

HIE as an Engineered System

Navigating the HIE Labyrinth

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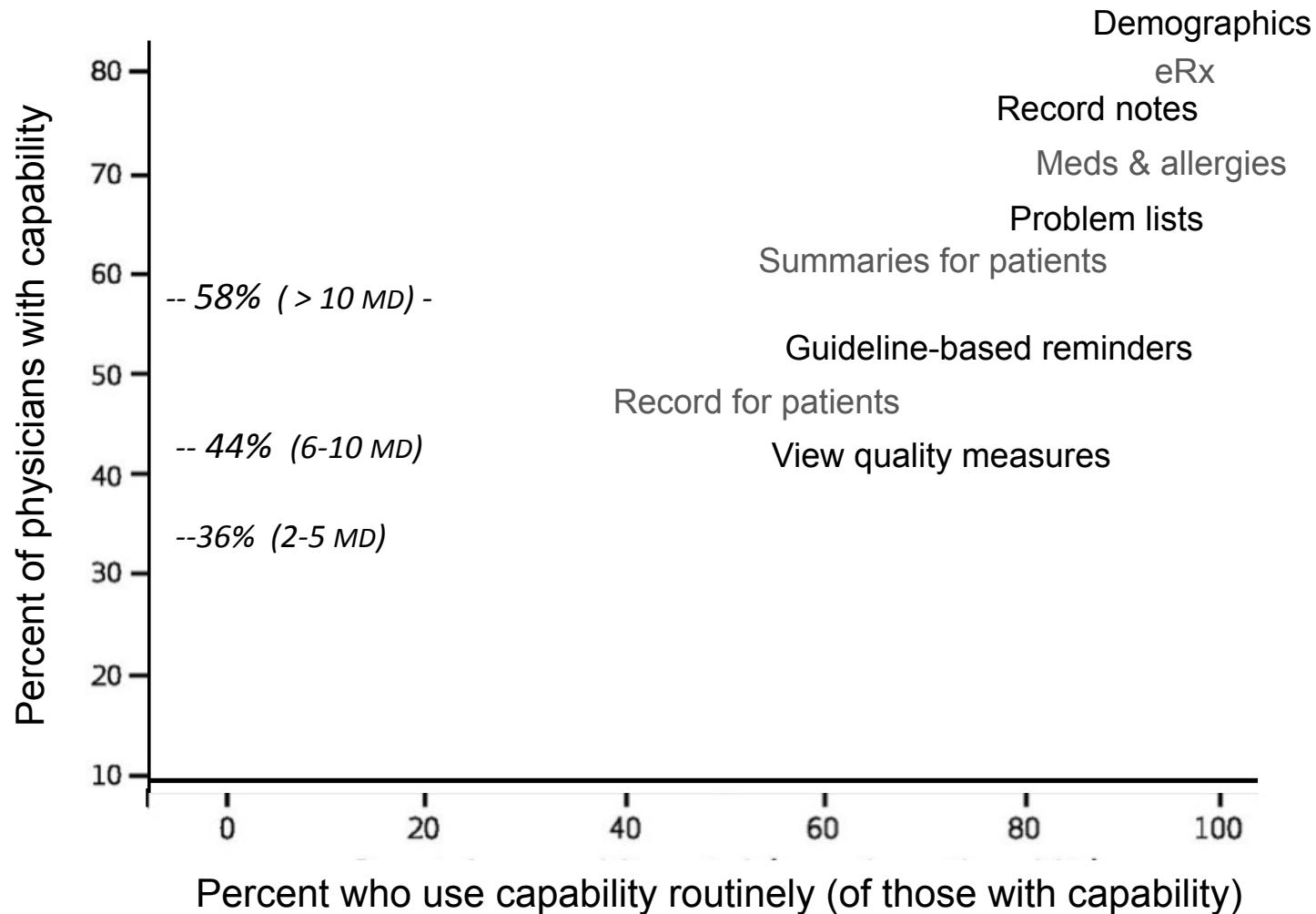
Topics

