

CONTRIBUTION STRUCTURES FOR REQUIREMENTS TRACEABILITY

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Our research is concerned with the problem of requirements traceability (RT). In the context of systems and software engineering, RT refers to the ability to describe and follow the life of a requirement in both a forwards and backwards direction. Despite being highlighted as an area in need of improvement in the 1970's, being introduced as a mandatory activity in numerous standards, and a surge in dedicated support, RT remains cited as one of the dominating problem areas by industry today.

In recognising that RT problems are multifaceted in nature, and that there is unlikely to be an all-encompassing solution, we attribute their persistence to the distinct lack of any thorough problem analysis. Prevailing approaches to RT only provide partial solutions because, being primarily solution-driven, they fail to account for the underlying issues which actually cause and perpetuate RT problems in practice. Consequently, our position is that the greatest potential for relieving RT problems lies in identifying and addressing those fundamental issues which underlie extant problems.

Arguing our position, we suggest that the crux of the RT problem revolves around the paucity and unreliability of information about the human sources of requirements. This suggestion is directly based upon findings from an empirical analysis of the RT problem conducted with over one hundred practitioners. In these studies, we found that practitioners predominantly claim to have experienced RT problems when, being unable to retrieve particular information about requirements artifacts that they want from a project repository, they have further been unable to identify those people in a position to supply it.

We propose that, by making the social infrastructure that gave rise to requirements artifacts explicit, an appropriate basis would be provided for tackling the crux of the RT problem. More specifically, we have developed an approach through which the contribution structures underlying requirements can be defined, maintained, and utilised for this purpose. This proposal is also grounded in our empirical findings. These indicated that, although human contact is considered the most intrinsic way to alleviate RT problems, it is surprisingly problematic to achieve. We assert that this is because contemporary RT-related work, in its strive to supplant the need for informal communication with ever-more extensive and traceable project documentation, does not prepare suitable foundations to actively facilitate this most basic of working practices.

We are currently undergoing case studies to evaluate our approach and position. Preliminary experience with a prototype tool suggests that the ability to extend conventional forms of artifact-based RT with corresponding contribution structures accommodates the diverse forms of personnel-based RT that practitioners were found to need to eliminate many of their RT problems.

KEY REFERENCES

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