

# **Is Continuous Adoption in SE Achievable and Desirable?**

:::::::

Gail C. Murphy



University of British Columbia  
Tasktop Technologies Inc.

@gail\_murphy

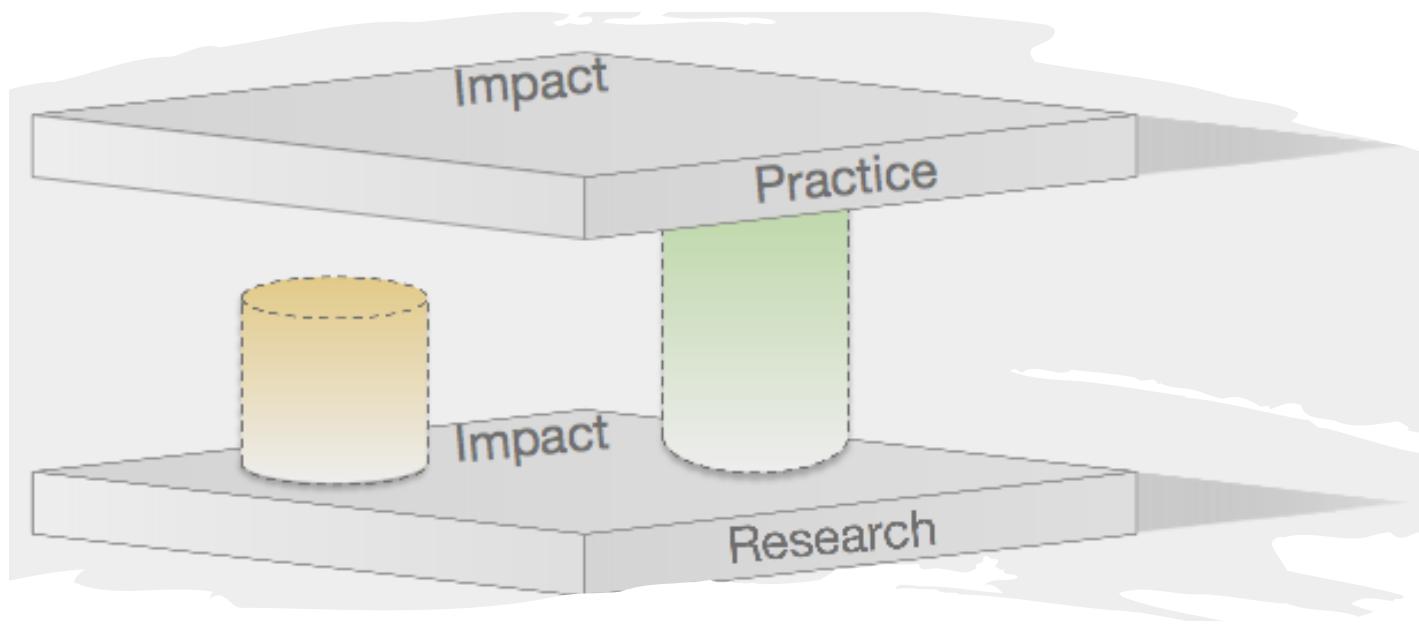




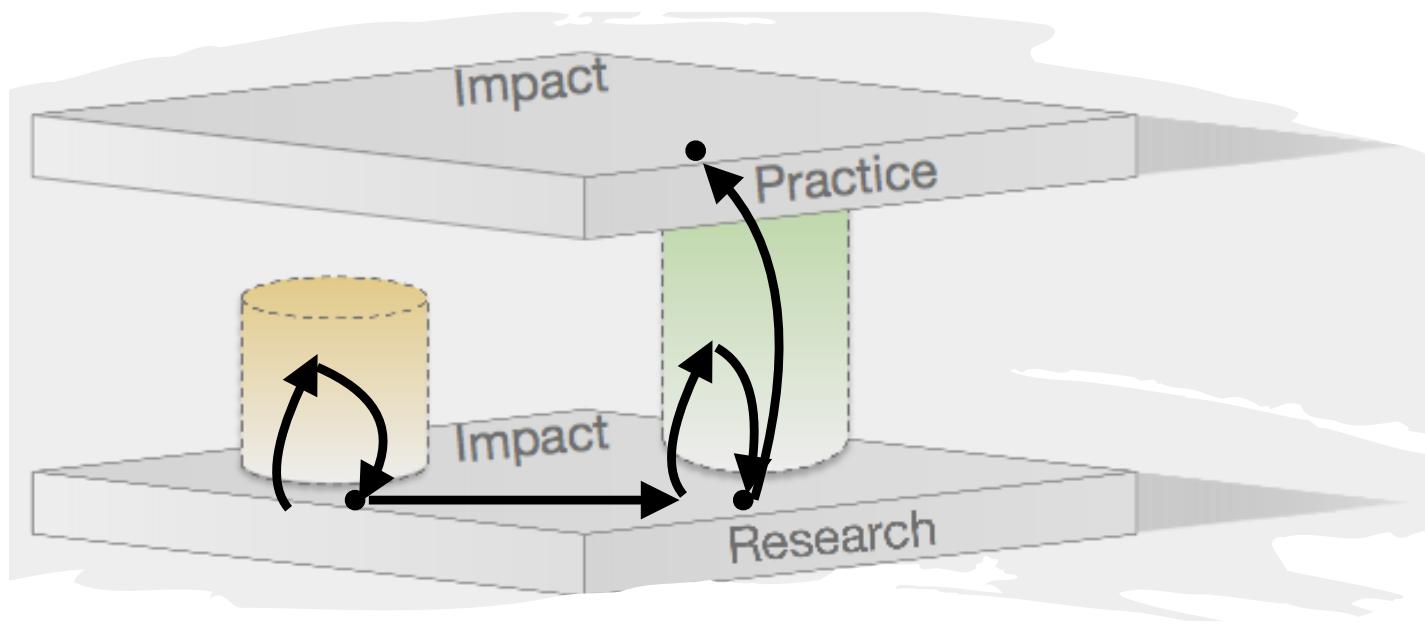
# **IMPACT**

# Stop thinking linearly





**Start thinking about multiple paths  
to impact(s) in  
research and practice**



**Start thinking about multiple paths  
to impact(s) in  
research and practice**

# **Overview**

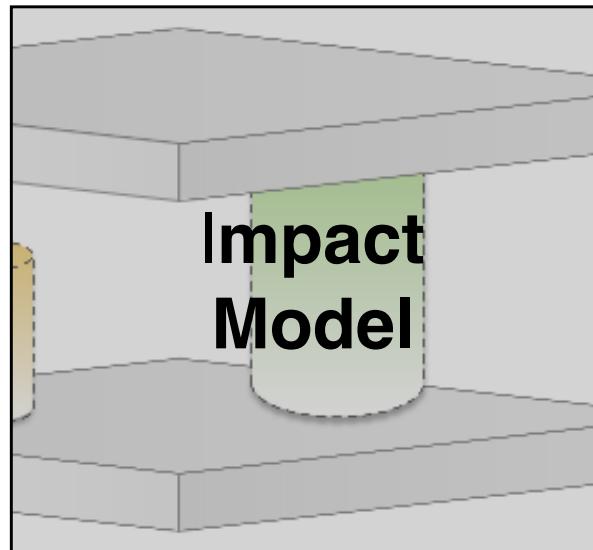
**Mylar**



**Story**

# Overview

How is research influencing the practice of software engineering?



**Innovation  
Adoption  
in  
Practice**

## **Continuous Integration Vignette**

# **Overview**

How is innovation occurring in the practice of software engineering?

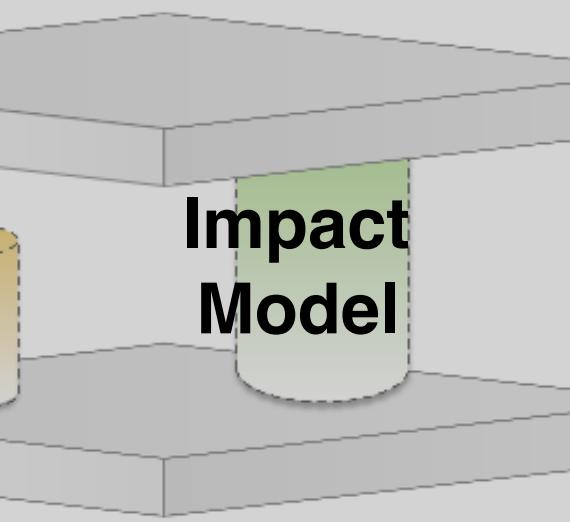
**Mylar**



**Story**

## **Continuous Integration Vignette**

**Innovation  
Adoption  
in  
Practice**



**Impact  
Model**

A diagram illustrating the Impact Model. It shows a cross-section of a layered system. A central vertical column is highlighted in green, representing the 'Impact Model'. This green area is surrounded by several horizontal layers, some of which are also partially shaded in grey or green, representing different components or layers of the system.

# **Overview**

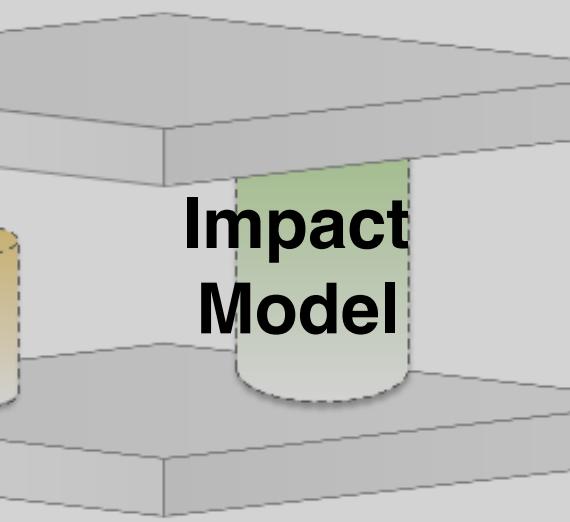
Mylar



Story

Continuous  
Integration  
Vignette

Innovation  
Adoption  
in  
Practice

A diagram illustrating the 'Impact Model'. It shows a cross-section of a layered system, possibly representing geological layers or different levels of a software stack. A specific layer is highlighted in green and labeled 'Impact Model'. This green layer is shown interacting with or situated between other grey layers.

Impact  
Model

# The Mylar/ Tasktop Story

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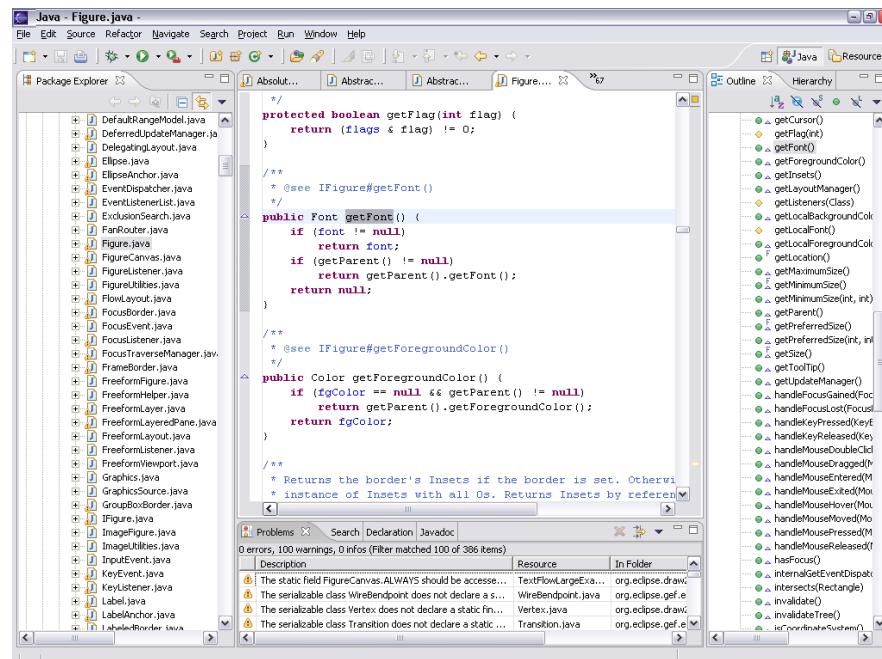
A story about  
paths to impacts  
in research and  
practice



# TIMELINE

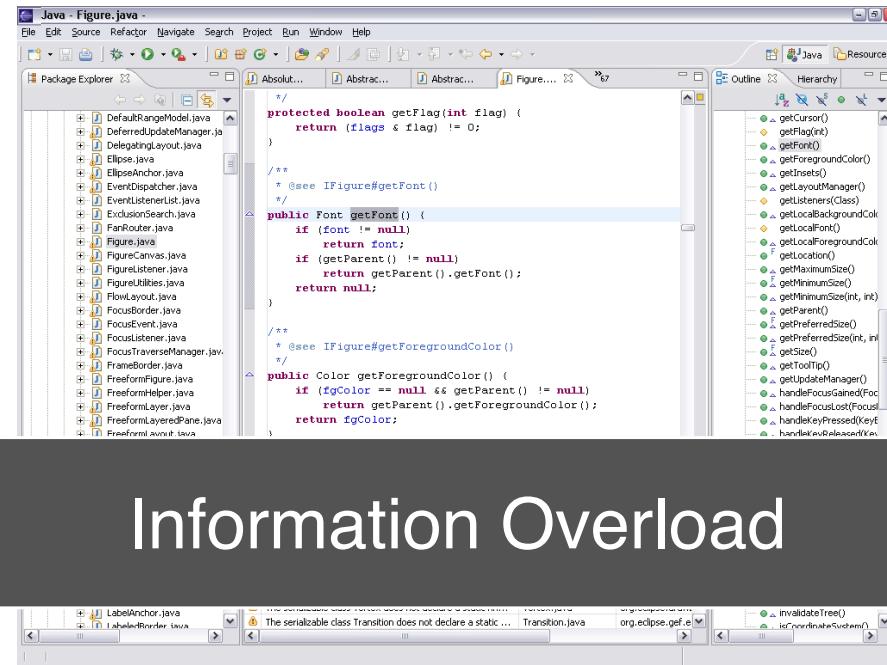
## 2004 Mylar

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# TIMELINE

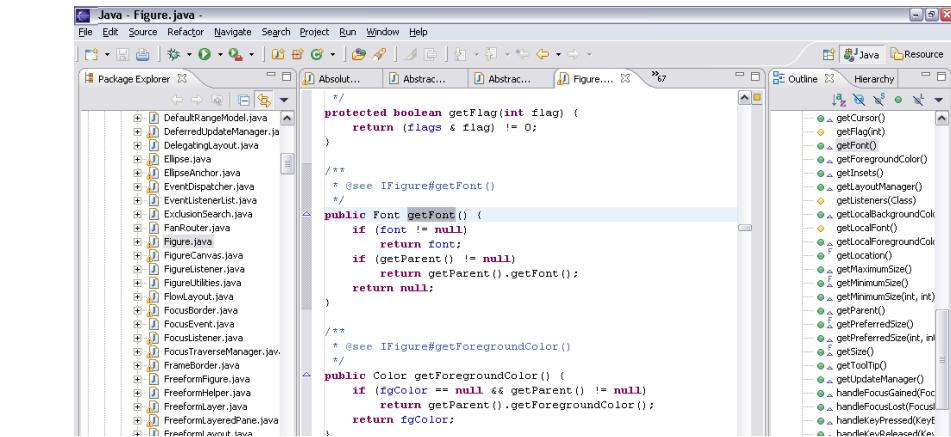
## 2004 Mylar



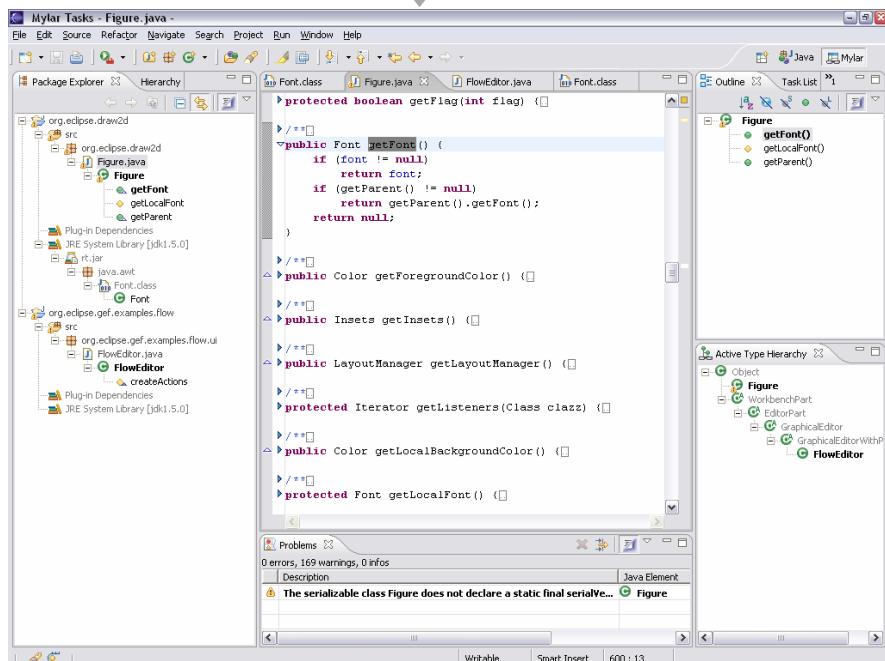
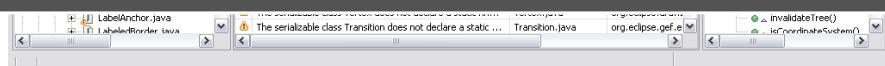
Information Overload

# TIMELINE

## 2004 Mylar



Information Overload



# TIMELINE

## 2004 Mylar

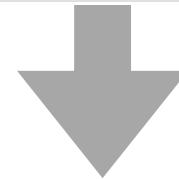
```
Java - Figure.java
File Edit Source Refactor Navigate Search Project Run Window Help
Package Explorer
Abstract... Abstract... Abstract... Figure.java
protected boolean getFlag(int flag) {
    return (flags & flag) != 0;
}

/**
 * @see IFigure#getFont()
 */
public Font getFont() {
    if (font != null)
        return font;
    if (getParent() != null)
        return getParent().getFont();
    return null;
}

/**
 * @see IFigure#getForegroundColor()
 */
public Color getForegroundColor() {
    if (fgColor == null && getParent() != null)
        return getParent().getForegroundColor();
    return fgColor;
}
```

Outline Hierarchy

Information Overload



Mylar

See only what you're working

## **TIMELINE**

2004 Mylar

**2007 Tasktop**

**Mik Kersten**



**Rob Elves**



**3 Co-founders**



**Gail Murphy**

**2 Staff**



**Shawn  
Minto**



**Leo Dos  
Santos**

## TIMELINE

2004 Mylar

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2016 Tasktop

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## **TIMELINE**

**2004 Mylar**

---

**2016 Tasktop**

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**Neelan Choksi**  
(President/COO since 2010)