1. The current state of EMRs & HIE
2. The policy labyrinth
3. Engineered systems for policy

Part 1

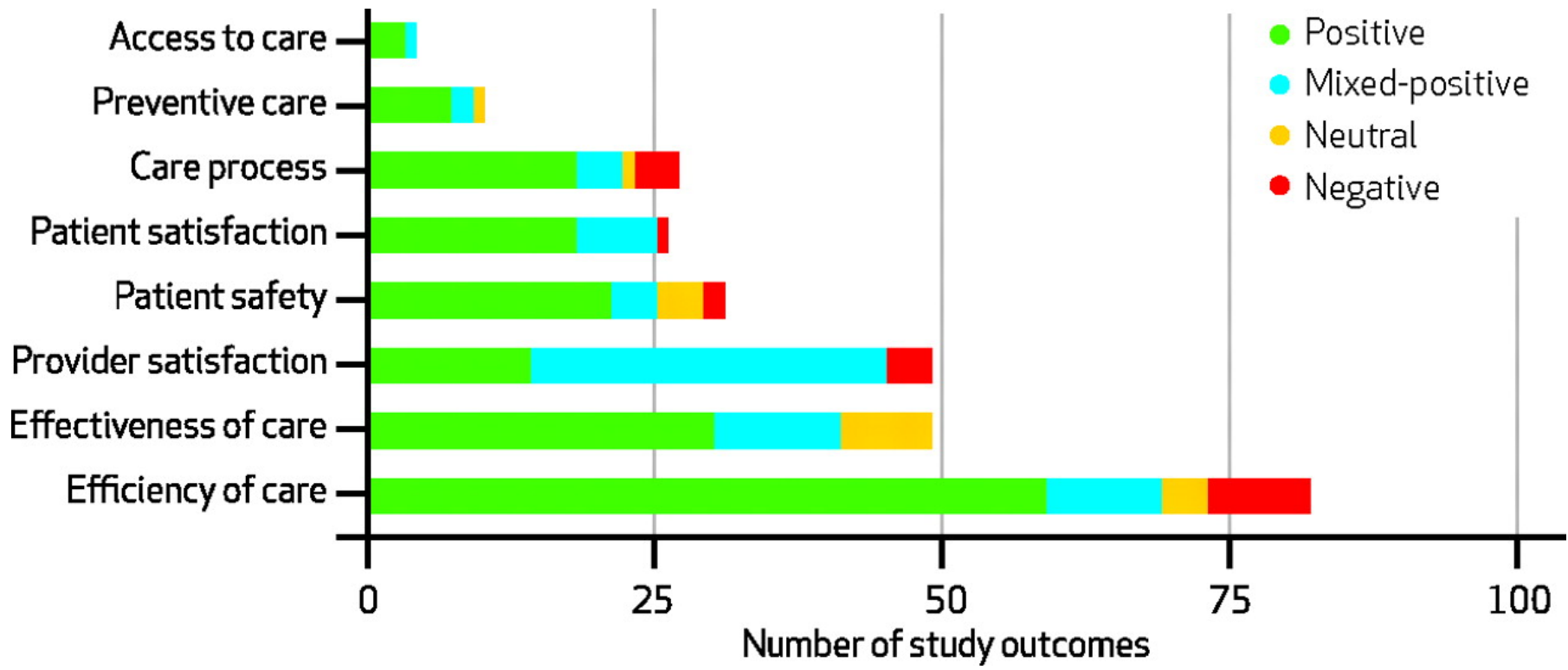
The Current State of EMRs & HIE

Small offices lag in adoption. Actual office-based use varies



● Source : Hsiao C et al. Health Aff doi:10.1377/hlthaff.2013.0323

Studies of HIT benefits are generally favorable



Source: Buntin et al. Health Affairs. 2011;30:464-471.
Authors' analysis of published peer-reviewed studies. NOTE A total of 278 outcome measures were evaluated across all studies included in our final sample.

So why isn't everyone satisfied?

Perhaps EMRs aren't meeting clinicians' real needs

Physicians want their EMRs to:

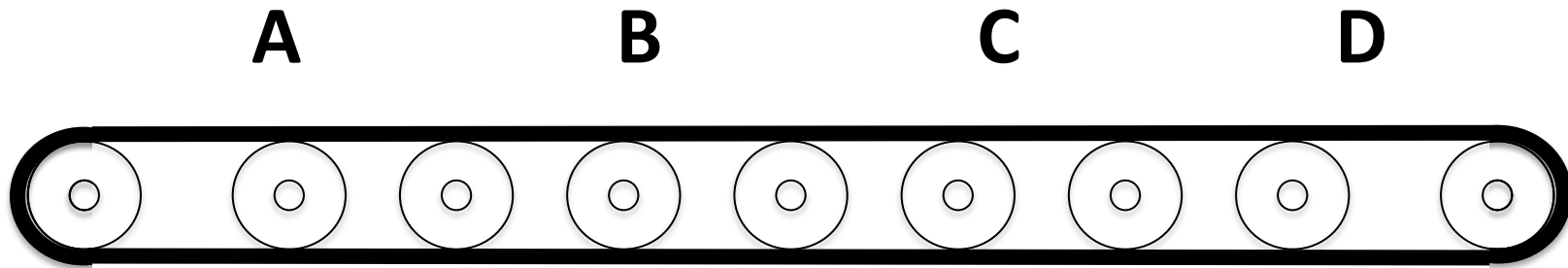
- Routinely confer immediate, dramatic clinical benefits
- Save them time
- Lower their costs
- Increase their revenues
- Mitigate medical & legal risk
- Eliminate administrative coding & other non-clinical work
- Bring knowledge to bear to make them seem smarter
- Require absolutely no change in behavior or office culture
- Serve as effective communication devices

EMRs must manage at least 3 different “businesses”

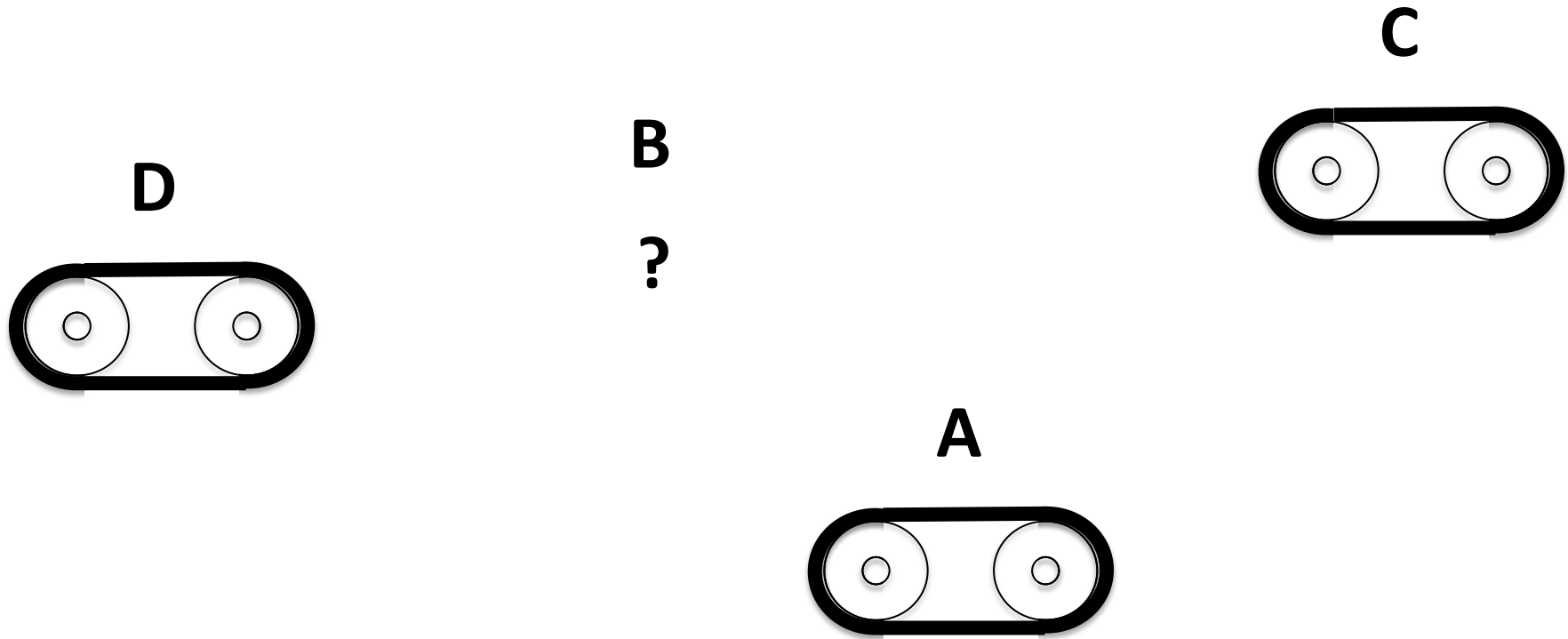
1. EMRs support problem solving and care planning
2. EMRs monitor care processes
3. EMRs communicate across organizational boundaries

