

# Statewide Calculative Knowledge Infrastructure for Enriched Reporting & Messaging

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# Agenda for Today

- Knowledge Infrastructure for Calculative-Predictive Models for Health
- HIE + Knowledge Infrastructure enables Enriched Messaging & Reporting
- Emerging Infrastructure: **The Knowledge Grid**

# 1<sup>st</sup> Up

- Knowledge Infrastructure for Calculative-Predictive Models for Health
- HIE + Knowledge Infrastructure enables Enriched Messaging & Reporting
- Emerging Infrastructure: **The Knowledge Grid**

# More Calculative Health Knowledge is Coming

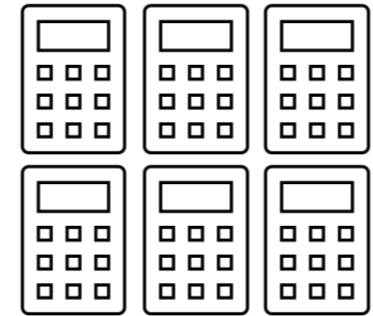


+



**ANALYTICS**

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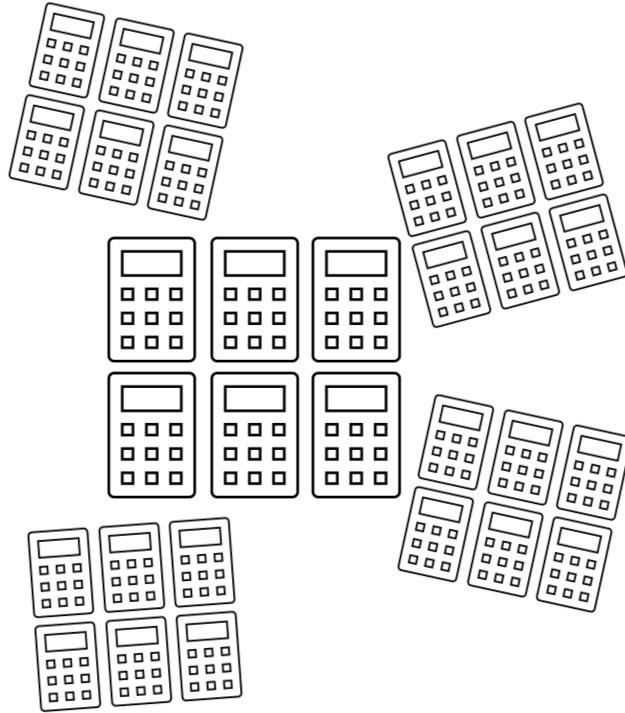
**CALCULATIVE  
KNOWLEDGE**

- LARGE REGISTRIES
- DATA NETWORKS
- DATA LAKES
- ADT MESSAGE SHARING
- etc.

- BASIC STATISTICS
- REGRESSION
- MACHINE LEARNING
- DEEP LEARNING
- etc.

- PREDICTIONS
- ESTIMATES
- DOSAGES
- COSTS
- etc.