**95+**

**Staff**



## **TIMELINE**

**2004 Mylar**

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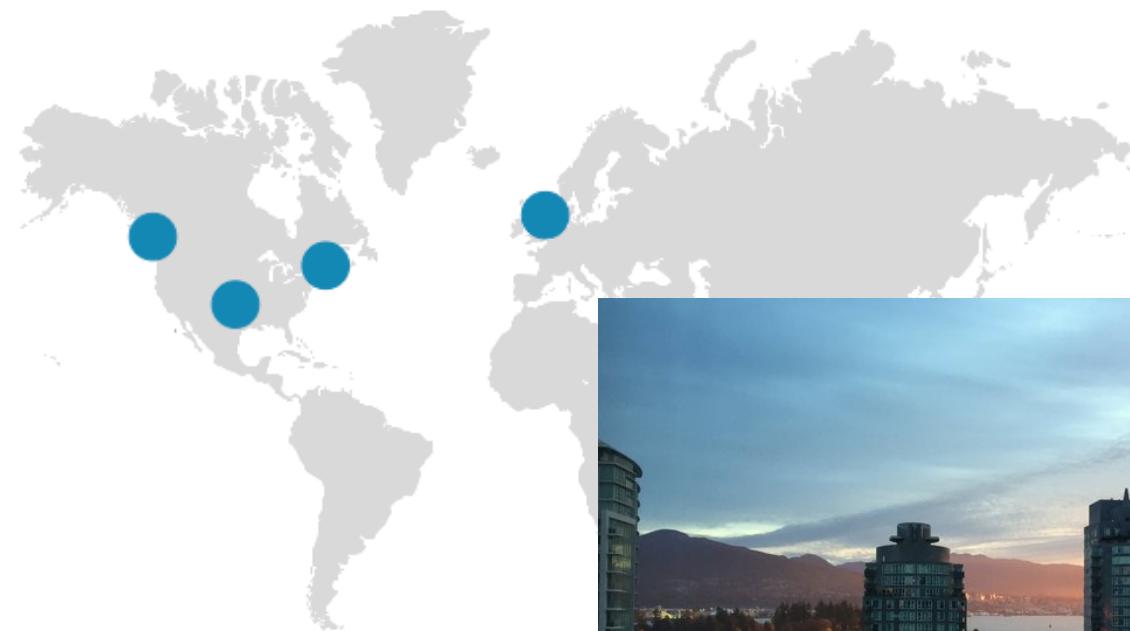
**2016 Tasktop**

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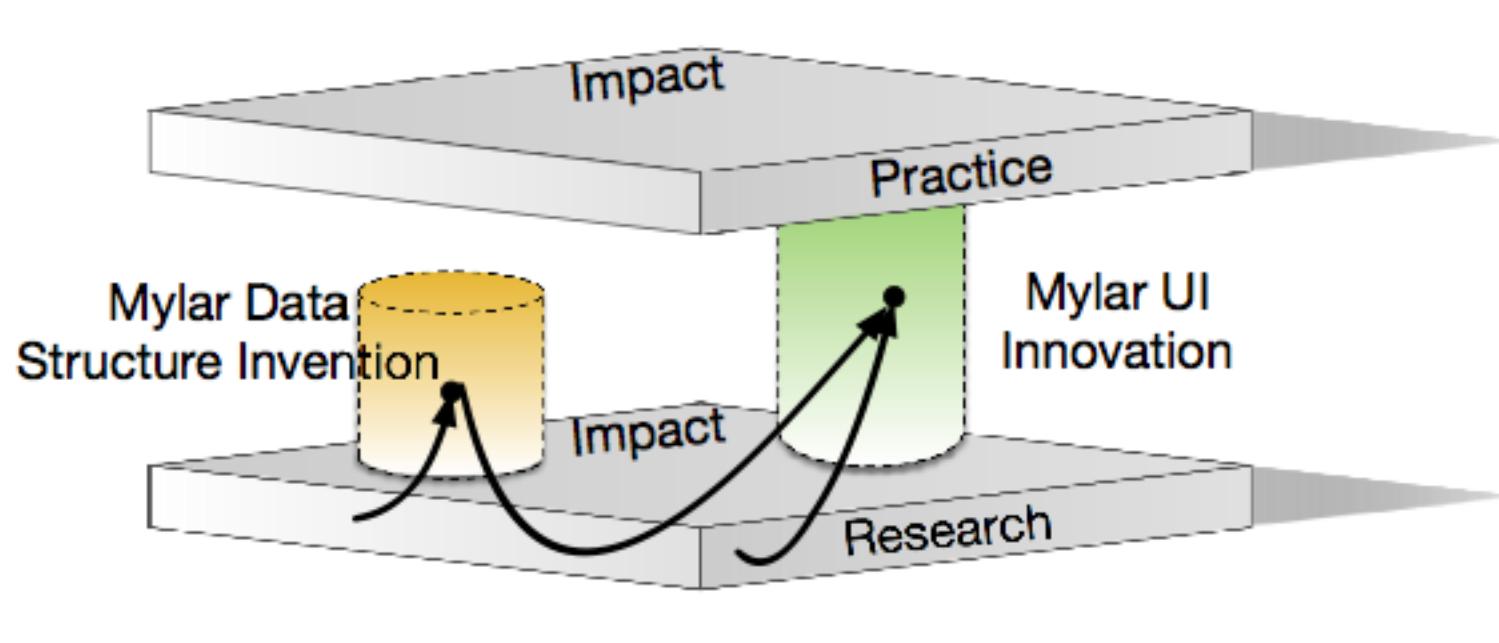
# Mylar Highlights: 2004-2007

- 2004      Mylar invention & innovation
  - 2004      1st industrial trial at IBM Toronto
  - 2005      1st academic publication
  - 2005      EclipseCon/Field Study/Eclipse project
  - 2005-06    Company discussions; biz competitions
  - 2007      Mik's Ph.D. Friday; incorporate Monday
- .....



# Mylar Highlights: 2004-2007

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|---------|--|
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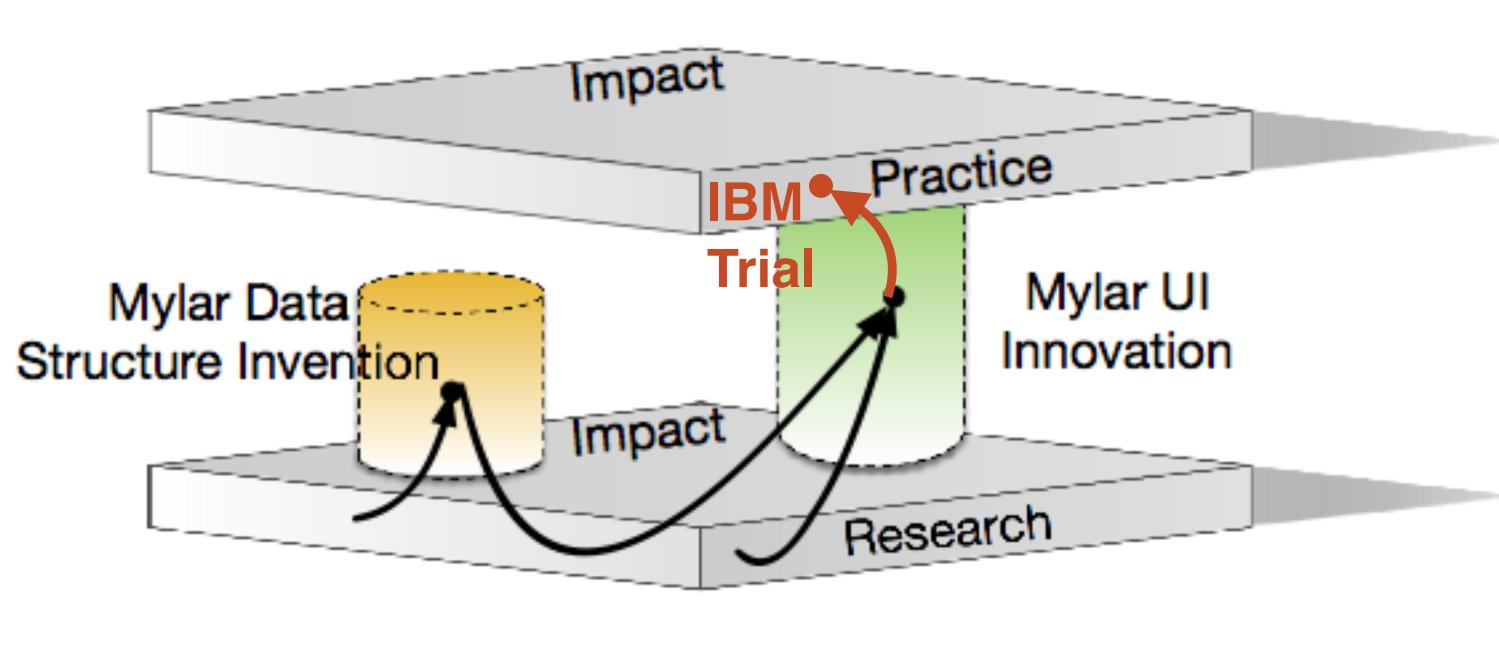




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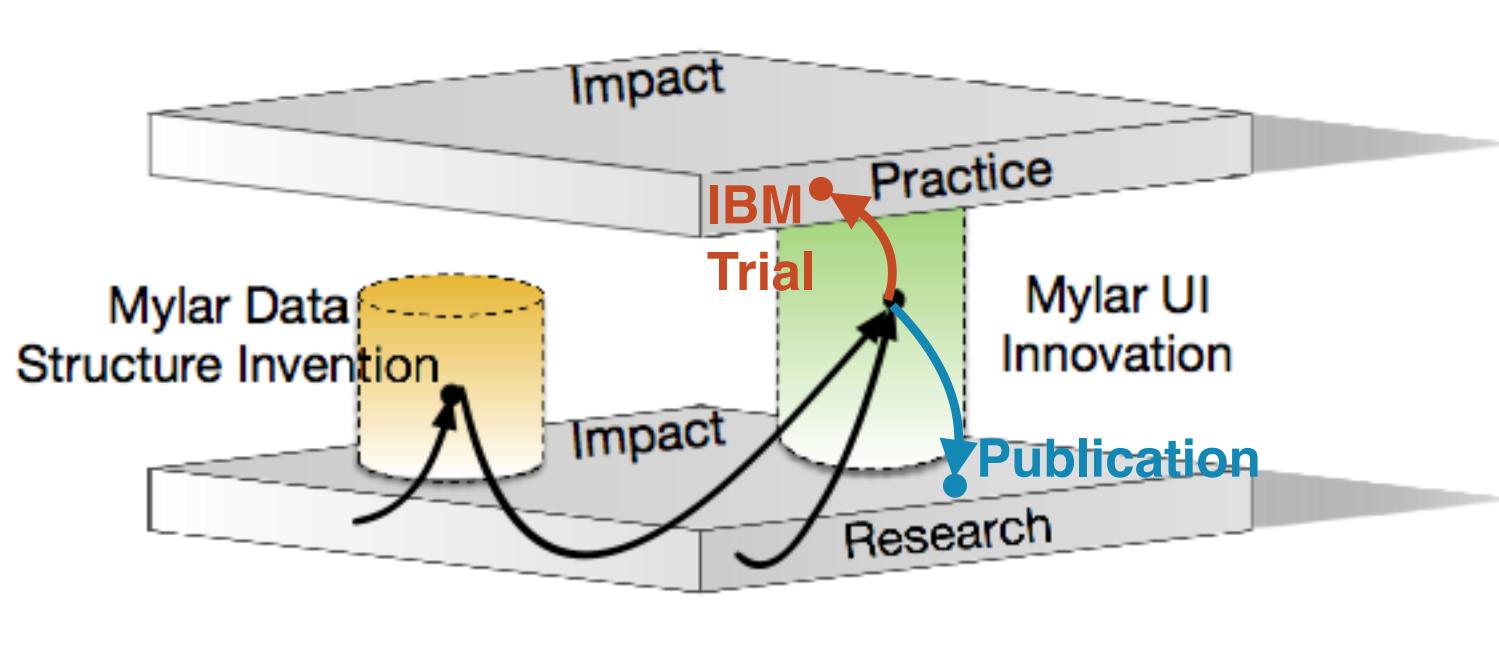
Involve  
industry  
early





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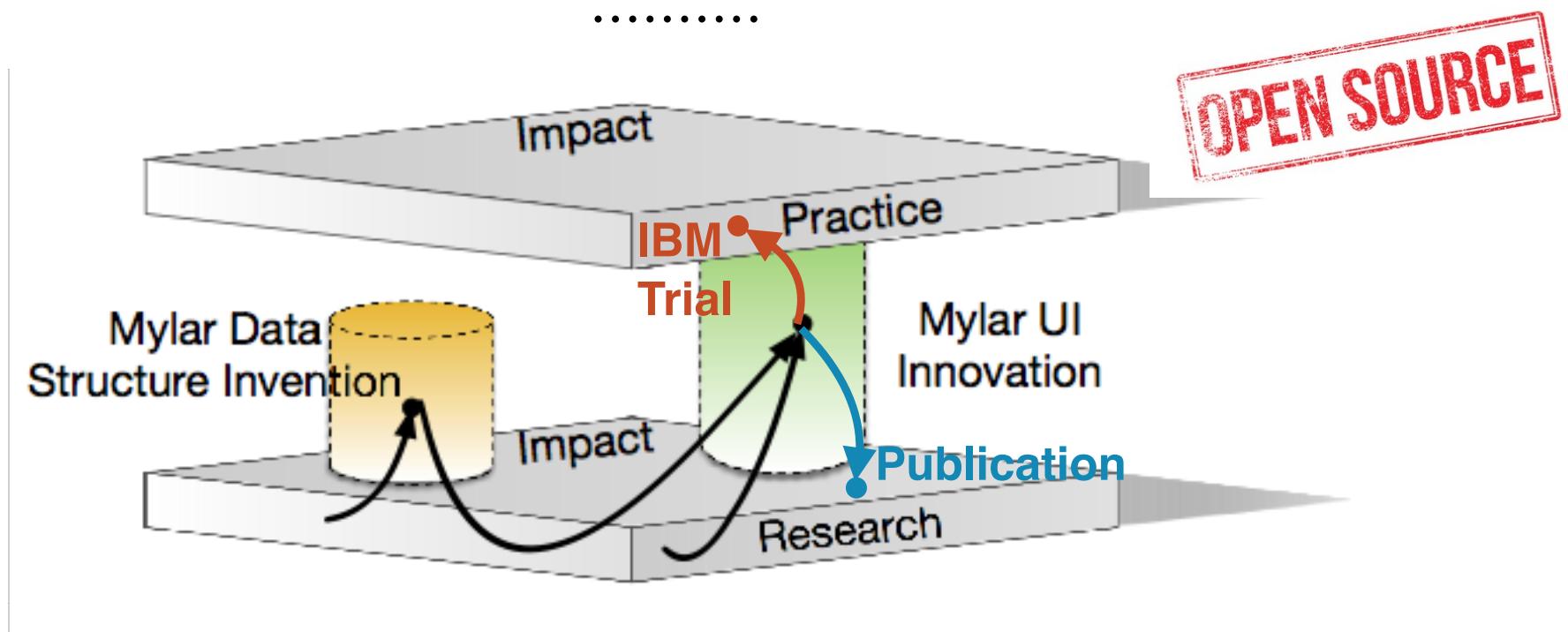




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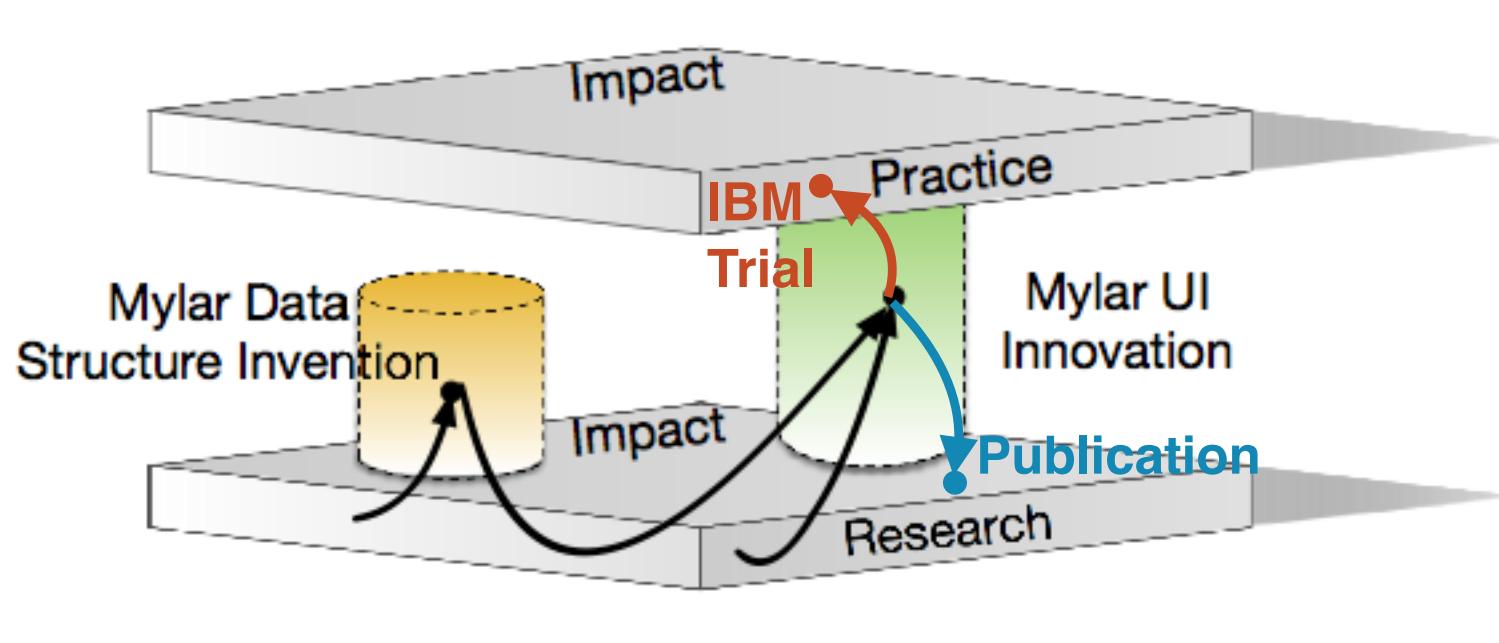
Robustness  
&  
community  
building





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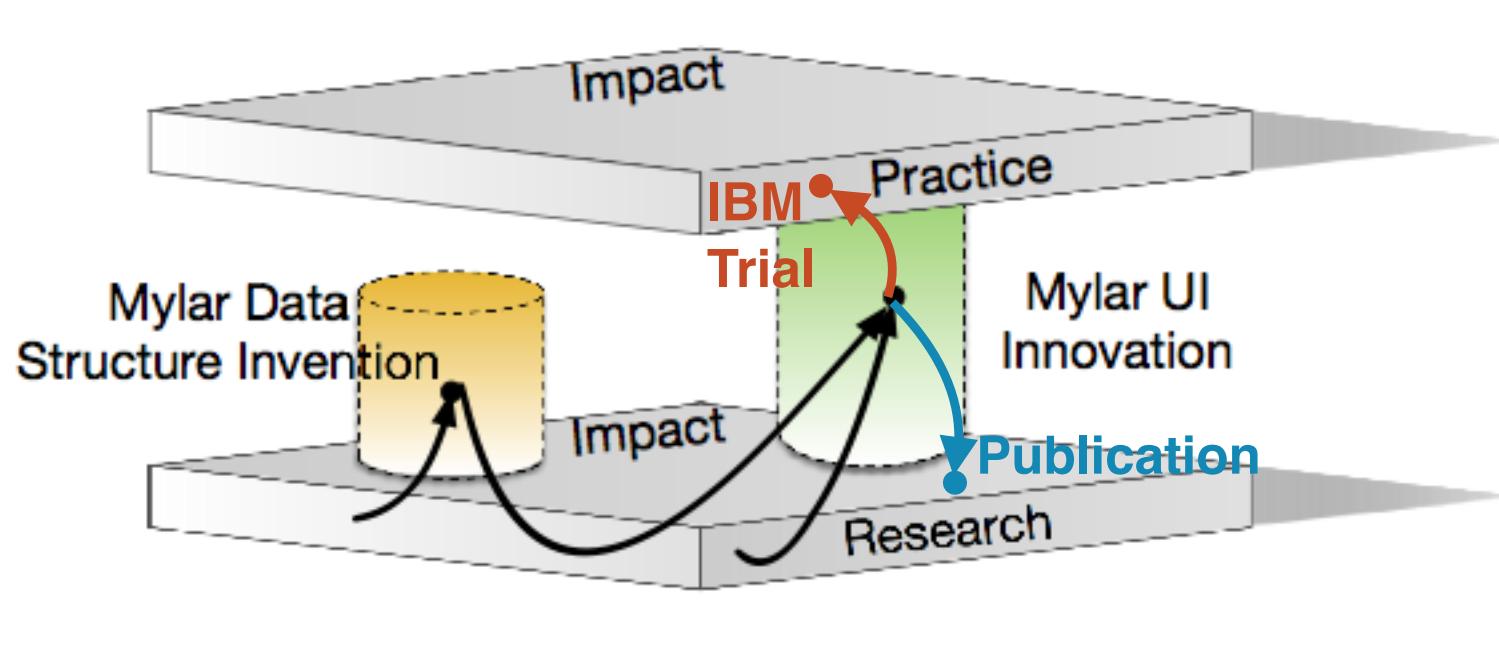




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- .....

