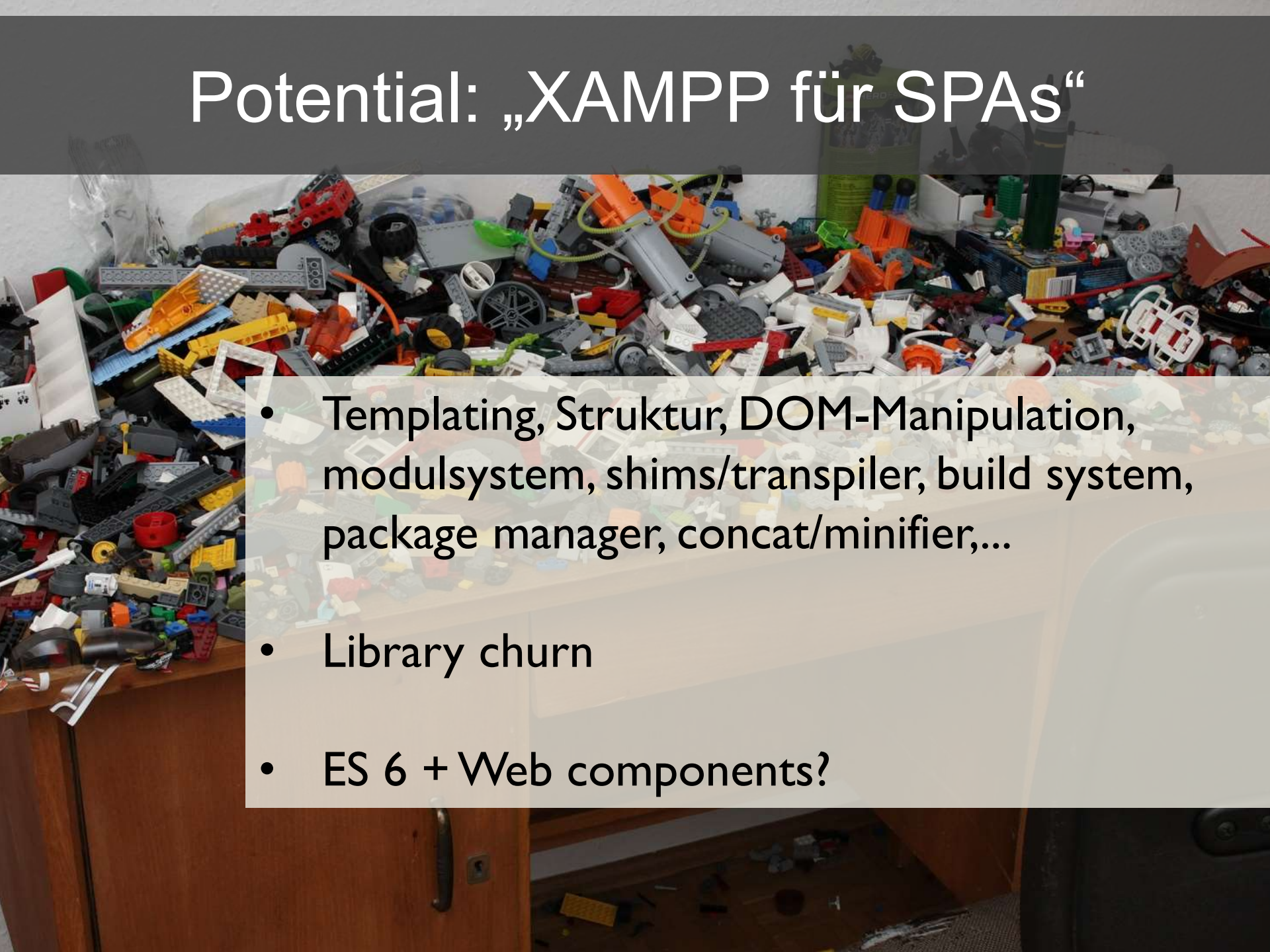
Prinzip: APIs == Application

- Guardian of Data
- REST
- “Dogfooding”:
 - Wordpress
 - AboutYou

Prinzip: Undo statt Confirmation

- Easy reversal over checks and confirmations
- Accept and handle failure rather than prevent it at all costs
- Small frequent deployments over big bang releases
- Eventual consistency over ACID transactions

Potential: „XAMPP für SPAs“

- 
- Templating, Struktur, DOM-Manipulation, modulsystem, shims/transpiler, build system, package manager, concat/minifier,...
 - Library churn
 - ES 6 + Web components?

Potential: Server-side JS

- Node = JS + Event loop
- VertX = Event loop + JVM
- JS + X -> ??

Polyglot everything

- DVCS: Technik != Lösung
- polyglot persistence + services
- "polyglot architecture"
- Vielfalt statt Standardlösungen
- Neue Ansätze als Ergänzung
- "cambrian explosion" der Möglichkeiten

The future is unevenly distributed



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MobileTech

Conference 2015



– Backup –

Exkurs: Lösungen für Single-page applications

- vs initialer Download:
FastBoot
 - initiales statisches Html
 - erst danach start der SPA
- - vs SEO: PhantomJS
 - pre-rendern statischer Seiten
- - vs graceful degradation:
 - Nur wegdefinierbar
 - Accesibility?
 - IoT?

Ausblick: Microservices

- 12factor.net
- Schnellerer Release-Zyklus -> kleinere Anwendungen
- Continuous Deployment -> Automatisierung
- Fixkosten für Einführung?



Ausblick: Safe Bets

- Javascript -> Ecmascript 6 -> ES2015 statt Präprozessor-Sprachen
- Web Components
- REST everywhere
- Async everywhere

Neue Ansätze: Middle End

- Voraussetzung: isomorphic app
- Doppelte Aufgaben FE/BE
 - Validierung
 - Formatierung
 - Templating
- Aufgaben, die FE und BE verbinden
 - Url routing
 - Session/cookie mgt
 - Caching
 - Packaging
- kleines frontend kann z.B. SPA sein
- backend kann microservices sein, jede Persistenz, jede Sprache,...

MIDDLES

BEGINNINGS