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Lecture 6: Applications; Implementation

SI583: Recommender Systems

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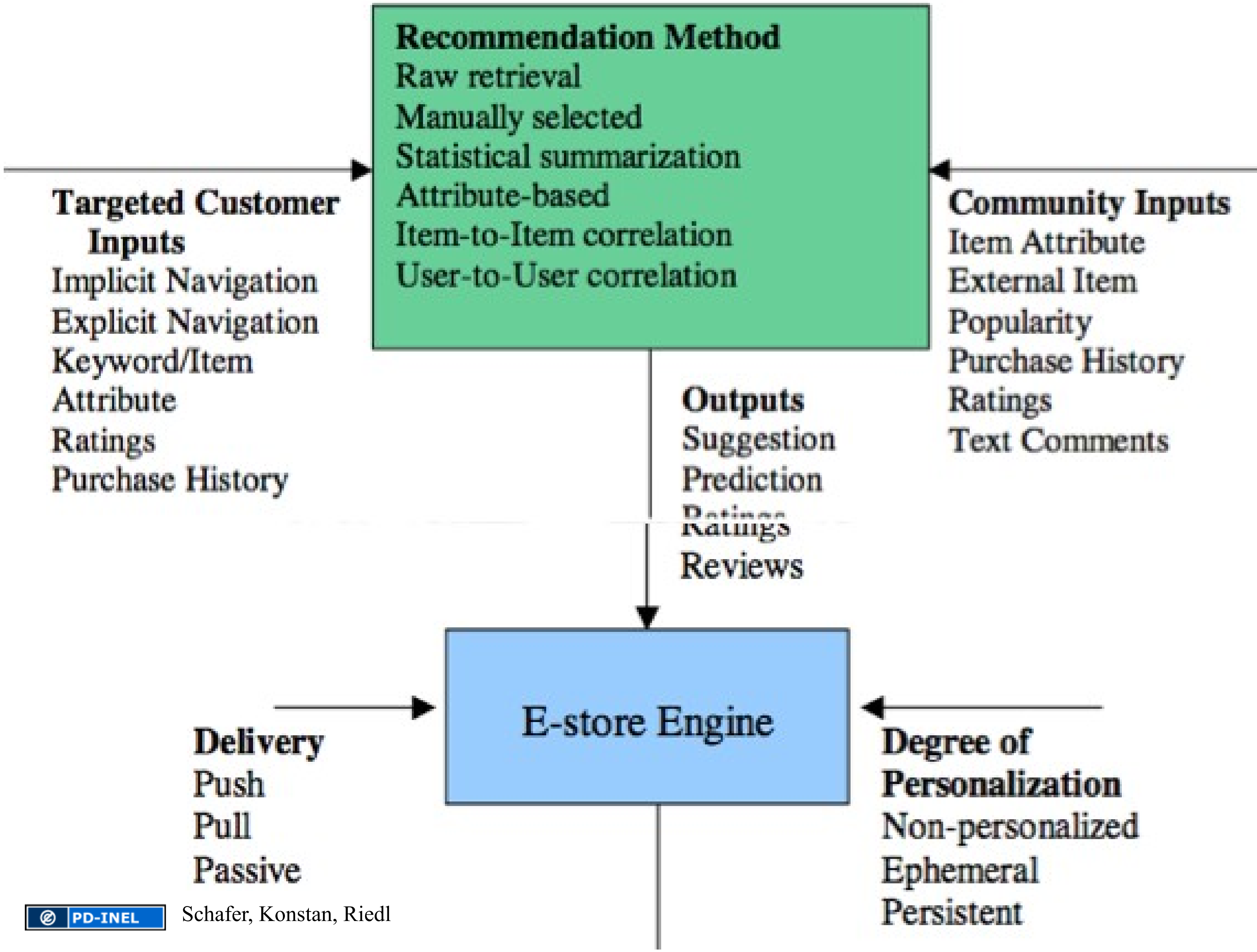
Taxonomy of E-Commerce Applications [Schafer, Konstan, Riedl]

- Characterize systems based on
  - Functional Inputs & Outputs
    - note: navigational inputs
  - Recommendation Method
    - user-user, item-item, PageRank, etc.
  - Other design issues (esp., personalization)

