

Adaptive Hypermedia

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Overview

- **Adaptive Hypermedia**
 - Information Overload - filtering, sequencing, reinforcing
- **PTV - A Case Study**
 - Information Overload & Digital TV
 - The Electronic Programme Guide (EPG)
 - The Personalization Solution
 - Personalized EPGs (adaptive hypermedia)
 - Technology
 - Content-Based & Collaborative Strategies

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Adaptive Hypermedia

- **Information Overload**
 - Millions of pages on the WWW
 - Thousands of pages on www.auckland.ac.nz
 - Hundreds of pages on www.cs.auckland.ac.nz
 - Pages change frequently
- **Solution – different routes for different people**
 - Students (undergrad postgrad), staff (academic, general)
 - Static – you have to know which route to take
 - Communal – you must fit a definition of a group
 - Dictatorial – someone decides for you in advance

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Adaptive Hypermedia

- **Solution – intelligent adaptation**
 - Information needs are met dynamically at browse time
 - Will not see things twice (unless you need to)
 - Your experience level can be satisfied
 - Different information for different people

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PTV: Intelligent Personalized TV Guides

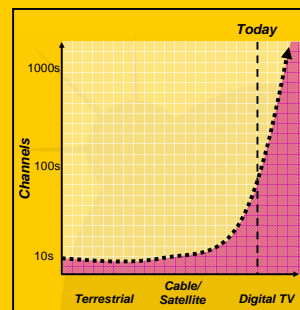
Barry Smyth
Smart Media Institute
University College Dublin
Ireland



Paul Cotter
ChangingWorlds
Belfield, Dublin 4
Ireland

The Digital TV Revolution

- **Information Overload**
 - Exponential channel growth.
- **User Implications**
 - Frustration!
 - Narrow focus.
 - Illusion of choice
- **Channel Implications**
 - Small channels invisible to users means reduced audience & revenue.



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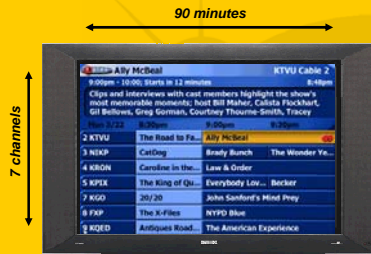
Electronic Programme Guides

- **Traditional TV Guides**

- The end of an era?

- **EPGs**


- Screen-based
- Category filters
- Interim solution

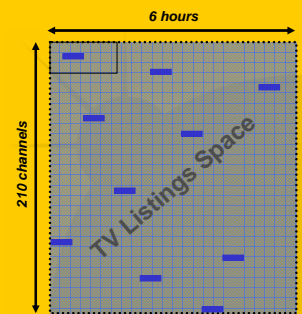


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Electronic Programme Guides

- **A Question of Scale?**

- Consider 210 channels over a 6 hour period.
- Average user interested in perhaps 10 programmes ().
- 120 screens of listings information!
- Over 24 hours ... 480 screens!
- 1 weeks viewing? Up to 3500 screens of listings.



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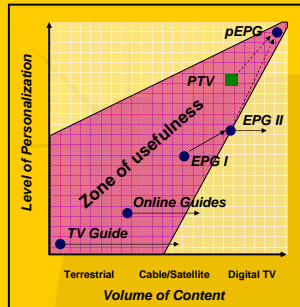
Electronic Programme Guides

- **The Solution**

- Personalize the EPG for the needs of the individual by learning about an individual's viewing preferences

- **Personalized EPGs (pEPG)**

- Scalable solution
- Adapts to user needs
- Democratisation of channels



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Personalised EPGs

- **Learning About Users**

- Channel, viewing time, programme, genre preferences...

- **Recommending Programme Content**

- Precision
- Recall
- Diversity

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Personalization Strategies

- **Content-Based Recommendation Techniques**

- Recommend TV shows that are *similar to shows* the user has liked in the past.

- **Collaborative Recommendation Techniques**

- Recommendations TV shows that *similar users* have liked in the past.

