Towards A Framework for Cyber Social Status Based Trusted Open Collaboration

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Open Collaboration?

"You spelled 'confidential' wrong."

Collaboration

- ## Closed Collaboration
  - Information and resource sharing amongst selected participants

- ## Open Collaboration
  - Anyone can participate
  - Proven to be productive
  - Inherently a social activity, hence trust establishment needs a social computing

Trusted Collaboration

- **Trusted Closed Collaboration**
  - Trustworthiness of selected users and shared resource is verified

- **Trusted Open Collaboration (TOC)**
  - NOT MEAN an open collaboration system with a guaranteed trustworthiness
  - MEANS a discriminative measure (for example, cyber social status in our case) can be facilitated in open collaboration to provide certain degree of trust to participants.

Open (source) Collaboration Principles

- *Egalitarian*
  - *Everyone can contribute, because open source projects are accessible on the Internet and the project community is typically inclusive to anyone who wants to help.*
- *Meritocratic*
  - *Contributions are judged transparently and based on their merits. All decisions are discussed publicly on mailing lists and can be looked up for reference.*
- *Self-organizing*
  - *There is typically no defined process imposed from the outside so the project community itself determines how to go about its work.*

- By Dirk Riehle et al. "Bringing Open Source Best Practices into Corporations." IEEE Software, 2009
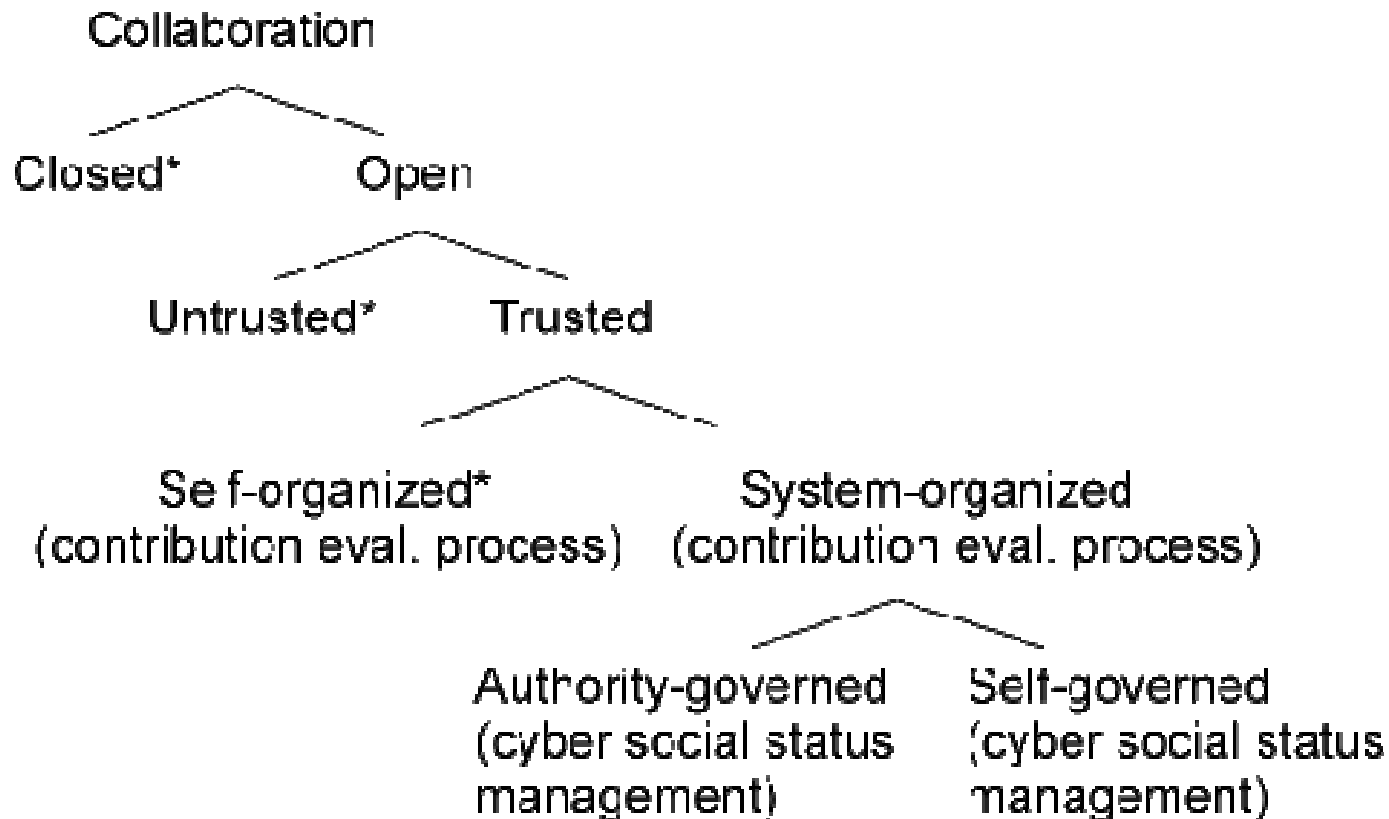
TOC: Three Principles

