Specific challenges for tourism recommender systems seen from academic and the industry perspectives

Panel Discussion

David Zibriczky
Data Scientist @ trivago
About us

- **Mission:** Helping the travelers to find their ideal hotel at the best price
- **Main Product:** Hotel meta-search
  - Hotel feature, price, advertiser comparison
  - Search criteria, Map, Sort orders
  - Ranking of hotels, adv. relevance
  - Redirection
- **Problem size:**
  - 100M+ visitors per month
  - 1M+ hotels
  - 250 advertisers (booking sites)
- **Primary business model:** Cost-per-click
Hotel domain

Main challenges:

1. Expensive transactions, price sensitivity
2. Frequency of the interactions (next travel, search sessions, low booking ratio)
3. Unstable preference (seasonality, domain knowledge, contextuality, multi-criteria optimization)
4. Online booking vs. real world
5. Business goals vs. user goals
Meta-search

Main challenges:

1. User Journey (limited tracking users after redirection, lack of feedback about the booked hotels)
2. Healthy marketplace (recommendation of advertisers, hotel inventory)
3. User Engagement (trivago to booking sites, high bounce rate, moment of truth)
4. Lack of registration (identification issues, camapaings)
5. Business model (click- or acquisition based revenue, short- vs. long-term revenue)
Product

Main challenges:

1. Real-time service (production, scalability, responsiveness, reliability)
2. Online KPIs (user reactions, business KPIs, multi-criteria, offline vs. online opt., A/B testing)
3. Personalization is more about recommendations
4. Productivity vs. completeness (workarounds, hard deadlines)
5. Cost of experimentation/monitoring (risk, failure, maintenance)
Further factors

<table>
<thead>
<tr>
<th>Factor*</th>
<th>Description</th>
<th>Trivago</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heterogeneity</td>
<td>Diversity of the characteristics and goals of the items in the inventory.</td>
<td>Low</td>
</tr>
<tr>
<td>Risk</td>
<td>User’s tolerance for false positives among the recommendations.</td>
<td>High</td>
</tr>
<tr>
<td>Churn</td>
<td>Probability of leaving the website, getting unavailable.</td>
<td>Low-High</td>
</tr>
<tr>
<td>Interaction style</td>
<td>Preference elicitation. Implicit or explicit feedbacks.</td>
<td>Both</td>
</tr>
<tr>
<td>Preference stability</td>
<td>Stability of the preference of the user over time.</td>
<td>Unstable</td>
</tr>
<tr>
<td>Scrutability</td>
<td>Demand for education and explanation.</td>
<td>Required</td>
</tr>
</tbody>
</table>

Thank You!

Questions?