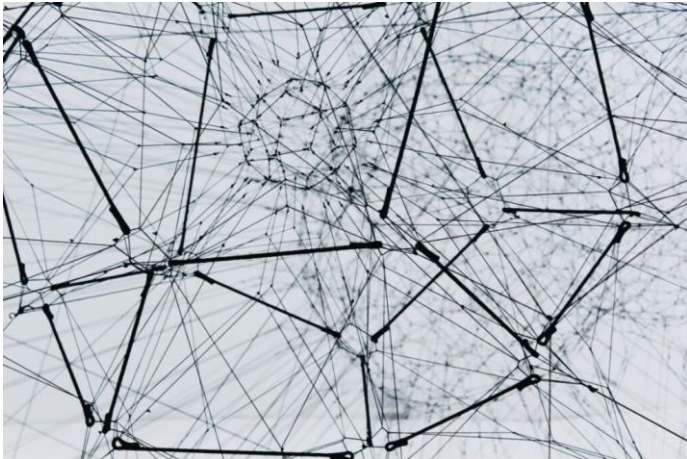
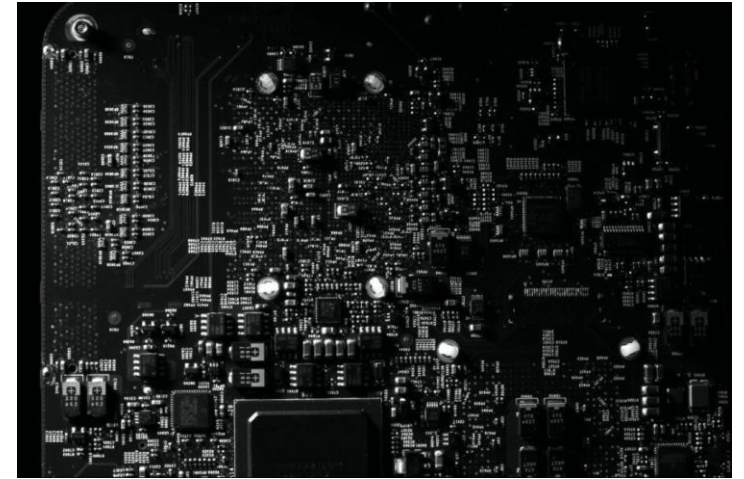


# Navigating the AI Revolution

Education at the Crossroads: Technologies, Values, and the  
Role of the Institution

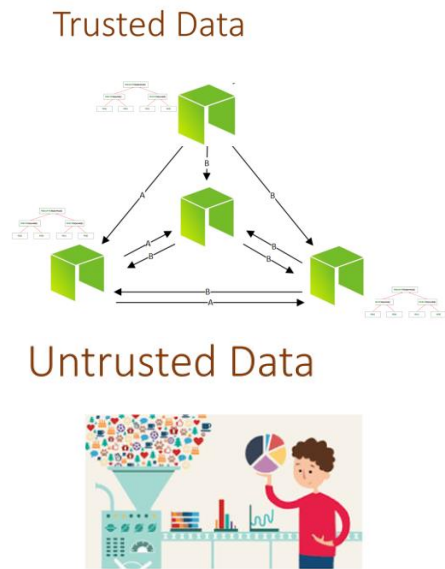


Stephen Downes  
February 10, 2023



<https://www.downes.ca/presentation/569>

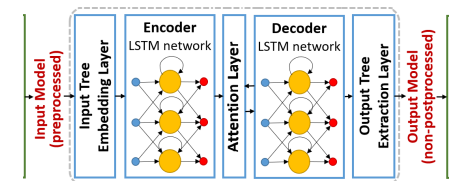
# The Challenge...



- Before this year: descriptive, diagnostic, predictive, prescriptive

- After this year: generative
- Future: deontic analytics

The domain of education?



# The Challenge...

What do we do when everything we do, and everything we teach people to do, can be done by artificial intelligence?

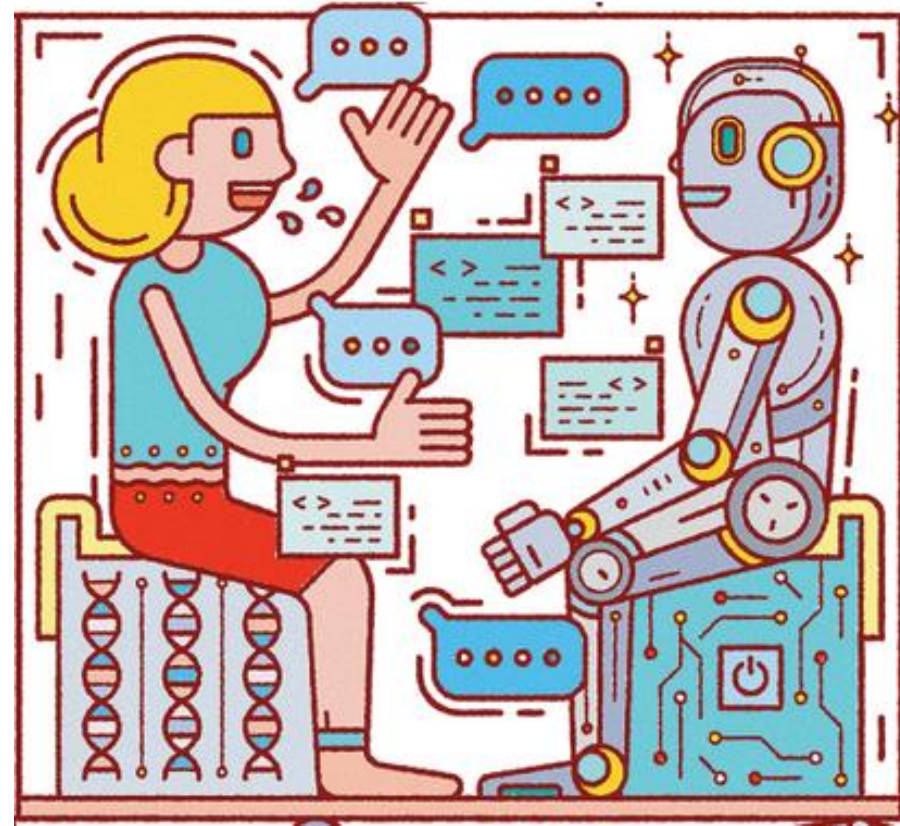


Image: <https://hbr.org/2018/07/collaborative-intelligence-humans-and-ai-are-joining-forces>

# The Response (tl:dr)

It is not what we do for our students. It is What we help students to do for themselves.

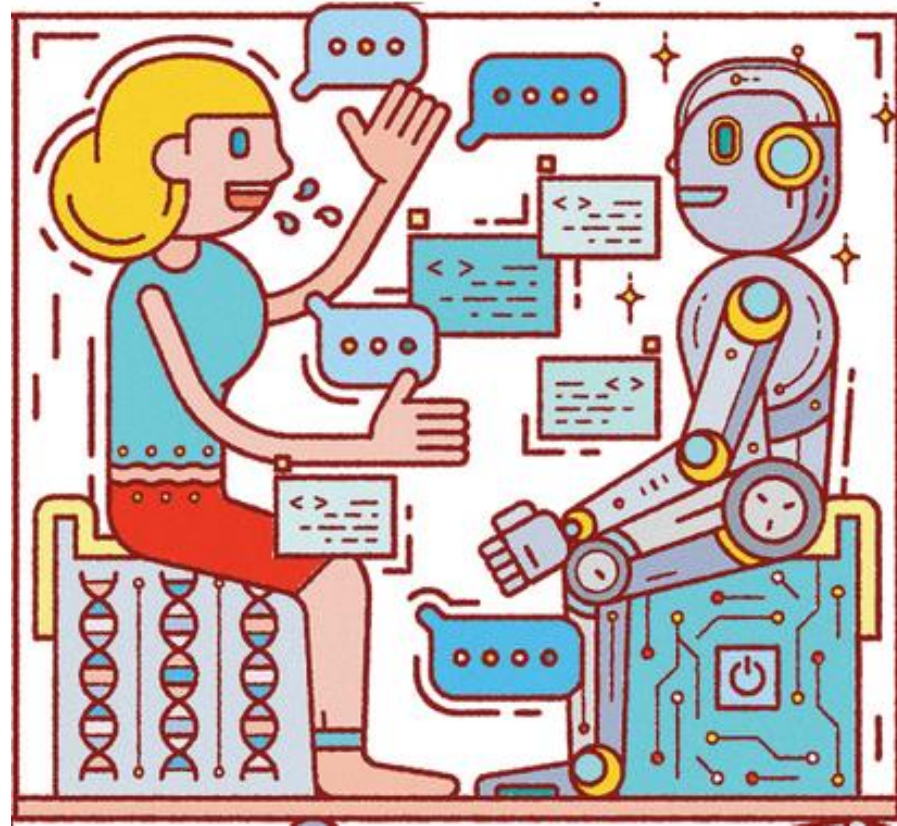
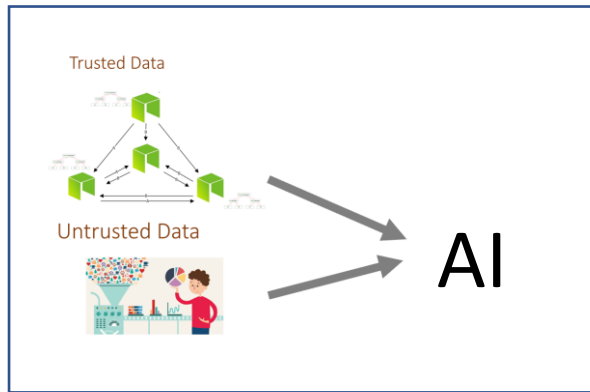


Image: <https://hbr.org/2018/07/collaborative-intelligence-humans-and-ai-are-joining-forces>



# Artificial Intelligence...



## • Generative Analytics

- *Generative* Pre-trained Transformer 3 (GPT-3 and chatGPT)
- *Generative Adversarial Network* (GAN)
- *Contrastive Language-Image Pre-training* (CLIP) e.g. DALL-E 2