- **Egalitarian**
  - user with equal footing
  - anyone can participate (contribute and get benefit)
  - No user account or anyone can create an account
  - Not necessarily means all contributions are valued equally
- **Meritocratic**
  - contribution-based weighted value of user and resource
  - True only to a certain degree since
    - Contribution-based discriminative social standing can allow a user to influence other users' social standing
    - Social standing can be given by authority or other social activities, not by contribution (or merit)
- **Discriminative**
  - Trust is based on selective discrimination of participants and resources
  - Discrimination is based on various cyber social statuses
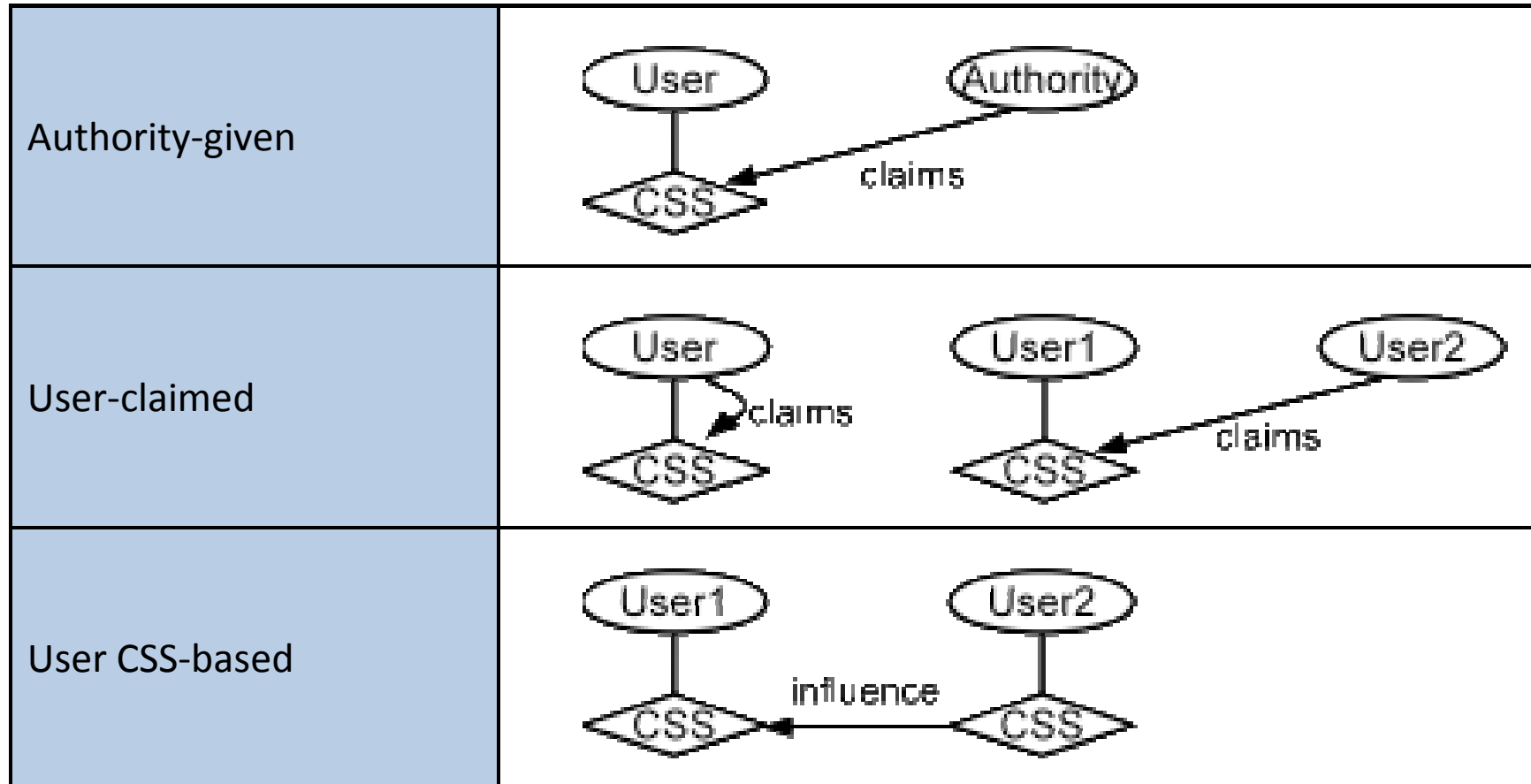
TOC: Two Criteria

