

November 12, 2013 - M3 Semantic Interoperability Workshop

Recommendation System for Tourist Attraction Information Service

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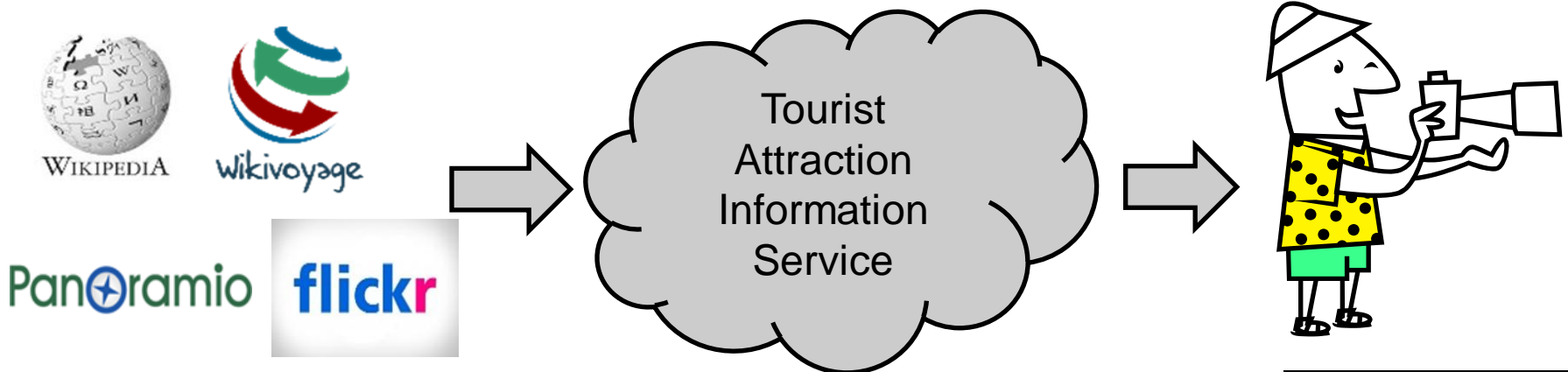
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Russian Academy of Sciences (SPIIRAS)

Table of Contents

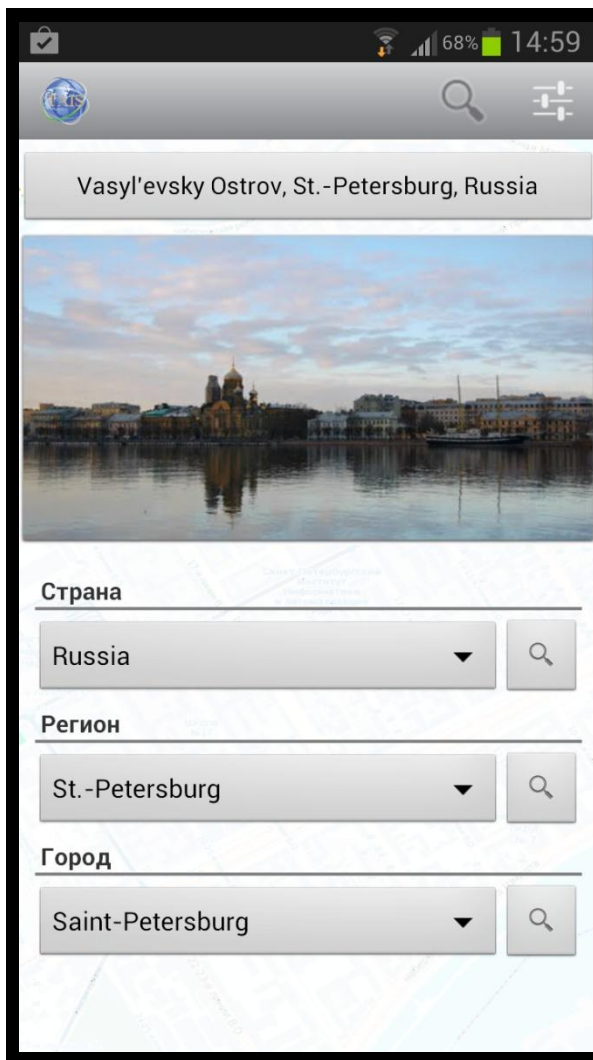
- Motivation
- Tourist Attraction Information Service Overview
- Tourist Attraction Recommendation System
- Smart Space Communication
- Recommendation Scenarios
 - Attraction Recommendation
 - Attraction Images Filtering
 - Attraction Descriptions Filtering
- Conclusion