Early  
thought  
about impact  
in practice



INDUSTRY

# Mylyn/Tasktop Highlights: 2007-2016

- 2007      Mylar becomes Eclipse Mylyn
- 2008      Tasktop Dev 
- 2009      Tasktop Dev - Enterprise sales
- 2011      Tasktop Sync 
- 2014      \$11M Series A funding
- 2015-16    Tasktop Data  & Gateway capabilities

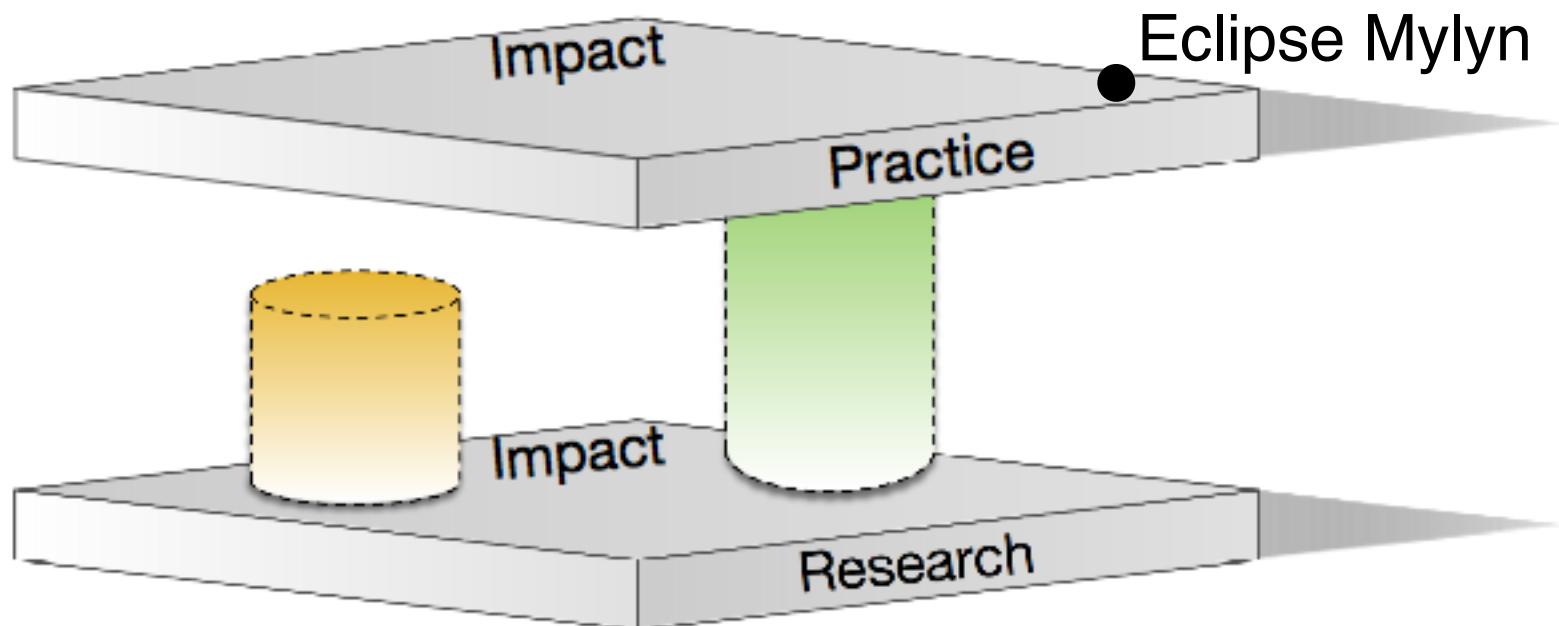
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INDUSTRY

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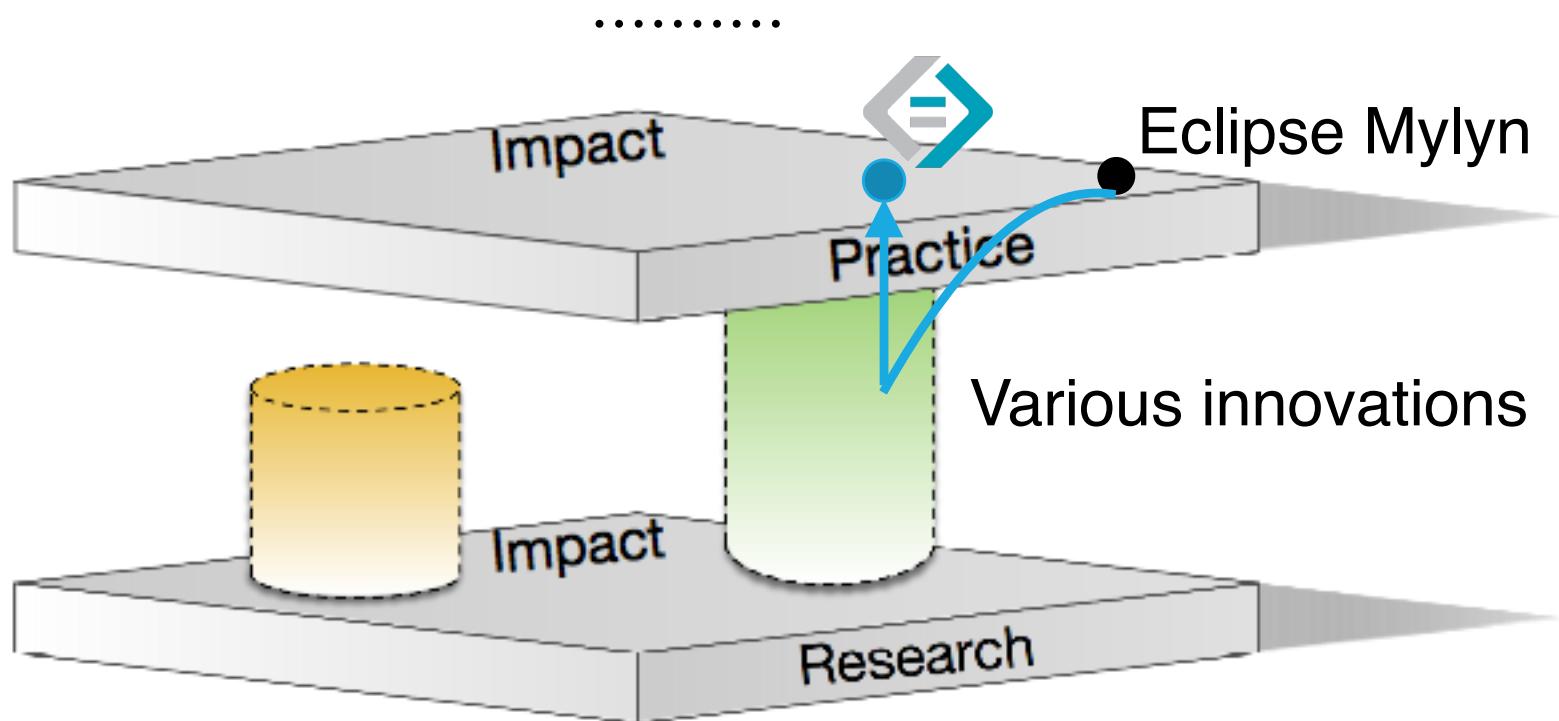
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INDUSTRY

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# Mylyn/Tasktop Highlights: 2007-2016



# Mylyn/Tasktop Highlights: 2007-2016

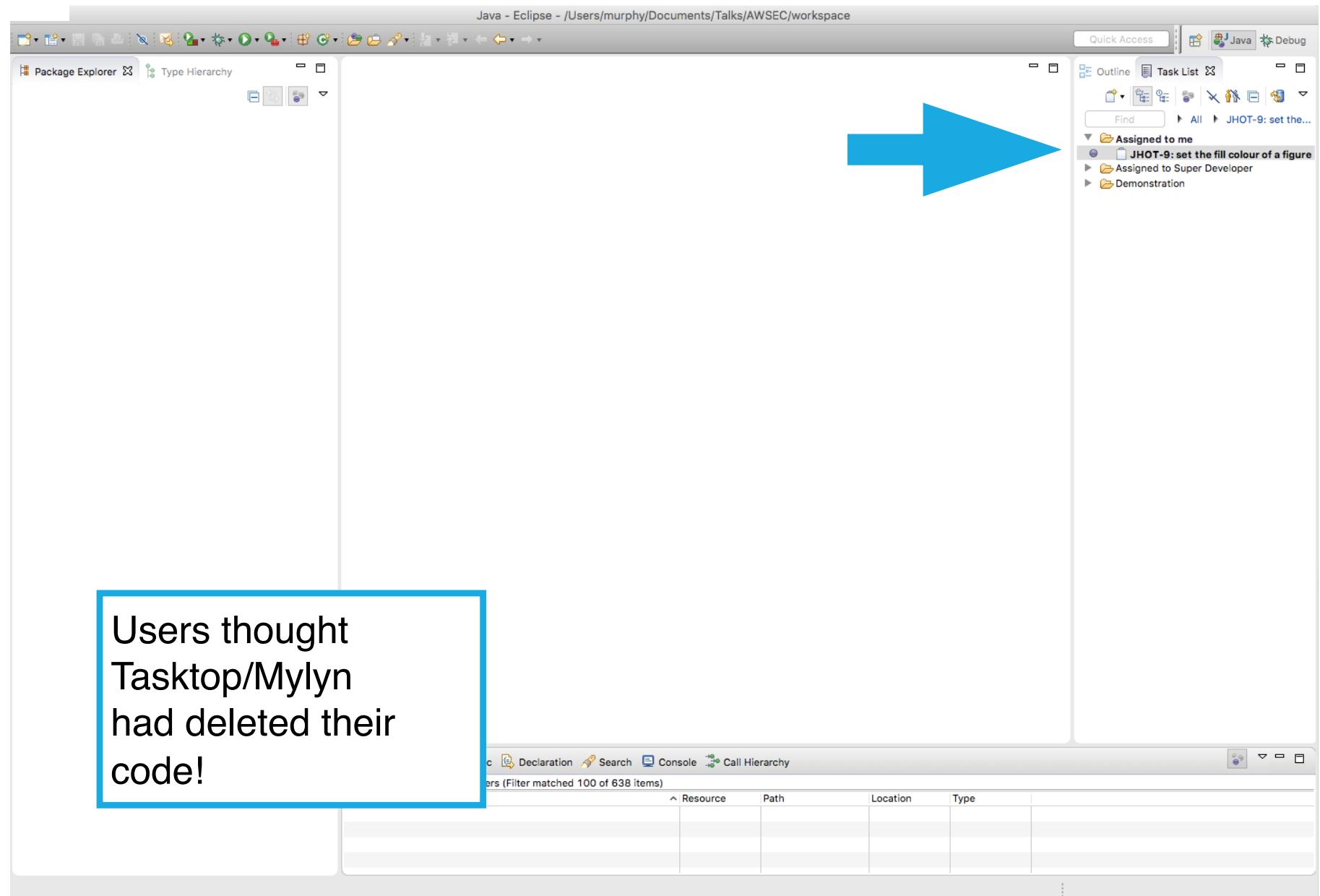
The screenshot shows the Eclipse IDE interface with the following details:

- Top Bar:** Java - jHotDraw/src/org/jhotdraw/framework/Figure.java - Eclipse - /Users/murphy/Documents/Talks/AWSEC/workspace
- Left Sidebar:** Package Explorer (containing files like GroupHandle.java, ImageFigure.java, InsertImageCommand.java, LineConnection.java, LineDecoration.java, LineFigure.java, NullConnector.java, NullFigure.java, NumberTextFigure.java, PolyLineConnector.java, PolyLineFigure.java, PolyLineHandle.java, PolyLineLocator.java, RadiusHandle.java, RectangleFigure.java, RoundRectangleFigure.java, ScribbleTool.java, ShortestDistanceConnector.java, TextFigure.java, TextTool.java, UngroupCommand.java) and org.jhotdraw.framework (containing ConnectionFigure.java, Connector.java, Cursor.java, Drawing.java, DrawingChangeEvent.java, DrawingChangeListener.java, DrawingEditor.java, DrawingView.java, Figure.java, FigureAttributeConstant.java, FigureChangeEvent.java, FigureChangeListener.java, FigureEnumeration.java, FigureSelection.java, FigureSelectionListener.java, FigureVisitor.java, Handle.java, HandleEnumeration.java, JHotDrawException.java, JHotDrawRuntimeException.java, Locator.java, Painter.java, PointConstrainer.java, Tool.java, ToolListener.java, ViewChangeListener.java).
- Central Area:** Code editor showing the `Figure.java` file content. The code defines a `Figure` class with methods for displaying boxes, drawing figures, getting handles, sizes, centers, and checking emptiness.
- Right Sidebar:** Task List view showing tasks assigned to the user:
  - Assigned to me
  - Assigned to Super Developer
  - JHOT-5: set the pen colour of a figure
  - Demonstration
- Bottom Bar:** Problems (0 errors, 638 warnings, 0 others), Declaration, Search, Console, Call Hierarchy, and a table showing the 100 warnings found.

Description	Resource	Path	Location	Type
Warnings (100 of 638 items)				
ArrayList is a raw type. References to generic type ArrayList<...>...	CollectionsFa...	/jHotDraw/src/org/j...	line 27	Java Problem
ArrayList is a raw type. References to generic type ArrayList<...>...	CollectionsFa...	/jHotDraw/src/org/j...	line 31	Java Problem
ArrayList is a raw type. References to generic type ArrayList<...>...	CollectionsFa...	/jHotDraw/src/org/j...	line 35	Java Problem



# Mylyn/Tasktop Highlights: 2007-2016





# Mylyn/Tasktop Highlights: 2007-2016

The screenshot shows the Eclipse IDE interface with the title bar "Java - Eclipse - /Users/murphy/Documents/Talks/AWSEC/workspace". The left side features the Package Explorer and Type Hierarchy views. The right side shows the Outline and Task List views. A large blue arrow points from the text box on the left towards the Task List view on the right. Two text boxes with blue borders are overlaid on the interface: one on the left containing the text "Solution was to add one line instruction" and another at the bottom left containing the text "Users thought Tasktop/Mylyn had deleted their code!".

Solution was to add one line instruction

Users thought Tasktop/Mylyn had deleted their code!



# Mylyn/Tasktop Highlights: 2007-2016

Solution was to add one line instruction

Empty task context, unfocus or Alt+click

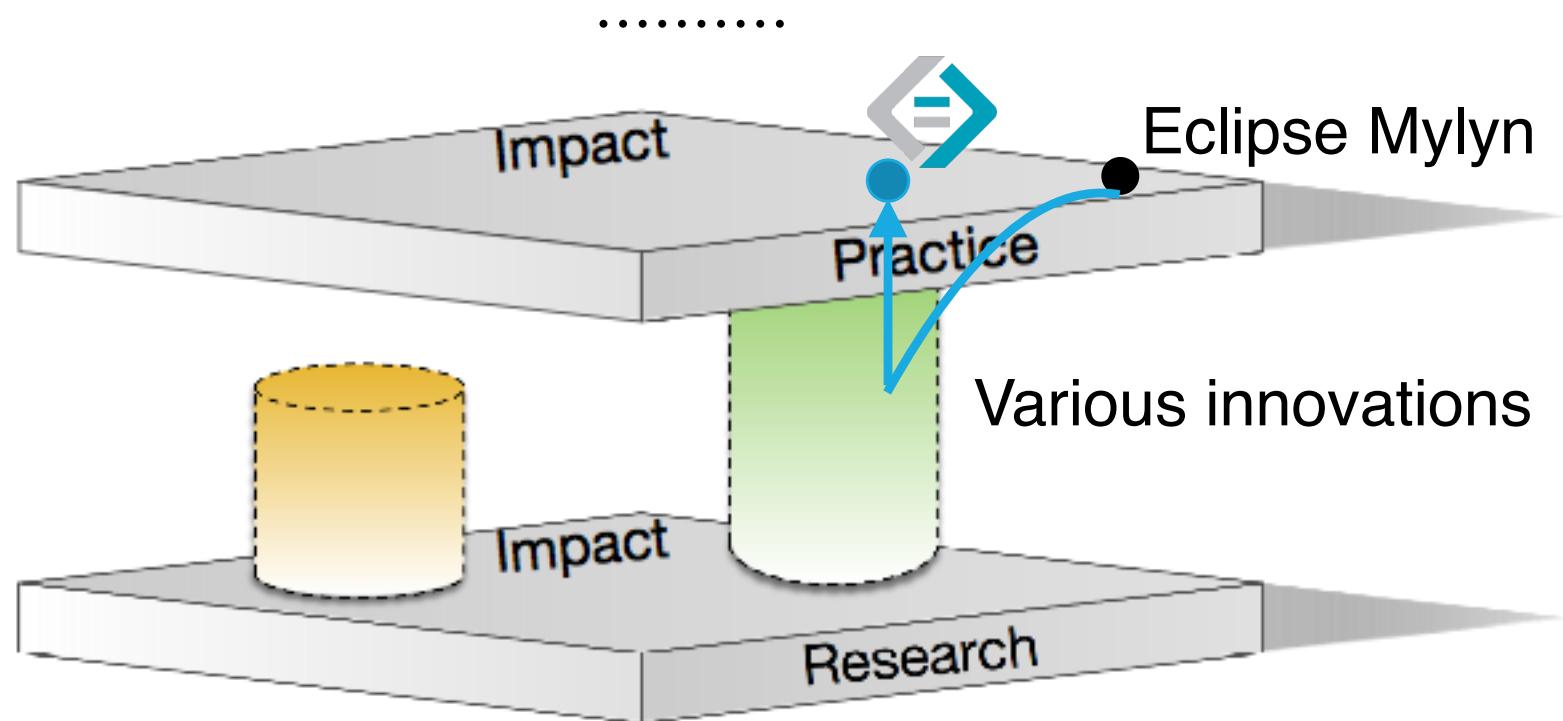
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The screenshot shows the Eclipse IDE interface. The top bar displays "Java - Eclipse - /Users/murphy/Documents/Talks/AWSEC/workspace". The left side features the Package Explorer and Type Hierarchy views. On the right, the Task List view is open, showing a list of tasks: "Assigned to me", "JHOT-9: set the fill colour of a figure", "Assigned to Super Developer", and "Demonstration". A large blue arrow points from the "Task List" text in the callout to the Task List view. Below the views, a message says "Empty task context, unfocus or Alt+click". Another callout box contains the text "Users thought Tasktop/Mylyn had deleted their code!", which points to the bottom of the screen where the Project Explorer and other toolbars are visible.

