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Towards Learning Travelers' Preferences in a Context-Aware Fashion

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Big picture

- Development of an innovative framework for intelligent mobility.
- Facilitating the efficient combination of ride-sharing and scheduled transport services.
- Enhancing the performance of the overall mobility system.

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Focus of this work

- Build a recommender system that offers **personalized** services to travelers.

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Solution

- Capturing the individuals' preferences through understanding their CONTEXT

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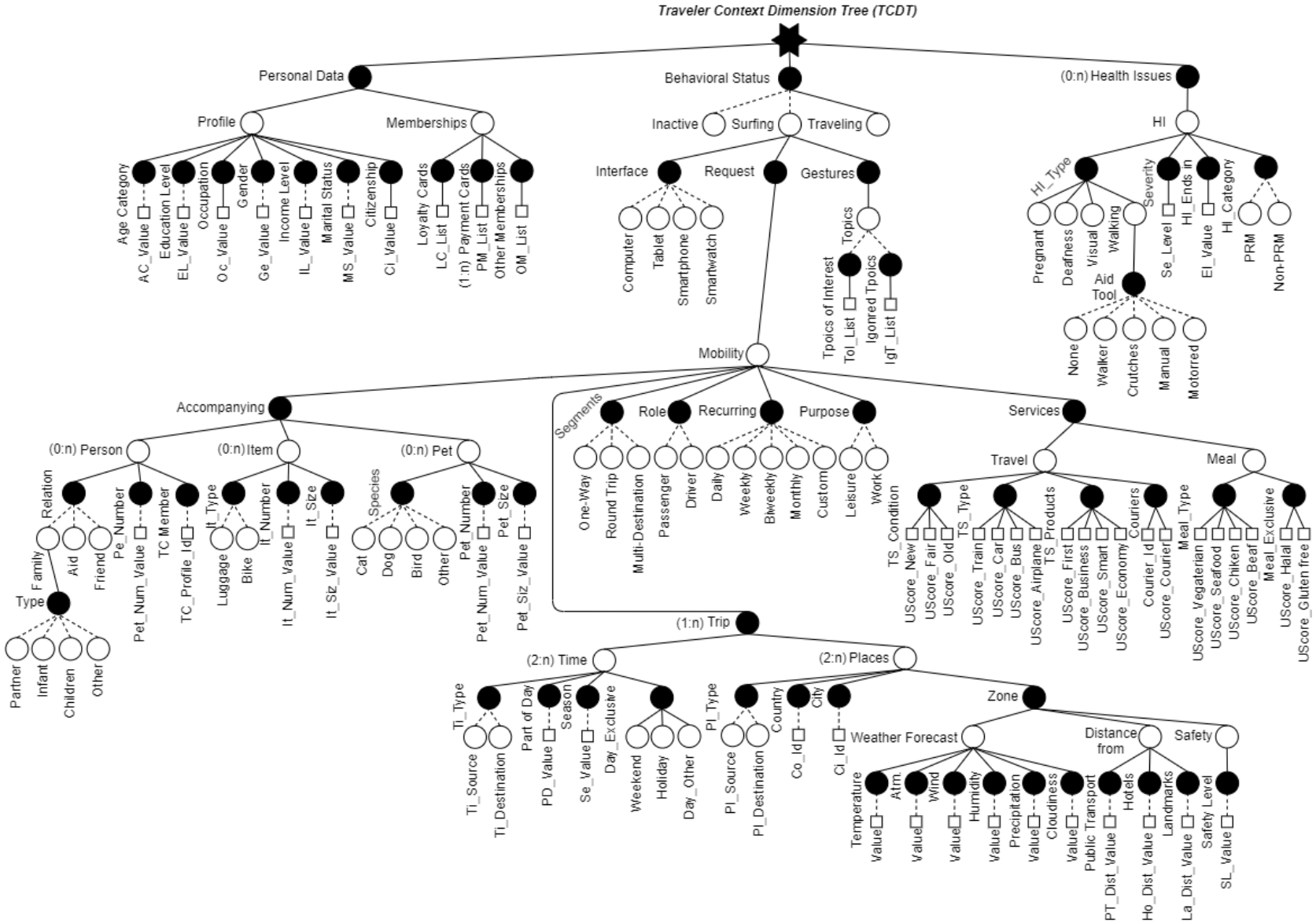
Preferences via Context Dimension Tree

- What is the context?
  - Context is **any information** that can be used to **characterize the situation of an entity**, where an *entity* is a person, a place, or an object that is considered as relevant for the interaction between a user and an application [Dey 2001].
  - Context is **not just a profile**, but an **active process** of how humans weave their experience within their **whole environment** to give it meaning.
- What is the Context Dimension Tree (CDT)?
  - A methodology to capture and exploit the information of different situations in which the user can act, and formalize them hierarchically as a rooted labeled tree.
  - A flexible model to capture the context both in the **conceptual** and **detail** level.

[Dey 2001] A. Dey. Understanding and using context. Personal Ubiquitous Comput., 5(1):4-7, 2001

