

Supplementary Material for Research Paper “Explanations in Everyday Software Systems: Towards a Taxonomy for Explainability Needs”

2024

1 Coding Guidelines

1.1 Round 1 - Preliminary Coding

Implicit Needs for Explanation:

We consider a statement to contain implicit need for explanation if it is not a direct question and fits one or more of the following criteria.

- Statement contains one or more trigger words:
 - not obvious
 - not comprehensible, strange, groundless
 - something suddenly happened
 - absurd output, output that does not make sense
 - questionable
- Lack of understanding: respondent expresses that he or she does not understand something
- Surprise: respondent expresses that something unexpected has happened
- Not comprehensible: respondent expresses that it is not possible to understand where output comes from (not criticism/complaint about functions)
- Software not usable without help/explanation: respondent expresses that he or she needs on help

Explicit Needs for Explanation:

We consider a statement to contain explicit need for explanation if it fits one or more of the following criteria.

- Statement is a direct question or request
- Statement contains one or more trigger words:
 - Question words in the context of a question: What, why, for what reason, how, where, when ...
 - Have/need/want/would like to find out
 - Have/need/want/would like to understand
- Respondent expresses intent to interact with the software, but also that they do not know how to do so
- Respondent expresses that they want to understand something
- Respondent complains that something is not explained

Unspecific Needs for Explanation:

We consider a statement to contain unspecific need for explanation if it fits one or more of the following criteria.

- Respondent states implicit or explicit need for explanation, but does not specify what for (e.g. “Yes, I want an explanation.”)
- Respondent states implicit or explicit need for explanation, but it is unclear what he or she means/is talking about.

Exclusion Criteria:

We consider a statement to not contain any need for explanation if it fits one or more of the following criteria.

- Respondent states that they do not need help/an explanation
- Response is not serious (e.g. state contains “lol”, “lmao”, etc.)
- Response does not relate to the question
- Response does not refer to software itself (question to management, business model, etc.)
- Respondent states that there was a need for help/explanation, but also that the solution was trivial

1.2 Round 2 & 3 - Type of Need Coding

We categorized needs for explanation based on the topics they referred to:
System Behavior:

- **Unexpected System Behavior**
 - Why did X happen?
 - Why did X change?
- **Bugs & Crashes**
 - Respondent expresses that there is a bug or a crash
- **Algorithm**
 - How does the system work?
 - How did the system arrive at a result?
- **Consequences**
 - What happens if one does X?
 - If I do X, does Y happen?

Interaction:

- **Operation**
 - How do I do X?
 - How do I achieve X?
 - Why can't I do X?
- **Navigation**
 - Where can I find X?
 - Respondent expresses that searching for X is bothersome
- **Tutorial**
 - Respondent expresses trouble using software as a lay user
 - What does new function X do?
 - How did function X change?

Domain Knowledge:

- **System-specific Elements**
 - Response refers to unique parts of a system (e.g. different types of accounts and their privileges, why specific inputs is needed in certain parts of the software, etc.)
- **Terminology**
 - Explanation of technical/non-intuitive/unknown terms (e.g. “V-Sync”, “MRT”, etc.)

Privacy & Security:

- **Privacy**
 - Response refers to the use/storage/processing of personal data
- **Security**
 - Response refers to vulnerabilities
 - Response refers to security mechanisms

User Interface:

- Response refers to user interface or design, but not to functionalities or interactions
- Why is the user interface the way it is?
- Why did the user interface change in X way?