MobileFirst Application Development & Lifecycle Management für mobile Anwendungen
Agenda

• Warum sind Mobile Applikationen anders?
• Mobile Application Development Lifecycle
  – Requirements Management
  – Real Time Planning
  – Development Intelligence
  – Testing
  – Mobile Development
Mobile is a mandatory transformation

10 Billion devices by 2020

61% of CIOs put mobile as priority

45% increased productivity with mobile apps
With enormous opportunities

**Business to Enterprise**
- Increase worker productivity
- Improved claims processing
- Increase revenue with sales engagements
- Extend existing applications to mobile workers and customers
- Reducing fuel, gas, or fleet maintenance costs where relevant
- Increase employee and business partner responsiveness and decision making speed
- Resolve internal IT issues faster
- Reduce personnel cost (utilizing personal devices instead of corporate devices)

**Business to Consumer**
- Improve customer satisfaction
- Deeper customer engagement and loyalty
- Drive increased sales through personalized offers
- Customer service
- Competitive differentiator
- Improve brand perception
- Deeper insight into customer buying behavior for up sell and cross sell
- Improve in store experience with mobile concierge services
Mobile is changing conventions for industries

<table>
<thead>
<tr>
<th>Healthcare</th>
<th>Construction</th>
<th>Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>From:</td>
<td>From:</td>
<td>From:</td>
</tr>
<tr>
<td>Traditional health institution</td>
<td>Construction general contractor with remote employees</td>
<td>Sitting in traffic jams</td>
</tr>
<tr>
<td>To:</td>
<td>To:</td>
<td>To:</td>
</tr>
<tr>
<td>Seamless interactions among physicians and providers, improving quality of care, patient safety and efficiency improving patient experience</td>
<td>Empowered construction project managers armed with mobile solutions to pitch new projects in higher-growth industries</td>
<td>Real-time re-direction to optimal routes using mobile info</td>
</tr>
</tbody>
</table>

IBM SolutionsConnect 2013
Agenda

• Warum sind Mobile Applikationen anders?
• Mobile Application Development Lifecycle
  – Requirements Management
  – Real Time Planning
  – Development Intelligence
  – Testing
  – Mobile Development
Mobile applications are not miniature PC applications…

<table>
<thead>
<tr>
<th>Mobile Applications</th>
<th>PC Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Usage Context</strong></td>
<td></td>
</tr>
<tr>
<td>▪ User may be in the middle of some other activity (e.g. shopping in a supermarket)</td>
<td>▪ Using the application is the primary activity</td>
</tr>
<tr>
<td>▪ Interactions are short and may be interrupted</td>
<td>▪ Interactions are longer and more focused</td>
</tr>
<tr>
<td>▪ Often used for monitoring / data consumption</td>
<td>▪ Active consumption and data input</td>
</tr>
<tr>
<td>▪ Users are very impatient</td>
<td>▪ Users are impatient</td>
</tr>
<tr>
<td><strong>Mode of Interaction</strong></td>
<td></td>
</tr>
<tr>
<td>▪ Non-keyboard: touch prevalent, also speech</td>
<td>▪ Keyboard and mouse</td>
</tr>
<tr>
<td>▪ Typing should be minimized</td>
<td>▪ Typing is okay</td>
</tr>
<tr>
<td>▪ Social interactions are important</td>
<td>▪ Larger screen size for presenting information</td>
</tr>
<tr>
<td>▪ Screen size/real-estate is small</td>
<td></td>
</tr>
<tr>
<td><strong>Other considerations</strong></td>
<td></td>
</tr>
<tr>
<td>▪ Integration with device capabilities (e.g. camera, GPS, accelerometer)</td>
<td></td>
</tr>
<tr>
<td>▪ Offline behavior</td>
<td></td>
</tr>
<tr>
<td>▪ Mobile hardware and user interfaces evolve much faster than the typical enterprise software cycle.</td>
<td></td>
</tr>
</tbody>
</table>
… and come with unique development challenges