Traveler Context Dimension Tree



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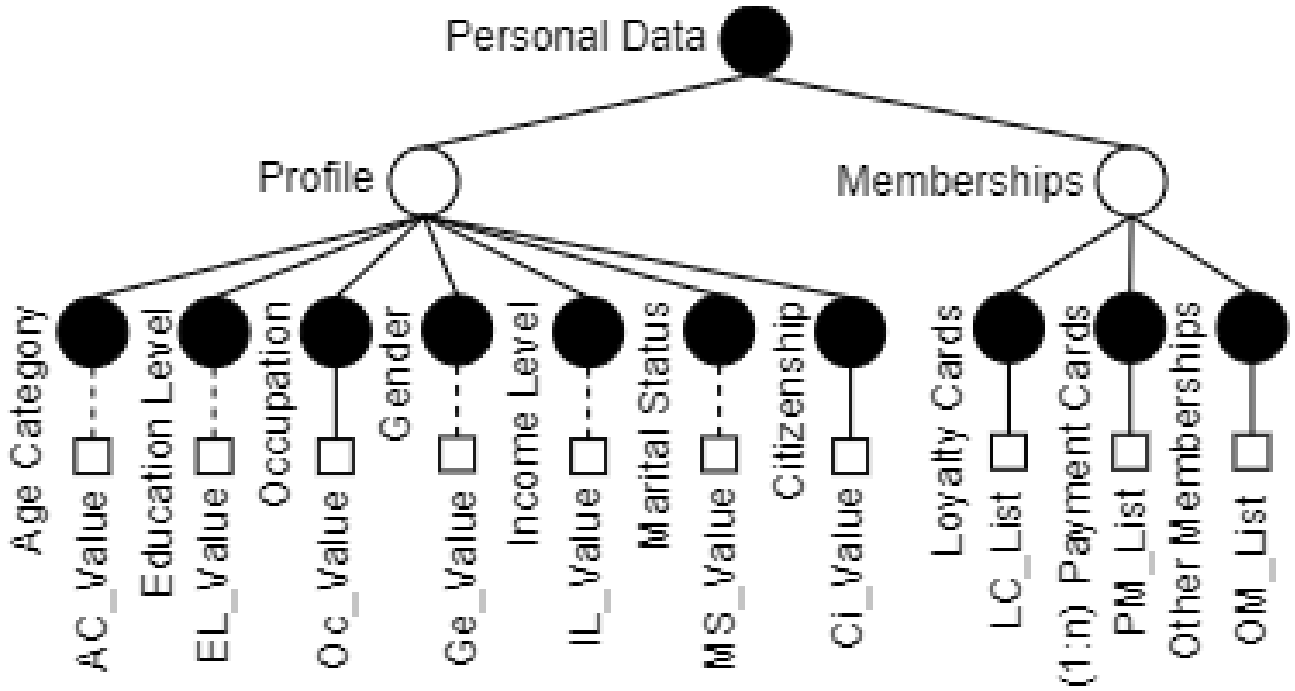
TCDT: Personal Data

- Socio-economic factors
- Useful for user profiling
- Stable preferences
- Enables Warm Start
- Capturing Communities



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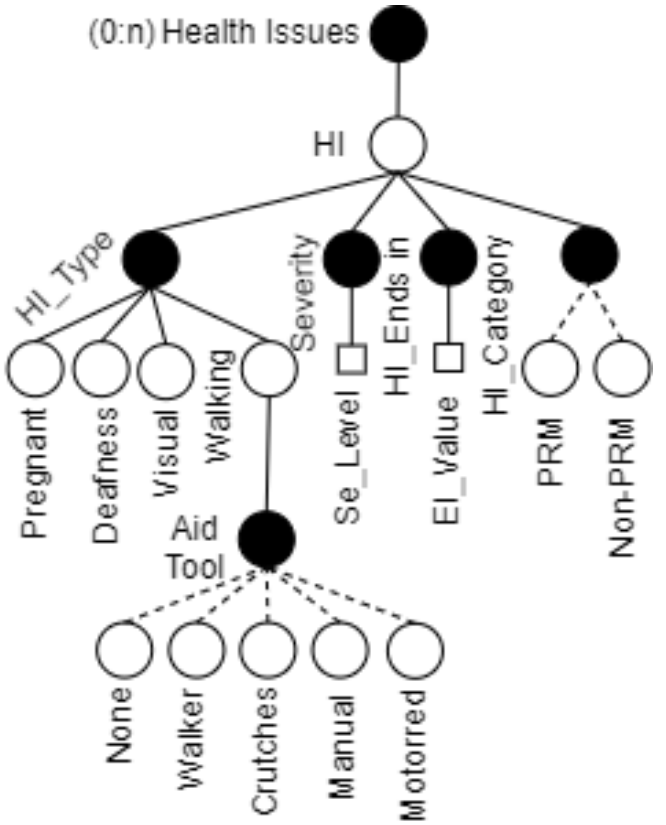
TCDT: Health Issues

- Support Person with Reduced Mobility (PRM)
- Capture important preferences that result in constraints
- Required for logistic purposes



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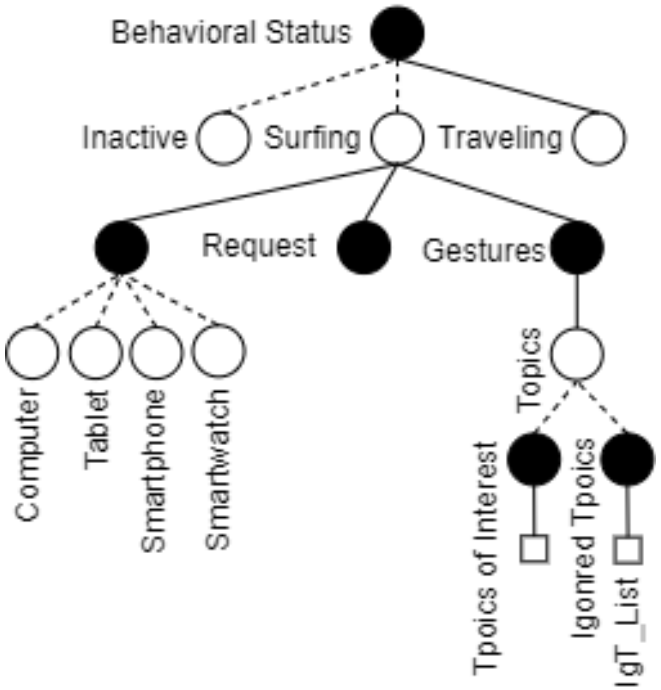
TCDT: Behavioral Status

