Agenda

- Background Information
- WP 7: Use Case Management
- R&D Work Packages
- Visitor Management, AI & Recommender

AIR

Agenda

Background Information

WP 7: Use Case Management

R&D Work Packages

Visitor Management, AI & Recommender

AIR

Visitor Management (1995)

„Visitor management seeks to influence the amount, type, timing and distribution of use as well as visitor behaviour. Actions include **regulating** visitor numbers, group size and length of stay, using **deterrence** and **enforcement**, **communicating** with visitors and providing **education.**"

Glasson, J., Godfrey, K., & Goodey, B. *Towards visitor impact management: Visitor's impacts, carrying Capacity and management responses in Europe's historic towns and cities*. Avebury, 1995

AIR

Key information about AIR

- Project duration: 01/2022–12/2024
- Funding by the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection
- Collaborative project to research and develop digital visitor management

Project goal

- Promoting sustainable mobility and development in a tourism context using a smart AI-based recommender
- Contributing to more sustainable tourism development by equalizing visitor flows
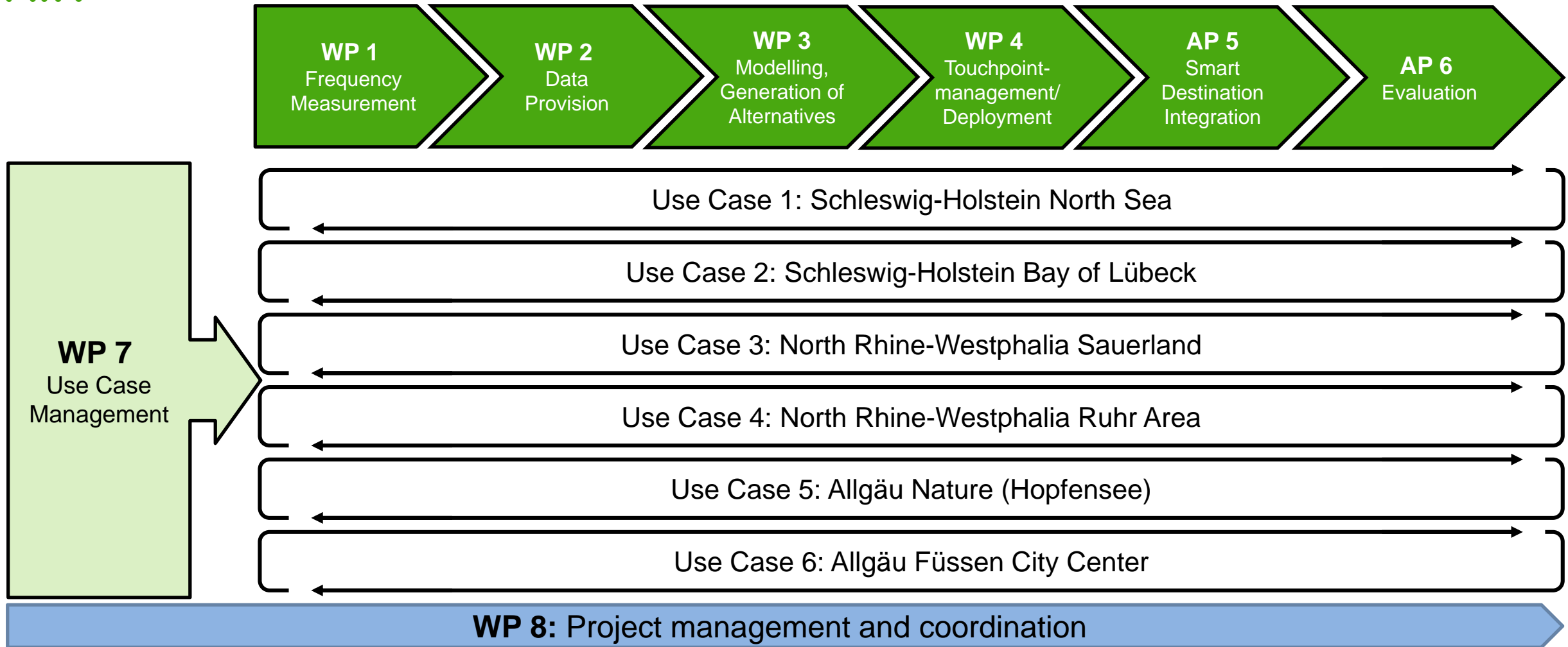
Project partners