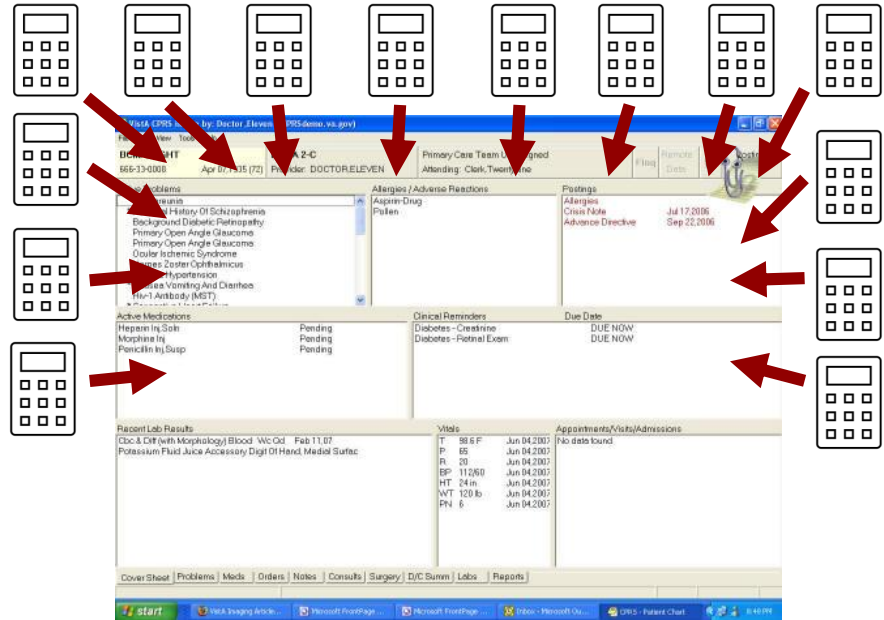
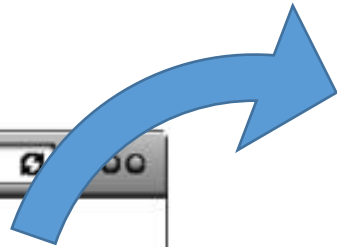
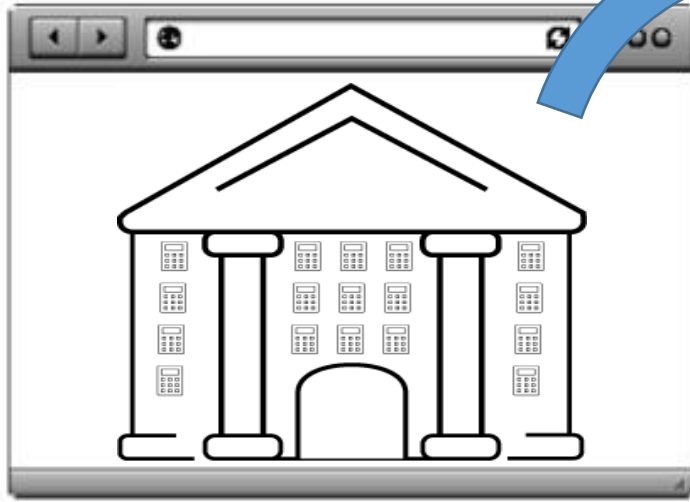
# Shared Infrastructure is Needed to Make Calculative Health Knowledge F.A.I.R.



