RS - Challenges

Trust

The greater the recommender influence, the greater the temptation to manipulate them

Trustworthy Recommendations

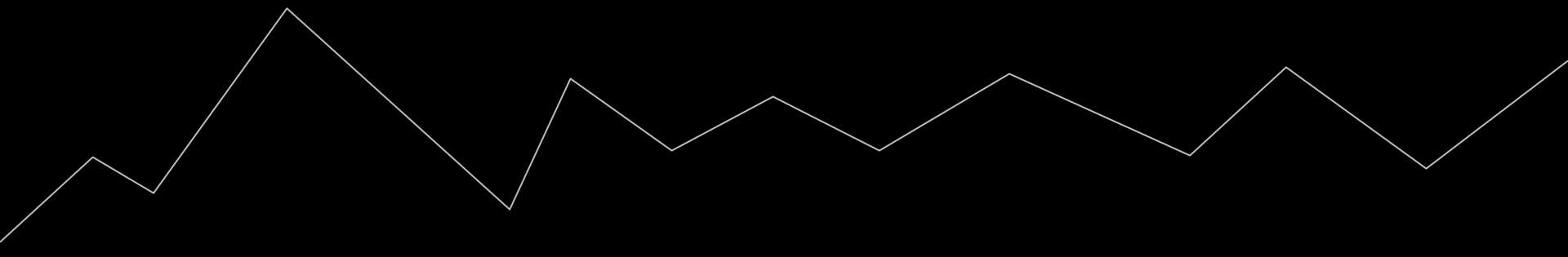
- Biasing recommendations - Individual Interests Vs Company's Interest
- Jeff Bezos perspective
- Long term Vs Short term

One wrote to me and said, "You don't understand your business. You make money when you sell things. Why do you allow these negative customer reviews?" And when I read that letter, I thought, we don't make money when we sell things. *We make money when we help customers make purchase decisions*. [emphasis added]

Trustworthy Recommendations

- Video platforms optimizing for video views instead of prioritizing customer’s mental health
- E-commerce platforms trying to influence customers to buy products which are not required by them

Privacy



Greater personalisation requires more personal data and information

Designers of RS want to create a system **“that know more about what you want than you do”**

How public do you want your dating, financial and medical information to be?

Informed Consent becomes important as RS becomes powerful and pervasive

Feedback loops

Data Flywheel

- Model controlling the next round of data collected
- Example of Youtube
  - Optimizing watch time
  - RS is responsible for 70% of content watched

Youtube Case Study

- Human beings like controversial content
- Conspiracy theory videos got recommended
- People who are interested in conspiracy theory watch a lot of videos
- As people started watching extreme content the algorithm started recommending extreme content

Ethics of AI - Youtube Case Study

Christiane C. didn't think anything of it when her 10-year-old daughter and a friend uploaded a video of themselves playing in a backyard pool…A few days later…the video had thousands of views. Before long, it had ticked up to 400,000…"I saw the video again and I got scared by the number of views," Christiane said. She had reason to be. YouTube's automated recommendation system…had begun showing the video to users who watched other videos of prepubescent, partially clothed children, a team of researchers has found.

On its own, each video might be perfectly innocent, a home movie, say, made by a child. Any revealing frames are fleeting and appear accidental. But, grouped together, their shared features become unmistakable.

YouTube’s recommendation algorithm had begun curating playlists for pedophiles, picking out innocent home videos that happened to contain prepubescent, partially clothed children

Why did this happen?

Youtube Case Study - Why did this happen

- Algorithm optimizing a metric
- This leads to edge cases
- Humans interacting with the system will exploit the edge cases and feedback loops to their advantage