Developing for multiple mobile platforms

- Highly fragmented set of platforms, devices, languages, and tools increases cost and complexity of development and test
- Choosing not to support one or more platforms reduces the reach of an application

Delivering high quality apps that engage users and meet business objectives

- Poor quality can negatively impact brand image
- Bad ratings and comments can cause other users to avoid trying an app

Integrating with enterprise systems

- Recreating instead of leveraging existing business logic increases maintenance costs and risk of inconsistent behavior
- Lack of ready back-end services slows front-end development and increases potential for last minute integration issues

Meeting accelerated time to market requirements

- Hand-off errors and delays between teams slows progress and responsiveness to features and fixes
- Misalignment of stakeholders results in late rework and increased cycle times
Agenda

- Warum sind Mobile Applikationen anders?
- **Mobile Application Development Lifecycle**
  - Requirements Management
  - Real Time Planning
  - Development Intelligence
  - Testing
  - Mobile Development
Application lifecycle management (ALM) is the discipline of overcoming these silos to realize a whole-team, whole-view approach to the software delivery cycle.

ALM manages the flow of:
- **People**
- **Process**
- **Information**

Mobile development requires the adoption of [Agile practices](https://www.ibm.com) to keep up with demand for frequent releases.
Mobile application development is more than just creating the source code

Add requirement to the plan
- Add item to sprint plan
- Update test plan

Elaborate requirement and review
- Review seeded artifacts; focus on linkage and UI sketching/storyboard
- Perform final approval to close out a review

Build and package for test
- Build the app based on integrated changes from the team
- Build for each target platform

Manual testing
- Launch emulator/device and perform integration test

Construct and simulate
- Review design from the IDE
- Code using visual editor
- Preview using mobile simulator
- Check in and deliver code

Deploy to Dev and Test environment
- Build deploys to the mobile app server-side, and ‘app store’
- Device under test retrieves app

Fix bug and simulate
- Find problem and fix
- Preview using mobile simulator
- Check in and deliver code

IBM SolutionsConnect 2013
Requirements Definition and Management

- Define lightweight requirements in agile context
- Manage Requirements in the backlog
- Collaborate as a team using comments and annotations
- Get feedback from non-technical stakeholders
- Use diagrams and storyboards to explain your idea
Real-Time Planning accelerates time to delivery

- Provides a **single plan** that spans requirements, development, and test, ensuring the whole team understands the overall scope of a project
- **Integrates planning with execution** ensuring the entire team understands the true project status
- Allows **everyone to participate** in keeping the plan current and accurate
- Helps teams **respond to the unexpected** in a timely manner ensuring the team stays on schedule
Lifecycle Traceability improves quality

- Establish **relationships between software artifacts**
- **Identify and close artifact gaps**, ensuring **coverage** across disciplines
- Provide visibility into the **completeness** of planned items by inspecting all related artifacts
- Provide easy **access to related artifacts** ensuring everyone shares the same view
- Deliver transparency which enables everyone to make **fully informed decisions** based business priorities

*Instant access to details from any point in development process*
Development Intelligence improves predictability

- Enable **fact-based decision making** (to communicate status, monitor progress, diagnose problems, identify corrective actions)
- **Steer projects and programs** to deliver on-time
- Apply **Business Intelligence techniques** to software and systems development

### Measurement Practices Impact Project Success

<table>
<thead>
<tr>
<th>Status</th>
<th>Weak measurement practice</th>
<th>Strong measurement practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancelled</td>
<td>15%</td>
<td>5%</td>
</tr>
<tr>
<td>Late</td>
<td>40%</td>
<td>20%</td>
</tr>
<tr>
<td>On-time</td>
<td>45%</td>
<td>75%</td>
</tr>
</tbody>
</table>

Test: What does a mobile tester need?