INDUSTRY

# Mylyn/Tasktop Highlights: 2007-2016

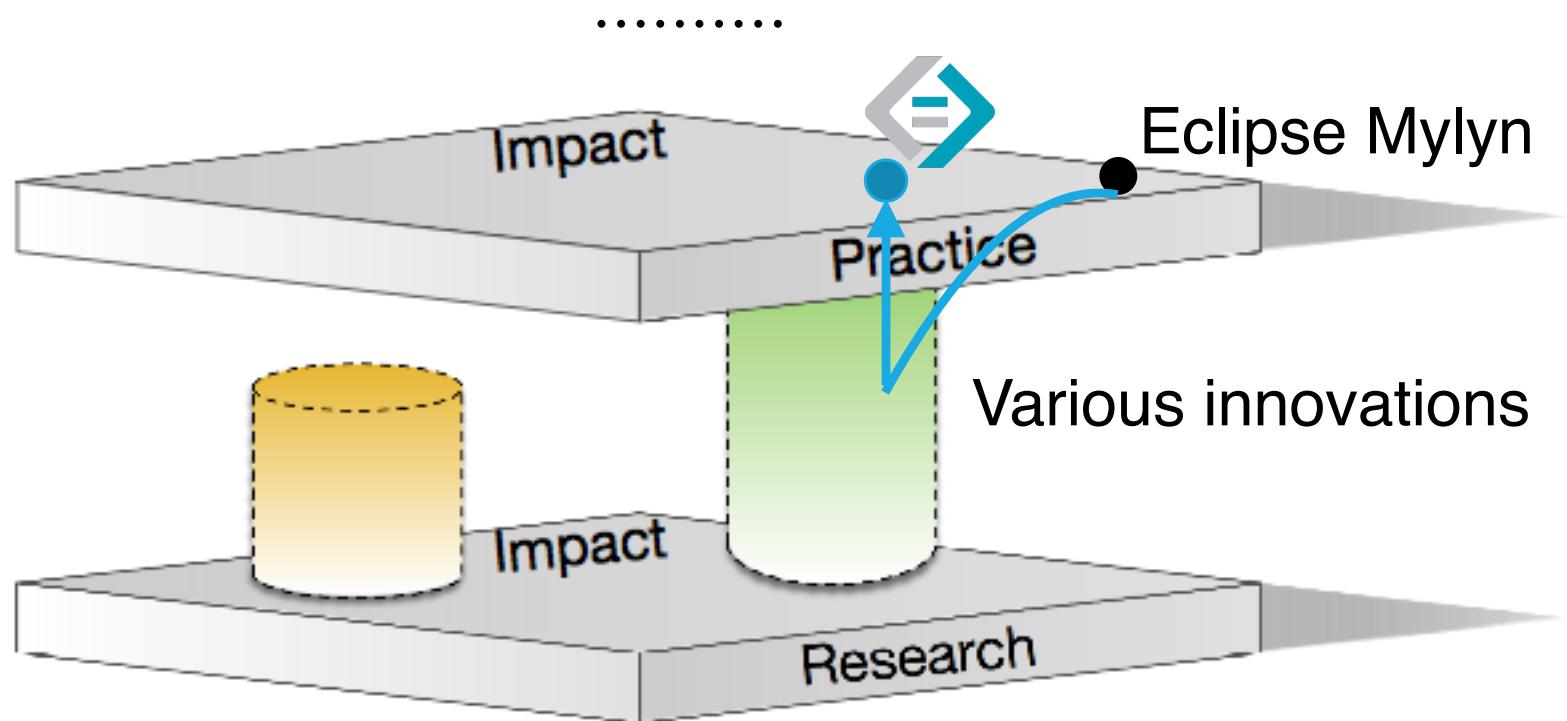
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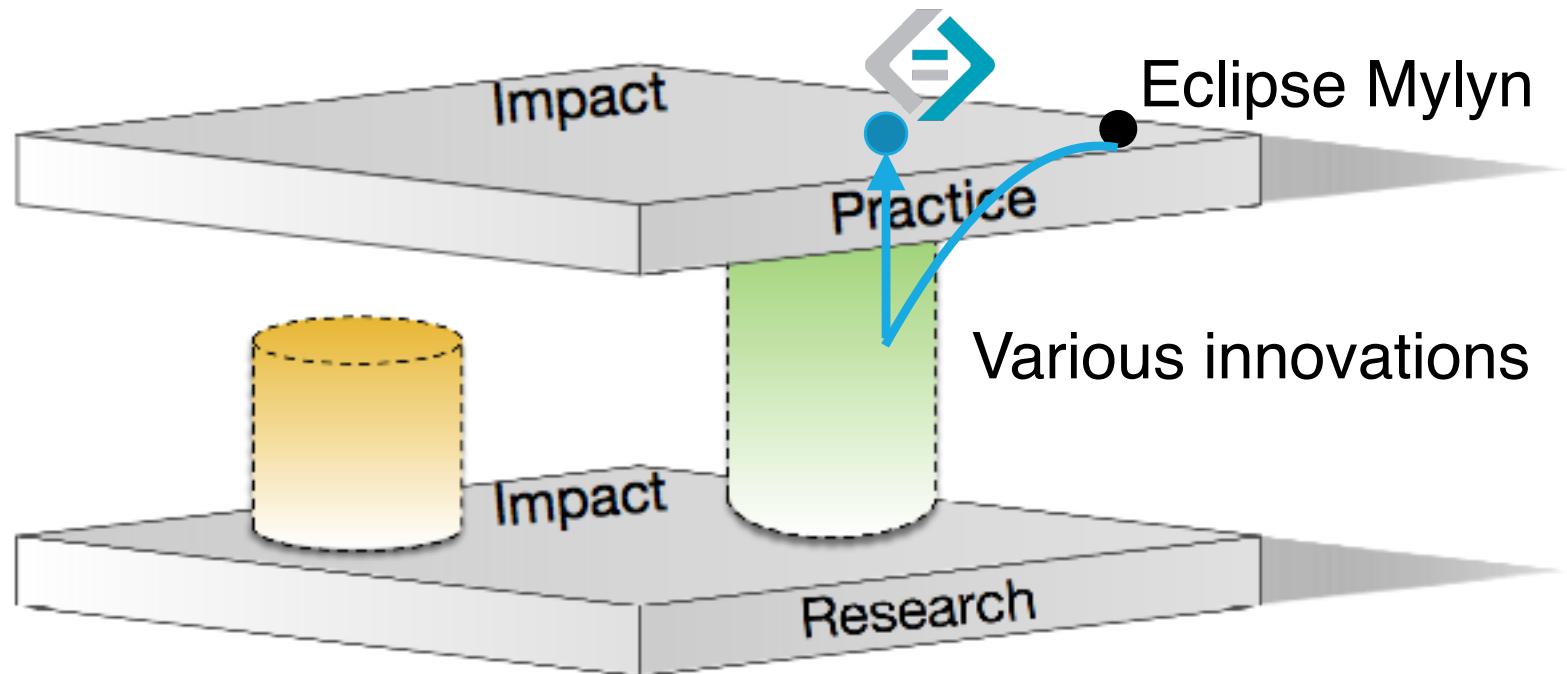


INDUSTRY

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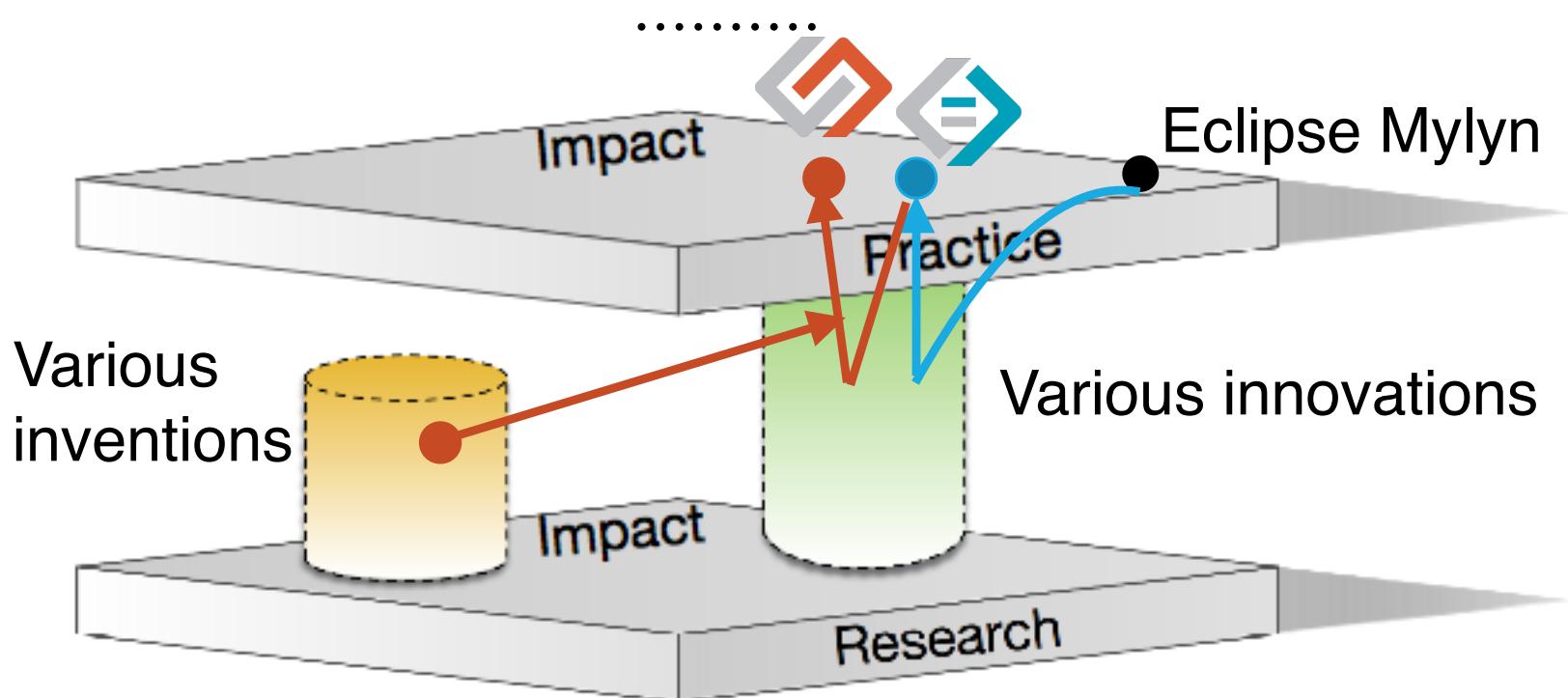
.....



INDUSTRY

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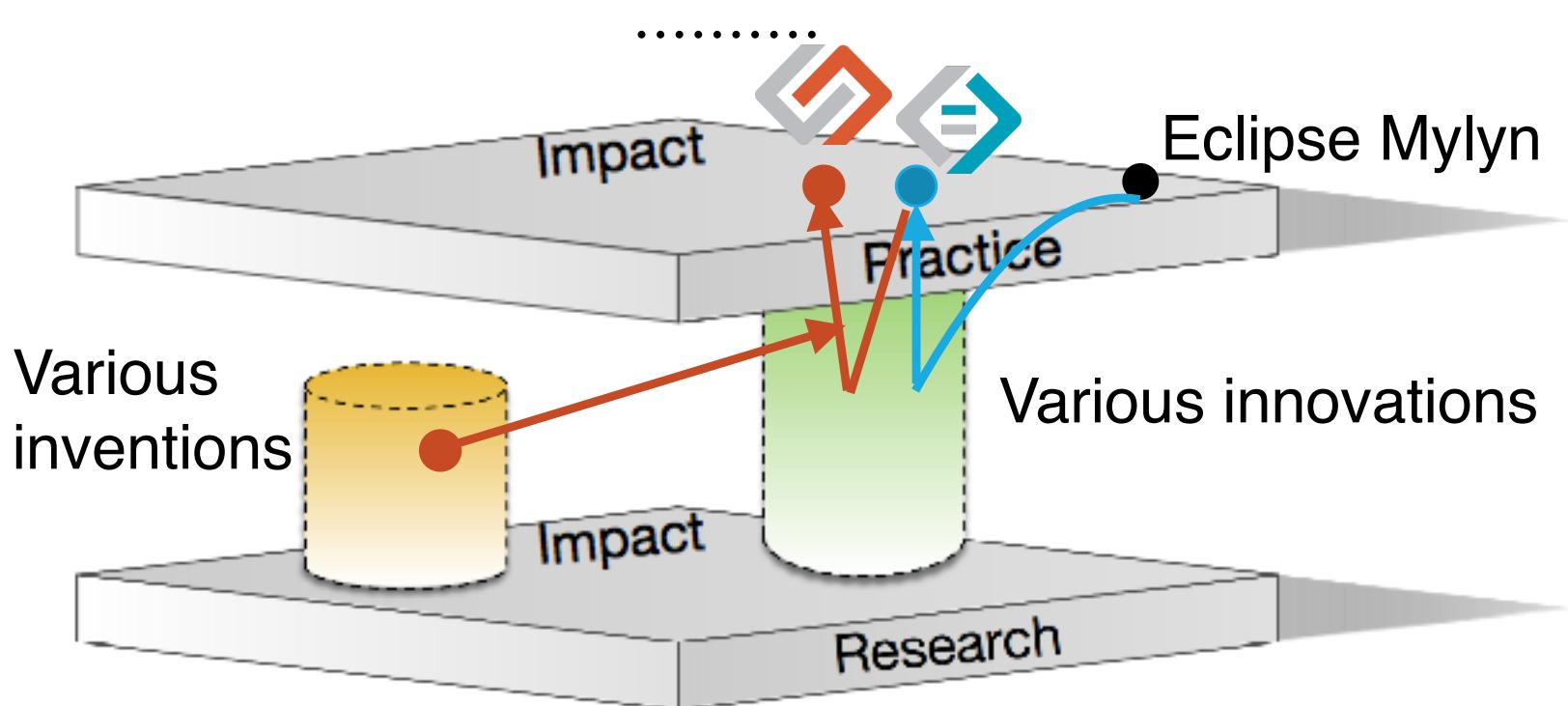




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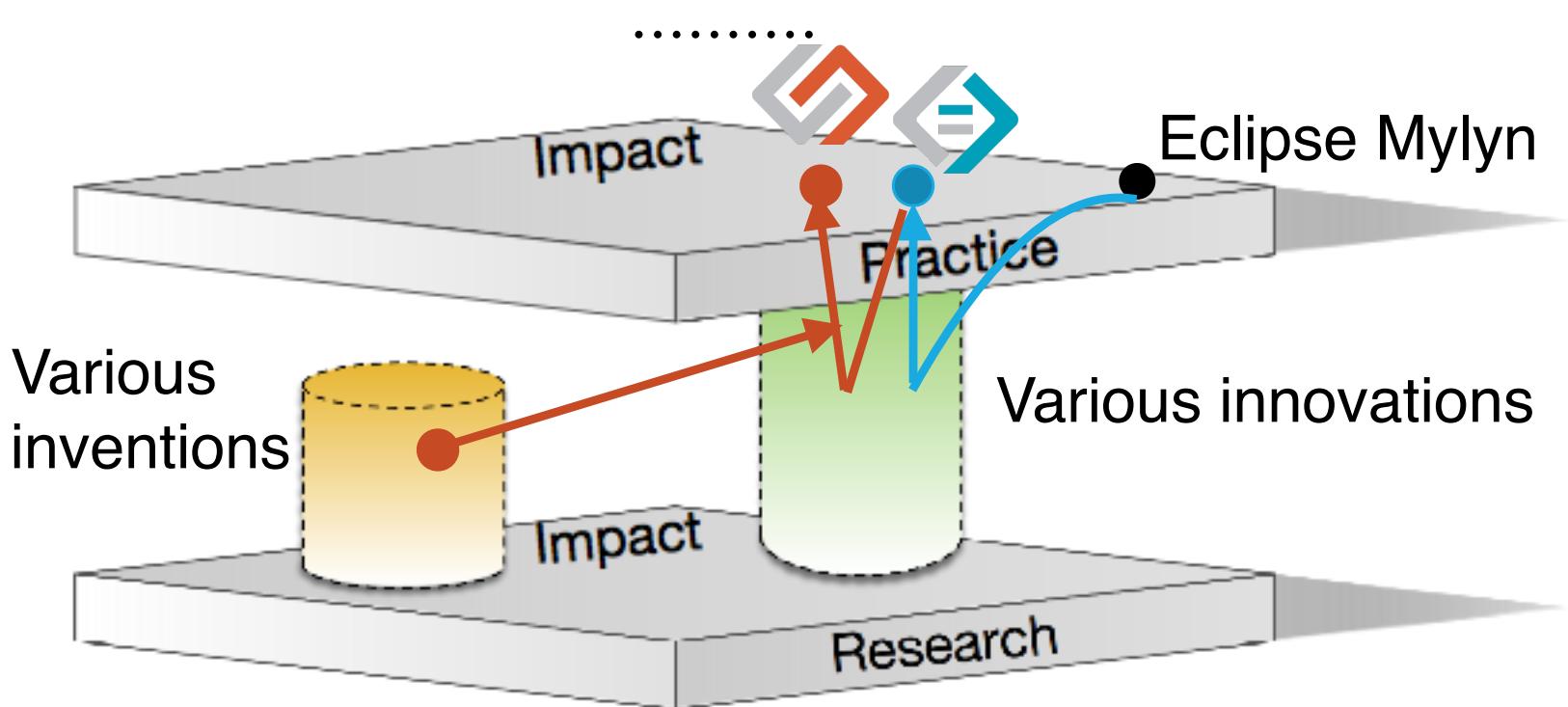
Bootstrapped  
to  
58 FTE





# Mylyn/Tasktop Highlights: 2007-2016

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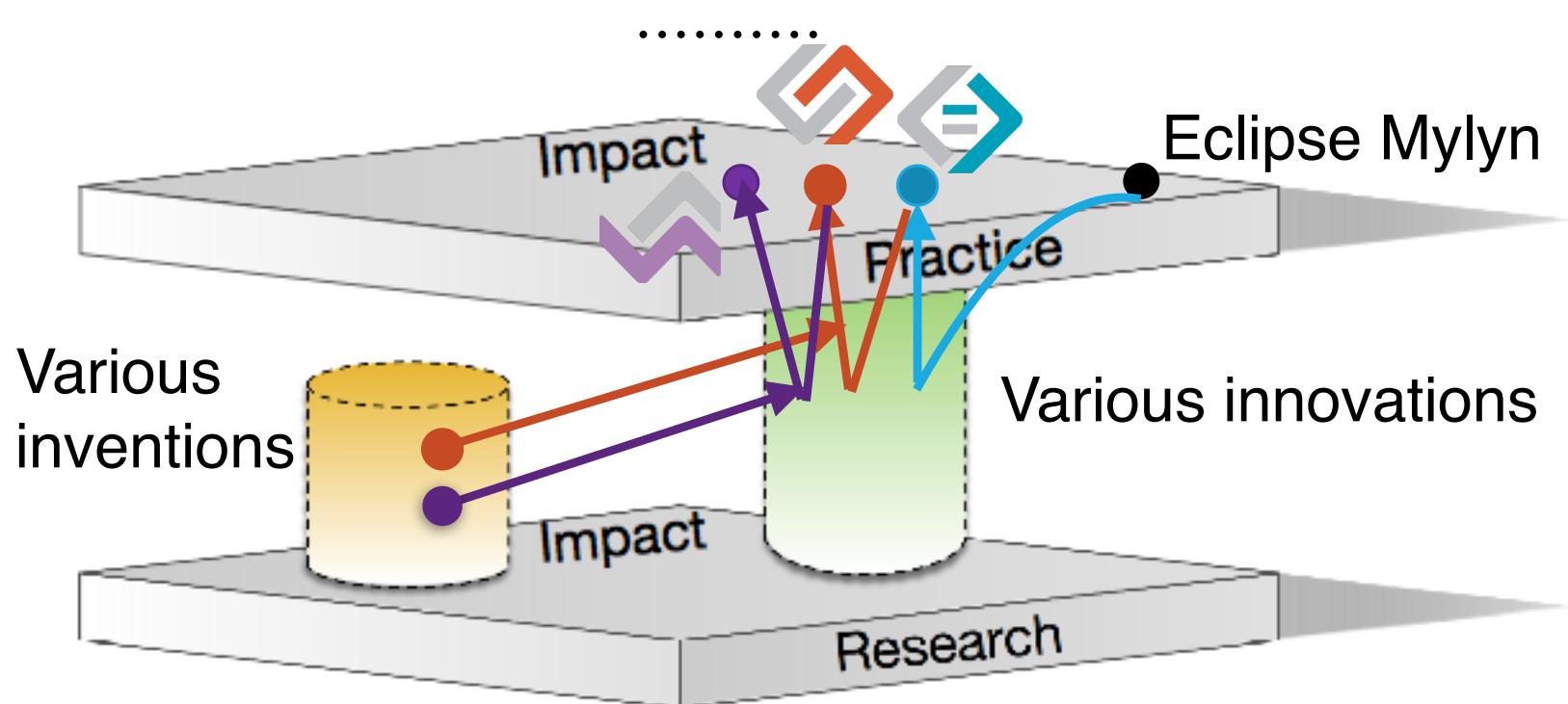


