



NoTube project overview

- Research



Institut für Rundfunktechnik **IRT**

- Broadcast & Telecommunication



- Industry



Stoneroos
Interactieve Televisie



ontotext
Semantic Technology Lab

- Dissemination & Training



This talk

- Project slogans
- Architecture
- Demonstrators: one example





PROJECT SLOGANS

“Putting the user back in the driver’s seat”



- Personalized services are now common
- But: user data is still under control of separate applications
- Result: user is faced with multitude of distributed personal data, hidden in tons of inaccessible cookies

“TV is not bound to the device”



- Multiple device scenarios
 - use of computer as TV & vice versa
 - use of mobile device as remote control

→ Architecture should support device independence

“Integration of TV & Web with help of semantics”



- Integration of Web & TV is becoming a fact
- Many practical software and hardware hurdles for users to handle this integration
- Using semantics (linked open data) to open and interlink TV content in a Web fashion

Open standards



- Focus on standards used by public broadcasters
- Combined use of Web & TV standards
- Where required: partial alignment of Web and TV standards

Out of scope

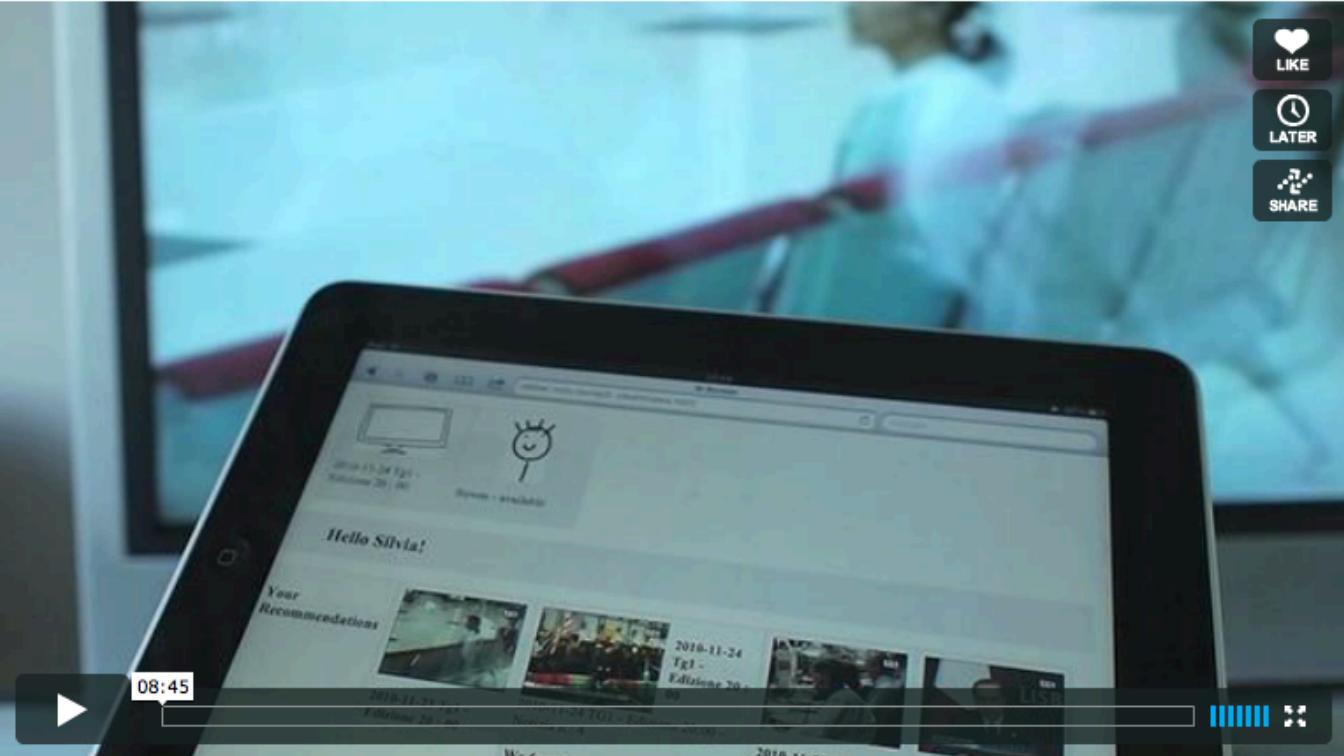


- Content access issues
 - e.g geo-restrictions on BBC content
- TV content-analysis research
 - video analysis
 - audio analysis
- EPG metadata access issues
- Privacy legislation

