

# Tourism and Language Technology

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### Issues in tourism and opportunities for language technology

We regard decision-making in tourism as a cycle of processing information, making, refining and revising (partial) plans until a decision is reached and a booking is made (cf. exhibit 1). This decision-making cycle is present in the preparation of a trip, but also during the trip for the choice of restaurants, events, attractions. Partial plans can be made before departure (e.g., visiting the opera in Vienna) and refined during the trip (choosing a particular performance).

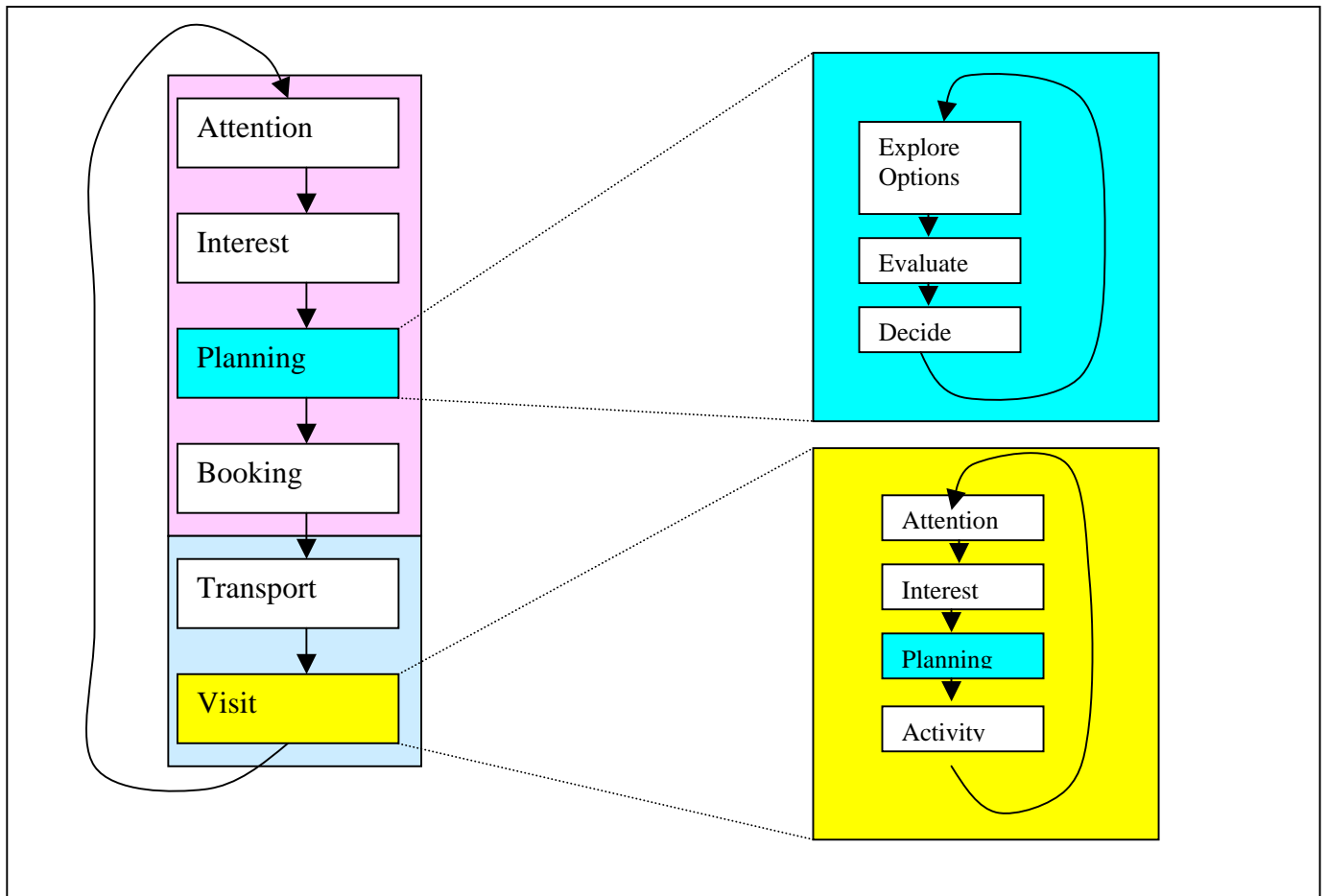


Exhibit 1: Decision-making processes for tourists

### Multitude of Players in the Tourism Business

In tourism, there is a large number of touristic service offers and attractions (hotels, restaurants, museums, airlines ...), intermediaries (travel agents ...), and an even larger number of customers (cf. exhibit 2). This limits the opportunities for centralised services, although booking systems like Amadeus are successful in the air travel industry and tourist boards collect and compile information about particular regions.

In general, however, the tourist will be confronted with a lot of different information sources, ranging from guidebooks and newspaper articles to TV programmes, travel portals and websites of individual hotels and restaurants.

