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Introduction

Multistakeholder recommendation recognizes

- The user is not the only party that benefits from recommendation delivery
- Many applications require integrating the concerns of other parties

Possible stakeholders include

- **Consumers (C):** Get recommendations
- **Providers (P):** Own items that may be recommended
- **System (S):** Owns the recommendation platform

Multisided Platforms

Multisided platform theory: firms can act as marketplaces.



- Enabling transactions between others; reducing market friction
- Platforms define rules for each side of the market
- Web examples: OpenTable, eBay, Etsy, Uber
- Old examples: Credit cards, shopping malls

Multisided platforms may need to consider more than one side when making recommendations.

Examples



Reciprocity / Business goals

- Recommendations should be acceptable to both parties
- Prime members should get better results



* Etsy doesn't currently offer personalized recommendations but if they did, they would have these concerns.

New entrant promotion / fairness

- May want balanced recommendations
- Established sellers and new sellers
- Otherwise, new sellers may have difficulty getting established



Pedagogical considerations

- Students have preferred programs
- Organizations have preferred student body composition
- System wants recommendations that promote student growth

Utility

Can represent recommendation outcomes in terms of utility

- Different utilities for each stakeholder $\langle C, P, S \rangle$
- Ultimately, system's utility is most important
- System utility will be a function of the utilities of other stakeholders

Design Dimensions

Neutral: C_n / P_n

- Recommendations are non-personalized

Personalized: C_p / P_p

- Recommendations personalized for actor

Passive: C^- / P^-

- Recommendations created from profile information

Active: C^+ / P^+

- Recommendations respond to query or other input

System: S_n, S_a, S_t

- Neutral: System considerations not included
- Aggregate: System utility a function of consumer and provider utility
- Targeted: System has its own utility considerations

Example Designs

Tinder

User and provider reciprocal, system aggregate
 $\langle C_p^-, P_p^-, S_a \rangle$

Etsy

User personalized, provider neutral, system aggregate
 $\langle C_p^-, P_n^-, S_a \rangle$

City of Learning

User personalized query, provider target audience, system targeted
 $\langle C_p^-, P_p^+, S_t \rangle$

Configurations

		Passive (-)		Active (+)	
		P_n^-	P_p^-	P_n^+	P_p^+
Passive (-)	C_n^-	Most Popular		Featured Items	
	C_p^-	Standard	Reciprocal	Paid placement	Online display advertising
Active (+)	C_n^+	Query		Search engine advertising	
	C_p^+	Personalized Search			

- Except for advertising, existing configurations are system-neutral
- Many configurations unexplored

For More

RecSys 2017 Workshop on Value-Aware and Multistakeholder Recommendation, Aug. 27, Como, Italy.