- Contribution evaluation process
  - Self-organized
    - Collaboration community decides the process (No pre-imposed process from outside)
  - System-organized
    - Evaluation process can be pre-imposed by system
    - E.g., In wiki, the system may allow an expert to delete other's shared resource

- Cyber Social Status (CSS) management
  - Self-governed
    - Collaboration community itself (participants' activities) generates and manages CSS
    - User participation in governing social status and social activity
  - Authority-governed
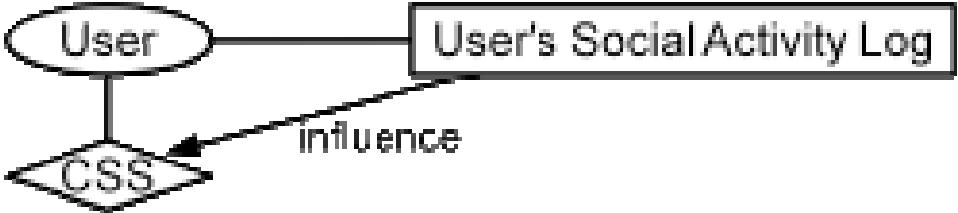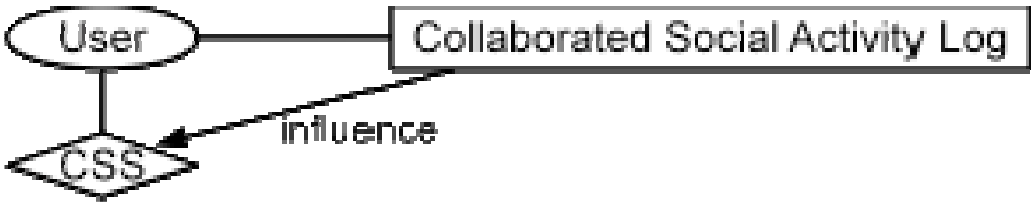   - CSS is given by an authority who is not a participant
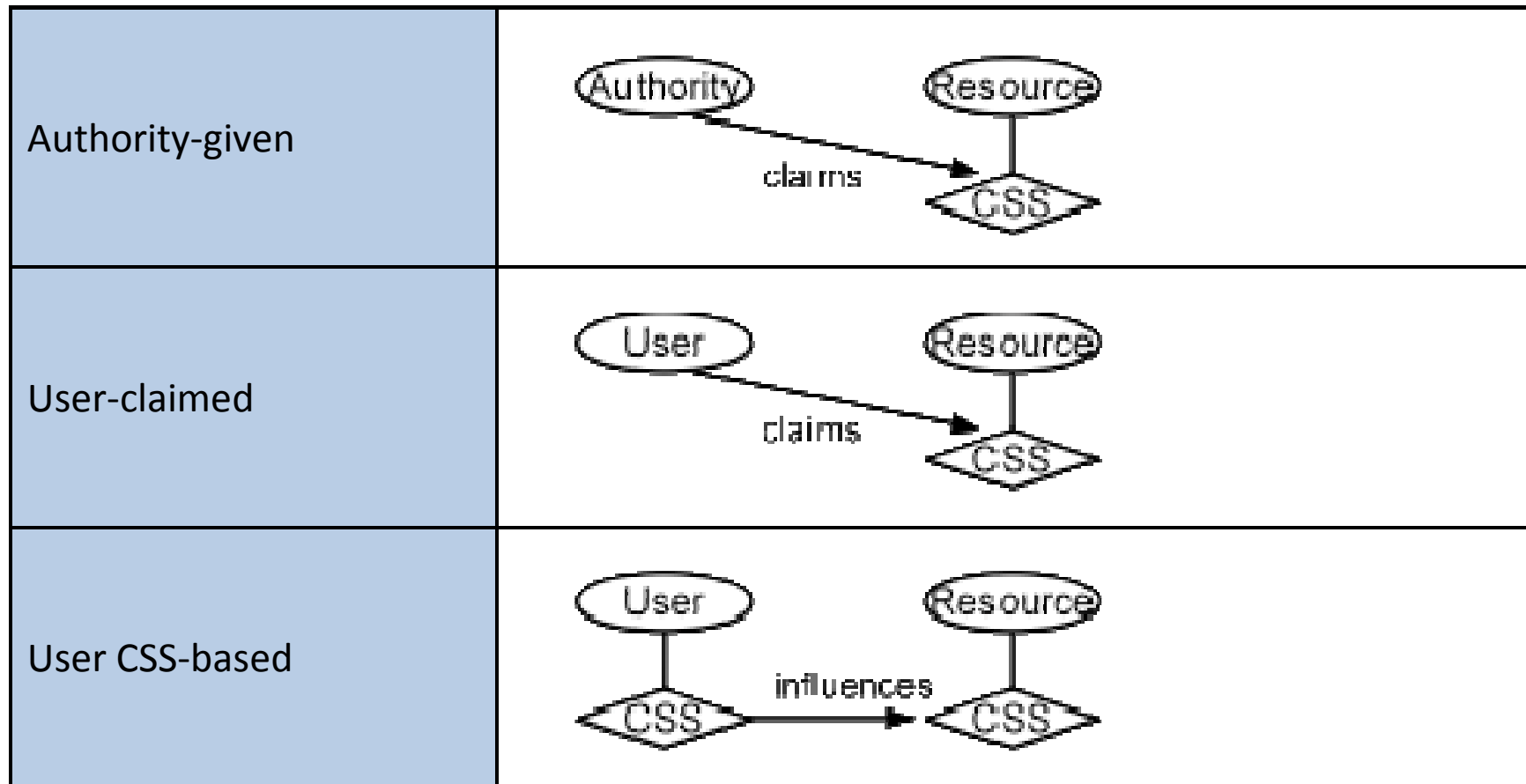
Collaboration Taxonomy

