Inspectability & Control

Advanced Decision Support Systems

Inspectability & Control

Today I will answer the following questions:

- What is Grounded Theory?
- How do I do Grounded Theory research?*

Social recommenders

A unique opportunity for inspectability and control

Social recommenders

Recommenders are usually quite opaque

Hard to understand where recommendations are coming from

- May reduce trust in the system

Hard to control the recommendations through interaction

- May reduce usability of the system

What if recommendations are based on **friends** rather than strangers?

TasteWeights

The **TasteWeights** system uses the overlap between you and your friends' Facebook "likes" to give you music recommendations.

- Friends "weights" based on the overlap in likes w/ user
- Friends' other music likes—the ones that are not among the user's likes—are tallied by weight
- Top 10 is displayed to the user

Svetlin's music

- Queen
- Metallica
- U2
- Linkin Park
- Prodigy
- 311
- Pendulum
- Dream Theater

Friends

- Veselin Kostadinov
- Sharang Mugve
- Kamal Agarwal
- Zlatina Radeva
- Annie Todorova
- Dave Grant
- Ahsan Ashraf
- Anastasia Poliakova
- Plamen Dimitrov
- Chavdar Chenkov

Recommendations

- Guns N' Roses
- Nirvana
- Nickelback
- Moby
- System Of A Down
- Audioslave
- Depeche Mode
- Pearl Jam
- Aventura
- Killers

Nickelback

Nickelback is a Canadian rock band from Hanna, Alberta, formed in 1995. Founded by members Chad Kroeger, Mike Kroeger, Ryan Peake and then-dr...

More Info

Experiment

Turn this into separate steps of **control** and **inspection**

To be able to manipulate them orthogonally

Step 1: Log in to Facebook

System collects your music “likes”

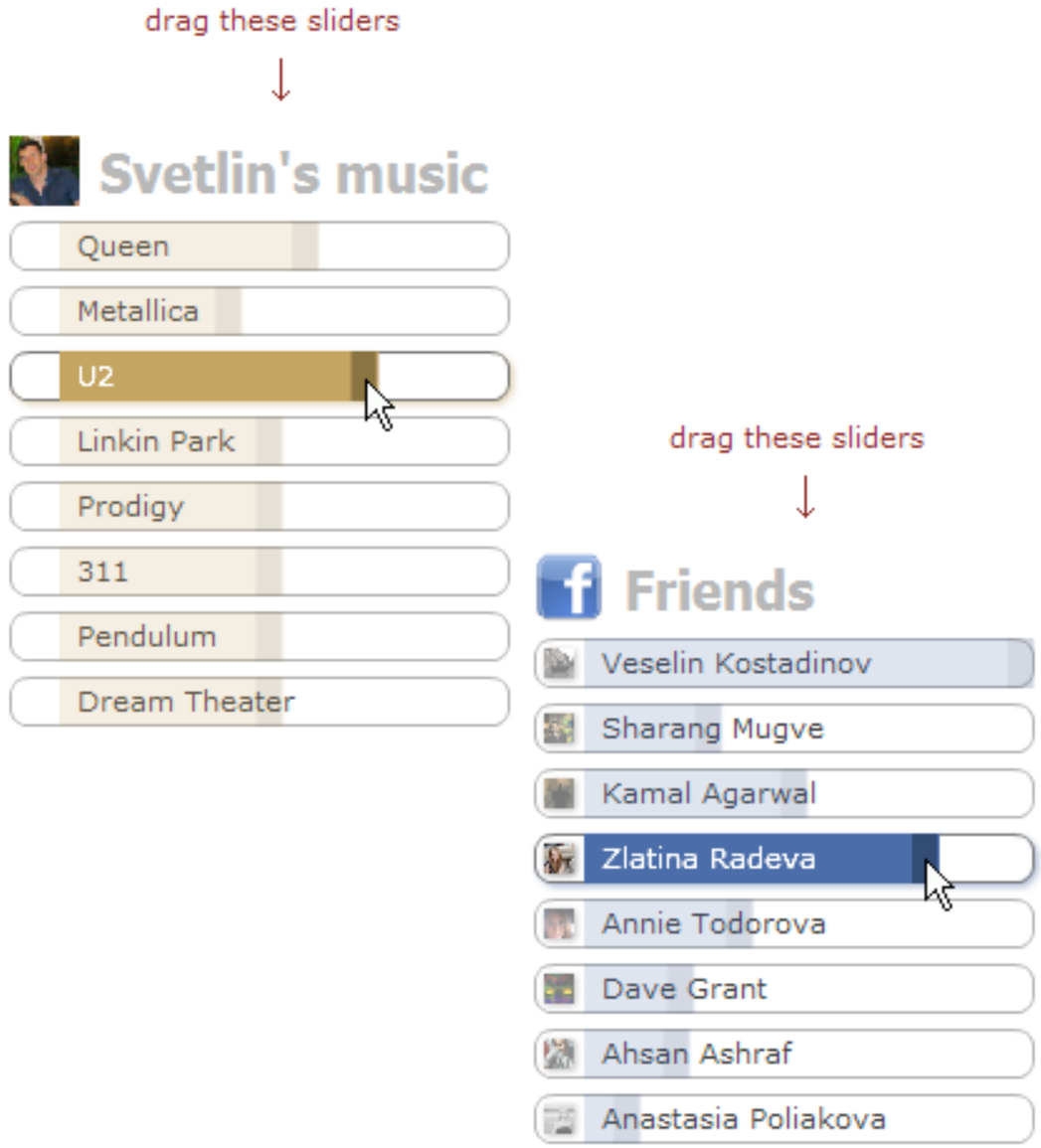
System collects your friends’ music likes

Experiment

Step 2: Control

3 conditions, between subjects:

- No control (just use likes)
- Item control (weigh likes)
- Friend control (weigh friends)

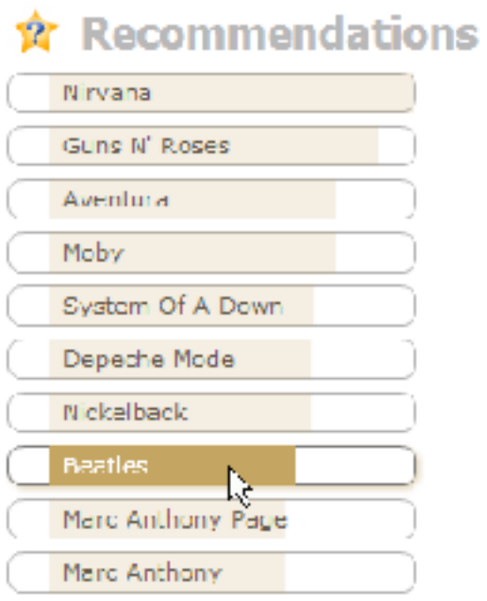


Experiment

Step 3: Inspection

2 conditions, between subjects:

- List of recommendations vs. recommendation graph



Measurements

Satisfaction with the system

Perceived quality of the recommendations

Perceived control over the system

Understandability of the system

User music expertise

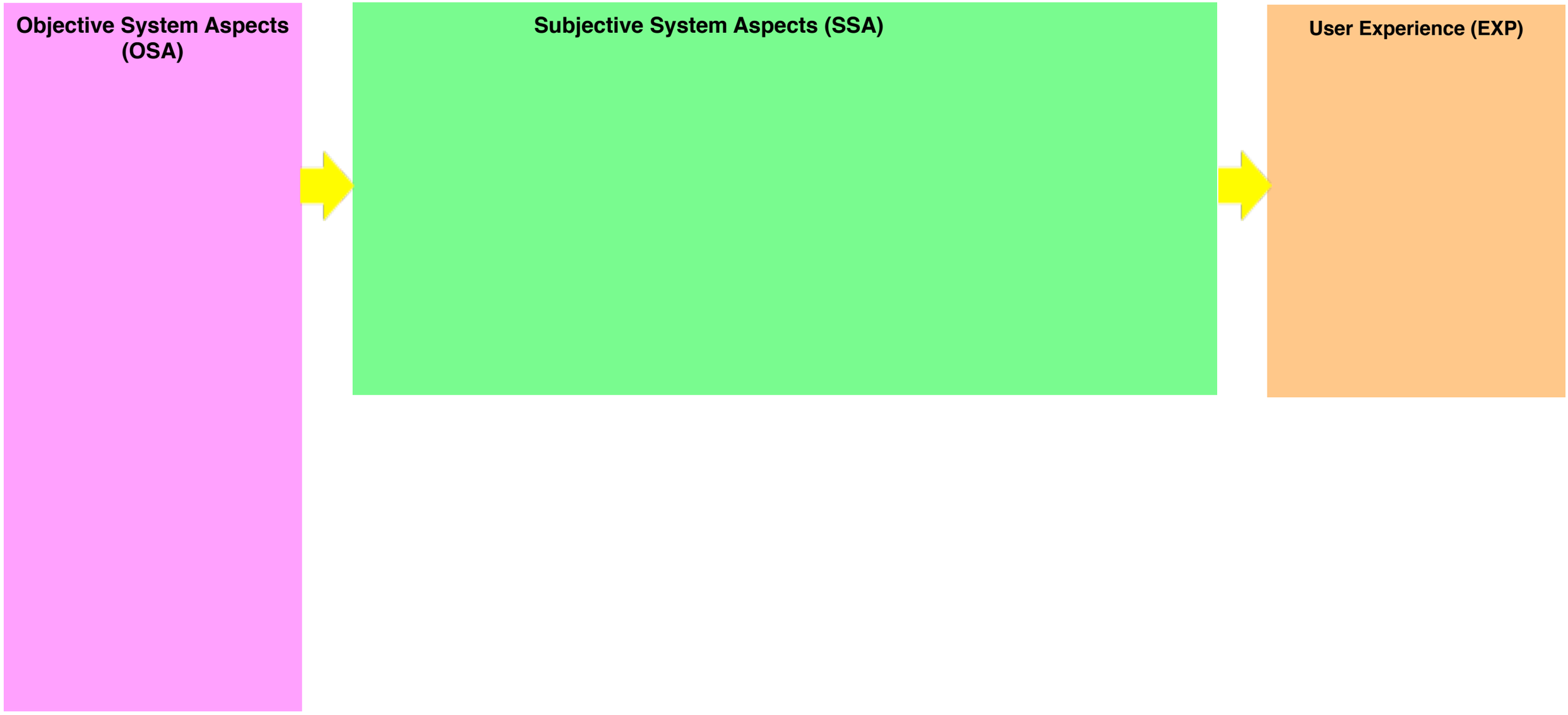
Propensity to trust

Familiarity with recommenders

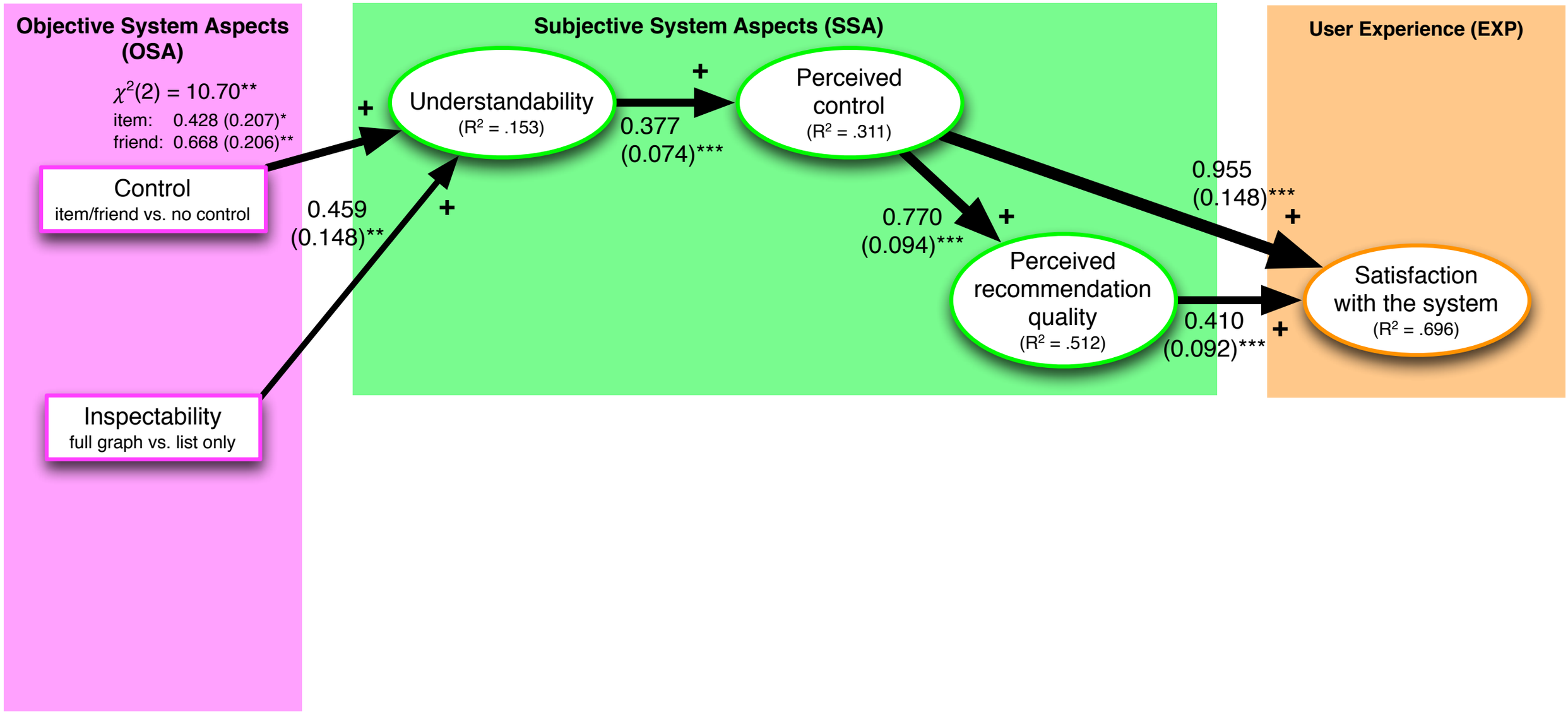
Avg. rating of, and # of known items in, the top 10

