Toward Complete & Sustainable Learning Systems

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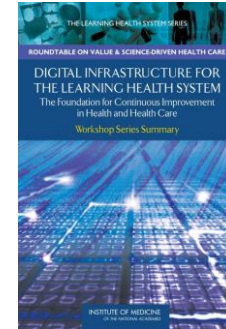
University of Michigan

December 8, 2014

Disclosure

I am the chair of the Interim Steering Committee of the Learning Health Community, a grassroots not-for-profit organization.

How I Got Here

- **2009-2011:** Encountered the LHS as ONC's Chief Science Officer and engaged with IOM

- **2011-2012:** Organized LHS National Summit, which spawned a national grass-roots Community

- **2013:** Organized NSF workshop on LHS research challenges

Toward a science of learning systems: a research agenda for the high-functioning Learning Health System

Charles Friedman,[1] Joshua Rubin,[1] Jeffrey Brown,[2] Melinda Buntin,[3] Milton Corn,[4] Lynn Etheredge,[5] Carl Gunter,[6] Mark Musen,[7] Richard Platt,[2] William Stead,[3] Kevin Sullivan,[6] Douglas Van Houweling[1]

- **Now:** Chair of first academic department of LHS

University of Michigan
Medical School

Main Points
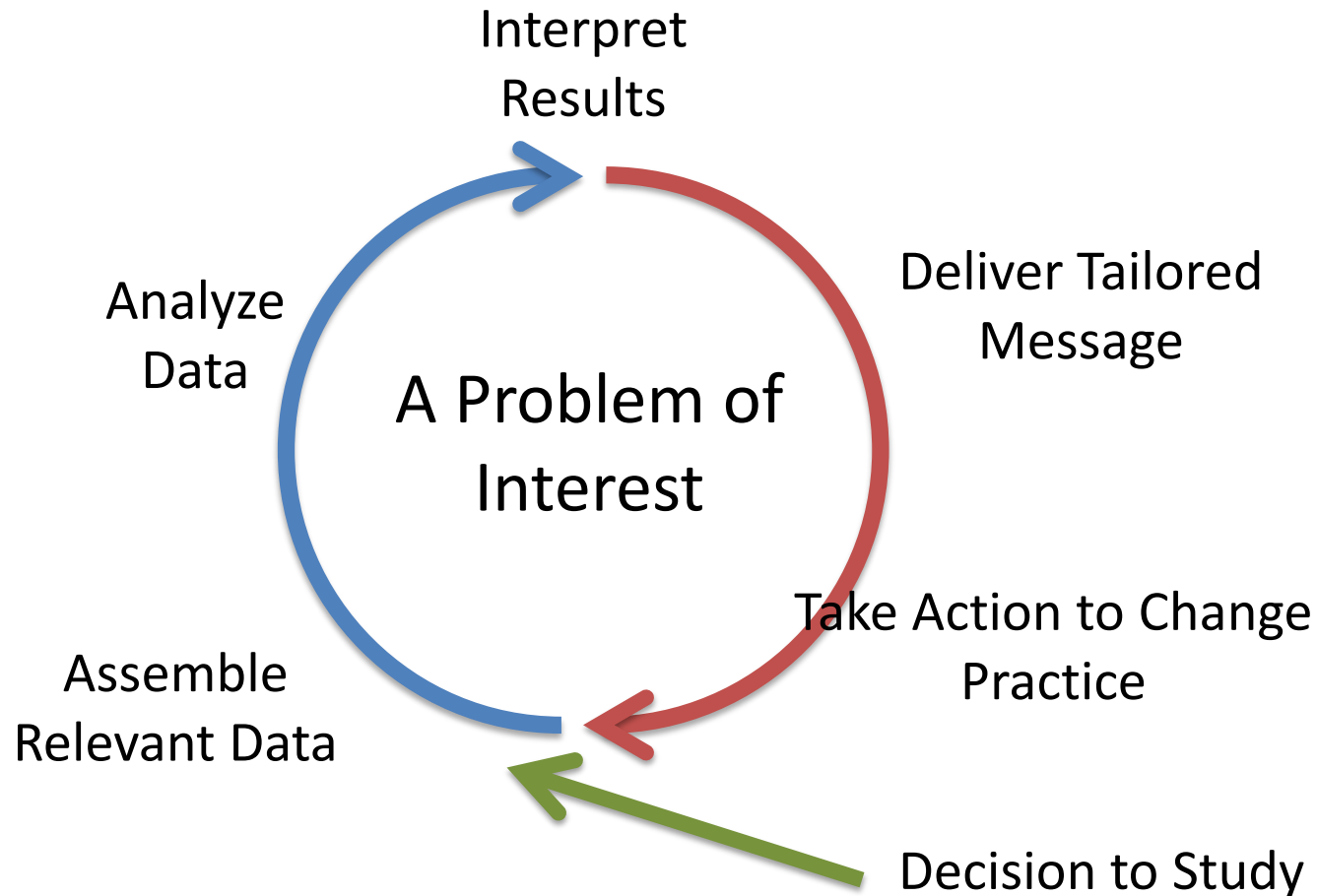
<u>Goal from Lynn's presentation</u>:

