

Introduction

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Recommender Systems

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Acknowledgements

some slides from:

- Dietmar Jannach, Markus Zanker, Alexander Felfernig, Gerhard Friedrich. Recommender Systems: An Introduction

Where do you see recommendations?



We Have Recommendations for You

Sign in to see personalized recommendations

Customers who bought this item also bought



Ultimate Ears Power Up Charging Dock for BOOM 3, MEGABOOM 3, BLAST and MEGABLAST

★★★★☆ 15

\$39.99



LTGEM Case Compatible for Ultimate Ears UE Megaboom Wireless Bluetooth Speaker. Fits...

★★★★★ 203

\$12.99

What other items do customers buy after viewing this item?



Ultimate Ears MEGABOOM Charcoal Wireless Mobile Bluetooth Speaker Waterproof and Shockproof (2015)

★★★★☆ 1,086

\$102.99 ✓ prime



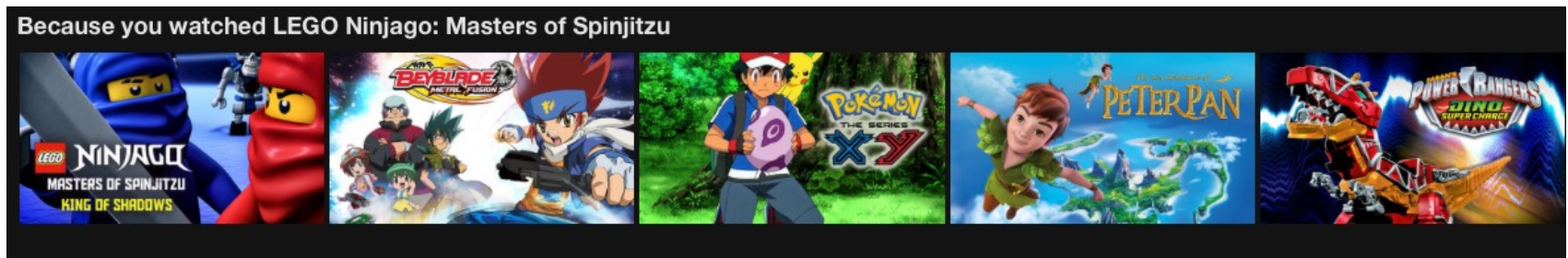
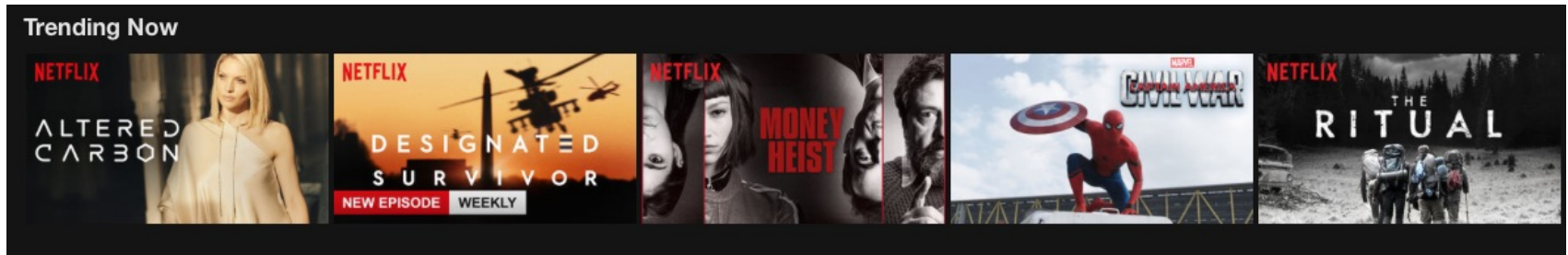
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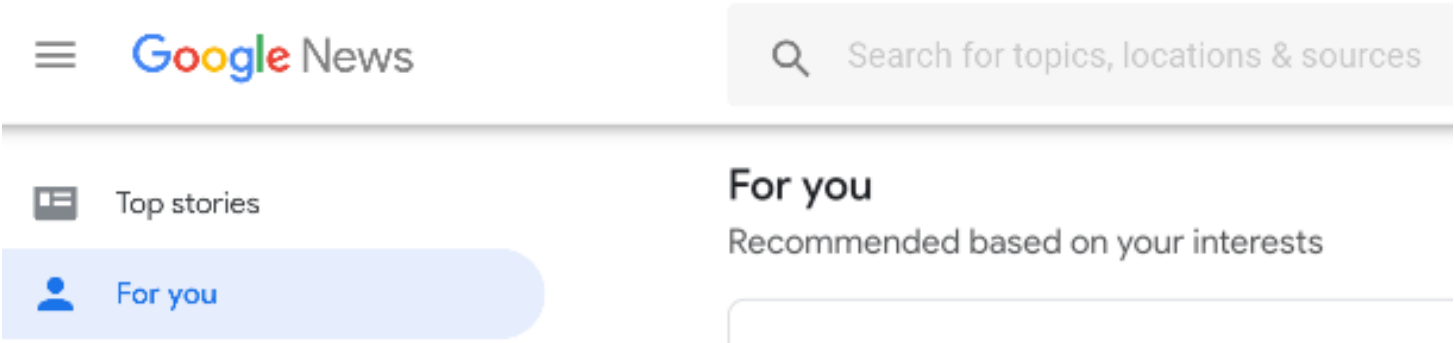
\$39.99 ✓ prime