First demonstrator



vimeo [Join](#) [Log In](#) [Create](#) [Watch](#) [Upload](#)



NoTube's approach to TV recommendations



ARCHITECTURE

Building blocks: TV metadata services



- EPG metadata grabbers
 - from 170+ channels
- Issues
 - Web representation: e.g. channel URLs
 - metadata format → TV Anytime
 - real-time service

Aside: Open Graph Protocol & RDFa



Using Objects
Using Actions
Open Graph
Permissions
Built-in Object
Types
Built-in Action
Types
Built-in Like
Simple Types
Complex Types
Explicit Sharing
Location Tagging
Mention Tagging
Open Graph
Follows
Publishing Past
Actions

 Guus Schreiber |

```
<html xmlns="http://www.w3.org/1999/xhtml"
      xmlns:og="http://ogp.me/ns#"
      xmlns:fb="http://www.facebook.com/2008/fbml">
  <head>
    <title>The Rock (1996)</title>
    <meta property="og:title" content="The Rock"/>
    <meta property="og:type" content="movie"/>
    <meta property="og:url" content="http://www.imdb.com/title/tt0117500/"/>
    <meta property="og:image" content="http://ia.media-imdb.com/rock.jpg"/>
    <meta property="og:site_name" content="IMDb"/>
    <meta property="fb:admins" content="USER_ID"/>
    <meta property="og:description"
          content="A group of U.S. Marines, under command of
          a renegade general, take over Alcatraz and
          threaten San Francisco Bay with biological
          weapons."/>
    ...
  </head>
  ...
</html>
```

Building blocks: metadata enrichment



- Making semantics in metadata explicit
 - e.g. channel name → channel URI
- Add links to external Web vocabularies and repositories

Building blocks: user activity streams



- Standard for activity stream representation
 - based on Open Social
- Access services to activity streams
 - YouTube, Twitter,
- Challenge
 - trusted access to “friend” information
 - implementation of OAuth 2.0 standard

Atom Activity Stream Model

sample “verbs”



create	Indicates that the actor has created the object.
delete	Indicates that the actor has deleted the object. This implies, but does not require, the permanent destruction of the object.
deliver	Indicates that the actor has delivered the object. For example, delivering a package.
deny	Indicates that the actor has denied the object. For example, a manager may deny a travel request.
disagree	Indicates that the actor disagrees with the object.
dislike	Indicates that the actor dislikes the object. Note that the "dislike" verb is distinct from the "unlike" verb which assumes that the object had been previously "liked".
experience	Indicates that the actor has experienced the object in some manner. Note that, depending on the specific object types used for both the actor and object, the meaning of this verb can overlap that of the "consume" and "play" verbs. For instance, a person might "experience" a movie; or "play" the movie; or "consume" the movie. The "experience" verb can be considered a more generic form of other more specific verbs as "consume", "play", "watch", "listen", and "read"
favorite	Indicates that the actor marked the object as an item of special interest.