To learn as quickly as possible about the best medical care for each person—and to deliver it.

- This requires support of complete learning cycles
  - Without complete cycles we cannot improve

- This requires a scalable infrastructure (platform)
  - Without a platform there will be chaos

A Health System That Can Learn

- Every patient's characteristics and experience are available for study

- Best practice knowledge is immediately available to support decisions

- Improvement is continuous through ongoing study

- This happens routinely, economically and almost invisibly

- All of this is part of the culture

Complete "Virtuous Cycles" of Study and Improvement

Interpret Results

Analyze Data

A Problem of Interest

Deliver Tailored Message

Assemble Relevant Data
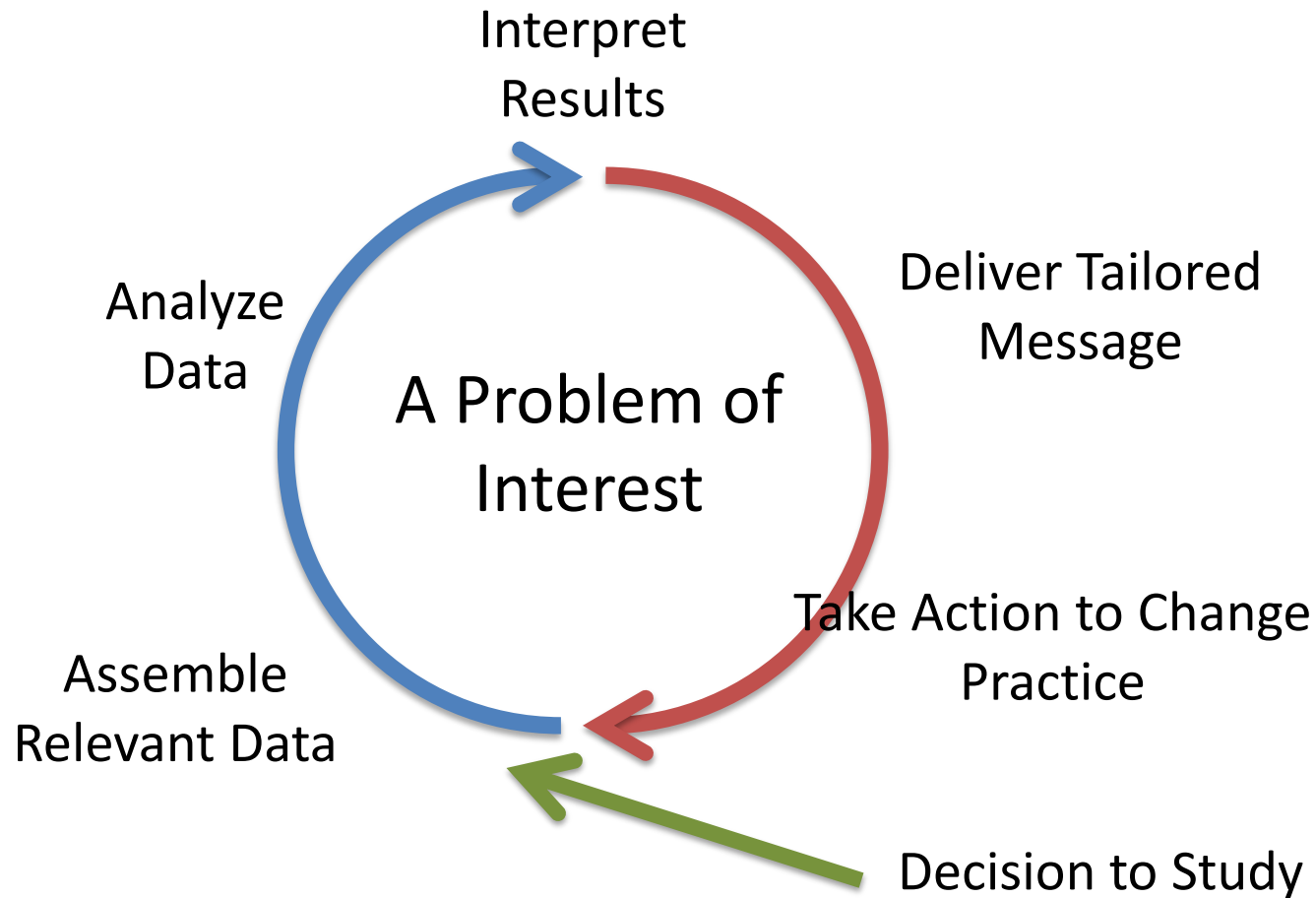
Take Action to Change Practice
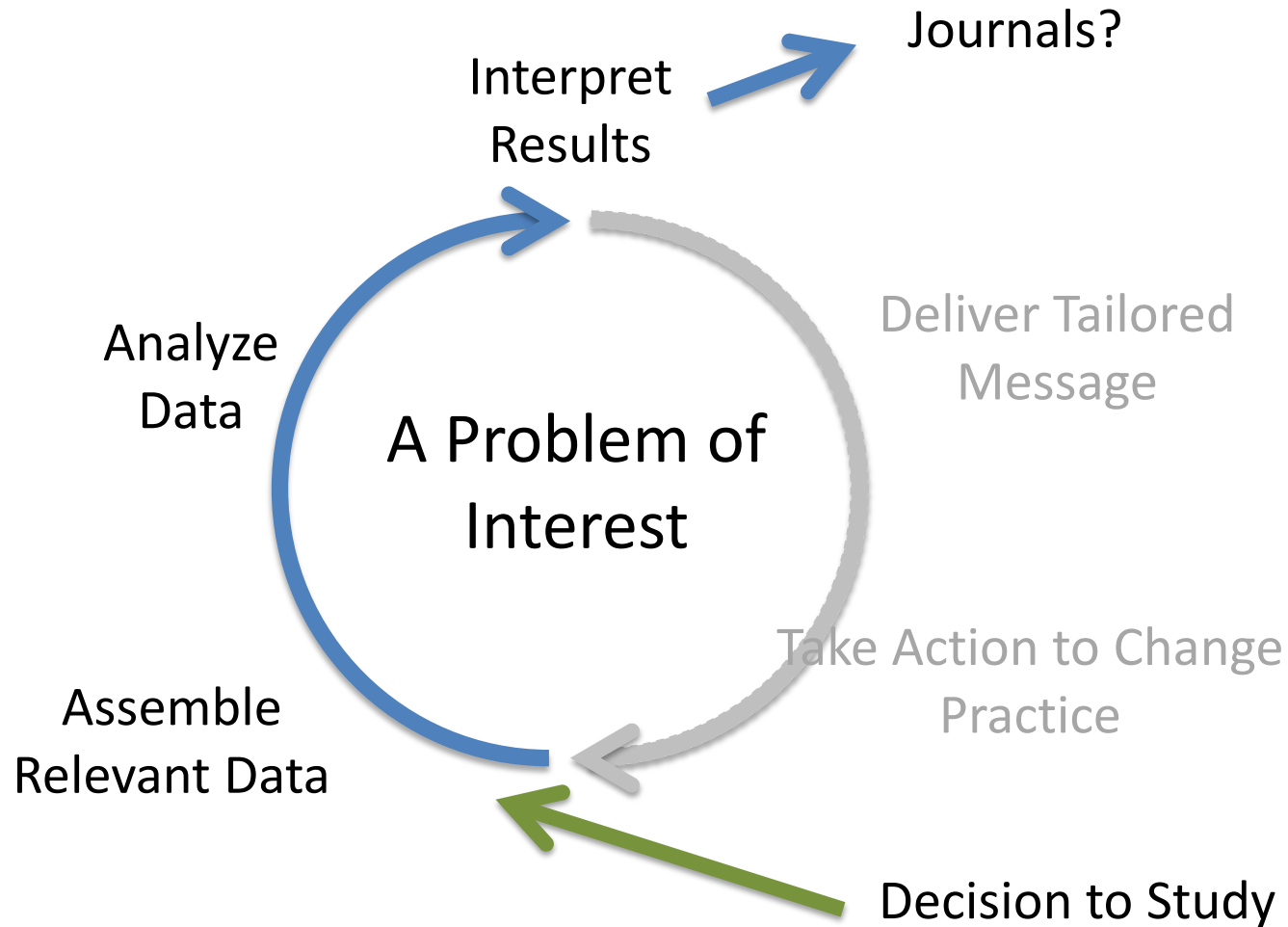
Decision to Study

