Mobile Applications

Einführung

- Kurztests in Woche 6 und 12
- Schlussprüfung: Open book, Januar 2016
- https://olat.zhaw.ch/auth/1%3A1%3A0%3A0%3A0/

Mobile Apps

Mobile Friendly Website: no fixed boundary to mobile apps, pages fetched from server, document rather than application, can be added to homescreen, responsive webdesign

Hybrid Mobile Applications

Natife code for additional features, webview with HTML5, e.x. PhoneGap

Moile Platforms

Features of mobile devices

- Smaller Screens
- Different input concepts (touch, keyboard, stylus)
- Slow, unstable network connection
- Less powerfull processors
- Batteries - minimize power consumption

Devicne Sensors: - Camera - Microphone - Geolocation, GPS - Accelerometer - Gyroscope - Magnetometer - Battery State - Proximity sensor

Touch Control: - Bigger control elements required - 44 x 44 points is the comfortable minimum size of a tappable UI element (by apple) - Gestures - Tap - Drag - Flick - Swipe - Double Tap - Pinch - Touch and hold - Shake - ... Touch Gesture Reference Guide - Force Touch (Apple: 3D Touch, Huawei)

Platforms and ecosystems

Android: - Open Handset Alliance led b Google - Publicy available since Nov. 2007 - Purpose - Differentiation - Consists of: OS, Applications, Frameworks - Problems: - Fragmentation (Different devices by various manufacturers, partially

upated to current version) - Chinese Android (3thrd Party Stores, Based on Android Open Source Platform)

IOS: - Cocoa Touch - XCode - Objective-C / Swift - Starke Integration HW / SW

Windows Phone: - Metro Design Paradigm - Live Tiles

Firefox OS: - Mozilla Foundation - Linux based, open source - Aimed at lower end smarphones - Becko Runtime for Apps - Interface: Gaia - Development: HTML / JavaScript / CSS, Firefox OS JS API for packaged apps - Marketplace (Apps are reviewed)

Blackberry: - Früher: HW & SW (wie Apple) - Suited for Messaging (BlackBerry Hub for messages) - Separation of business and private data - Private Mode: Android runtime available (Android Open Source Stack, Amazon-Store)

Ubuntu: - Ubuntu Touch - Qt5-based UI - Scopes for information on home screen - Linux based

Tizen: - Open Source, Linux based - Target: Various smart devices, platfrom independant - Web Apps, C++ (Bada Framework), Tizen SDK - Tizen Store

Sailfish: - Jolla, based on MeGo / Metro - Homescreen with tiles - Apps: Sailfish native-apps, Android apps, Mee-Go-native apps, linux apps compiled for sailfish devices

Feature Phones: - Grösster Anteil - Java ME (J2ME) - KDE Plasma - Symbian OS - Palm OS - WEBOS - Windows Mobile - Bada OS (Vorgänger von Tizen)

Mobile Web

Varianten: - Native Apps - Mobile Apps - Hybrid Apps

Webapps - Dynamic, interactive - Rather SPA implementation - Client side logic

Websites - Rather static content - Multiple links / pages - Server side logic

Herausforderungen: - Platform integration of native apps cannot be reached - More or less dependent on connectivity - lack of developer tools compared to native app development - Monetization of mobile sites can prove tricky

Browsers and Rendering Engines

- WetKit (Safari)
- Blink (Chromium)
- Trident (Internet Explorer), EdgeHTML (Edge)

Mobile First

- Content First

Mobile Web

- Forms
  - type=“number” (Choose the correct type)
  - type=“email”
  - type=“tel”
  - type=“date”

Response Webdesign

- Client Side Adaptation
  - Responsive Web Design
- Server-Side Adaptation
  - Device Database
- Hybrid Adaptation
  - RESS (Responsive web design with server side components)
- Viewport
  -
  -
  - content: width, initial-scale, minimum-scale, maximum-scale, user-scalable
- Fixed Layout
- Fluid Layout (Angaben in Prozent)
- CSS3 Media Queries
  -
  - @import url(small.css) screen and (max-width: 400px)
  - @media screen and (max-width:400px):
  - tv, portrait, landscape, ...

Responsive Webdesign

```
- Ethan Marcotte: Fluid Grids, Responsive Web Design
```

What is a Pixel

```
CSS 2.1: Absolute Unit, pt: 1/72 of 1in, px: 1px = 0.75px
Tatsächliche Grösse: Browser + OS (Spez. Auflösung), Druck: physikalische Grösse

##Referenz Pixel
Grösse Pixel bei 96dpi und 1 Armlänge Abstand
```

CSS Pixel

```
- Screen Size: 1px
- Units (cm) based on px
- Opera on HTC Desire: 1 CSS Pixel = 1.5 Screen Pixel
- iPhone with Retina: 1 CSS Pixel = 2 Screen Pixel
```

CSS, JavaScript - Update

Flexbox

- FlexContainer: display: flex (auf parent element)
- FlexContainer: display inline-flex
- FlexItem (Unterhalb FlexContainer):
- vh: View-Height
- flex-direction: row | column | row-reverse | col-reverse
- order: Reihenfolge der Container
- justify-content: flex-start | flex-end | justify-content
- align-items: stretch | center | flex-start | baseline
- flex-grow, flex-shrink, flex-basis –> flex: x y z (Bsp. Wenn weniger platz, dann x mal so stark verkleinern)
- flex-wrap

ECMASCRIPT 6 / 2015

- Features: Modules, Classes, Maps, Sets, Promises, Generators
- Only additional Features
  - Block level scope (var -> function level scope, let -> block level scope)
  - const ITEMS = 30; (Konstanten) (Block Level Scope)
  - Destructuring Assignments (a,b = b,a, mehrere Return-Werte)
  - Functions
  - Default parameters

- REST Parameters (function(year,...names))
- Destructured Parameters
- Arrow Functions (var um = (num1, num2) => {num1 + num2})
- Symbols ("Enums") (let sym = Symbol())
- Objects let obj = { myMethod() {...}}
- Class declarations (class Point extends GeometryObject with constructor + methods)
- Modules (Import, Export Default)
- Template strings
- Collections: Maps, Sets

Mobile Web-APIs

URLs Beyond the Web (URIs)

- Phone call and text mesage links
- Deep Linking into Apps

Order Pizza Now!

- tel:
- sms:?body=...
- Schema: http://www.iana.org/assignments/uri-schemes/uri-schemes.xhtml

Deep Linking: - iOS: Universal Linking - JSON file file im root der webseite (https) - Android M: App to App Link - Click link -> App available -> open in app, otherwise: open in browser

Geolocation

- navigator.geolocation.getCurrentPosition(success, fail)
- Geofencing API (notifications on entering region), a Service Workers API (only Chrome)

Device Orientation

- Gyroscope
- Accelerometer
- Magnetometer

Capturing Pictures, Audio, Video

- Up till now: often plugins required
- Currently: Several variants of “Media Capture API”
- WebRTC
- GetUserMedia

```
<input type="file" accept="image/*" capture="camera" />
```

Other APIs

- BatteryStatusAPI
- Vibration API
- Ambient Light API
- Proximity API
- Also not mobile:
  - Application Cache
  - Service Workers
  - Web Workers
  - Web Storage
  - IndexedDb
  - Multimedia
  - Page Visibility API
  - Fullscreen API
  - Clipboard API
  - ...

Not only mobile