- Test management
  - Planning, tracking, etc.
  - Manual testing capabilities
  - Integration into broader collaborative lifecycle

- Automation
  - Device agnostic test cases
  - Multi-target test cases
  - Interaction with device-specific capabilities
  - Virtualization of middle-tier and back-end systems

- Access to a diverse set of devices
  - Platforms
  - Manufacturers
  - Form factors
  - Carriers

Client Tier Devices

Middle Tier Server

Back-end Data & Services
Quality management techniques and cloud-based solutions can help ensure adequate test coverage in this fragmented environment

• **Test coverage optimization**
  – Testing against all possible combinations of devices, OS versions, carriers, etc requires large combinatorial number of tests
  – Combinatorial optimization can dramatically cut down on number of test cases that need to be run while providing coverage for interaction between environment factors

• **“Mobile device cloud” services**
  – Sometimes it is necessary to test on specific devices/carriers
  – Maintaining a huge library of device across the world is impossible/extremely costly
  – “device-cloud” services provide virtual access to physical devices

![Diagram showing 10 devices, 3 OS versions, 5 carriers resulting in 150 combinations, and 30-50 test cases.](image-url)
Green Hat Virtualization Technology

- Test Virtualization is an enabler for continuous Integration Testing

- Services, applications, systems are introduced into the continuous integration cycle in a prioritized, controlled fashion
Automated Mobile Functional Testing
Delivering support for native, web, and hybrid applications on Android and iOS

- Supported Mobile Operating Systems
  - Android 2.2+
  - IOS 6+
  - Android & iOS hybrid apps
    - HTML5/CSS3
    - JQuery Mobile

- Capture (record) a test from a physical device or mobile emulator
- Structured test definition language (ClearScript) simplifies authoring and supports multi-language
- Shares multi-channel, Keyword, and execution capabilities within the Rational Test Workbench
- Shell-share provides seamless transition from Worklight to RTW
Mobile Development

✓ Use programming models of your choice
✓ Incorporate native mobile SDKs
✓ Coding, unit testing, code analysis, test coverage
✓ Use technologies (Ajax/Dojo, Jquery, HTML5/CSS, JSF, Struts, REST, OSGi)
✓ Support for connectivity with backends
✓ Rapid WYSIWYG UI construction
✓ Mobile Browser Simulator for initial testing
✓ Manage the taskboards in an agile environment
✓ Software Configuration management (SCM)
✓ Continuous Integration (Build & Deploy)
✓ Integration into broader collaborative lifecycle
Mobile application styles
Addressing the multi-platform challenge with hybrid

<table>
<thead>
<tr>
<th>Web</th>
<th>Mobile Web</th>
<th>Hybrid Mobile</th>
<th>Native</th>
</tr>
</thead>
<tbody>
<tr>
<td>- HTML, JavaScript, CSS</td>
<td>- HTML, JavaScript, CSS</td>
<td>- HTML, JavaScript, CSS, with optional native code</td>
<td>- Native code</td>
</tr>
<tr>
<td>- Accessed from a mobile web browser</td>
<td>- Accessed from a mobile web browser; mobile-optimized UI</td>
<td>- Installed and run like a native mobile app; mobile-optimized UI</td>
<td>- Access to full set of lower-level device capabilities</td>
</tr>
<tr>
<td>- No device-specific capabilities</td>
<td>- Limited access to lower-level device capabilities</td>
<td>- Access to lower-level device capabilities</td>
<td></td>
</tr>
</tbody>
</table>

**Richness of Mobile Presentation / Services**

**Portability (cross-device reuse)**

**Maintenance Cost (TCO)**

IBM SolutionsConnect 2013
IBM Worklight V5.0
Open, cost-effective, cross-platform app development

App development using native and/or familiar web technologies:
• HTML5
• CSS3
• JavaScript

App delivery in variety of forms:
• Mobile Web app
• Hybrid app
• Native

Compatible with prominent HTML5 libraries and tools:
Worklight mobile platform overview

**Worklight Studio**
The most complete, extensible development environment with maximum code reuse and per-device optimization

**Worklight Server**
Mobile middleware offering unified push notifications, version management, security and integration

**Worklight Runtime Components**
Extensive libraries and client APIs that expose and interface with native device functionality and the Worklight Server

