

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

the 1990s, the number of people in the UK who are employed in the public sector has increased from 10.5 million to 12.5 million, and the number of people in the public sector who are employed in health care has increased from 1.5 million to 2.5 million (Department of Health 2000).

There are a number of reasons why the public sector has expanded. One reason is that the population has aged, and the number of people who are dependent on the state has increased. Another reason is that the state has taken on more responsibilities, such as providing education and health care. A third reason is that the state has become more interventionist in the economy, and has created more public sector jobs.

The expansion of the public sector has led to a number of challenges. One challenge is that the state has to raise more money to pay for the increased spending. Another challenge is that the state has to manage the increased demand for services. A third challenge is that the state has to ensure that the public sector is efficient and effective.

There are a number of ways in which the public sector can be improved. One way is to increase efficiency. Another way is to increase effectiveness. A third way is to increase transparency. A fourth way is to increase accountability.

The public sector is a complex and challenging environment. It is important to understand the challenges and to find ways to improve it. This paper will discuss the challenges of the public sector and will propose some ways to improve it.

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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”**