



**PM Fair 2022, 7<sup>th</sup> October**

The Royal Museum for Central Africa  
Tervuren, Belgium

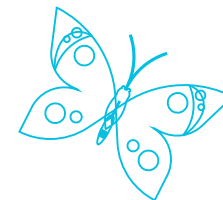


**Marjolein Deryck**

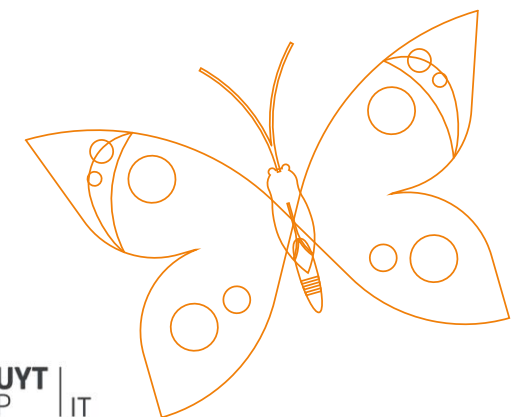
Engineering Technology

**Presentation**

**The best of both worlds: combining  
artificial and human intelligence**



More info and Registration at : <https://www.pmfair.org/>



# Affiliations



Intelli-Select



# The digital transformation challenge



# The digital transformation challenge

A silhouette illustration of four people pushing a large, dark sphere up a steep, dark slope. The sphere is positioned at the top left of the frame, and the figures are arranged in a line, pushing it from behind. The background is a solid, bright blue color.