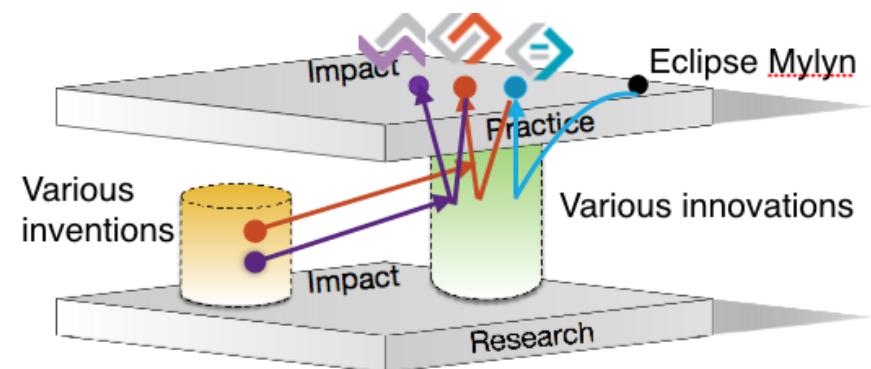
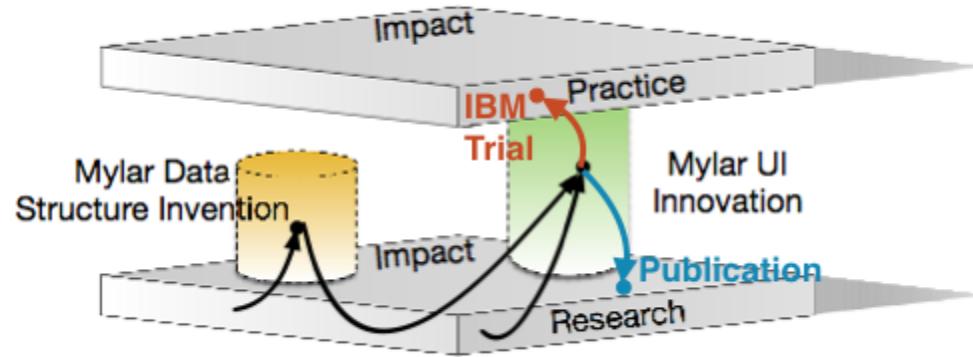


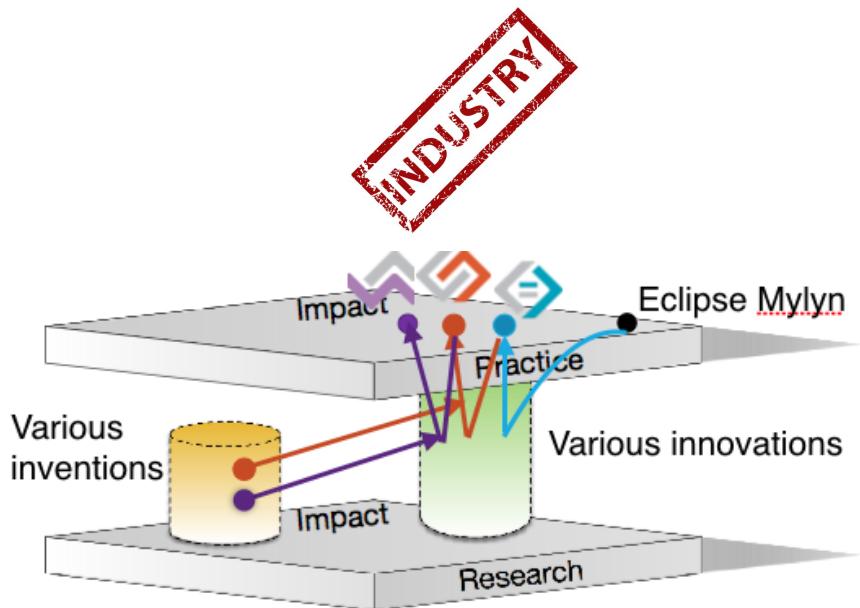
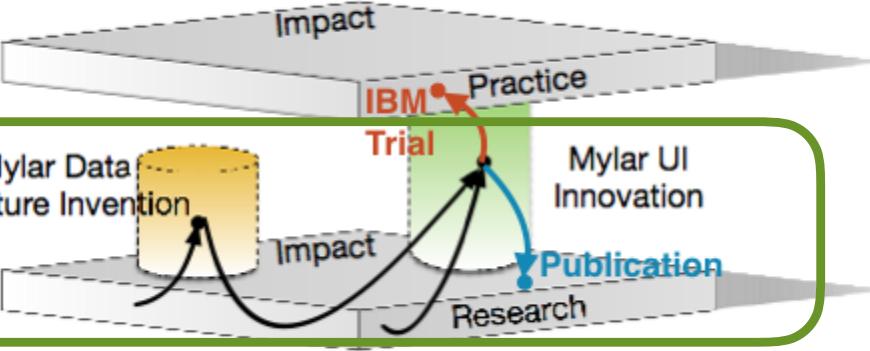
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Continual  
innovation &  
incremental  
validation





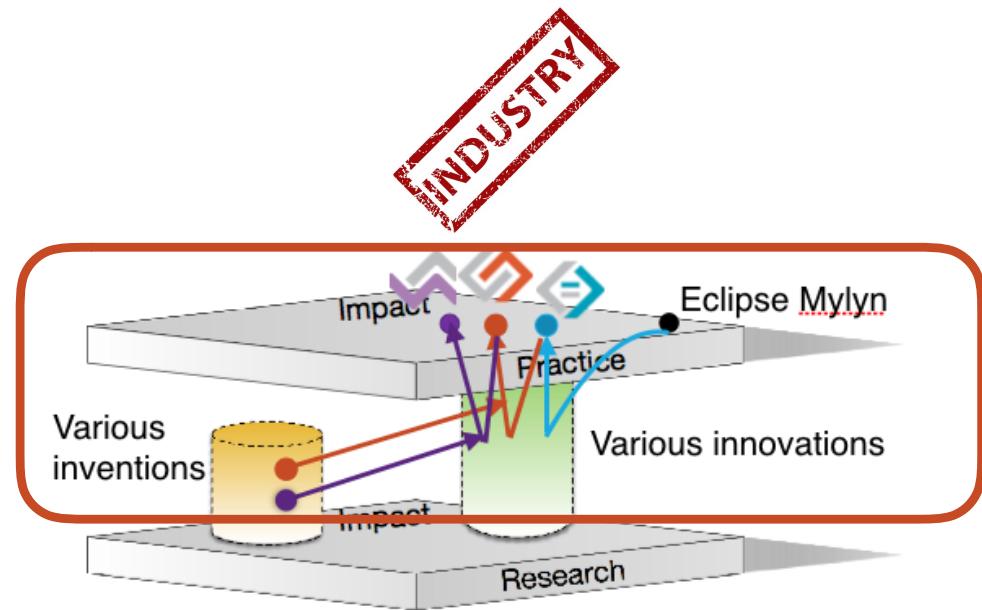
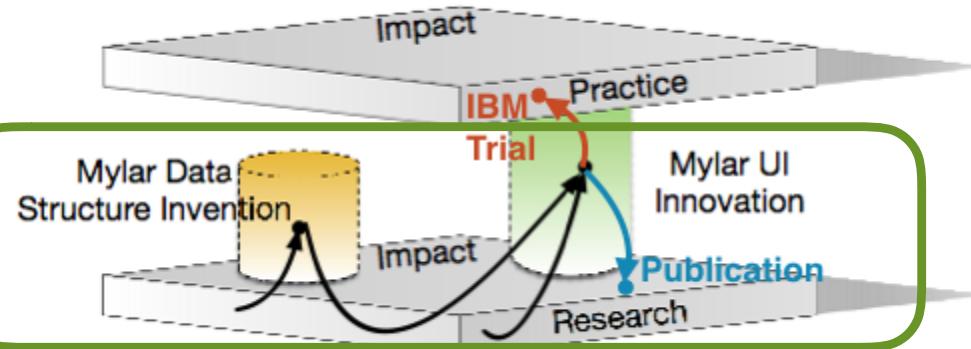


Involve  
industry  
early

Robustness  
&  
community  
building

Early  
thought  
about impact  
in practice

OPEN SOURCE



Involve  
industry  
early

Robustness  
&  
community  
building

Usability  
is  
critical

Staged  
value

Early  
thought  
about impact  
in practice

OPEN SOURCE

Listen  
to  
customers

Continual  
innovation &  
incremental  
validation

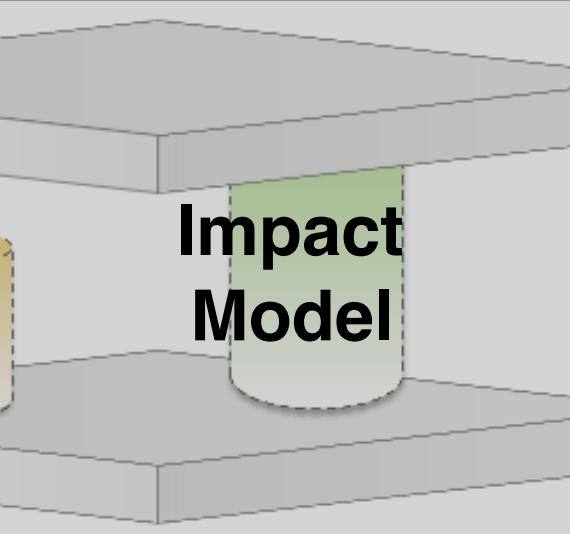
**Mylar**



**Story**

**Continuous  
Integration  
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**Innovation  
Adoption  
in  
Practice**



**Impact  
Model**

# **Innovation in Practice**

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**A story about  
paths to impacts  
in practice  
from practice**

# Continuous Integration

.....

**Problem: Slow discovery of integration problems  
slows development and delivery**

Shared  
Repository

Everyone  
commits  
to baseline  
each day

Automated  
Fast Builds

Build  
every commit  
on  
integration  
machine

Self-testing  
Builds

Automate  
Deployment

Thanks to [https://  
www.thoughtworks.com/continuous-  
integration](https://www.thoughtworks.com/continuous-integration)

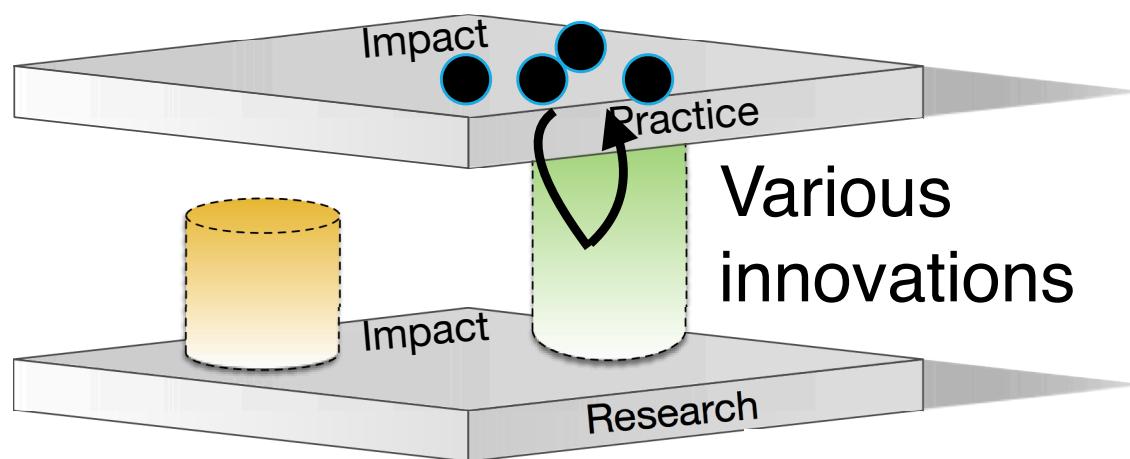
# Continuous Integration

.....



cruisecontrol

Buildbot,  
Travis CI,  
Django-Jenkins...

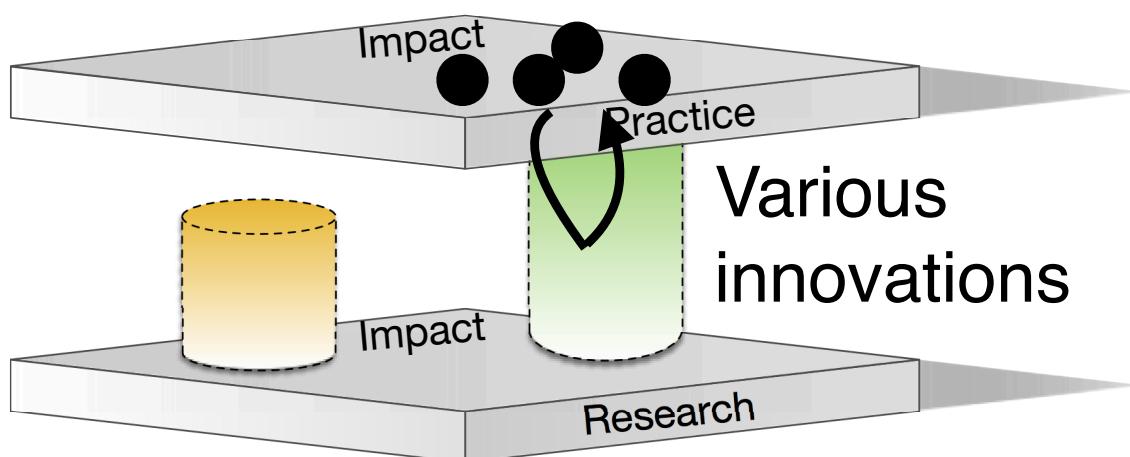


Many tools evolving in

OPEN SOURCE

# Continuous Integration

.....



- » Practice is not still
- » Practice is always innovating
- » OPEN SOURCE

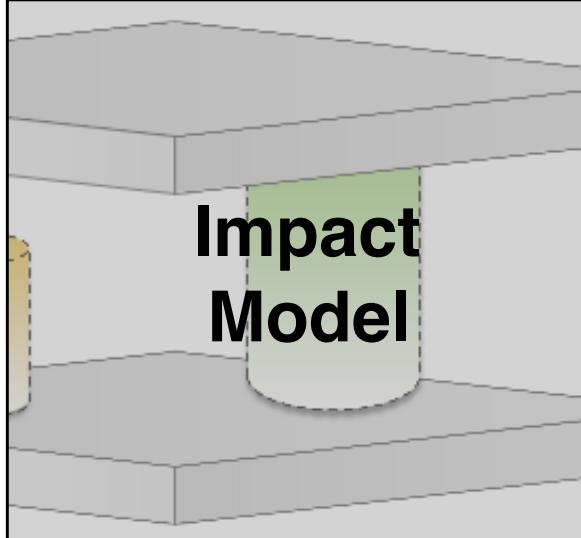
**Mylar**



**Story**

**Continuous  
Integration  
Vignette**

**Innovation  
Adoption  
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Practice**



**Impact  
Model**

A diagram illustrating the 'Impact Model'. It shows a grey 3D block representing a system or organization. A green rectangular box, labeled 'Impact Model', is positioned within a specific area of the block, suggesting its integration or impact on the system.

# **Adoption of Innovations**

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**How are  
innovations  
generally  
adopted in  
practice?**

# Interviews of Technology Leaders

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4  
financial,  
insurance,  
retail