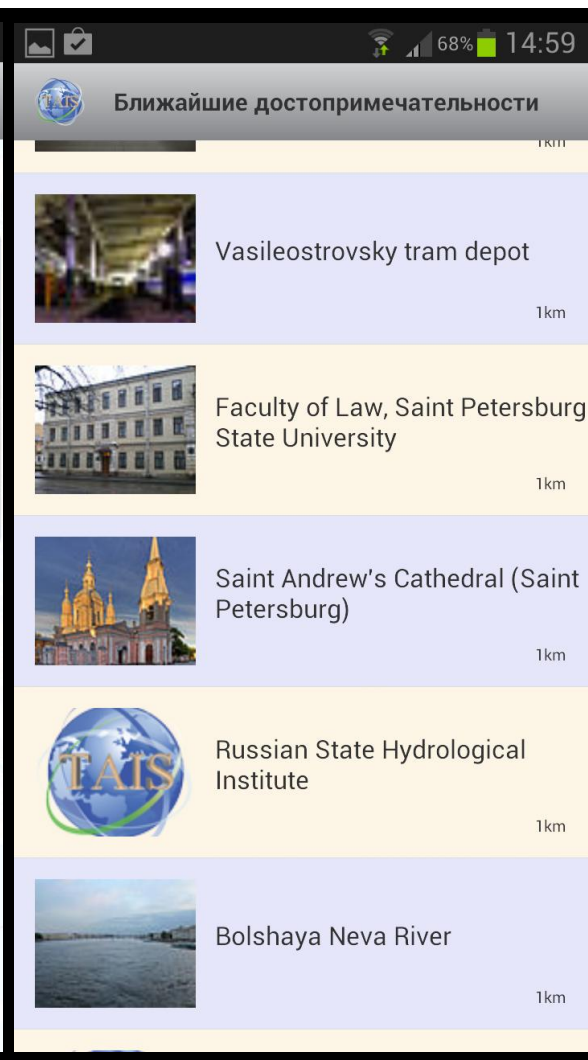
Motivation

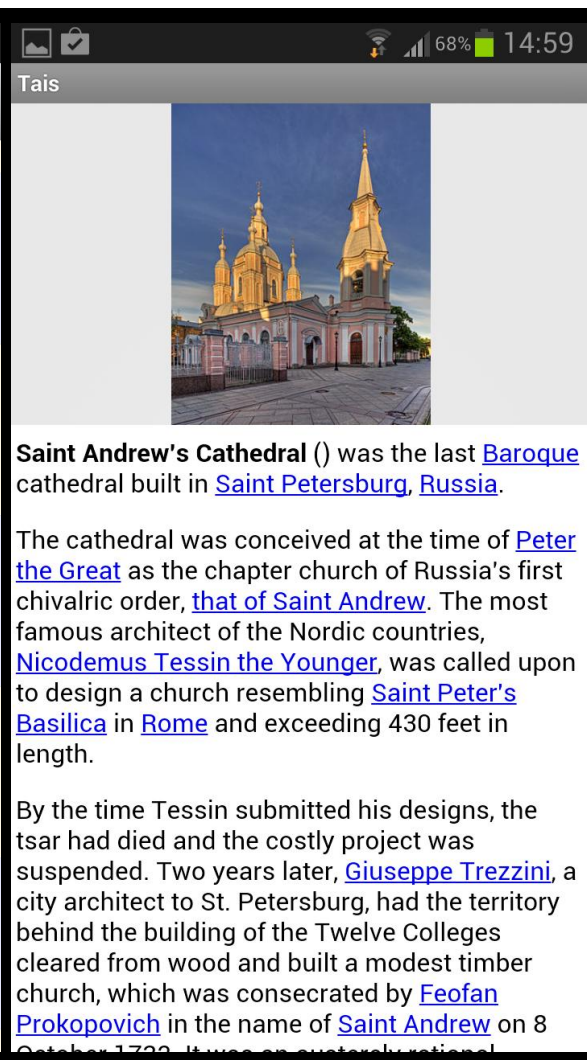
- The tourist business has become more and more popular
- More and more tourists prefer to use Internet services to book hotels, buy flights, search attractions to see instead of booking complete tours
- Mechanisms for providing the user information are needed
- Tourist attraction information service
 - Finds attractions nearby the tourist
 - Provides descriptions of attractions acquired from different Internet Sources
 - Provides accessible in the Internet images of attractions



