Automatic News Recommendation via Profiling

within

ACM MM - 3rd AIEMPro Workshop

Erik Mannens

IBBT – Ghent University - MMLab

Overview

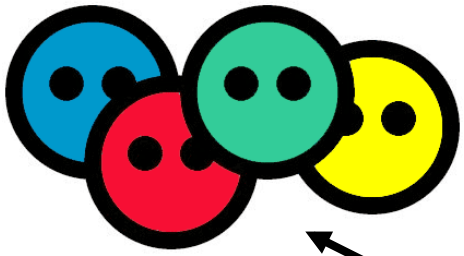
- Personalised News Distribution Use Case
- News Modelling
- Profile Modelling
- Recommendation
- Global Architecture

Personalised News Distribution Use Case

- Our aim is to demonstrate the possibility of dynamically digesting an up-to-date news bulletin by merging different news sources, assembled to match the *real individual* consumer's likings, by recommending his favourite topics.

- Key:
  - (developing) news stories can be characterised as dynamic, chained, and **distributed events** in addition to which it is important to **aggregate, link, enrich, recommend, and distribute** these news event items **as targeted as possible** to the **individual**, interested user

News Modelling : Linking NAR with other Ontologies



foaf:Person ≈
nar:Person

dc:Subject ≈
nar:Subject

Dublin Core Metadata Initiative®
Making it easier to find information.

NewsML G2
+
EventsML G2

sioc:Item ≈
nar:Item

geo:lat
geo:long

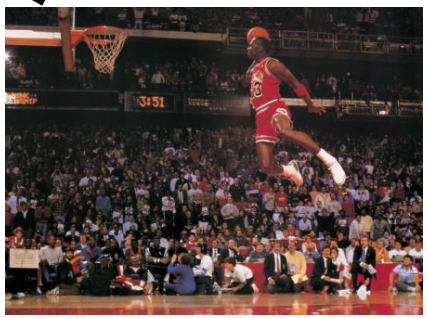
News Modelling : Enriching News Metadata with LOD