Images

Music

Software

Text

Research and Education

# Artificial Intelligence... Images



2019 – This Person Doesn't Exist – GAN - <https://thispersondoesnotexist.com/>



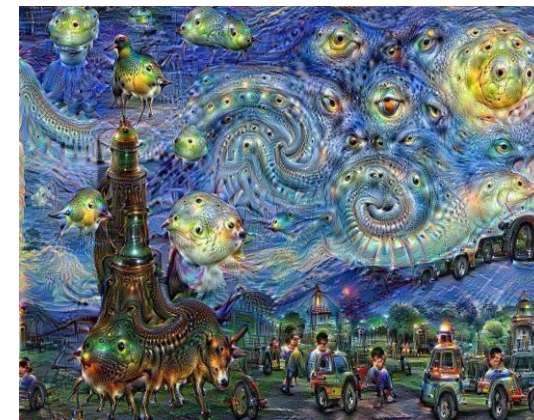
2022 – Dall-e  
<https://openai.com/dall-e-2/>

2020 – GPT-3  
<https://www.technologyreview.com/2020/09/25/1008921/ai-allen-institute-generates-images-from-captions/>



2023-02-10

Stephen Downes



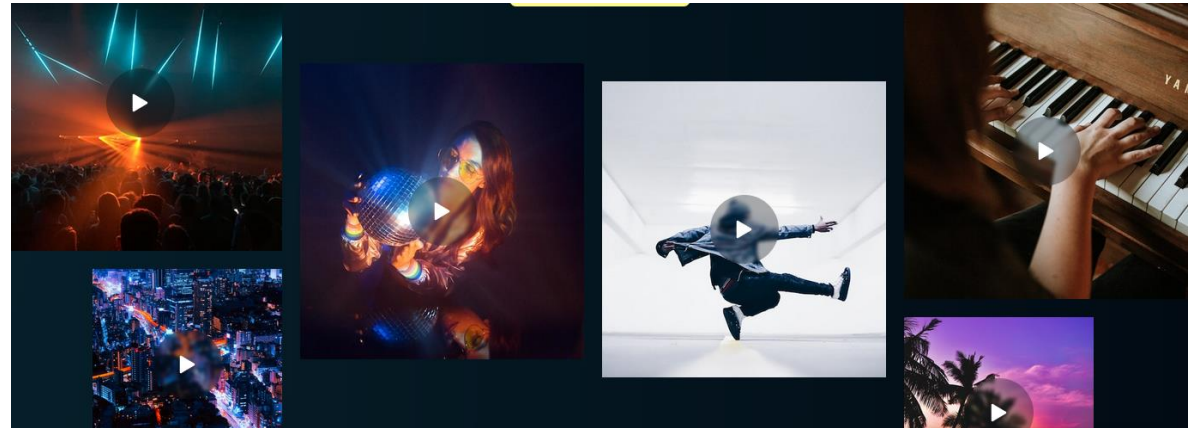
2015 - Google Deep Dream - <https://deepdreamgenerator.com/>

# Artificial Intelligence... Music



2020 – OpenAI Jukebox  
<https://openai.com/blog/jukebox/>

2023-02-10  
[https://soundcloud.com/openai\\_audio/jukebox-86115728](https://soundcloud.com/openai_audio/jukebox-86115728)



2022 – Soundraw - <https://soundraw.io/>



2018 - Brian Eno – Reflection -  
<https://www.youtube.com/watch?v=fSofXKGpenQ&t=5s>

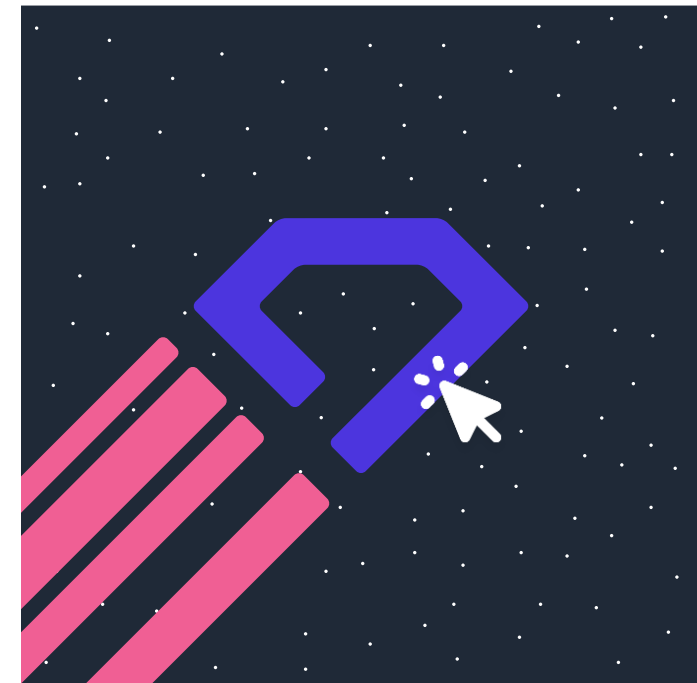
# Artificial Intelligence... Software

```
1 #!/usr/bin/env ts-node
2
3 import { fetch } from "fetch-h2";
4
5 // Determine whether the sentiment of text is positive
6 // Use a web service
7 async function isPositive(text: string): Promise<boolean> {
8   const response = await fetch(`http://text-processing.com/api/sentiment/`, {
9     method: "POST",
10    body: `text=${text}`,
11    headers: {
12      "Content-Type": "application/x-www-form-urlencoded",
13    },
14  });
15  const json = await response.json();
16  return json.label === "pos";
17 }
```

Copilot

2021 – GitHub Co-pilot -  
<https://github.com/features/copilot>

2016 – Wix ADI -  
<https://www.tooltester.com/en/wix-adi-review/>



2023 – Durable -  
<https://durable.co/ai-website-builder>



# Artificial Intelligence... Text



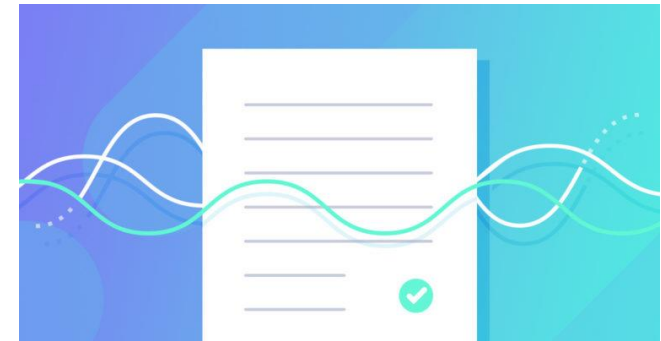
2016 – Associated Press - <https://www.digitaltrends.com/cool-tech/ap-uses-ai-for-sports-writing/>



2022 – Jasper - <https://www.jasper.ai>



2022 – chatGPT - <https://openai.com/blog/chatgpt/>

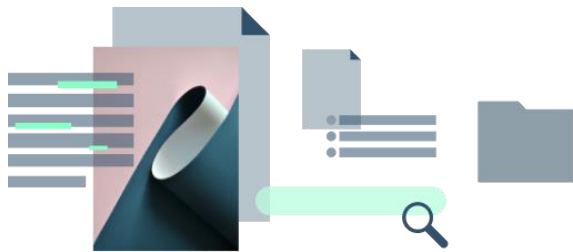


2019 – Grammarly - <https://www.grammarly.com/blog/how-grammarly-uses-ai/>

# Artificial Intelligence... Research and Education



2023 – 3D Audio and Video – Nvidia gauGAN  
- <https://www.nvidia.com/en-us/research/ai-playground/>



2022 – Genei - <https://www.genei.io/>

2023-02-10



2022 – OpenAI Playground -  
<https://www.vice.com/en/article/m7g5yq/students-are-using-ai-to-write-their-papers-because-of-course-they-are>

2023 – LessonPlans.ai

<https://www.lessonplans.ai/>

**Topic:** Prepositional Phrases

**Learning Objectives**

Students will be able to identify prepositions and prepositional phrases.

**Materials**

Reading Comprehension: The Secret Garden Worksheet

Document camera

Highlighter

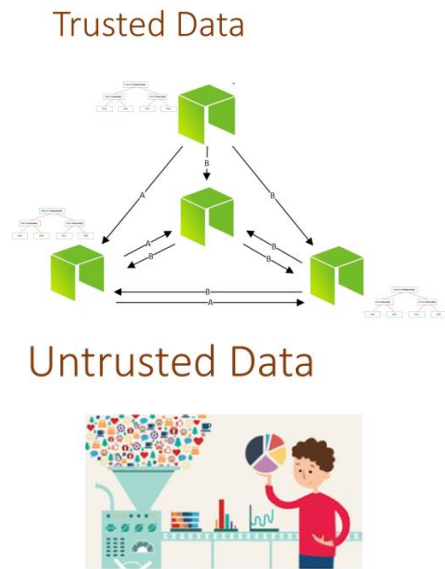
**Introduction**

- Explain to the class that a preposition is a word that specifies the location, direction, or time. Prepositions are "near," "above," and "before." Note that prepositions can be used in time. A prepositional phrase is the combination of a preposition and its object. "The dog is sitting near the tree," the prepositional phrase is "near the tree."
- On the board, write three sentences that include prepositions.
- Ask students to copy the sentences, circle the prepositions, underline the object, and draw an arrow from the preposition to its object.
- Give students 5-10 minutes to complete this warm-up.
- Go over the answers.
- Explain that this lesson will involve finding prepositional phrases in a museum sample.

**Procedure**

- Hand out copies of the Reading Comprehension: The Secret Garden worksheet.
- Model the process of reading the text on the worksheet using your copy.
- Read up to the first semicolon.

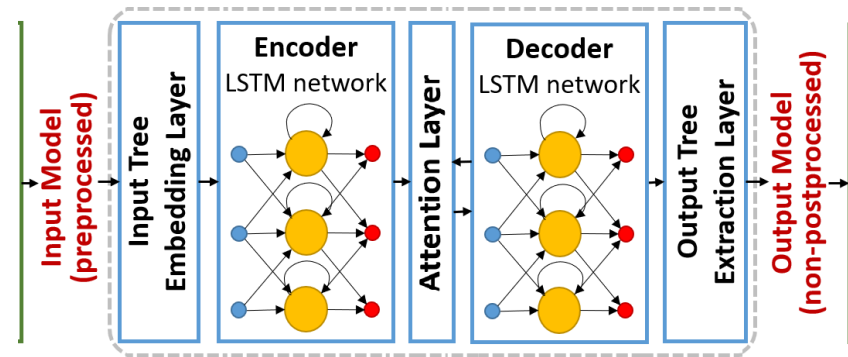
# Artificial Intelligence...