*Sources: Stabell CB, Fjeldstad ØD. Strategic Management Journal. 1998
Hwang J, Christensen CM. Health Affairs..*

EMRs help coordinate and monitor care in hospitals



Ambulatory EMRs can't communicate to coordinate

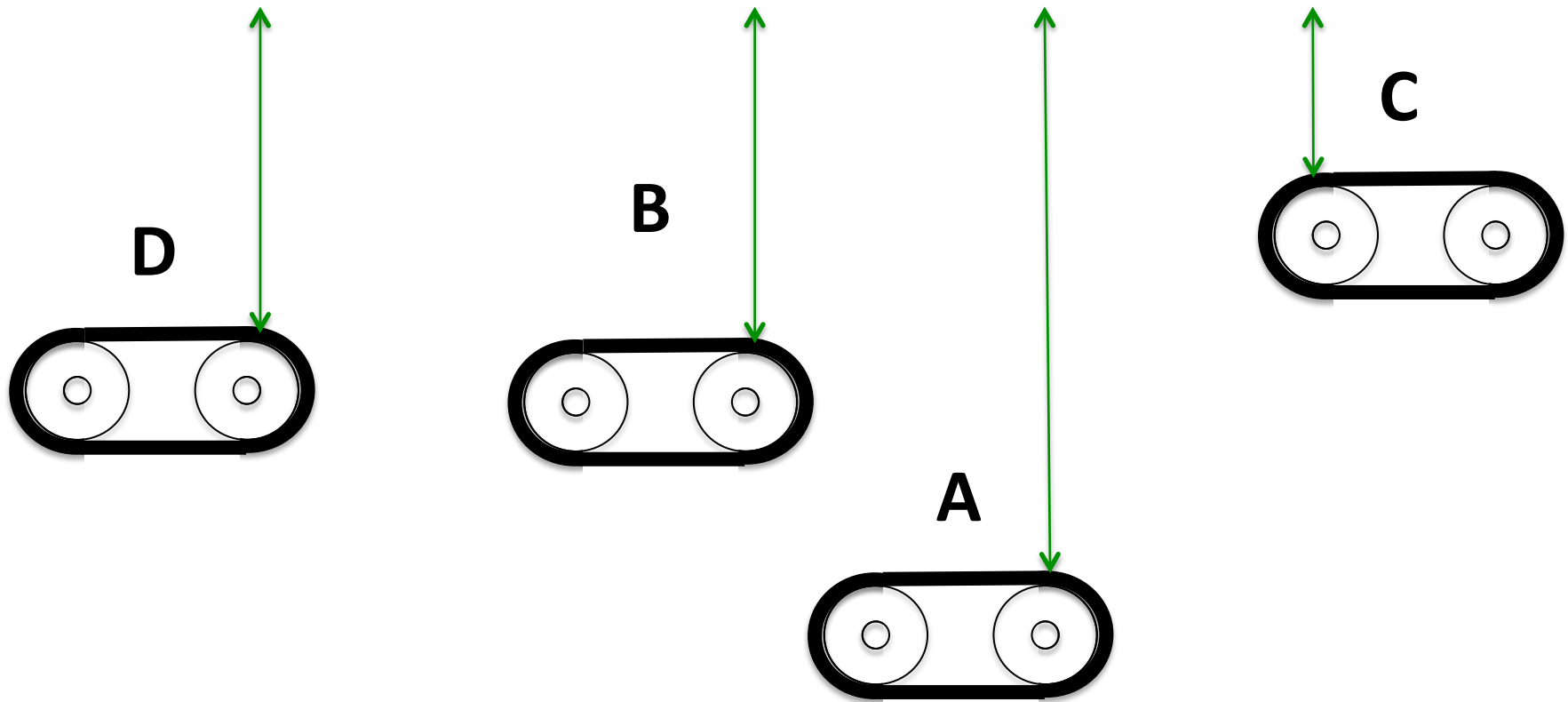


Medicare beneficiaries see at least five different clinicians and many more pharmacists, therapists, and other clinicians.

source: Pham, H.H., et al., Care patterns in Medicare and their implications for pay for performance. N Engl J Med, 2007. 356(11); p. 1130-9.

Health information exchange brings EMRs together

Data are made available to those who require access



Can state exchanges do this job?

43 states and territories have directed exchange

- 79,957,695 directed exchange messages*

20 states have statewide query-based exchange

- 2,794,705 patient queries

Only 4 states and 4 territories report not having any directed or query-based exchange

** Q3 2012 Data*

Tripathi: Only a few state HIE programs may be ready to do so

Directed transactions

State HIE Grantee	Monthly transactions
Indiana	14,532,368
Colorado	5,011,816
New York	3,322,812
Minnesota	1,680,124
Vermont	889,700
Delaware	827,483
Washington	138,422
Michigan	98,976
Maryland	48,655
Ohio	35,359
Rhode Island	29,627
California	28,439
Alaska	3,701
Utah	2,482

42 remaining HIE activities had fewer than 1,000 monthly transactions

Query transactions

State HIE Grantee	Monthly transactions
Indiana	351,070
Texas	215,005
New York	101,748
Kentucky	92,387
South Carolina	50,515
Delaware	37,245
Oklahoma	32,015
Colorado	22,665
Mississippi	12,909
Nebraska	3,459
Tennessee	3,254
Maryland	3,223
Maine	3,211
New Jersey	1,601
Utah	454
Kansas	302
Minnesota	208
New Mexico	165
Rhode Island	130