Where do you see recommendations?

NETFLIX



Where do you see recommendations?

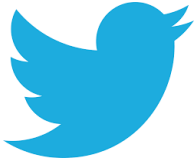


The screenshot shows the Google News homepage. At the top left is the Google News logo with a menu icon. To its right is a search bar with the placeholder text "Search for topics, locations & sources". Below the search bar, there are two navigation options: "Top stories" with a list icon and "For you" with a person icon. The "For you" option is highlighted with a light blue background. To the right of these options, the text "For you" is displayed in a larger font, followed by "Recommended based on your interests". Below this text is a horizontal line indicating the start of the recommendation feed.



Recommended for you

- People
- Groups
- Companies
- Hashtags



Who to follow · Refresh · View all

Followed by



Follow

Why use Recommender Systems?

- explosion of choice – information overload
- an increased number of options may lead to confusion
- exploratory search
- **recommender system** are **tools** that can **guide** you through a **decision process** (but not make the decision for you)



Why use Recommender Systems?

- benefits for the **receiver**/user/consumer/customer
 - Find things that are interesting
 - Narrow down the set of choices
 - Help explore the space of options
 - Discover new things
 - Entertainment
 - ...

only part of the picture

- how about the **system owner** of recommender systems?
- how about the **provider** of content/objects/items?

Why use Recommender Systems?

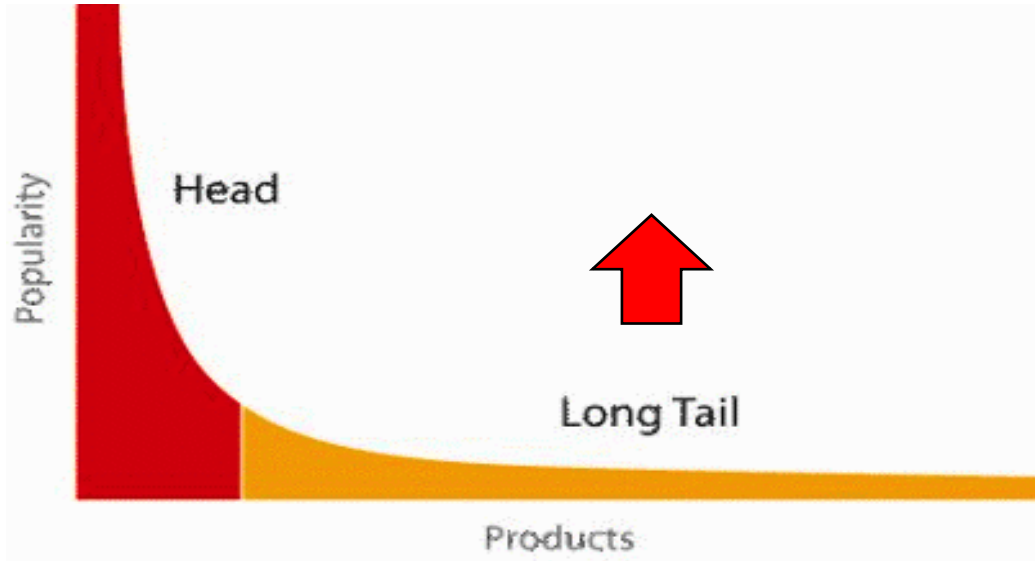
- benefits for the **system owner**
 - Personalized experience for the customer
 - Increase trust and loyalty
 - Increase sales, click through rates, conversion etc.
 - Opportunities for promotion, persuasion
 - Obtain more knowledge about customers
 - ...

