

Transparency as a Requirement

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The concept of transparency refers to the possibility of accessing information, intentions or behaviours that are revealed through a process of disclosure [4]. It is usually linked to accountability, openness, and efficiency [1]. Transparency depends on the accessibility and availability of information and how this can support users in the process of decision making [4].

In requirements engineering literature, socio-technical systems (STSs) are typically seen as a set of inter-dependent social and technical actors, as is the case with goal modelling and business process modelling. Amongst these actors, transparency is generally considered to produce desirable effects. For example, transparency can result in a high level of resilience in STSs [3]. However, there are instances where transparency may have adverse effects. For example, in a four-year organisational study, [2] discovered that transparency in the context of a clinical risk management can act, perversely, to undermine ethical behaviour, leading to organisational crisis and even collapse. Consequently, transparency cannot be seen as a one-size-fits-all solution, and when implemented ineffectively, it can lead to serious issues in STSs. Transparency may have multiple side-effects on the business goals of actors and their inter-relations. For example, it may lead to information overload or create unnecessary bias and clustering amongst actors. Transparency could be seen either as a special kind of requirement or as a meta-requirement, i.e., to know how a requirement is being fulfilled.

In the domain of information systems and requirements engineering, modelling similar social concepts such as trust, privacy and security [5] is motivated by the concept of separation of concerns and modularity. However, despite the importance of transparency, and the unique characteristics and special properties that should be identified with this concept, e.g., deciding the right transparency level and predicting its side-effects, there are no dedicated models, tools or approaches with which to handle transparency. As a result, the fine line that usually exists between balanced transparency, on one side, and the lack or abundance of transparency, on the other, is an under-researched issue. Furthermore, the conflicts that may arise when different stakeholders need different levels of transparency are yet to be explored and researched.

Example. There are several websites which offer audio-to-text transcription services. While users' actual requirement is the transcription of their audio files to text files, they may also want to know how their requirement is achieved, e.g. whether the transcription is done via an automated process or by handing it over to other people, and if so, how much these people are paid, etc. On the other hand, the policies practised by the transcription service may prevent it from disclosing such information to its users.

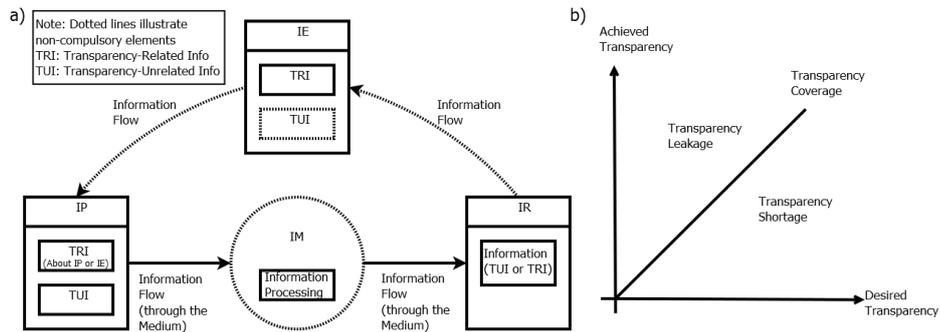


Fig. 1: a) Information Transparency Model; b) Transparency Analysis

We aim to identify how transparency requirements should be modelled, in order to best aid analysis of an STS and support for communication and collaboration among the range of actors. This would include consideration of how to find the transparency level that suits an actor's needs and also falls within their personal, organisational and institutional limits and boundaries.

As an initial conceptual model, we consider transparency as being about information and how it flows among different entities. Such flows of information can be broken down into constituent elements: information, information provider (IP), information receiver (IR), information medium (IM), and information entity (IE), as illustrated in our initial transparency model (Fig. 1a). Note that here information is considered from the viewpoint of information providers, and not information receivers. Such conceptualization is meant to enable us, amongst other things, to consider three outcomes for transparency analysis: transparency shortage, transparency coverage and transparency leakage (Fig. 1b).

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