Project content

The sustainability impact and contribution of the AI-based recommender to ecological, economic and social problem solving arise mainly from:
- Equalizing visitor flows at highly polluted hotspots and sensitive ecosystems (e.g. mountains, lakes, beaches) by recommending alternatives
- Suggesting a more resource efficient and environmentally friendly transportation alternative

Project structure and procedure

WP 1 Frequency Measurement	
WP 2 Data Provision	
WP 3 Modelling, Generation of Alternatives	
WP 4 Touchpoint-management/ Deployment	
AP 5 Smart Destination Integration	
AP 6 Evaluation	

WP 7 Use Case Management

Use Case 1: Schleswig-Holstein North Sea

Use Case 2: Schleswig-Holstein Bay of Lübeck

Use Case 3: North Rhine-Westphalia Sauerland

Use Case 4: North Rhine-Westphalia Ruhr Area

Use Case 5: Allgäu Nature (Hopfensee)

Use Case 6: Allgäu Füssen City Center

WP 8: Project management and coordination

ON AIR

- Opening the project for other destinations, tourism stakeholders and interested people

- Consists of – so far – 3 modules:

  - Live online discussion (every 3 months)

  - Discussion forum

  - Interactive map: overview of different projects regarding visitor management in the DACH region

- Future adjustments and additions possible

Next live online discussion:
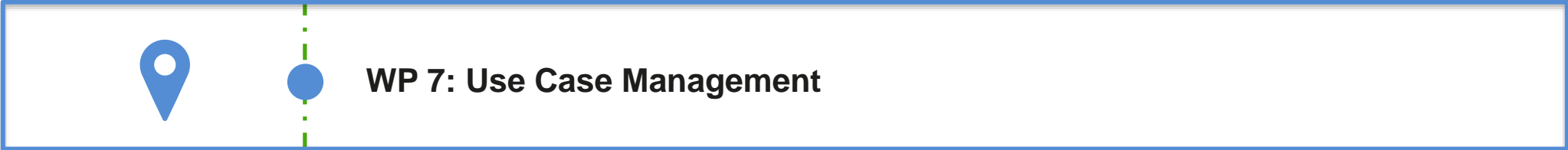
Friday, 5 May 2023 from 10 to 11 am

