

Universities at the Crossroads: Technologies, values and the role of the institution



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The Crossroads

- Technology
- Institutions
- Values

My objectives are to:

- offer clear and understandable descriptions of three current technologies (metaverse, blockchain, artificial intelligence)
- discuss how they will impact the traditional role and function of universities
- describe the application of the conference themes to these technologies with respect to these roles

The Crossroads

- Technology
 - The Metaverse
 - Blockchain and Crypto
 - Artificial Intelligence
- Institutions
- Values

The Crossroads

- Technology
- Institutions
 - Teaching and Learning
 - Research and Development
 - Innovation and Growth
- Values

The Crossroads

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

Values

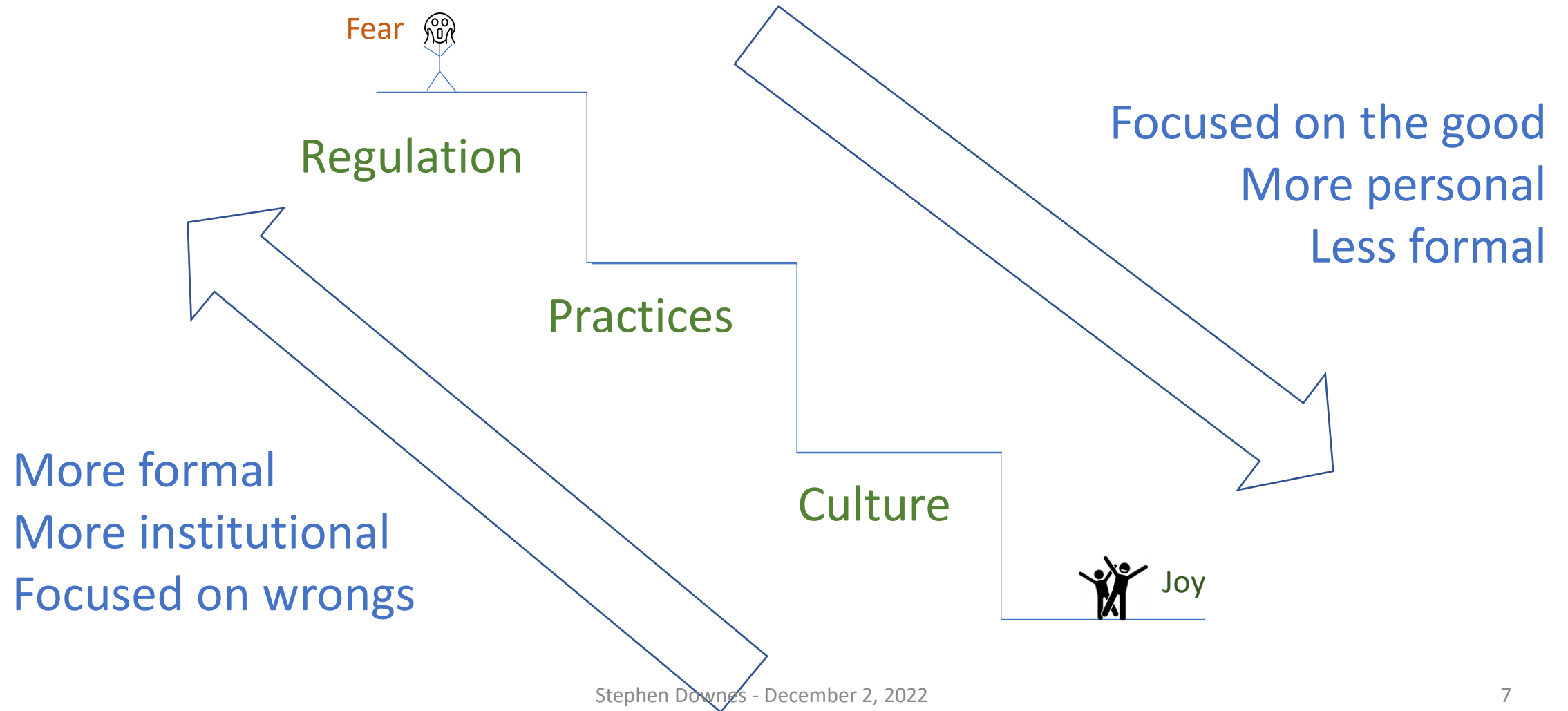
- Inclusion
- Sustainability
- Ethics



Other Themes?