- Data Models
- Algorithms
- Application

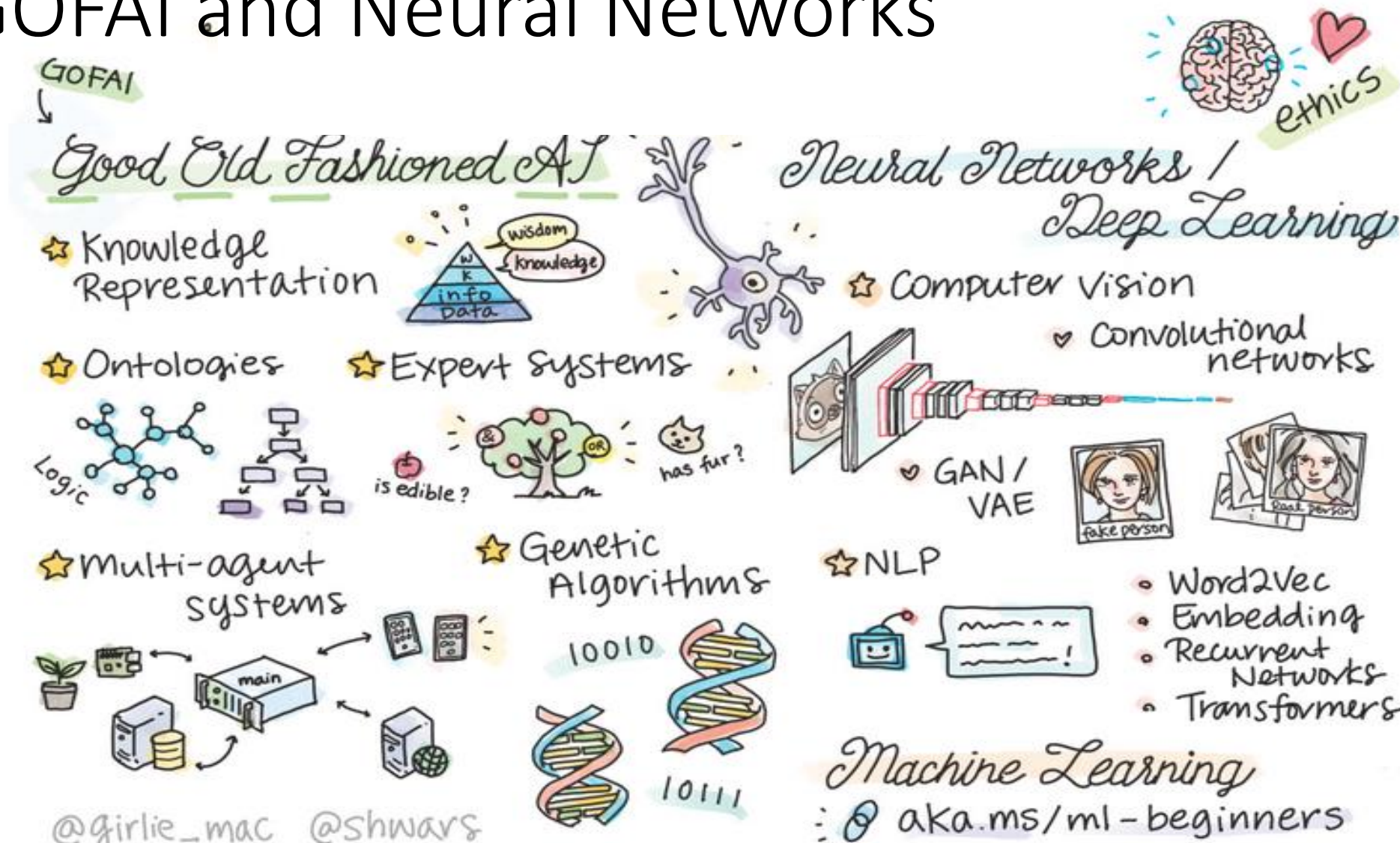
How AI Works

<https://ethics.mooc.ca/cgi-bin/page.cgi?presentation=59>





# GOFAI and Neural Networks





# Pattern Recognition



# The Prediction Game

Mary had a little \_\_\_\_\_ .

There's no place like \_\_\_\_\_ .

Oh say can you \_\_\_\_\_ .

Luke, I am your \_\_\_\_\_ .

Trust \_\_\_\_\_ .

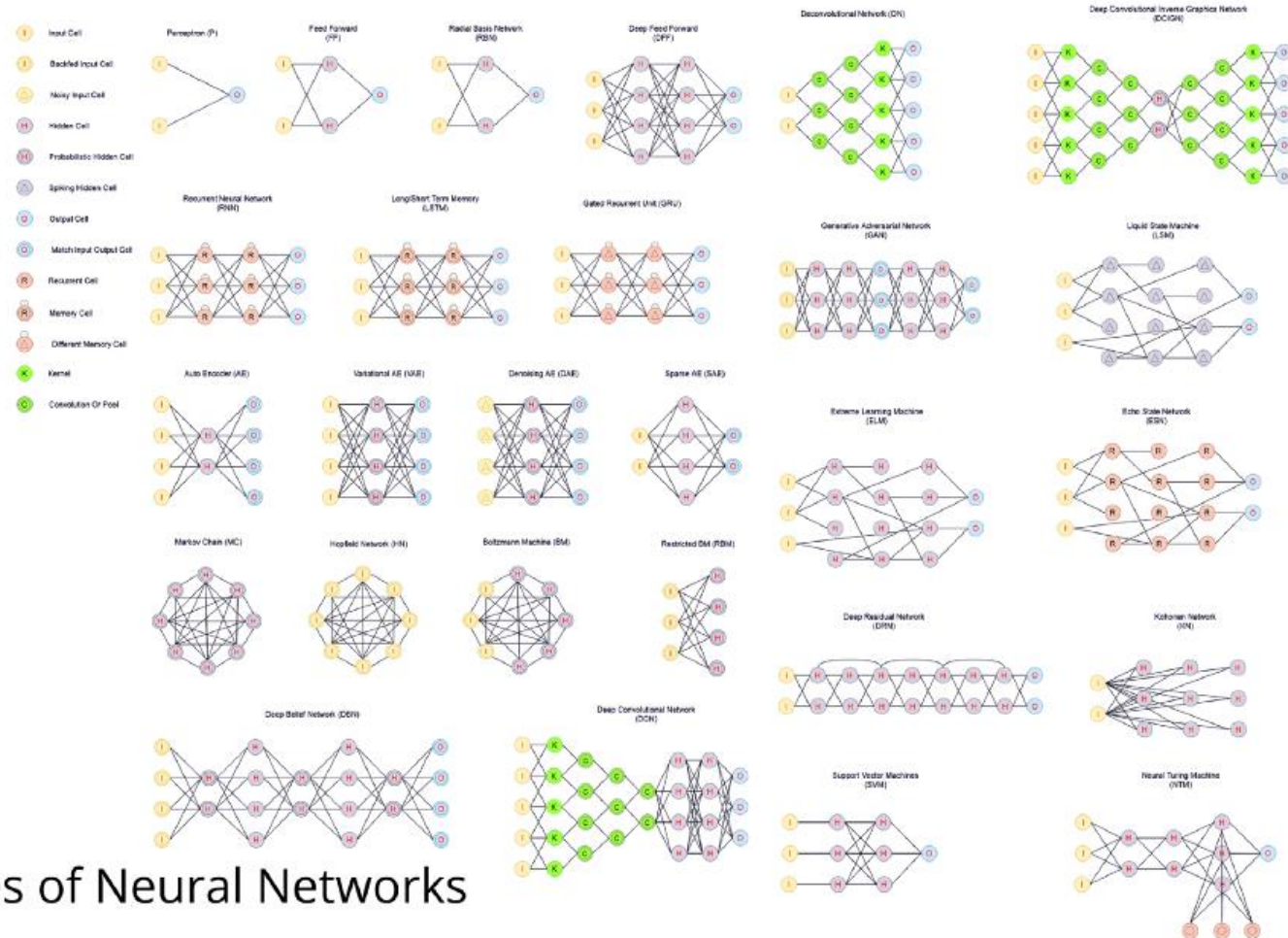
# The Prediction Game

I get requests all the time from left y guitar ists for charts and diagrams that are easy for  
was a from the time from people wing people who a for tabs of show useful to  
them to read This printable left handed guitar chords chart can be used as a poster for your wall ,  
use I is ing chart chart char pack is help to guide or left room or  
desktop background or keep it in your guitar case as a quick cheat sheet Click the poster for  
o , your you practice . guide reference You here link image  
a larger version ( be sure to zoom in on the when viewing the bigger image ) OR Download the Left  
free or aware save ) image you on charts version . click here poster  
Hand ed Ch ord PDF .  valid token? no  
Guitar arts Chart here

<http://rr-lm-game.herokuapp.com/>

# Questions...

What is the model that we're going to select?



Main Types of Neural Networks



# Questions...

How do we explain how a model produced the result that it did?

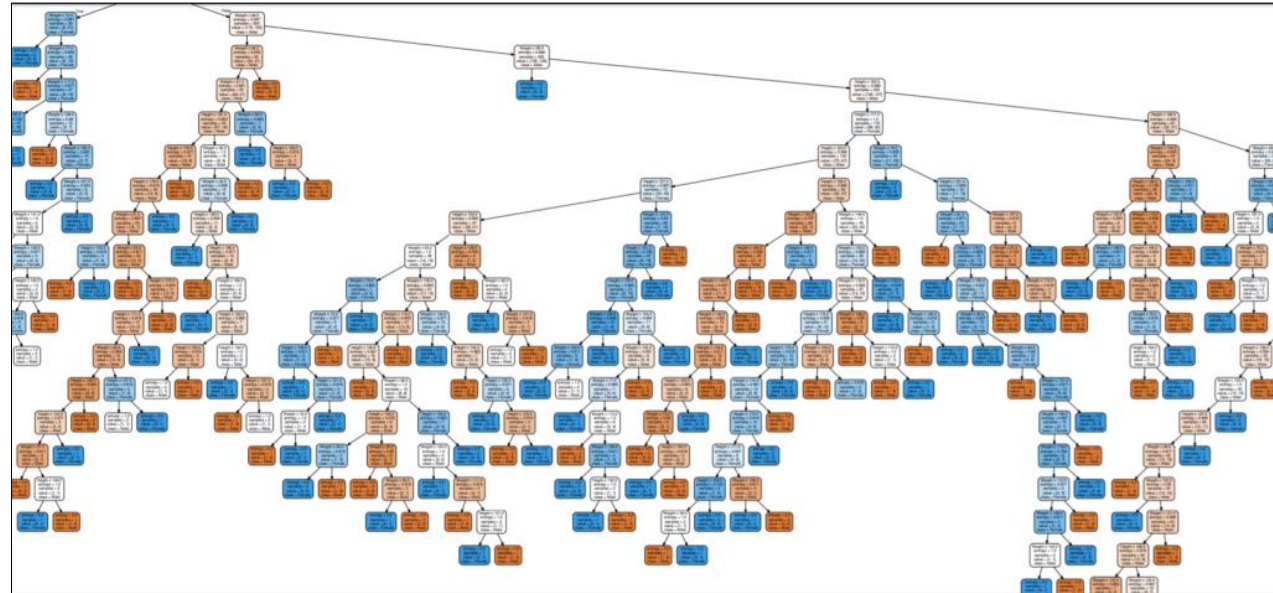


Image: <https://towardsai.net/p/programming/decision-trees-explained-with-a-practical-example-fe47872d3b53>

# Questions...

Can you  
appeal an AI  
decision?  
Who is  
accountable?