Why use Recommender Systems?

- remember Netflix before it was a verb
- before streaming business, they were renting DVDs via mail
- what do people want to watch?
 - the newest, **most popular**, just released movies
- is this business model sustainable?
 - can you afford renting out the most popular DVDs to everyone?
- new business model:
 - **generate demand** for the not-so-popular DVDs
 - learn what customers like to make appropriate recommendations

Why use Recommender Systems?

- popularity distributions have a long tail
- Pareto principle 80/20 rule: 80% of plays comes from 20% of items



recommenders can

- generate demand for the “long tail”
- lead to a more sustainable business model

Why use Recommender Systems?

- benefits for the **content providers**
 - Targeted exposure
 - Create brand awareness
 - Increase trust and loyalty
 - Increase sales, click through rates, conversion etc.

What is a Recommender System?

- recommender systems help match **users** with **items**

*Recommender systems are **software agents** that **elicit** the interests and **preferences** of individual consumers [...] and make recommendations accordingly. They have the potential to support and **improve** the **quality** of the **decisions** consumers make while searching for and selecting products online.*

[Xiao & Benbasat, MISQ, 2007]

Some Terminology

- **user** – the *receiver* of the recommendation process
- **item** – the *object* to be recommended
- **preference** (or taste, intention) of a user toward item(s)
- **recommender** – matches **users** with **items** based on **preferences**

Some Terminology

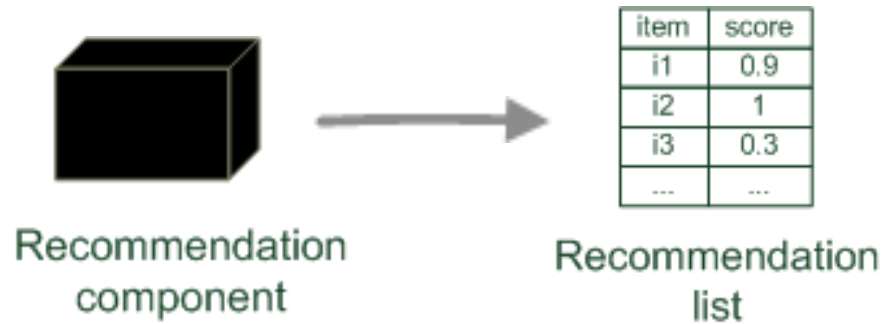
- **feedback** – contains information about the users' preferences to items
 - explicit feedback – **rating** (e.g., on a 5-star scale), review
 - implicit feedback – via user behavior observed by the system (like, view, click, purchase)
- **item content** – description of an item, e.g., via attributes, text
- **user profile** – information collected by the system describing the user and preferences; e.g.,
 - demographic data (country, city, age, gender, education, etc.)
 - preferences (towards items, item types, etc.)
 - feedback

Some Terminology

- **relevant item** – an item that matches the user's preferences
- a main task of a recommender is to **estimate** the (degree of) **relevance**, also called *utility*, of an item to a user
- **recommendation list** – a ranked list of items recommended to a user
 - usually (but not always!) sorted from most relevant to least

Types of Recommender Systems

- view of a recommender as a **black box** that
 - receives some **input**, and
 - produces a **recommendation list**
- **classification** based on what this input consists of