Time taken to inspect the recommendations

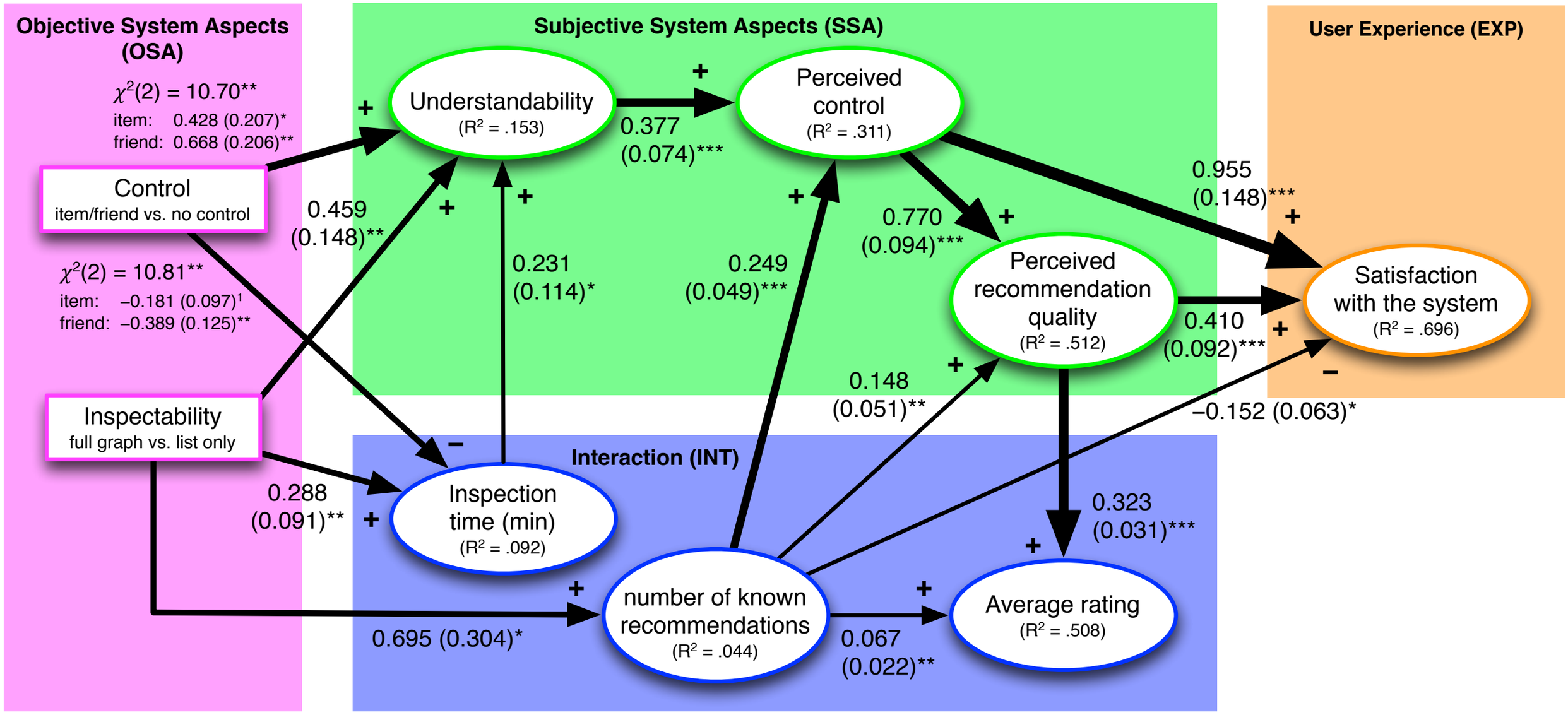
Structural model



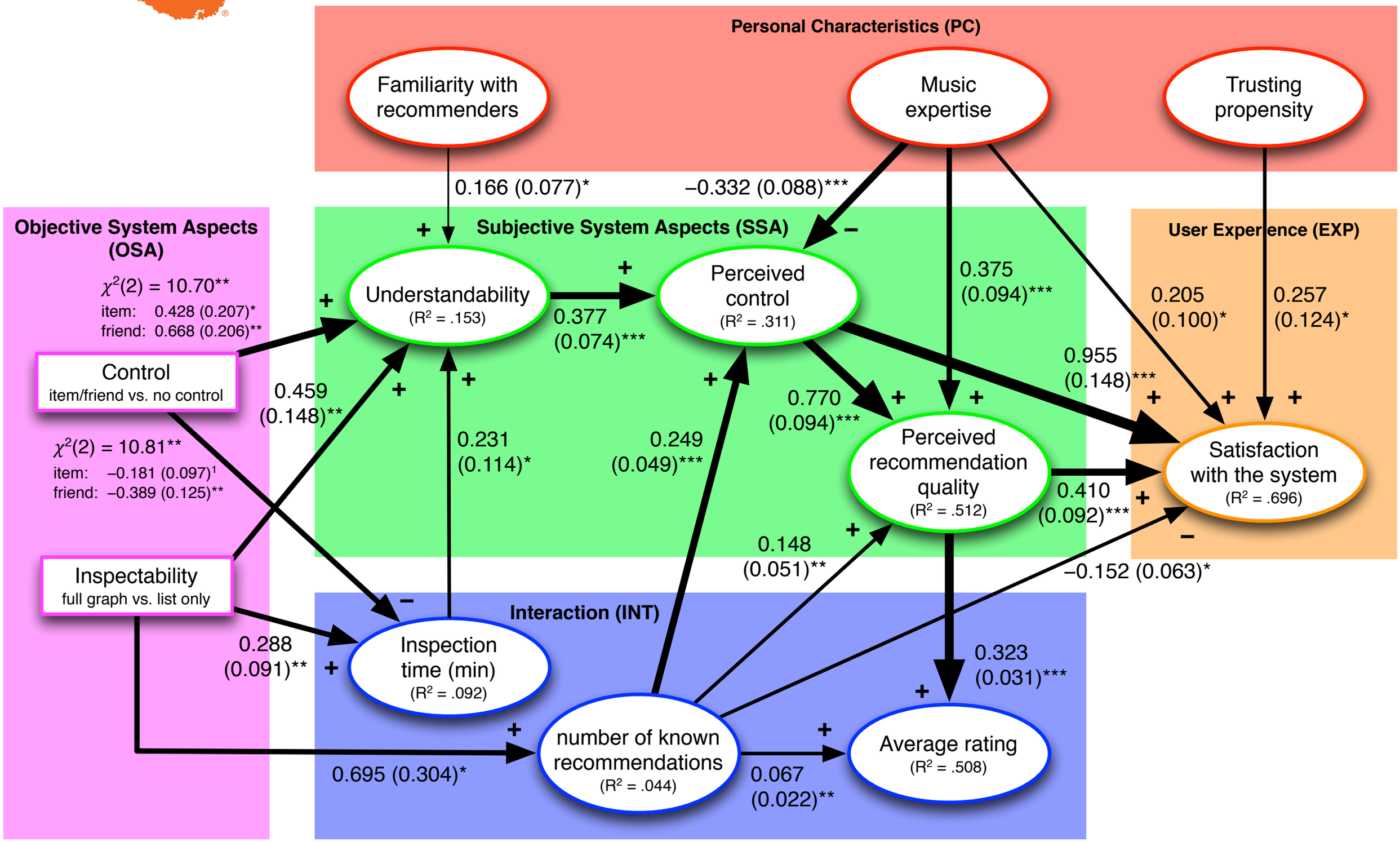
Structural model



Structural model



Structural model



More inspectability

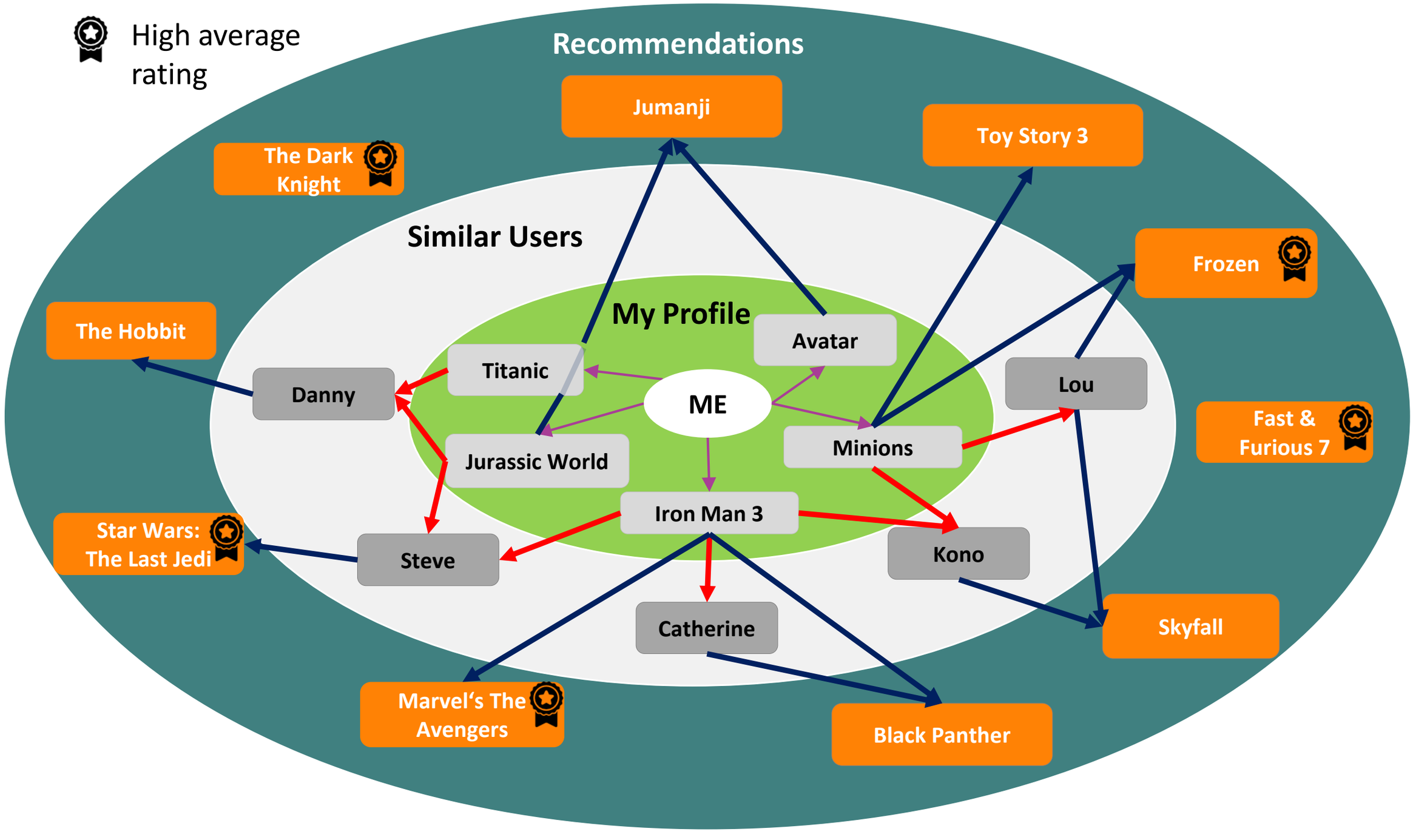
