Components and Functions of Crowdsourcing Systems

A Systematic Literature Review

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Short Vita

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• Research interests:
  • Information and Knowledge Management
  • Semantic Web and Linked Data
  • Crowdsourcing
• Affiliations:
  • Manifesto for a Standard on Knowledge Exchange in Social Knowledge Management Environments
  • Knowledge Research Center (KRC) e.V. Dresden
Motivation

Practical relevance:
• development of a crowdsourcing system (CSS) and its integration into existing IT infrastructure is risky, cost-intensive, and time-consuming,
• structured development process required

Theoretical relevance:
• various theoretical contribution in the area of crowdsourcing
• however, little has been investigated to define a crowdsourcing system and its technical design aspects precisely
Method: Systematic Literature Review

Research Questions (RQs):

**RQ1:** How and in which detail are CSSs defined in current research literature? What design aspects do they cover?

**RQ2:** What type of components and functions of a CSS can be conceptualized?
Search Strategy #1

- **Population**: peer-reviewed conference proceedings and journal papers in English since 2006; dissertations, newspaper articles, unpublished works or non-scientific articles were not considered

- **Search Resources**: ACM Digital Library, Ebscohost (Academic Search Complete and Business Source Complete), Emerald, IEEE Xplore Digital Library, Sage Journals, ScienceDirect, SpringerLink and Wiley

- **Search Terms**: crowdsourcing system, crowdsourcing application, and crowdsourcing platform (in singular and plural)
Search Strategy #2

<table>
<thead>
<tr>
<th>Database / Search string and restrictions</th>
<th>Crowdsourcing</th>
<th>Crowdsourcing system(s)</th>
<th>Crowdsourcing application(s)</th>
<th>Crowdsourcing platform(s)</th>
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</table>

- **Inclusion criteria:**
  - define or at least propose a description of what CSSs are (RQ 1)
  - address design issues of CSSs (RQ 2)
  - or classify or give an overview of CSSs (RQ 2).

- **Exclusion criteria:**
  - use CSSs for evaluation purposes but do not address design issues
Conduct Search

Step 1:  
  a) review the abstract, introduction, and conclusion  
  b) check inclusion and exclusion criteria  
  c) label publication and research type → Relevant studies = 72

Step 2:  
  a) read article, find and record the definitions of CSS  
  b) set keyword for each article to identify components and functions of CSSs
Results: Crowdsourcing System Definitions (RQ1)

- 17 definitions or descriptions of the term crowdsourcing system, application, or platform
- vary in detail and none of them cover all of the four derived perspectives

“Crowdsourcing Platform is a trusted broker ensuring that providers successfully complete the task requests and that requestors pay for the charges. Crowdsourcing Platform issues authentication credentials for requestors and providers when they join the platform, stores details about skill-set, history of completed requests, handles charging and payments, and manages platform misuse. Crowdsourcing platform can execute crowdsourcing requests in a number of different modes, by advertising them on the marketplace, allowing providers to bid for them, or in the form of a competition, where requestor identifies criteria to be used for selection of the winning submission. Crowdsourcing platform may further allow requestors and providers to team-up.” (Vukovic, 2009)
Perspectives

- **Organizational perspective**
  - mediator, marketplace, interface, or trusted broker

- **Process perspective**
  - detailed actions performed to data objects or users

- **Technical perspective**
  - software components, technical functions, or data objects

- **Human-centric perspective**
  - human brainpower and collective intelligence

**Crowdsourcing System**

- broker
- requester
- crowd

**Perspectives of crowdsourcing systems (source: own illustration)**
Results: Components and Functions (RQ 2)

Components and functions of crowdsourcing systems (source: own illustration)
Conclusion and Next Steps

• development of an integrated CSS definition
• overview of reusable software components and functions may be used as a checklist
• dependencies between the elements are not well represented
• designing a semantic model to support knowledge-intensive crowdsourcing activities
Components and Functions of Crowdsourcing Systems

References


Contact

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