https://fh-westkueste-de.zoom.us/j/89374465944

www.adhocracy.plus/air

Agenda

Background Information

WP 7: Use Case Management

R&D Work Packages

Visitor Management, AI & Recommender

AIR
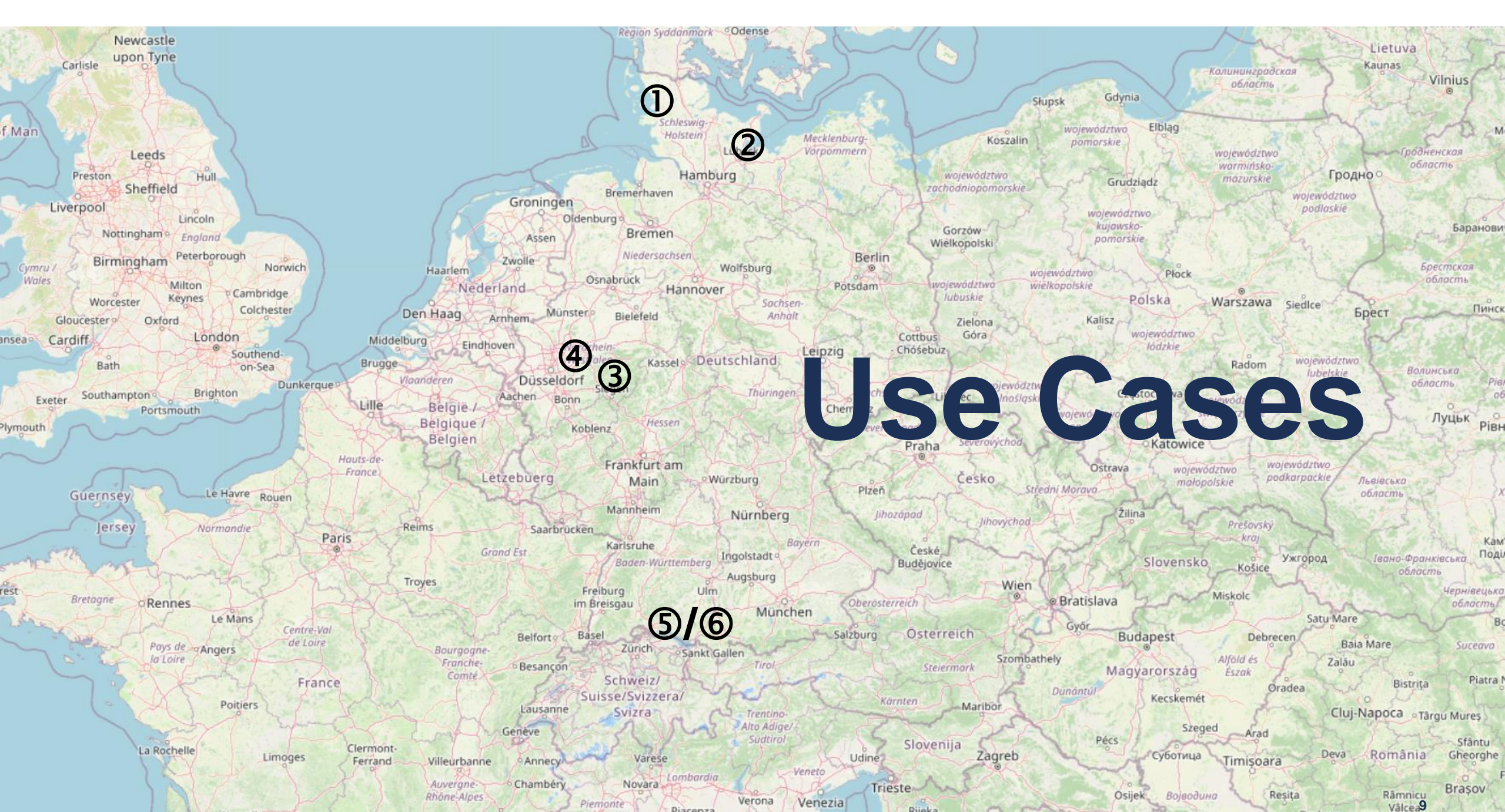
Use Cases

Use Case 1: Schleswig-Holstein North Sea

Source: https://urlaubaer.ferienwohnungen.de/reiseziele/deutschland/schleswig-holstein/

- 2019: approx. 19 million overnight stays & 16 million daily trips
- **St. Peter-Ording, Sylt, Speicherkoog, Büsum**
- Problem: seasonal and weather-dependent congestion situations at locations such as beaches or bathing areas, leisure pools, spas and indoor facilities

**Nordsee-Tourismus-Service GmbH (NTS)
is the central DMO for the North Sea
coast of Schleswig-Holstein**

Use Case 2: Schleswig-Holstein Bay of Lübeck

Source: https://www.ferienland-luebecker-bucht.de/

- The destination accounts for more than 3 million overnight stays
- Problem: very strong unequal distribution of people in the region → partly strong park-and-seek traffic, different utilization of leisure facilities including beach

Tourismus-Agentur Lübecker Bucht AöR (TALB) is the local tourism organization

Use Case 3: North Rhine-Westphalia Sauerland

- Use Case Sauerland lakes (summer) & ski resorts (winter)
- Problem during summer: crowded parking areas, sunbathing areas and hiking trails at the five lakes Bigge- & Listersee, Diemelsee, Hennesee, Möhnesee, Sorpesee
- Problem during winter: heavy flow of visitors on weekends and in holiday periods → serious traffic congestion and traffic jams on the main access routes

**Wintersport-Arena Sauerland/
Siegerland-Wittgenstein e.V.**

&

Sauerland-Tourismus e.V.