**FAIR =**

- **Findable**
- **Accessible**
- **Interoperable**
- **Reusable**

# Shared Infrastructure such as Digital Libraries and Deployment Tools



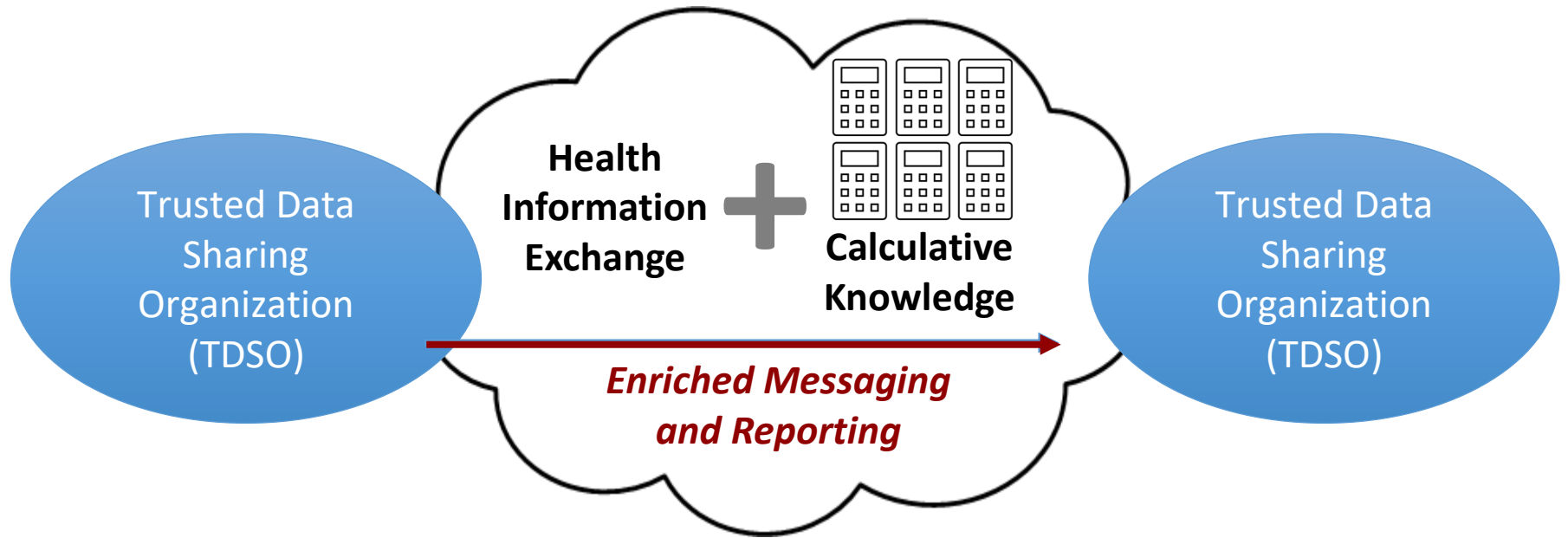
- Findable
- Accessible

- Interoperable
- Reusable

## 2<sup>nd</sup> Item

- Knowledge Infrastructure for Calculative-Predictive Models for Health
- HIE + Knowledge Infrastructure enables Enriched Messaging & Reporting
- Emerging Infrastructure: **The Knowledge Grid**