**Worklight Console**
A web-based console for real-time analytics and control of your mobile apps and infrastructure
IBM Worklight – a mobile end-to-end solution

- **Secure app management**: Direct Update, Remote Disable, App Validation without MDM
- **Secure Login**: Security framework with device-ID, offline authentication etc.
- **Secure backend integration**: Hardened and optimized access to backends via adapters and the security framework
- **Data security**: Encrypted data store on the device, secure connectivity to the backend
- **Cross-platform**: Provides concepts for high re-use especially with platform optimization and multi-brand-approach
- **Native Look & Feel**: Native UI Elements such as Tabbar, Dialog, etc, Native elements can be embedded, JavaScript Mobile Components
- **Support for device functions**: Camera, localization, etc as well as notification via unified JavaScript APIs
- **Rich set of testing features**: Simulator for app testing incl. device functions without specific hardware, AppStore with rating for line of business and production
- **Online and offline capabilities**: Apps can be used online and/or offline. This includes synchronization of data.
- **Control about usage**: App Auditing Events on server, Embedded analytics functionen about usage of the app
Rational IDEs with IBM Worklight

Design, code, build, test, and deploy mobile apps that run on a wide variety of mobile platforms; extend existing back-end services and data to mobile apps

Integrated multi-platform development environments

Construct, debug, and test mobile UIs

Refactor and extend existing logic on enterprise platforms (System z, Power) as mobile-consumable services

IBM Worklight 5.0 is now included in the following IDEs (for development purposes only):

- Rational Developer for zEnterprise v8.5
- Rational Developer for Power Systems v8.5
- Rational Application Developer v8.5
- Rational Software Architect v8.5
A cost effective IDE focussed on web application and modern service development

Design web, Java EE and OSGi applications with persistence

Made for the WebSphere Application Server and Liberty profile
Available from the Eclipse Marketplace
Develop Mobile Apps with Rational Developer for System z

- Built on Eclipse
- Common tool set for end to end development
- Build, preview, and deploy within the IDE
- Mobile simulator (for unit test)
- End-to-end debug
- Integrate with third-party SDKs (e.g. Android Development Tools)
IBM’s unique value for mobile development

IBM provides the only comprehensive mobile development solution currently in the market combining a mobile application platform, construction tools, and lifecycle management.
IBM Mobile Development Lifecycle Solution V4.0

Enact a collaborative, multi-platform mobile development lifecycle

A comprehensive mobile development solution combining:

- Enterprise-grade, standard-based mobile application platform, supporting native, hybrid and mobile web programming models
- Best-of-class collaborative mobile application development lifecycle capabilities
- Distributed team build and test integrations with the IBM Mobile Platform
- “Mobile device-cloud” service integration for on-device testing
- Support for Agile methodologies for dealing with fast-paced development for mobile
- Mobile development best practice
Solve mobile development challenges with IBM Mobile Development Lifecycle Solution V4.0

Developing for multiple mobile platforms

- Cross-platform mobile web and hybrid app development, test, and build
- Manage plans, tasks, code, builds from a common development workbench
- Agile planning

Delivering high quality apps that engage users and meet business objectives

- Linkage and traceability across all phases of development
- UI sketching and storyboarding
- Test plan optimization and management and integration with mobile “Device-clouds”
- Portfolio management

Integrating with enterprise systems

- Integrate Worklight Studio with the Rational IDEs to create a comprehensive IDE for all parts of the app (UI, mid tier, back-end)
- Extend enterprise assets as mobile-consumable services and connect via Worklight adapters

Meeting accelerated time to market requirements

- Automate and manage continuous, end-to-end build and deployment process with RTC
- Deploy to private dev/test app
- Reduce cycle times by aligning dev and operations teams
Thought provoking resources

- Video: Lifecycle management in mobile application development
- Podcast: 5 best practices to develop 5 star mobile applications
- Video: Opening the mainframe to mobile devices
- Podcast: Cut The Cost and Complexity of Testing Mobile Applications, Not Quality
Vielen Dank!