BEYOND ACCURACY: SERENDIPITY

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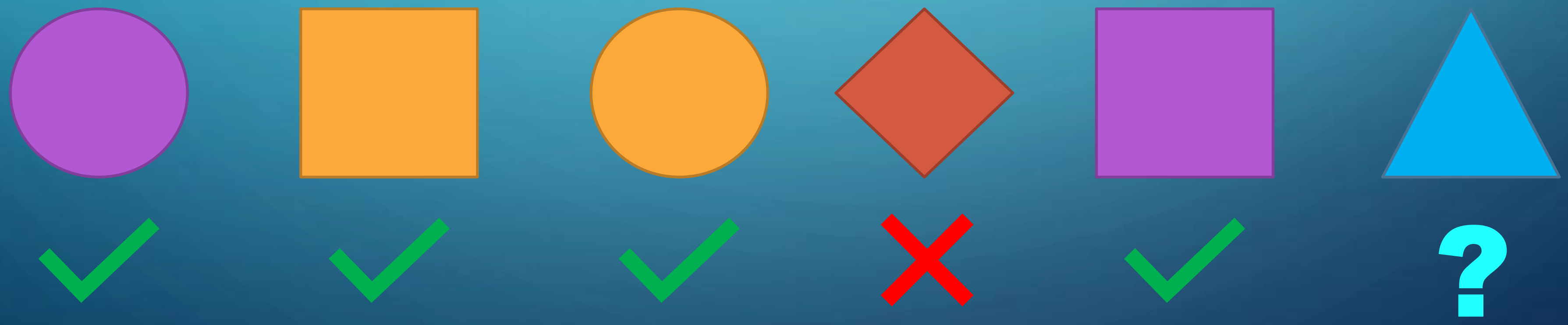
ACCURACY

- Tells if the recommender system is able to predict those items that you have already rated
- Accuracy will naturally place those items at the top of a user's list
- Does not take usefulness into consideration



