Explicit and Implicit Ratings for Mobile Applications

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www.appaware.org

Leipzig, September 2010
About us

- ETH Zurich
  - founded in 1855
  - 380 professors in 17 departments
  - 10,000 Bachelor/Master &
    2,800 Ph.D. students

- Project Manager of Auto-ID Labs
  - www.autoidlabs.org
  - ETH D-MTEC (Prof. Fleisch)
  - Network of 7 universities (MIT, Keio, Cambridge, Fudan, Adelaide, KAIST)
  - 5 PhD’s
  - topics: RFID, NFC, Barcode, Internet of Things, Ubiquitous Computing
Demonstrators & Prototypes

Smart Toolbox

Smart Surgical Kit

My2Cents

Product Rating

SwissPeaks

Claim Reporter

Product Authentication

1D and 2D Barcode Scanning

Digitally Augmented Reality

Soft Identification

Appliance Interaction Device

Ubiquitous Payment Prototype

Tweet a phone call

Carbon footprint calculator

Smart Meter Product Authentication

ThingBook

Product information

My2Cents

Product Rating

Ubiquitous Payment Prototype

Smart Surgical Kit

Social Application Finder

Digi
Industry Partners since 2001

- Retail
  - MIGROS
  - GALERIA KAUFHOF
  - valora
- Manufacturers
  - The Gillette Company
  - HARTMANN
  - NOVARTIS
  - SIG
  - Volkswagen
  - BAYER
- Financial services
  - UBS
  - Swiss Re
  - Basler Versicherungen
  - Die Mobiliar
  - swisscom
  - Deutsche Telekom
  - NOKIA
  - Connecting People
- Telecommunications
- Technology providers
  - Infineon Technologies
  - SAP
  - SAP SI
- Others
  - swisstopo
  - Ernst Basler + Partner
  - comparis.ch

30/09/10 / F. Michahelles
Content overview

1. Concept of AppAware

2. Explicit and implicit ratings

3. Evaluation
1. Concept of AppAware

- more than 60,000 available applications, 9,000/month
- need to know keywords
- Many apps are the same
1. Concept of AppAware

How do you find new and/or unexpected mobile applications?
1. **Concept of AppAware**

Sharing mobile applications

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Install a new application → Share
1. Concept of AppAware

Underlying technologies

- Android OS
- Intent
- Location
- Cell tower
- AppAware mobile app
- REST
- Json
- AppAware server

Explicit and Implicit Ratings for Mobile Applications
1. **Concept of AppAware**

Real-time and around you

Mobile applications installed by other users: now or nearby
1. Concept of AppAware

Top mobile applications in the last hour...

Explicit and Implicit Ratings for Mobile Applications
EVERY DAY:
250,000 page-views, 20,000 active users and an average of 75,000 applications shared
1. Concept of AppAware

...we are collecting a lot of data regarding the distribution of mobile applications!
Content overview

1. Concept of AppAware

2. Explicit and implicit ratings

3. Evaluation
2. Explicit and implicit ratings

Explicit ratings on the Android Market

Application

Average ratings

Comments

User rating
Explicit and Implicit Ratings for Mobile Applications

2. Explicit and implicit ratings
Explicit ratings on the Android Market

• Adding an explicit rating requires human **effort**:
  • Open Android Market, search for app, rate

• **Selective** ratings

• **Quality** of ratings:
  • very good - **5 stars**
  • very bad - **1 star**
2. Explicit and implicit ratings

Implicit ratings on AppAware

To cope with the mentioned issues we use installations, updates and removals of applications as implicit ratings.
1. Concept

The algorithm

\[ v(app) = \sum_{user \in U} \frac{last(app, user)}{|U|} \]

\[ last(app, user) = \begin{cases} 
0 & \text{if last event of user for app = removed} \\
90 & \text{if last event of user for app = installed} \\
100 & \text{if last event of user for app = updated} 
\end{cases} \]
Content overview

1. Concept of AppAware

2. Explicit and implicit ratings

3. Evaluation
3. Evaluation  The datasets

• From **AppAware** we took for each application:
  - number of implicit ratings
  - meter value (scaled to 1 to 5 range)

• For each mobile application we retrieved from the **Android Market**:
  - number of explicit ratings
  - average of ratings
  - download category

• We then divided the 18,740 applications under study into the 9 download categories provided by the Android Market
## 3. Evaluation

### Implicit and explicit rating statistics

<table>
<thead>
<tr>
<th>Download categories</th>
<th>Number of applications under study</th>
<th>AppAware</th>
<th></th>
<th></th>
<th>Android Market</th>
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<tr>
<td></td>
<td></td>
<td>Avg</td>
<td>St. dev</td>
<td>Avg</td>
<td>St. dev</td>
<td>Avg</td>
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<td>&lt;50</td>
<td>906</td>
<td>5.71</td>
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<td>50-100</td>
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<td>100-500</td>
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<td>3.32</td>
<td>0.64</td>
<td>9189.60</td>
</tr>
</tbody>
</table>
3. Evaluation Correlation between explicit and implicit ratings

No “good” applications on AppAware but “bad” for the users!
3. Evaluation

Conclusions

• **Low ratings activity** on the Android Market

• Ratings are highly **skewed** towards the range 3 to 5

• AppAware’s meter gives an idea about the adoption of a mobile application as soon as someone installs or removes it. Good for **new** applications.

• Opportunities to **improve** our implicit rating algorithm
  
  • **time spans** between installations and removals
Questions?

Thank you.

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Visit Internet of Things Conference IoT2010, www.iot2010.org in Dec in Japan