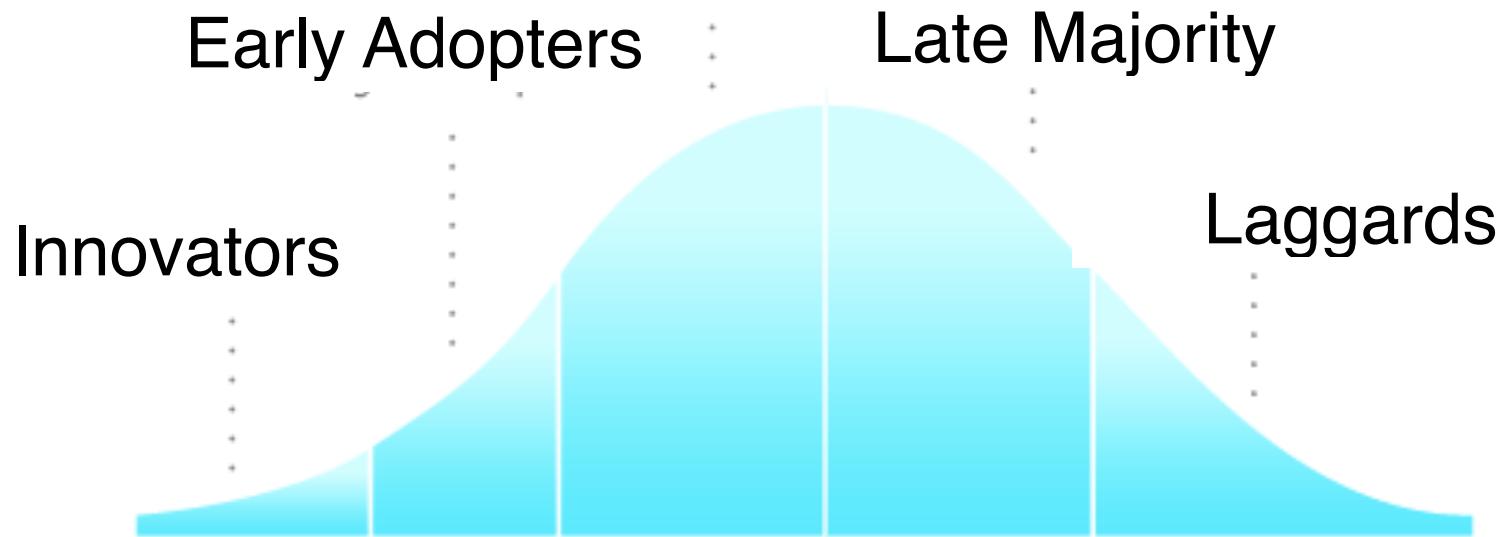


e-commerce



cloud

# Technology Adoption Curve

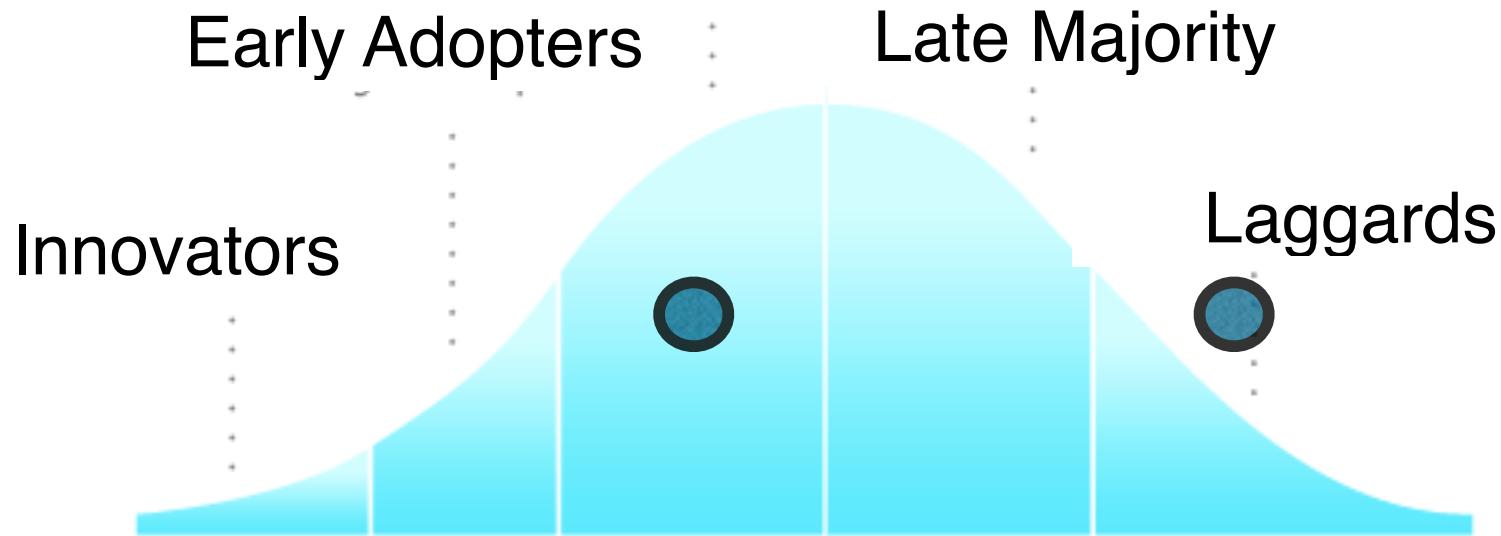


Fortune  
100

IPO

SME

# Technology Adoption Curve

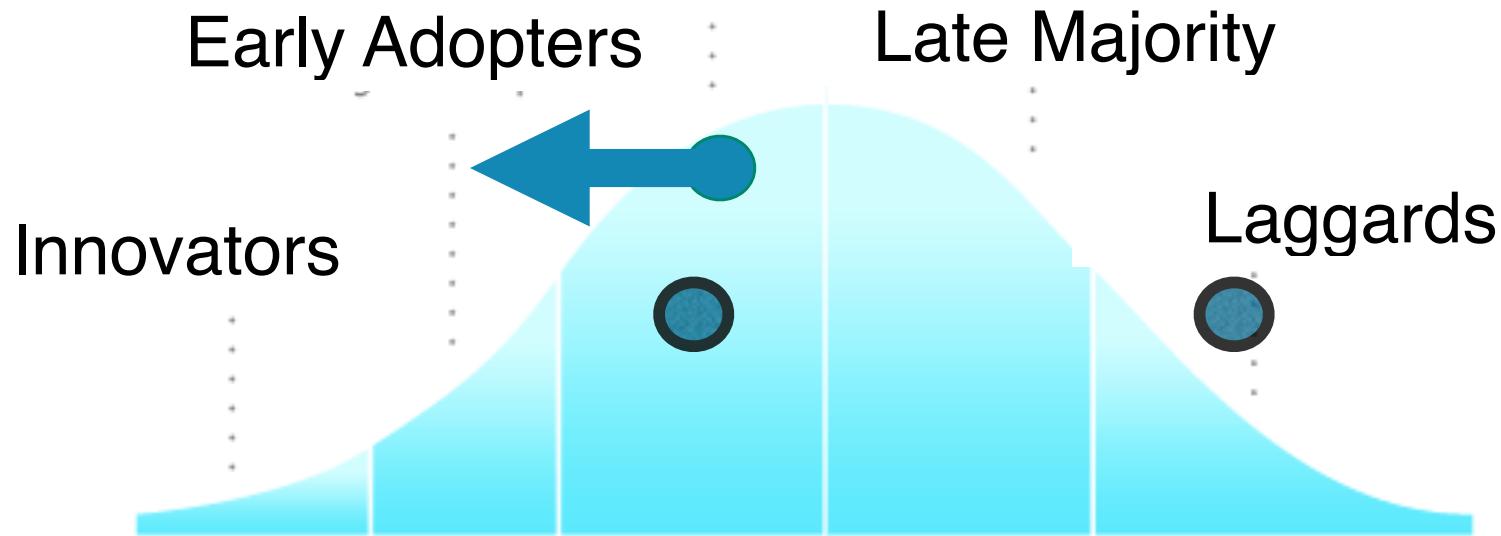


Fortune  
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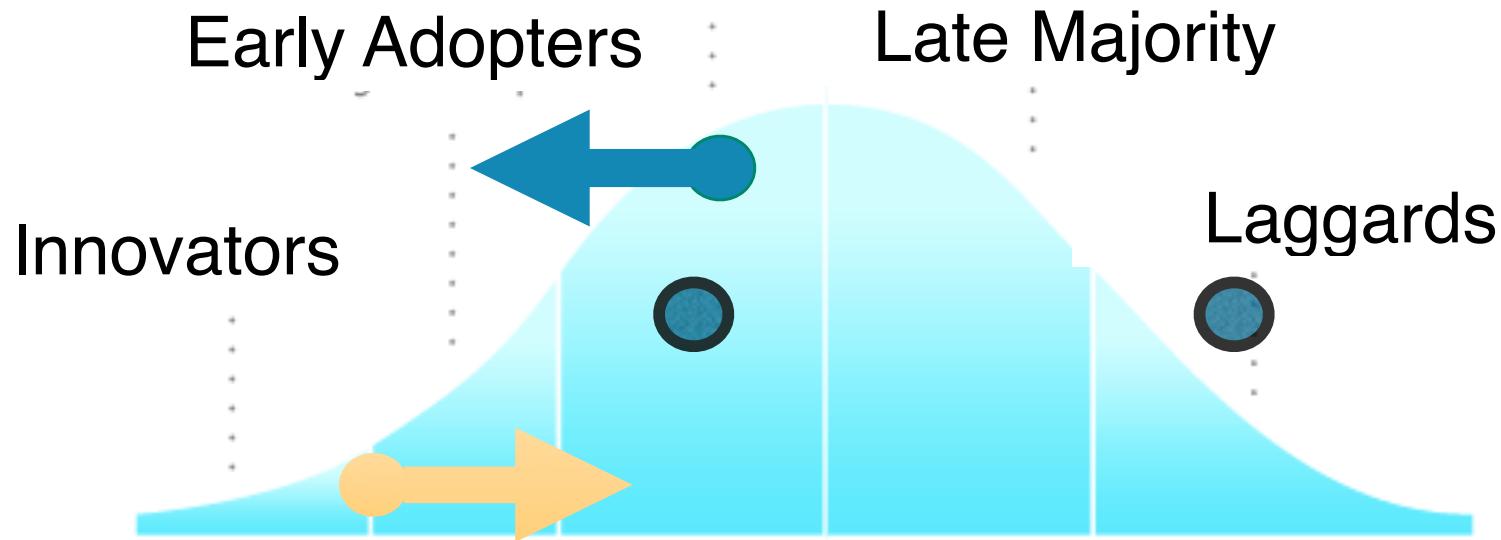


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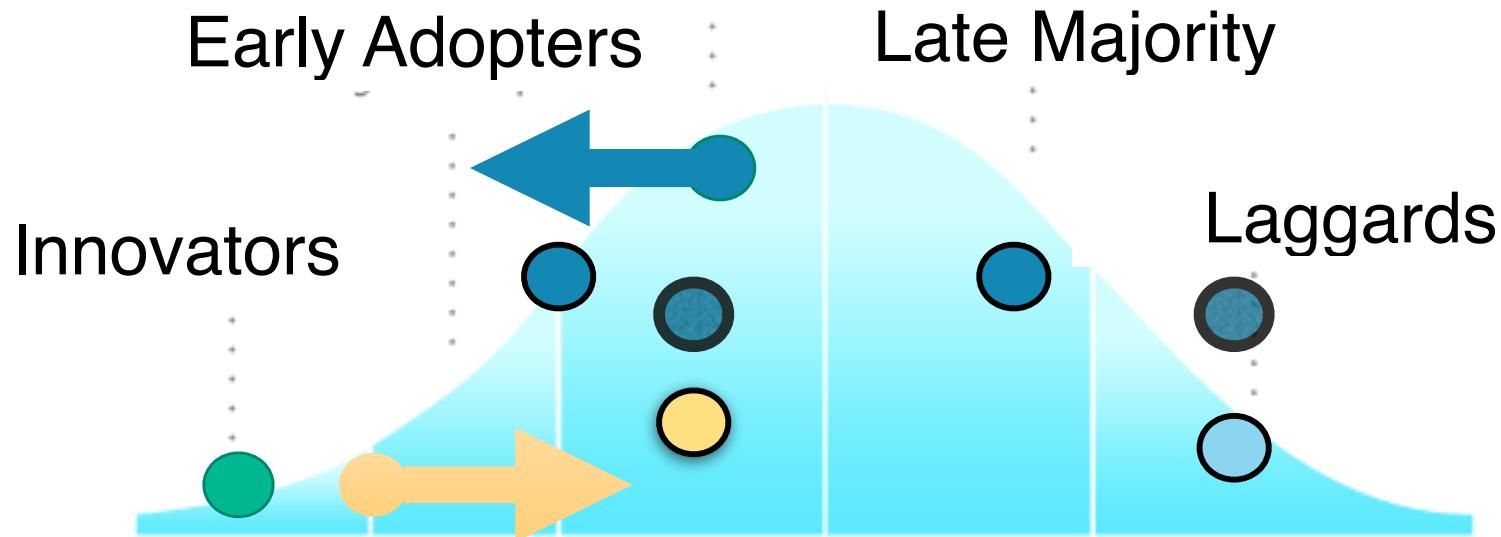


Fortune  
100

IPO

SME

# Technology Adoption Curve



Fortune  
100

IPO

SME



# **Interview about Innovation Adoption**

Process and philosophy

Factors

Awareness and spread

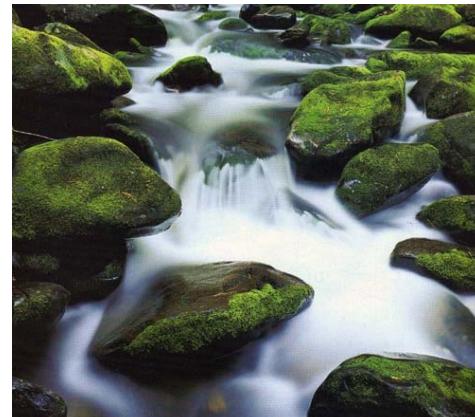
# Process and Philosophy for Innovation Adoption

.....



Managed but  
Individual

---



Add to Value  
Stream

---



Cost-effective in  
Environment

---

# Factors Affecting Innovation Adoption

.....



Open before  
Closed



People and  
Technology



Credibility  
& Momentum



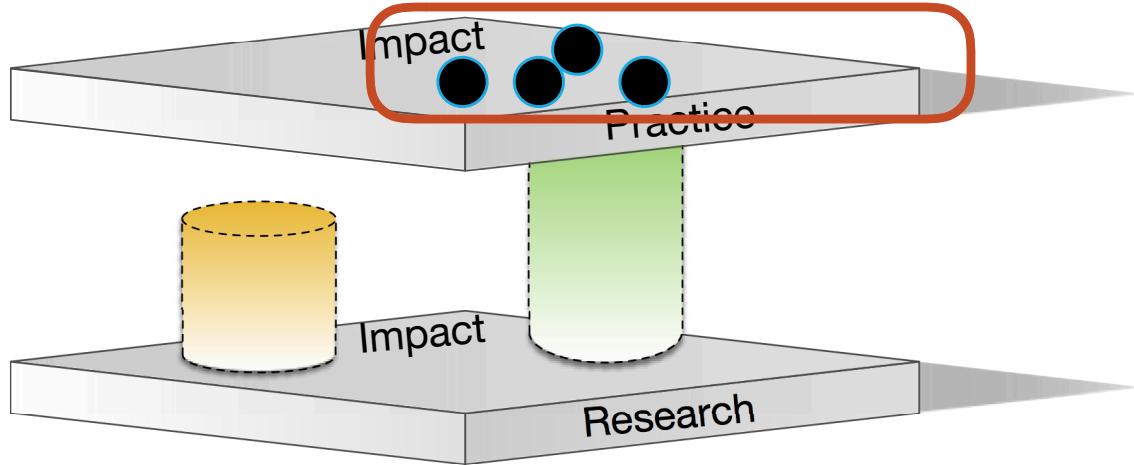
Developer  
Happiness

Hacker News, Reddit,  
Peers, Meetups/  
Conferences,  
“Work Out Loud”, Surveys,  
Papers (non-SE)



# Adoption of Innovations in Practice is...

.....



- » frequent
- » of impactful technologies
- » **OPEN SOURCE**  
when possible

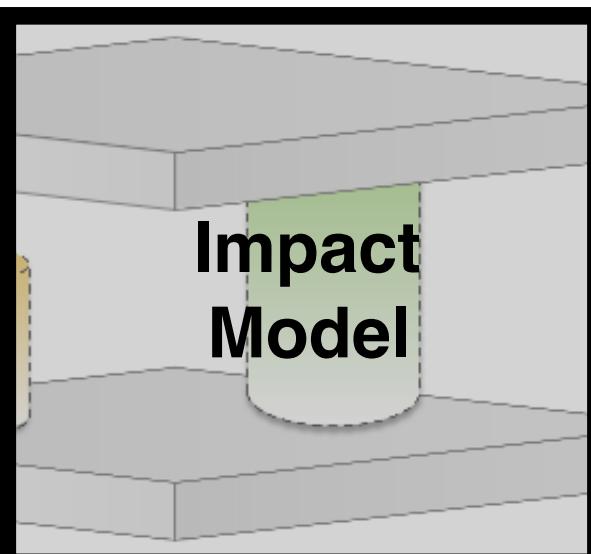
**Mylar**



**Story**

**Continuous  
Integration  
Vignette**

**Innovation  
Adoption  
in  
Practice**



A 3D perspective diagram showing a stack of horizontal layers. A single layer is highlighted in green and labeled "Impact Model".

**Impact  
Model**

# **Adoption of Innovations**

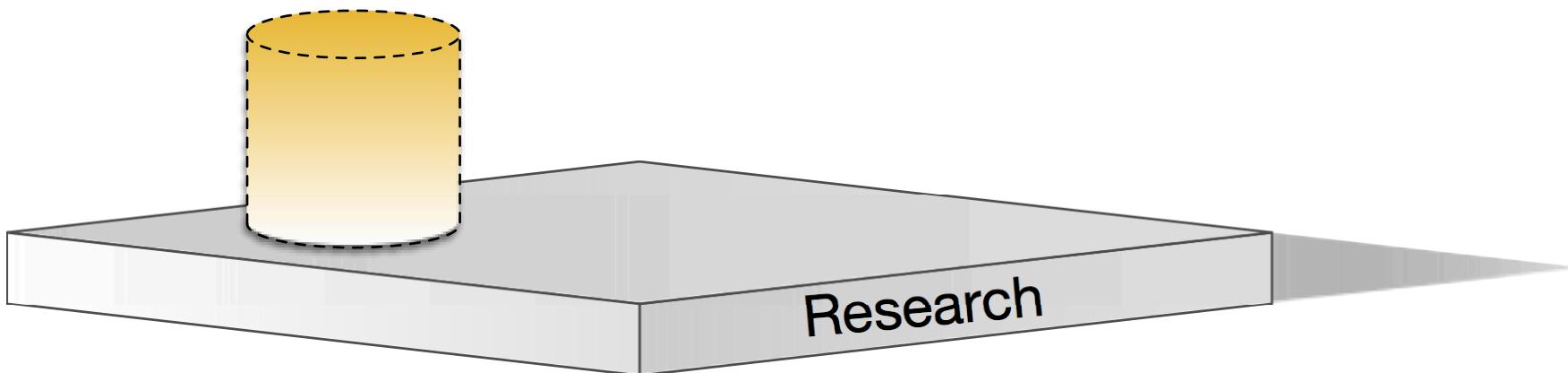
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**How are  
innovations  
generally  
adopted in  
practice?**

# Invention

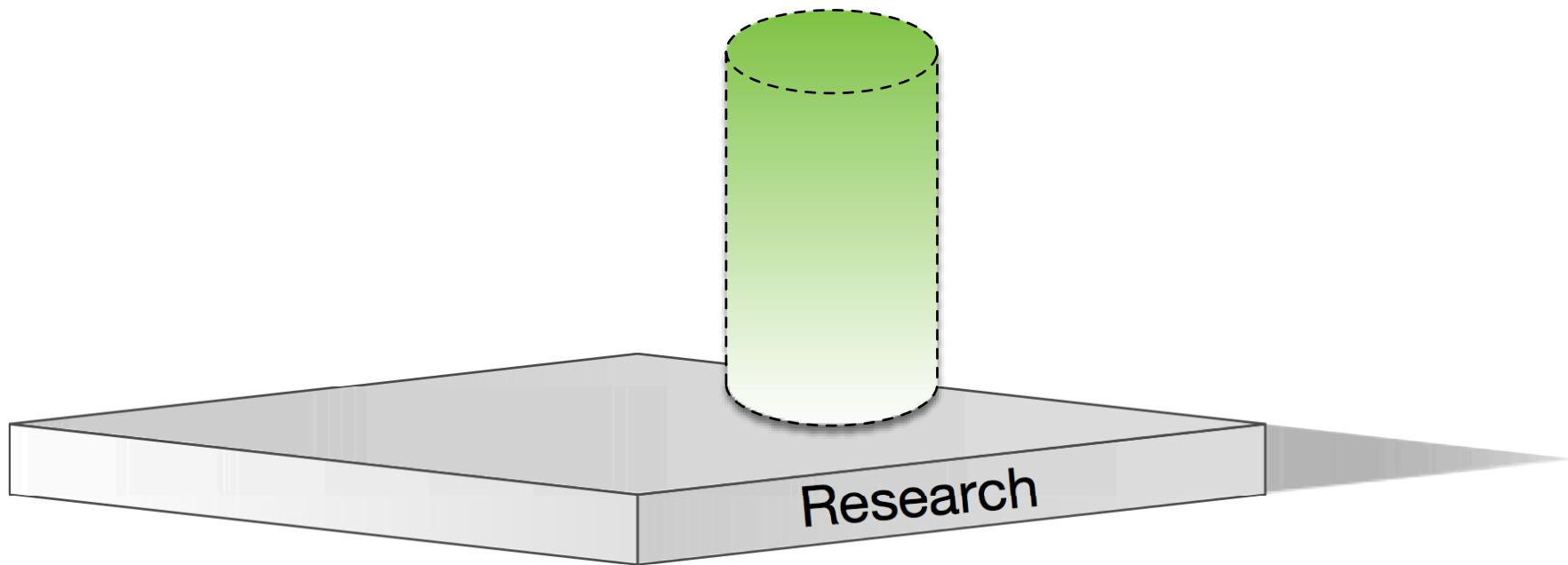
creation or  
design of  
something that  
has not existed  
before