Use Case 4: North Rhine-Westphalia Ruhr Area

Baldeneysee
(Essen)

Kemander See
(Hattingen / Witten)

Source: https://www.google.de/maps

- 2019: 1.9 million cycling tourism days in the Ruhr Metropolis

- 240 km long RuhrtalRadweg

- Problem: on many stretches the visitor frequency is very high, especially on holiday weekends in spring and during school holidays → conflicts of use

Ruhr Tourismus GmbH is the umbrella brand for cycling vacations in the Ruhr region

Use Cases 5 & 6: Allgäu Nature (Hopfensee) & Füssen City Center

Source: https://www.allgaeu-abc.de/region-allgaeu/allgaeu-landkarte/allgaeu-karte-gross/

- 2019: more than 500,000 guest arrivals & more than 1.2 million overnight stays
- Problems: dense streams of visitors, full sunbathing areas, conflicts of use, traffic jams, park-and-seek traffic

Institute for Sustainable and Innovative Tourism INIT Füssen
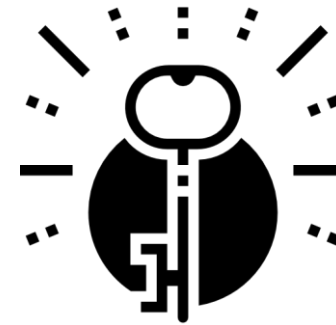
&

Füssen Tourismus und Marketing AöR

Take Away Messages

Heterogeneous Use Case compilation

Use cases exemplary for the most diverse types of destinations

Problems ranging from busy city centres to traffic problems to crowded beaches

Agenda

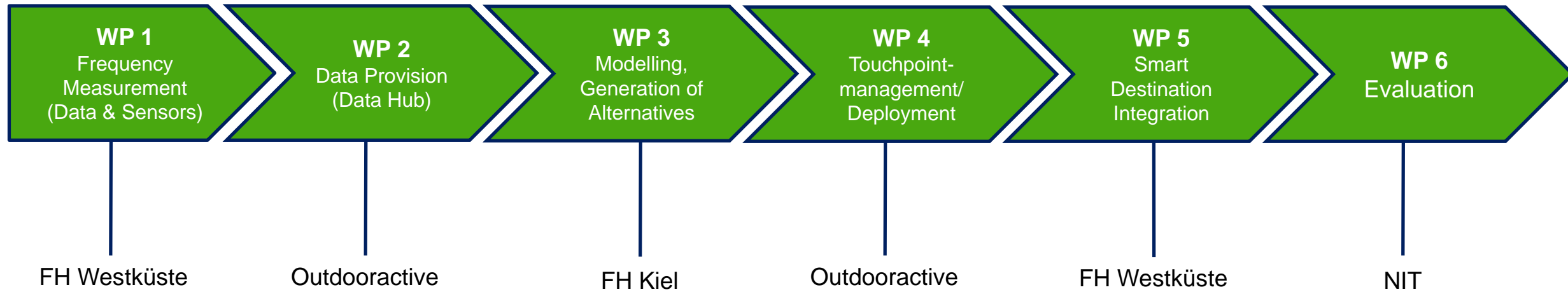**Background Information**

WP 7: Use Case Management

R&D Work Packages

Visitor Management, AI & Recommender

AIR

R&D Work Packages

WP 1
Frequency Measurement (Data & Sensors)

WP 2
Data Provision (Data Hub)