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

Values and Practices



Technology

- The Metaverse
- Blockchain and Crypto
- Artificial Intelligence

These technologies are *here now*. In the future we will face the same decisions with future technologies.

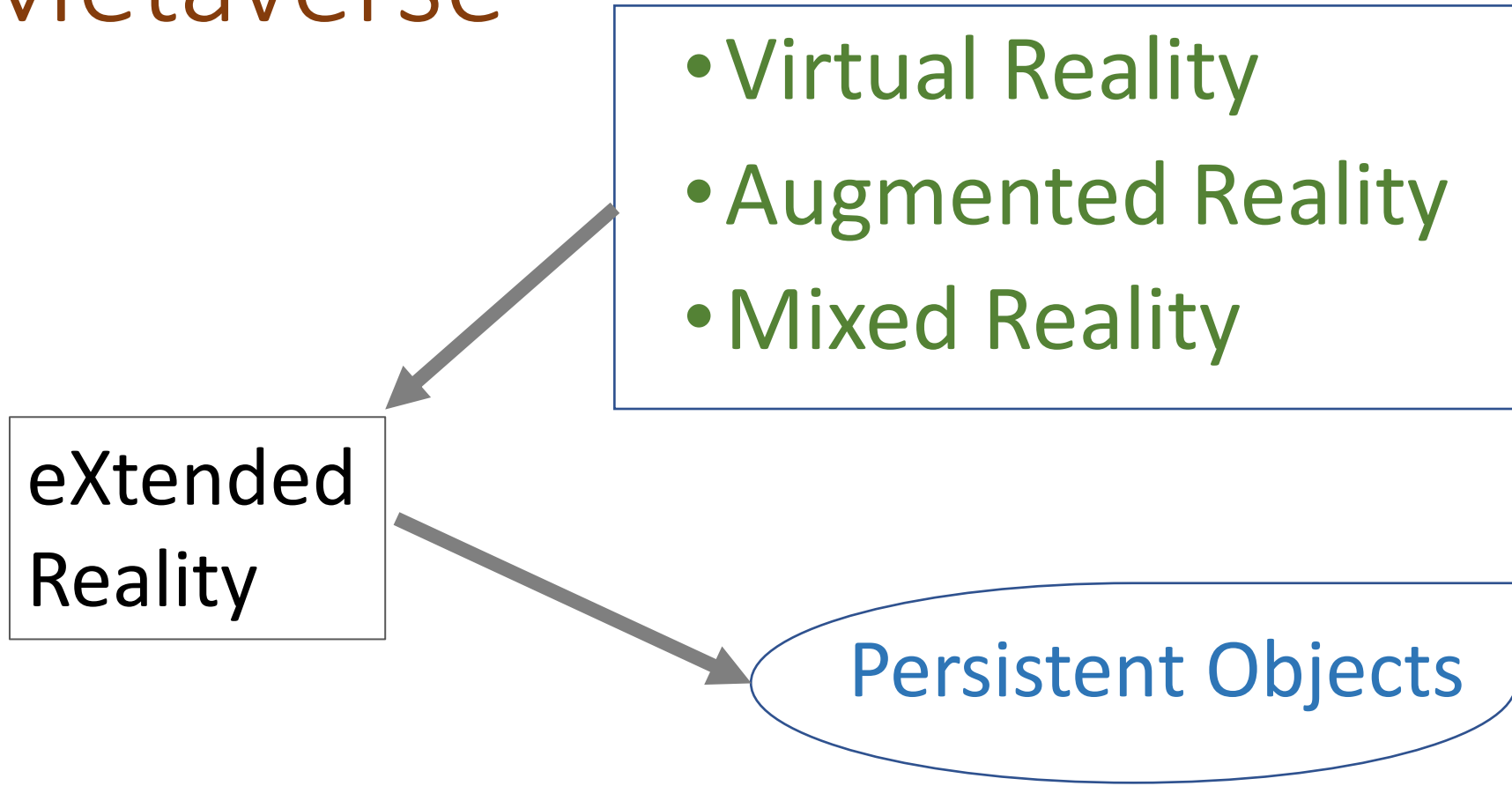