User involvement

# The next challenge

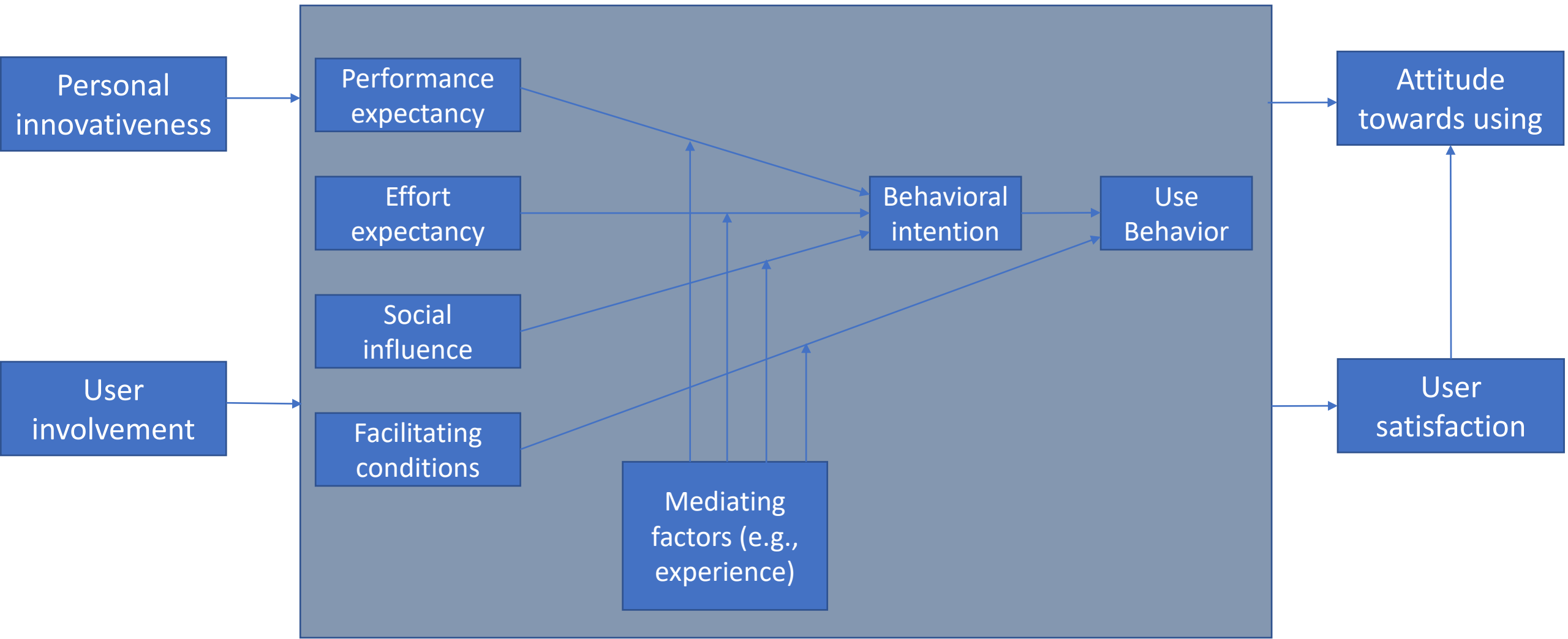


# Unified theory of acceptance and use of technology\*



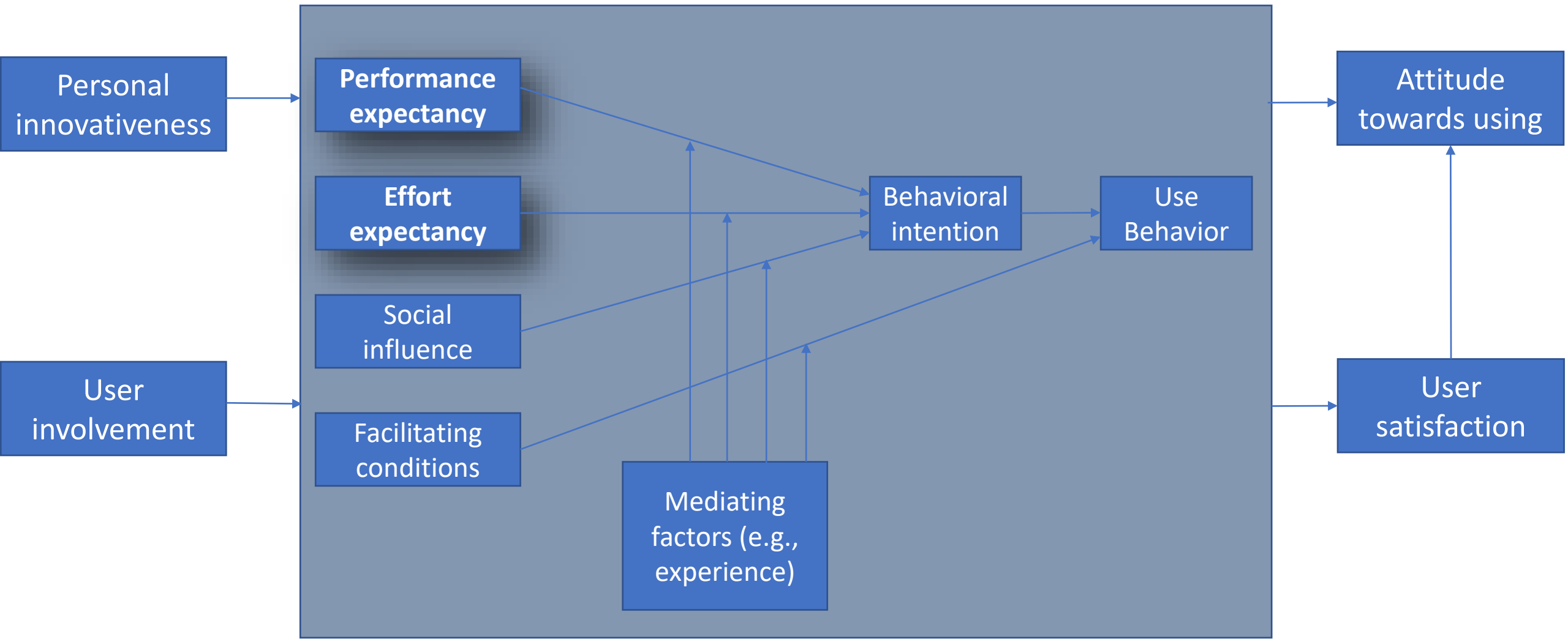
\* Venkatesh et al., 2003

# Unified theory of acceptance and use of technology\*



\* Venkatesh et al., 2003

# Unified theory of acceptance and use of technology\*



\* Venkatesh et al., 2003



# Performance expectation



# Performance expectation



# Performance expectation



*Intelligence comes in many forms, some of it through **reasoning** on the laws of the universe, others through conclusions out of **experience***

# Non-symbolic AI

- Unconscious Knowledge
- *Based on behavior & observations, subconscious to our reason.*
- *Lack of vocabulary or explanations to understand “why”*
- Machine learning algorithms

Computer vision

Natural language processing

Preference learning

Customer profiles

*Intelligence comes in many forms, some of it through reasoning on the laws of the universe, others through conclusions out of **experience***

# Symbolic AI

Business rules automation

Product configurators

Legal applications

Contract implementations

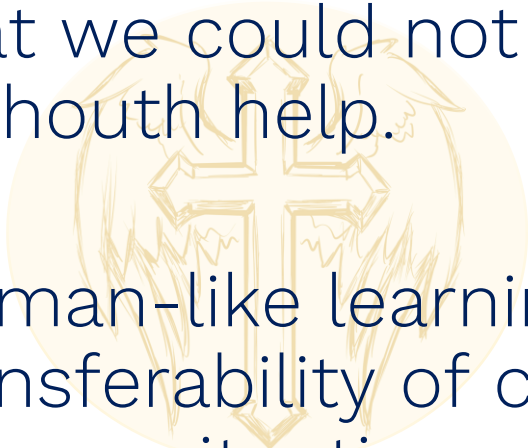
Logic puzzles

- Conscious Knowledge
- *Based on expertise and formal models of our reality.*
- *We can understand the “why” of the conclusions*
- Knowledge representation and reasoning

*Intelligence comes in many forms, some of it through **reasoning** on the laws of the universe, others through conclusions out of experience*

# Non-symbolic AI

- Finding statistical relations that we could not discover without help.
- Human-like learning: transferability of conclusions to new situations
- Need for data, data, data, ...
- Uncertainty / unexplainability what is learned
- Biased learning
- Effort for the end-user: Plug & play..... & swallow



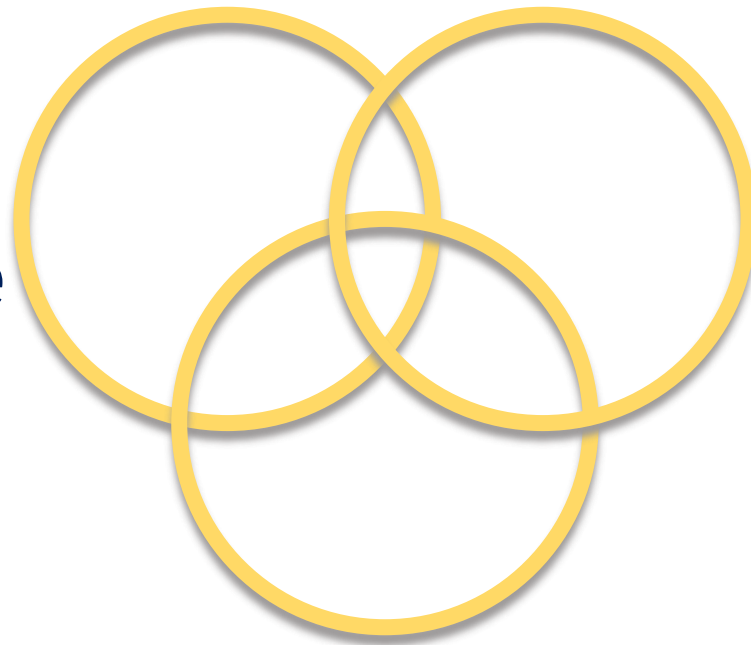
# Symbolic AI

- Deriving correct conclusions in complex situations.
- Versatile use of knowledge as humans do.
- Knowledge harvesting