# New Capabilities with Calculative Knowledge

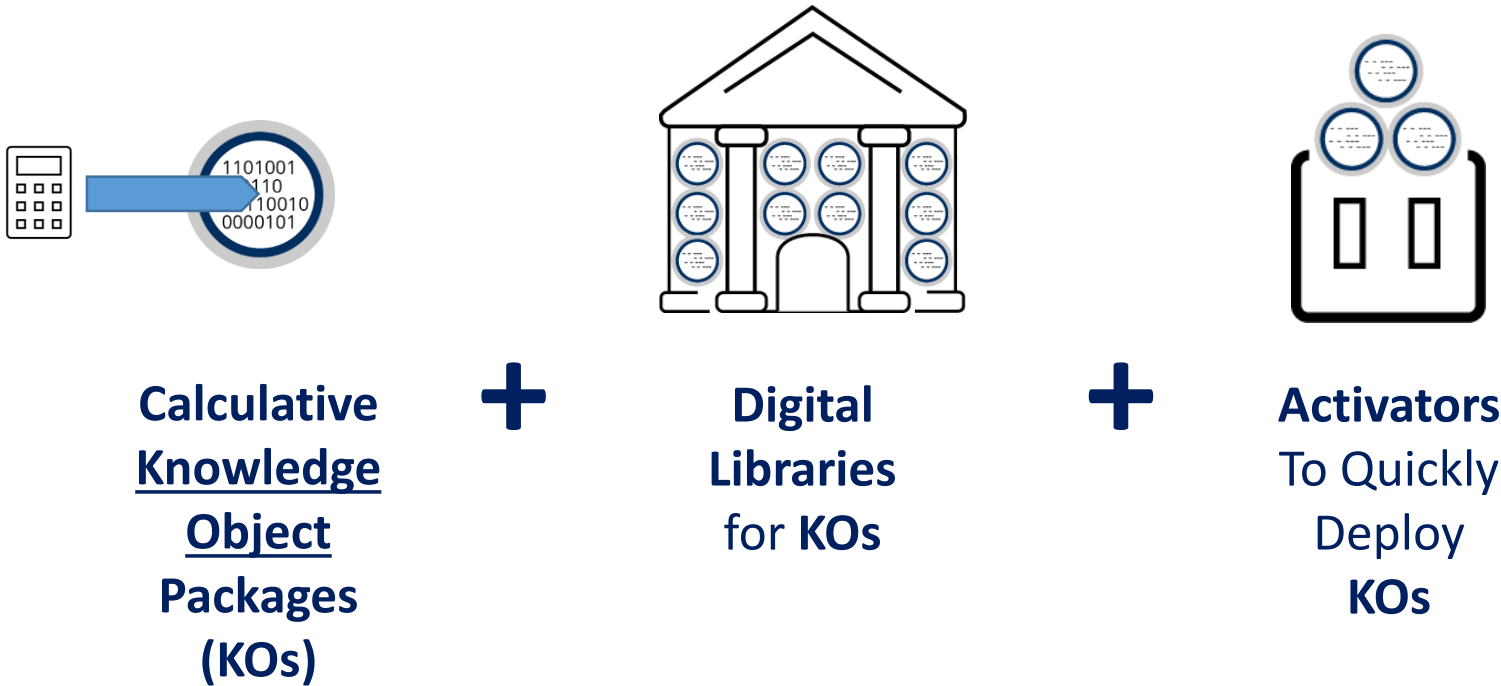




# 3<sup>rd</sup> & Final Item

- Knowledge Infrastructure for Calculative-Predictive Models for Health
- HIE + Knowledge Infrastructure enables Enriched Messaging & Reporting
- Emerging Infrastructure: **The Knowledge Grid**

# Components of The Knowledge Grid infrastructure platform



KGrid's Three Components

# Prototype Digital **Library** to Make Calculative Knowledge Findable and Accessible

The screenshot shows a web browser window with the URL `kgrid.med.umich.edu/library2/#/`. The page features a navigation bar with the "Knowledge Grid Library" logo, "About", "FAQ", and "Contact Us" links, and a "Sign In" button. The main content area displays the title "Knowledge Grid Library" and a grid of 12 calculator icons. Below this is a search bar with the placeholder text "Search by Keywords, Owners or Title". The interface includes a filter section with a "risk" filter selected and a "Clear All Filters" button. It also shows "Filters" and "Viewing 14 Objects" information, along with a "Sort by: Last Updated - Newest" dropdown menu. Two search results are visible, each with a title, a keyword, an object ID, and a last updated date.