*Out of Scope

User Cyber Social Status (u-CSS)
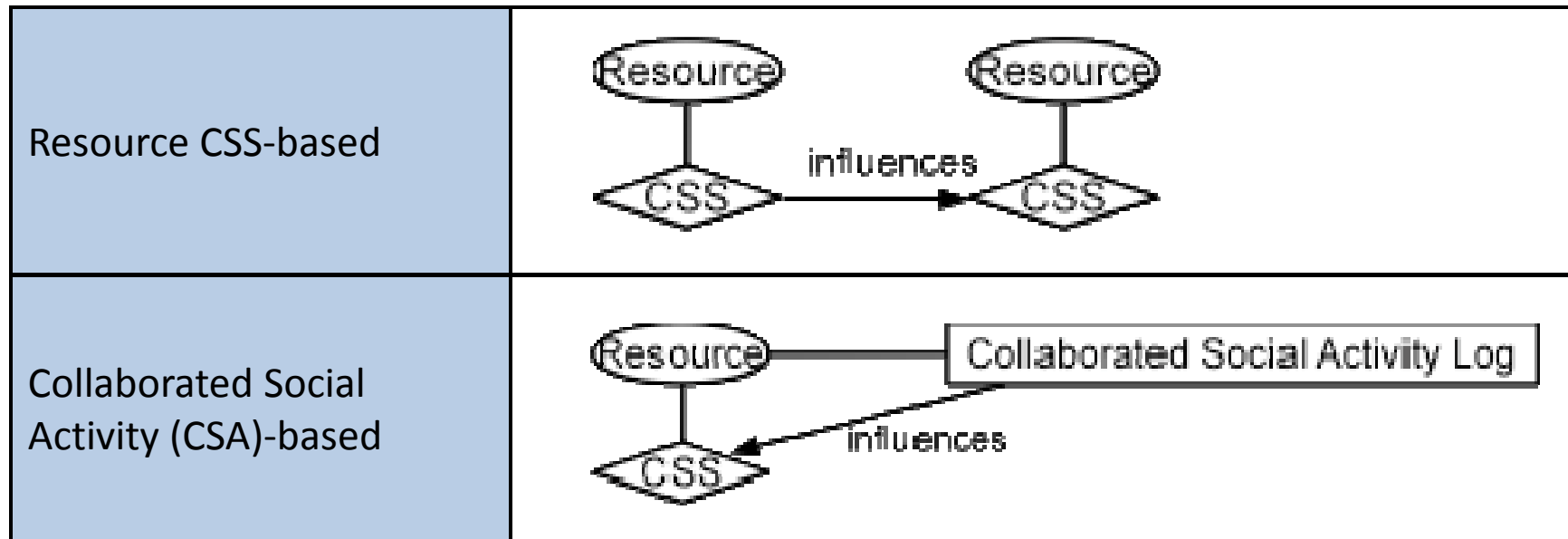
Authority-given	
User-claimed	
User CSS-based	

User Cyber Social Status (u-CSS) – cont.

Resource CSS-based	
User-participation-based	
Collaborated Social Activity (CSA)-based	

Resource Cyber Social Status (r-CSS)

Authority-given	
User-claimed	
User CSS-based	

Resource Cyber Social Status (r-CSS) – cont.

Resource CSS-based	
Collaborated Social Activity (CSA)-based	

Characteristics of u-CSS Types

| CSS Type	CSS Governing	Meritocracy	CSS Vulnerability
Authority-given	authority	Not meritocratic	No Sybil Attack
User-claimed	Self or other user	Not meritocratic	If self, no Sybil Attc. If other, depends on difficulty of user claiming
User CSS-based*	Depends on added CSS type	No, alone. Meritocratic w/ CSA-based u-CSS	No Sybil Attack alone
Resource CSS-based	users	Meritocratic w/ CSA-based r-CSS	Vulnerable if r-CSS can be generated by CSA
User participation-based	self	limited meritocratic (no others' eval.)	No Sybil Attack
CSA-based	users	Meritocratic	Vulnerable to Sybil Attack

*Needs other u-CSS type(s)

Characteristics of r-CSS Types

| CSS Type	CSS Governing	Meritocracy
Authority-given	authority	Not meritocratic
User-claimed	User	Not meritocratic
User CSS-based	User	Not meritocratic
Resource CSS-based*	Depends on additional r-CSS type	Meritocratic w/ CSA-based r-CSS
CSA-based	Users	Meritocratic