37 remaining HIE activities had no query-based transactions



14 million directed exchanges per month



3.2 million directed exchanges per month



200K+ directed exchanges per month

Fortunately, HIE is maturing

HIE 1.0



hie 2.0

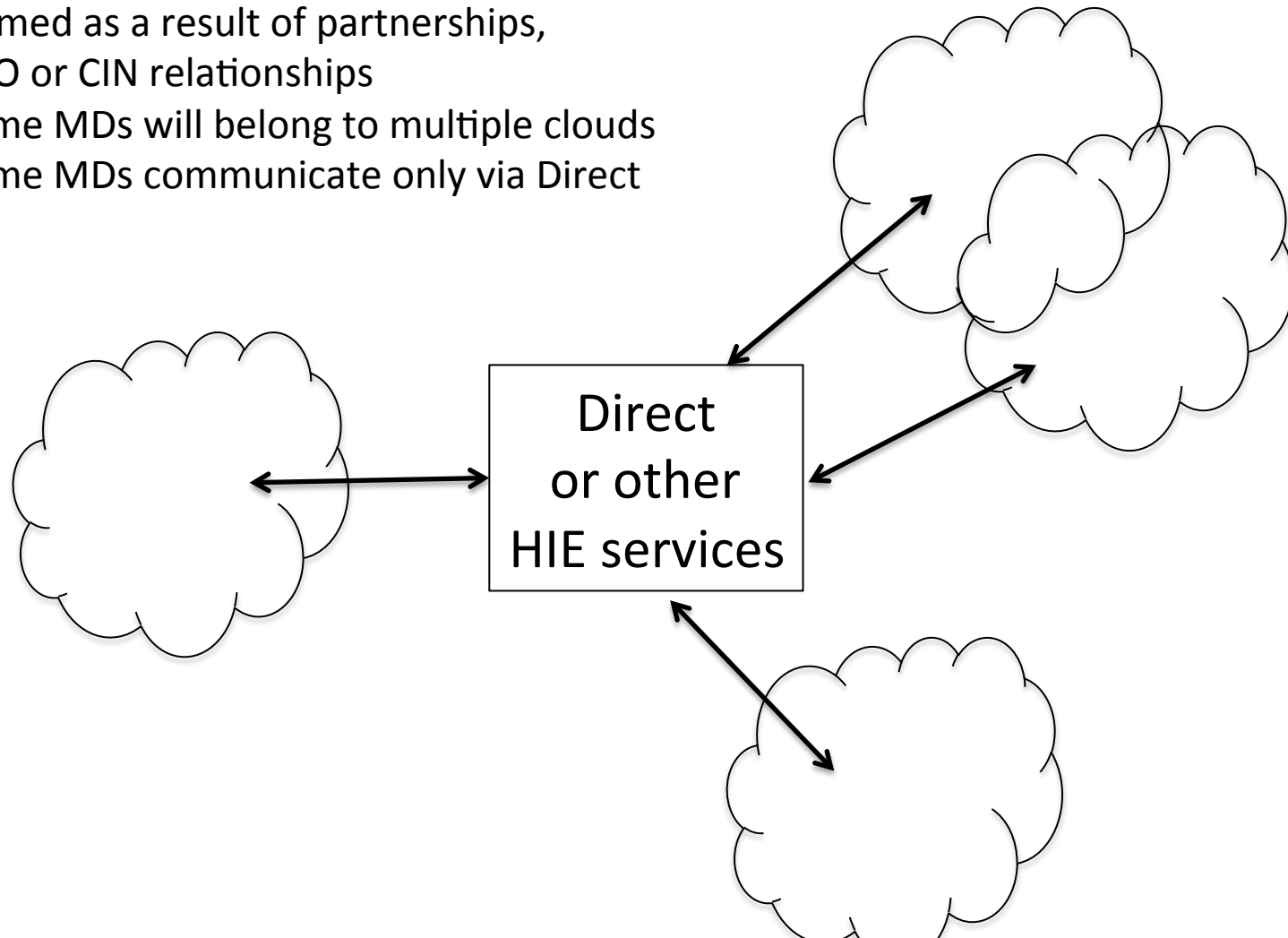
- Focused on “the noun”
- Trying to solve “market failures”
- Multi-entity governance, but often driven by third-party entities
- Strived to solve wide variety of rich use cases through comprehensive interoperability
- Complex legal, business, and technical requirements to support rich array of use cases
- Tried to tackle policy issues to enable business practices and technology solutions

- Focused on “the verb”
- Demand-driven -- trying to meet market needs
- More tactically focused to meet immediate interoperability needs
- Led by any organization that has business need and ability to marshal financial, technical, and organizational resources
- Designed to fit within existing legal, business, and technical constraints – technology out ahead of policy in some areas

Regional HIE as a collection of “enterprise HIE” relationships


Frissé’s Hunch:


- A number of “hub & spoke” HIE efforts formed as a result of partnerships, ACO or CIN relationships
- Some MDs will belong to multiple clouds
- Some MDs communicate only via Direct




Health plans' position is advantageous

PAYER-AGNOSTIC TOOLS†		AETNA	CIGNA	HUMANA	UNITED HEALTH
	HEALTH INFORMATION EXCHANGE	✓		✓	✓
	DATA EXCHANGE/AGGREGATION	✓		✓	✓
	CARE MANAGEMENT	✓			✓
	PATIENT PORTALS/APPS	✓			✓
SERVICES	PERFORMANCE MANAGEMENT	✓			✓
	ACCESS TO CLAIMS DATA	✓	✓	✓	✓
	CARE GUIDANCE REPORTS	✓	✓	✓	✓
	CARE COORDINATORS	✓	✓	✓	
	PLAN ADMINISTRATION	✓		✓	✓

 VALIDATED

 OFFERED

 NOT OFFERED

†NOTE: EXCLUDES PROPRIETARY SYSTEMS, SUCH AS PATIENT PORTALS AND PERFORMANCE MANAGEMENT TOOLS COMMONLY OFFERED BY PAYERS

Source: Alphin M (KLAS). *Accountable Care Payers: Partners in a Changing Paradigm*. 2013