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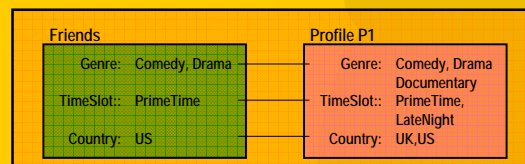
Content-Based Recommendation

- **Feature-Based**

- Requires feature-based description of content assets and user profile.
- Recommend *k* nearest content assets to the user profile.

- **Problems**

- Knowledge engineering
- Similarity sensitivity.
- Reduced diversity



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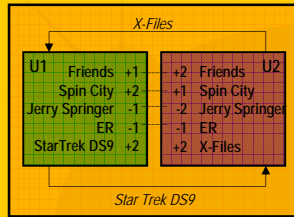
Collaborative Recommendation

- **Feature-Less**

- Profiles as graded content item histories (i.e., user rank shows)
- Similar users have similar grading histories.

- **Recommendations**

- Similar users act as recommendation partners.



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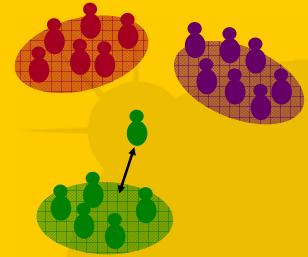
Collaborative Recommendation

- **Community-Based**

- Organise users into virtual communities with similar histories.
- Recommend items from the user's community.

- **Problems**

- Latency Problems (i.e., new shows take time to be recommended).
- Unusual users & one-off items.



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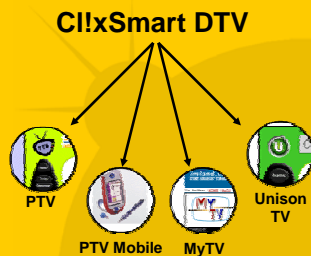
ClxSmart Personalization Engine

- **Hybrid Personalisation Engine**

- Content-based
- Collaborative

- **ClxSmart DTV**

- Toolkit for developing personalised TV services, including pEPGs.



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PTV Case Study

- **Personalised TV Portal**

- Personalised TV Guides
 - Today's and Tomorrow's TV
 - What's on Now and Next
 - Charts
- Personalised Advertising & eCommerce Services

- **The Launch**

- Launched 1999
- 20,000 Registered Users (3-5% of Irish Internet Population)

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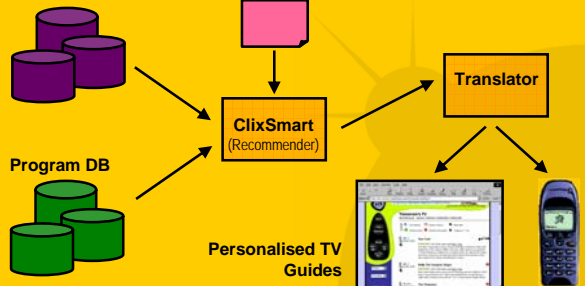
PTV Case Study