- Momentary behaviors
  - Implicit
  - Explicit



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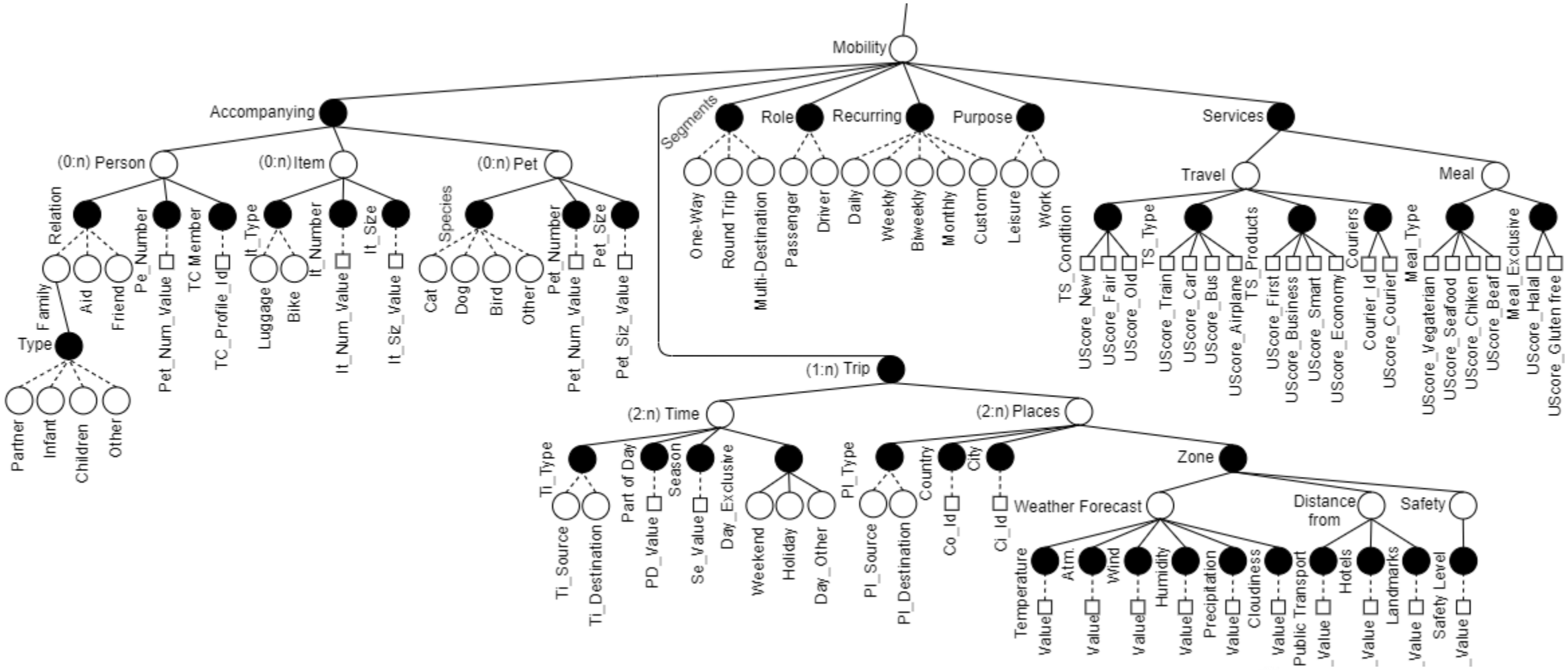
TCDT: Mobility Request



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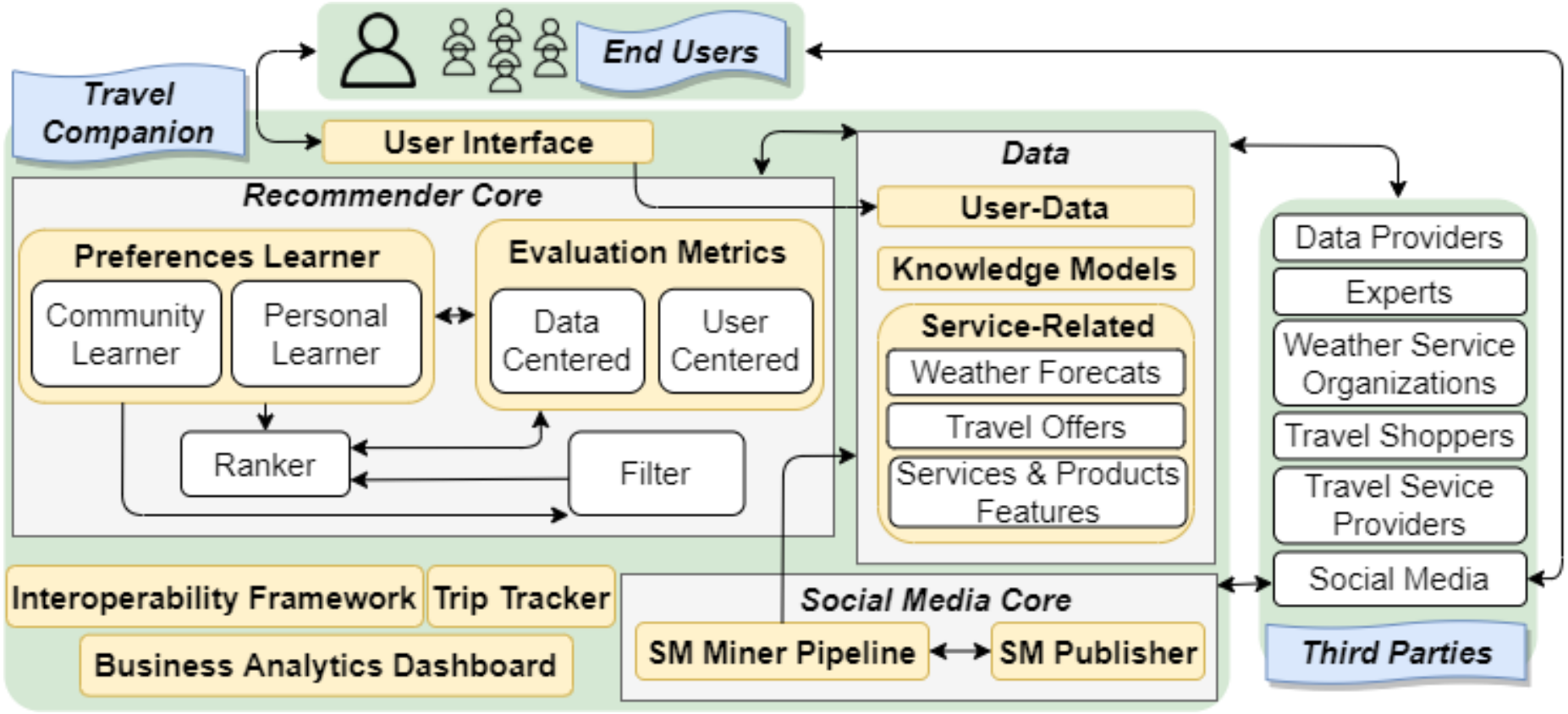
Conceptual System Architecture