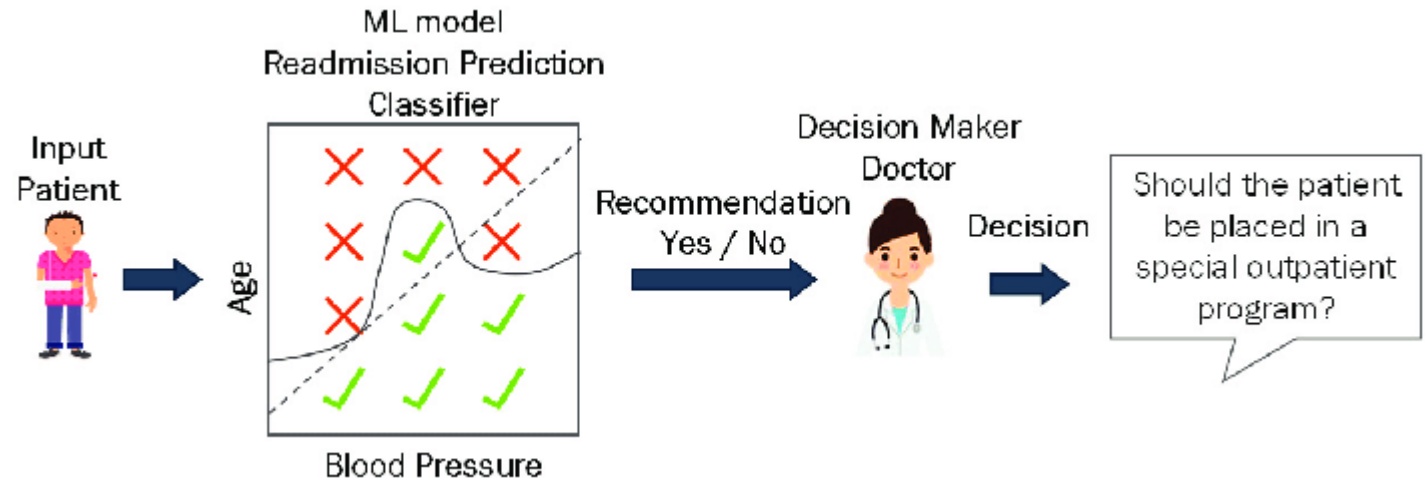


Image:

<https://www.microsoft.com/en-us/research/publication/beyond-accuracy-the-role-of-mental-models-in-human-ai-team-performance/>

2019 – AI and Agency - <https://escholarship.org/uc/item/8q15786s>

2023 – Nature – chatGPT listed as author on research papers - <https://www.nature.com/articles/d41586-023-00107-z>

2022 - US Court of Appeals Affirms That AI Cannot Be An Inventor Under US Patent Law - <https://www.dww.com/articles/us-court-of-appeals-affirms-ai-cannot-be-an-inventor-under-us-patent-law>

# The Crossroads



- Technology
- Institutions
- Values
  - Inclusion
  - Sustainability
  - Ethics

Image: <https://www.atlasobscura.com/places/clarksdale-crossroads>

# Values

- Inclusion
- Sustainability
- Ethics



## Other Themes?

- Autonomy and Agency
- Integrity and Honesty
- Openness
- Care and Respect
- Value and Benefit  
etc



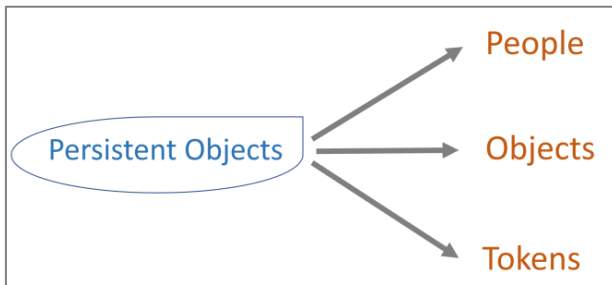
Image: <https://haiilo.com/blog/the-importance-of-company-values/>

2023-02-19 See also: <https://ethics.mooc.ca/cgi-bin/page.cgi?module=8> Stephen Downes