Building blocks: user profiling



- Services for generating user preferences
 - “Beancounter”
 - abstractions from activity stream
- User-model representation based on FOAF

BEANCOUNTER

aggregating user information



BEANCOUNTER
Personalise your TV recommendations based on what you do and say on the web

INTERESTS ANALYTICS ACTIVITIES

24 **COMEDY** **365** **76%**

Television hours this week
Is your favourite genre of all time
Programmes watched since 12 July 2009
Of your TV hours are at night

FAVOURITE PROGRAMMES

Programme	Percentage
The Wire	~35%
Top Gear	~15%
Little Britain	~20%
Have I Got News For You	~20%

WHEN YOU WATCH OR LISTEN

Time	Percentage
6-12 am	~15%
12-6 pm	~20%
6-9 pm	~30%
9-12 pm	~35%

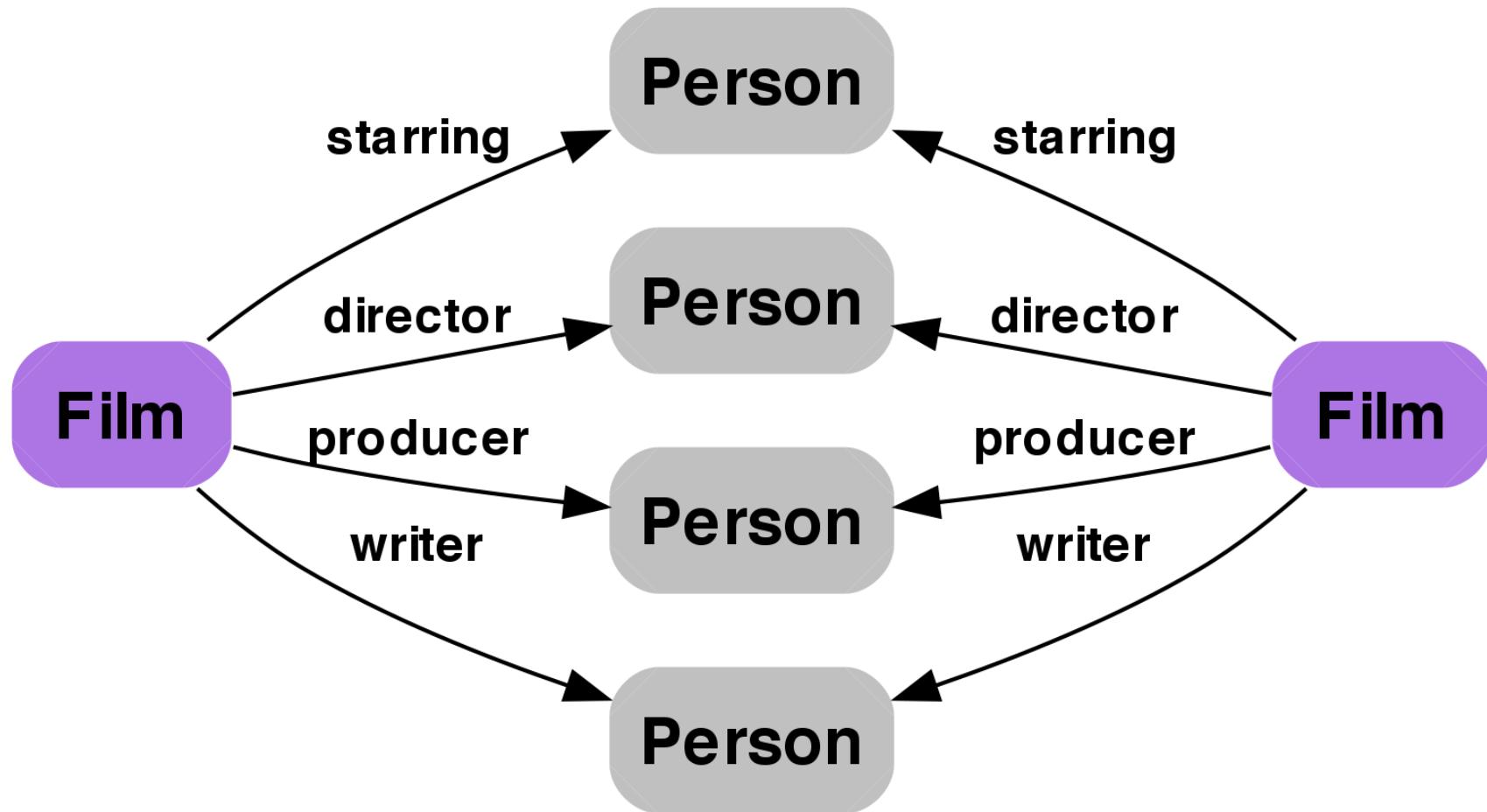
YOUR TOP ACTOR
JASON STATHAM
In 56% of the movies you've watched since 13 August 2009