WP 3
Modelling, Generation of Alternatives

WP 4
Touchpoint-management/ Deployment

WP 5
Smart Destination Integration

WP 6
Evaluation

FH Westküste

Outdooractive

FH Kiel

Outdooractive

FH Westküste

NIT

AIR

Status Quo & Outlook

- Current data collection based on camera sensors counting pedestrians, cyclists and vehicles
  - More than 80 sensor locations
- Gathering of additional data, e.g. traffic censuses
- Next steps:
  - Start of global data collection, e.g. smartphone data
  - Aim to create visitor flow profiles
  - Gathering additional data on visitors perception on crowding
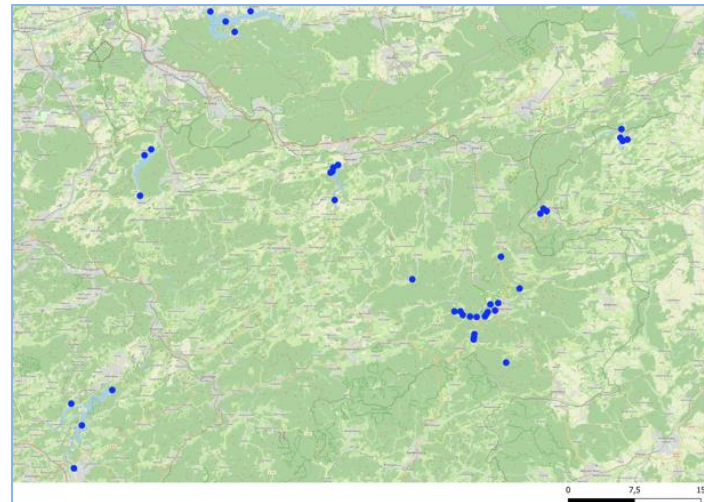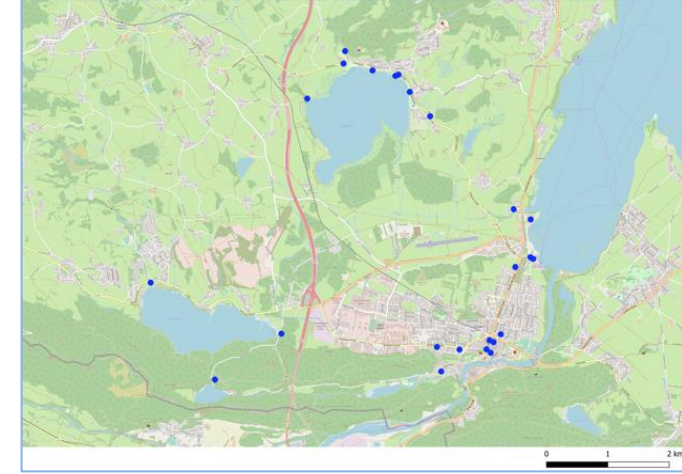

Source: Bernard Technologies GmbH

Status Quo & Outlook

- Aim: enable technical access to all data relevant to the project via an (open) digital data infrastructure
  - Provides the basis for the AI-based methods
- Important aspects
  - Technical requirements for data streams (static, dynamic)
  - Standardization of utilization data
  - Open data standards
  - Data granularity and data aggregation
  - Persistence and (semantic) preparation of all data
  - Data exchange within the project and beyond project boundaries

Data		
Static		**Dynamic**
Points of Interest		Sensors
Tours		Opening hours
...		...
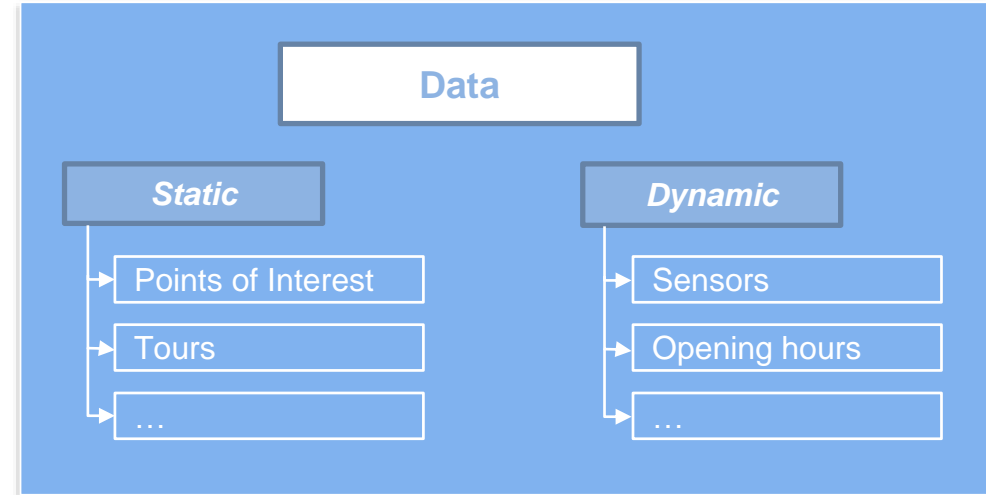
Current plan:
All data will be collected in a so-called Knowdledge Graph

AIR

19

Status Quo & Outlook

- Aim: develop scalable AI-based methods for determining utilization rates and generating recommendations of alternatives

- An IT-infrastructure where all data from the Data Hubs can be collected in a standardized form is needed