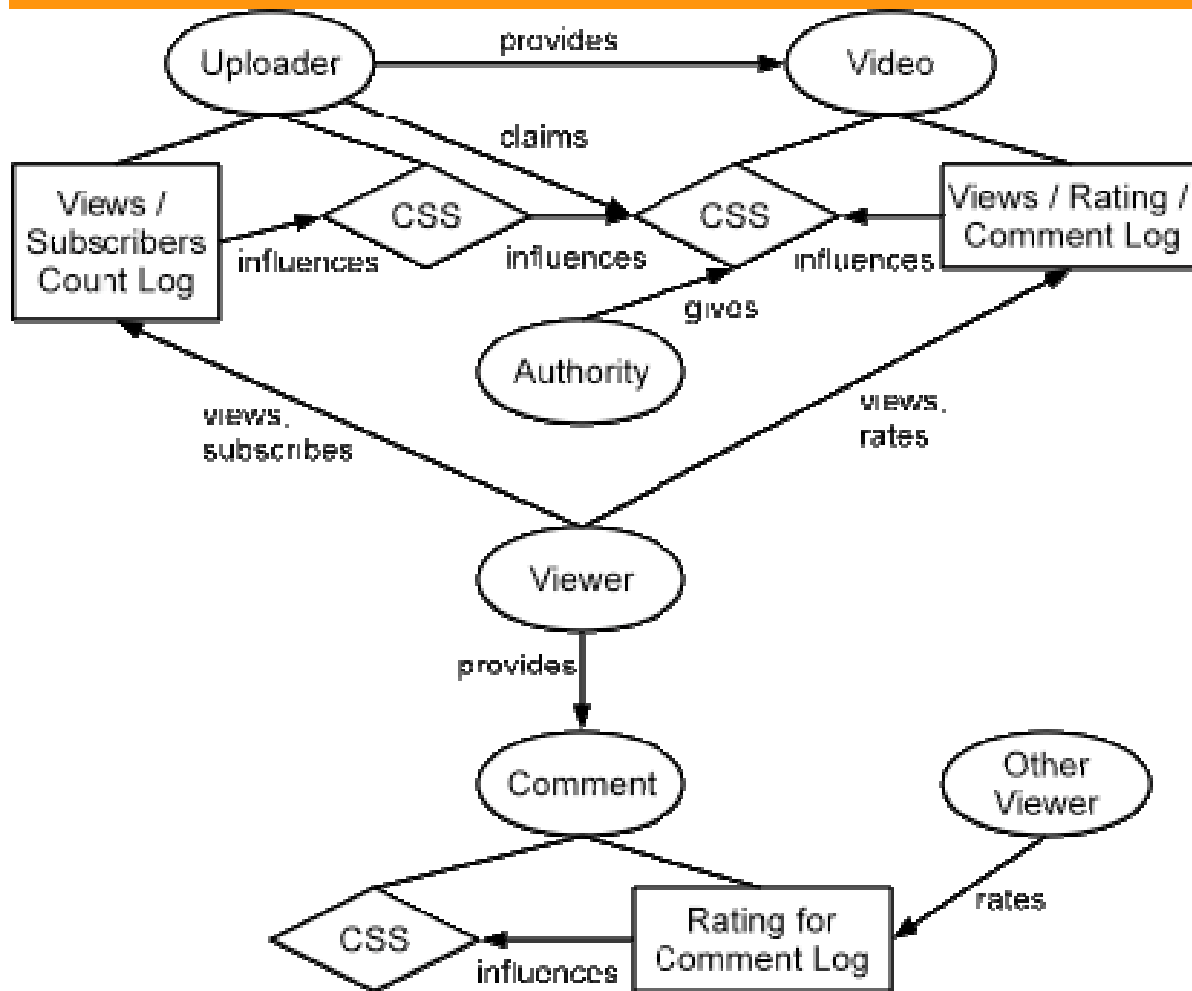*Needs other r-CSS type(s)

