

A Norm-based Approach for Crowdsourcing

We outline an approach to capture requirements for a social-crowdsourcing application. Follow this approach to prepare your project report.

Background on Norms

Humans, organizations and technical systems such as software interplay with each other in a *sociotechnical* system. To capture requirements of sociotechnical systems, we adopt Singh's [1] model of norms. A norm is directed from a subject to an object and is constructed as a conditional relationship involving an antecedent (which brings the norm in force) and a consequent (which brings the norm to satisfaction). This representation yields clarity on who is accountable to whom. A norm has four core elements—SUBJECT, OBJECT, *antecedent*, and *consequent*. It can be formalized as $N(\text{SUBJECT}, \text{OBJECT}, \textit{antecedent}, \textit{consequent})$. Norms in our approach are of the following main types.

A commitment means that its subject commits to its object to ensure the consequent if the antecedent holds. For example, in a meeting room, the participants may be committed to each other to keep their phones silent. We write a commitment as:

$C(\text{SUBJECT}, \text{OBJECT}, \textit{antecedent}, \textit{consequent})$

A prohibition means that its subject is forbidden by its object from bringing about the consequent if the antecedent holds. For example, in an examination hall, the proctor may forbid students from answering phone calls. We write a prohibition as:

$P(\text{SUBJECT}, \text{OBJECT}, \textit{antecedent}, \textit{consequent})$

Scenario

Consider hypothetical scenarios involving two phone users Alice and Bob.

Library scenario: Alice is in a public library when receives a call from her friend Bob. Knowing library is not the right place to talk loudly, and Bob's calls are usually casual, she decides to not answer Bob's call. Later, when she is at home, she answers Bob's call.

Theater scenario: Bob is in a theater when he receives a call from his coworker Steve. He decides to answer Steve's call believing the call would be urgent, and ignores the fact that movie theater is not the correct place to talk on phone.

Approach Outline

- Identify all actors involved in a scenario, e.g., *Alice* and *Bob*.
- Abstract actors as roles where appropriate, e.g., *phone user* and *coworker*.
- Identify all actions in a scenario, e.g., “Alice’s does not answer phone call when she was in library” and “Bob answer his coworker’s urgent phone call.” Further, abstract actions where appropriate, e.g., “Phone user does not answers phone call” and “Phone user answers phone call.”
- Identify contexts in the actions, e.g., “in library”, “in theatre,” and “urgent phone call.”
- Identify relevant norms, e.g., “Phone user is committed to answer urgent phone calls from coworkers,” and “Phone user is prohibited from speaking (answering calls) in the library.”

$C_{coworker}$: $C(\text{PHONE-USER}, \text{COWORKER}, \text{urgentcall}, \text{answer})$

$P_{library}$: $P(\text{PHONE-USER}, \text{LIBRARY}, \text{call}, \neg \text{answer})$

- Identify possible conflicts and inconsistencies between norms, e.g., “urgent phone call from coworker when phone user is in library”, e.g., $\text{conflict}(C_{friend}, C_{library})$.
- Resolve conflicts by capturing contextual preference between norms, e.g., “always answer phone calls by coworkers.”

References

- [1] Munindar P. Singh. Norms as a basis for governing sociotechnical systems. *ACM Trans. Intell. Syst. Technol.*, 5(1):21:1–21:23, December 2013.