Product Reviews in Mobile Decision Aid Systems

René Wietsma[1] **and Francesco Ricci** - eCommerce and Tourism Research Laboratory
ITC-irst
http://ectrl.itc.it

[1] Visiting student from the University of Twente, The Netherlands

Content

- Introduction
- Problems & Motivations
- Research Objectives
- (Mobile) Recommender Systems
- Demo
- Approach / Methodology
- Conclusions

Introduction

Product reviews:

"Subjective piece of non structured text describing the user's product knowledge, experiences, opinions and advices"

- Are typically enriched with a rating as the 'final thought'

- Can be classified as Consumer Generated Media together with other sources like:
  - (Travel) Blog content (www.Igougo.com)
  - (Travel) forum content (www.lonelyplanet.com)
  - Social networking web sites (www.del.icio.us)
  - Individual web sites. (like my homepage)

Recommender Systems

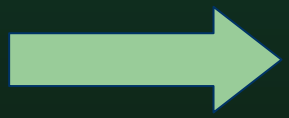
- A **recommender system** helps to make choices without sufficient personal experience of the alternatives
  - To suggest products to their customers - PUSH
  - To provide consumers with information to help them decide which products to purchase - PULL
- Some examples found in the Web:
  1. **Amazon.com** – looks in the user past buying history, and recommends product bought by a user with similar buying behavior
  2. **Tripadvisor.com** - Quoting product reviews of a community of users
  3. **Activebuyersguide.com** – make questions about searched benefits to reduce the number of candidate products
- They are based on a number of **technologies**: information filtering, machine learning, adaptive and personalized system, user modeling, …

Limitations of current Recommender Systems

- Explanation of recommendations: "Why is this suitable for me"?
- Objectivity: "Can I trust this recommendation?, or .."
- Explicit quality rating: "Is this movie worth watching?"
- Not able to take user 'experiences' in account.
- The context of travellers
  - Lack of "local aware" knowledge
  - Demand best value and **experience** for their budget
  - Highly changing circumstances: Weather, Location, Group composition

Mobile devices

- Limited input and output modality: low-res screen, virtual keyboard, no interface pointers, small computation power
- (Still) high data exchange costs
- External Influences: disturbances, parallel activities of the user



Therefore, Recommendations should be **meaningful** and **easy** to be retrieved

Mobile recommender systems

- Mobile recommender systems (mRS)
  - Many successful web based RSs. Only a few mobile RS
  - To our knowledge, none of the existing mobile RSs are conversational
  - Most of the existing mobile RSs run only on PDAs (i.e., Palm or Pocket PC), but not on mobile phones
- Our previous project: MobyRec
  - On-tour support on Mobile phones and Pda's
  - User can criticize the recommendations (I like / dislike it) instead of formulating a new search query.
  - Offers recommendations for restaurants and attractions

Motivations for Integrating RS and PR

- Current user-opinion platforms offer Product Reviews in a very basic way:
  - Only browsing
  - No decision aid tools (search, rank, filter)
  - No personalization
- Increasing usage of Consumer Generated Media (CGM)
  - Wall Street Journal states travel blogs are booming in popularity. Offers a more nuanced view of tourist products.
  - CEO Briefing of The Economist for 2005:
    - 80% of CEO: Mobile Technologies are part of our strategy
    - 91 % Accomplish better customers relationship
- Recommendations in mobile context
  - The necessity for meaningful and easy to retrieve recommendations
  - Increasing usage of mobile applications [Clickz stats 2005]

Objectives and Approach

- Identify the potential benefits of reviews in mobile recommender systems:
  - Which part of the decision process may benefit of using PR?
  - What kind of new content they bring?
  - Can they complement other decision aid tools like those for searching and sorting products?
- Developing of a recommendation methodology, adapted to Product Reviews
- Implementation (prototype) in a mobile context
- Validation

User Study

- From ideas to (design) principles: A User behaviour study:
  - 29 students "Tourism/Economics", University Bocconi
  - 2 parts:
    - Hotel and Attraction booking task
    - Questionnaire (12 multiple choice questions)
  - Simulation by using two web resources (including structured search tools and product reviews browsing)
- Results
  - Different product booking behaviour
    - Hotels: user is more focussed on product features
    - Attraction: decision process more based on reviews
  - Correlation: perceived usefulness of PR ~ experience product reviews sites
  - Correlation: interests in negative reviews ~ experience product review sites

Demo

Recommendation Methodology in General

- Usage of difference sources of knowledge
  - Product repositories: Structured information
  - Product review repositories: Non structured inf.
- Different underlying recom. techniques
  - "tailor-fit" approach: Use the best technique for each knowledge source
  - Compute the final score as a aggregation of the underlying 'scores'

Recommendation Methodology: User model

- On behavior based user model
  - Ideas from tourism: Motivators, Determinants and Typologies
- 2 main components:
  - General *behavioral* characteristics (GUMO Ontology)
  - Domain (travel) characteristics
- Ubiquitous approach:
  - Profile can be stored anywhere
  - Profile can be used in different contexts

Recommender Methodology: Stages

- Interaction Stages
  1. Product filtering:
     - Either by user profile or initial constraints
  2. Product ranking according:
     - Score products and score reviews
     - User can 'critize' rankings by giving feedback
  3. Review ranking according the score of the review
     - Users can re-rank according: attitude, length, date written or keywords

Recommender Methodology: Ranking

- Product ranking:
  - Aggregation of the sub scores: Content-score and Collaborative score
    - Content score: The similarity of products features with the given user constraints and wishes.
    - Collaborative score: Review rating * Similarity of the user with the writer of the review (profile comparison)
  - Final score: A weighted content score + A weighted collaborative score
- Review ranking:
  - Only using the collaborative score

Implementation Details

- 3-Tier architecture
  - Client layer: J2me Midlet.
  - Server layer:
    - Servlets: Communication
    - Beans: Logic and Data management
  - Data layer:
    - Persistent Storage of data
    - Oracle/Mysql implementation
- Used techniques:
  - Java: J2me, J2ee
  - Xml: User model

Discussion

- User test
  - Verify the role PR can play
  - Verify the recommendation methodology
  - For validation we will use 2 systems: one system with- and one without reviews
- Expectations:
  - Reviews will help the user in better understanding the product
  - Reviews will improve the acceptance rate of reviews
  - Products reviews might increase to willingness to use mobile applications

Conclusion

- We have seen:
  - Motivations to incorporate reviews
    - From a user's point of views
    - From the industry
  - Methodology for incorporating reviews
  - A demostration.

Thanks

Research supported by:

-E.U: Leonardo placement

-Dr. L.A. Buma Foundation