Ideas for presenting recommendations

More inspectability

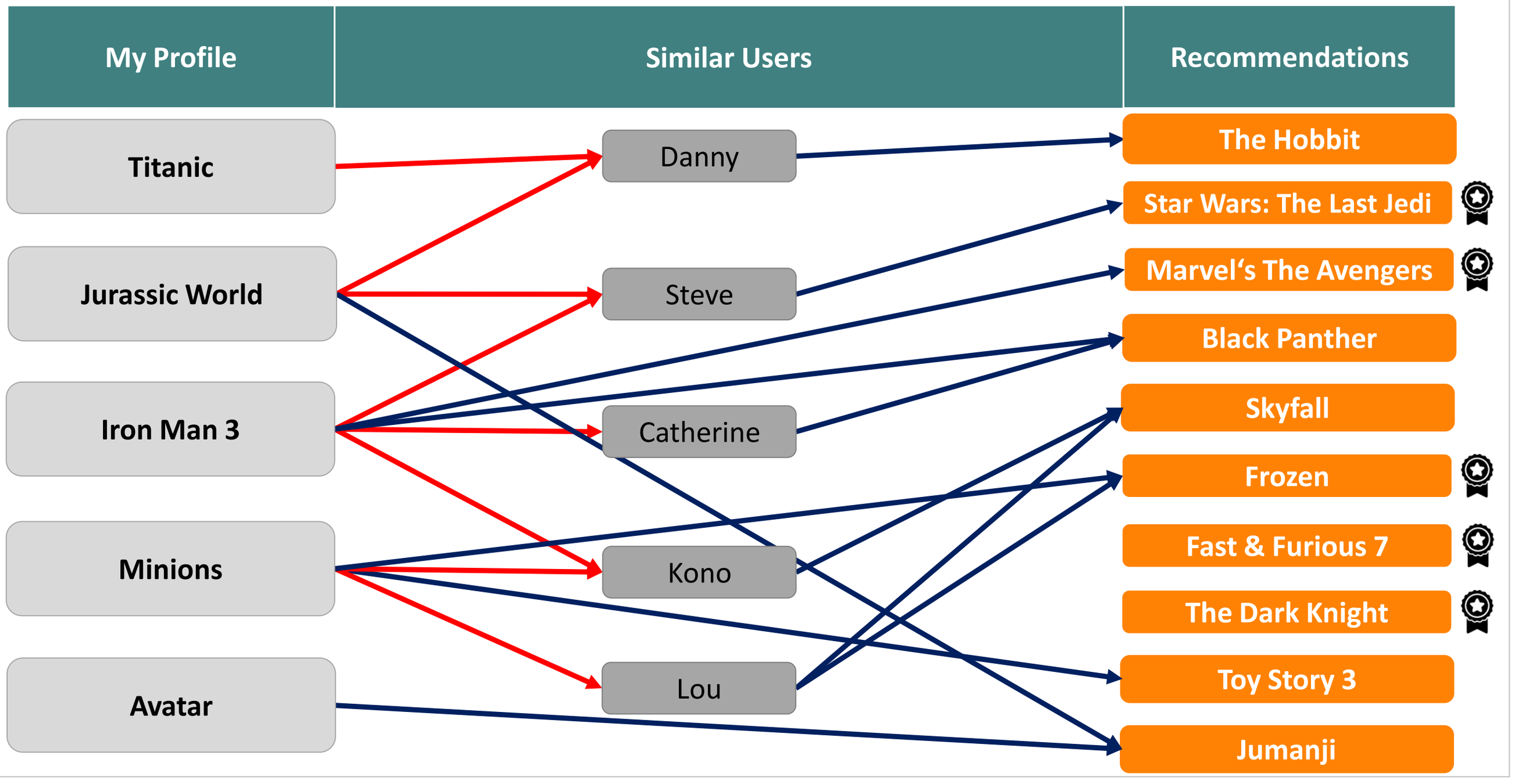
Imagine a recommender system with hybrid recommendations based on:

- Item-item CF
- Social connections (like TasteWeights)
- General Top-N

Is there an intuitive way to present the recommendations?


High average rating
Recommendations
Jumanji
Toy Story 3
The Dark Knight
Frozen
Similar Users
My Profile
The Hobbit
Avatar
Titanic
Danny
ME
Lou
Fast & Furious 7
Minions
Jurassic World
Iron Man 3
Star Wars: The Last Jedi
Steve
Kono
Catherine
Skyfall
Marvel's The Avengers
Black Panther