Knowledge Grid Library

About FAQ Contact Us

Sign In

## Knowledge Grid Library

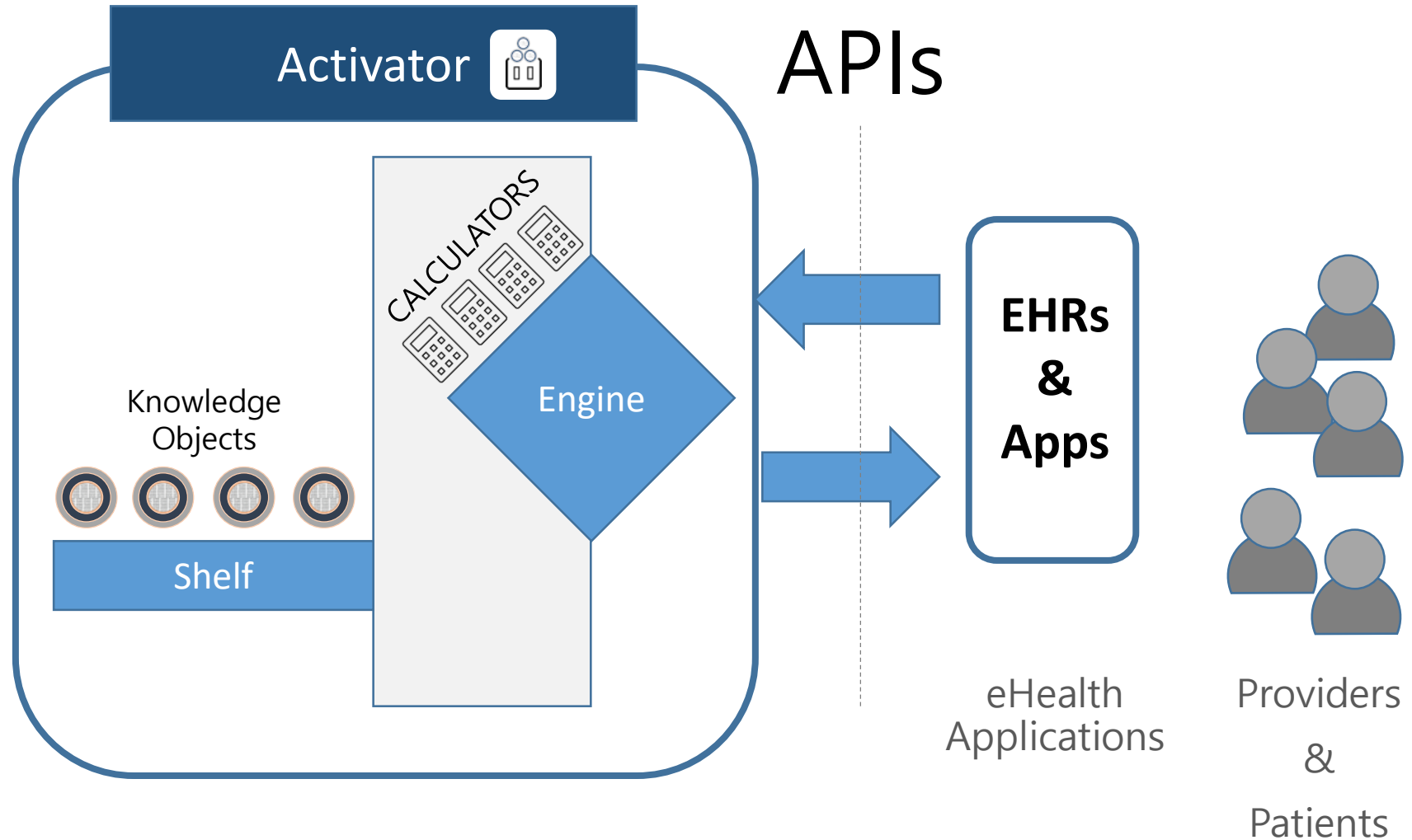
Search by Keywords, Owners or Title

✕ risk Clear All Filters

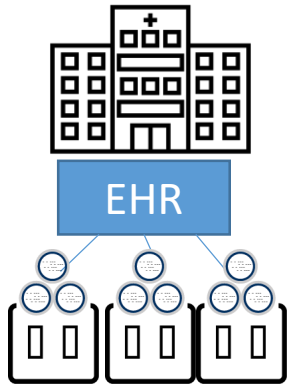
Filters Viewing 14 Objects Sort by: Last Updated - Newest

- Cassidy, LLP risk model: an individual 5-year risk prediction model for lung cancer  
Keyword: lung cancer risk Object ID: ark:/99999/fk4571pp25 | Last Updated: Jan 19, 2018
- Lung Cancer Risk Model, Adult, 6 Year Time Horizon, PLCOm2012, Tammemagi  
University of Michigan Cancer Center  
Keyword: lung cancer Object ID: ark:/99999/fk4kd26036 | Last Updated: Nov 06, 2017

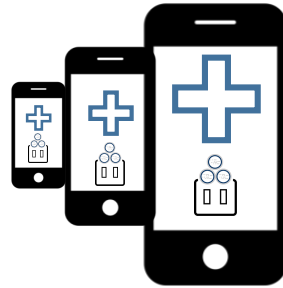
# Prototype **Activator** to Increase the Interoperability of Calculative Knowledge



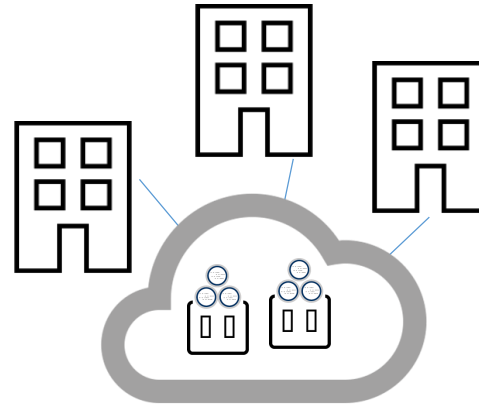
# The **Activator** Puts Calculative Knowledge Wherever it is Needed



