

# Survey on Explanations in Recommender Systems through Knowledge Graphs

My name is Giacomo Balloccu, and I am a PhD student at the University of Cagliari (Italy).

I am investigating the design and development of explanations for recommender systems, and the goal of this questionnaire is to collect your opinion about three novel concepts and practices in this domain: explanation temporal relevance, explanation entity popularity, and explanation type diversity. Your survey responses will be analyzed and summarized to depict the opinions of users on these three aspects.

It will take approximately 3/5 minutes to complete the questionnaire.

Your participation in this study is completely voluntary. There are no foreseeable risks associated with this project. However, if you feel uncomfortable answering any questions, you can withdraw from the survey at any point. It is very important for us to collect your opinions.

Your survey responses will be collected in an anonymous way and data from this research will be reported only in the aggregate. Your information will be coded and will remain confidential.

If you have questions at any time about the survey or the procedures, please feel free to contact me at [gjacoballoccu@gmail.com](mailto:gjacoballoccu@gmail.com).

Thank you very much for your time and support.

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**\*Campo obbligatorio**

## Demographic Information

We remind you that your survey responses will be collected in an anonymous way and data from this research will be reported only in the aggregate. Your information will be coded and will remain confidential.

1. What is your gender? \*

*Contrassegna solo un ovale.*

- ☐ Male
- ☐ Female
- ☐ Other
- ☐ Prefer not to say

2. What is your age? \*

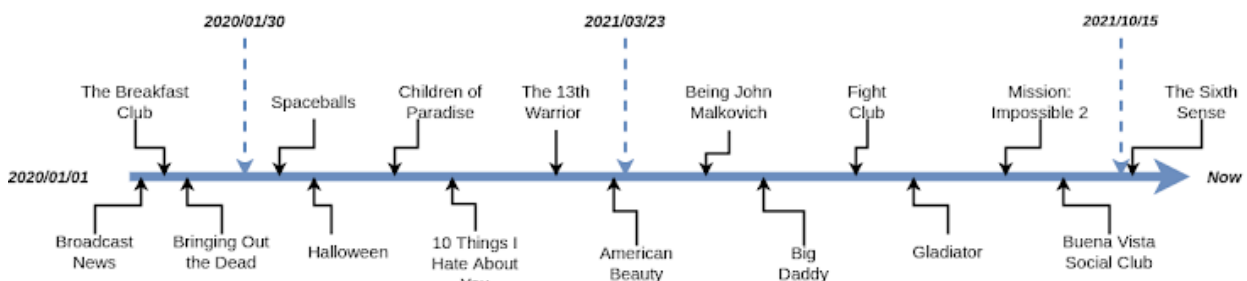
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3. What is your current country? \*

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### Explanation Temporal Relevance

Suppose that the following picture represents your watching interactions with movies in a platform. The horizontal blue arrow indicates a time span from 2020/01/01 to now, and the black arrows are associated to each movie you watched (the position of a black arrow indicates when you watched that movie). The thick vertical blue arrows just indicate some reference dates, to give you the perception of the time along the considered interval. An explainable recommender system may suggest you the item "The Silence of the Lambs" and provide you with one of the following two explanations: 1. "Based on the similarity with a user who watched Gladiator" or 2. "Based on the similarity with a user who watched The Breakfast Club". You may notice that the first explanation has a high temporal relevance since you interacted more recently with the movie "Gladiator", while the second explanation has a lower temporal relevance since you interacted with the movie "The Breakfast Club" almost a year ago.



4. When a recommendation is provided to you, would you prefer to see an explanation: \*

*Contrassegna solo un ovale.*

- ☐ Based on an item you interacted more recently (the more recent the better)
- ☐ Based on an item you interacted in the past (the older the better)
- ☐ You do not care about this temporal aspect

#### Explanation Entity Popularity

An explainable recommender system may suggest you the item "Almost Famous" and provide you with one of the following two explanations: 1. "Because it shares Kate Hudson as an actress with another movie you watched" or 2. "Because it shares Ana Maria Quintana as an actress with another movie you watched". We call Kate Hudson and Ana Maria Quintana shared entities, as they are entities shared between the recommend item and an item you interacted with. You may notice that the shared entity in the first explanation has a high popularity, since Kate Hudson is generally considered a popular actress due to the number of movies where she appearances, while the the shared entity in the second explanation has a low popularity, since Ana Maria Quintana is generally considered a less popular actress and has done only few movies.