High average rating

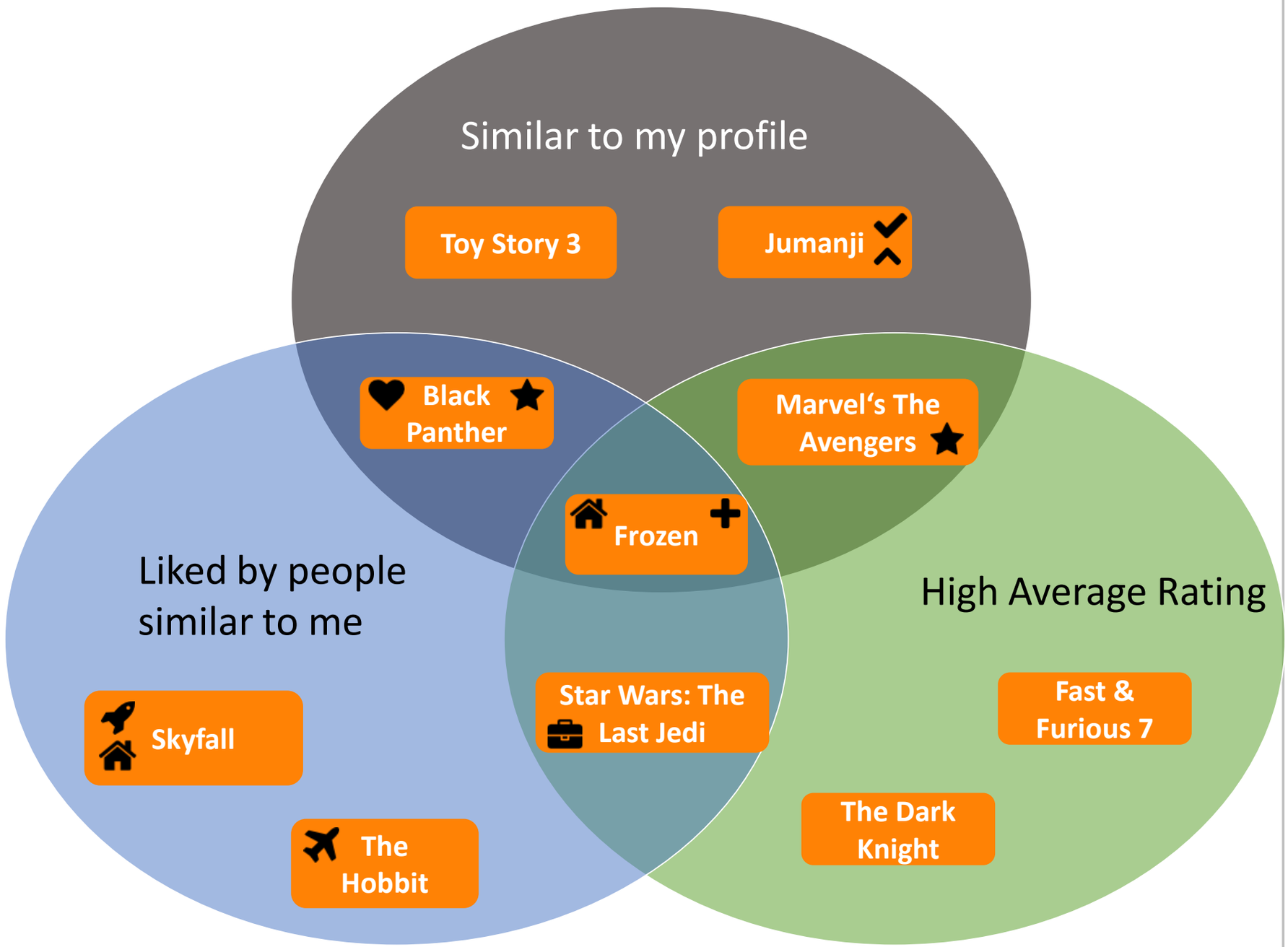


My Profile:

Titanic ○ | Avatar ✔ | Minions ✚ | Iron Man 3 ★ | Jurassic World ^

People Similar to Me:

Steve	Jurassic World Iron Man 3
Danny	Titanic Jurassic World
Kono	Minions Iron Man 3
Catherine	Iron Man 3
Lou	Minions



Marvel's The Avengers

Recommended because…
…it is **similar** to **Iron Man 3**, which you liked
…it has a **high average rating**.

Fast & Furious 7

Recommended because…
…it has a **high average rating**.

Star Wars: The Last Jedi

Recommended because…
…**Steve** loved it, who also watched **Iron Man 3** and **Jurassic World** like you.
…it has a **high average rating**.

Black Panther

Recommended because…
…it is **similar** to **Iron Man 3**, which you liked.
…**Catherine** loved it, who also watched **Iron Man 3** like you.

Frozen

Recommended because…
…it is **similar** to **Minions**, which you liked
…**Lou** loved it, who also watched **Minions** like you.
…it has a **high average rating**.

Toy Story 3

Recommended because…
…it is **similar** to **Minions**, which you liked.

Jumanji

Recommended because…
…it is **similar** to **Jurassic World**, which you liked.
…it is **similar** to **Avatar**, which you liked.

The Dark Knight

Recommended because…
…it has a **high average rating**.

Skyfall

Recommended because…
…**Kono** loved it, who also watched **Iron Man 3** and **Minions** like you.
…**Lou** loved it, who also watched **Minions** like you.

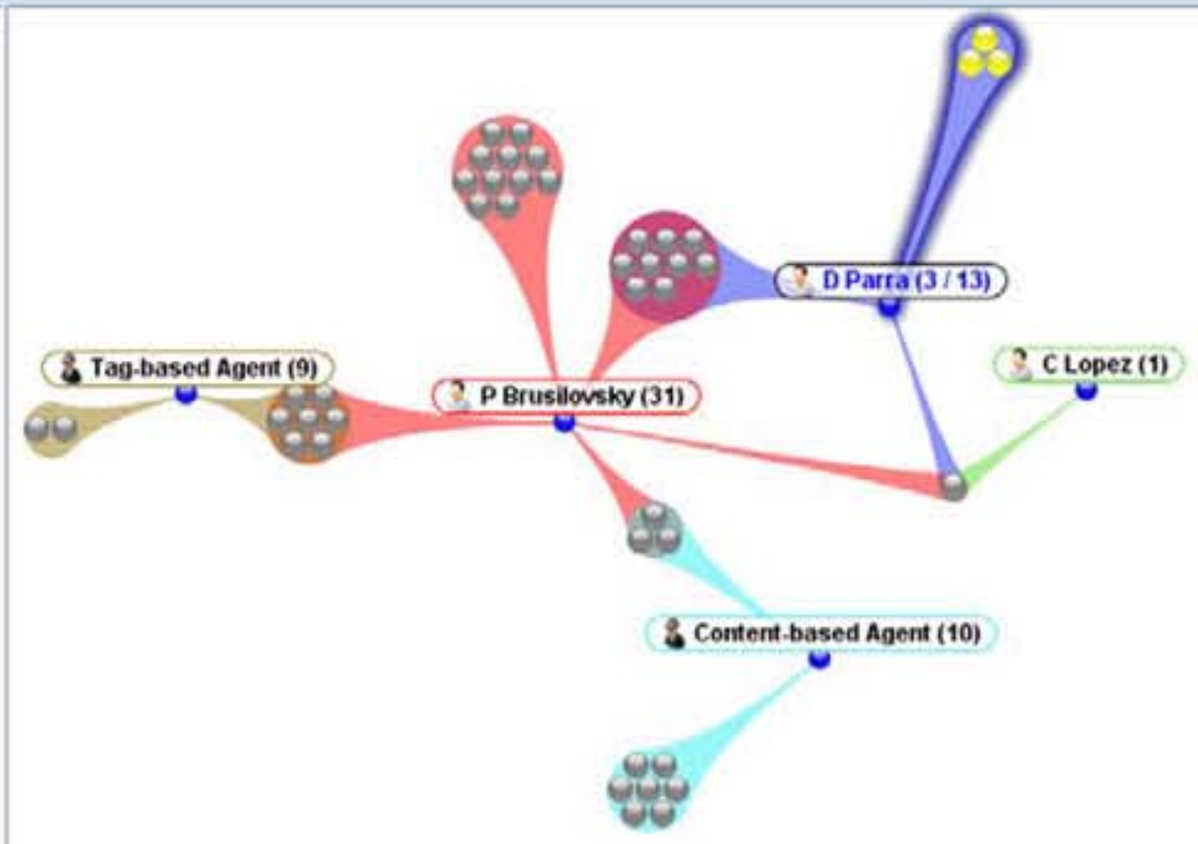
The Hobbit

Recommended because…
…**Danny** loved it, who also watched **Titanic** and **Jurassic World** like you.