Building blocks: Recommenders



- Collaborative recommenders
 - preferences of friends
- Content-based recommenders
 - program about Alma Mahler => program about Walter Gropius
- Experiment with mix of these recommenders

Content recommendations: the role of patterns



Pattern occurrences in BBC dataset



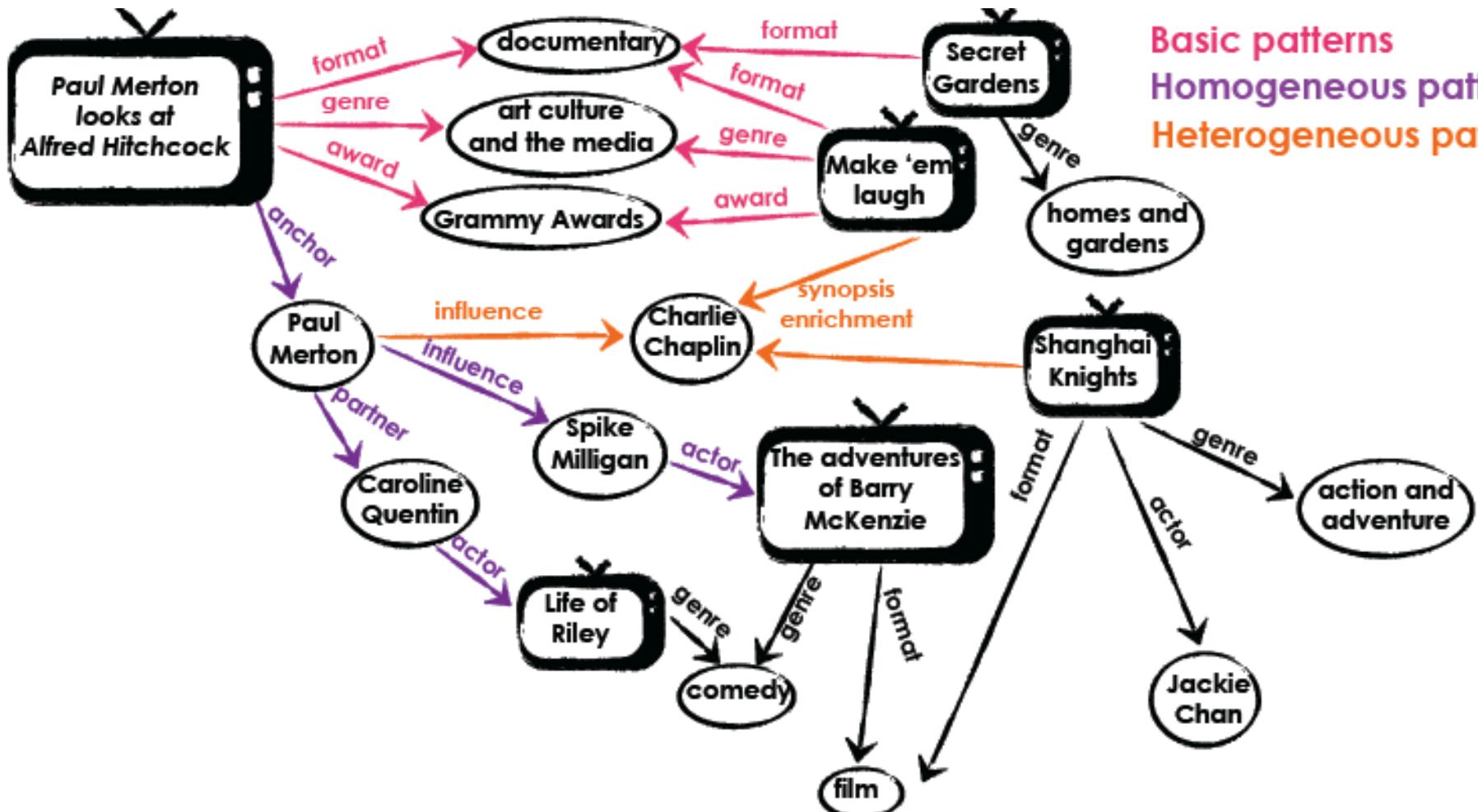
Dataset	Enriched BBC
#triples	240,630
#props	41
#types	17,029