5. When an item is recommended to you, would you prefer to see an explanation: \*

*Contrassegna solo un ovale.*

- ☐ Where the shared entity is popular and/or familiar (the more popular the better)
- ☐ Where the shared entity is unpopular and/or unexpected (the less popular the better)
- ☐ You do not care about this popularity aspect

#### Explanation Type Diversity

Within a recommended list of items, each item can be accompanied with an explanation. The explanation attached to an item can be of different types, and these types depend on the domain. In the movie domain, we consider eight main types, based on the relationships between the recommended item and the item mentioned in the explanation: same actor, same director, same production company, same producer, same writer, same cinematographer, same category, same taste of another user. An explainable recommender system may suggest you one of the following explained list of items (see the figures below). You can notice that the explanations provided with the list of recommended items A have a low explanation type diversity, since only two types of explanations are included (same taste of another user or same director). Conversely, the explanations provided with the list of recommended items B have a high diversity, since they include 6 different types of explanations.

### Explained list of recommendations A

Recommend Item	Associated Explanation
In the Line of Fire	based on the similarity with a user who has also seen "The Fugitive"
Alien	based on the similarity with a user who has also seen "Star Wars: Episode IV - A New Hope"
Enemy of the State	based on the similarity with a user who has also seen "Desperado"
Forrest Gump	based on the similarity with a user who has also seen "The Fugitive"
The Outlaw	based on the similarity with a user who has also seen "The Saint"
The Godfather	based on the similarity with a user who has also seen "Braveheart"
Star Trek III: The Search for Spock	because shares the director "Leonard Nimoy" with another movie that you previously watched
How to Make an American Quilt	based on the similarity with a user who has also seen "The Evening Star"
Speed	based on the similarity with a user who has also seen "Star Wars: Episode IV - A New Hope"
The Terminator	based on the similarity with a user who has also seen "The Mummy"

### Explained list of recommendations B

Recommend Item	Associated Explanation
Speed	based on the similarity with a user who has also seen "The Fugitive"
Star Trek III: The Search for Spock	because shares the director "Leonard Nimoy" with another movie that you previously watched
Forrest Gump	based on the similarity with a user who has also seen "Cliffhanger"
Con Air	because belong to category "Spatial Thing" like another movie that you previously watched
Outbreak	based on the similarity with a user who has also seen "The Hunt for Red October"
X-Men	because belong to category "Superhero Films" like another movie that you previously watched
Blade Runner	based on the similarity with a user who has also seen "Young Frankenstein"
The World Is Not Enough	because shares the producer "Michael G. Wilson" with another movie that you previously watched
From Russia with Love	because shares the production company "Eon Productions" with another movie that you previously watched
Mission to Mars	because shares the actor "Jerry O'Connell" with another movie that you previously watched

6. When a list of items is recommended to you, would you prefer to see: \*

*Contrassegna solo un ovale.*

- ☐ More diverse types of explanations, as in List B (the more diverse the better)
- ☐ Less diverse types of explanations, as in List A (the less diverse the better)
- ☐ You do not care about this diversity aspect

### Perception of Explanations

7. Consider the three properties of the explanations you encountered in this survey: explanation temporal relevance, explanation entity popularity, and explanation type diversity. Do you believe explanations that meet the above three properties: (Please rate between Strongly Disagree and Strongly Agree) \*

*Contrassegna solo un ovale per riga.*

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
Help to explain how the system works	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Allow users to tell the system it is wrong	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increase users' confidence in the system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Help users make good decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Help users make decisions faster	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increase the ease of usability or enjoyment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Convince users to try or buy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. Here, you can provide any additional comment you may have (this field is not mandatory)

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