# The AI Values Chain

## Objects



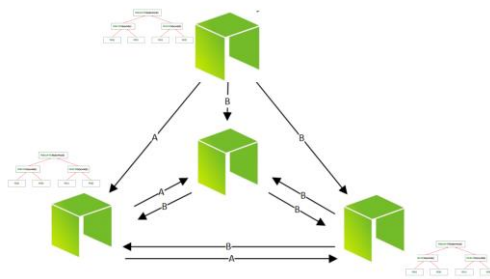
*Metaverse*

## Data

Untrusted Data

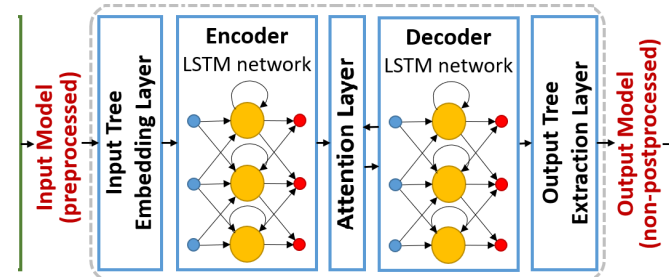


Trusted Data



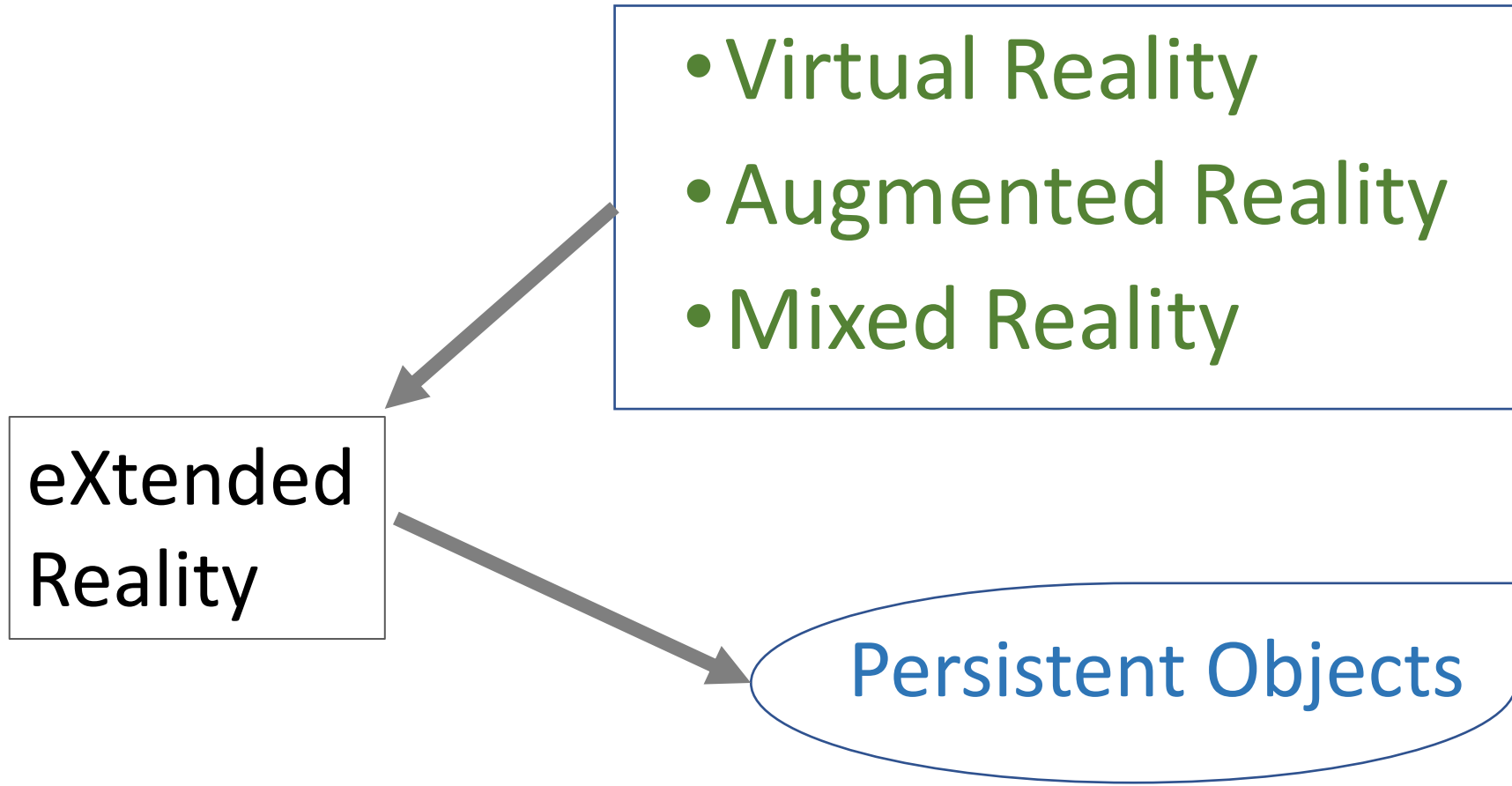
*Blockchain*

## Application

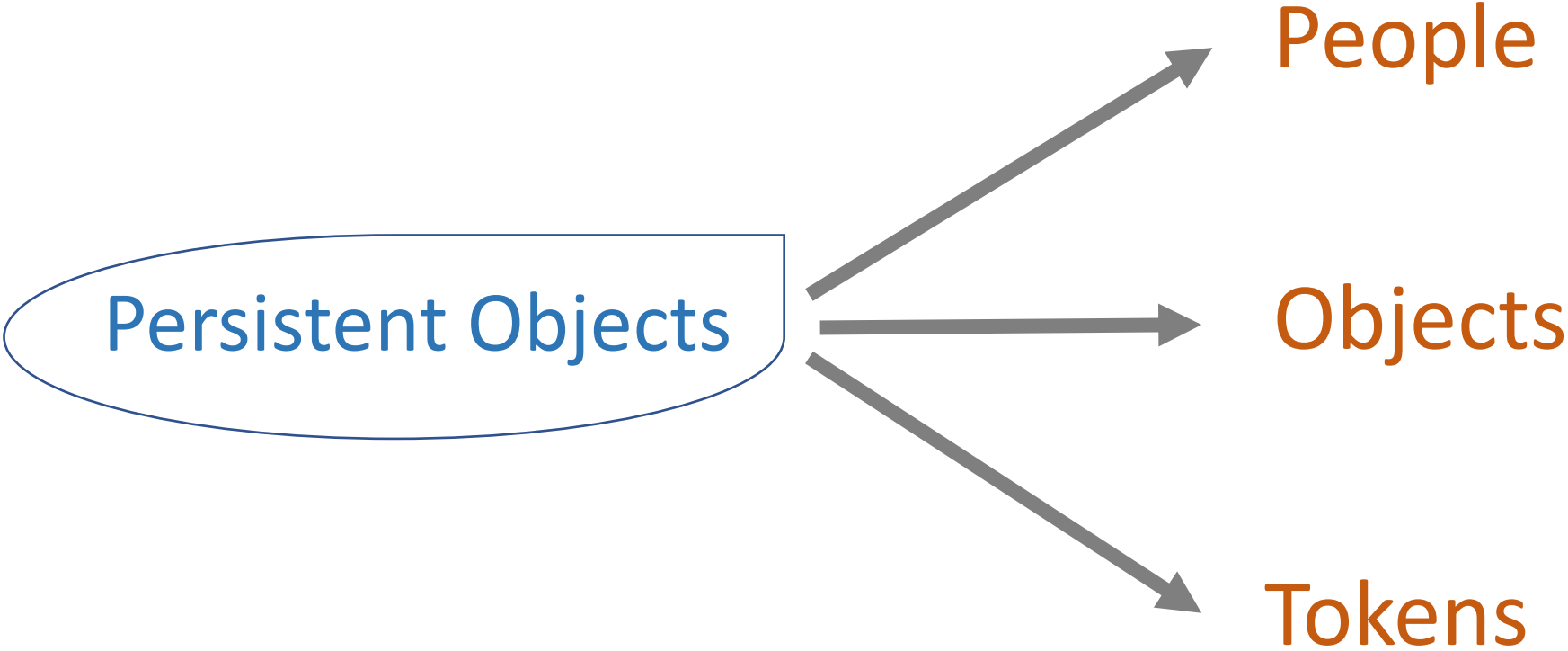


*AI*

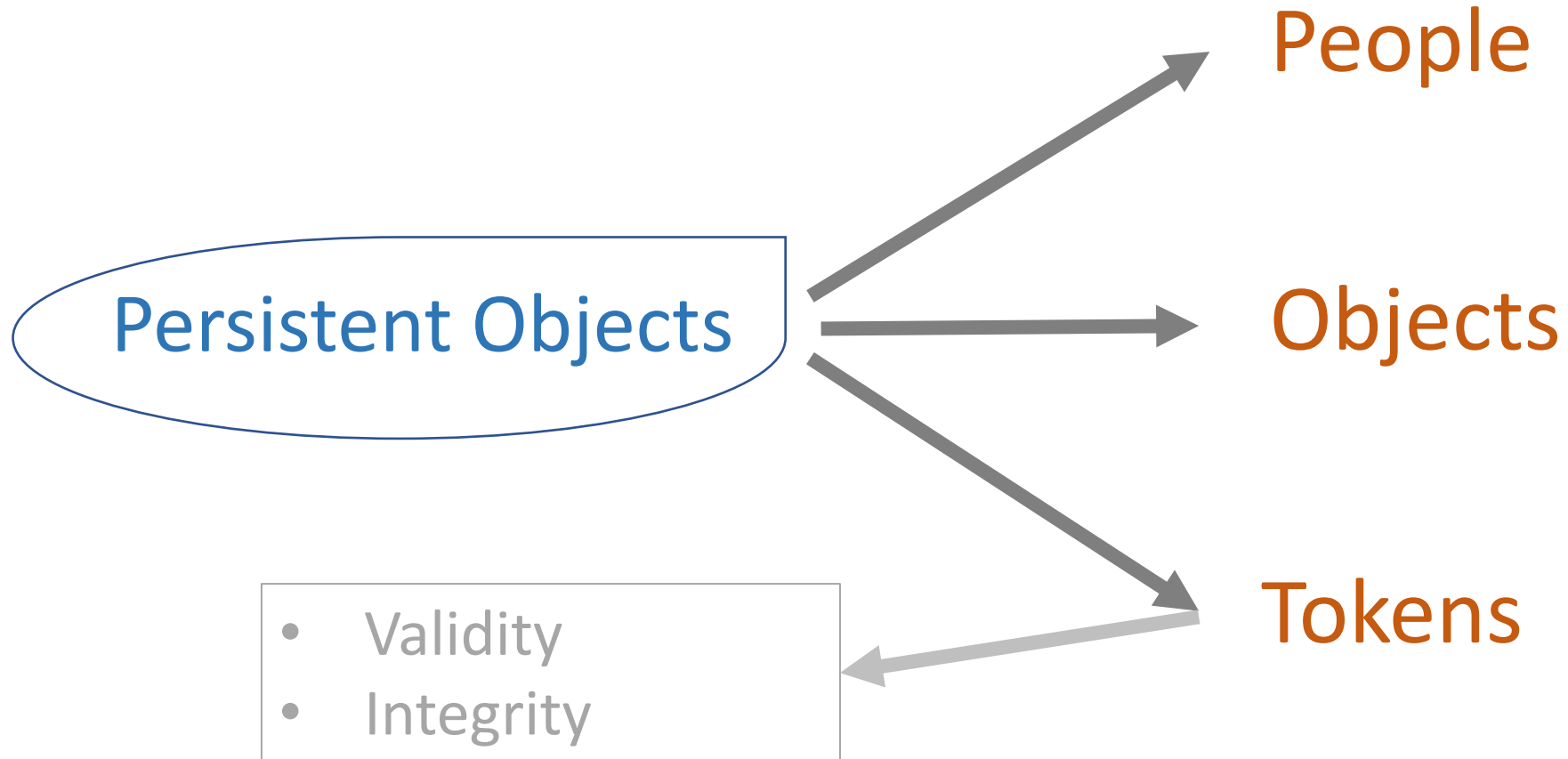
# The Metaverse



# The Metaverse

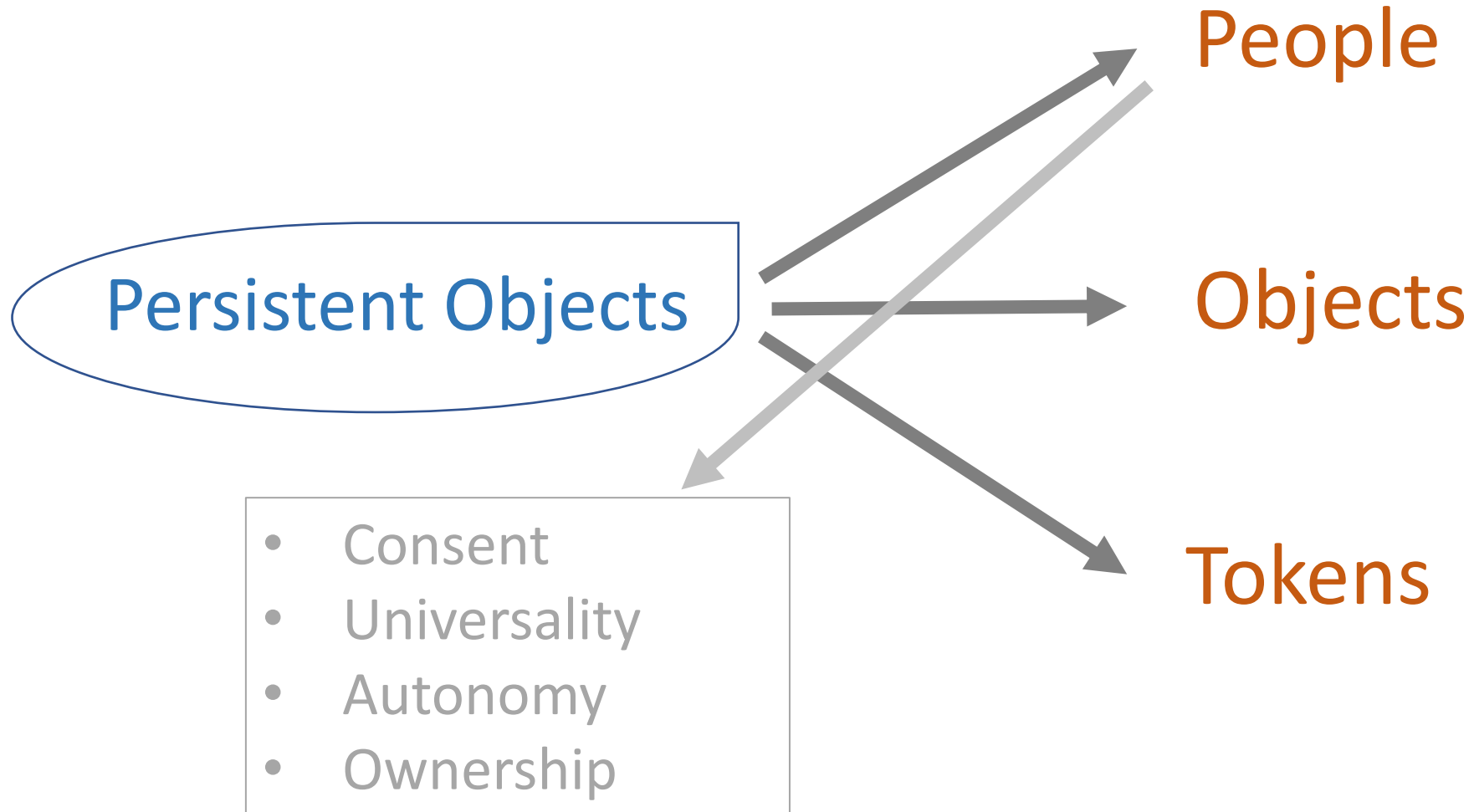


# The Metaverse

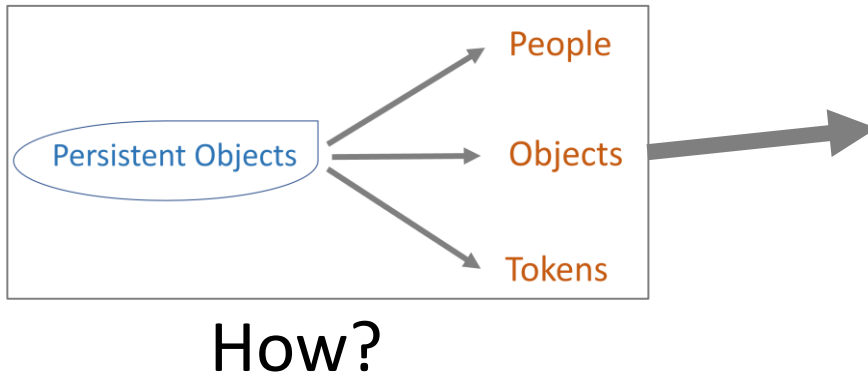




# The Metaverse



# The Metaverse



- Content Addressing (Blocks)
- Merkle Graphs (Chains)
- Consensus

