Research Methods for Group Recommender Systems

E-Tourism Domain

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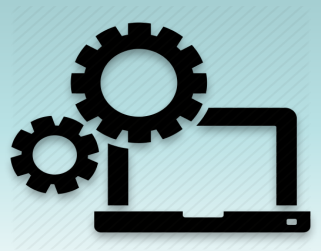
BACKGROUND & MOTIVATION

Background

- Importance of recommender systems for groups is increasing
  - Items experienced by groups & social activities (i.e., movies, music, travelling)
  - Social web – users form interrelated groups
- Main research focus is on the aggregation techniques
  - No ultimate winner according to Arrow's theorem and group recommender system studies
- Only a few studies that concentrate on decision / negotiation support
- No observational studies on group decision processes in the context of group recommender systems that we are aware of

Motivation

Raising the awareness in the group recommender systems community about the importance of the new analysis type



Engineering research tradition (i.e., prototype building and testing)

- No exploration of the effects of alternative design choices
- No identification of potentially important dimensions

Initiating a design of more effective and novel GRSs

- By understanding groups in action and measuring their behavior
- By identifying concrete opportunities for computerized systems to become more useful to people

Motivation dimensions & issues

Decision making

- Ultimate motivation for GRSs
- Understanding the process and different aspects

Application domain

- E-tourism domain
- Movies vs. tourism destinations

Multidisciplinary approach

- Social disciplines and computer science together

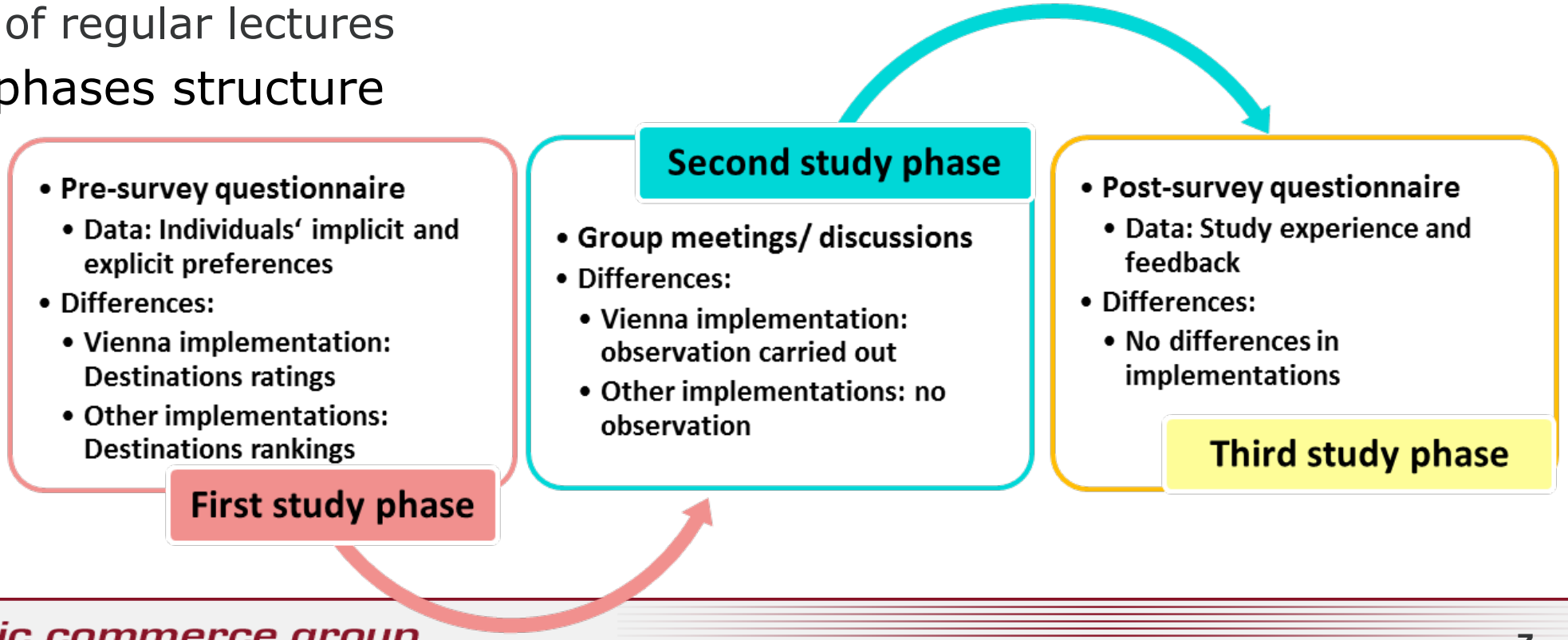
Data collection

- No similar datasets are available in the e-tourism

STUDY PROCEDURE & MEASUREMENTS

Study procedure

- In a cooperation with the International Federation for Information Technologies in Travel and Tourism (IFITT)
- First implementations at: TU Delft, UNI Klagenfurt, UNI Leiden, TU Wien
  - Part of regular lectures
- Three-phases structure



Study procedure – First study phase

Groups formations: 4 decision makers & 2 observers

For decision makers: fill in online pre-questionnaire

- Captures individual profiles, preferences and dislikes

For observers: observation training

- How to perform observation in the specific e-tourism context

Measurements – First study phase

Demographic data

- age, gender, country of origin, university and student identification number