Types of Recommender Systems

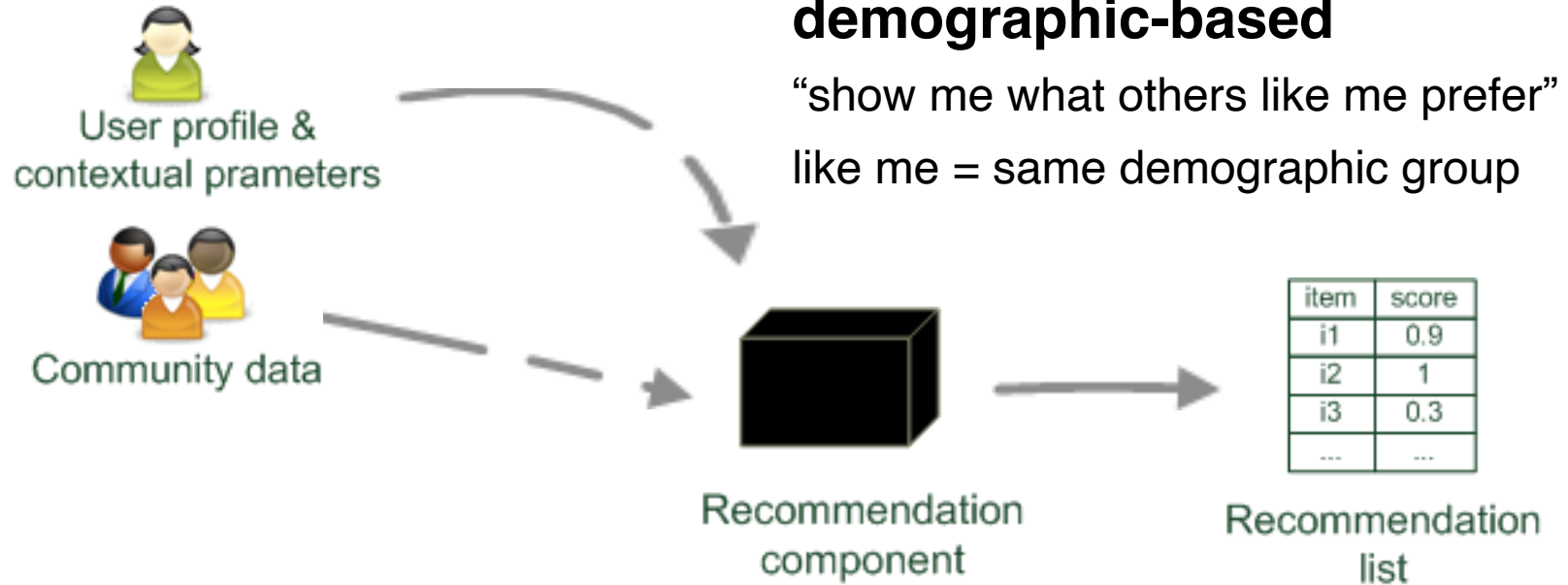
popularity-based

“show me what is popular”