e.g., the  
incandescent  
lightbulb



# Innovation

about the use of  
an idea or  
method  
e.g., iPhone



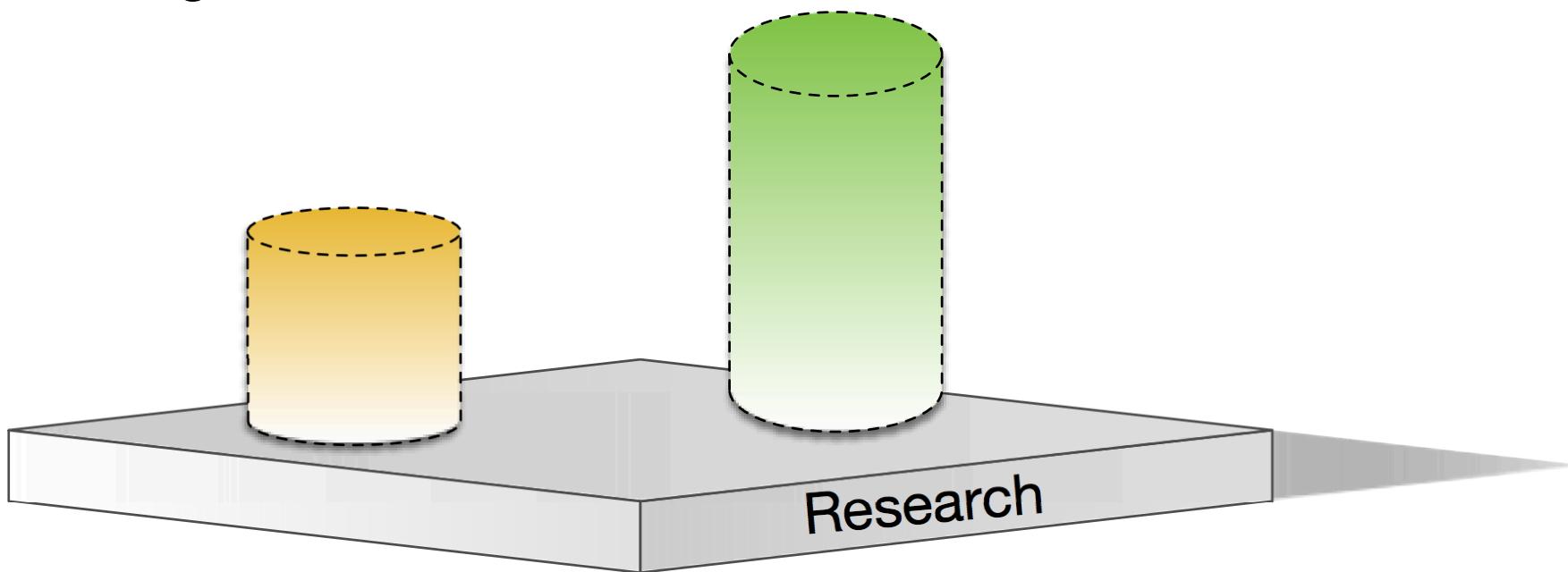
## **Invention**

creation or  
design of  
something that  
has not existed  
before

e.g., the  
incandescent  
lightbulb

## **Innovation**

about the use of  
an idea of  
method  
e.g., iPhone



## Invention

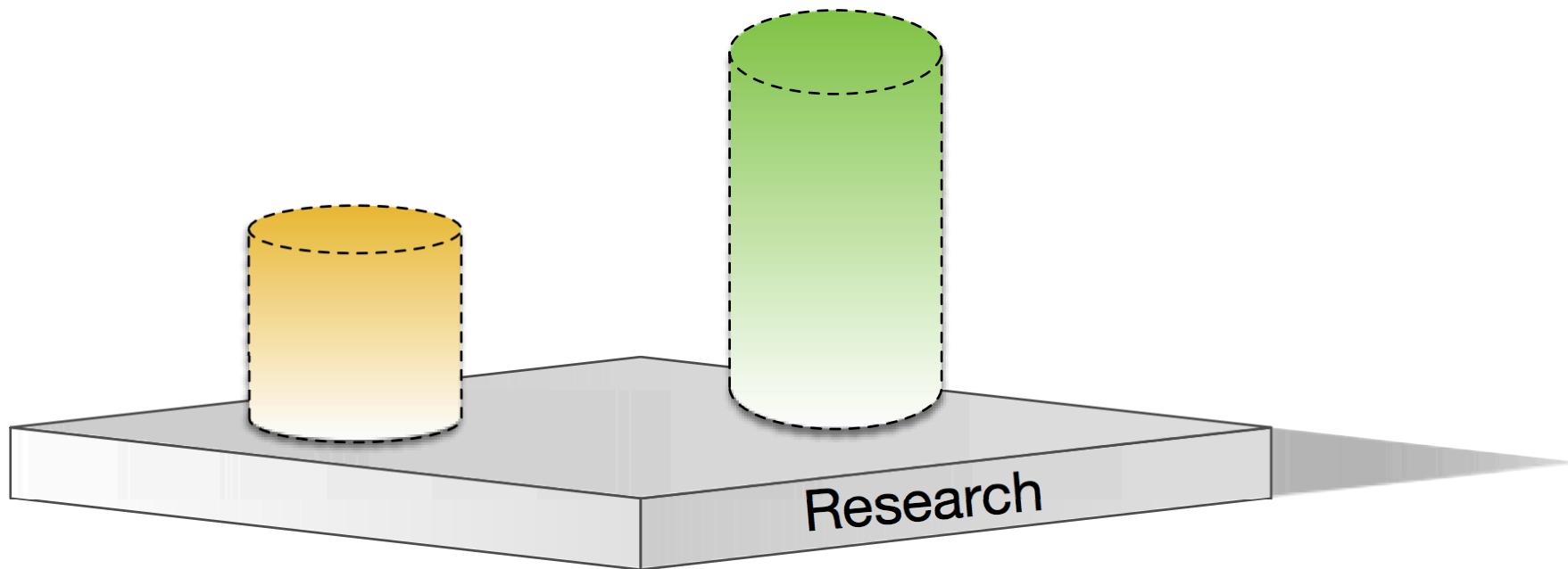
creation or design of something that has not existed before

e.g., the incandescent lightbulb

## Innovation

about the use of an idea of method  
e.g., iPhone

» Both “I”s are important



## Invention

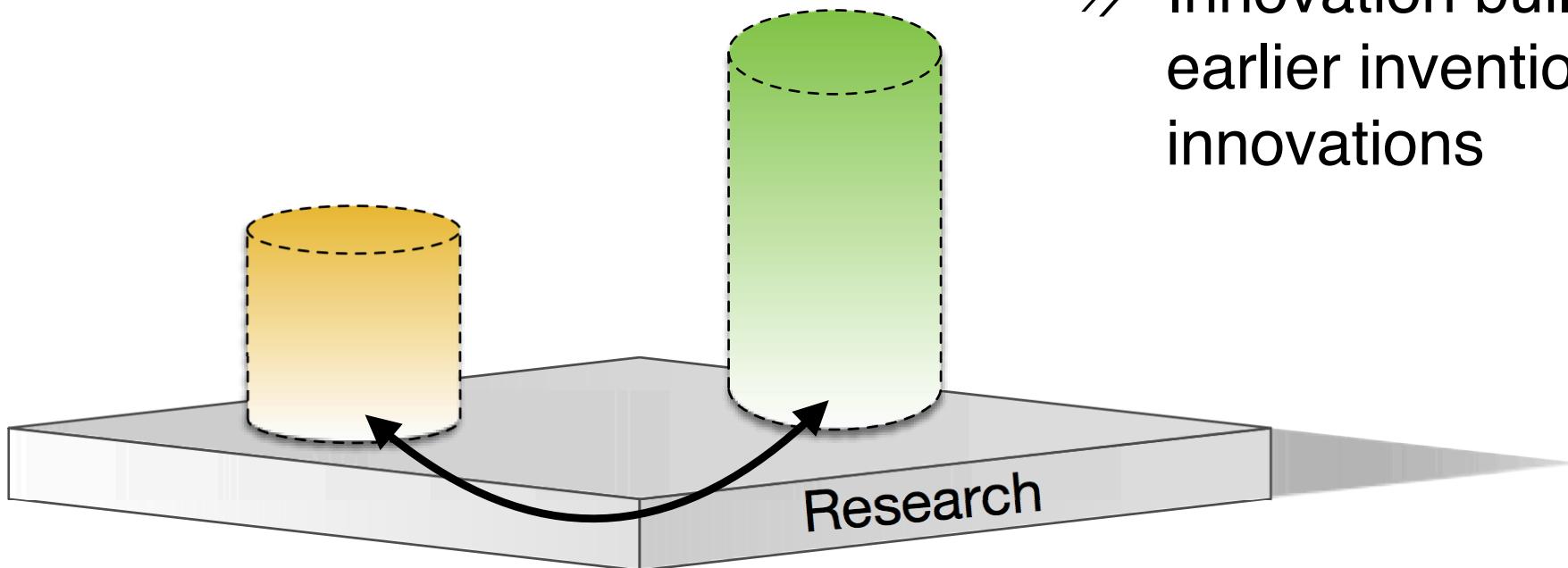
creation or design of something that has not existed before

e.g., the incandescent lightbulb

## Innovation

about the use of an idea of method  
e.g., iPhone

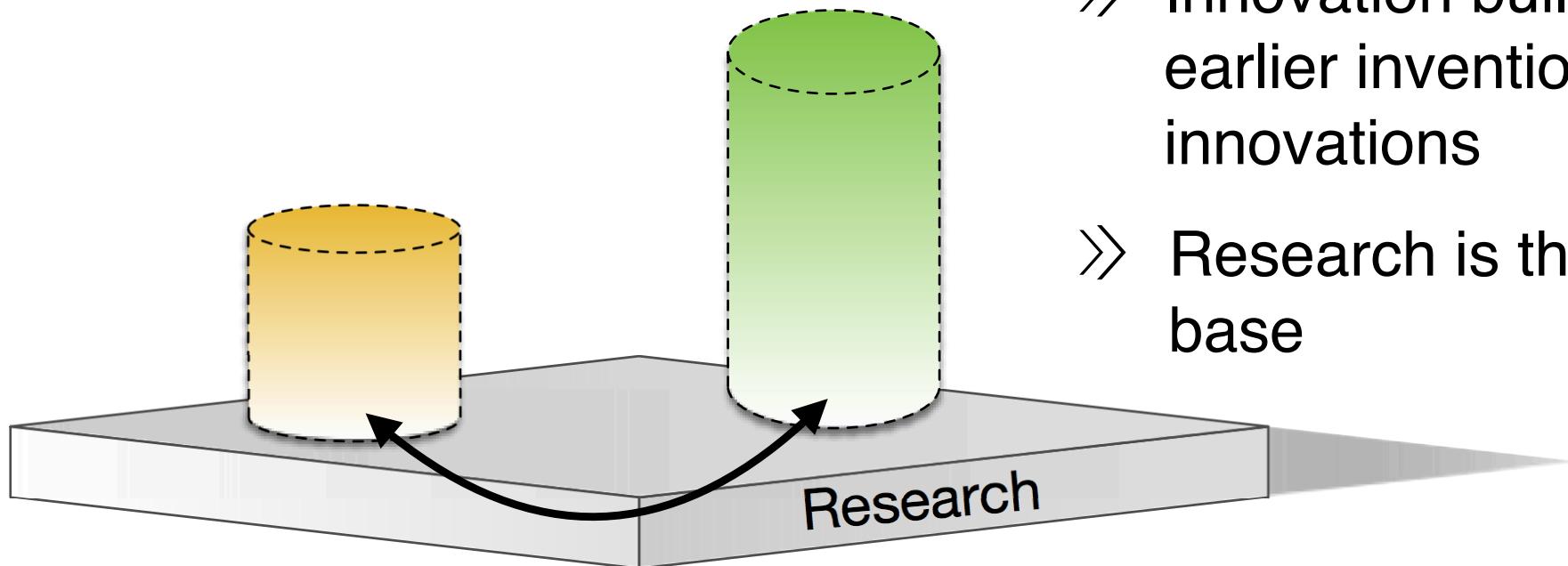
- » Both “I”s are important
- » Innovation builds from earlier inventions and innovations



## Invention

creation or design of something that has not existed before

e.g., the incandescent lightbulb



## Innovation

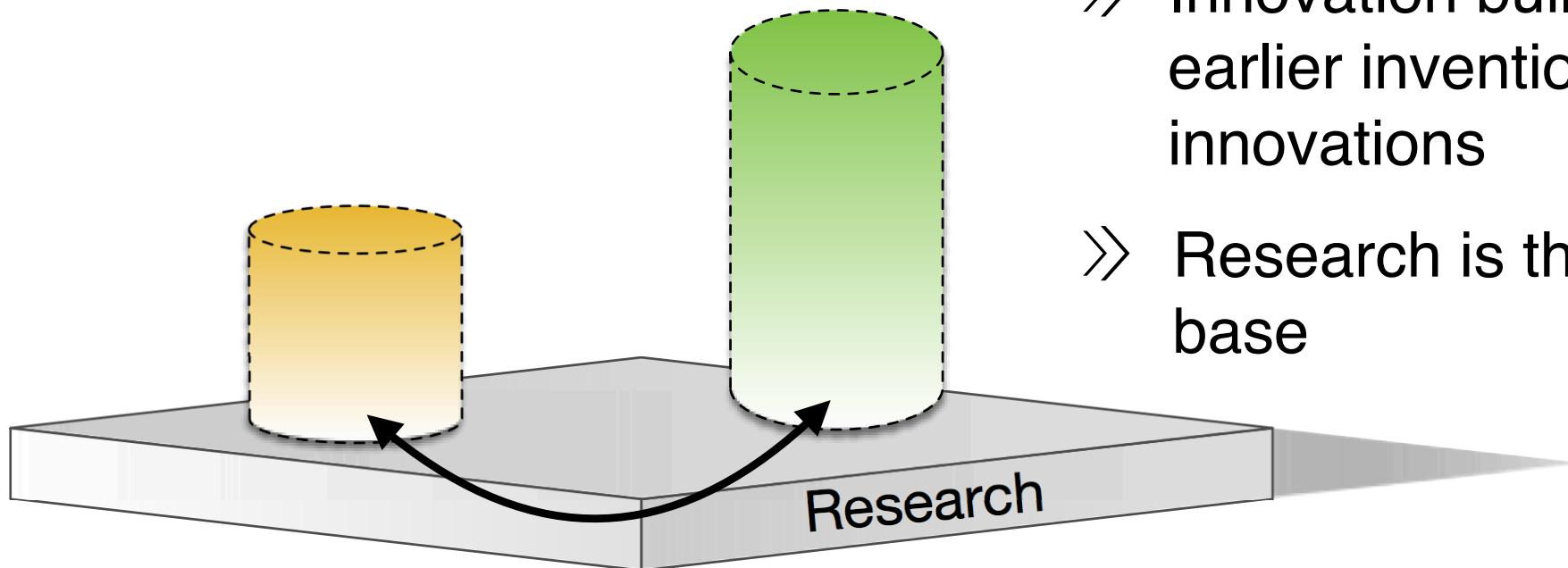
about the use of an idea of method  
e.g., iPhone

- » Both “I”’s are important
- » Innovation builds from earlier inventions and innovations
- » Research is the base

## Invention

creation or design of something that has not existed before

e.g., the incandescent lightbulb



## Innovation

about the use of an idea of method  
e.g., iPhone

*It takes almost as much creativity to understand a good idea as to have it in the first place.*  
- Alan Kay

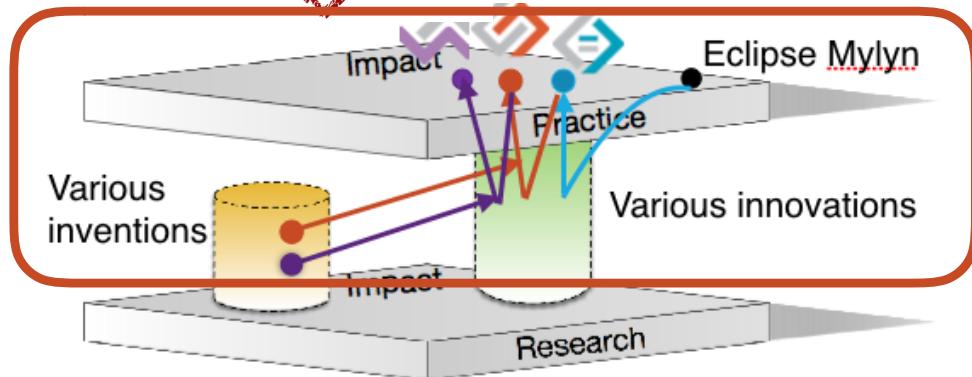
- » Both “I”’s are important
- » Innovation builds from earlier inventions and innovations
- » Research is the base

*Tech Radar image removed for licensing reasons.*

*Image showed that static analysis tools, version management, etc. from SE research community have impact in SE in practice.*

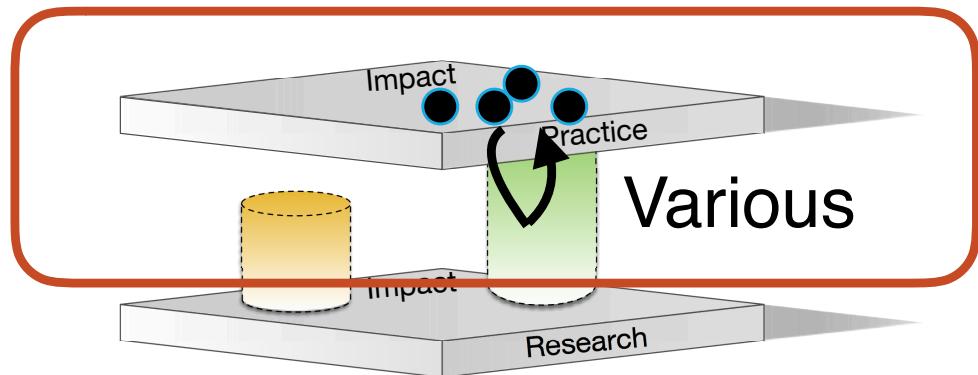
**Research is having impact**

INDUSTRY



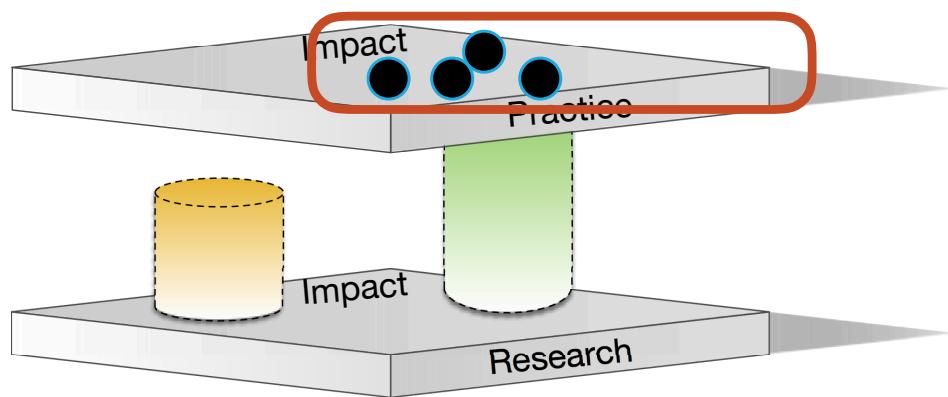


# Continuous Integration





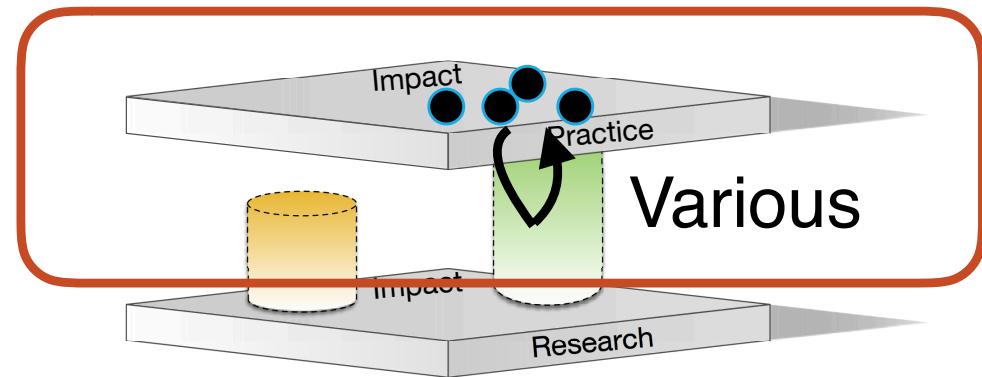
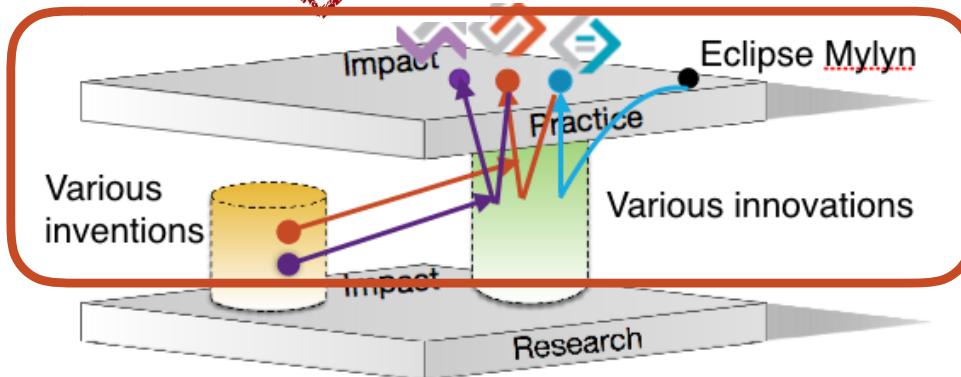
# Technology Adoption



