5 Hypermedia Support for Argumentation-Based Rationale: 15 Years on from gIBIS and QOC


Abstract: Having developed, used and evaluated some of the early IBIS-based approaches to design rationale (DR) such as gIBIS and QOC in the late 1980s/mid-1990s, we describe the subsequent evolution of the argumentation-based paradigm through software support, and perspectives drawn from modeling and meeting facilitation. Particular attention is given to the challenge of negotiating the overheads of capturing this form of rationale. Our approach has maintained a strong emphasis on keeping the representational scheme as simple as possible to enable real time meeting mediation and capture, attending explicitly to the skills required to use the approach well, particularly for the sort of participatory, multistakeholder requirements analysis demanded by many design problems. However, we can then specialize the notation and the way in which the tool is used in the service of specific methodologies, supported by a customizable hypermedia environment, and interoperable with other software tools. After presenting this approach, called Compendium, we present examples to illustrate the capabilities for support security argumentation in requirements engineering, template driven modeling for document generation, and IBIS-based indexing of and navigation around video records of meetings.

Keywords: rationale capture, cognitive overhead, hypermedia, argumentation, compendium, IBIS, QOC

5.1 Introduction and Overview

Few would disagree with this book’s opening chapter that the systematic management of design rationale (DR) is not yet common software engineering practice. By extension this applies to the particular flavor of DR with which we work, namely the IBIS/QOC approaches to creating graphical argumentation maps of design deliberation (reviewed in Chap. 1 and classed as “prescriptive, intrusive” in nature). It is the “intrusive” nature of such notations that represent an obstacle to adoption (we will unpack in more nuanced terms what this means), and which has led many to the conclusion that DR based around explicit, graphical argument maps is yet another failure of exciting research ideas to overcome the harsh realities of actual day-to-day practice.
This chapter argues that the story is more complicated but more hopeful. Since the late 1980s, through business and industrial case studies, detailed lab analysis, and continual design refinement, we have been reflecting on the set of interacting factors which together can “make or break” them in the heat of collaborative analysis, modeling and design. The Compendium technique and tool has matured to the point where a steering group (a subset of the authors) is coordinating the development of an open source Java hypermedia IBIS mapping tool, with an international user community spanning government, NGOs, education and business, documented case studies, and training courses and online resources. Clearly, there are no silver bullets, but progress has been made since the intense activity that led up to the first DR book in 1996, and the subsequent decline in activity as the challenges of truly embedding argumentation-based DR in work practices sank in. In particular, although quality software support is required, it turned out to be the human factors that required closer attention.

The objective of this chapter is to update the software engineering community on how and why the QOC [20, 21] and gIBIS approaches [10, 11] we helped to create originally, have subsequently evolved into the current Compendium approach and tool.

5.2 The Vision

Chapter 1 has already provided a broad summary of the rationale behind Horst Rittel’s IBIS, and the ways on which software engineering DR researchers have appropriated and extended it, so we will not duplicate that review. What we can add by way of introduction is an amplification of the rationale behind “prescriptive, intrusive” approaches, whose goal is to support and improve design reasoning. A converging strand of research in the history of computing to augment intellectual work, Rittel’s work converged with that of computing pioneers such as Vannevar Bush, Douglas Engelbart and John Seely Brown to forge an exciting vision of the power of cognitive, collaborative tools to both capture and augment design reasoning. The research community envisioned that hypertext groupware would make it easy to capture and structure the spectrum of informal and formal knowledge that goes into DR. Designers could capture their deliberations on the fly during design sessions. Visual networks of icons would be intuitive enough to realize the vision of participatory analysis amongst diverse stakeholders, who would not need to learn cryptic formal schemes in order to contribute tangibly to system requirements. Captured DR’s might be reusable, or at least would contribute greatly to the process of