Importance of Complete Cycles

- Lynn's expressed goal of delivering best care after learning what it is

- Jason report: November, 2014

The learning health system needs to be "closed loop" to ensure a continuous and transparent cycle of research, analysis, development, and adoption of improvements relevant to health and wellness and to the delivery of health care.
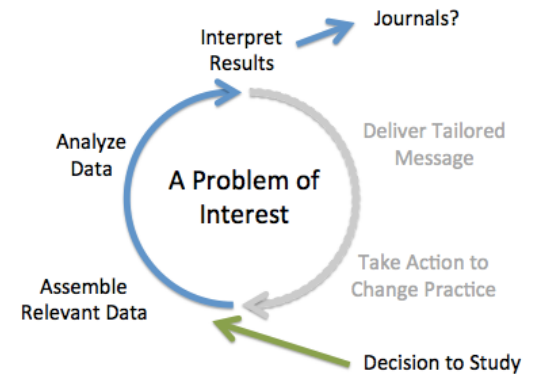
But Instead of Doing This...

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We Seem to be Doing This

Journals?

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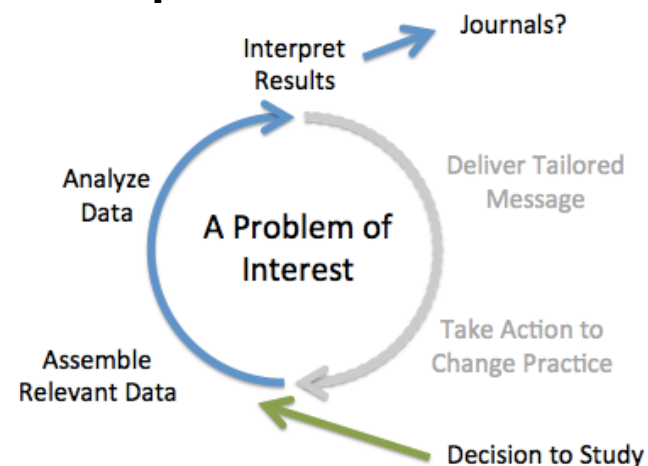
What I'm Observing

- Belief that if we get the data and analytics side right, everything else will fall into place

  – But we know that's not true

- "Big Data to Knowledge"

  – And then what?

- PopMedNet (basis of PCORnet) does not support the feedback "red" side of a complete cycle
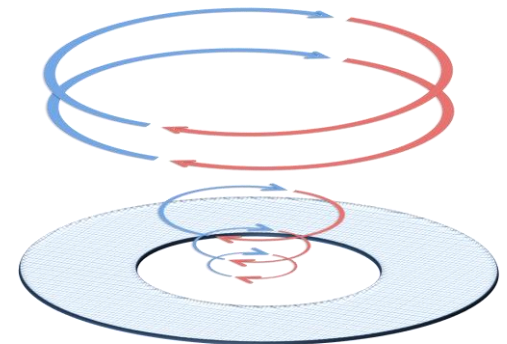
Jeff Brown's NIH Grand Rounds: 11/14/14

Use cases, all "open loop":