- Knowledge acquisition
  - Discovering knowledge
  - Modelling knowledge
  - Maintaining knowledge
- Detail of formalized knowledge



Human  
Intelligence



Symbolic AI

Non-symbolic AI

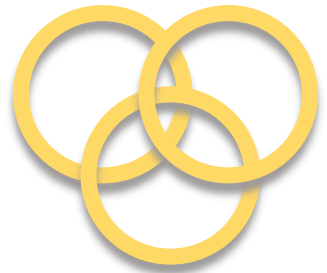


# Sudoku Assistant (T. Guns, App store)

- Convolutional network to predict value of cells
- Use of Sudoku rules to increase accuracy
- Providing hints/explanations

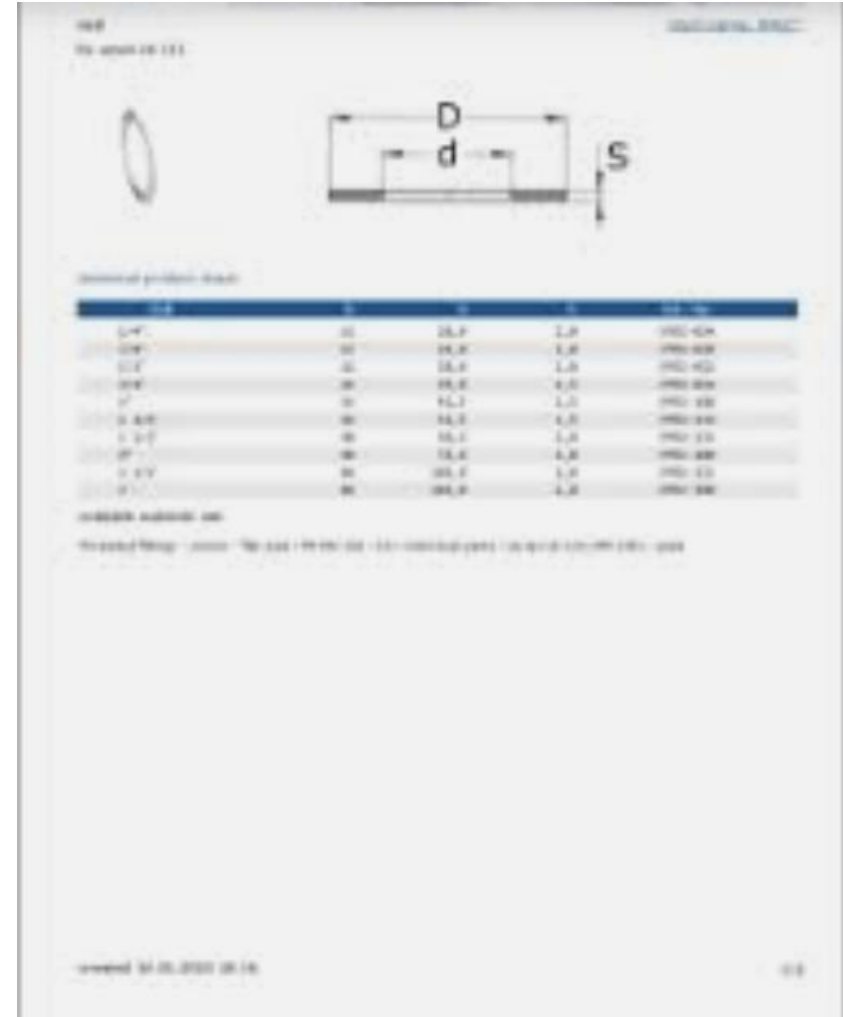
A photograph of a hand-drawn 9x9 Sudoku grid. The grid is partially filled with numbers. Some numbers are printed in black, and others are handwritten in blue ink. Some cells are crossed out with blue ink. The grid is as follows:

		4			3		1	
	1			5				8
			2	<del>1</del>	7		<del>4</del>	<del>4</del>
3	<del>4</del>							
	5		3	2			6	1
	9					4	3	
4			8	3	5			
			7	9	2		4	6
			<del>1</del>	<del>4</del>	6	2	5	<del>3</del>



# Product configurator with historical designs

- Rule and constraint-based product configuration system
- Access to database of historical designs based on machine learning
- Evaluation of proposed designs by product engineer