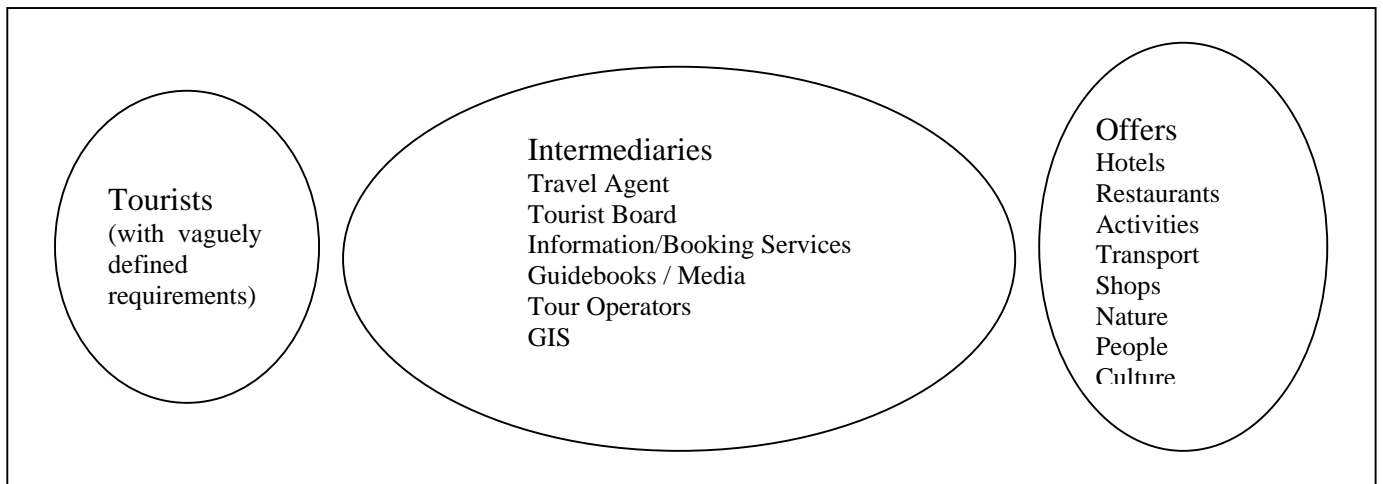


Exhibit 1: Players in the tourism business

### Opportunities for Language Technology:

- Search engines play a major role for finding tourist offers of interest. Specialised search engines or portals can help focus the search.
- Information extraction technology can extract semi-structured information from heterogeneous information sources (e.g., projects MIETTA, GETESS)

### Multilinguality / Multiculturality

There are often differences between the language(s) spoken by the tourist and the language(s) in which information about tourist offers is presented, creating a need for translation, which is served by printed or electronic dictionaries and phrasebooks for the tourist, and by translation services for the information provider.

Differences in culture present a problem as well as an opportunity in tourism, and should be taken into account in the design of information material, websites, and dialog systems.

### Opportunities for Language Technology:

- Machine translation can provide indicative translations of information sources (e.g., Babelfish)
- Cross-language search engines can help tourists find information which is presented in other languages (e.g., project MULINEX)
- Spoken language translation can help communication in the destination country (e.g., project VERBMOBIL)
- Multilingual spoken dialogue systems can provide information (e.g., Voice Portal for Vatican-Expo 2000)

## Variety of Interests

Tourists have a wide variety of interests, including beautiful beaches, exotic food, opera, sports, museums, gambling and many others. Therefore, many language technologies, which are specialised for a particular domain, are difficult to apply. The information pertaining to special interests is often compiled by hand (e.g., Guide Michelin).

### Opportunities for Language Technology:

- Search engines which are not specialised to a particular domain can help locate information for particular interests.
- Collaborative filtering and recommendation systems can take advantage of the experiences of other people with the same interests.

## Mobility

Tourists are by definition mobile users of information services. The need for mobile information access has traditionally been supported by mobile information sources such as guidebooks, maps, and leaflets, as well as phone-based services like the Japan Tourist Phone. Mobile devices have great potential for delivering information to tourists but impose certain restrictions concerning text entry (keyboards very small, or only numeric or touchscreens) and information output (limited screen size).

### Opportunities for Language Technology:

- Telephone-based speech dialog systems for travel planning
- Multimodal information access through mobile terminals (e.g., WAP)
- Information kiosks with text or voice in/output.

## Documentation

The need of tourists to document their experiences and impressions is evident from the millions of photos taken and postcards sent every year and from numerous travel reports throughout the ages from antiquity to today's web age.

### Opportunities for Language Technology:

- Voice annotation of photographs and video recordings.
- Spoken travel reports in searchable archives.
- Archiving of addresses of restaurants, museums etc.