- Pragmatic clinical trial design
- Observational studies
- Single study private network
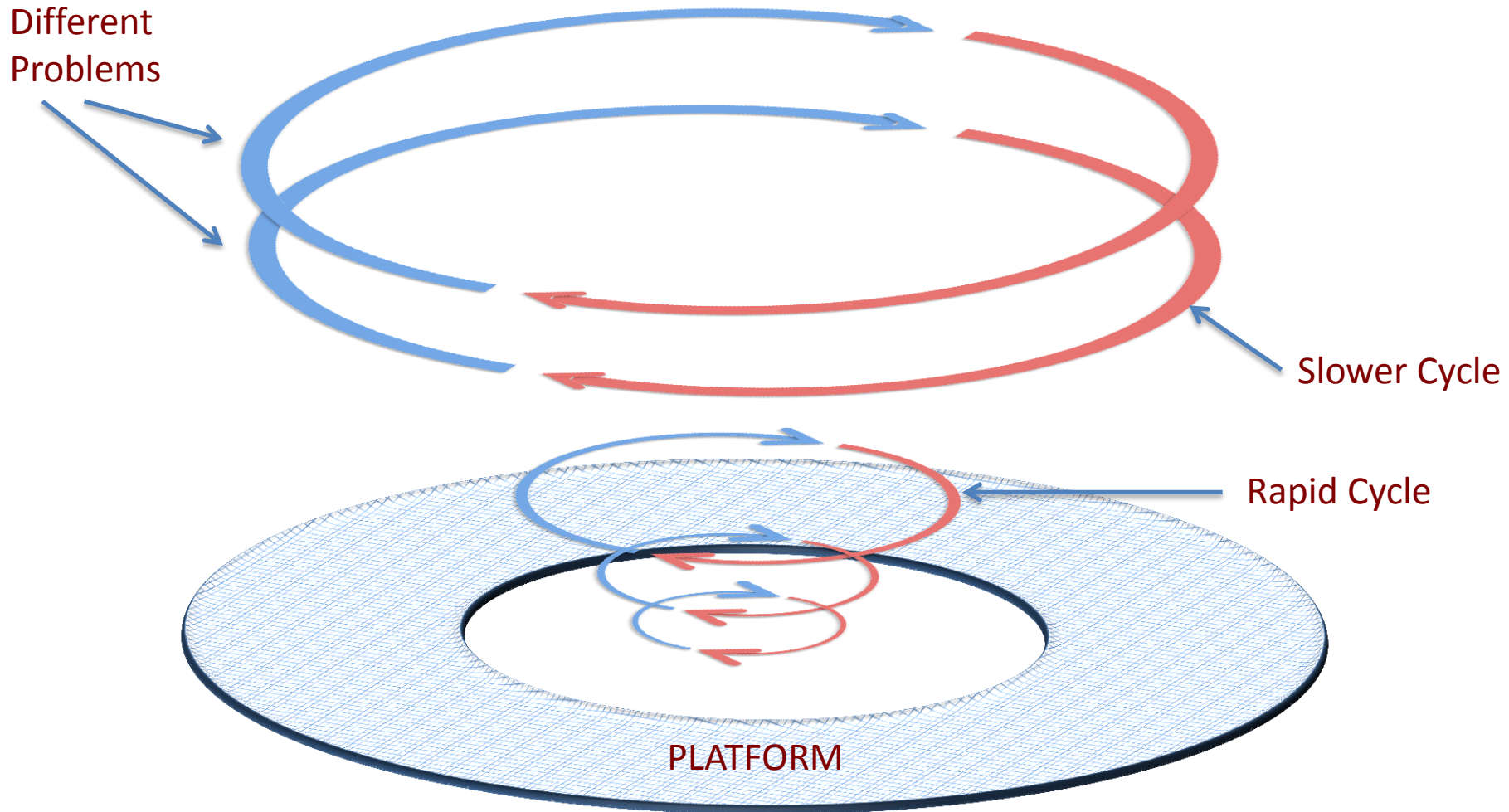- Pragmatic clinical trial follow up
- Reuse of research data

NIH Collaboratory   NIH Distributed Research Network

Interpret Results → Journals?

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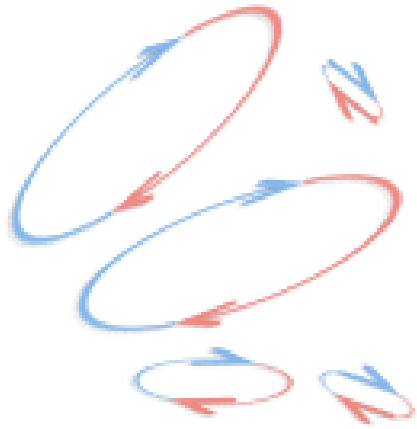
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Decision to Study

My Pitch…

- To meet Lynn's goal, delivery systems & research networks must run many complete learning cycles simultaneously, each addressing a different problem

- Also, need an infrastructure that makes learning effective, sustainable, and routine--with economy of scale
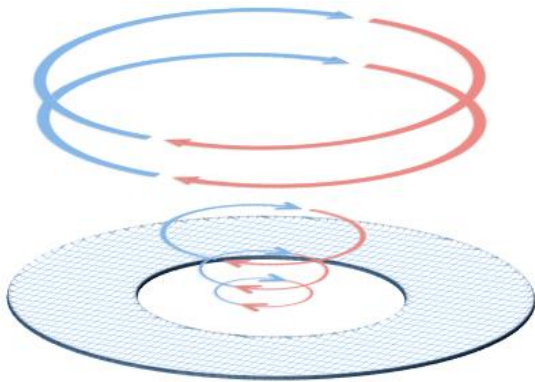
- Enter the platform…

How to Learn *Routinely*: A Single Platform Supports Multiple Simultaneous "Virtuous Cycles"

