

Birth of the Industrial Haskell Group

Duncan Coutts

 **Well-Typed**

CUFP 2009

Outline

A shared infrastructure

Establishing a consortium

An idea for shared development

Economics of programming languages

The economics drives us to *shared* languages and implementations.

- Private languages are a private cost
- Shared languages:
 - more public resources
 - more skilled people available
- Shared implementations:
 - share past development costs
 - **opportunity to share future development costs**

The more we do share, the more we can share

The more we share already, the greater the opportunity to share costs of new development

- Compilers
- Standard libraries
- Tools (profiling, testing, etc)

Models of programming language development

- Proprietary product
 - F#
- Open, central commercial vendor
 - Erlang
- Open, no central vendor
 - Haskell
 - ML
 - Lisp

Funding programming language development

Who do you pay?

- do it in-house
- central vendor
- consultants
- grad students...

How do we share costs?

Open community languages

Open community languages have particular advantages and disadvantages

- Loads of stuff for free
- Choice of consultants
- Academics and open source hackers can have different priorities and timescales
- Harder to share future development costs

We think a **consortium model** is a good match for the open languages.

Outline

A shared infrastructure

Establishing a consortium

An idea for shared development

Why start a consortium now?

Indicators of commercial use pointing upwards:

- Job postings
- Informal discussions
- CUFP attendance
- Mailing list traffic, downloads, feature request tickets

Planning discussions

Discussed it with Galois after CUIP last year

- Who does the organisation?
- Issue of cost and expected number of members

The Caml Consortium

- Aimed for around 20 members
- Cost: €3k– €10k for 12 months (\$4k–\$14k)
- Provides OCaml & libs under 4-clause BSD license
- Started with 4 members in 2002, 7 members by 2008
- Initially unable to fund full-time development
- Now has 10 members

Our analysis:

not charging enough, aiming for too many members

The Industrial Haskell Group

- Aim initially for 5 members
- Cost £6k for 6 months (\$10k)
- No special license

Starting a venture in a recession...



“Great idea! Call us back in a year.”

Birth of the IHG



- Started in March 2009 with 3 members
 - Including Galois and Amgen
- Funded 2 man-months of development work

How we decide what to do

- Internal mailing list
- Collect wish lists
- Look for overlaps and high priority tasks
- Collectively agree on the tasks

What IHG members asked for

- Short & medium term projects
- Feature additions
- System integration
- Development tools

- Not bug fixes
- Not releases
- Not language or core compiler issues

What the IHG has funded so far

- Dynamic libraries on Linux
- Ongoing work for dynamic libraries on Windows
- Allow building GHC without GMP lib
- Cabal improvement to reduce build times by increased sharing

Reflections on the process

- “Individual pots” have not been used much
- We would add our own suggestions for projects

Future aims

- Expand membership
- Add price-point for small companies
- Consider “sponsorship” level membership

Outline

A shared infrastructure

Establishing a consortium

An idea for shared development

What should consortia fund?

- Whatever the members want!
- Short and medium term projects of direct benefit:
adding features
- Fixing bugs, testing, performance, making releases
- **Development infrastructure**

Investing in infrastructure

A modest investment in development infrastructure...

Potentially large benefit

- more open reusable code
- higher quality (code, tests, docs)

Mechanism: help the open community to do more

A quick poll...

Benefits of a community language

Hackage — Haskell's package archive

- 1,500+ packages
- 400+ developers
- Growing steadily
- Mostly uniform packaging

Hackage contains

- Robust reusable libraries and tools
- Latest academic research
- Plenty of chaff

The Hackage example

For example, extend Hackage by publishing

- Build results
- Test results
- Test coverage
- Quality metrics

Benefits

- Distinguish the good packages
- Encourage quality

Virtuous cycle between commercial and other users

Summary

- Opportunities to share development costs
- Consortium model for open languages
- Invest in development infrastructure