# Knowledge articulation in project management

**Human Intelligence**



**Non-symbolic**

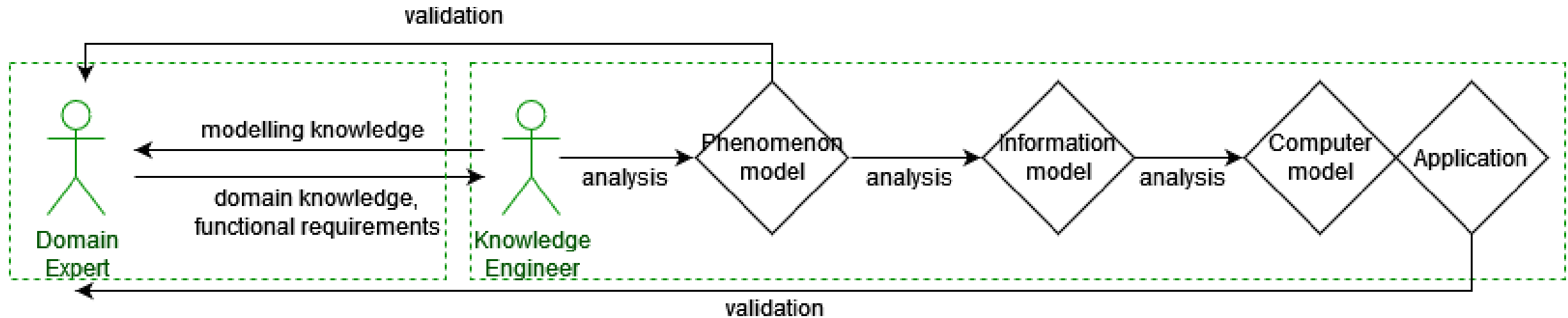


**Symbolic**

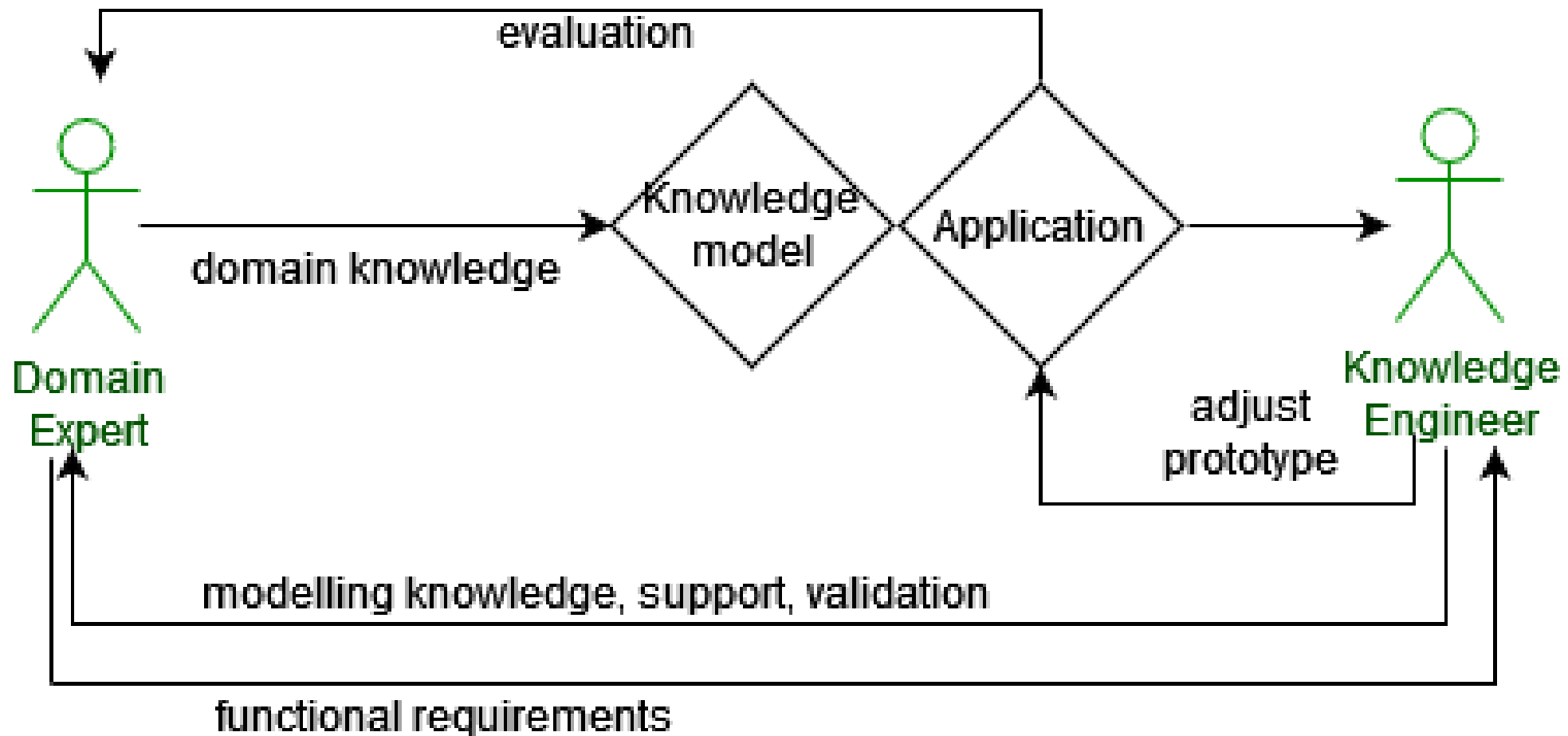


# To go from here....

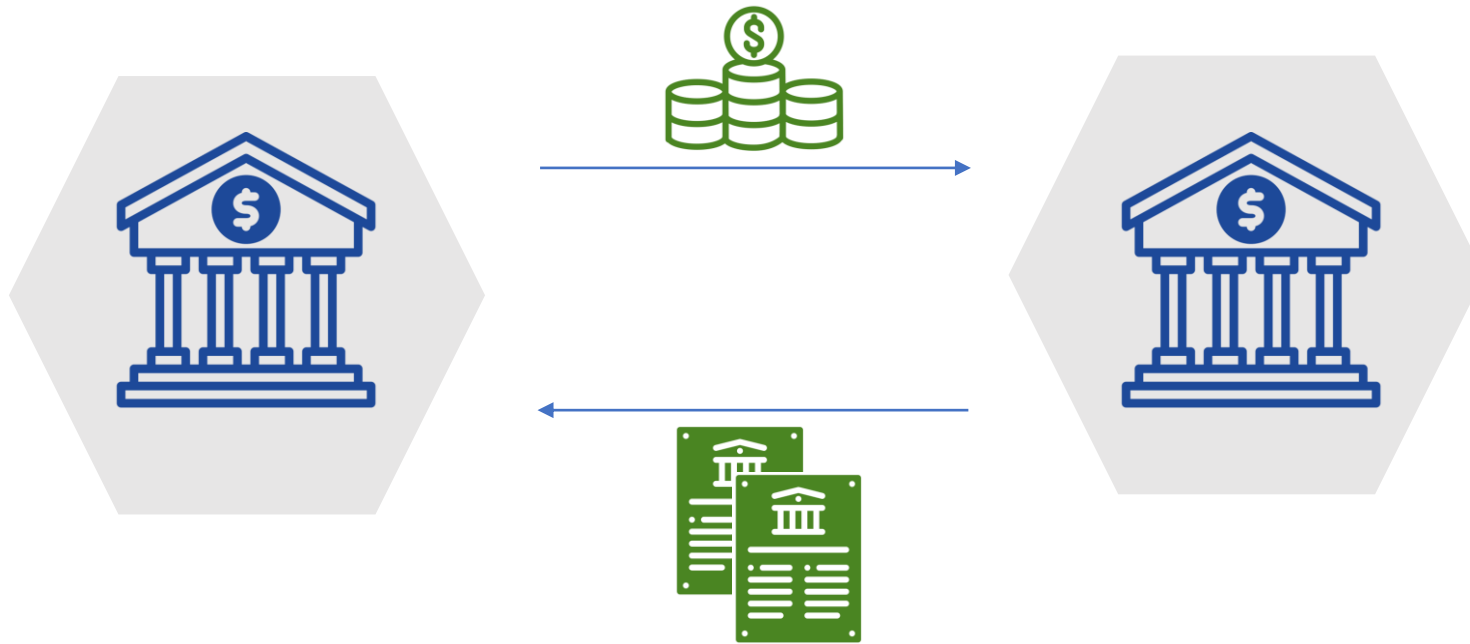
Knowledge acquisition



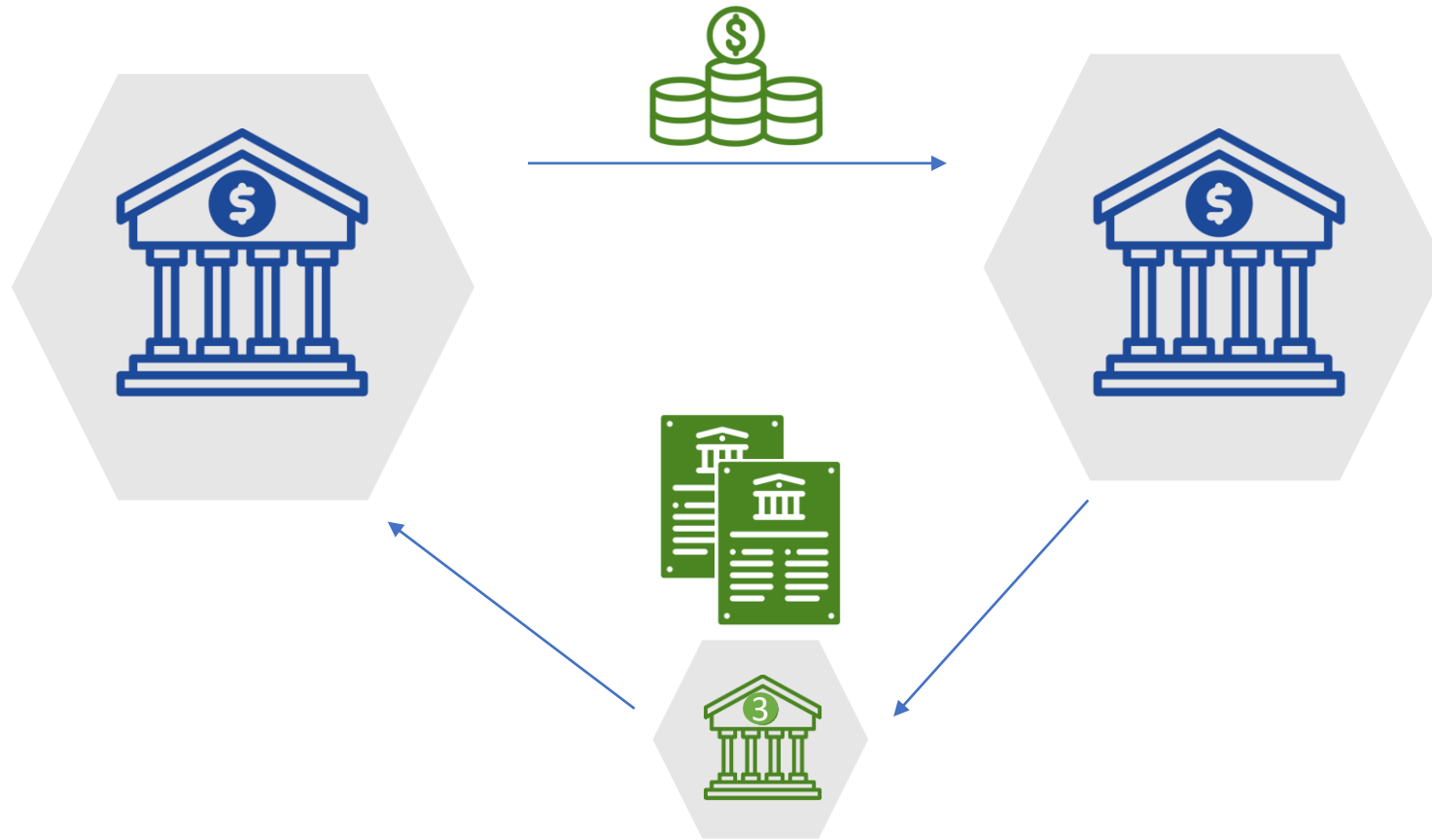
... to here