Type	Pattern	#
People	person - co_participation - person	62162
People	person - actor - person	24843
Format	program - has_format - format	13108
Genre	program - has_genre - genre	12767
People	person - influencedBy - person	10053
People	person - partner - person	10053
Award	program - award_won - award	782

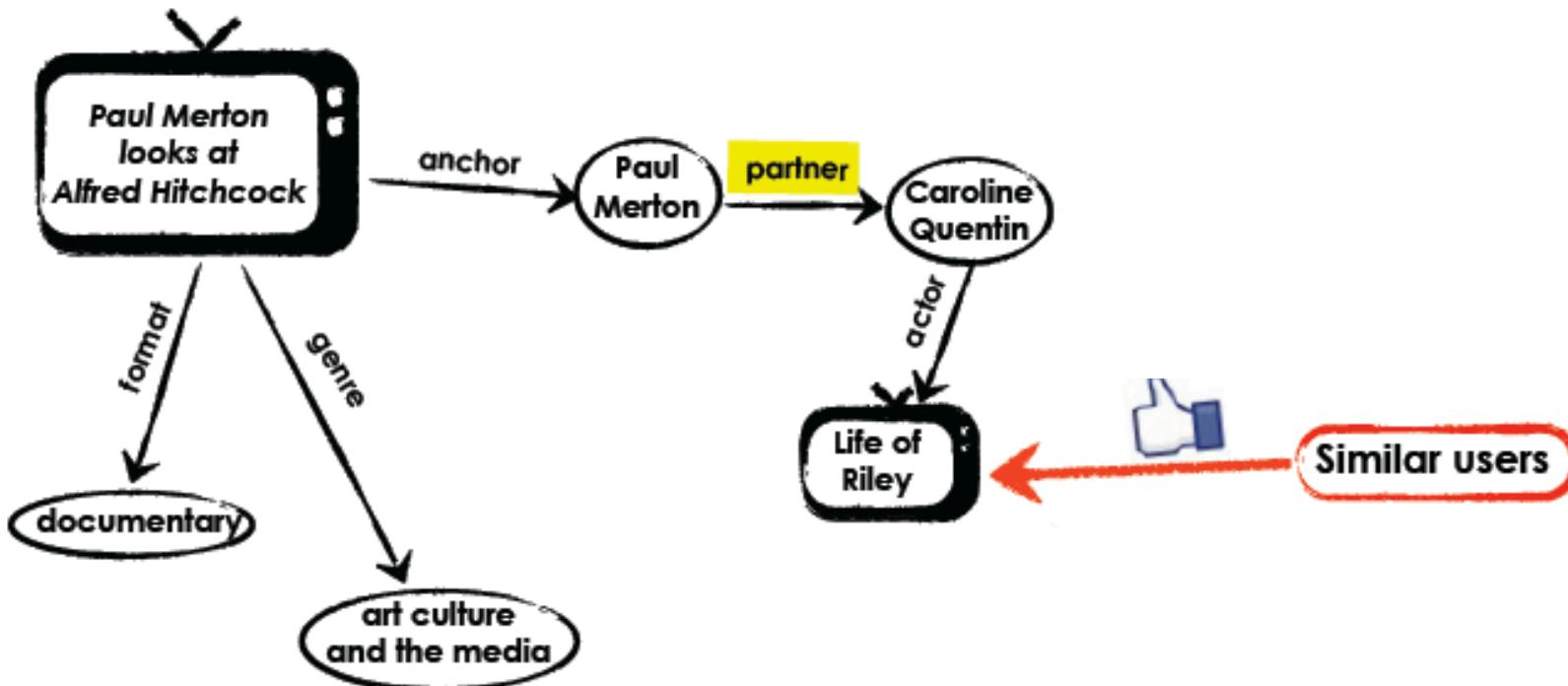


Pattern examples

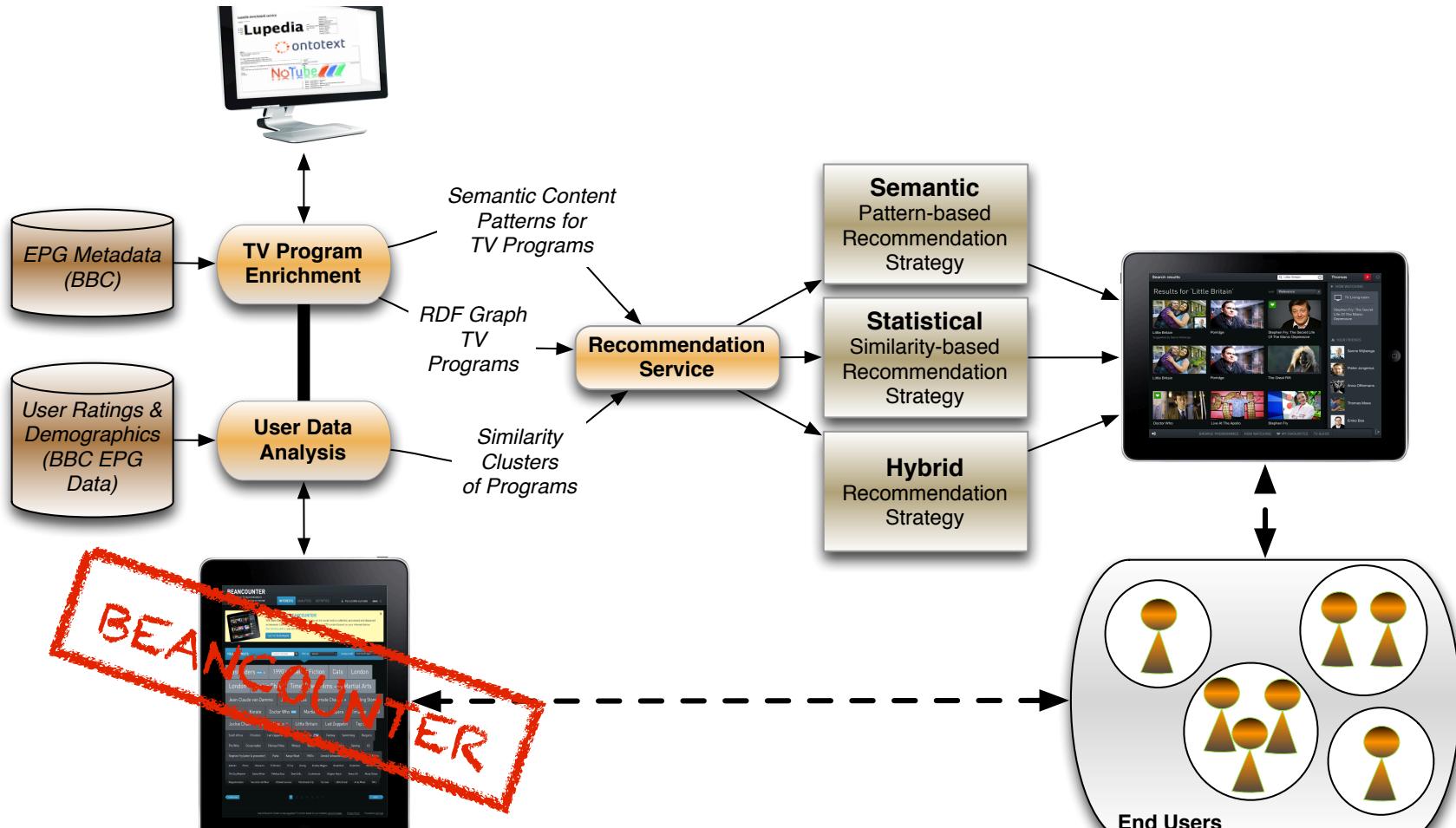




Hybrid recommendations



Architecture





SAMPLE DEMONSTRATOR

N-Screen demonstrator



BBC one
Live: BBC London News

BBC TWO
Live: Animal 24:7

BBC NEWS
Live: BBC News

BBC iPlayer
iPlayer catchup

TED
TED Talks

BBC
BBC Archive

Second Screen Annotations

My TV

Nothing currently playing

SHARE WITH

Group #notube

libby

danbri



Suggestions for you

SUGGESTIONS FOR YOU [View All](#)



Idea of personalised suggestions based on things you've done in the past was universally liked

SHARED BY FRIENDS [View All](#)



RECENTLY VIEWED [View All](#)



NOW WATCHING

 **Shared TV**

Nothing currently playing

YOUR FRIENDS

 **Group**

 **Tom**

 **Liz**

Drag-and-drop real-time sharing



SUGGESTIONS FOR YOU [View All](#)

People didn't realise programmes were draggable initially

EastEnders: 06/12/2011
Recommended because you watched *EastEnders: Omnibus* which also has Ace Bhatti in it

DIY SOS: The Big Build - Chippenham