## Activities of ftw.

The FTW projects *speech&more* and *UMTS Application Development* address the issue of supporting mobile information access through 3G (third generation) wireless devices. The services will be aware of the physical location of the user, and will support multimodal information access dialogues, for example for public transport, cinema and theatre programs, and information about monuments. A combination of speech and pointing gestures will be accepted as input, and a combination of speech and multimedia information as output if supported by the device. Speech-only interaction will also be possible.

## References to Projects

GETESS: German Text Exploitation and Search System

<http://www.getess.de/>

MIETTA: Multilingual Information Extraction for Travel and Tourism Applications

<http://www.mietta.net/>

MULINEX: Multilingual Indexing and Navigation

<http://mulinex.dfki.de/>

Verbmobil: spoken language translation

<http://verbmobil.dfki.de/>

## Curriculum Vitae: Dr. Markus Kommenda

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Geboren am 24. 1. 1958 in Wien als Sohn von Ludwig Kommenda, Kaufmännischer Angestellter, und Dipl.-Dolm. Erna Franziska Kommenda, geb. Mandl; verheiratet seit 4. 5. 1983 mit Dr. Doris Kommenda, geb. Lampel; drei Kinder.

### Ausbildung:

- 1964 - 1968 Volksschule.
- 1968 - 1976 Neusprachliches Gymnasium am Schottengymnasium der Benediktiner in Wien.
28. 6. 1976 Reifeprüfung mit ausgezeichnetem Erfolg.
- 1976 - 1983 Studium der Elektrotechnik und der Informatik an der TU Wien.
- 1980 - 1981 einjähriges Auslandsstipendium der Französischen Regierung: Studium der Fachrichtung *Automatique* an der Ecole Nationale Supérieure de Toulouse; Mitarbeit an einem Forschungsprojekt zur Robotersteuerung am Laboratoire d'Automatique et d'Analyse des Systèmes du CNRS, Toulouse.
27. 1. 1983 2. Diplomprüfung aus Elektrotechnik.
- 1983 - 1991 Doktoratsstudium der Technischen Wissenschaften, Elektrotechnik.
- seit 1987 Studium der Sprachwissenschaften an der Universität Wien.
6. 6. 1991 Rigorosum mit ausgezeichnetem Erfolg.

### Berufliche Tätigkeit:

- 1983 - 1994 zunächst Vertragsassistent, dann Universitätsassistent am Institut für Nachrichtentechnik und Hochfrequenztechnik der TU Wien; Leitung mehrerer Forschungsprojekte (FWF) und Betreuung von Industriekooperationen auf dem Gebiet der elektronischen Sprachsynthese und Spracherkennung; Betreuung von Übungen und Laborübungen.
- seit 1991 Lehrauftrag am Institut für Computersprachen.
- 6/92 - 9/92, 7/93 - 8/93, 2/94 - 3/94 Forschungsaufenthalte am Centre National d'Etudes des Télécommunications (CNET) der France Télécom in Lannion (Frankreich); Mitwirkung an einem Projekt zur Entwicklung eines mehrsprachigen Sprachsynthesystems.
- 6/94 Wissenschaftlicher Berater für France Télécom CNET.
- 1992 - 1993 als Organisationssekretär verantwortlich für die Abwicklung des österreichweiten Projekts *Evaluation Elektrotechnik 1993*.
- 5/94 - 5/96 Fachreferent für den Bereich Informations-, Kommunikationstechnologien und Telematikanwendungen im Büro für internationale Forschungs- und Technologiekooperation (BIT), Wien; Beratung und Betreuung österreichischer Projektwerber für europäische F&E-Programme, Vertretung österreichischer Interessen in internationalen Gremien.
- 6/96 - 5/99 Leiter der Gruppe *Forschung und Entwicklung Sprachverarbeitung* bei der Kapsch AG.
- 12/97 - 5/99 zunächst als Vorsitzender der *ARGE Proponenten des Forschungszentrums Telekommunikation Wien*, später als designierter Geschäftsführer verantwortlich für den Aufbau dieses Forschungszentrums.
- seit 1. 6. 99 Geschäftsführer des Forschungszentrums Telekommunikation Wien (FTW).

## **Curriculum Vitae: Dr. Gregor Erbach**

Gregor Erbach befaßt sich als Leiter des Projekts B2 mit Anwendungen der automatischen Spracherkennung. Nach seinem Studium der Linguistik und Künstlichen Intelligenz in Mainz und Edinburgh arbeitete er am Institut für Wissensbasierte Systeme der IBM Deutschland, an der Universität des Saarlandes, wo er in Computerlinguistik promovierte, und am Deutschen Forschungszentrum für Künstliche Intelligenz im Forschungsbereich Sprachtechnologie. Er war Mitglied der Formalismen-Arbeitsgruppe der Expert Advisory Group on Language Engineering Standards (EAGLES) und Gastforscher an der University of Edinburgh, am Österreichischen Forschungsinstitut für Artificial Intelligence in Wien und am Electrotechnical Laboratory in Tsukuba, Japan.