	My Profile					People Similar To Me					
Recommendations	○ Titanic	✚ Avatar	^ Jurassic World	★ Iron Man 3	✔ Minions	^ ★ Steve	○ ^ Danny	★ ✔ Kono	★ Catherine	✔ Lou	High Average Rating
Marvel's The Avengers	○	○	○	●	○	○	○	○	○	○	●
Star Wars: The Last Jedi	○	○	○	○	○	●	○	○	○	○	●
Frozen	○	○	○	○	●	○	○	○	○	●	●
Jumanji	○	●	●	○	○	○	○	○	○	○	○
Skyfall	○	○	○	○	○	○	○	●	○	●	○
Fast & Furious 7	○	○	○	○	○	○	○	○	○	○	●
Black Panther	○	○	○	●	○	○	○	○	●	○	○
Toy Story 3	○	○	○	○	●	○	○	○	○	○	○
The Dark Knight	○	○	○	○	○	○	○	○	○	○	●
The Hobbit	○	○	○	○	○	○	●	○	○	○	○

Clustermap visualization

- LAK13
  - Tags
  - Recommender Agents
    - Tag-based Agent 9
    - Content-based Agent 10
  - Users
    - [fcs] P Brusilovsky 31
    - [s] S Wollin-Giering 23
    - [s] M Specht 15
    - D Parra 13
    - [s] Annette 12
    - [s] Tom 12
    - [s] A Monés 11
    - [s] M Anjorin 10
    - [s] R Kawase 10
    - [f s] S (Sherry) 9
    - [s] A Esposito 6
    - [s] G Parra 5
    - [s] Madjarov 5
    - [s] S Govaerts 5
    - [fcs] S Hsiao 3
    - [fcs] C Lopez 1
    - [s] U Schroeder 1



Results

43 result(s)

Title: Authoring Adaptive Serious Games
Authors: Maurice Hendrix, Evgeny Knutov, Laurent Laurent Auneau, Aristidis Protopsaltis, Sylvester Arnab, Ian Dunwell, Panagiotis Petridis, Sara de Freitas
Tags:
Bookmarked by:
Location: Open in browser...
Add to schedule: bookmark

[Already bookmarked]
Title: Designing mobile learning games to support learners
Authors: Birgit Schmitz
Tags: learning games
Bookmarked by: D Parra
Location: Open in browser...

Title: To err is Human, To Explain and Correct is Divine: A Study of Interactive Erroneous Examples with Middle School Math Students
Authors: Bruce M. McLaren, Deanne Adams, Kelley Durkin, Bethany Rittle-Johnson, George Goguadze, Richard Mayer, Sergey Sosnovsky
Tags: math learning
Bookmarked by: P Brusilovsky
Location: Open in browser...
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Title: Just4me: functional requirements to support informal self-directed learning in a personal ubiquitous environment

More control

Ideas for controlling recommendations

More control

Some more advanced preference elicitation methods exist

Mostly developed for MAUT-based systems

See preference elicitation lecture

One prominent idea: **critique** the recommended item(s)

Ultimate goal: create a conversation!

Great for chatbots!

To find similar products with better values than this one

Canon PowerShot S2 IS Digital Camera

Add to saved list

$424.15

Canon, 5.3 M pixels, 12x optical zoom, 16 MB memory, 1.8 in screen size, 2.97 in thickness, 404.7 g weight. detail

would you like to improve some values?

	Keep	Improve	Take any suggestion
Manufacturer	Canon	Sony	
Price	$424.15	less expensive	
Resolution	5.3 M pixels		
Optical Zoom	12x		
Removable Flash Memory	16 MB	more memory	
LCD Screen Size	1.8 in	larger	
Thickness	2.97 in	thinner	
Weight	404.7 g	lighter	

less expensive
$100 cheaper
$200 cheaper
$300 cheaper

Show Results Reset

To find similar products with better values than this one

Canon PowerShot S2 IS Digital Camera Add to saved list

$424.15

Canon, 5.3 M pixels, 12x optical zoom, 16 MB memory, 1.8 in screen size, 2.97 in thickness, 404.7 g weight. detail

The product being critiqued

We have the following

1. Less Optical Zoom and Thinner and Lighter Weight	Explain	Show Products
2. Different Manufacturer and Lower Resolution and Cheaper	Explain	Show Products
3. Larger Screen Size and More Memory and Heavier	Explain	Show Products

System-suggested compound critiques

OR would you like to improve some value(s) by yourself?

	Keep	Improve	Take any suggestion
Manufacturer	Canon	Sony	
Price	$424.15	less expensive	
Resolution	5.3 M pixels	higher	
Optical Zoom	12x	more zoom	
Removable Flash Memory	16 MB	more memory	
LCD Screen Size	1.8 in	larger	
Thickness	2.97 in	thinner	
Weight	404.7 g	lighter	

Show Results Reset

User-initiated critiquing facility

The product best matching your preferences

Toshiba Portege M200 Tablet PC Add to saved list

$ 2649 (USD)
Toshiba, Microsoft Windows XP Tablet PC, 4.34 hours battery, 12.1 in display size, 80 GB HD, 1500 MB memory, Intel Pentium M Processor (Centrino), 2 GHz processor speed, 2.07 kg weight. detail

Self specify criteria for Better Features

We also recommend the following products with some Better Features

These products have Cheaper Price and Longer Battery Life, although they have slightly Lower Processor Speed

Panasonic Toughbook 18 Tablet PC - Touchscreen PC Version Add to saved list

$ 2599.99 (USD)
Panasonic, Microsoft Windows XP Pro, 8.5 hours battery, 10.4 in display size, 40 GB HD, 256 MB memory, Intel Pentium M Processor (Centrino), 1.1 GHz processor speed, 2.03 kg weight. detail

Better Features

Acer TravelMate C302XCi-SP2 Tablet PC Add to saved list

$ 1299 (USD)
Acer, Microsoft Windows XP Tablet PC, 5.5 hours battery, 14.1 in display size, 60 GB HD, 512 MB memory, Intel Pentium M Processor (Centrino), 1.6 GHz processor speed, 2.79 kg weight. detail

Better Features

6 products Show All

These products have Larger Display Size, although they have slightly Shorter Battery Life and Heavier Weight

Acer TravelMate C314XMi Tablet PC Add to saved list

$ 1776.49 (USD)
Acer, Microsoft Windows XP Tablet PC, 4 hours battery, 14.1 in display size, 100 GB HD, 1024 ME memory, Intel Pentium M Processor (Centrino), 2 GHz processor speed, 2.88 kg weight. detail

Better Features

Toshiba Satellite R10 Tablet PC Add to saved list

$ 1429 (USD)
Toshiba, Microsoft Windows XP Tablet PC, 4 hours battery, 14 in display size, 40 GB HD, 512 MB memory, Intel Pentium M Processor, 1.6 GHz processor speed, 2.93 kg weight. detail

Better Features

6 products Show All

These products have Lighter Weight and Different Processor Class, although they have slightly Smaller Display Size

ElectroVaya Scribbler SC500 Tablet PC Add to saved list

$ 2499 (USD)
ElectroVaya, Microsoft Windows XP Tablet PC, 8 hours battery, 10.4 in display size, 30 GB HD, 512 MB memory, Intel Pentium III Processor with SpeedStep, 0.866 GHz processor speed, 1.76 kg weight. detail