The Metaverse

- Virtual Reality
- Augmented Reality
- Mixed Reality

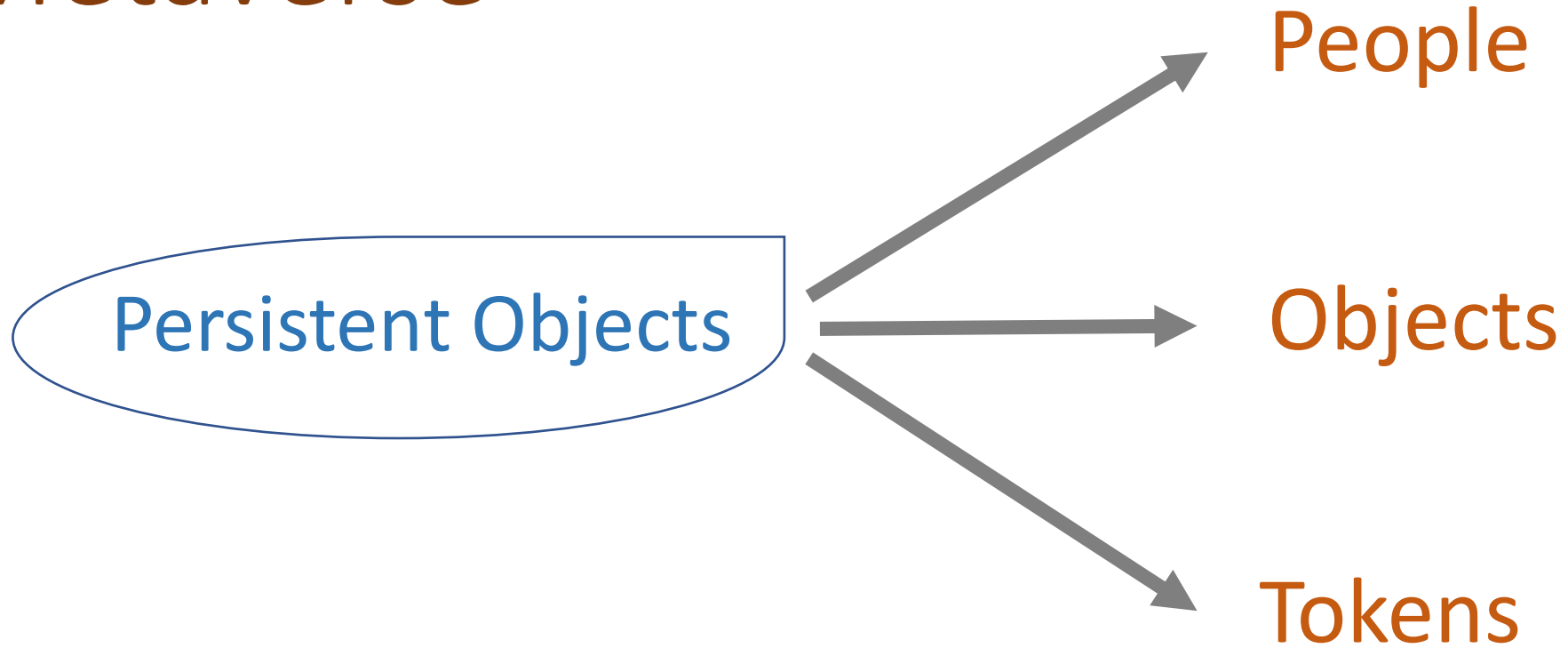
Values

- Accessibility
- Environmental Sustainability