- Models can be trained and tested with collected data

- Outcome: forecasts of the expected utilization of tourism infrastructures and the identification of relevant, alternative and sustainable offers for recommender services
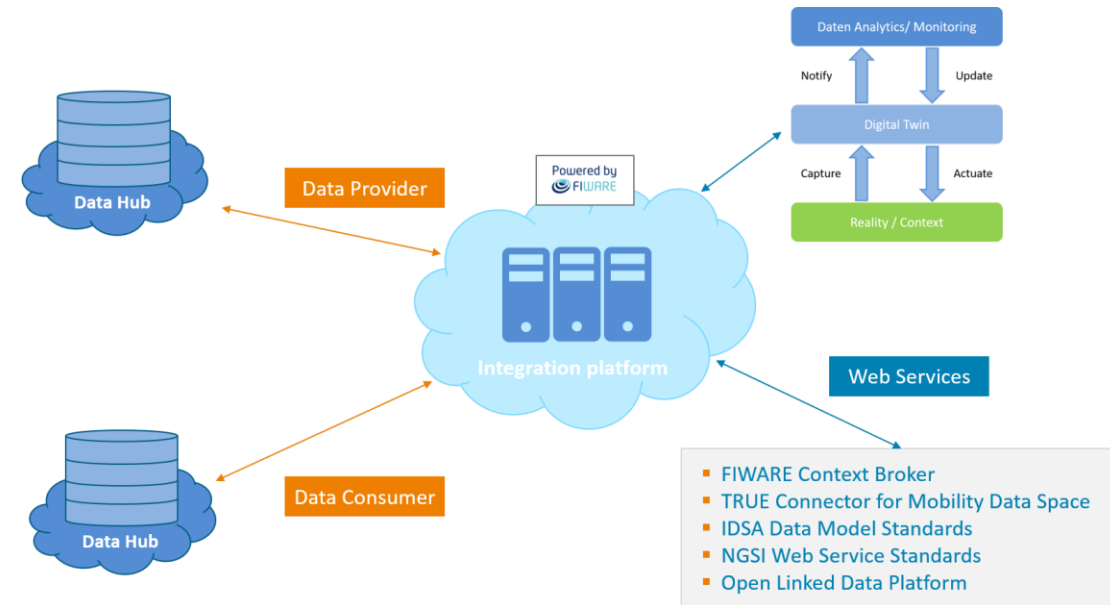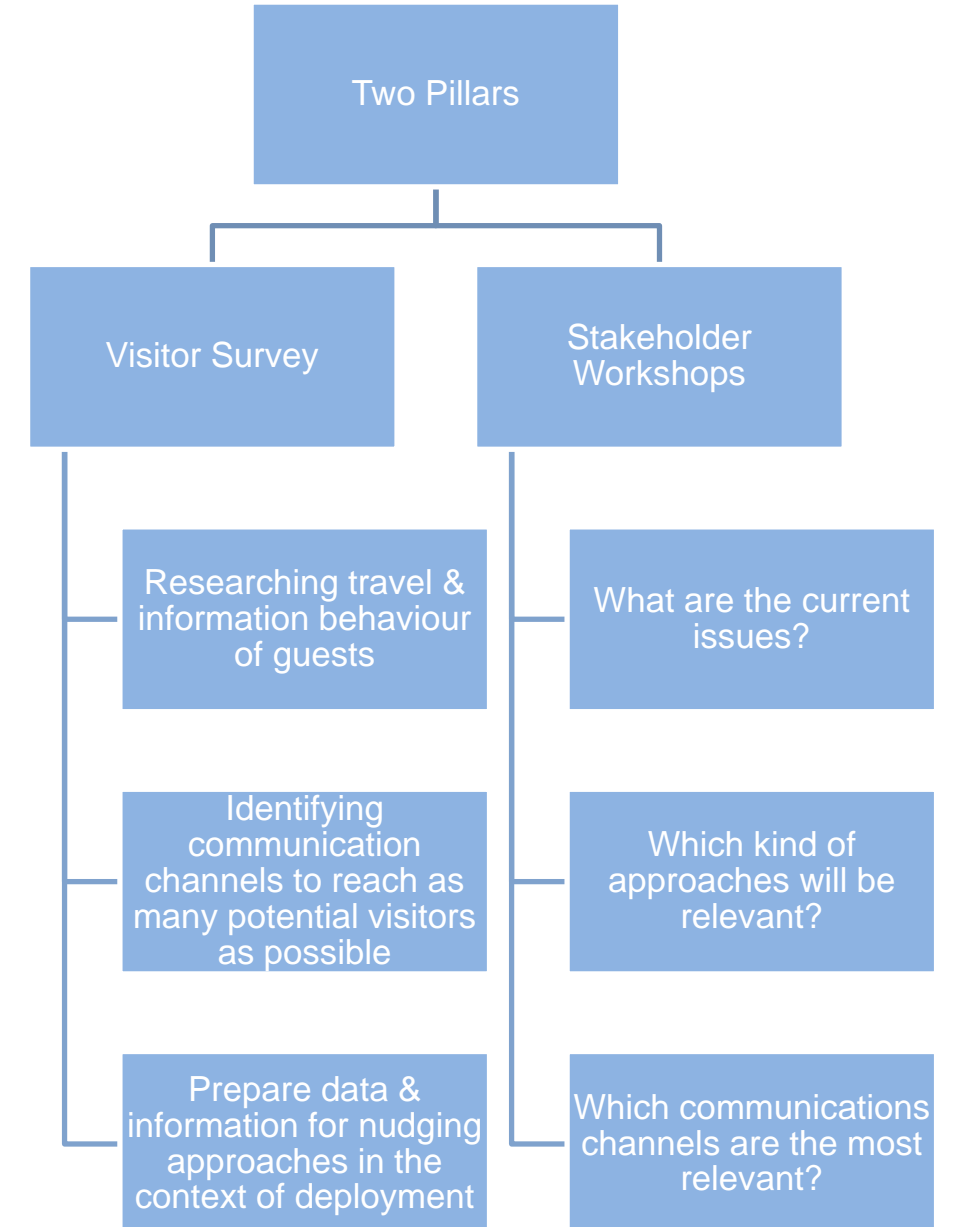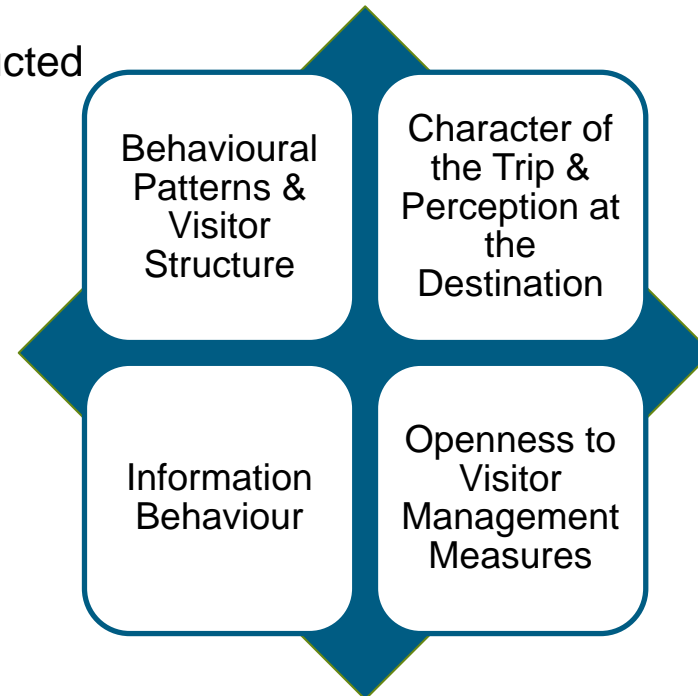
Touchpointmanage-
ment / Deployment