Amazon-like TOC
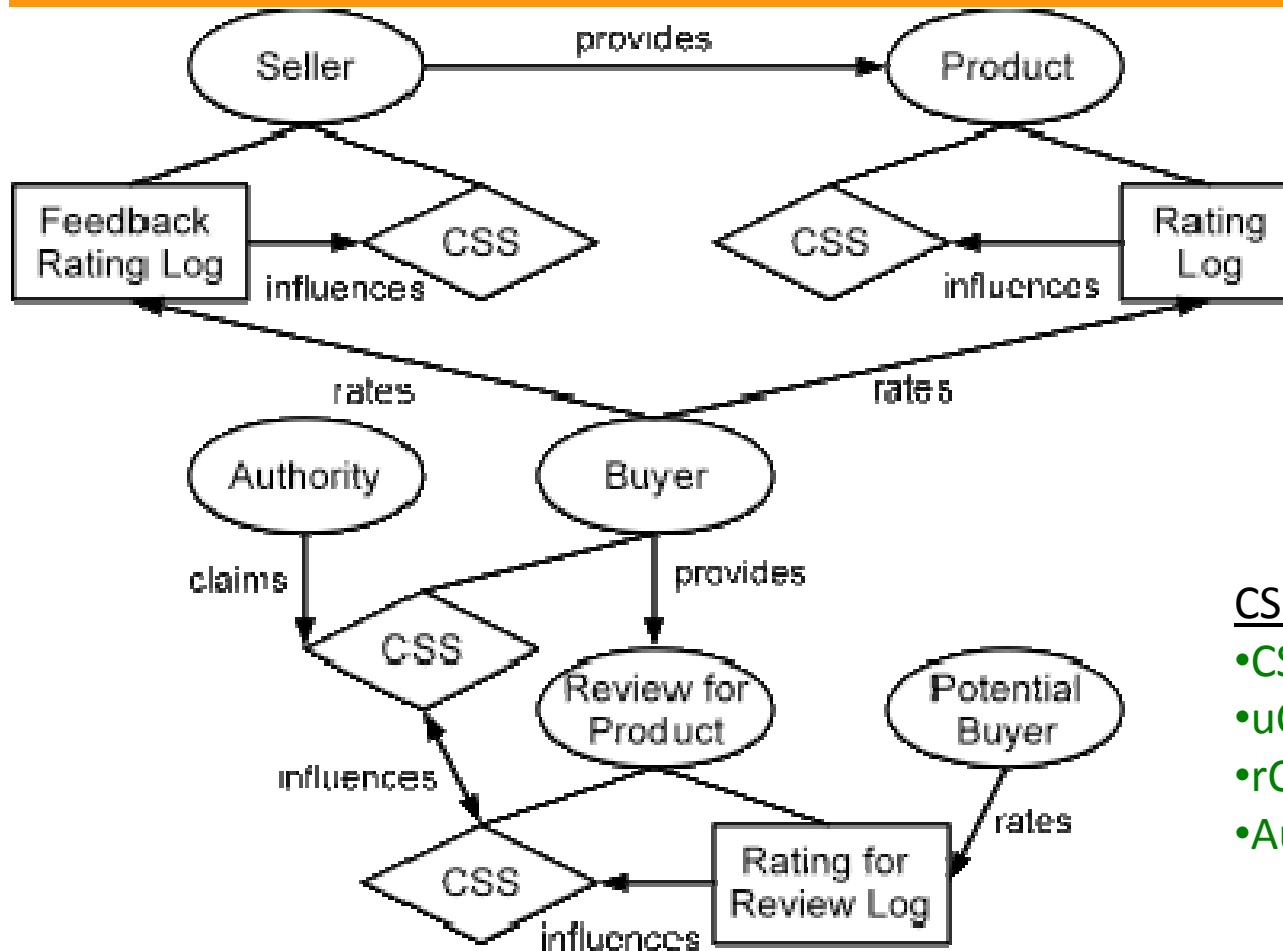
CSS Types used:
- CSA-based uCSS/rCSS
- uCSS-based rCSS
- rCSS-based uCSS
- Authority given uCSS