Tourist Attraction Information Service

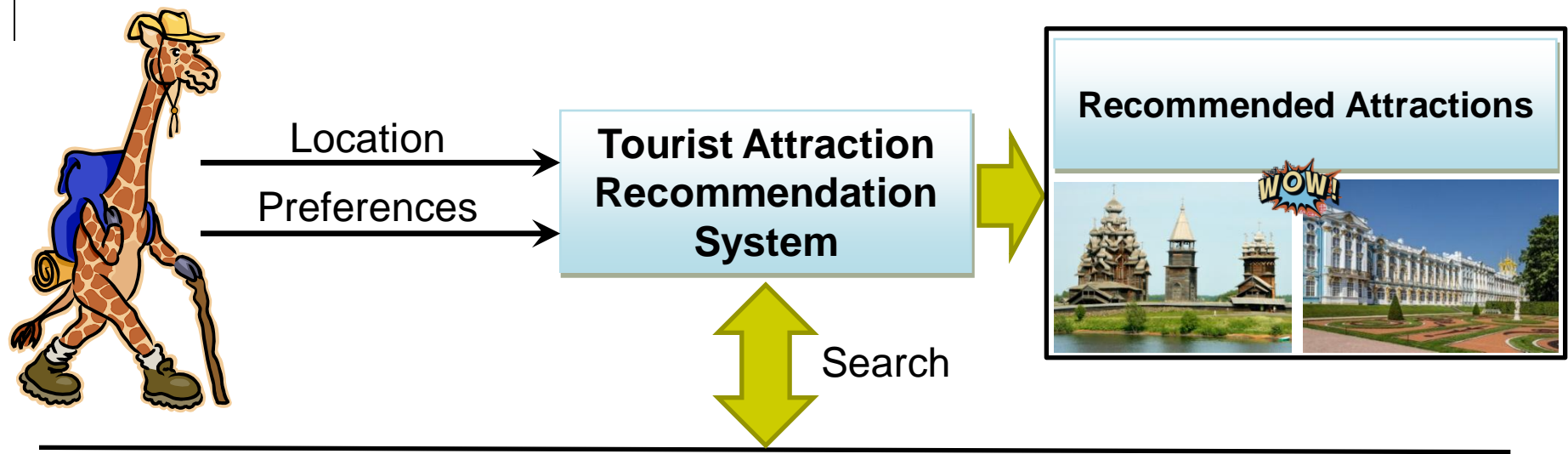




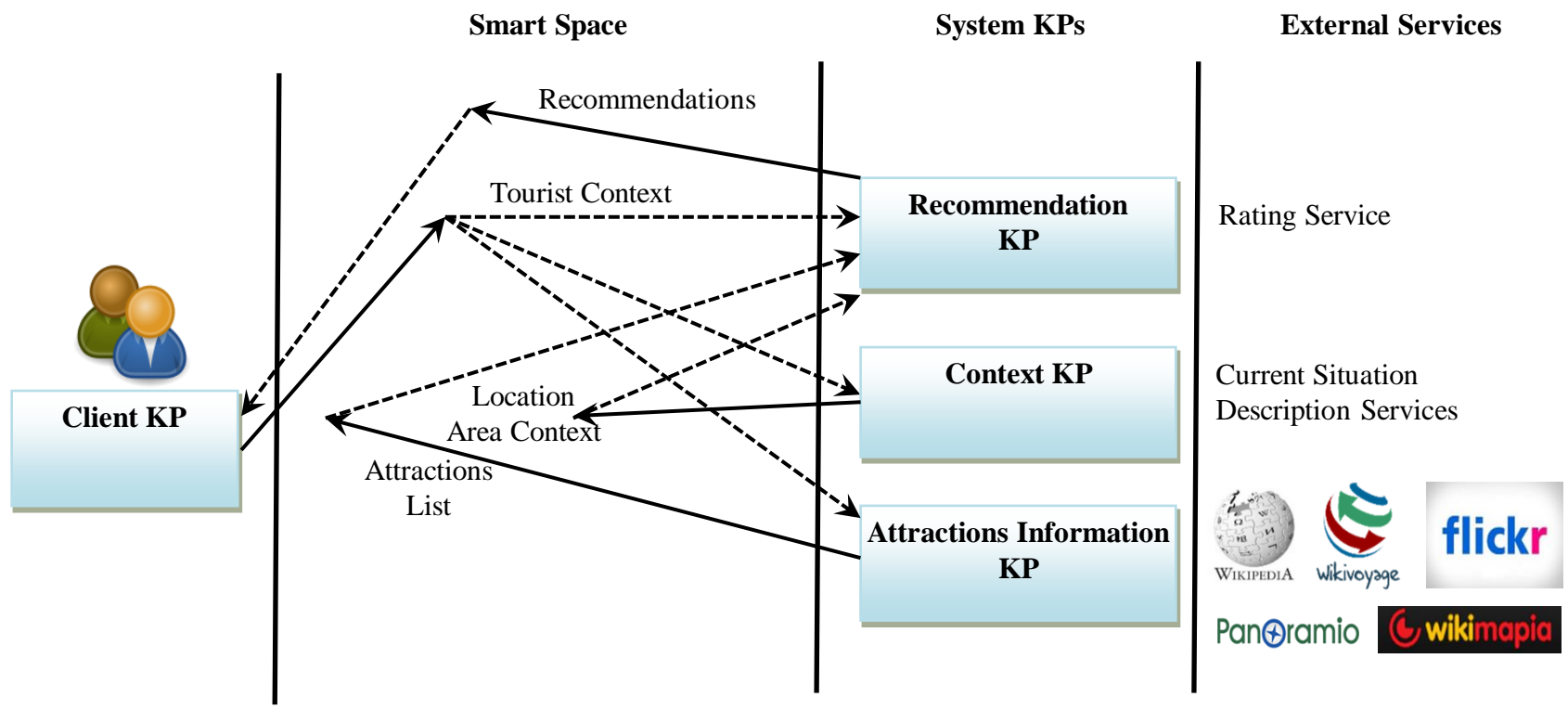


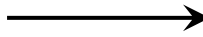

Tourist Attraction Recommendation System (TARS)

- <https://play.google.com/store/apps/details?id=ru.nw.spiiras.tais>
- DEMO Section of FRUCT conference



TARS Services Interaction based on Smart-M3 Platform



 Inserting information to the smart space
 Reading information from smart space (subscribe for information)

Smart Space Communication

- **Client KP**

("alexey.kashevnik@gmail.com", "is_a", "tourist")

("alexey.kashevnik@gmail.com", "longitude", "60,12")

("alexey.kashevnik@gmail.com", "latitude", "30,24")

("alexey.kashevnik@gmail.com", "date_time", "2013-10-18 12:53")

("alexey.kashevnik@gmail.com", "language", "English")

("alexey.kashevnik@gmail.com", "company", "alone")

("alexey.kashevnik@gmail.com", "role", "traveler")

- **Context KP**

("alexey.kashevnik@gmail.com", "weather", "Sunny")

- **Attraction Information KP**




("alexey.kashevnik@gmail.com", "near_by", ListOfAttractionsXML)




- **Recommendation KP**

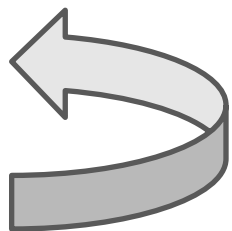
("alexey.kashevnik@gmail.com", "recommended_attractions", RecommendedAttractionsXML)

Attractions Recommendation

- Collaborative filtering systems make recommendations based on users interests similarity.