Status Quo & Outlook

- Task: the recommender needs to be deployed exactly where the guests look for the information they need
- So far: approx. 5,700 conducted interviews
- Visitor survey:

Behavioural Patterns & Visitor Structure	Character of the Trip & Perception at the Destination
Information Behaviour	Openness to Visitor Management Measures

Two Pillars

Visitor Survey

Stakeholder Workshops

Researching travel & information behaviour of guests

What are the current issues?

Identifying communication channels to reach as many potential visitors as possible

Which kind of approaches will be relevant?

Prepare data & information for nudging approaches in the context of deployment

Which communications channels are the most relevant?

AIR

Status Quo & Outlook

- Integrating previously collected and processed data into a digital management system

- Integrating data of other projects and exporting our data

- Implementing an exchange between various destinations and tourism stakeholders

- Mutual added value

www.adhocracy.plus/air

Status Quo & Outlook

- Aim: monitor the success of the measures in the use cases based on KPIs

- Use case-specific metrics will be developed and implemented

- Nudging measures of WP 4 (Deployment) = interventions

➢ examine the continuously generated utilization data with regard to these

  interventions

- Possbile optimization of the modeling and incorporation of the results into

  the design of the recommender

- General tourism demand data in the destinations of the use cases must also be
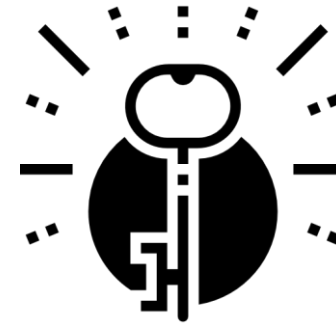
  used