nc:15008001

wp:OldestPlayer50+

nar:subject

events:id



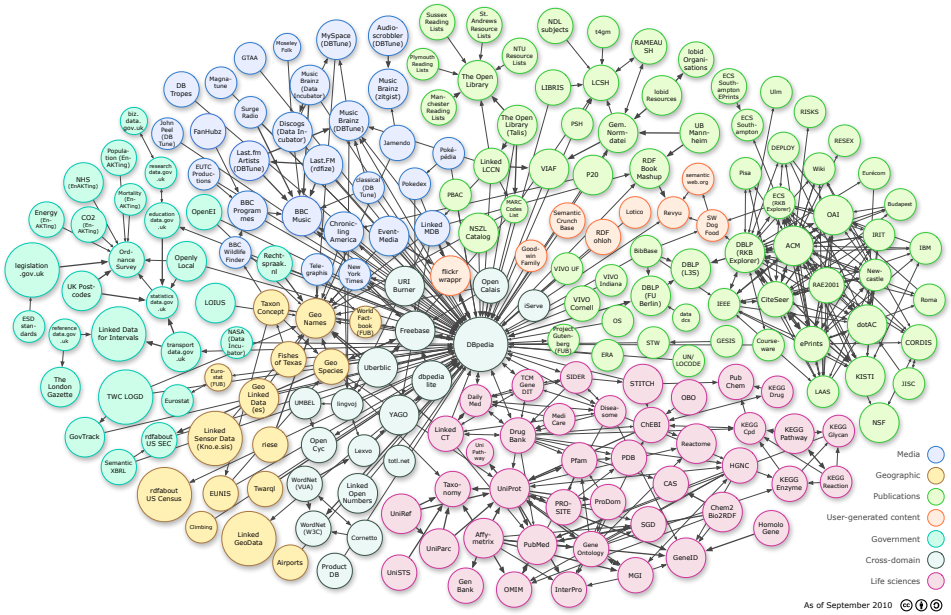
nar:location

foaf:depicts

geonames:4887398

dbpedia:MichaelJordan

LINKINGOPENDATA
W3C SWEO Community Project

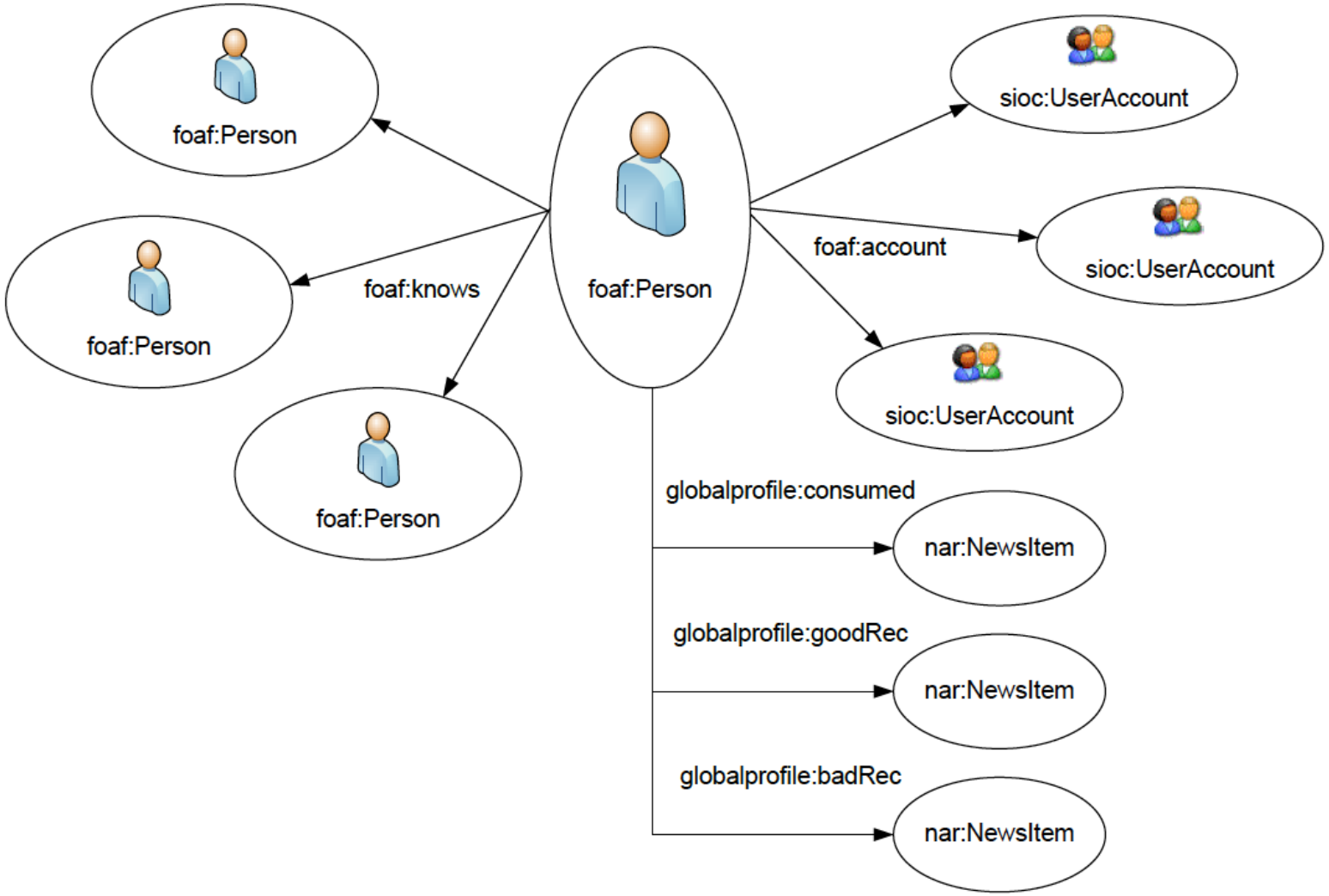


Profile Modelling

- Typical user's profile:
  - **Static Information**: e.g. the user's all-time favourite hobbies, birthplace, gender, name, address, …
  - **Dynamic Information**: the user's activity stream, e.g., what the user is listening to, the user's current location, feedback of the user on offered content, etc, using the *OpenLike paradigm*
  - **Social Graph**: this contains all the user's connections to other users, e.g., the friendlist.