eBay-like TOC
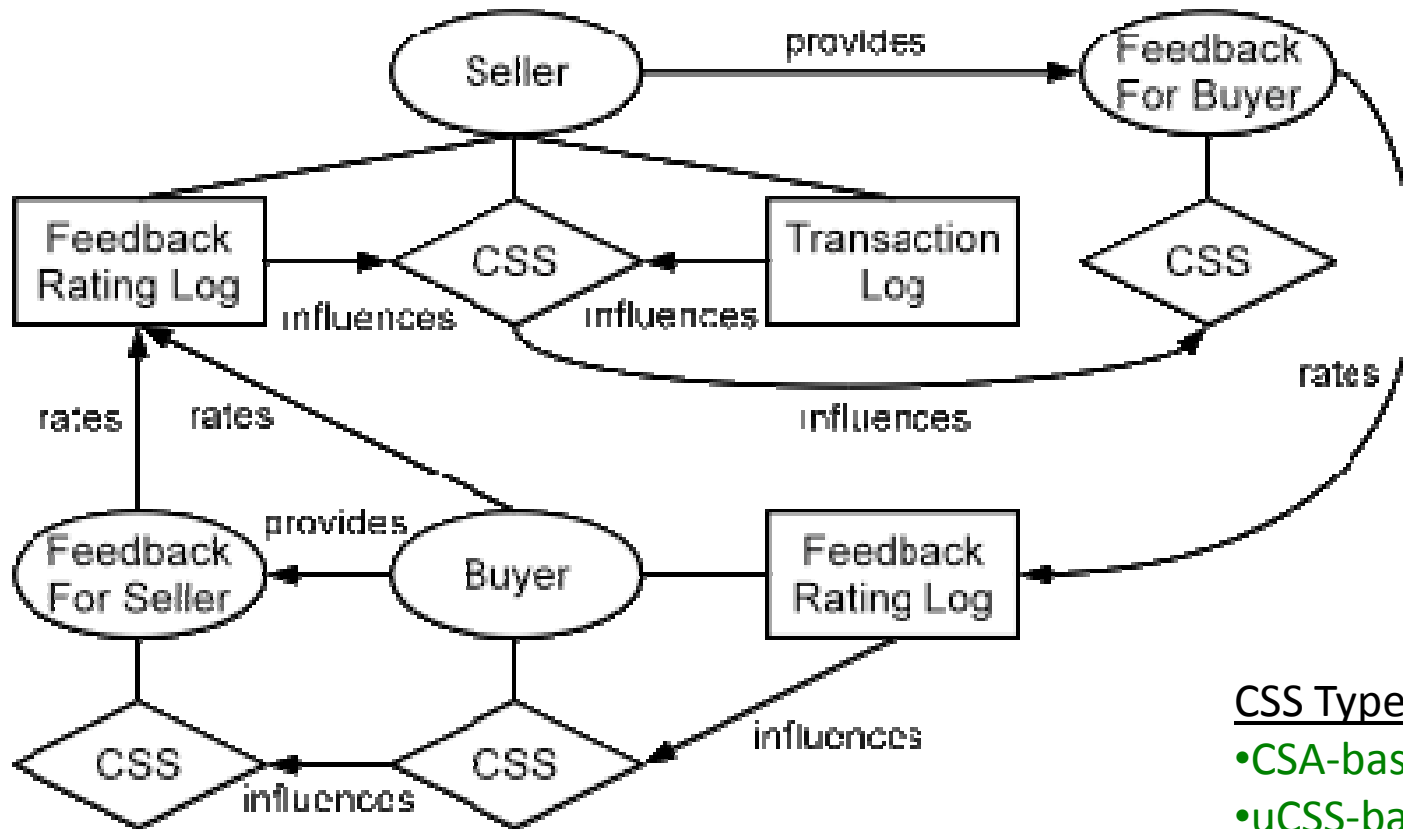
CSS Types used:
- CSA-based uCSS
- uCSS-based rCSS

YouTube-like TOC

CSS Types used:
- CSA-based uCSS/rCSS
- uCSS-based rCSS
- User-claimed rCSS
- Authority given rCSS

Questions? Comments?