# Example: Collateral management

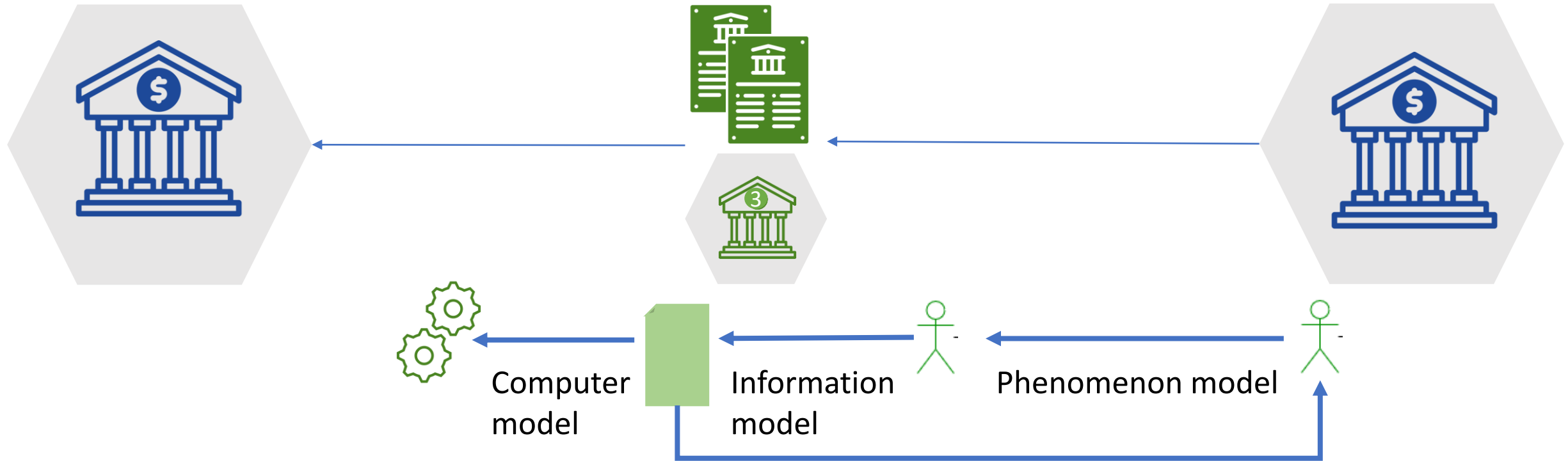


# Collateral management

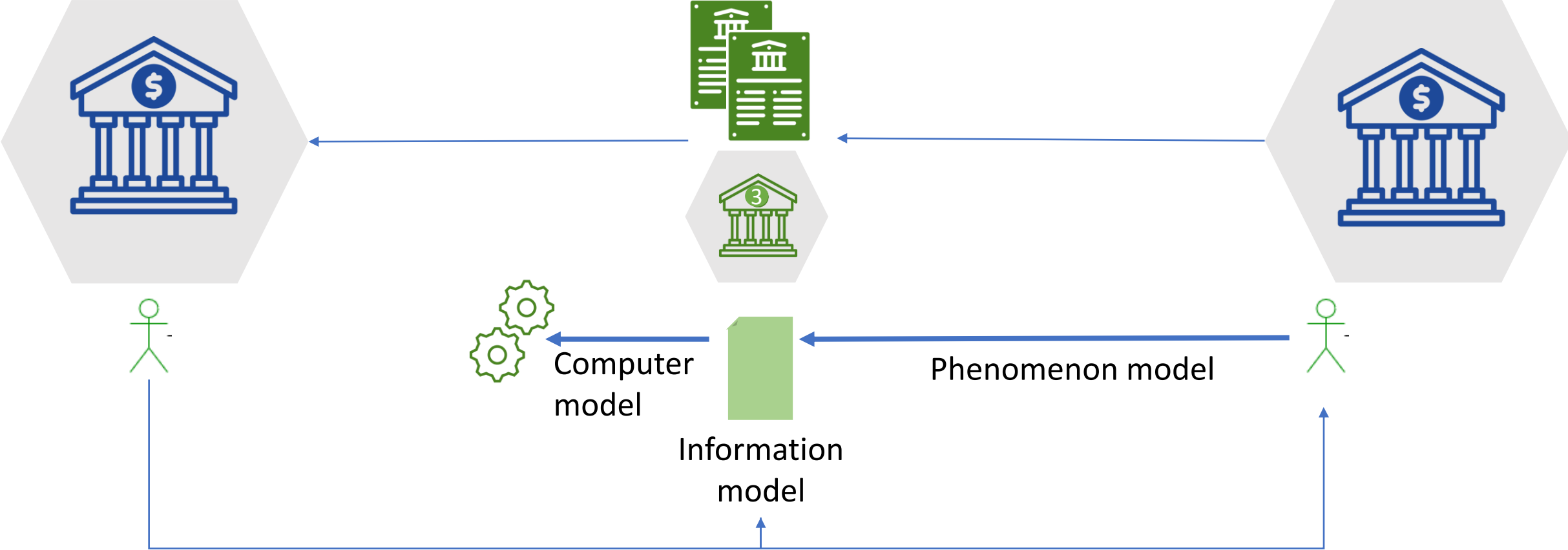




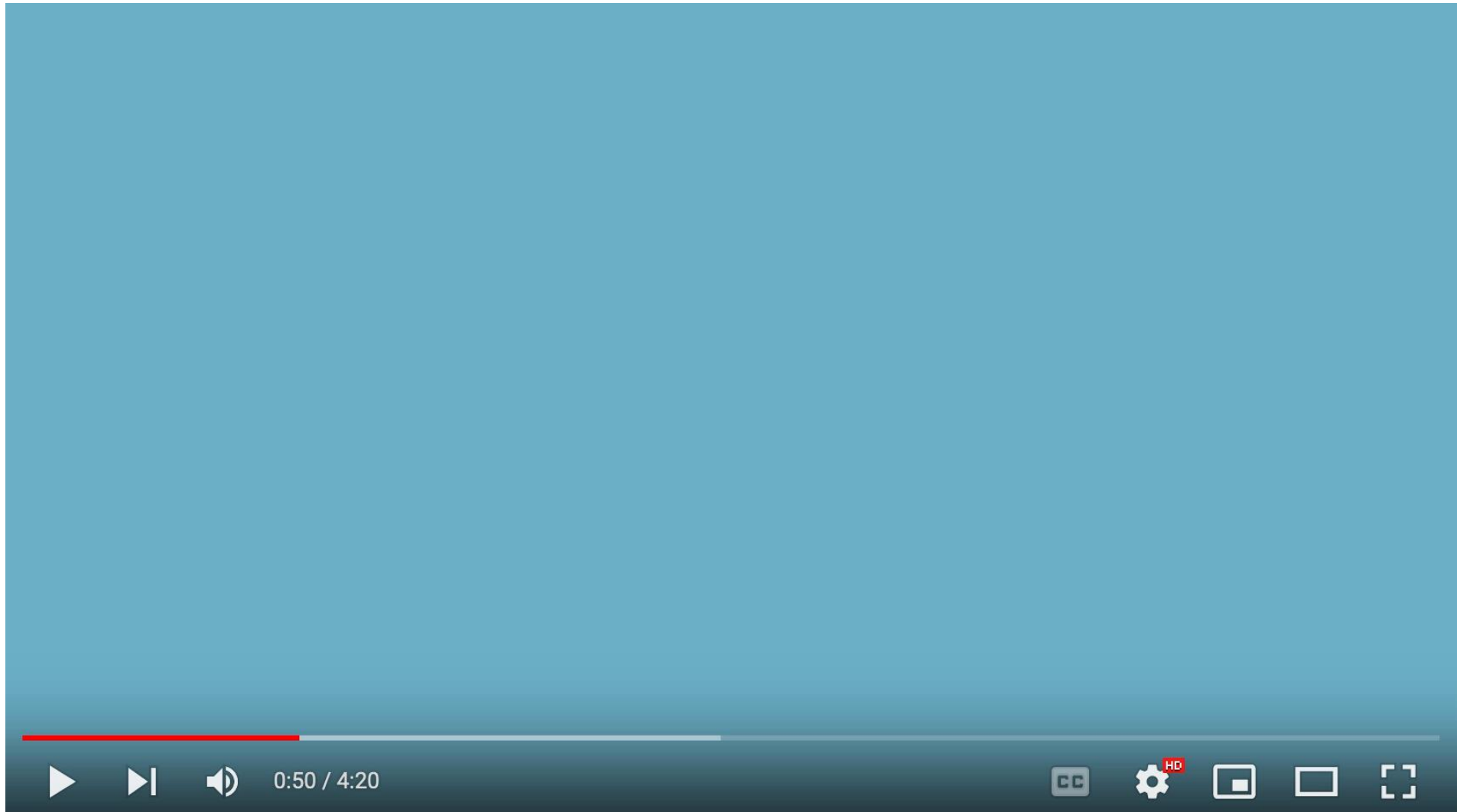
# Knowledge acquisition process



# Knowledge articulation process



# Knowledge base creation by natural language processing

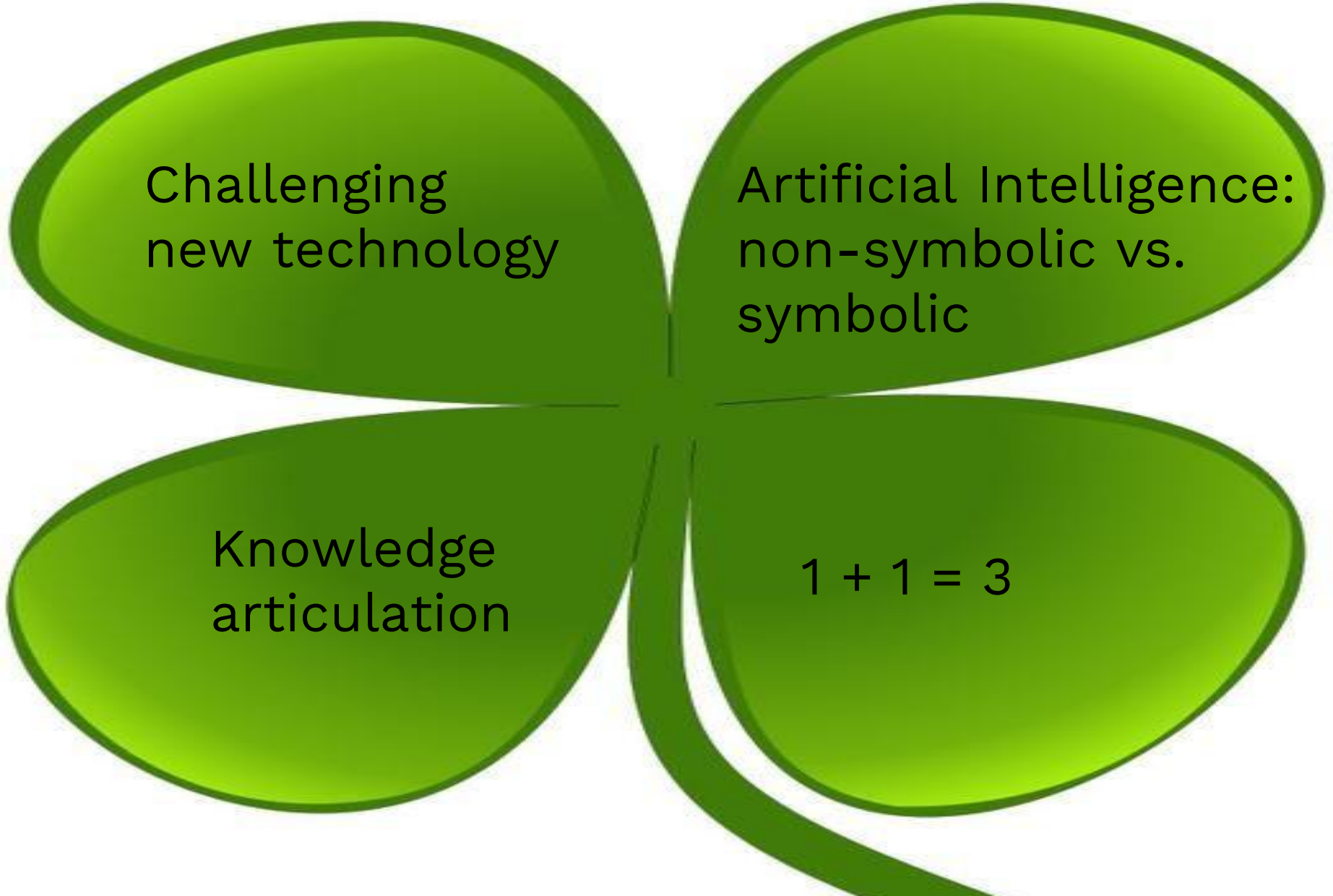