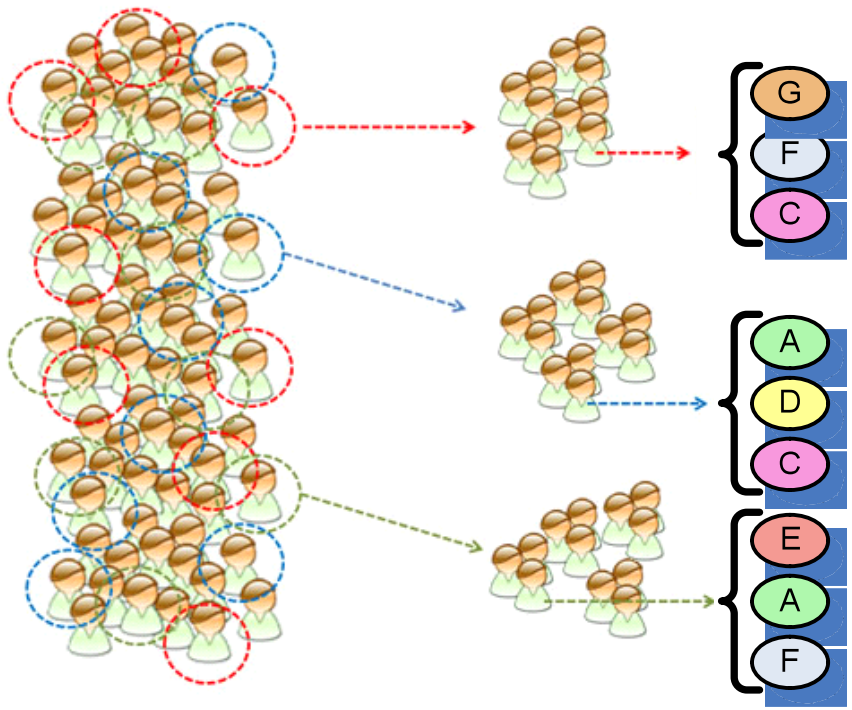
- 'Global' profile: aggregated profiles of all one's social networks
  - Via *OpenID* identity authentication service (identity + profile)
  - Via *OAuth* as an authorisation service

Profile Modelling : Global Profile



Recommendation : User-based Collaborative Filtering (CF)

- **Goal**: Recommending the news items that one will like the most based on the consumption behaviour of one and all of its friends
- **Idea**:
  - Find a collection of neighbouring users with a taste similar to that of one self
  - Gather the items that the neigh-bourly friends appreciated and that are not yet consumed by oneself
  - The items which received the highest ratings from the most similar friends, will be recommended



Recommendation : Content-Based Recommendation (CB)