17 tourist roles and Big Five Factors

- Short term, tourist behavioral patterns (Yiannakis & Gibson, 2002)
- Openness, Conscientiousness, Agreeableness, Extroversion, Neuroticism

Experience and ratings of ten destinations

- *"How many times have you visited each of these destinations?"*

Ranking of decision criteria

- budget, weather, distance, social activities, sightseeing and other

Study procedure – Second study phase

Decision makers

1. Ten destinations and Wiki pages

"Imagine that you are working on a research paper together with the other group members. Interestingly, your university offers you the opportunity to submit this paper to a conference in Europe. If the paper gets accepted, the university will pay to each group member the trip to the conference.

In addition, you will be able to spend the weekend after at the conference destination. Ten conferences will take place in European cities around the same summer period"

2. Decision task scenario

3. Group decision task

"Discuss and choose first and second destination option that you as a group would visit together"

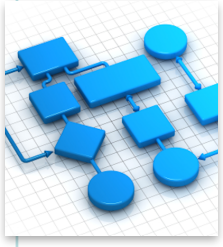
Audio & behavior (IPA) recording

Observers

Interaction process Analysis – IPA

- A method to study small groups and interactions among group members
- Observing “units” of interaction
  - i.e., facial expressions, gestures, body attitudes, verbal acts, etc.
- Twelve categories of behavior
  - 1. Show solidarity - ”Friendly”, 2. Show tension release, 3. Agree, 4. Give suggestion, 5. Give opinion, 6. Give information, 7. Ask for suggestion, 8. Ask for opinion, 9. Ask for information, 10. Disagree, 11. Show tension, 12. Show Antagonism – “Unfriendly”

Measurements – Second study phase



Plan for group decision process and duration of different phases

- Orientation, Discussion, Decision and Implementation and evaluation (Forsyth, 2014)

Group members' roles

- e.g., leader, follower, initiator, information giver, opinion seeker

Group members' behavior (Bales's IPA framework)

Social decision scheme

Strength of group members' preferences

Study procedure – Third study phase

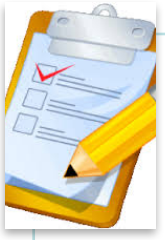
1. For decision makers: fill in the post-survey questionnaire

- Study and task experience

2. For observers: interviews

- Observation task and reports
- Differences between reports
- Behavior of decision makers