Part 1: CONCLUSION

The EMR & HIE Landscape is changing

Part 2

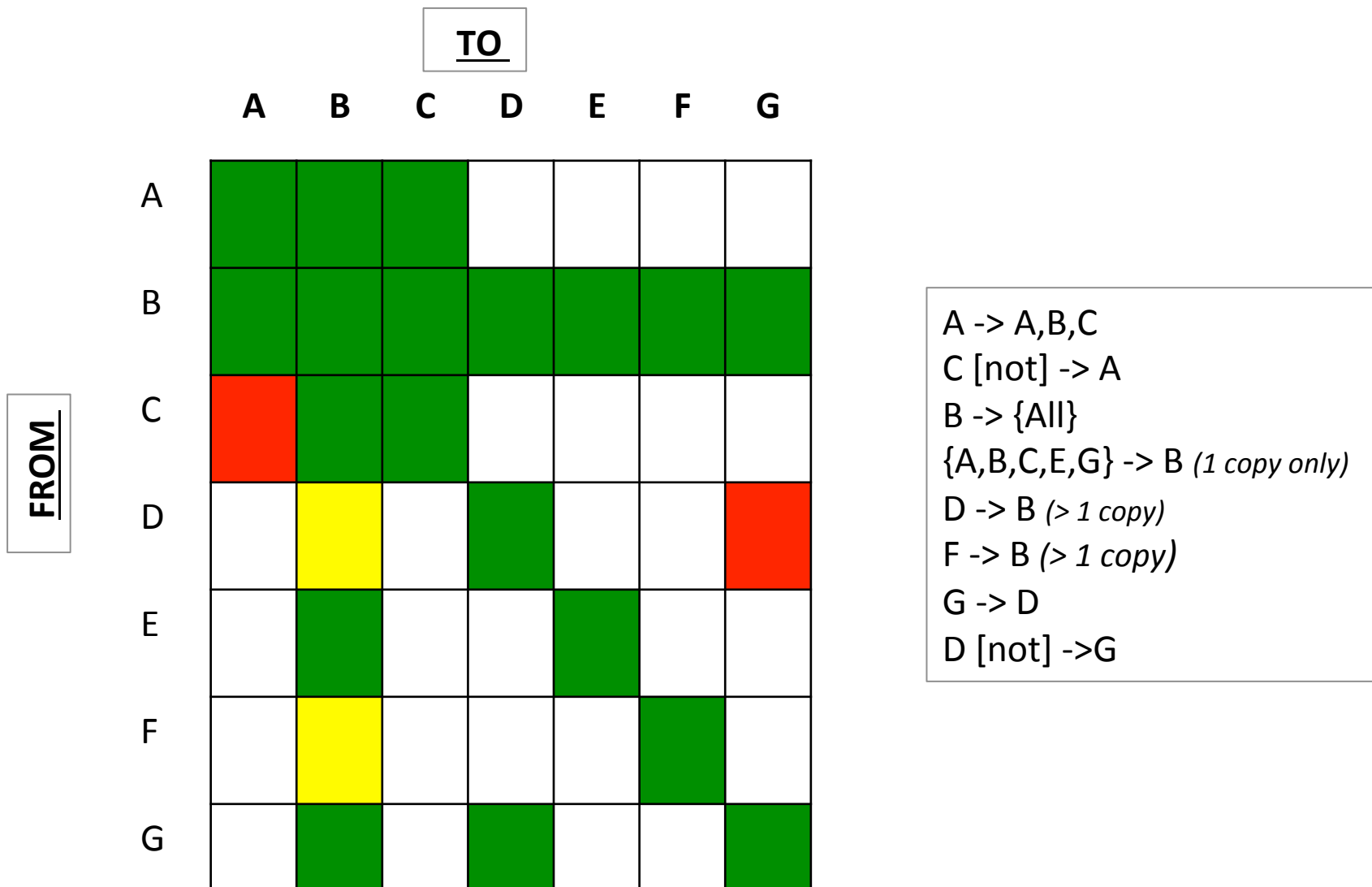
The Labyrinth of Policy & Technology

Governance: Early regional models were difficult to govern

Few options

- Global or institutional opt-out
- Progressive opt in
- Repudiation & referential integrity
- Use limited to support direct patient care
- Anti-trust concerns when cost or quality efforts are considered
- Challenging to finance and govern advanced use where members use HIO data not only to provide care but also to compete with one another.