Recommended because you watched *That's Britain!* which also has Nick Knowles in it

Come Fly With Me: Episode 6
Recommended because you watched *Come Fly With Me* which also has Judi Dench in it

Come Fly With Me: Episode 6
Recommended because you watched *Come Fly With Me* which also has Judi Dench in it

NOW WATCHING

Shared TV
Nothing currently playing

SHARED BY FRIENDS [View All](#)

Picking up an item can be tricky: it's easy to select an item by mistake, opening an overlay instead

RECENTLY VIEWED [View All](#)

Target for dropping is too small, most people had to make a couple of attempts before they managed to share something successfully

YOUR FRIENDS

Group

DIY SOS: The Big Build - Chippenham
Recommended because you watched *That's Britain!* which also has Nick Knowles in it

Liz

Tom

Most people thought the **drag and drop** made the app simple, fun and easy to use - once they realised they could do it and got the hang of it.

More information about a programme



DIY SOS: The Big Build - Chippenham

Nick Knowles and the team build an extension to help bring a brain injured son home.

Recommended because you watched That's Britain! which has Nick Knowles in it

[Sharable Link](#)

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Changing the TV using drag and drop



SUGGESTIONS FOR YOU [View All](#)



EastEnders: 06/12/2011
Recommended because you watched *EastEnders* Omnibus which also has Ace Bhatti in it



DIY SOS: The Big Build - Chippenham
Recommended because you watched *That's Britain!* which also has Nick Knowles in it



Come Fly
Recommended because you watched *Come Fly With Me* which also has Judi Dench in it



Participants loved dragging and dropping to change their own TV, but were against the idea of changing someone else's TV remotely
QI XL: Series 1, Intelligence Shared with you by Tom



De 6
Panorama: The Truth About Supermarket Price Wars

SHARED BY FRIENDS [View All](#)



Panorama: The Truth About Supermarket Price Wars
Shared with the group by Tom



QI XL: Series 1, Intelligence Shared with you by Tom



DIY SOS: The Big Build - Chippenham Shared with the group by Amy

RECENTLY VIEWED [View All](#)



Panorama: The Truth About Supermarket Price Wars

YOUR FRIENDS



Group



Liz



Tom



Social TV survey



Some observations about Social TV



- People want to watch TV together. They like talking about TV
- People like others having watched the same thing as them, and older people miss the days when people were much more likely to have watched something they had.
- To get the social benefit they don't have to watch it at the same time as others but sometimes this is fun.