Measurements – Third study phase



The first and the second group choice

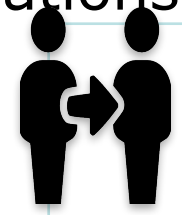
Usage of the provided Wiki pages

Description of the decision process

Overall attractiveness of the ten predefined destinations

Satisfaction with the group choice

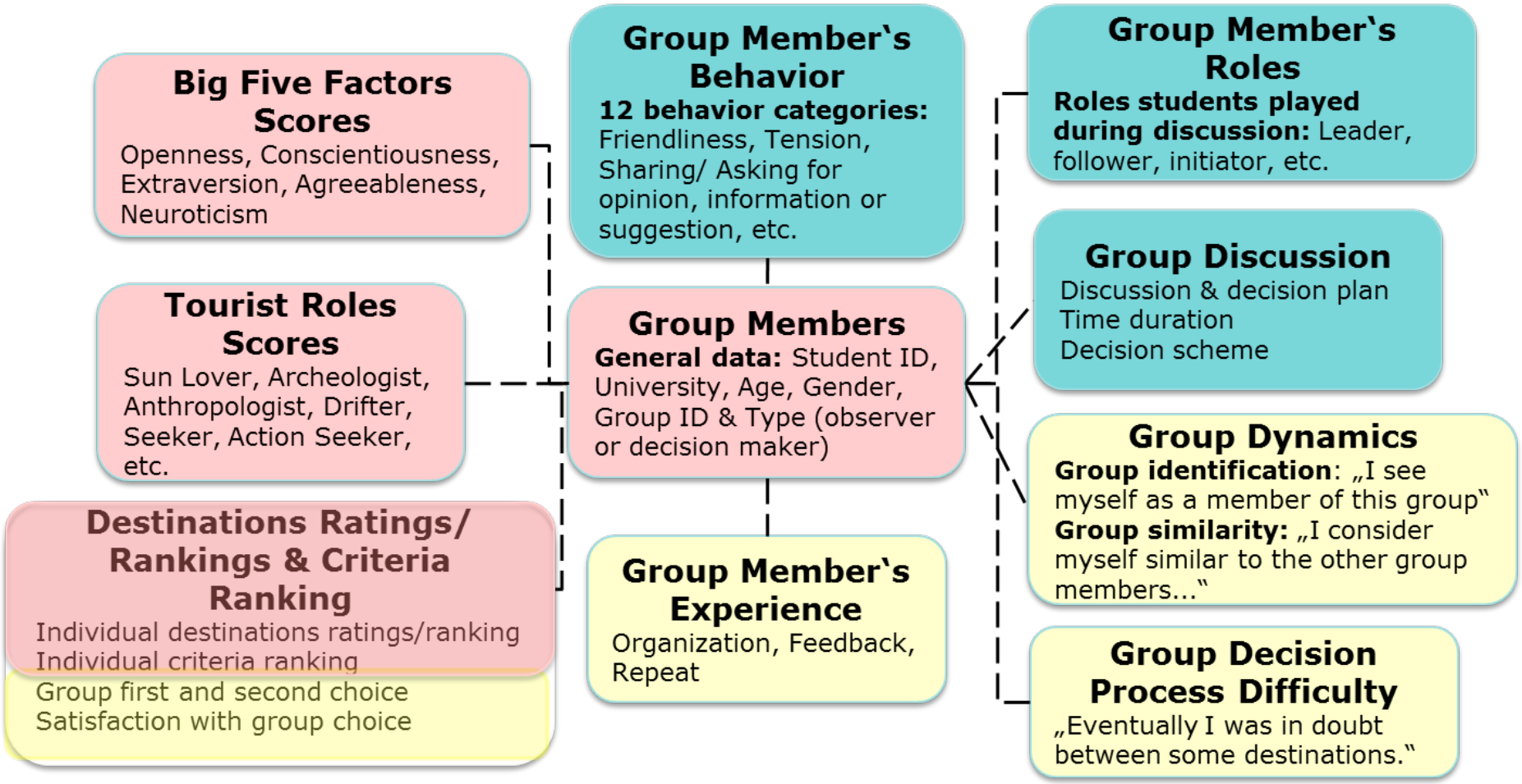
Difficulty of the decision process



Identification and similarity with the other group members

Assessment of the task

Measurements – Data structure



Preliminary results

FIRST INSIGHTS

First insights – Preliminary results

- High satisfaction for vast majority of users even if their top destination did not get selected by the group
- Group preferences were not just an aggregation of the initial group members' preferences but were rather constructed during the group decision process
  - Commonly used aggregation strategies in group recommender systems were hardly able to predict the groups’ choices
- Significant correlations between individual and group characteristics with satisfaction