User Profiles

Schedules

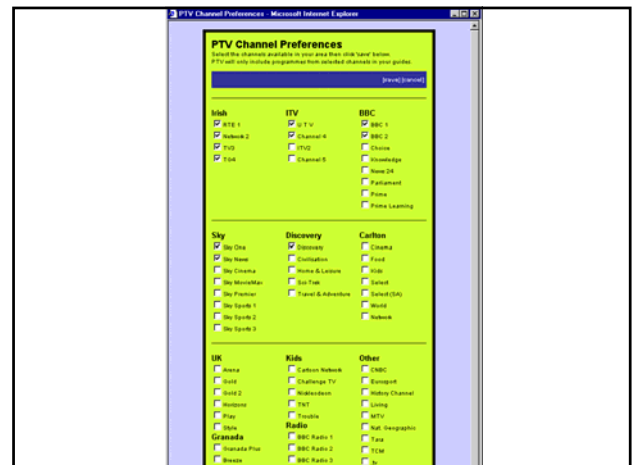
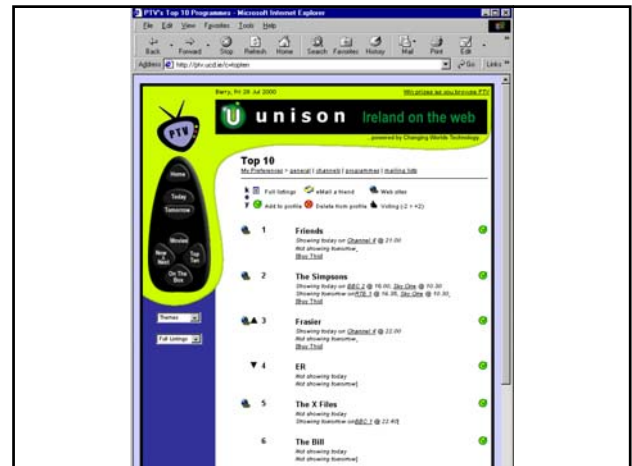
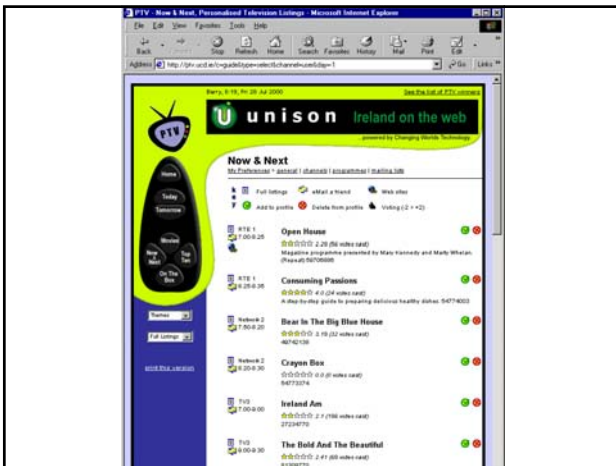
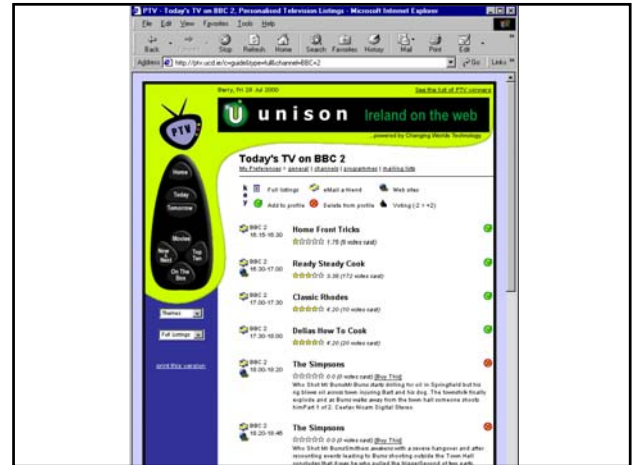
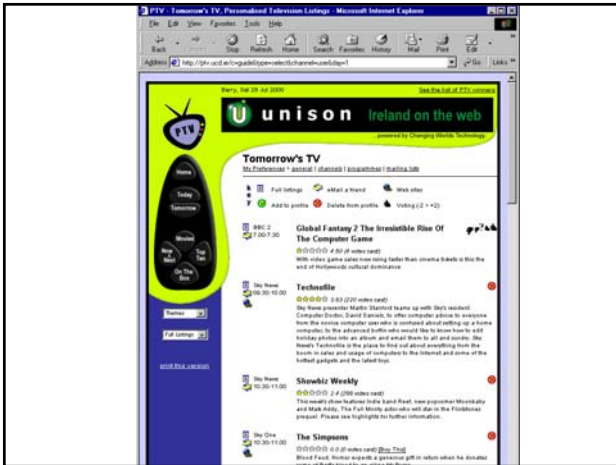
Program DB

Personalised TV Guides



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PTV on WAP

- WAP Internet Access
 - Screen Limitations
 - Memory Limitations
 - Speed Limitations

User Trials

- 500 users tested over 6 months ...

Guide Quality

Good	36%
Satisfactory	61%
Poor	3%

Ease of Use

Good	23%
Satisfactory	76%
Poor	1%

Speed

Good	36%
Satisfactory	52%
Poor	12%

Legend: Good (orange), Satisfactory (blue), Poor (white)

Conclusions

- Information Overload in the DTV Space
 - The need for personalized EPGs.
- CI!xSmart
 - Personalization Engine
 - DTV Toolkit
 - Reference Sites: PTV, PTV Mobile, MyTV, UnisonTV
- The Future
 - ChanginWorlds.com