A Taxonomy for Recommender Applications



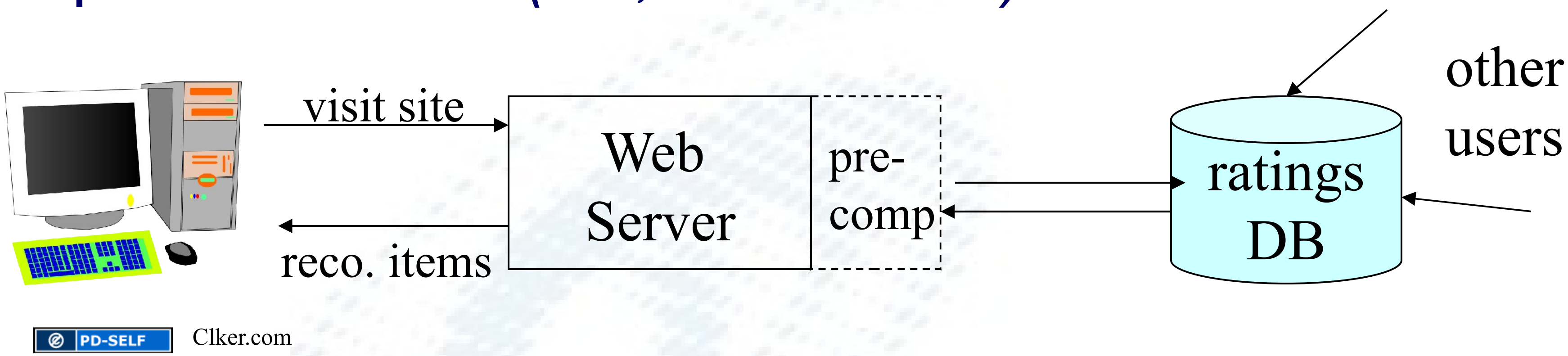
Schafer, Konstan, Riedl

Degrees of Personalization

- Unpersonalized
- Ephemeral personalization
  - e.g., based on shopping cart alone
  - user profile is not long-lived
- Persistent personalization
- What factors would influence your choice?

Software Architecture

- Don’t try to do the entire recommendation process *online (i.e., in real time)*



- Goal: precompute as much as possible, and do as little as necessary when you have to generate a recommendation

Software Architecture

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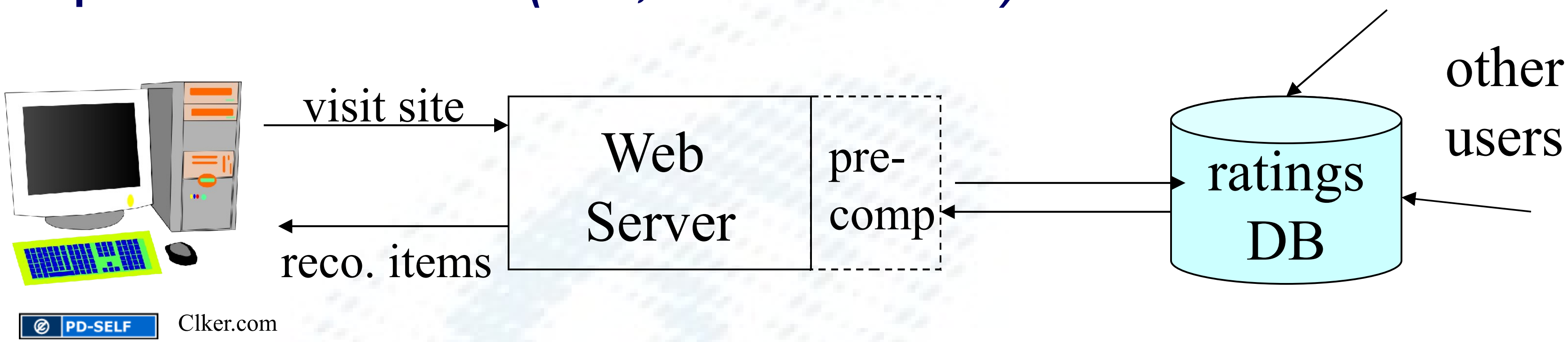

- Goal: precompute as much as possible, and do as little as necessary when you have to generate a recommendation
  - *Tradeoff: precomputed values may be “stale”*

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User-User algorithm: Precompute what?