## Blockchain

# Blockchain

- Provenance
- Ownership

- Content Addressing (Blocks)

- Merkle Graphs (Chains)

- Consensus

## Input

Fox

The red fox jumps over the blue dog

cryptographic hash function

cryptographic hash function

## Digest

DFCD 3454 BBEA 788A 751A  
696C 24D9 7009 CA99 2D17

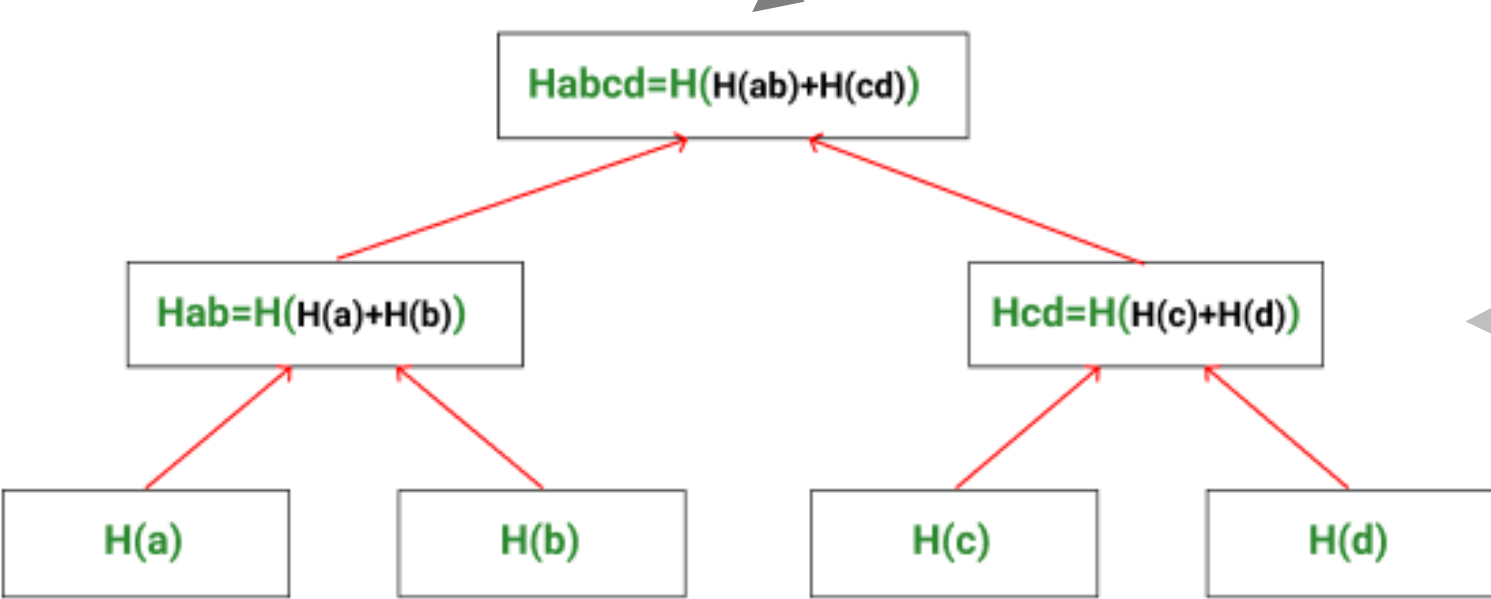
0086 46BB FB7D CBE2 823C  
ACC7 6CD1 90B1 EE6E 3ABC

- Openness
- Access

## Address

# Blockchain

- Content Addressing (Blocks)
- Merkle Graphs (Chains)
- Consensus



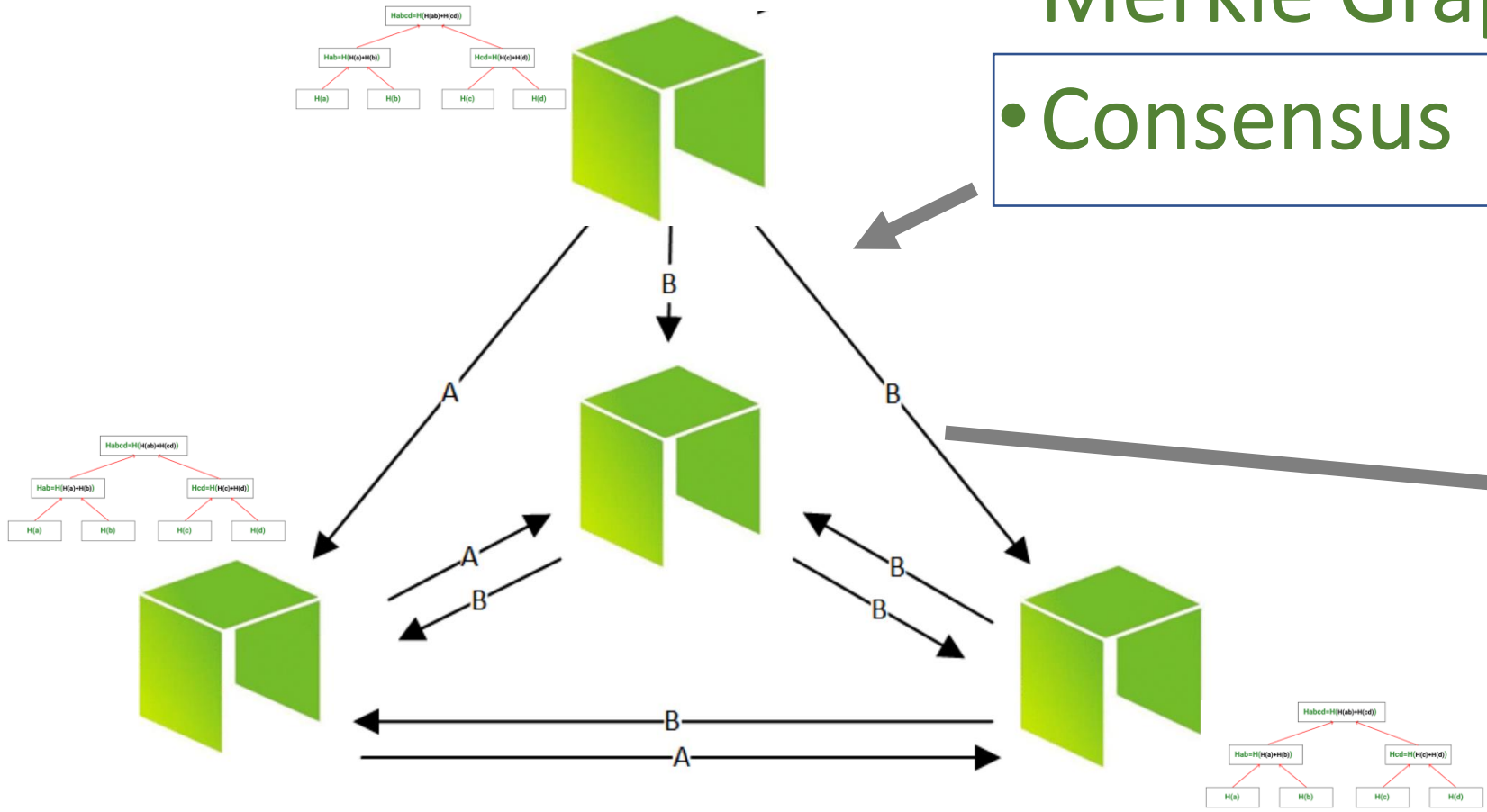
- Findable
- Accessible
- Interoperable
- Reusable