Different Problems

Slower Cycle

Rapid Cycle
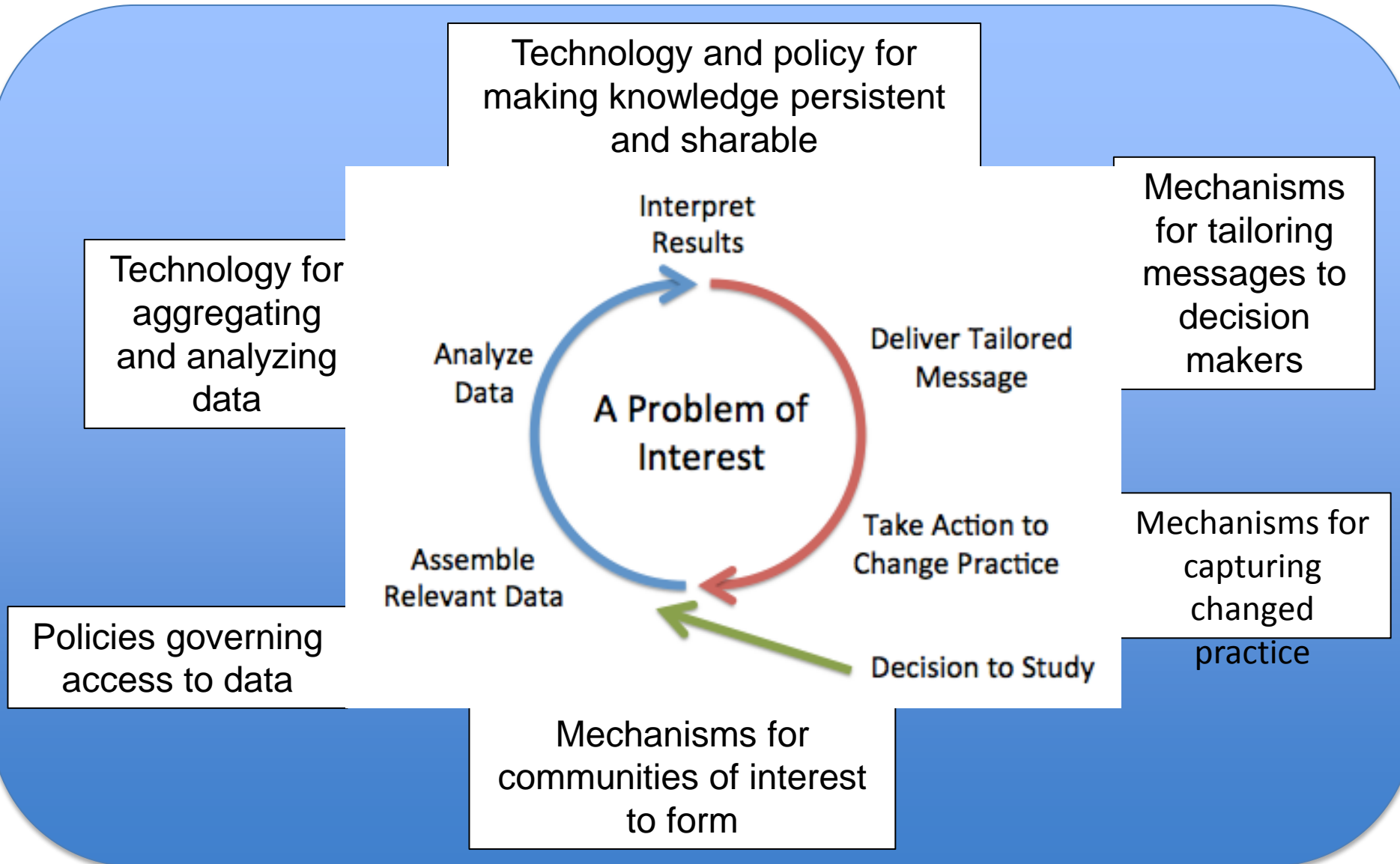
PLATFORM

In Other Words…

- **Without a platform**, each learning cycle develops its own, sub-optimal methods for learning; no economy of scale