# Functionalities of the system

- Define full collateral profile
- Compare collateral profiles
- Explain (non-)eligibility of assets
- Suggestions to improve profile
- Translation of logic profile into decision tables
- .....

# Knowledge articulation: users in the drivers seat

- Users create the knowledge base of the system
- Users are able to maintain the knowledge base
- Decisions can be explained to the users
- Combination of AI techniques help to achieve this



Challenging  
new technology

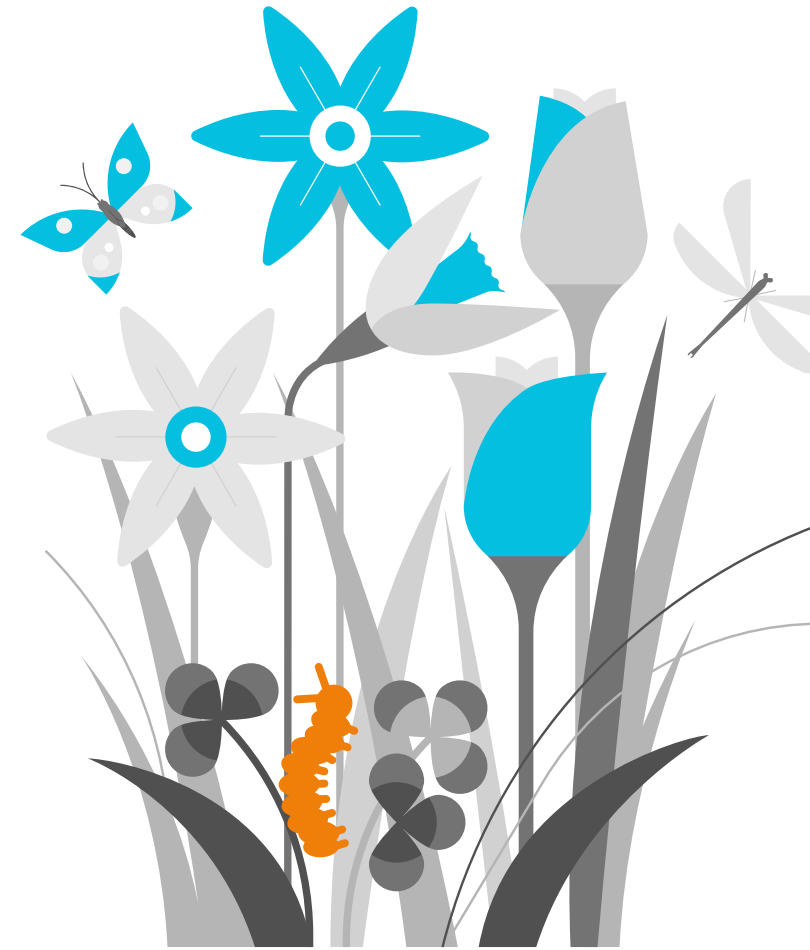
Artificial Intelligence:  
non-symbolic vs.  
symbolic

Knowledge  
articulation

$$1 + 1 = 3$$



Thank you!



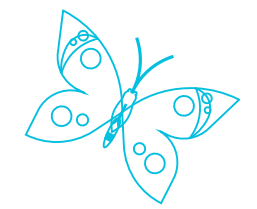


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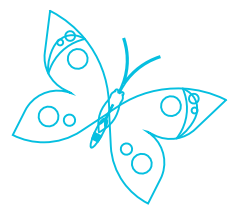
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Tervuren, Belgium



# A big **“Thank You!”** .. to our **Sponsors,** **without you this wouldn't be possible!**



**The Bayard Partnership**  
*Making a difference at work and in the community*



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