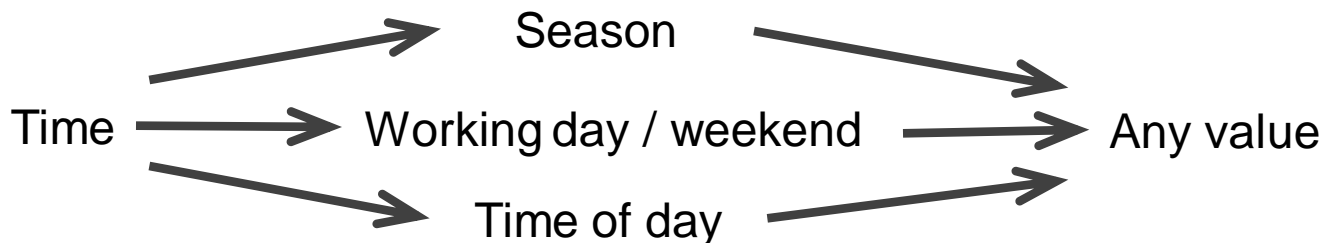




| | | | |
|--------------------------------------------------------------------------------------------|----------|----------|----------|
| User 1  | 2 | 3 | 2 |
| User 2  | 5 | 4 | ? |
| User 3  | 4 | 5 | 5 |



Context for Attractions Recommendation

- Conditions in which a user rates an attraction (or gets recommendations) is called **context**.
 - Outside attractions will be rated better in sunny day then in rainy day
 - Zoological museum will be rated better if a user comes with children.
- The following context attributes have been identified for TARS:
 - Time
 - Weather
 - Company
- For taking context into account the **context generalization** method is used:



Example of Applying Context Generalization Method

Time: July 31, 2013 17:30

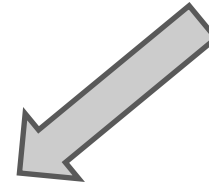
Company: With family

Weather: Sunny

| | | | |
|---|---|---|---|
| 5 | 4 | | 3 |
| 4 | 5 | | 2 |
| | 3 | 3 | 5 |
| | 2 | 5 | 4 |



Context Generalization



Time: Summer

Company: With family

Weather: Any value

| | | | |
|---|---|---|---|
| 5 | 4 | | 3 |
| 4 | 5 | | 2 |
| | 3 | 3 | 5 |
| | 2 | 5 | 4 |

