

Proposing an acceptable semantics is a major issue for EM ...

In Computer Science, the preoccupation has been with how programs are interpreted on the machine ("operational semantics") or can be modelled mathematically ("denotational semantics"). As Brian Cantwell-Smith observes in "Two Lessons of Logic", this semantic story doesn't address the way in which the abstract structures manipulated in programming acquire meaning in the external world. This issue of understanding how software references "real-world entities" is a critical matter for improving the development process.

Spreadsheets (and to some degree other areas of computer science, such as the theory of relational databases) illustrate principles that do relate in an essential way to the connection between what is constructed on the computer and what it refers to in the application. Functional dependencies feature in both contexts: they determine the definitions of cells in a spreadsheet and also guide the way in which data is organised in a relational database. EM generalises this principle and is concerned in very general ways with how dependencies reflect intentions.

To use EM effectively for software development involves connecting these semantic stories. Relevant issues are:

- progression from artefact to construal to model to program
- linguistic elisions: *observable* to *variable*, *agent* to *process*, *privilege* to *protocol*
- traversing the EFL
- Harel - statecharts and Play-In Scenarios
- continuity in the development process: specification as conceptual firewall?

Giving a semantics to LSD is a central issue. Helpful to contrast various ways in which LSD can be applied:

- railway accident scenarios
- telephone
- vehicle cruise control
- digital watch
- systolic array

- each exhibiting more constrained and engineered operational behaviour. We ideally want to be able to provide a semantic framework that allows us to make the transition from an LSD account to an LSD specification seamlessly.

A key ingredient in this transition is from the personal to the common world. This motivates a role for construction. The semantics of dependency also demands a variety of construction: dependency is only meaningful in relation to the interaction of an agent in perturbing state.