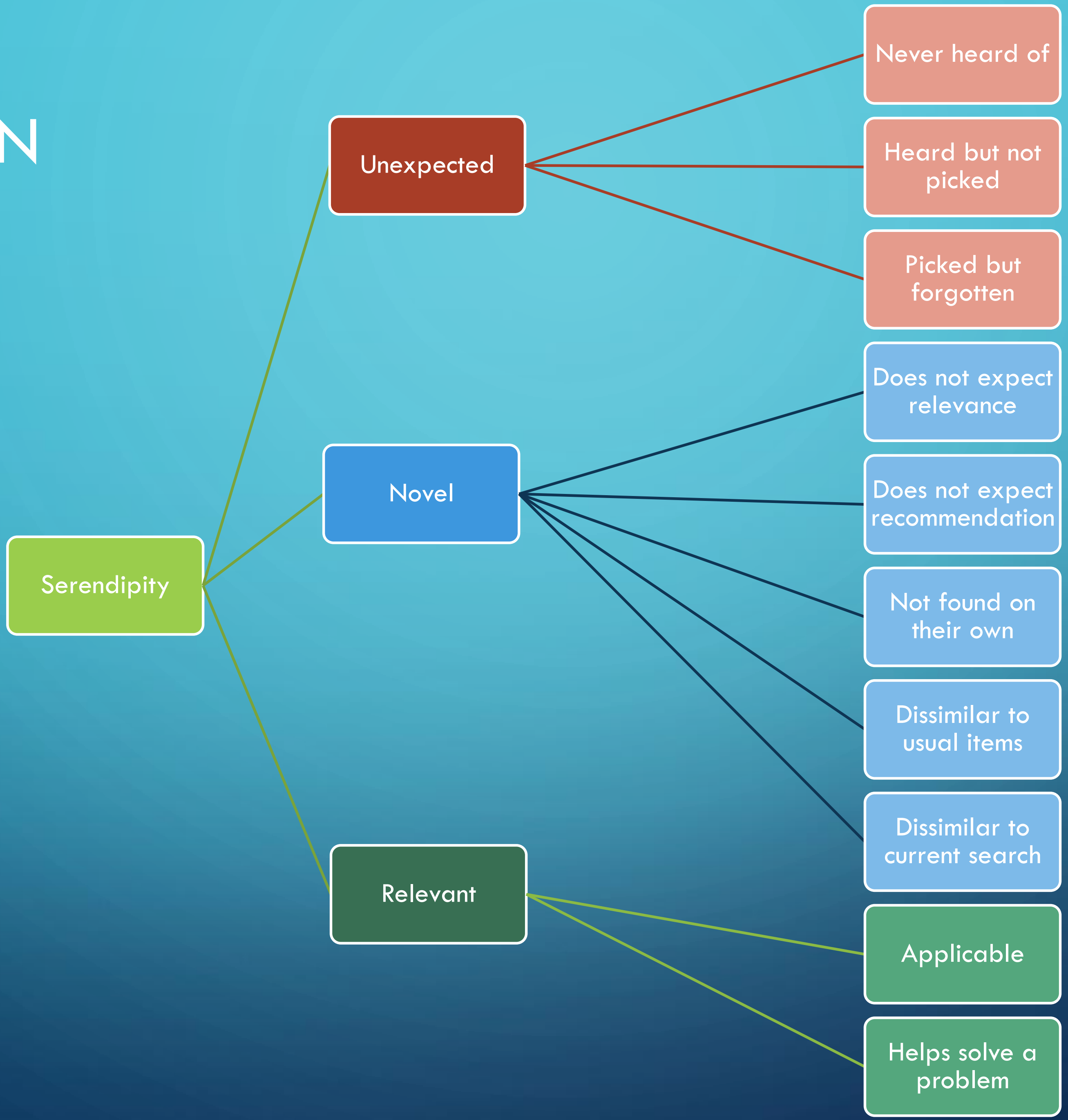
OTHER METRICS

- Diversity — How dissimilar are the recommendations?
- Coverage —What percentage of the user-item space can be recommended?
- Relevancy — How relevant are the recommendations?
- Novelty — How surprising are the recommendations in general?
- **Serendipity — How surprisingly delightful are the relevant recommendations?**

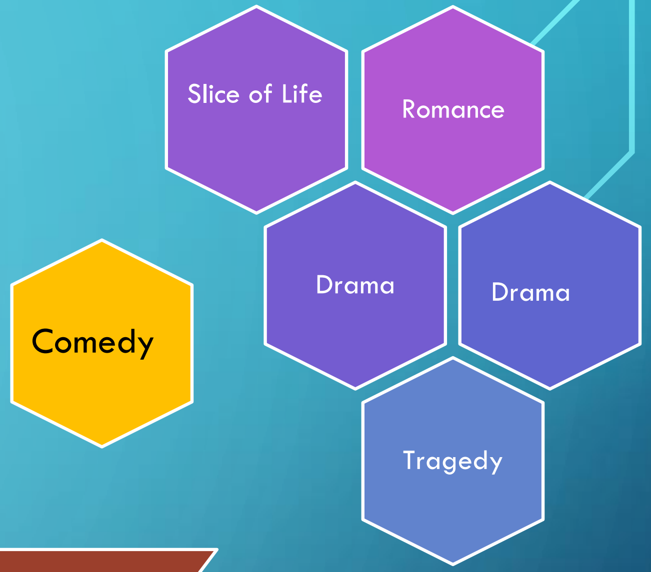
SERENDIPITY

- System appears more lively by making non-trivial and surprising recommendations
- Reveals unexpressed users' wishes
- Difficult to measure
  - How do you measure levels of unexpectedness?
  - How do you measure levels of delight?
  - Ratability has its pitfalls with emotional responses
    - Emotions are unpredictable
    - The popular choice may not be picked
- Focus shift
  - Previously unimportant now is important

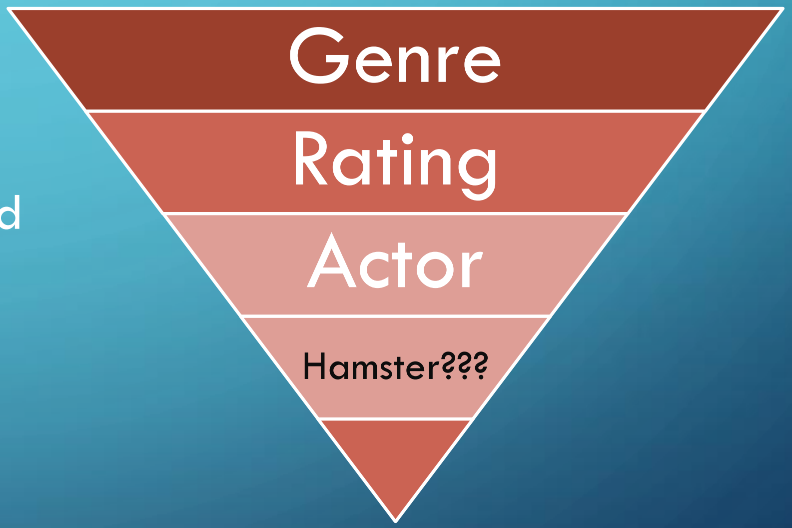
DEFINITION


Serendipity
Unexpected
Novel
Relevant
Never heard of
Heard but not picked
Picked but forgotten
Does not expect relevance
Does not expect recommendation
Not found on their own
Dissimilar to usual items
Dissimilar to current search
Applicable
Helps solve a problem

STRATEGIES TO INDUCE SERENDIPITY



- Randomness
  - Introduce new items into the system
  - High Risk since randomness is not relevance



- Already existing items
  - Make recommendations based on background items
  - Focus shift is important

- Anomalies
  - Focus on items that are unexpectedly liked

	Item 1	Item 2	Item 3	Item 4
Actual	Liked	Hated	Hated	Liked
Predicted	Liked	Hated	Hated	Hated

HOW TO SERENDIPITY

- Surprise! No one has a standard way to do this.
  - No satisfactory Collaborative Filtering solution for serendipitous item recommendation
- **Surprise/Unexpectedness**
  - Measuring an item's surprise as its distance from a set of unsurprising items
  - Difference of probability of item recommended to user and probability of item recommended to all users
- Delight
  - Favorable rating given by user

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