Tech: Direct messages can lead to asymmetries & redundancies



Privacy: Today, everyone has to PAY ATTENTION

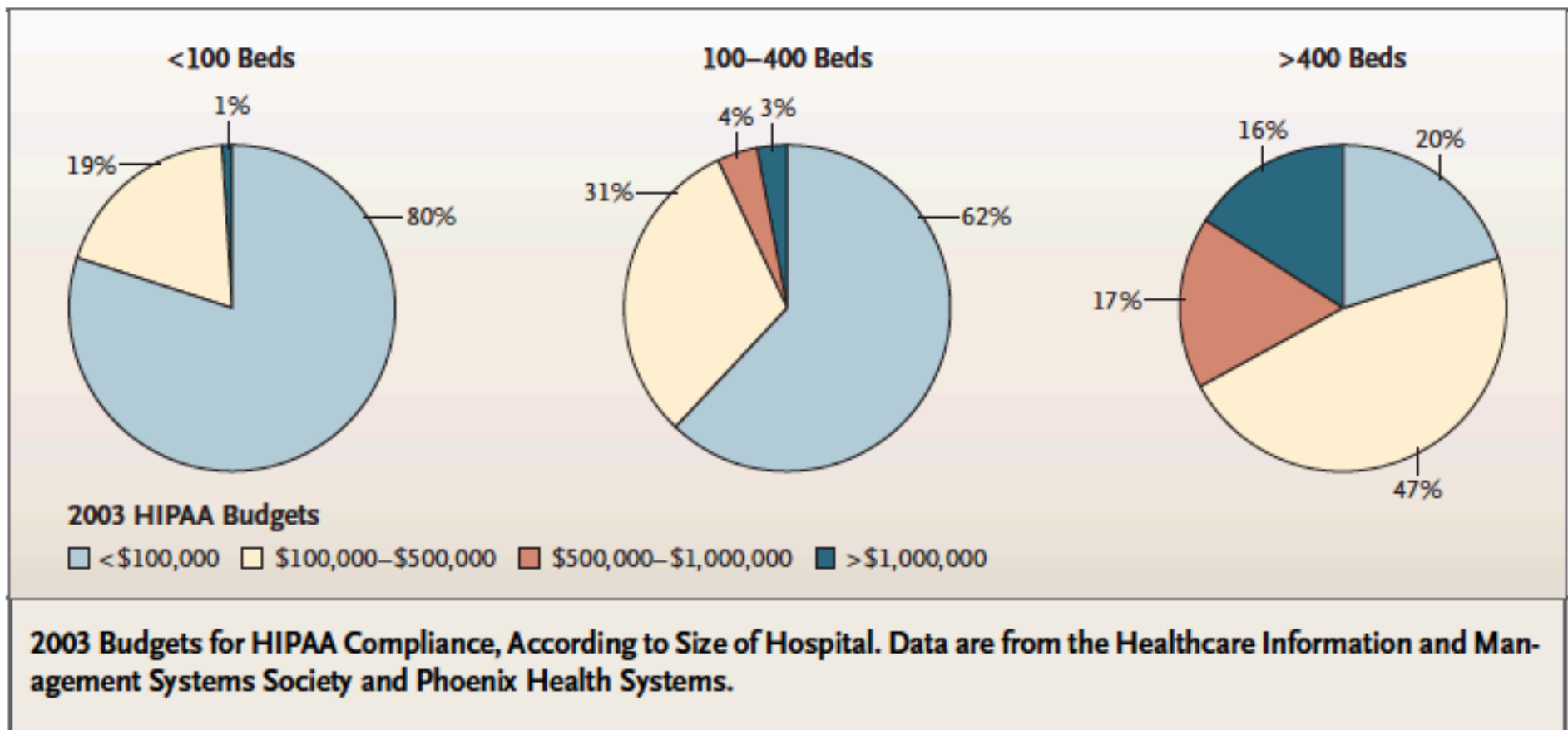
10 years ago – Few really affected

- HIPAA focused on notification of privacy practices
- Most institutional policies not aligned with NHIN / HIE aims
- External audits were infrequent and cumbersome
- HISPC as an intellectual exercise

Today

- Everyone is affected
- All access and privacy policies must be aligned
- Legal and administrative costs of enforcing Omnibus rule and MU may be on par with costs of enforcing original HIPAA

HIPAA cost estimates (AHA): \$670,000 to \$3.7 million per hospital



Policy: The entire “policy pipeline” must be considered

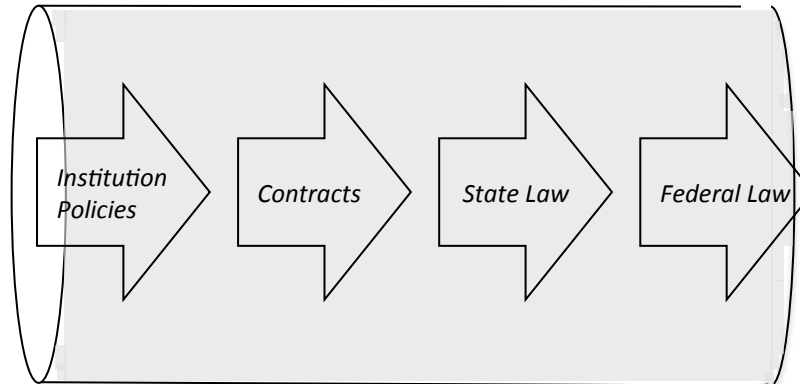
Our goal is ensure that {B} conforms to expectations set forth in {A}



{A}

CONSENT:

- Context
- Information
- Roles
- Relationships
- Terms



{B}

USE:

- Context
- Information
- Roles
- Relationships
- Terms

Policy: Logical consistency or practicality is elusive in some areas

Authorization

Authentication

Consent

Use

Provenance

Re-transmission

Cash payments

Inconsistent ontologies

Sometimes one cannot create consistent logical models for authorization or access controls.