Note: It provides an overall view, hiding the details of all the TC's blocks and functions; also, it does not specify the modules' physical locations (cloud, *etc*.)

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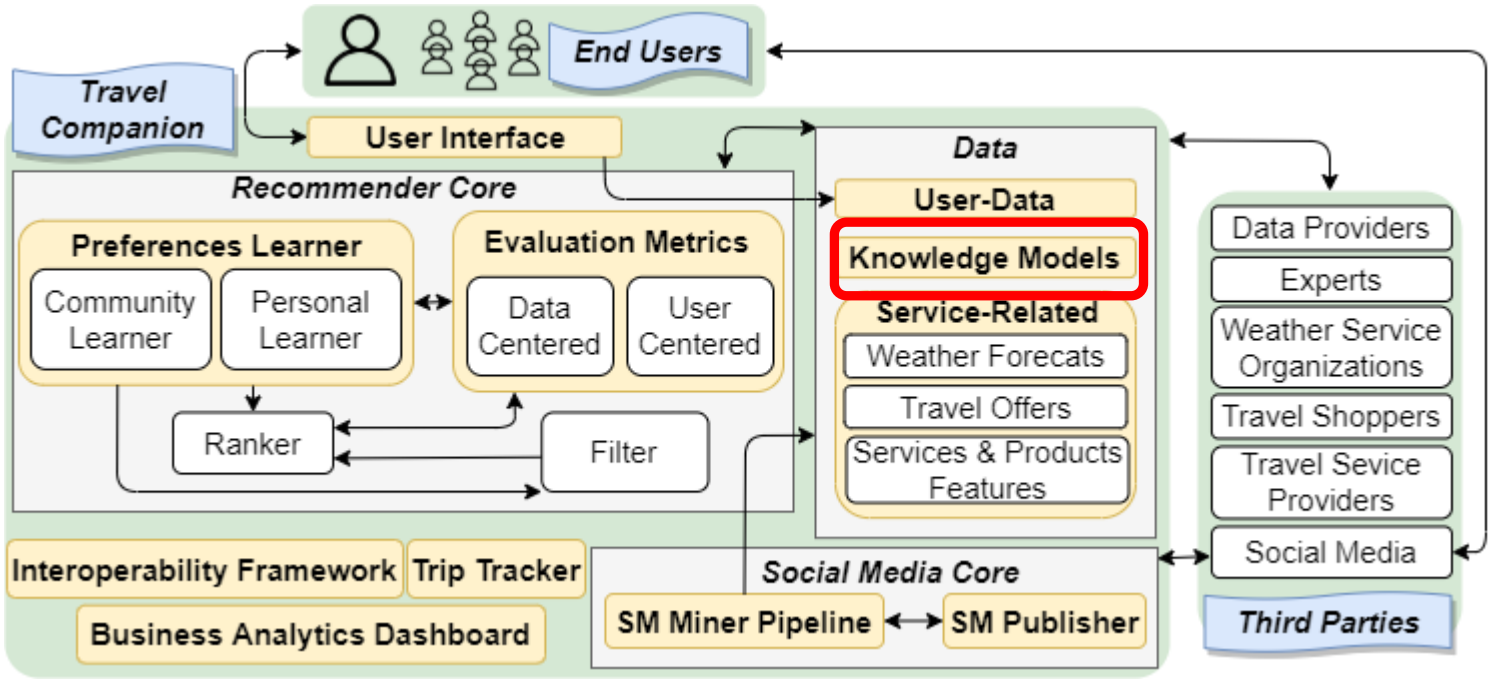
Conceptual System Architecture: Knowledge Models

