# Guiding Requirements for the Ongoing Scheme Standardization Process

Mario Latendresse
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# Scheme Revisions

- Scheme, 1975 : Sussman and Steele
- R1RS, 1978 : Steele and Sussman
- R2RS, 1985: Clinger
- R3RS, 1986: Clinger and Rees
- R4RS, 1991: Clinger and Rees
- R5RS, 1998: Kelsey et al.
- R6RS, 2007: Sperber et al.
- R7RS, 201x: ...

# Current Steering Committee

- William D Clinger
- Marc Feeley
- Jonathan Rees
- Chris Hanson
- Olin Shivers

# Two Language Levels

- The R7RS standardization process introduced an amended charter.
- Two language levels: Small and Large.
- Two working groups, one for each level.
- Any conforming program for Small must also work for Large.

# Meta Comment

I am an outsider to the R7RS process.

# Main Objectives

- Opening a discussion on the Scheme Standardization process.

- In particular on the Steering Committee’s role.

# Main Points

1. There are not enough detailed Guiding Requirements for the Working Groups.
2. The rationales are as important, if not more important, as the resulting language.

# Observations

- Very knowledgable researchers working on the standardization of Scheme.
- A lot of the technical argumentations appear to be based on different implicit guiding requirements.

# Debugging

- Debugging is a common task of software development.

- It is rarely stated as a guiding requirement in language design.

- But it is implicit in many arguments: the REPL, the `load` command, detecting and signaling as many errors as possible, and more.

# Efficiency

- Small aims at a light Scheme but efficiency is also an important aspect.
- Efficiency can hardly be argued without implementation details.

# Optional Parameters

- SRFI 89, optional positional and named parameters, is based on SRFI 88.
- SRFI 88, keyword objects, is an example of a language feature that is required in Small based on efficiency considerations.

# Main Guiding Requirement of Scheme

*Programming languages should be designed not by piling feature on top of feature, but by removing the weaknesses and restrictions that make additional features appear necessary.*

# Some More Existing Guiding Requirements

1. Small should be compatible with R5RS.

2. Semantics compatible with some REPL (interactive read/eval/print loop).

3. Large should be compatible with a subset of R6RS.

# Existing Requirements

- In summary, the existing requirements are very general and lack guidance to decide between a large variety of point of views.

# “The goals of the steering committee:

we don't standardise or otherwise define the language;

- rather, we oversee the process of its definition.
- ...and, when necessary, we may steer the effort a bit.

That is, we *enable* the Scheme community to prosecute the development of the language – its definition, growth, extension, standardisation and implementation. Our chief mechanism is by granting charters to various committees that will carry out the actual tasks, and stamping the results of these efforts with our imprimatur.”

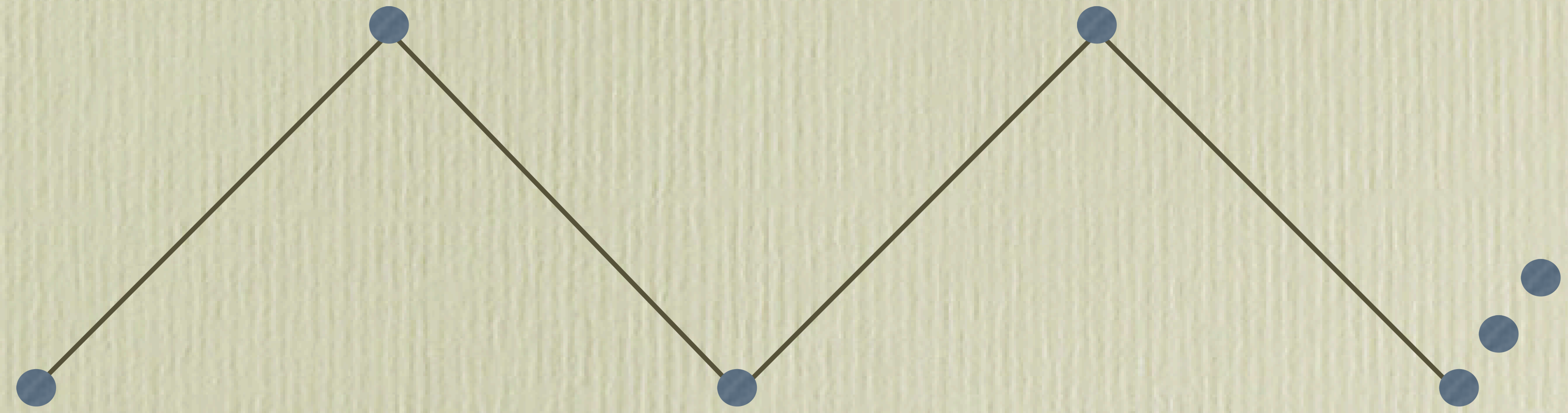
# Design Rationales
# vs
# Guiding Requirements

- Rationales are used by the Steering Committee to amend their Guiding Requirements.
- A guided  evolutionary approach:

*An iterative process between the Working Groups' rationales and the Steering Committee's Guiding Requirements.*

# Iterative Process

Working Groups



Rationales

Rationales

Starting Requirements

Revised Requirements

Revised Requirements

Steering Committee

# Prioritizing Guiding Requirements

- The Steering Committee might find it necessary to prioritize the Guiding Requirements as some of them can be conflicting.
- Example: debugging requirements vs efficiency.

# EuLisp

- Started in 1985 in Europe.
- General goal: less complex than Common Lisp but not as minimalist as Scheme.
- A two-level approach too, but only one group designed the two levels.
- Not any *guiding requirements* besides: "`efficiency, orthogonality and bloat` (avoidance of)"

Julian Padget, personal correspondence.

# The End

Thank you

Comments?

Questions?