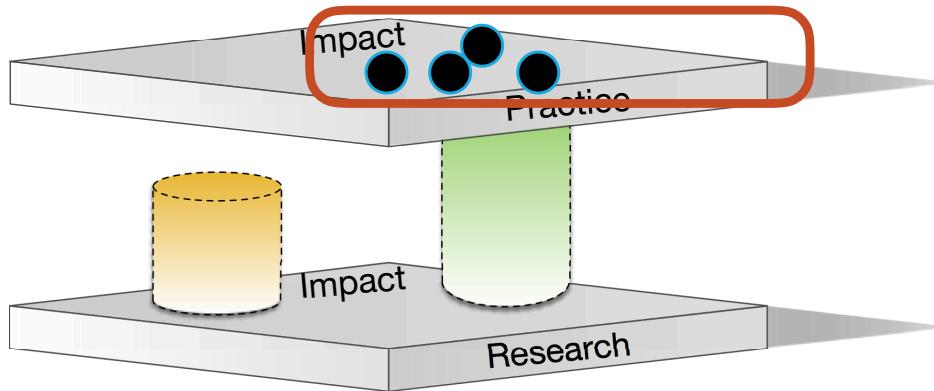
INDUSTRY



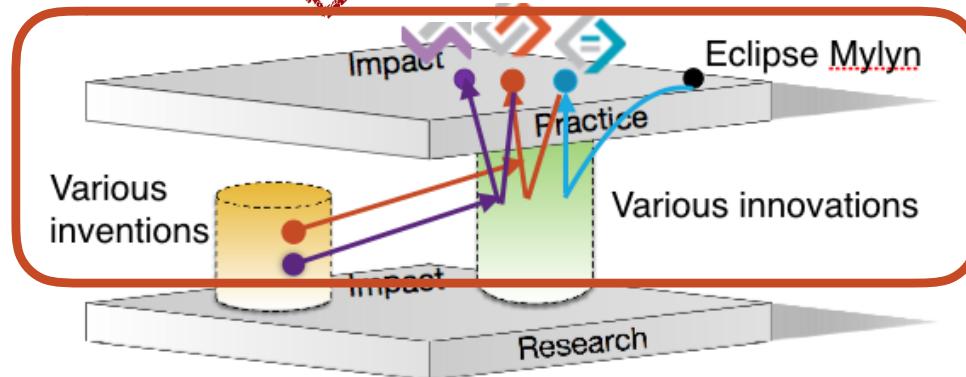
# Continuous Integration



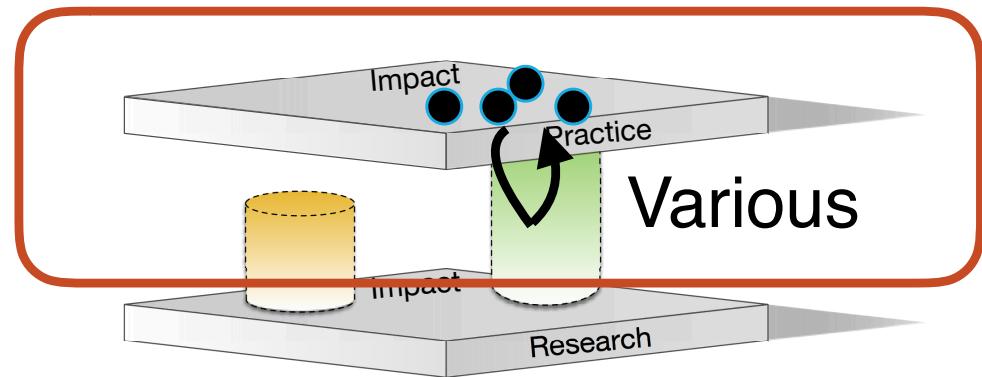
# Technology Adoption



INDUSTRY

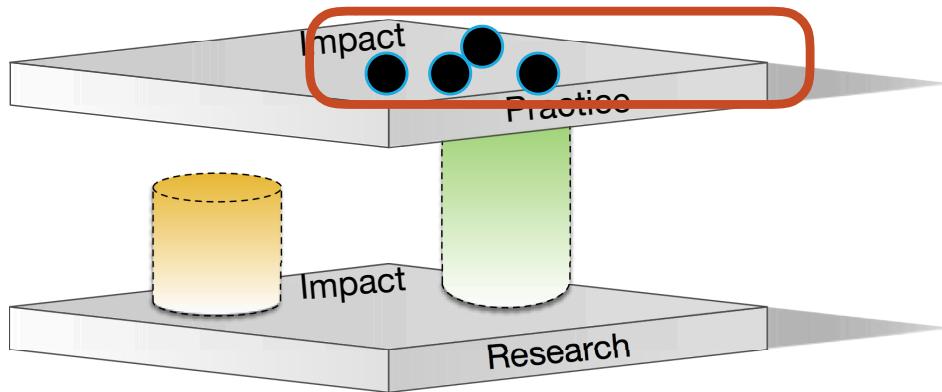


## Continuous Integration

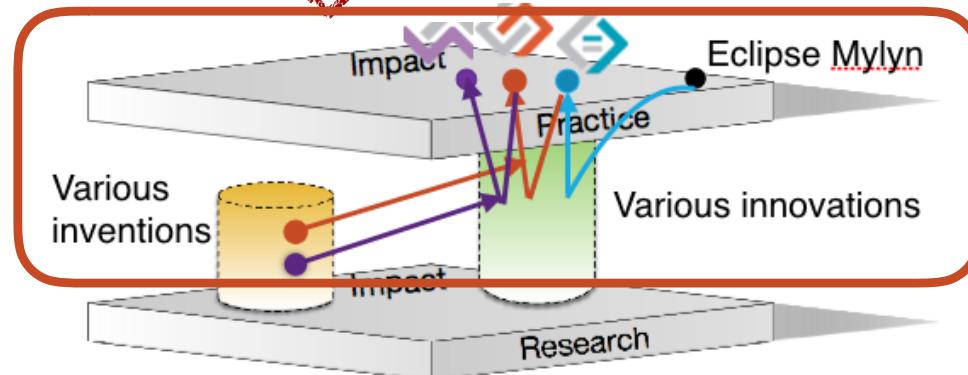


## Technology Adoption

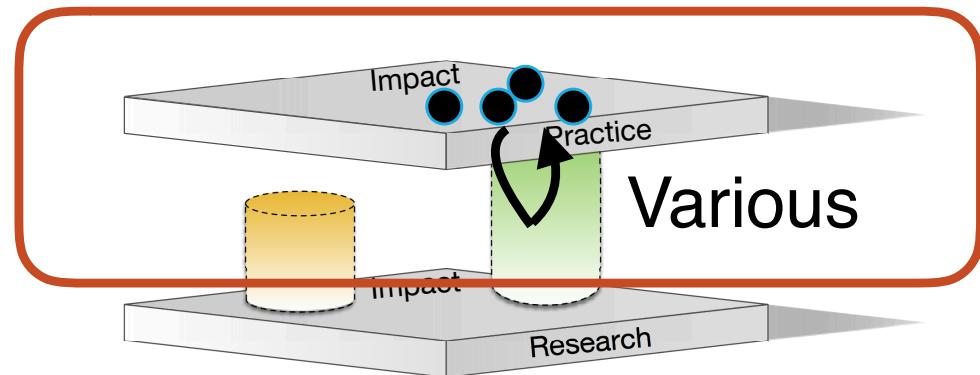
» Practice innovates continually



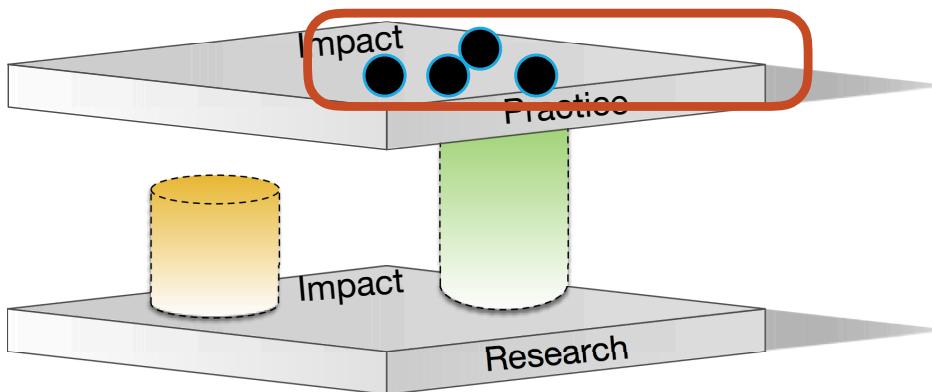
INDUSTRY



## Continuous Integration

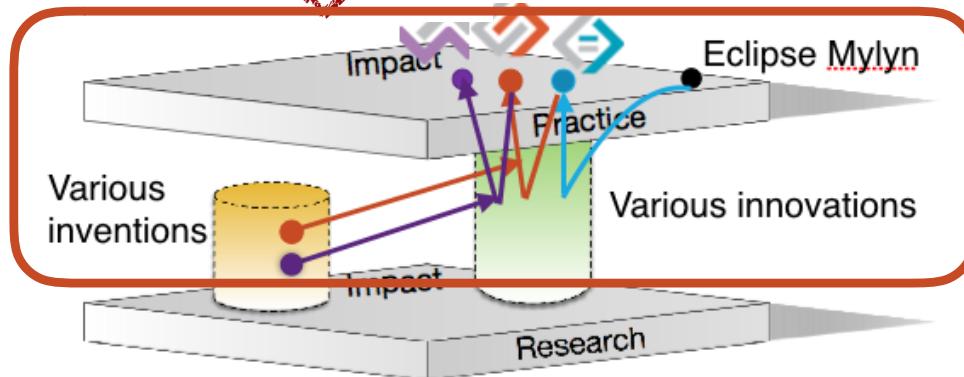


## Technology Adoption



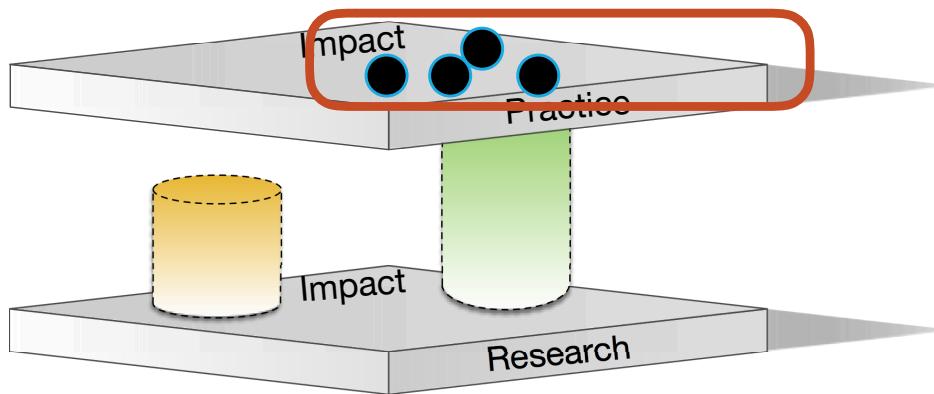
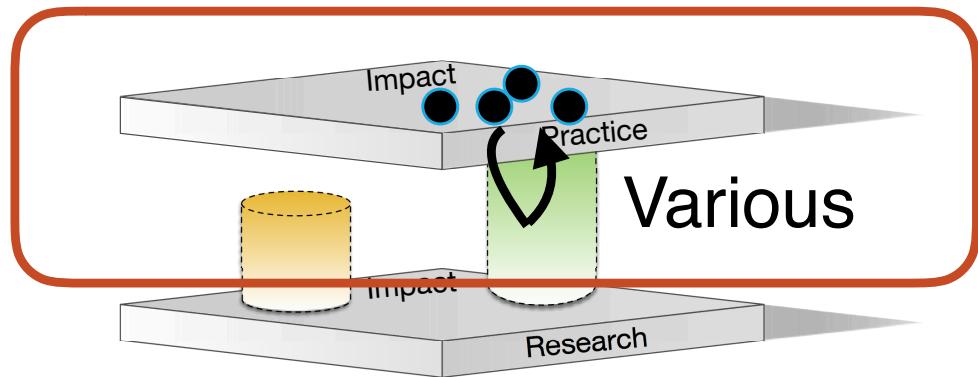
- » Practice innovates continually
- » Innovation is required to take Research into impact in Practice

INDUSTRY



## Technology Adoption

# Continuous Integration



- » Practice innovates continually
- » Innovation is required to take Research into impact in Practice
- » Innovation requires understanding of Practice

# Thanks to...

## Mylar + Early Tasktop:



## Tasktopians circa 2013



Reid Holmes and my research group for suffering through practice talks: Daniel Almeida, Julius Davies, Michalis Famelis, Marc Palyart, Albert Thompson, Giovanni Viviani

Mik Kersten, Rob Elves, Shawn Minto, Davor Cubranic, Taivo Evard, Nathan Hapke, Wesley Coelho, Meghan Allen, Leo Dos Santos, Steffen Pingel

# Summary

Mylar



Story

Continuous  
Integration  
Vignette

Technology  
Adoption  
in  
Practice

Impact  
Model

A 3D-style diagram showing a large grey rectangular block with several internal divisions. A central vertical column is highlighted with a green rectangle, and the text 'Impact Model' is placed within this green area.

# Summary

Impacts  
in  
research  
and  
practice

Mylar



Story

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# Summary

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Mylar



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# Summary

Impacts  
in  
research  
and  
practice

Mylar



Story

Open  
before  
closed

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Mylar



Story

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practice

Open  
before  
closed

Technology  
Adoption  
in  
Practice

Impact  
Model

Think  
about  
paths to  
impact(s)

I **do not** want you to leave this talk thinking...

- Every research project needs impact in practice
- Every research project should result in an open source project
- It is good enough to transfer people to Practice
- Having impact in practice requires creating a company



# **Is Continuous Adoption in SE Achievable and Desirable?**

# Is Continuous Adoption in SE Achievable and Desirable?

**It is happening**

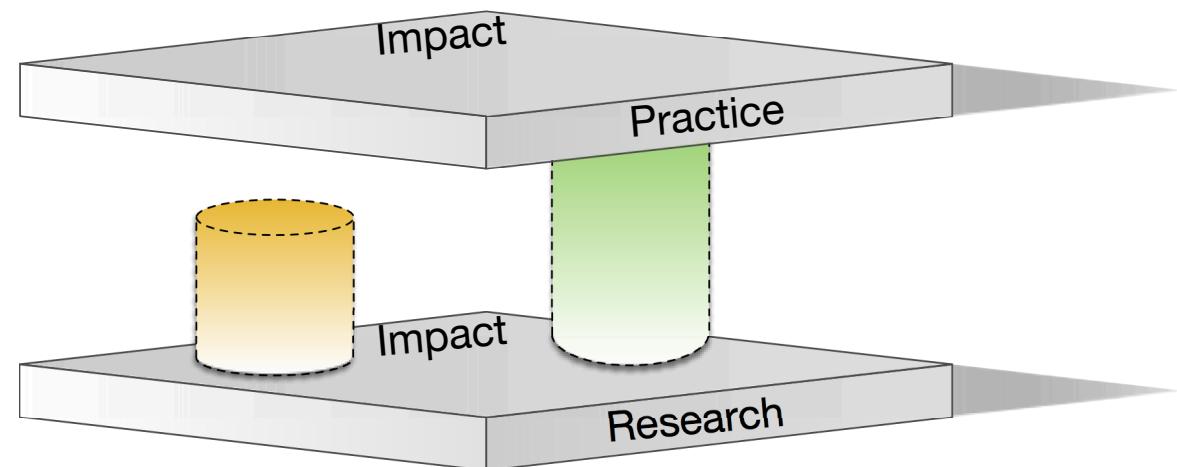
# Is Continuous Adoption in SE Achievable and Desirable?

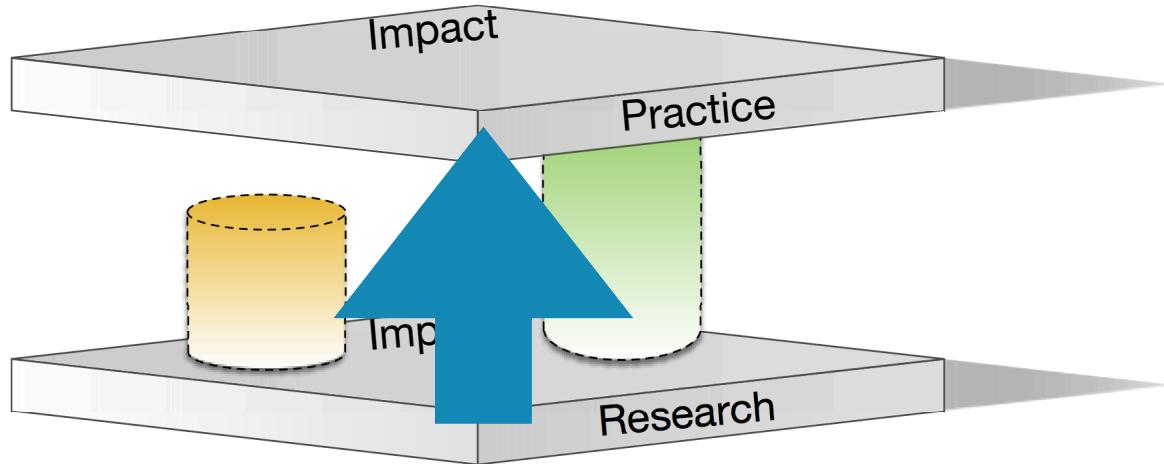
It is happening

**Much more often from practice,  
driven by need to solve problems,  
not from SE research**

# Some Actions on the Paths to Impact in Practice

engage with the practice of software engineering  
convey (blog?) results in terms of problems in practice  
create and nurture an open source project  
commercialize a technology  
collaborate with industrial partner  
track results and share the stories  
and more...





Think about the paths to impact in research **and** practice for your projects

## Challenge: Take at least one of your projects from research to practice

Gail C. Murphy

University of British Columbia

Tasktop Technologies Inc.

@gail\_murphy