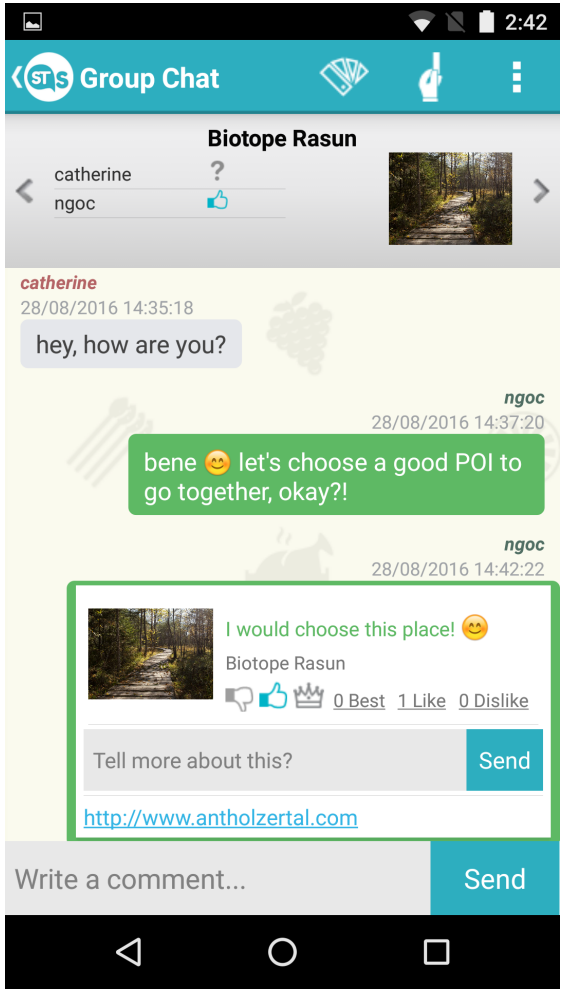
Group Recommender Systems

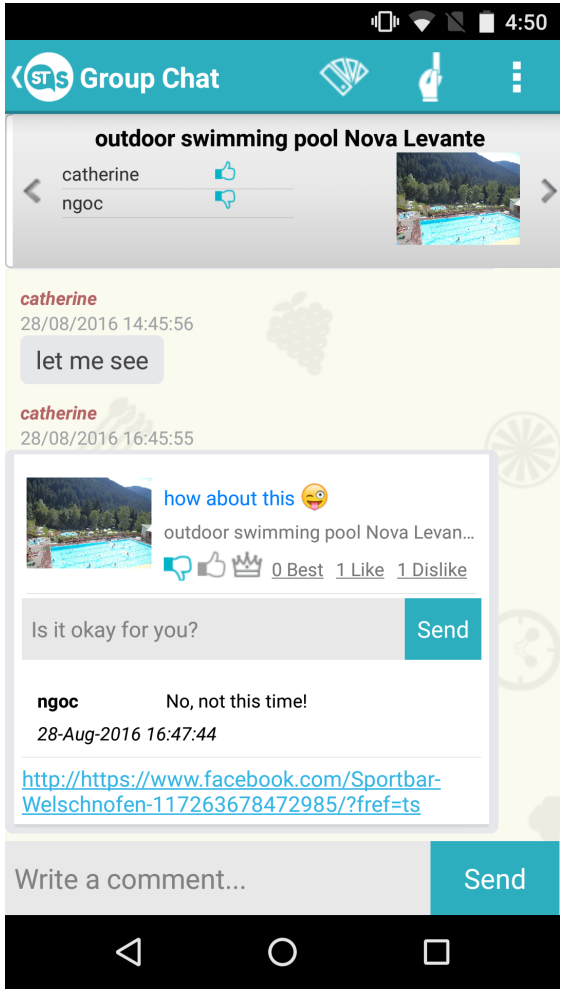
IMPLICATIONS

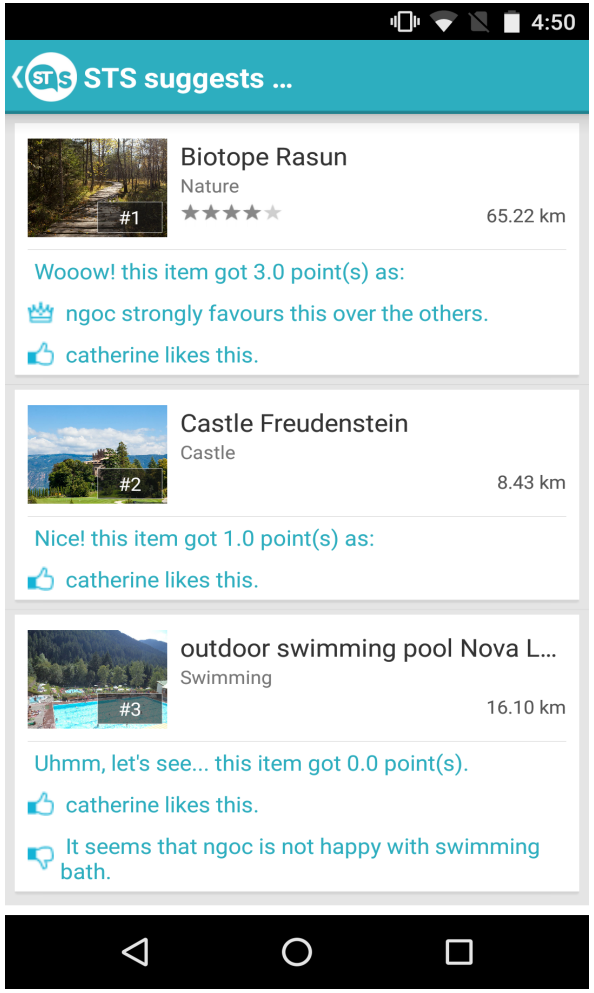
Implications

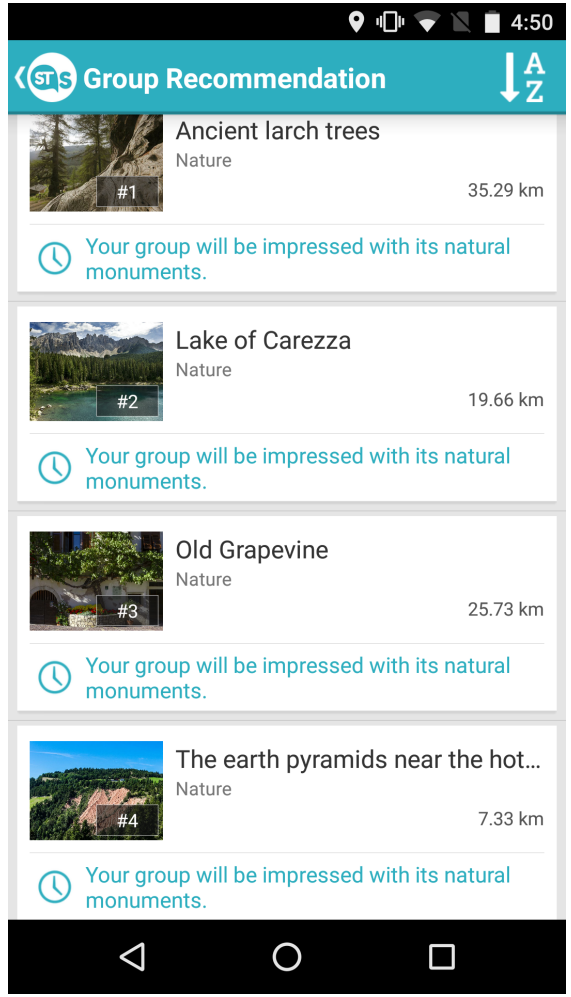
- Choosing and customizing aggregation approach based on specific contextual conditions of groups
- Construction of a more dynamic GRSs
  - System captures user preferences derived from discussion together with baseline user preferences
- Defining the objective for GRS
  - System as a facilitator for the group decision making process vs. a rigid mediator of users' preferences

Implications (STSGroup)









Implications (Picture-based approach)

www.pixmeaway.com

SUMMARY & CONCLUSION

Summary

- A detailed description of the replicable study procedure and the instruments used for the data collection
- Experimental results showing that certain individual and group characteristics, which go beyond the initial preferences of the individuals and their straightforward aggregation, play an important role in the final choice of the group
- The implications of the observational study for group recommender systems and different aspect that should be considered when building such systems

Conclusion

- GRSs research requires more user centric approach
  - Observational studies to understand what is really happening
  - But also ground truth and datasets construction
- Group decision support in GRSs equally important as other aspects
  - e.g., aggregation strategies
- Two type of individual user preferences in GRSs
  - Independent preferences
  - Dependent preferences – constructed during the group interaction

Thank you & Questions

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