

UPTRENDZ: API-CENTRIC REAL-TIME RECOMMENDATIONS IN MULTI-DOMAIN SETTINGS

EMANUEL
LACIC
ELACIC@KNOW-
CENTER.AT

TOMISLAV
DURICIC
TDURICIC@KNOW-
CENTER.AT

LEON
FADLJEVIC
LFADLJEVIC@KNOW-
CENTER.AT

DIETER
THEILER
DTHEILER@KNOW-
CENTER.AT

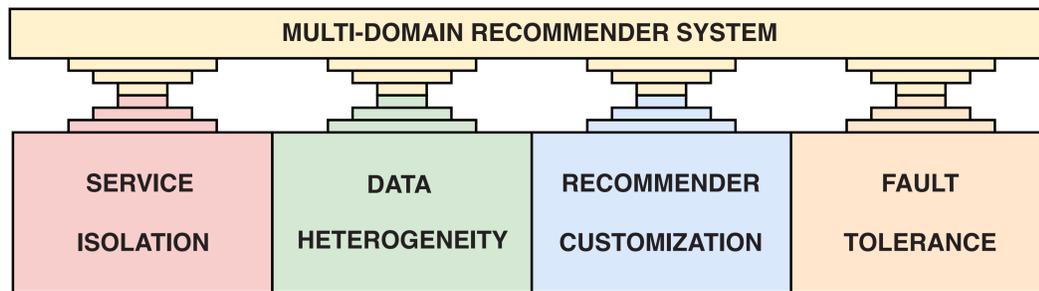
DOMINIK
KOWALD
DKOWALD@KNOW-
CENTER.AT



THE UPTRENDZ PLATFORM

Multi-domain support [1]:

- **System-level:** Data belongs to distinct system and is stored separately
- **Item-level:** Domains have different data types (e.g., items) which may share some attributes



Microservices-based system architecture. Provides a layer on top of the ScaR [2] framework to **dynamically configure** an application domain and to instantly **provide an API** to:

- Upload data about **items**
- Upload data about **users**
- Upload the corresponding **interaction** data
- Request **recommendations**

Domain-specific data model. The underlying algorithm needs to unambiguously know which **source of information** should be used to calculate the recommendations. The Uptrendz platform allows generating **customized data upload APIs** for multiple **item** and **user entities** with the following data types:

Type	Sub-Type	Description
Categorical Text	Single Value	String value, which usually represents a category. Used for post-filtering recommendation results.
	Multiple Values	List of string values, which usually represent an array of categories. Used for post-filtering recommendation results.
Free Text	English	English text , which is processed and utilized for content-based recommendations.
	German	German text , which is processed and utilized for content-based recommendations.
Numeric	Integer	Used for post-filtering recommendations (e.g., user age).
	Real	Used for post-filtering recommendations (e.g., price).
Date	-	Date information for the respective entity (e.g., creation date)

The **customized interaction API** can support **registered** users, **anonymous sessions** or both. It also supports defining an **unrestricted amount** of **explicit** and **implicit** interaction types.

DEMO WALKTHROUGH: SYSTEM LEVEL DOMAIN

Goal: Create a **real-time movie recommender** and use it in an **API-centric** for an **online setting**.

Code: <https://github.com/lacic/ECIR2023Demo>

API Setup:

- Create a movie domain on the **system-level**
- Configure what meta-data is available for **movies**
- Configure what meta-data is available for **users**
- Configure that we are using **explicit rating interactions**
- Customize **recommendation scenarios** with appropriate algorithms and post-filtering logic

Items

What should be recommended? A product, a news article or a job posting?
What attributes are available for each item? A categorical or a plain text description?

Status: online Preview

Interactions

How do the users interact with the items which we want to recommend?
Are they buying, viewing or rating them? Are they registered users or anonymous?

Status: online Preview

Users

What kind of users do you have? A customer, a reviewer or a company perhaps?
What attributes are available for each user? A categorical or a plain text description?

Status: online Preview

Data Services

Use the following API to upload your data:

- Item Data**
<https://app.v2.uptrendz.ai/dl/items/movie>
- Interaction Data**
<https://app.v2.uptrendz.ai/dl/interactions>
- User Data**
<https://app.v2.uptrendz.ai/dl/users/user>

ITEM-LEVEL DOMAIN

What would you like to recommend?

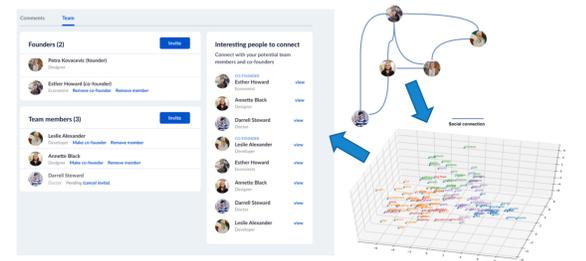
product, article, job...

Add Item Entity

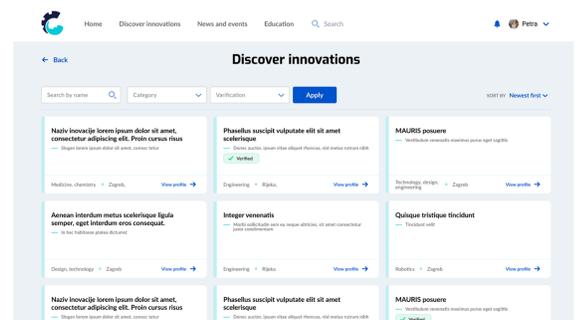


Entrepreneurial start-up founding. Need to define **recommendable entities** which users can interact with on the Cogsteps platform:

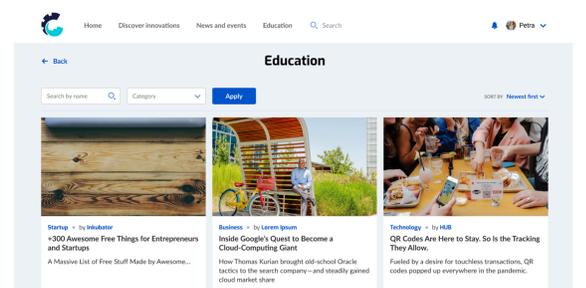
D1: Co-founder candidates that should be matched with a startup-idea.



D2: Innovations to be discovered by incubators, innovation hubs, and accelerators.



D3: Educational materials until the innovation idea matures enough to form a start-up.



Recommender customization. Defining a recommendation scenario involves configuring a specific algorithm on the data of a respective item-level domain (e.g., innovations).

General Settings

Scenario name: discover-innovations

Scenario ID: discover-innovations

What will be recommended?
Innovation

Recommendation Model: HybridRecommenderWeighted

Model Specific Settings

Available profiles:

- Connect People Innovation Content
- Invite People Brainstorm Content
- Discover Innovations Personalized 10
- Discover Innovations Popular 1
- Discover Innovations Content History 5

REFERENCES

- [1] Lacic, E., Duricic, T., Fadljevic, L., Theiler, D., Kowald, D. (2023). *Uptrendz: API-Centric Real-time Recommendations in Multi-Domain Settings*. In Proceedings of the 45th European Conference on Information Retrieval (ECIR'2023).
- [2] Lacic, E., Kowald, D., Parra, D., Kahr, M., Trattner, C.: *Towards a scalable social recommender engine for online marketplaces: The case of apache solr*. In: Workshop Proceedings of WWW'2014. pp. 817–822 (2014)