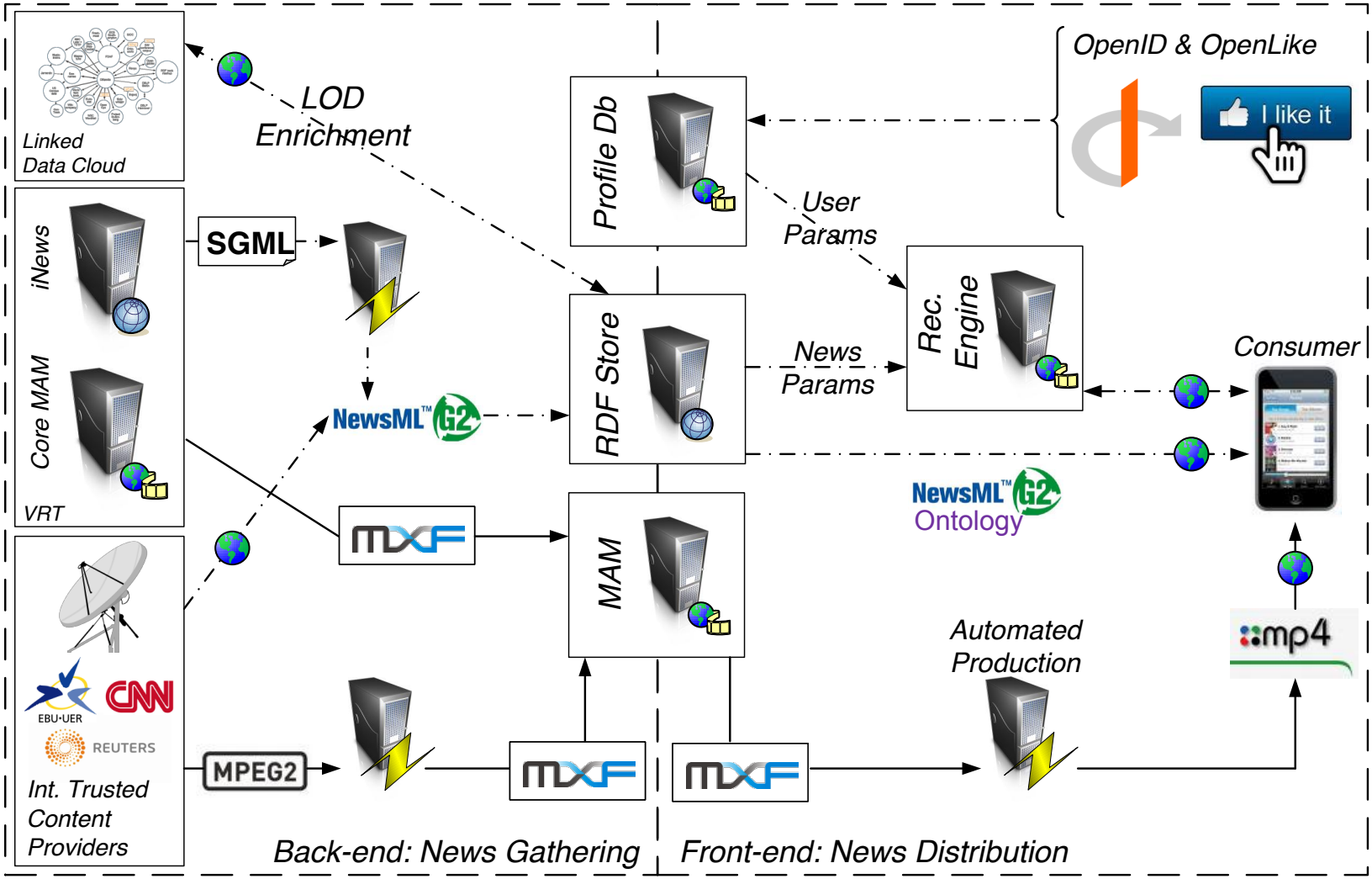
- **Goal**: Predict user's appreciation = Predict user's rating behaviour
- **Idea**: based on the available metadata
  - Profile: +/- Tag clouds
  - Feedback: star-rating mechanism (expl.) & click behaviour/viewing times (impl.)

Recommendation : Hybrid Approach (CB & CF)

- CB recommendations analyze user preferences for known characteristics of data items.
  - e.g. Erik likes sports items about NBA
- CB allows dealing with new items (solves the cold start problem)
- CB allows for deeper explanations
  - e.g. We recommend you this item because you like NBA sports
- Hidden item characteristics that drive human preferences are hard to define within CB (opposed to CF)
- CB requires extensive data gathering (opposed to CF)

- Our Hybrid Systems (Best-of-both-worlds):
  - Sequential combination: First 'Content-Based', then 'Collaborative Filtering'

Global Architecture



Conclusions

- **News-ML** as unifying (meta)datamodel
  - Data communication interface within E2E news distribution architecture & workflow engine for aggregation, categorisation, enrichment, profiling, recommendation, and distribution

- Provided (inter)national (news) community with mechanisms to describe/exchange news event/profile info in a standardised way
  - Generic data portability of user profiles
  - Generate recommendations based on such **a Global Profile**
  - Implemented with **open standards** like OpenID, OAuth, and OpenLike

- Tool to automatically recommend (developing) news stories 1-to-1 to the targeted customer for the first time

erik.mannens@ugent.be