Merkle Tree



# Blockchain

- Content Addressing (Blocks)
- Merkle Graphs (Chains)
- Consensus

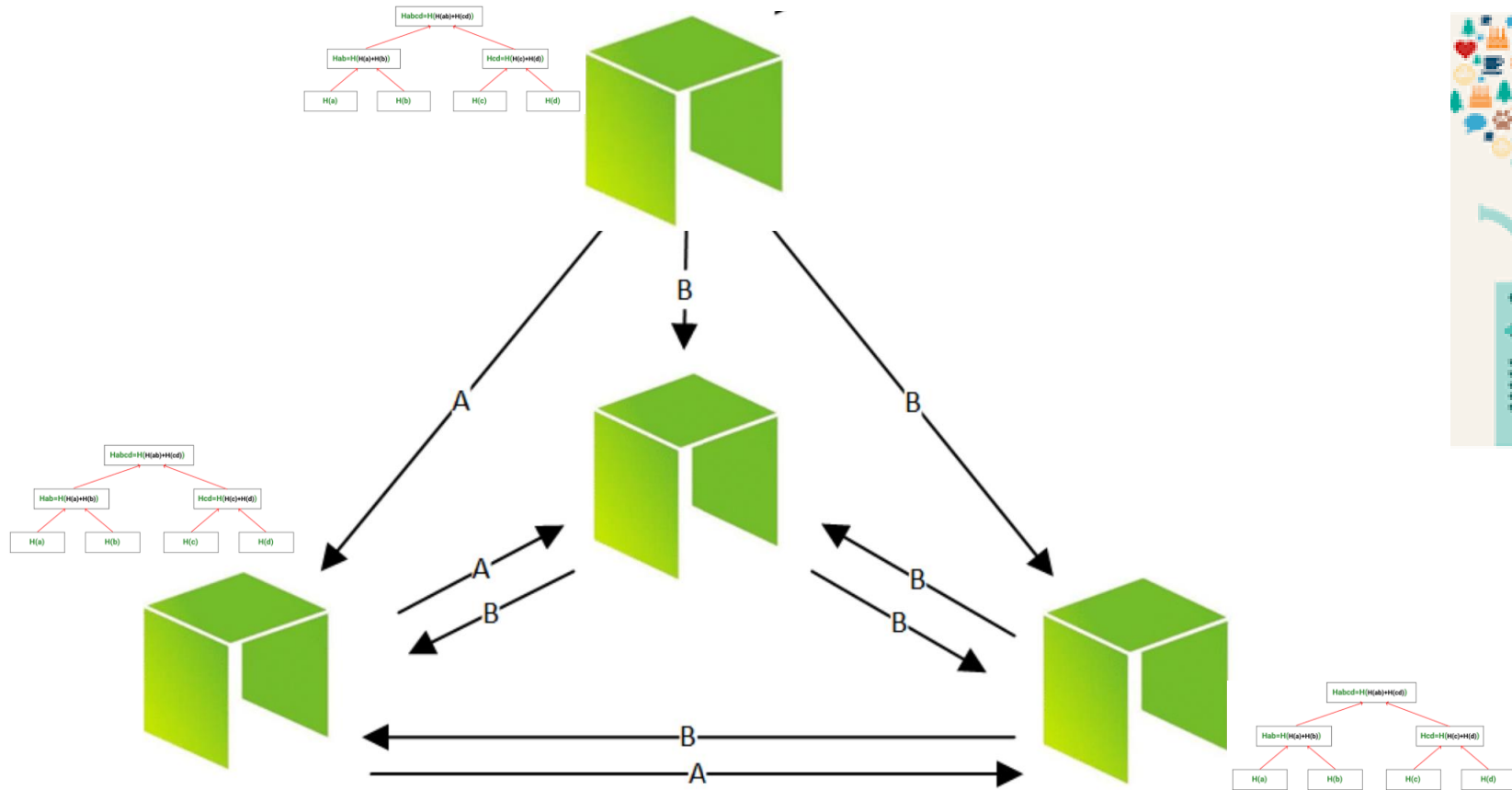


Environment

- Proof of Work
- Proof of Stake
- Proof of Authority

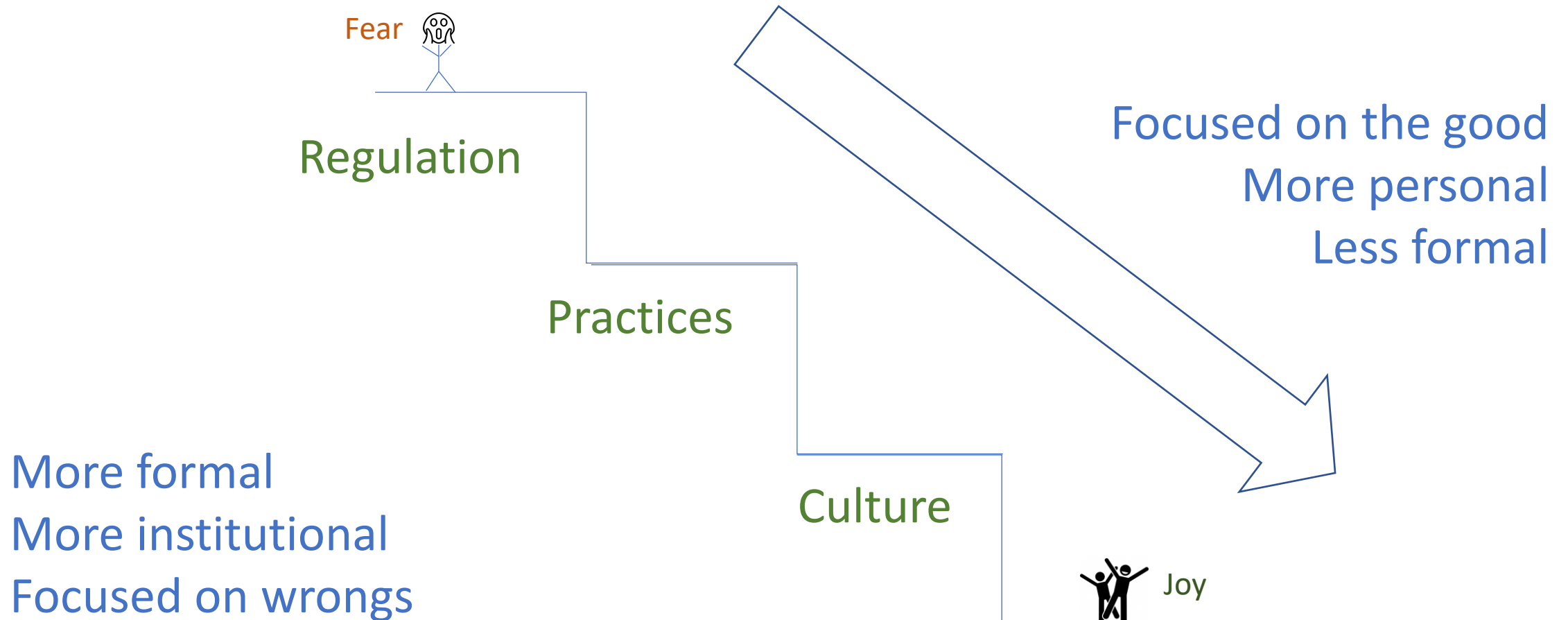
Inclusion

# Trusted versus Untrusted Data

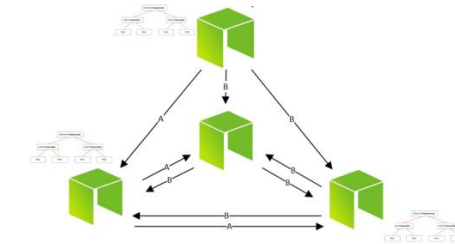
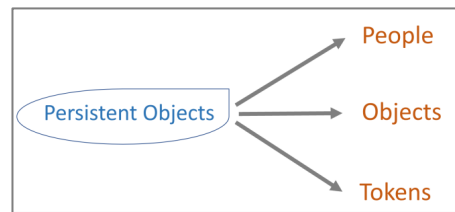


Data bias, representation, consent and inclusivity

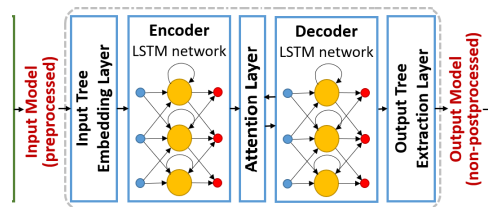
# Values



# Institutions...

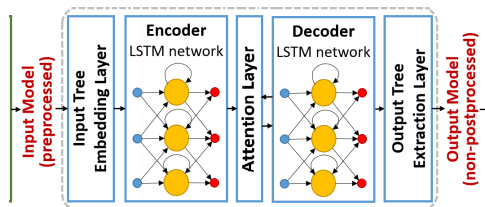
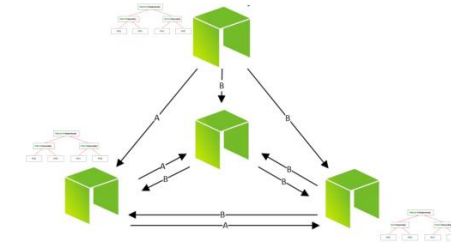
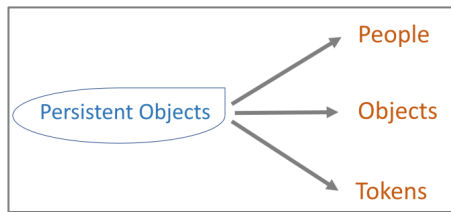


- Teaching and Learning
- Research and Development
- Innovation and Growth





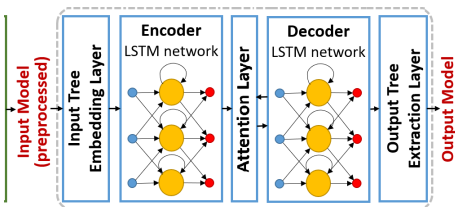
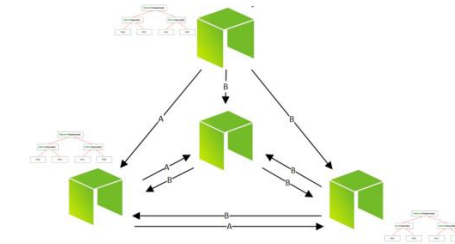
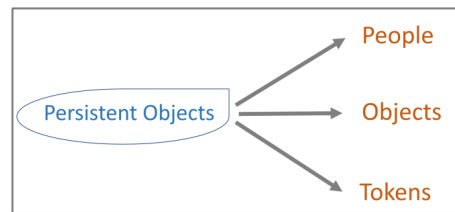
# Institutions...