- Knowledge Models:
  - Warms start
  - Behavioral drifts



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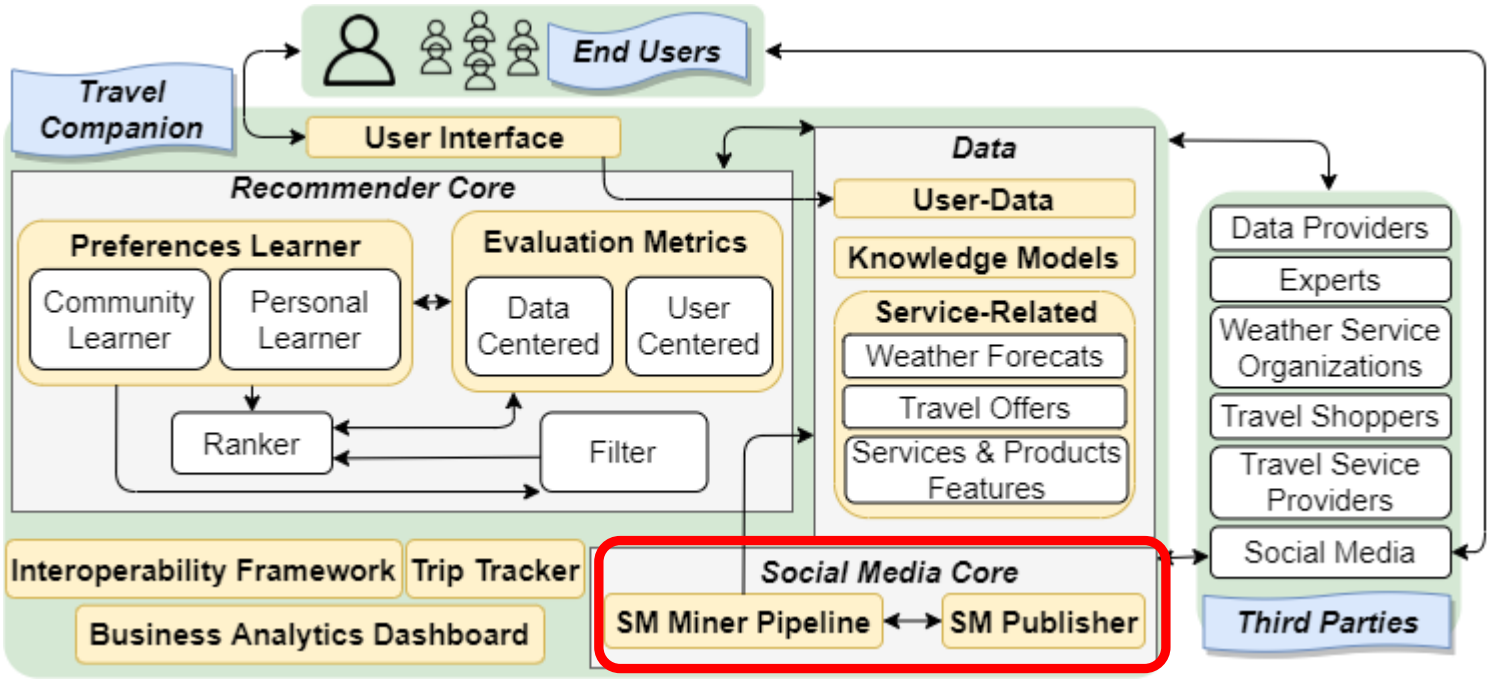
Conceptual System Architecture: Social Media Core

- Social Media Core:
  - Harvest knowledge from SM platforms
  - Publish tailored info
  - Share experience



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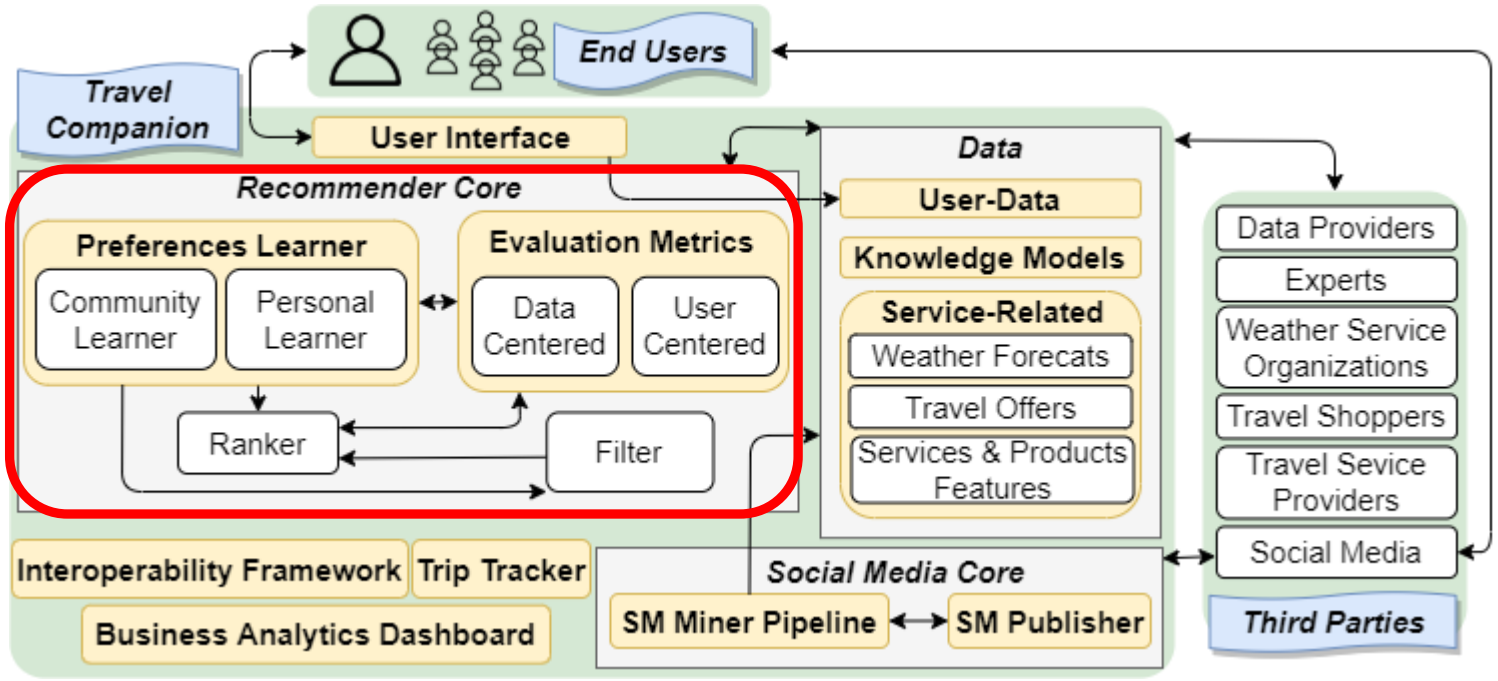
Conceptual System Architecture: Recommender Core