To recommend items to Joe:

- Normalize all ratings by user means, standard deviations
- Compute similarity (Pearson correlation coefficient) between Joe and each other user
- Compare a set of nearest neighbors based on similarity scores
- Compute the weighted average of other users' z-scores on each item X
- Either:
  - denormalize and report predicted value
  - or, sort and report ranked list of items

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(typically precomputed)

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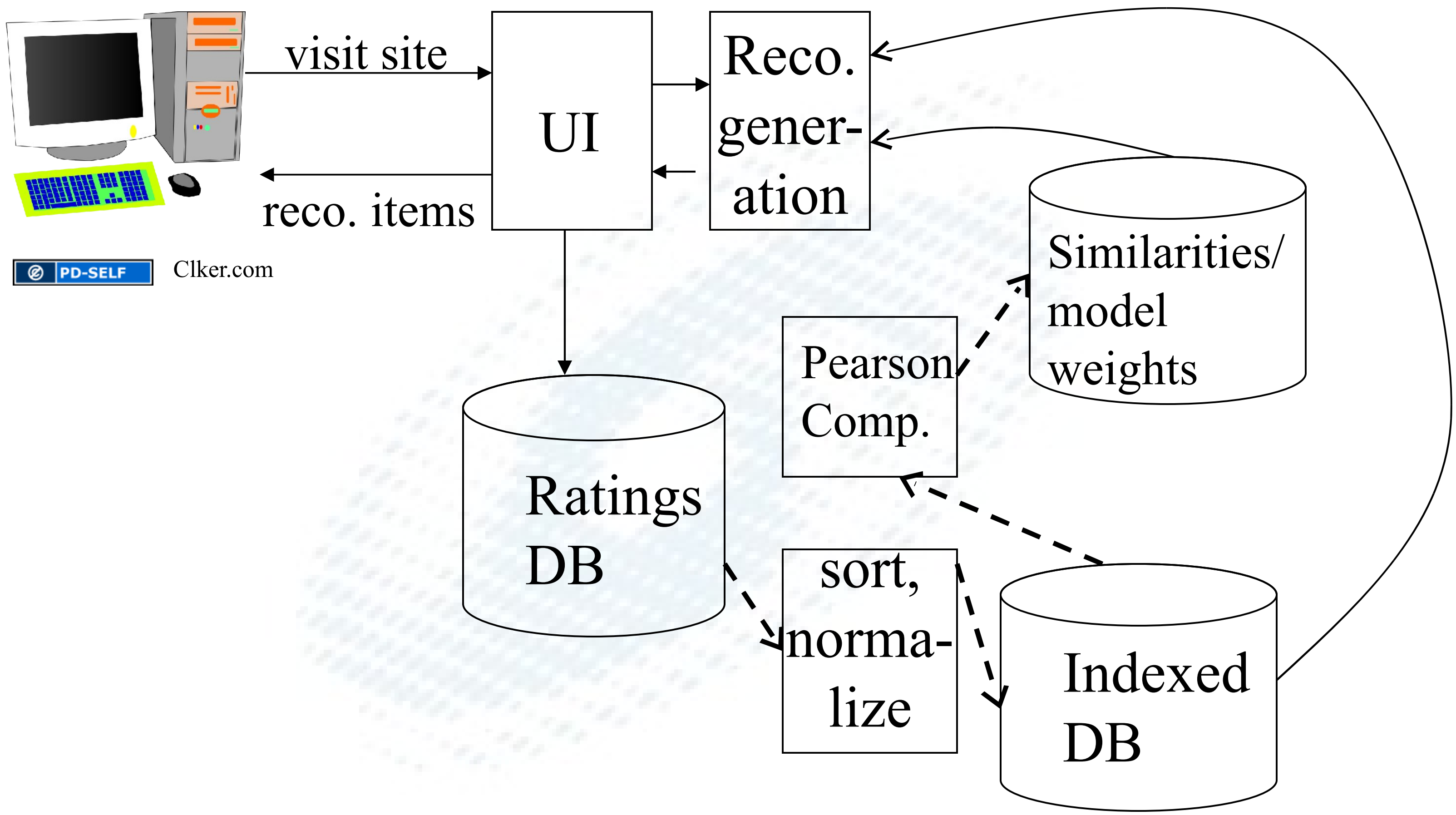
Rationale

- Similarity between users is more likely to be stable over time => it should not matter too much if you use slightly old value
- Neighborhoods decided using only similarity info=> no additional damage if they are also pre-computed
- Recent items may have many new ratings => pre-computing these would lose a lot of information

Software modules



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Recap: Term papers

- A short paper that is a mock “consultant’s report” which
  – identifies a potential application for a recommender system
  – explores the design space of a recommender system for that domain
  – suggests a design
  – points out strengths and weaknesses/pitfalls
- Due by Feb 20th (before winter break)

Case Study: Recommending email messages from a list

- Domain: email list for an online community
- How a recommender might help: guide users to interesting messages