Take Away Messages

Simultaneous handling of all work packages

Data lay the basis for all further steps in the process

Open data (standards) is a key success factor

Ongoing evaluation, adaptation and rethinking of all steps

Collateral benefit of the sensors (will remain and can be used for other purposes)

AIR

Agenda

- Background Information
- WP 7: Use Case Management
- R&D Work Packages
- Visitor Management, AI & Recommender

From WP1 to WP6: Managing visitors with the help of a recommender using AI

- Recommender as a tool to manage visitor flows in a destination

- Developing the recommender is dependent on

    - Data

    - User Experience and their demand

    - Reference to current data (crowding, weather etc.) and the user reference (interests, means of transportation etc.) to define similar PoI

    - Recommendations based on the visitor's acceptance and openness of being managed and on the pursued intention of the visitor management/ destination

However:
Is a recommender really able to make a difference?
Are visitors sufficiently willing to be managed and influenced?
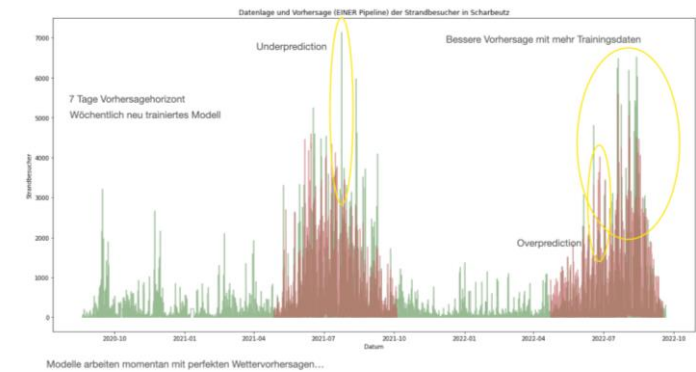
AI-based Recommender for sustainable tourism

Forecasts

- Visitors to the beach, parking lot occupancy, cyclists, …

- Identifying potential occupancy peaks is especially important

- Develop understanding of dynamics

Longterm and sustainable perspective:
models can be used for different destinations since being stored in an open platform (e.g. FIWARE-platform)

Recommendations/ Alternatives when POIs are crowded

- Alternatives can be
  - Thematic
  - Temporal
  - Spatial
- Recommendation of
  - A less crowded POI
  - A specific parking place on the beach
  - An alternative cycle route
 - An alternative means of transportation, etc.

AIR

Take Away Messages

AI-based models for utilization forecasts and recommendations might help managing vistor flows

Visitor management is an important contributor to a more sustainable tourism

Visitors' willingnesss to change travel behaviour based on the recommender and sustainability issues still needs to be examined

Therefore, effectiveness of a recommender is yet to be proven

AIR
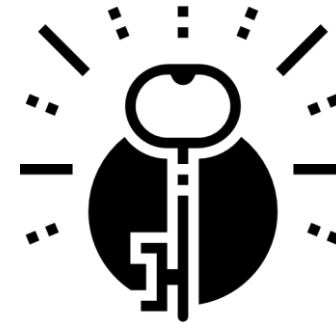
Thank you for your attention!
Are there any questions?

Marina Bergler, B.A.
Project Manager

University of Applied Sciences Kempten
Institute for Sustainable and Innovative Tourism
INIT Füssen
Bahnhofstraße 61
87435 Kempten

Phone: +49 (0) 8362 70395-37
E-Mail: marina.bergler@hs-kempten.de

www.hs-kempten.de
www.hs-kempten.de/forschung/forschungsinstitute/init-institut-fuer-nachhaltige-und-innovative-tourismusentwicklung

Lisa Naschert, M.Sc.
Project Manager

Westcoast University of Applied Sciences
German Institute for Tourism Research
Fritz-Thiedemann-Ring 20
25746 Heide

Phone: +49 (0) 481 8555-402
E-Mail: naschert@fh-westkueste.de

www.fh-westkueste.de
www.ditf-fhw.de

www.nit-kiel.de/air

Feel free to contact us!