- Recommender Core:
  - Learning
  - Filtering
  - Ranking



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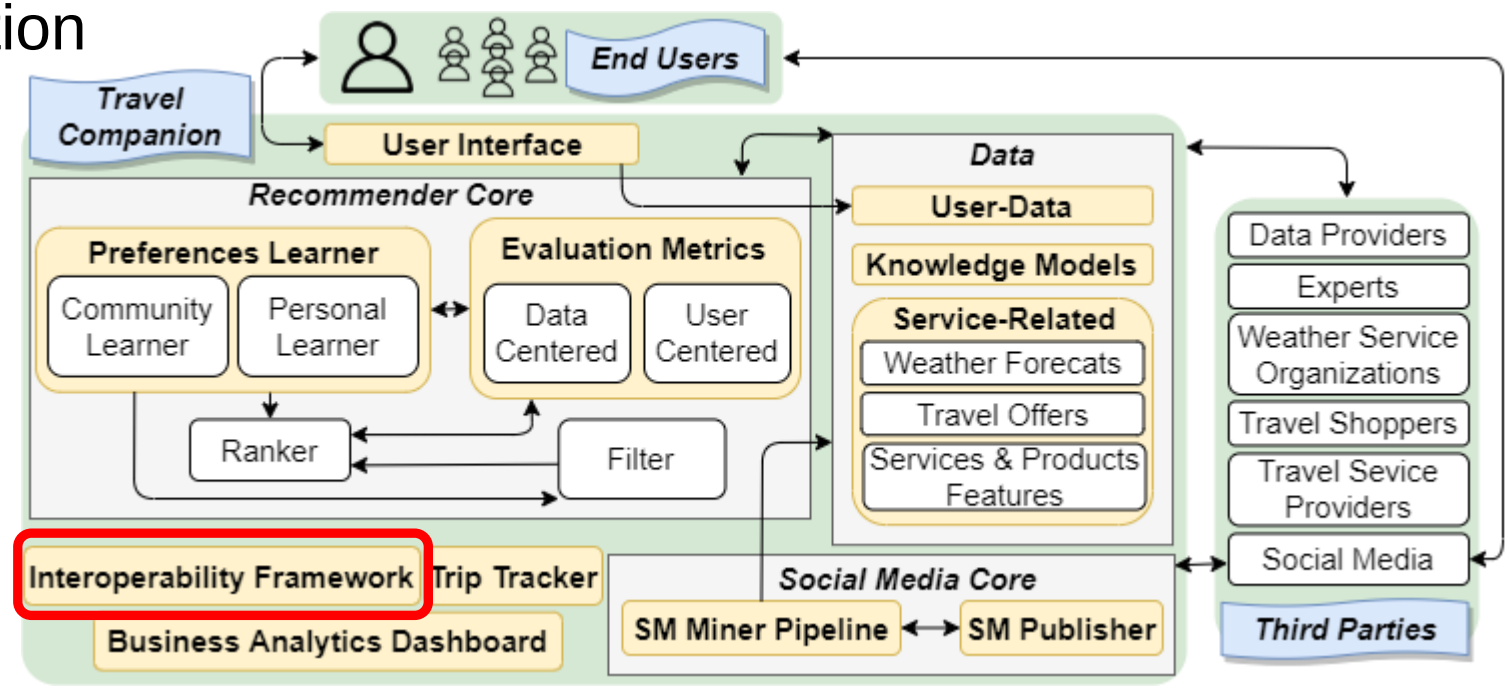
Conceptual System Architecture: Interoperability Framework

- Interoperability Framework:
  - Exchange of information between TC and different modules



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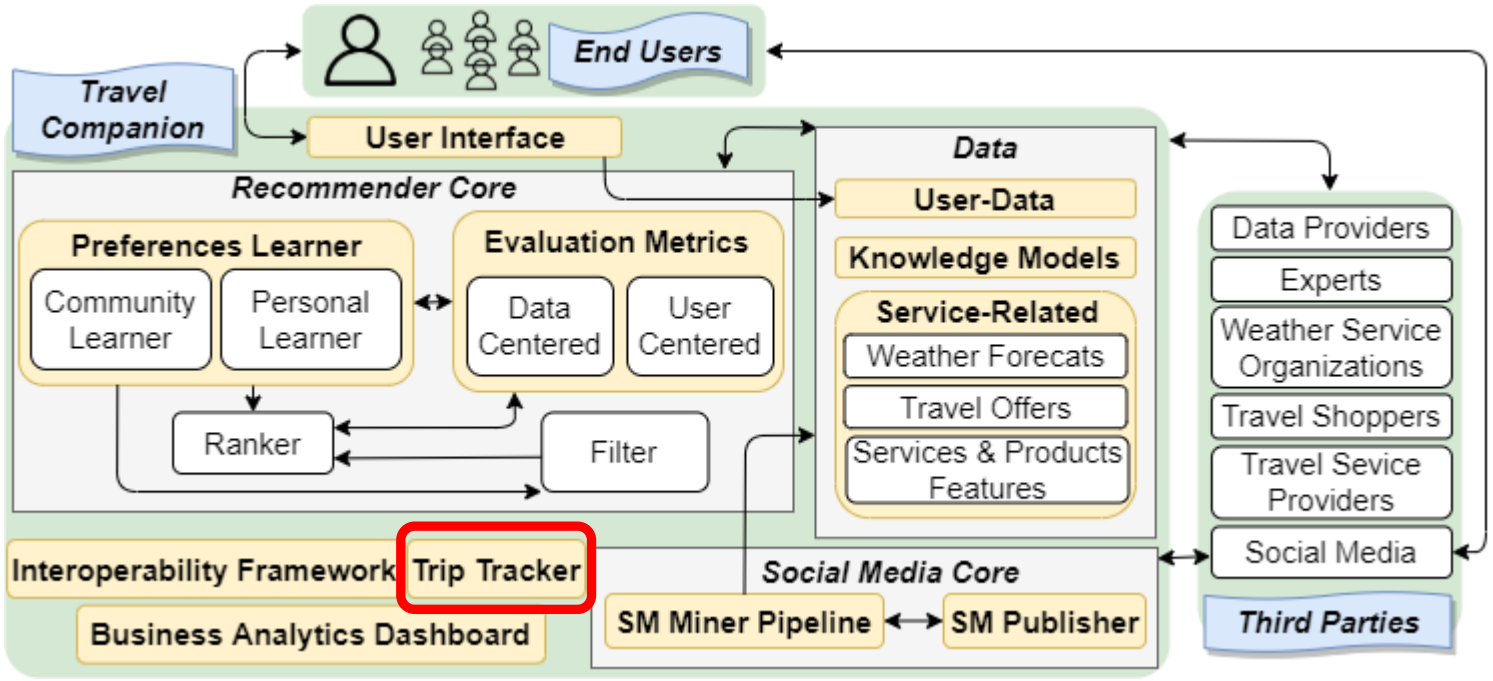
Conceptual System Architecture: Trip Tracker