- Teaching and Learning
- Research and Development
- Innovation and Growth

Our roles are changing

# Institutions...

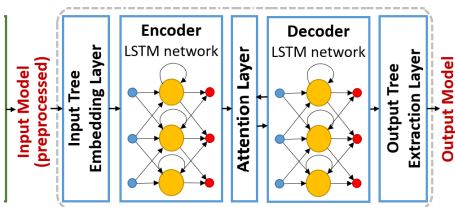
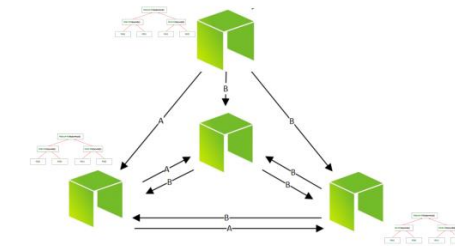
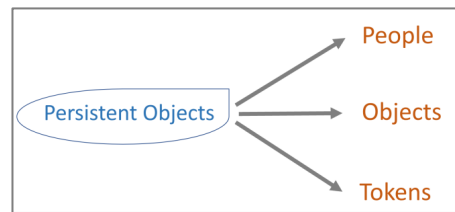


## Persistent Objects

- Distributed ID (DID)
- Open Educational Resources
- Badges and Credentials

- Ensuring individual agency and autonomy
- Ensuing diversity, equity and inclusion

# Institutions...

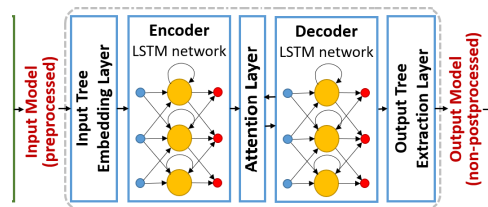
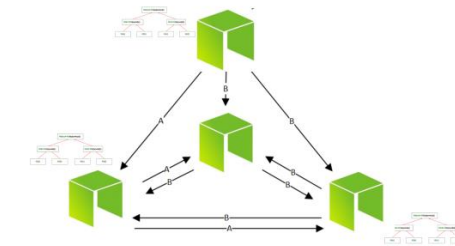
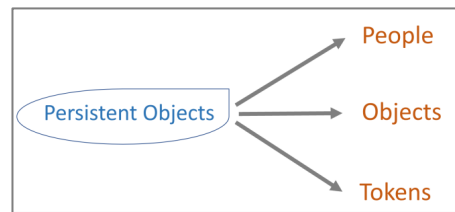


## Persistent Objects

- Distributed ID (DID)
- Open Educational Resources
- Badges and Credentials

- Accessible and usable learning resources
- Support for informal and lifelong learning

# Institutions...

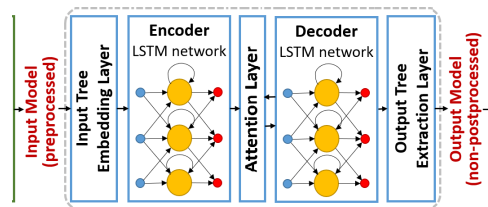
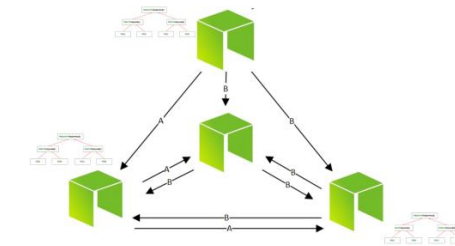
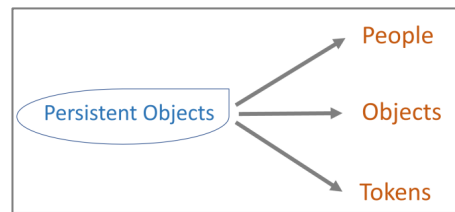


## Persistent Objects

- Distributed ID (DID)
- Open Educational Resources
- Badges and Credentials

- Bridging the link to employability
- Facilitating knowledge recognition networks

# Institutions...

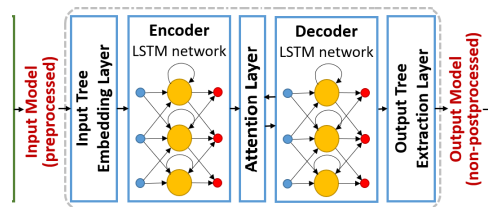
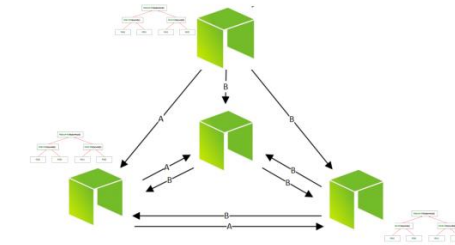
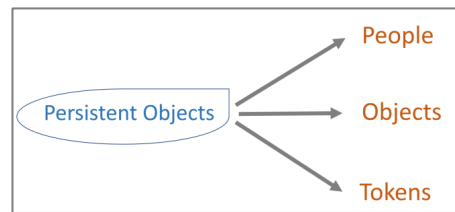


## Consensus

- Peer Networks
- Fediverse (Mastodon)
- Open Community

- Building and facilitating mechanisms for people to support their own learning
- For example, Personal Learning Environments

# Innovation and Growth



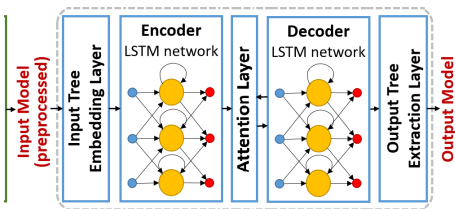
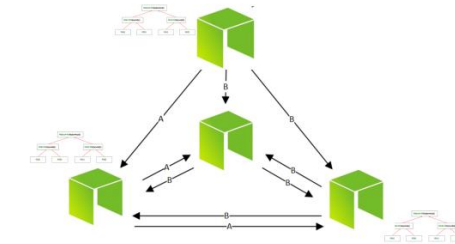
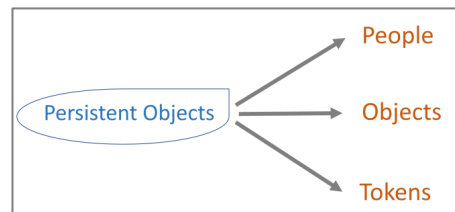
## Artificial Intelligence

- Resource Creation
- Coaching and Tutoring
- Automated Assessment

- Build quality trusted data networks
- Assess and validate AI models
- Automated resource development
- Support public access to the technology



# Institutions...

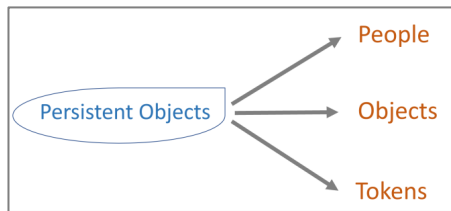


## Consensus

- Innovation Networks
- Needs Assessment

- Redefinition from *how* to innovate to *what we want* from innovation
- Key role for access and inclusion

# Concluding Remarks



← This is us

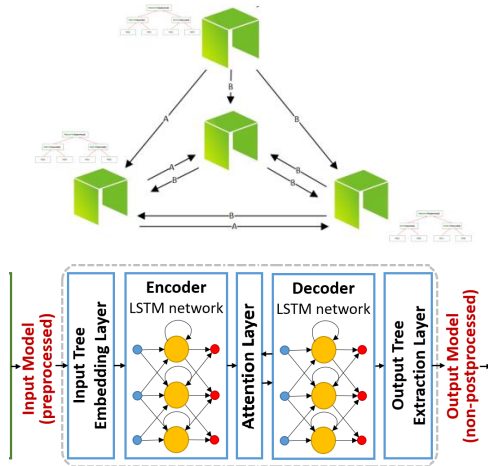
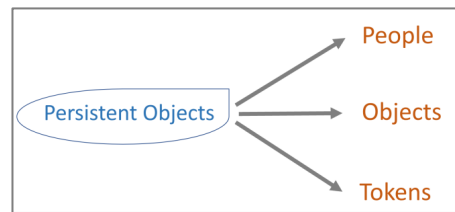


Image: <https://www.radiotimes.com/tv/drama/this-is-us-season-5-how-to-watch/>  
Stephen Downes

# Concluding Remarks



Everything this does depends on what we do

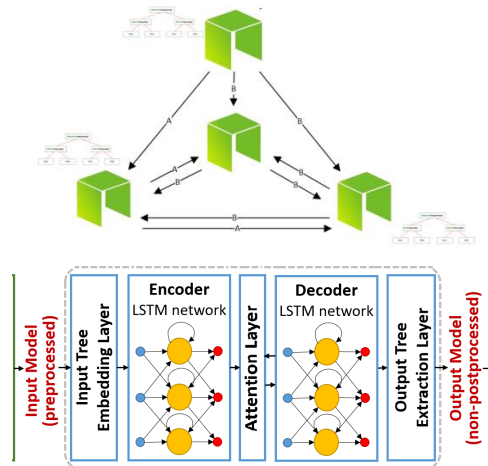
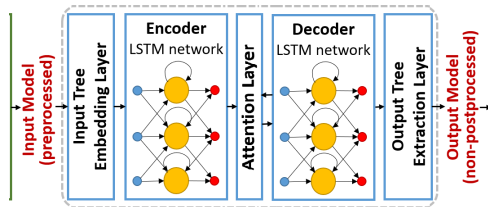
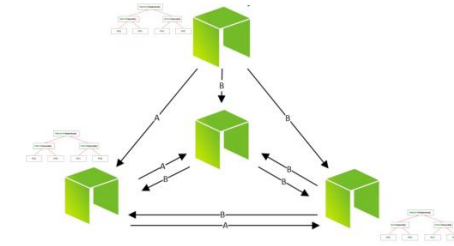
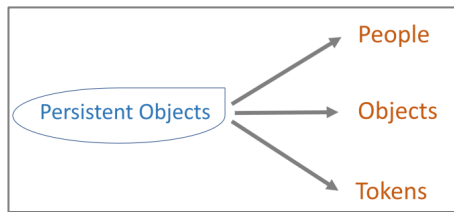


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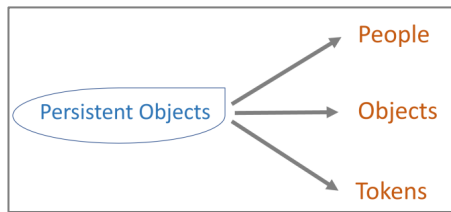
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# Concluding Remarks

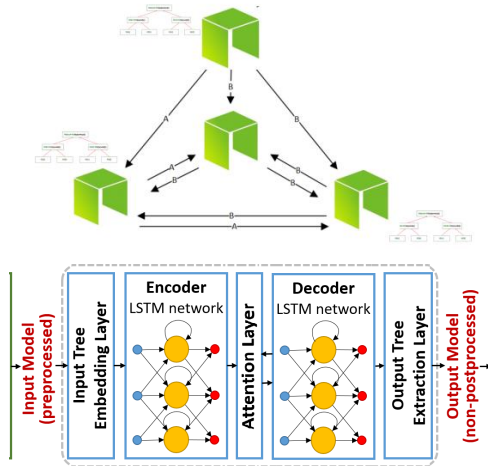


If we want a more inclusive, sustainable and ethical society, we must make inclusive, sustainable and ethical decisions

# Concluding Remarks



All of us



It is not what we do for our students. It is What we help students to do for themselves.

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