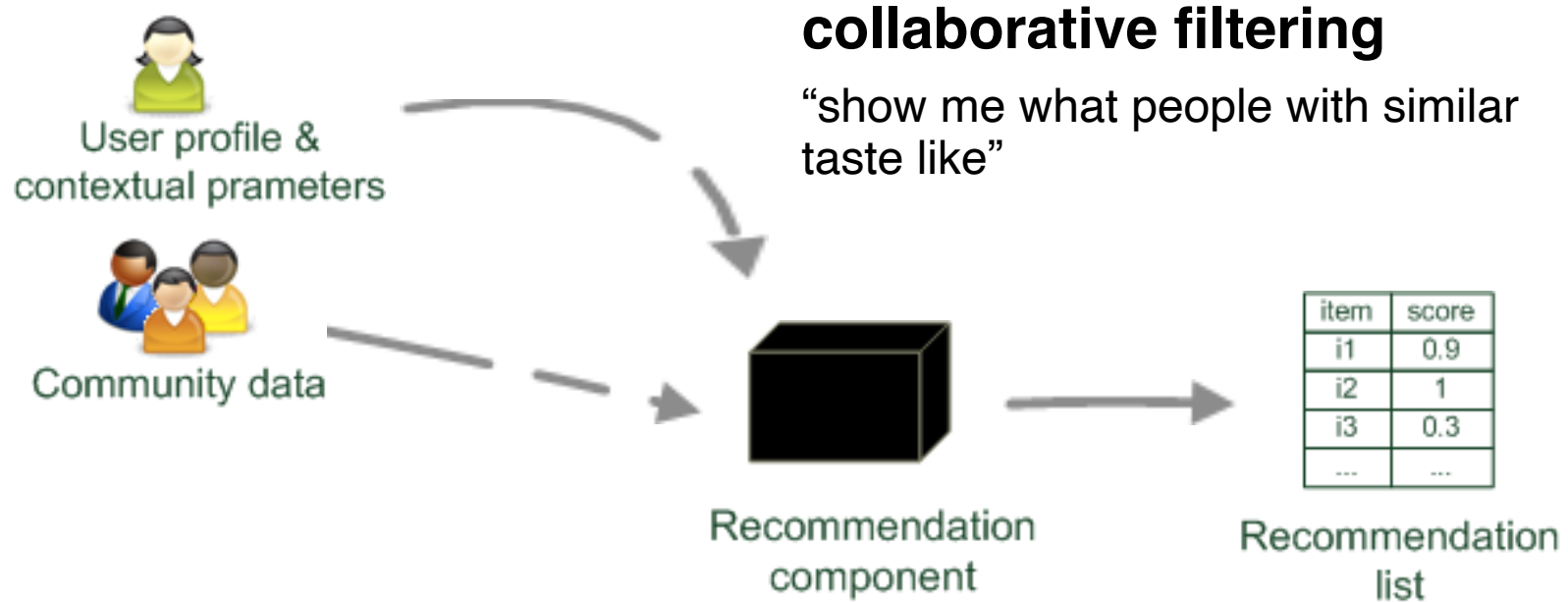
non-personalized recommendations



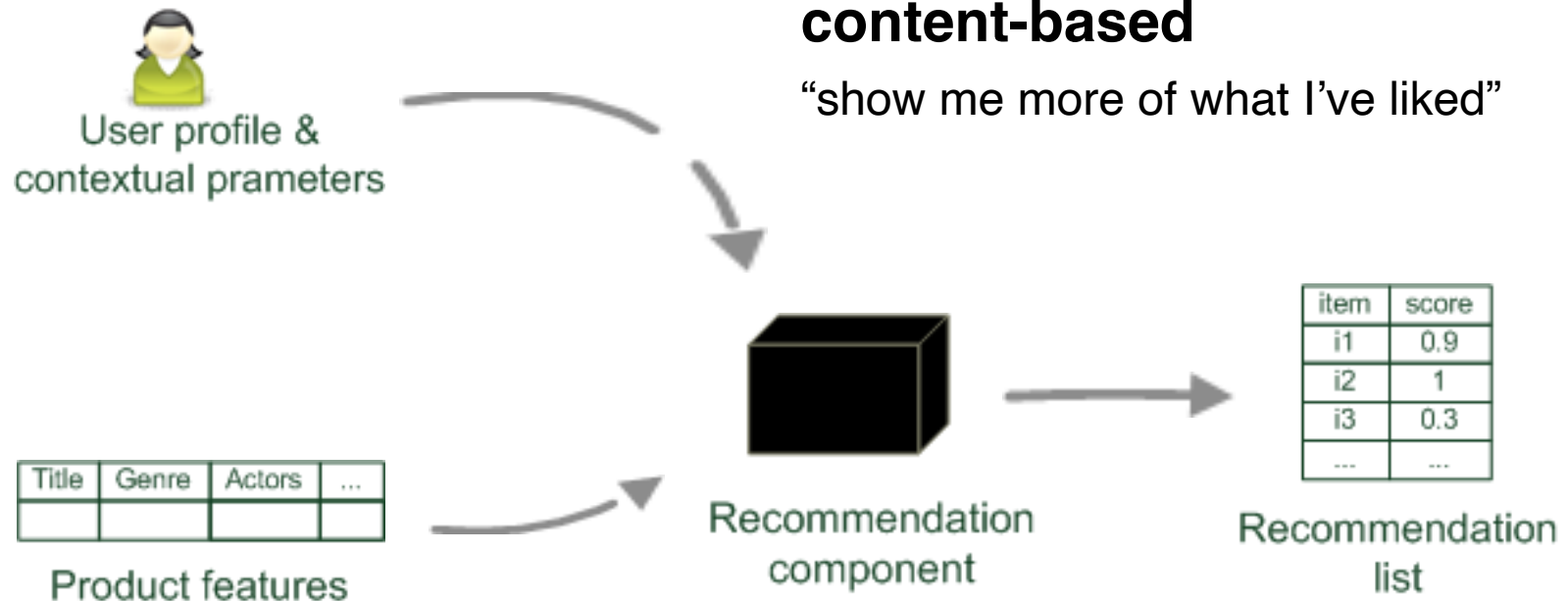
Types of Recommender Systems



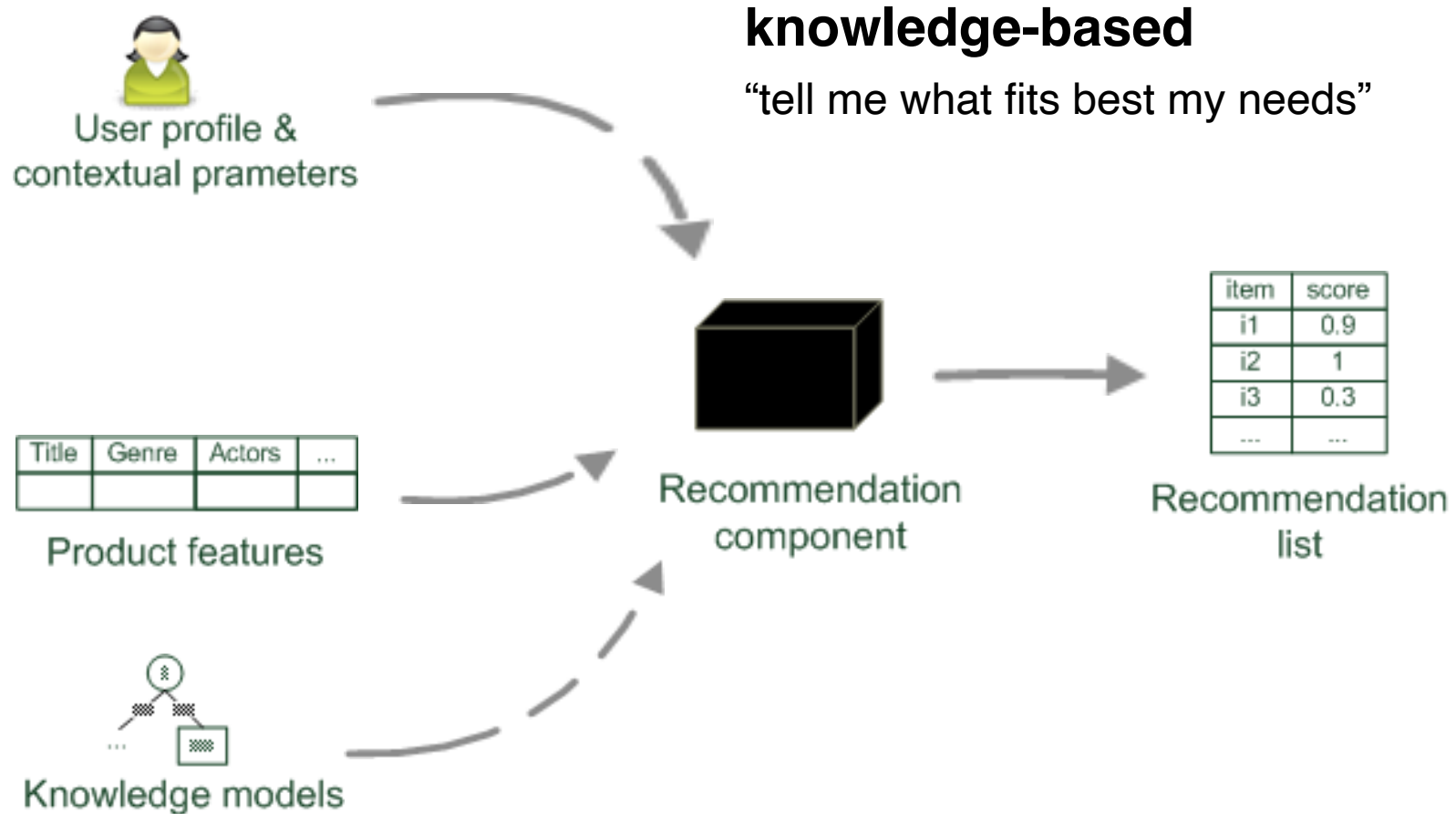
Types of Recommender Systems



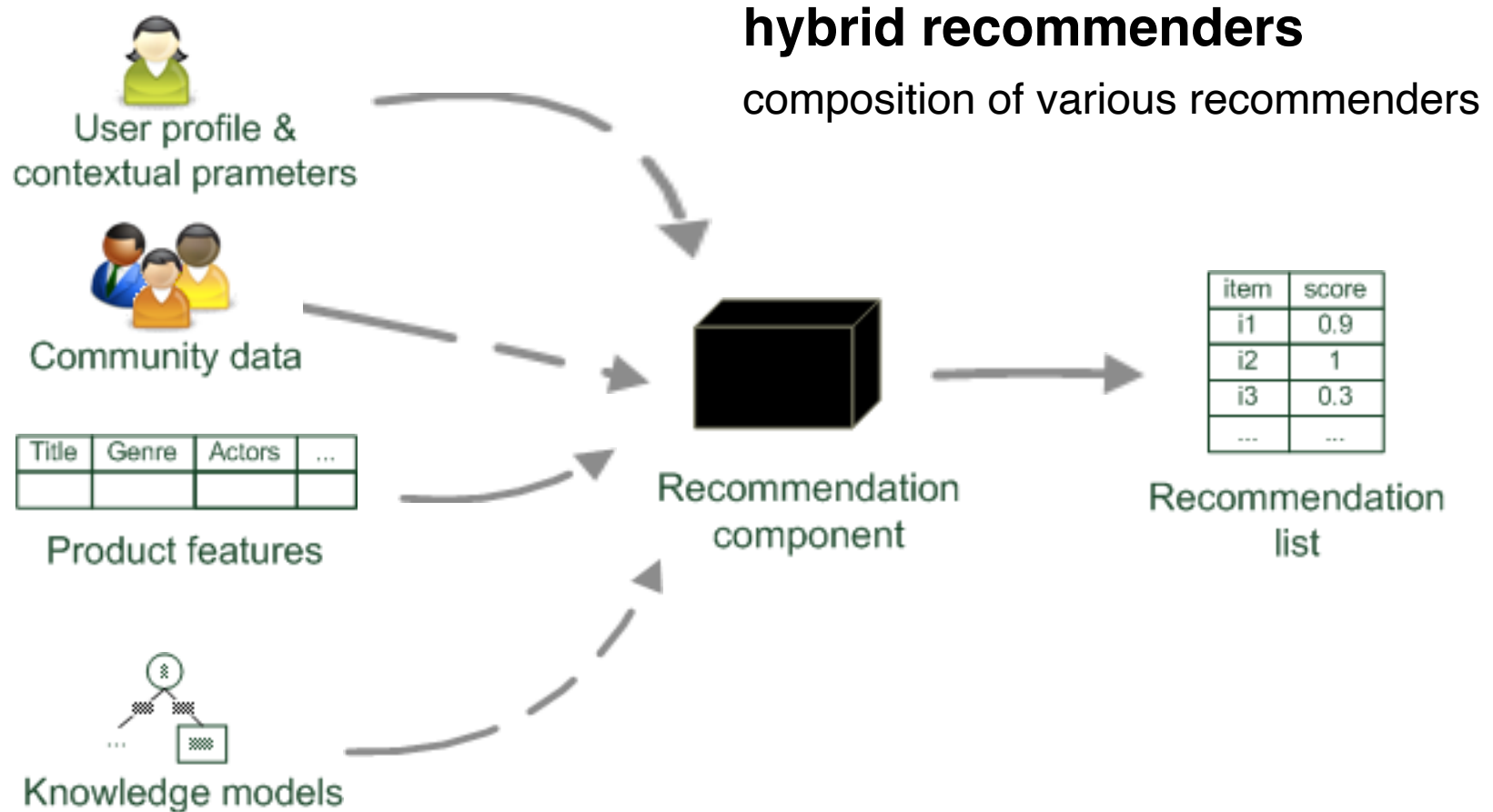
Types of Recommender Systems



Types of Recommender Systems



Types of Recommender Systems



Types of Recommender Systems

	Pros	Cons
Collaborative Filtering	No knowledge-engineering effort, serendipity of results, learns market segments	Requires some form of rating feedback, cold start for new users and new items
Content-based	No community required, comparison between items possible	Content descriptions necessary, cold start for new users, no surprises
Knowledge-based	Deterministic recommendations, assured quality, no cold-start, can resemble sales dialogue	Knowledge engineering effort to bootstrap, basically static, does not react to short-term trends