- Trip Tracker:
  - Notifications



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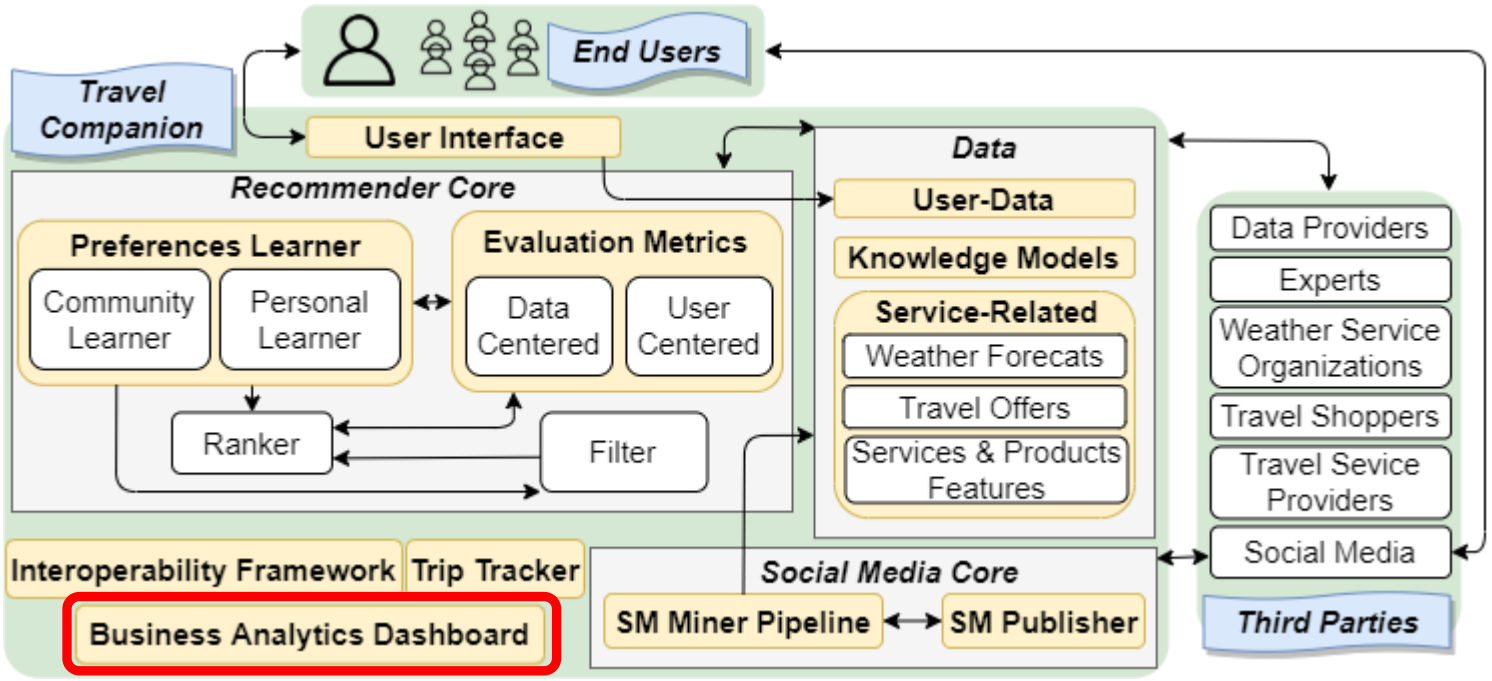
Conceptual System Architecture: BA Dashboard

- Business Analytics Dashboard:
  - System performance
  - Trends
  - Behavioral drifts



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Challenges and Future works

- Dealing with the change of personal preferences and adopting the system accordingly.
- Adopting appropriate semantic technologies.
- Dealing with privacy issues.
- Dealing with the heterogeneity of the services provided by Travel Service Providers.

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THANK YOU!
QUESTIONS?