When models can be created uniform policy enforcement cannot be guaranteed

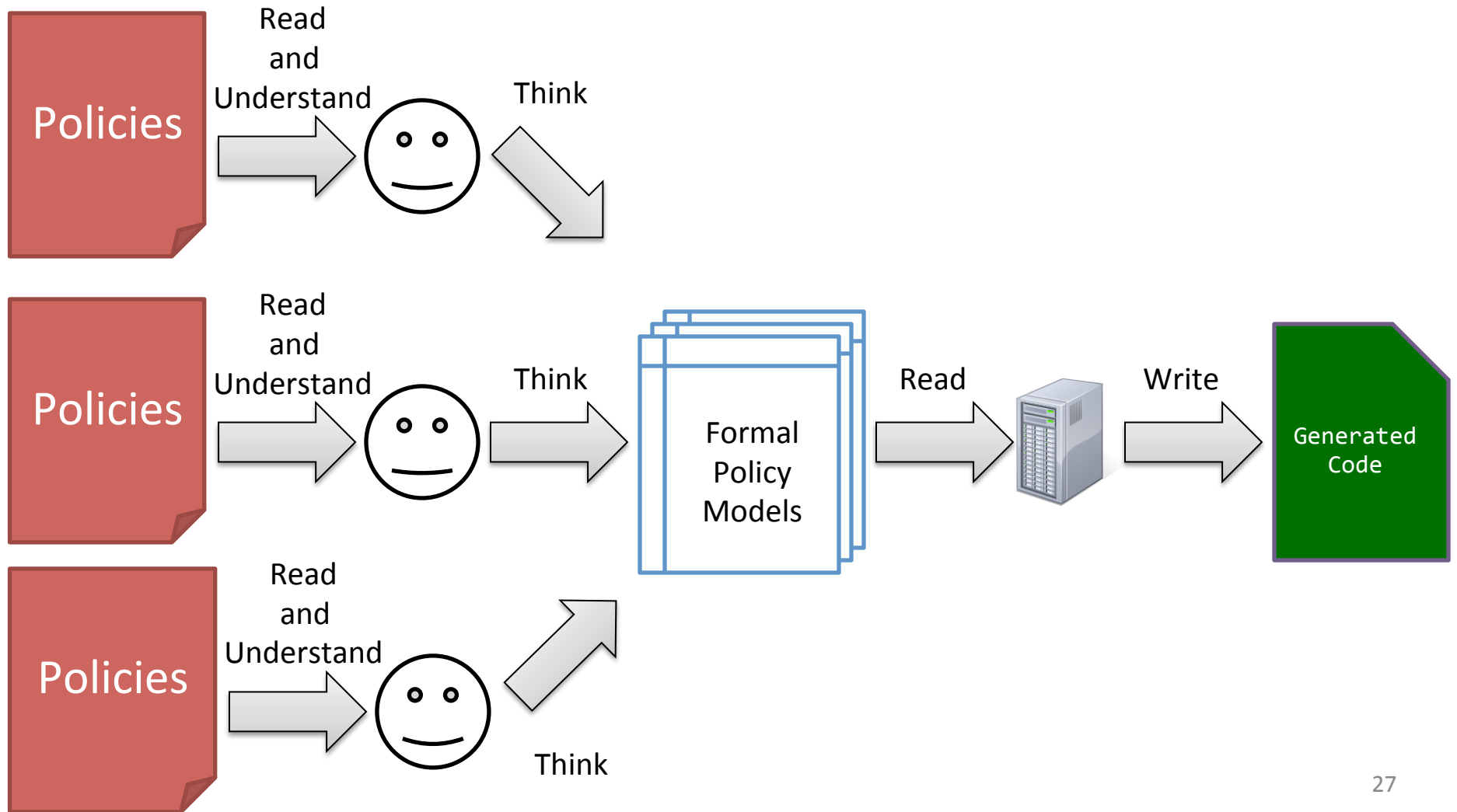
Part 2: CONCLUSION

Many formidable technical & policy issues

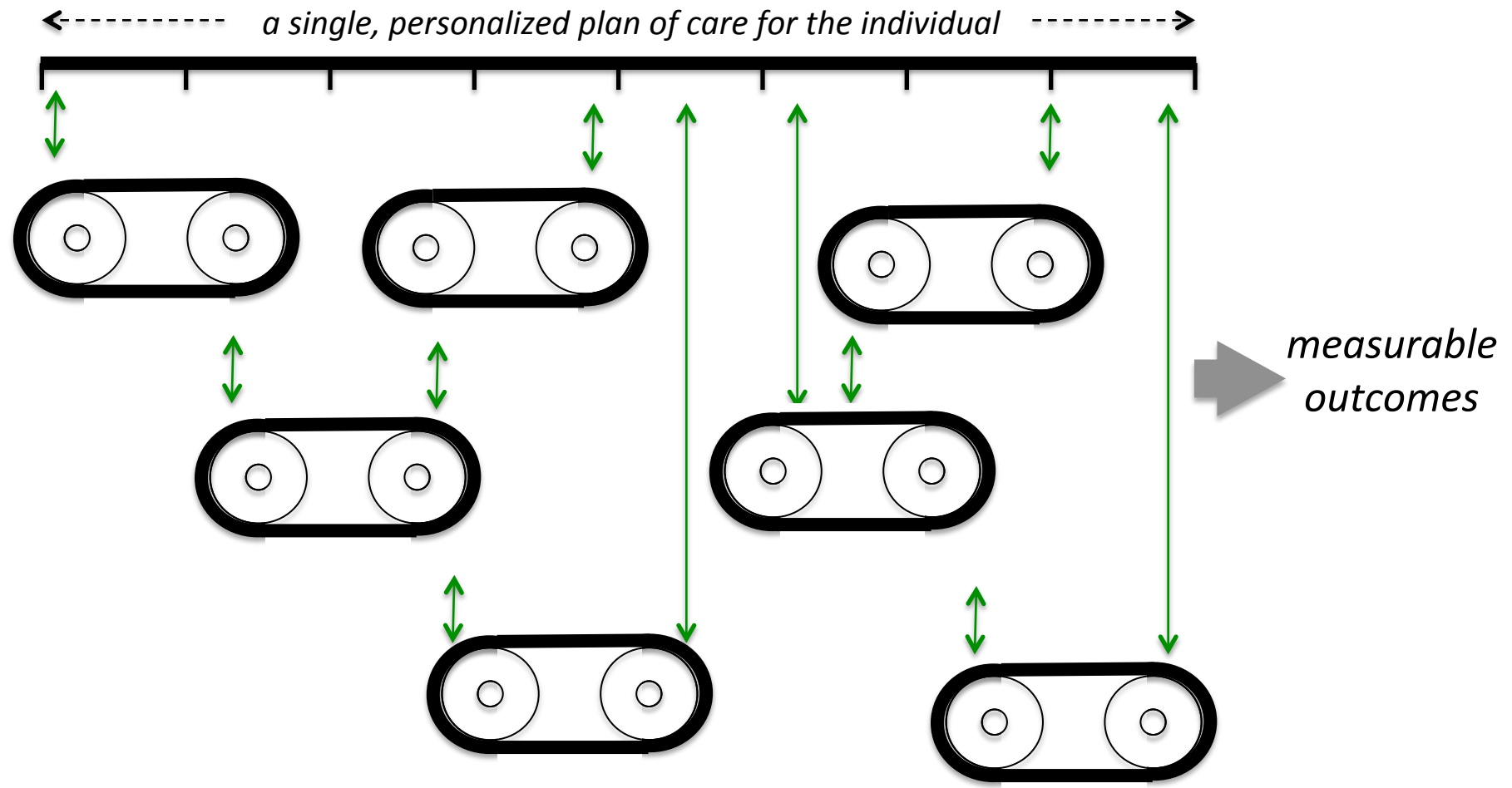
Part 3

Policy as Engineered Systems

Explicit policy modeling doesn't always work



We seek a single record and a single coordinated care plan



We could engineer a system and try to fit to policies

We could create an unambiguous system for the majority of instances through systems engineering.