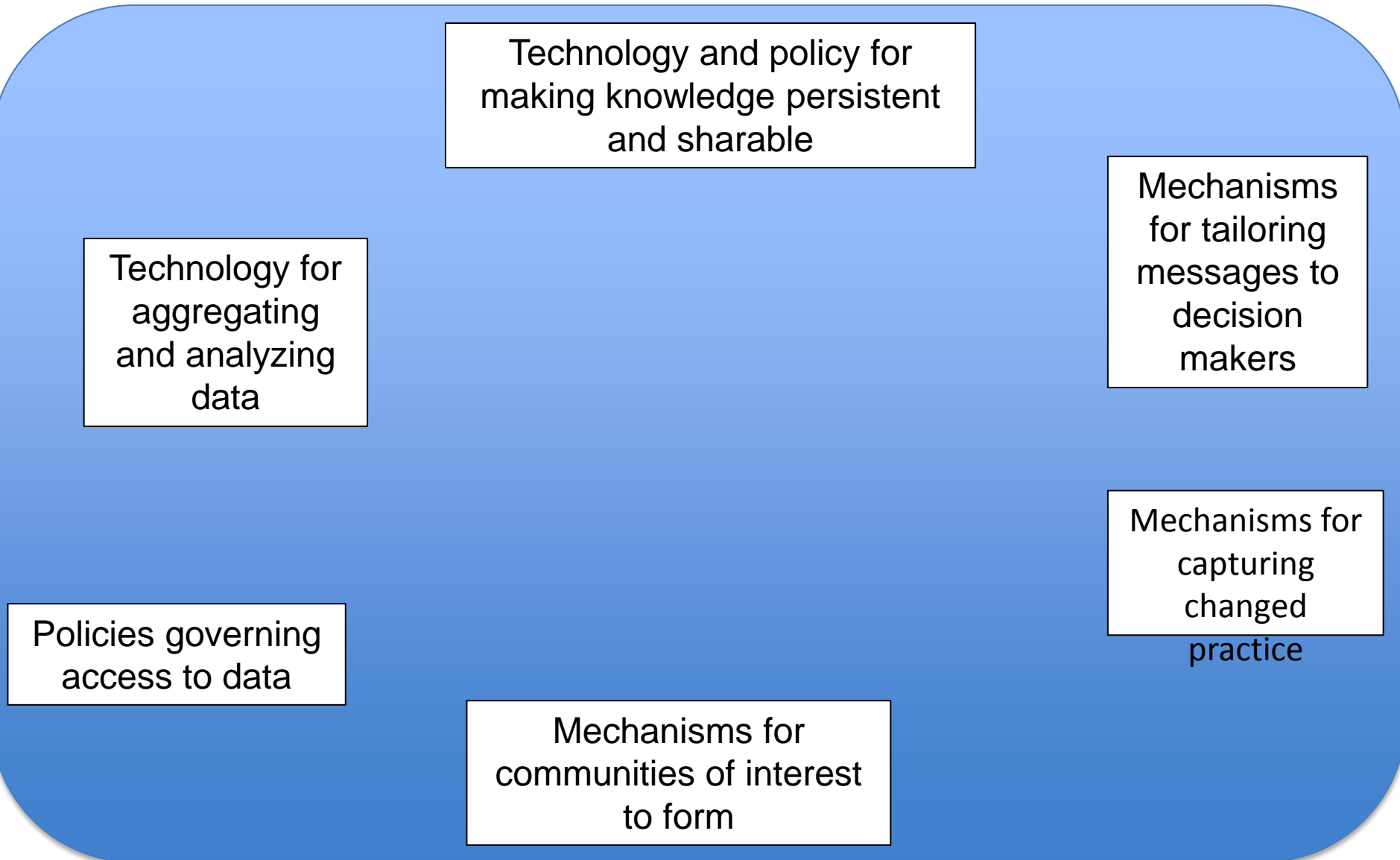
- **With a platform**, all cycles share & benefit from a common infrastructure; costs are distributed
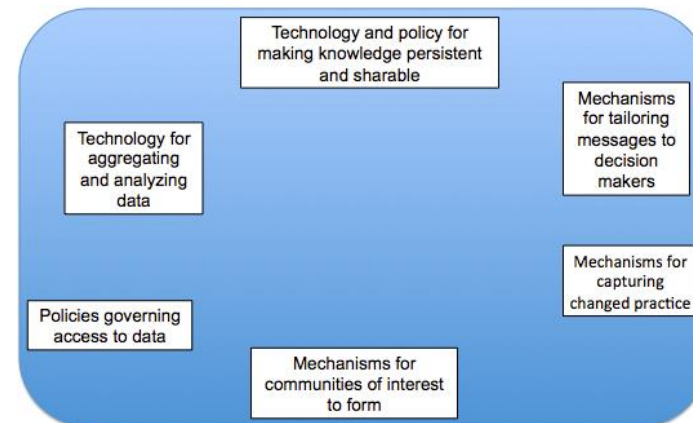
Components of the Complete Platform