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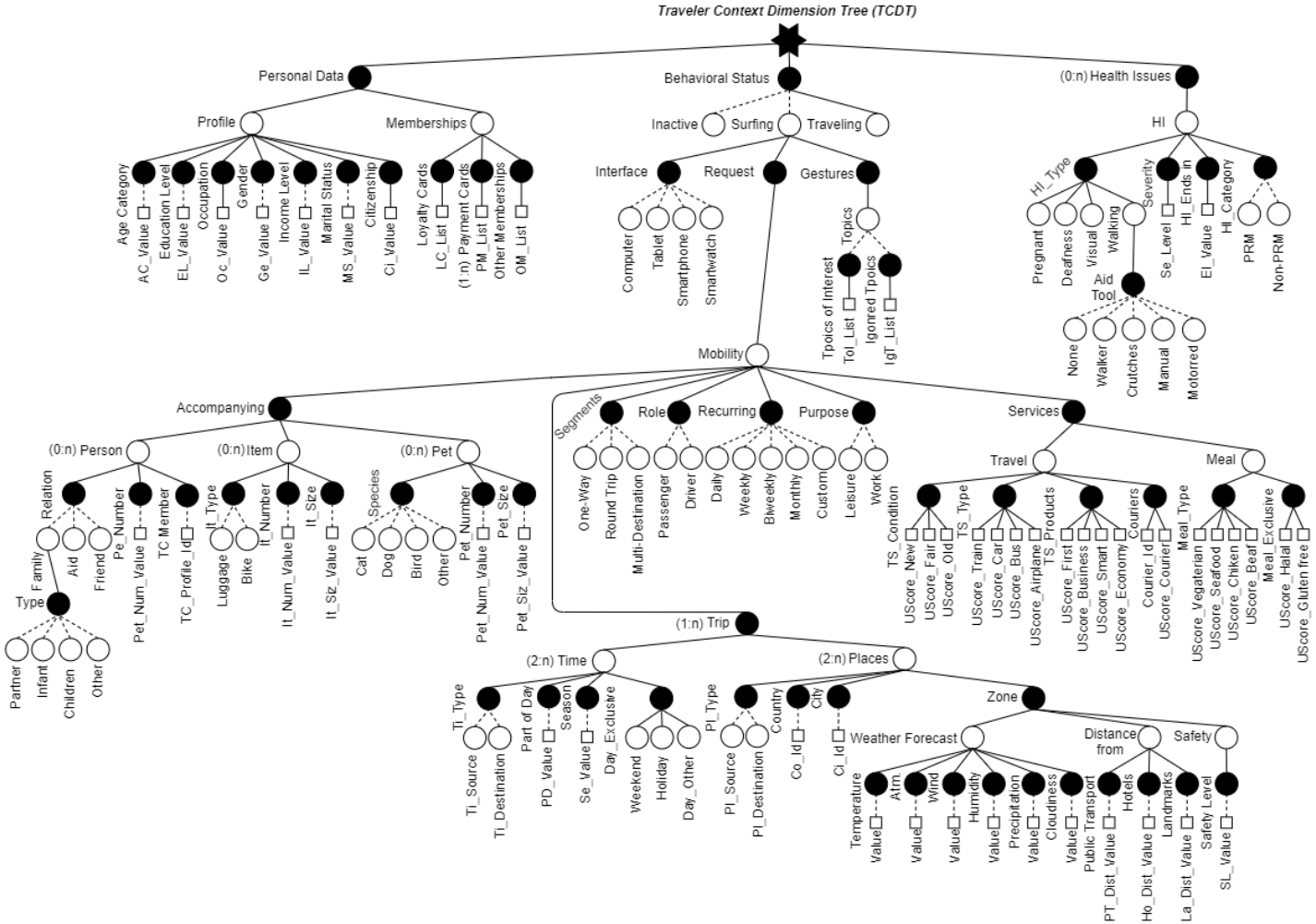
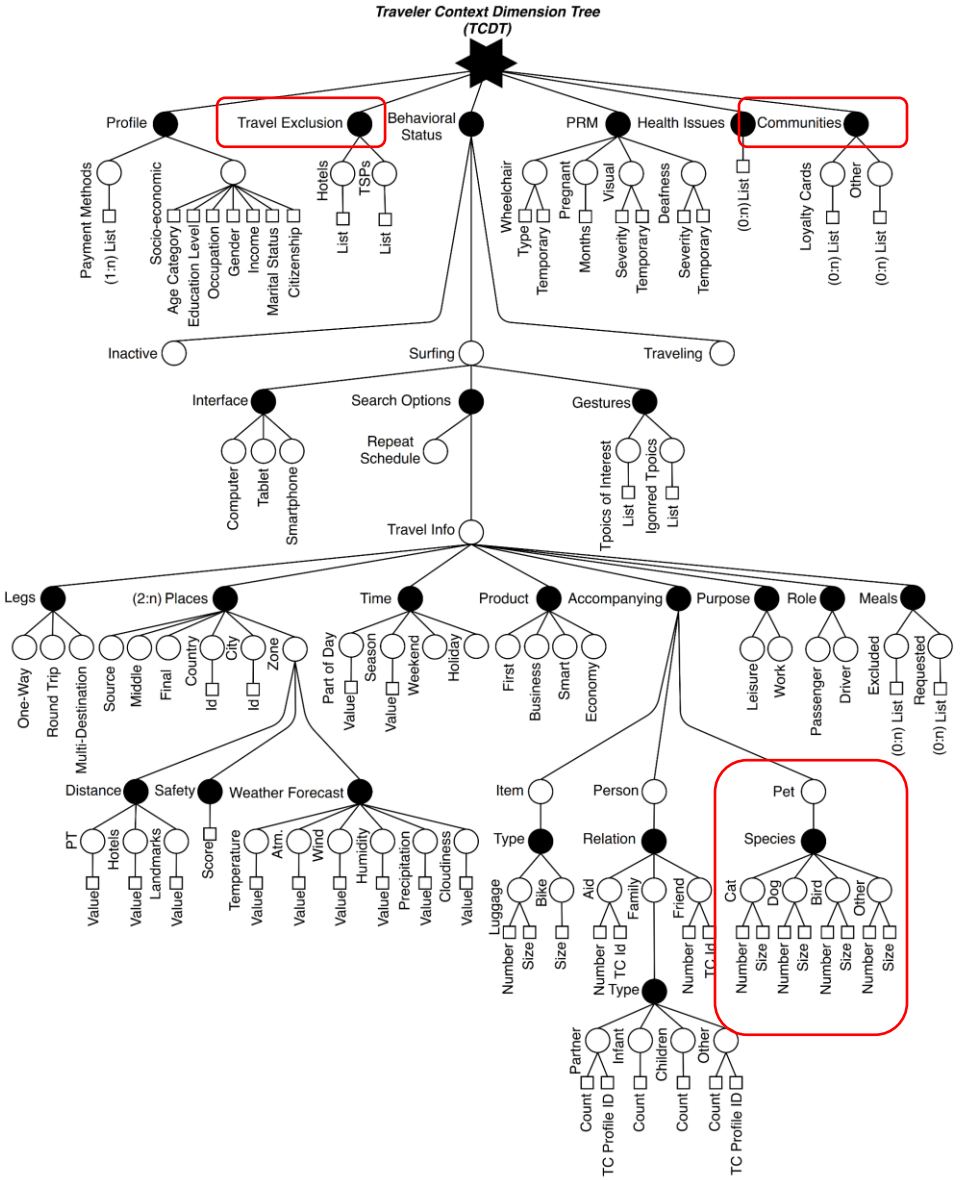
TCDT V2



Vs

TCDT V1



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