What is Research Impact? How to Assess it?

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Where Does Software Technology Come From?

- Who should get the credit?
  - What credit should they get?
- How to award credit?
  - What measures?
  - How to determine them?
- Does this really matter?
  - To whom?
  - For what reasons?

Facile answers are misleading

- It comes from:
  - Sun, Microsoft, IBM, Rational, the web,
- Yes, but!
  - Where did they get it from? And how?
- It comes from Dr. X's research
  - Published a seminal paper
- Yes, but!
  - Someone else cleaned it up, crafted code
- It was "in the air"
  - How did it get there? Who nurtured it?

Why should we care? (as users, beneficiaries)

- Some technology isn't great
  - Why are we stuck with it?
  - Why isn't it better?
- Some technology seems useful
  - How can we get more of same?
  - How can we speed its appearance?
  - Are there institutions that need to be
    - Strengthened
    - Demolished

Why Should We Care? (As Researchers)

- Altruistic reasons
  - More effective tech transfer
  - Better technologies in use
- More self-serving reasons
  - Self-image
  - Academic status
  - Positive Attitude
  - Funding prospects

The Impact Project: Tracing the Source(s) of Technology to its Origins

- Focus is on Software Technology
- Start with technologies in widespread use
- Trace back to how they came into widespread use
- Document and analyze
  - What facilitates/inhibits technology flow?
  - How to make more good things happen more easily and more often

Credit is due to:

- Commercializers
- Researchers
- Tech Transfer agents
- Early adopters
- Scientific and Technical Communities
- Students with new degrees
- New Hires
- ETC.

What are the natures of their contributions?
How to value them?

Contributions Differ

- Initial conceptualization of idea
- Evangelism
- Prototype demonstration
- Public promulgation
- Nurturing by community activities
- Indoctrination and training (students)
- Product commercialization

How to Evaluate These?

- Qualitatively
- Quantitatively
- Different perceptions by different parties
- Difficulties in assessing contributions

Addressing These Difficulties

- History is hard
  - Especially for non-historians

Our Panel

- Mike Mahoney, Historian (!)
  - A historian views the Impact Project
- Dieter Rombach
  - Assessing Impact in Reviews/Walkthroughs
- Jacky Estublier
  - Assessing Impact in Config. Management
- Barbara Ryder
  - Assessing Impact on Modern Programming Languages

Some Broader Lessons

- Vendors tend to see value (impact) in
  - algorithms (e.g., differencing)
  - pieces of reusable code (e.g., RCS)
- But not in
  - concepts (e.g., hierarchical workspaces)
  - architectures (peer-to-peer repositories)
  - Which are often seen as “engineering common sense”
  - “Research had very little influence …”
  - “We do not sell ideas, but tools. We (re)invented everything we needed…”

More Lessons

- Researchers tend to see impact in
  - Precedence
  - Concepts
  - Prototypes
- But tend to devalue importance of
  - Efficiency
  - Usability
  - Reliability
  - seeing as “engineering common sense”
  - “We invented almost everything …”
  - “Tools are only an engineering issue …”

Still More Lessons

- **Both are right, both are wrong**
- **A good idea is had more than once**
- **Vendors have disincentives for distributing credit for ideas**
- **Researchers have incentives for claiming credit for ideas**
- **Research and productization both require *engineered creativity***

“Those who refuse to study history are doomed to relive it”

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“History teaches us that History teaches us nothing”