Reference

- Guardian Article
- Algotransparency
- Ny times Article

Bias in AI - Meetup Case study

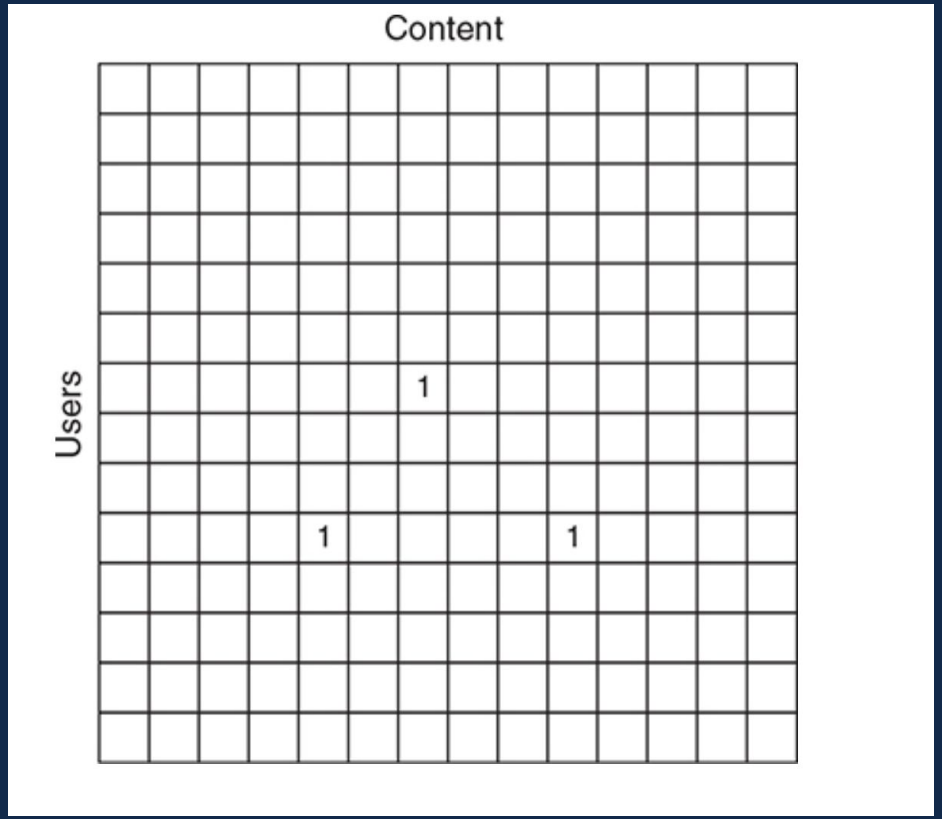
- Men more interested in tech meetups
- Including Gender in recommendation algorithm will lead to less tech meetup recommendations for women
- Fewer women will attend tech meetups
- It becomes a self-reinforcing feedback loop

Reference

Sparsity

	Indiana Jones	*Microcosmos*	*Avengers*	*Pete's Dragon*
Sara	4	5		
Jesper	4		5	
Therese	5			3
Helle	4			5
Pietro		3	4	3
Ekaterina	3		3	3

What's the Challenge with this kind of data?



Lack of information

- Most users evaluate a few items
- Challenging for the algorithms
- Cold start
  - New Users
  - New Products

Scalability

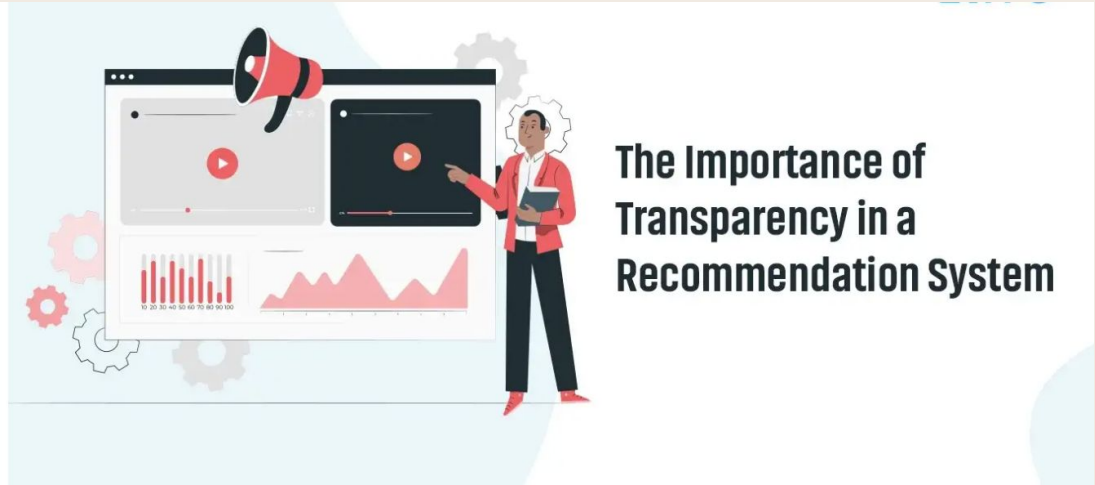
Handling User and Product Growth

- Computational resources
- Real time requirements
- Complexity Vs Latency


Transparency

Transparency

- White Box Vs Black box recommenders - Users trust recommendations which can be explained
- Algorithm complexity Vs Transparency - As the complexity of algorithm increases, transparency decreases



Recommender systems should be designed and implemented responsibly considering its importance, prevalence and impact