Better Features

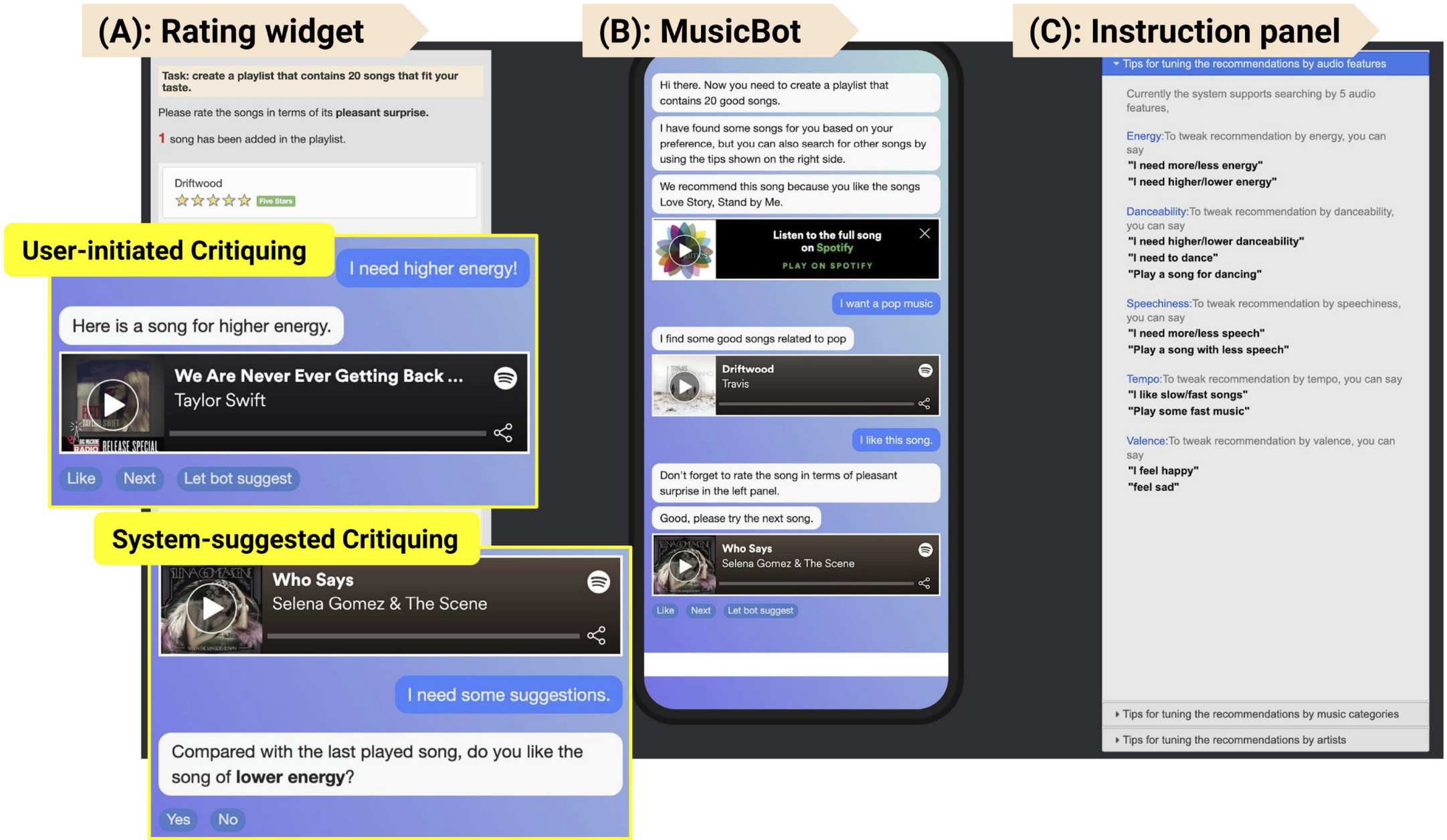
Acer TMC104TI Tablet PC Add to saved list

$ 1059 (USD)
Acer, Microsoft Windows XP Tablet PC, 3.5 hours battery, 10.4 in display size, 30 GB HD, 256 MB memory, Intel Pentium M Processor, 0.99 GHz processor speed, 1.4 kg weight. detail

Better Features

6 products Show All

If suggested critiques and products do not interest the user, he/she could switch to create critiques his/herself by clicking the button “Self specify criteria for ‘Better Features’.


(A): Rating widget
Task: create a playlist that contains 20 songs that fit your taste.
Please rate the songs in terms of its pleasant surprise.
1 song has been added in the playlist.
Driftwood
Five Stars
User-initiated Critiquing
I need higher energy!
Here is a song for higher energy.
We Are Never Ever Getting Back ...
Taylor Swift
Like
Next
Let bot suggest
System-suggested Critiquing
Who Says
Selena Gomez & The Scene
I need some suggestions.
Compared with the last played song, do you like the song of lower energy?
Yes
No
(B): MusicBot
Hi there. Now you need to create a playlist that contains 20 good songs.
I have found some songs for you based on your preference, but you can also search for other songs by using the tips shown on the right side.
We recommend this song because you like the songs Love Story, Stand by Me.
Listen to the full song on Spotify
PLAY ON SPOTIFY
I want a pop music
I find some good songs related to pop
Driftwood
Travis
I like this song.
Don't forget to rate the song in terms of pleasant surprise in the left panel.
Good, please try the next song.
Who Says
Selena Gomez & The Scene
Like
Next
Let bot suggest
(C): Instruction panel
Tips for tuning the recommendations by audio features
Currently the system supports searching by 5 audio features,
Energy:To tweak recommendation by energy, you can say
"I need more/less energy"
"I need higher/lower energy"
Danceability:To tweak recommendation by danceability, you can say
"I need higher/lower danceability"
"I need to dance"
"Play a song for dancing"
Speechiness:To tweak recommendation by speechiness, you can say
"I need more/less speech"
"Play a song with less speech"
Tempo:To tweak recommendation by tempo, you can say
"I like slow/fast songs"
"Play some fast music"
Valence:To tweak recommendation by valence, you can say
"I feel happy"
"feel sad"
Tips for tuning the recommendations by music categories
Tips for tuning the recommendations by artists

More chatbots

for recommendations

More chatbots

20th ACM Conference on Intelligent Virtual Agents (IVA'20)

How can we build agents that truly understand you?

Explicitly model aspects of the user's state of mind, using multiple sources of data

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