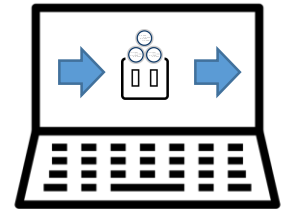
A **Hospital** adds calculative knowledge to its EHR



A **Health app developer** embeds calculative knowledge in an app



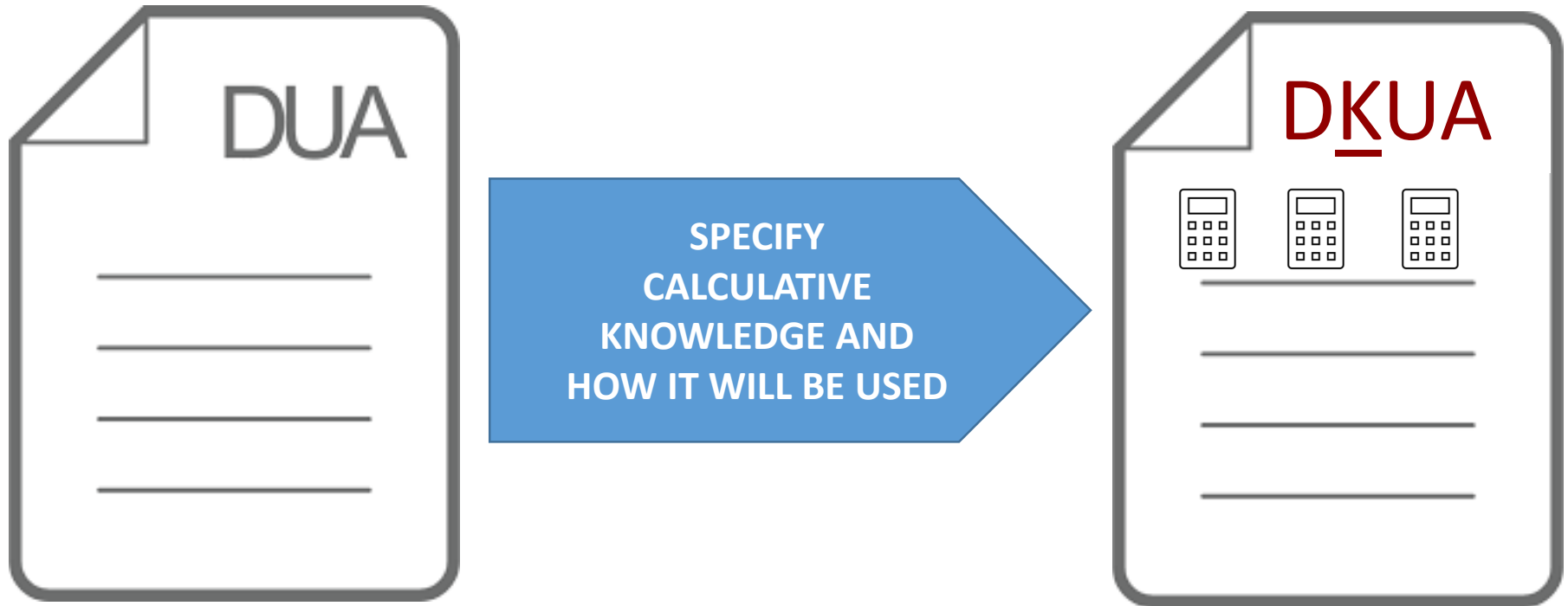
**Multiple organizations** share calculative knowledge in the cloud



A **Researcher** applies calculative knowledge in an analytic workflow



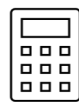
# Data & Knowledge Use Agreements to Make Calculative Knowledge Reusable



# We Can Make Calculative Health Knowledge F.A.I.R. throughout Michigan



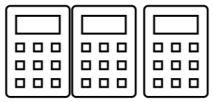
**Statewide  
Sharing**



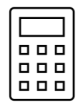
PREDICT HEPATITIS C PROGRESSION



PREDICT MORTALITY



PREDICT DISEASE RISKS



CALCULATE MORPHINE EQUIVALENTS



etc

