



Application Development for Mobile and Ubiquitous Computing

FINAL PRESENTATION

Event_Log

Group 14 (Tom Troschütz, Martin Klaude) Dresden, 27 January 2017





Structure

- Application Scenario
- Demo: Usage Example (Screenshots)
- Architecture
- Challenges
- Adaptation and Context
- Code Example for Adaptation Mechanism
- Technologies
- Lessons Learned





Application Scenario

- You have problems managing your appointments and events?
- You are often late to your appointments so that you have to inform or contact the person which is waiting?
- You want to get the perfect route to your actual event right from your actual position?
- If you could answer all these questions with "YES" than here comes our App which can probably fulfil all your needs!





Application Scenario – in detail

- A simple to use calendar with additional, helpful functions.
- Schedule your appointments
 - with additional information: place, contact, E-Mail, phone number.
- Get a notification for your upcoming event with further options:
 - Plan a route from your current location to the event place with just one click.
 - You don't make it in time? → Notify the person which is waiting via phone call or E-Mail without looking scrolling through your whole phone book.











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Final Presentation







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Final Presentation

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Challenges

- Connectivity/Offline challenge
 - Find a route to your event even without internet connection
 - If one contact channel isn't available, e.g. can't send E-Mail because there is no internet connection, use another channel
- Usability challenge
 - Easy-to-use and intuitive UI
 - Not to many buttons, options, etc.
 - Fulfill the needs of the user, e.g. inform user about date collisions





Adaptation and Context

Connectivity/Offline challenge

- Inform the user about GPS and internet connection and provide alternatives
- Context: detect if the device's GPS/internet connection is available
- Adaptation:
 - Inform user that GPS isn't available → detection of current location for route planning via internet
 - Route planning without internet connection → make use of offline maps (X)
 - Disable the option to use a specific contact channel if it's not available; e.g. disable call function if network connection is lost





Adaptation and Context

Usability challenge

- Offer the user an intuitive and easy-to-use UI and try to scale with different screen sizes; reduce user input; inform user about date collisions, etc.
- **Context**: handle different display sizes; detect user input, empty fields and "predicted" behavior (operational context)

Adaptation:

- Scale to display size by trying to use only weight values in layouts (e.g. android:layout_weight="0.5")
- Hide text views, inputs and other layout elements if they aren't needed → therefor scale other layout elements
- Auto fill inputs in some special cases for less user input
- Make user aware of collisions and wrong inputs with highlighting and the usage of Toasts (text bubbles in Android)





Code Example for Adaptation Mechanism

NetworkConnectionListener for checking network (phone) state

01 public class NetworkConnectionListener extends PhoneStateListener {

- 02 public static NetworkConnectionHandler handler;
- 03 @Override

}

- 04 public void onServiceStateChanged(ServiceState serviceState) {
- 05 super.onServiceStateChanged(serviceState);
- 06 boolean isConnected = serviceState.getState() == ServiceState.STATE_IN_SERVICE;
- 07 if (handler != null) {

08 handler.onNetworkConnectionChanged(isConnected);

- 09
- **10** }
- 14 }





Code Example for Adaptation Mechanism

- Check (listen) for network connection
- 01 final NetworkConnectionListener networkConnectionListener = new NetworkConnectionListener();
- 02 NetworkConnectionListener.handler = this;
- 03 final TelephonyManager telephonyManager = (TelephonyManager) getSystemService(TELEPHONY_SERVICE);
- 04 telephonyManager.listen(networkConnectionListener,

PhoneStateListener.LISTEN_SERVICE_STATE);

20 @Override

- 21 public void onNetworkConnectionChanged(boolean isConnected) {
- 22 if (isConnected) {
- 23 //React and adapt to the new state of the network.
- 24 }
- 25 }





Technologies

- OS: Android OS (minimum SDK 19, targeted SDK 24)
- Language: Java; Framework: Android Studio
- APIs: GoogleMaps
- Storage: SQLite DB to store events and contacts
- GPS for route planning and setting of location of event
- GitHub as VCS







Lessons learned

- Developed our own first Android App!
- Learned about the difficulties of mobile computing (like different screen sizes, SDKs, etc.) and how to manage those difficulties with adaptations.
- Working better with a VCS like Git Merging can be fun... :/
- Open issues so far:
 - some leftover but small TODOs
 - Offline functionality of the route planning → without GoogleMaps because this feature is not free
 - further improvement of performance
 - additional features for the future