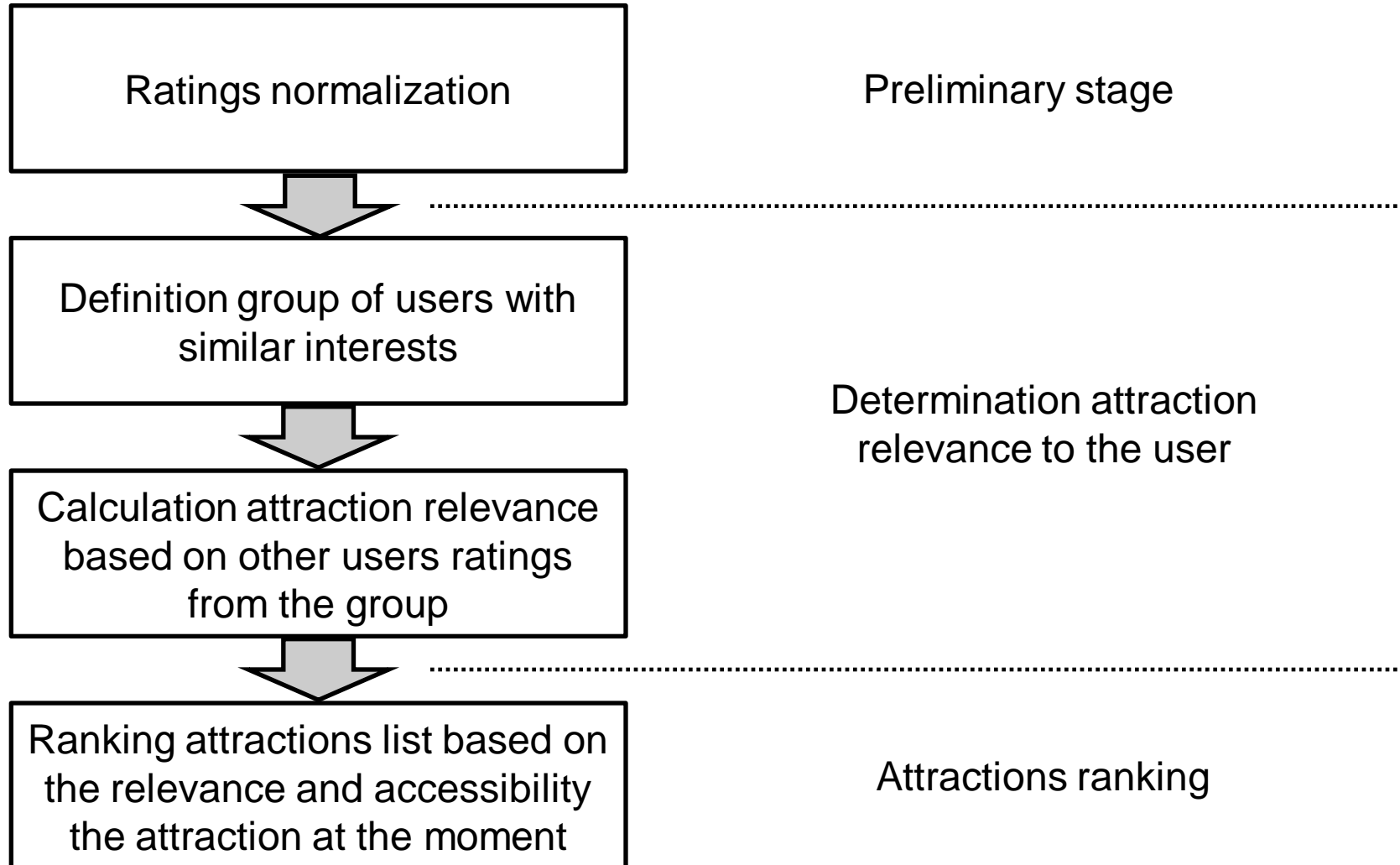
Time: Any value

Company: Any value

Weather: Any value

| | | | |
|---|---|---|---|
| 5 | 4 | | 3 |
| 4 | 5 | | 2 |
| | 3 | 3 | 5 |
| | 2 | 5 | 4 |

Algorithm for Attractions Recommendation



Attraction Images and Descriptions

Filtering

- Internet services provide a big amount of images
- The system allows users to estimate every image (“like”, “dislike”)
- It is reasonable to show the user only the best images of the selected attraction
 - Show images that have the best score
 - Show new images (images without score)
 - Show small amount of images that have negative score (to exclude mistakes)
- Internet services provide several text blocks for an attraction
- It is needed to show the user the best text block and range other
 - User estimations («Like» / «Dislike»)
 - Text block characteristics: size, variety of vocabulary
 - Degree of similarity of a text block with the last shown

Conclusion

- Recommendation Scenarios for tourist attraction information service have been successfully implemented in special Recommendation KP.
- At the moment the tourist attraction information service has 50+ downloads in Google Play.
- The smart space based tourist attraction recommendation service can be overviewed during the DEMO section (Thursday, November 14 from 18.00 till 21.00, Seminar Hall A116).

**Thank you for Attention
Questions are Welcome**



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