The process:

- Explore the barriers, face the inconsistencies
- Take an explicit position
- Create and implement a system
- Assess its performance; examine the trade-offs
- Revise and test again

We use the same logic to dictate specific required acts and roles.
After providing access, systems advise on what to do

We are attempting to do this through PolicyForge

The screenshot shows the PolicyForge website. At the top left, the text 'Y FORGE' is partially visible. The main header features a large red gear icon with a white 'PF' logo inside, and the text 'POLICY FORGE' in a large, white, serif font. Below the header, there are three statistics: '7 projects', '1 components', and '17 designers'. On the left side, there is a sidebar titled 'ARTIFACT CATEGORIES' with a list of categories and a 'Register to discover!' link. The main content area is titled 'FEATURED PROJECTS' and lists several projects with their respective icons, titles, descriptions, and creation dates.

ARTIFACT CATEGORIES

- Policy Documents
- Use Case Documents
- Ontology Models
- Policy Template Models
- Patient Consent Models
- Federal Policy Models
- State Policy Models
- Institutional Policy Models
- Disclosure Scenario Models
- Access/Use Scenario Models

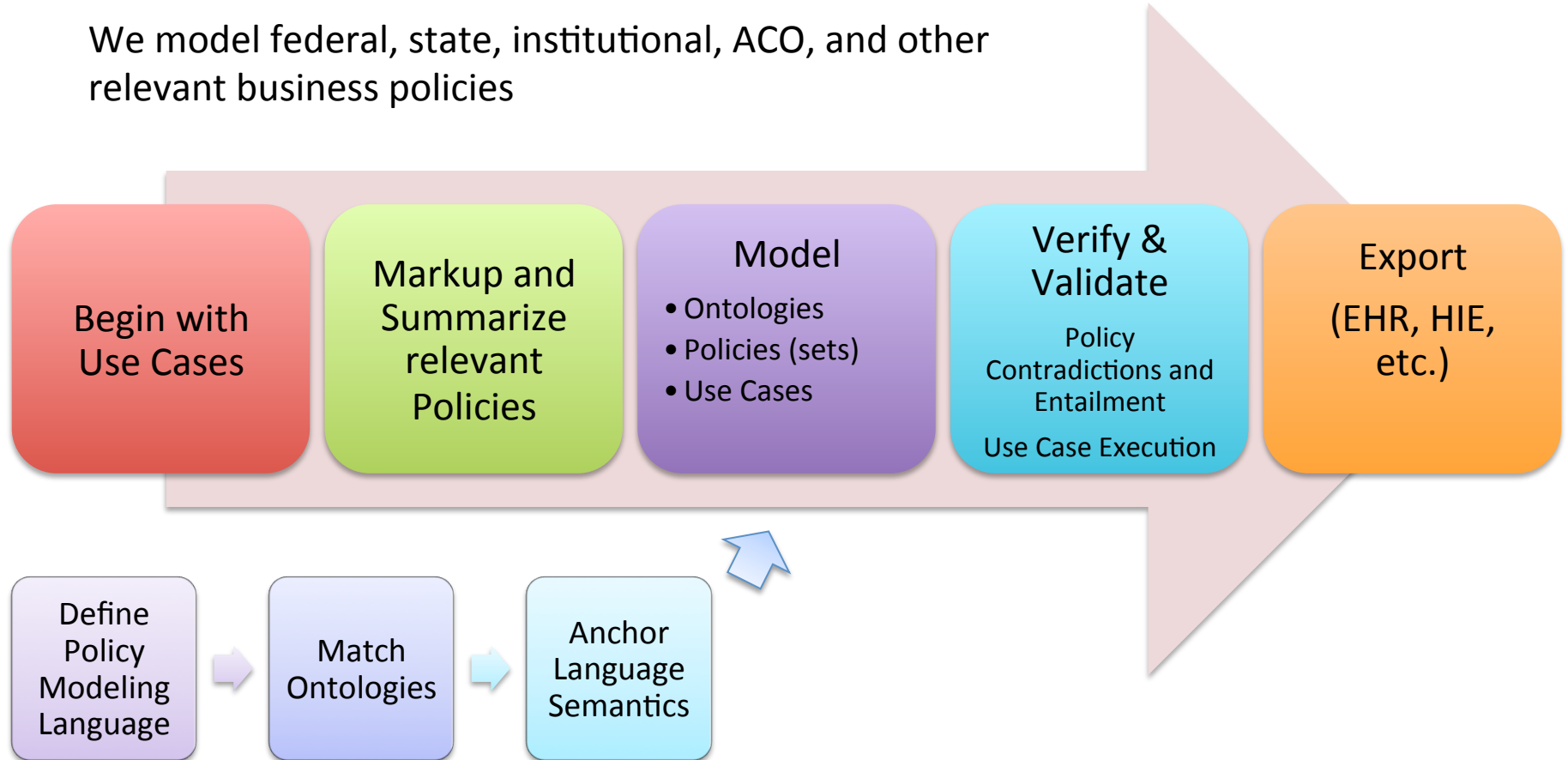
[Register to discover!](#)

FEATURED PROJECTS

Icon	Project Name	Description	Created
	PolicyForge Future Discussion	Project for discussion of use and improvement of PolicyForge	Created 2013-03-06
	Demo Project	Example project with tool demonstrations	Created 2013-02-08
	Federal Policies HIPAA and HITECH	Project for collecting and representing federal policies for PHI Use and Disclosure.	Created 2013-02-08
	State Policy Formalization	Project for collecting and representing State Policies for Use and Disclosure of PHI	Created 2013-02-08
	PATRN	Project for the GME based Policy Modeling and Verification tool	Created 2013-03-13
	HIE Use Cases		Created 2013-02-08
	Forge Administration	Services related to the management of PolicyForge.	Created 2013-02-08

We begin with an explicit use case, not the policies

We model federal, state, institutional, ACO, and other relevant business policies



Part 3: CONCLUSION

Consider an engineered systems approach

Finally

Summary Remarks

We are in an era of unparalleled opportunity

New technologies are being introduced at an unparalleled rate

Our workflows and technologies are not coordinated

Our “markets” are immature (“buyer” – “seller” mismatch)

Our reimbursement systems are schizophrenic

Incentives are misaligned

HIE will remain a patchwork for the foreseeable future

Business relationships and consumer engagement will drive the process

The near-term outcome is uncertain