Technology and policy for making knowledge persistent and sharable

Mechanisms for tailoring messages to decision makers

Technology for aggregating and analyzing data

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Mechanisms for capturing changed practice

Policies governing access to data

Mechanisms for communities of interest to form

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A Platform, Built Right

- Will scale to embrace genomic data
- Will have sharable, interchangeable components: "build once, use many"
- I urge the genomic community to demand attention to complete learning cycles and the "platform" approach
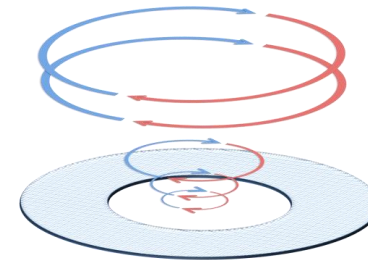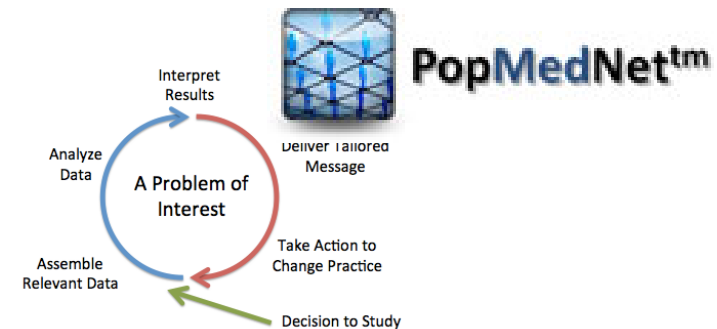
What is My Department Doing?

- Viewing the LHS as a research challenge

- Trying to balance out current efforts with focus on the "feedback" side
  - Partnering with PopMedNet

- Building reusable and scalable platform components

- Would be delighted to partner with the genomics community
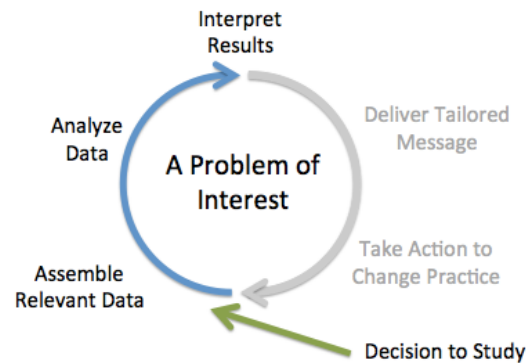

Research and applications

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PopMedNet™

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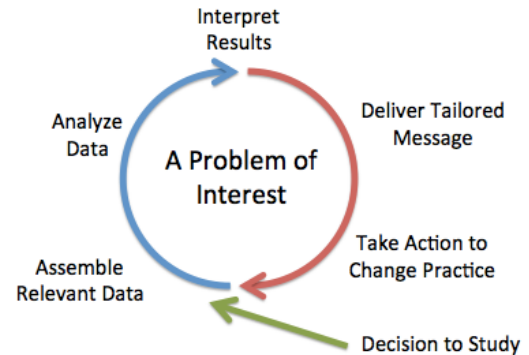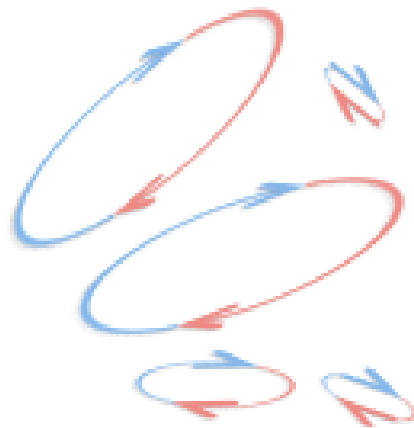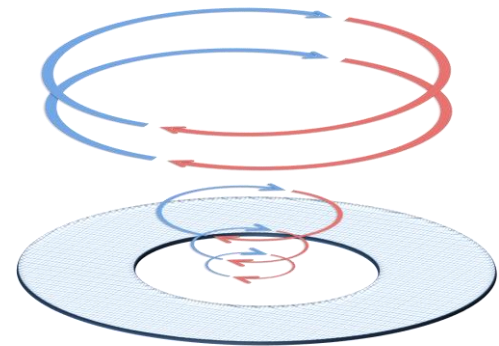# So It's Up to Us and the Stakes are High

Is it?

Or

And is it?

Or

Thanks & Write to Me

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