- Benefits and Outcomes

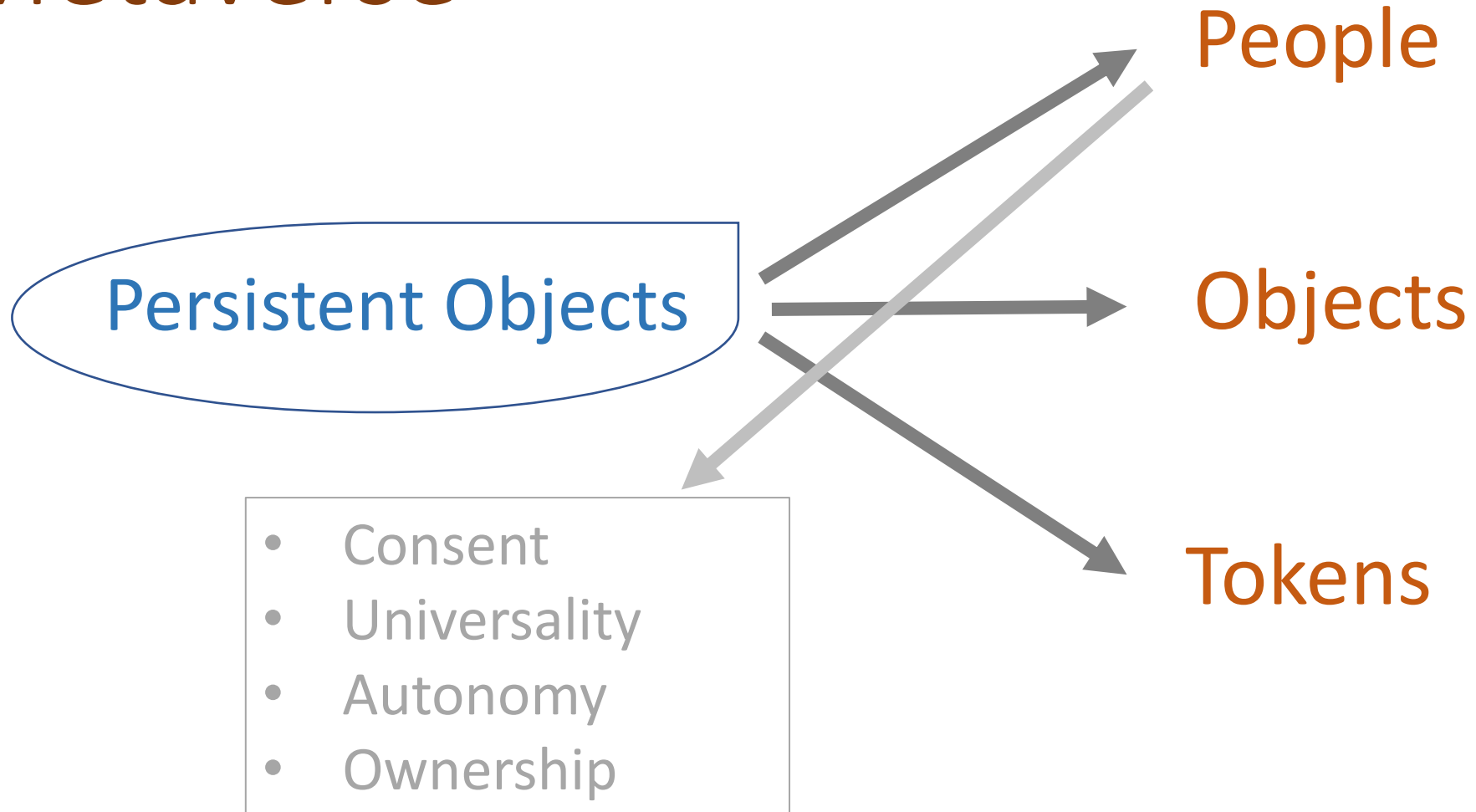
The Metaverse



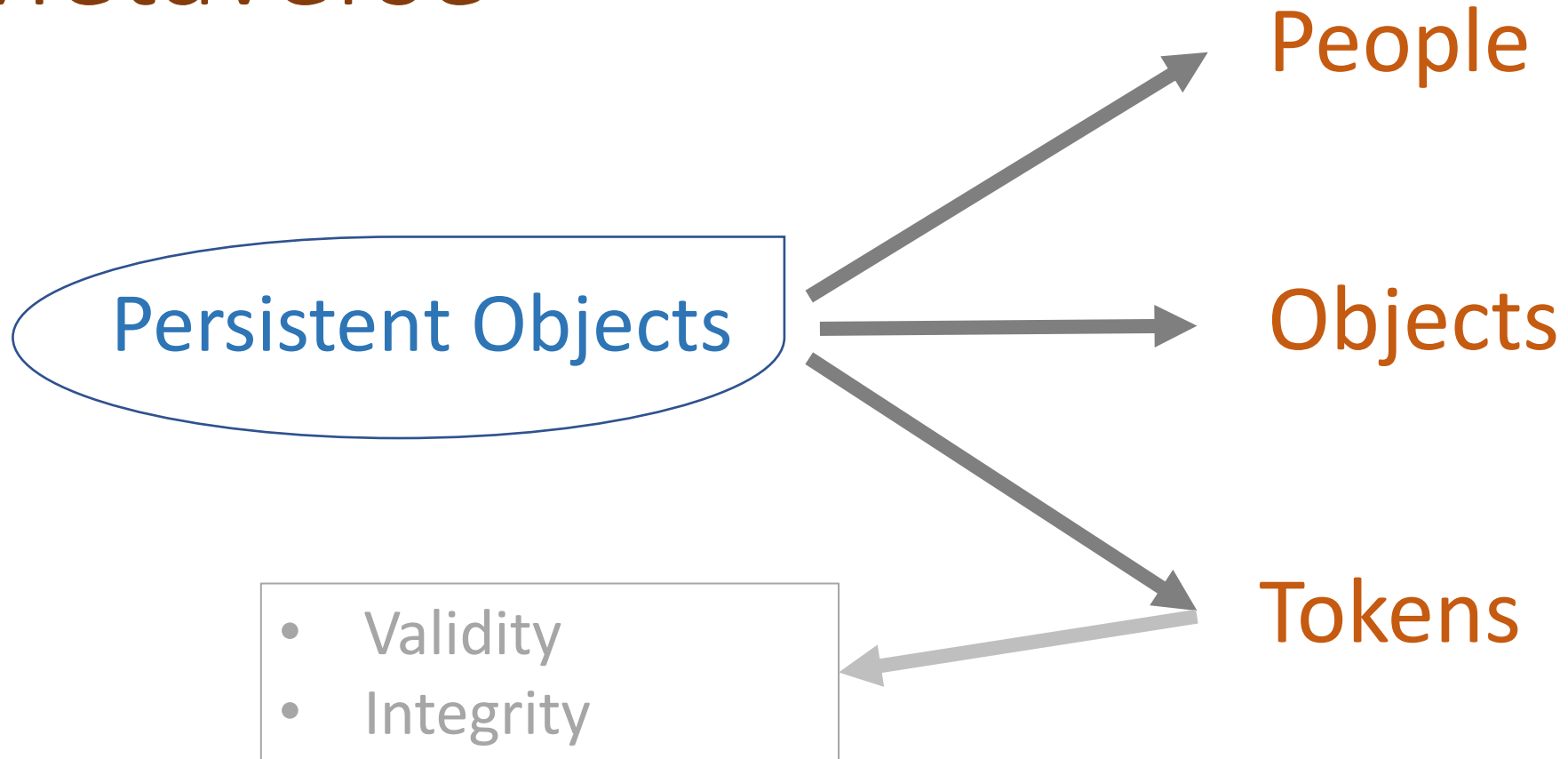
The Metaverse



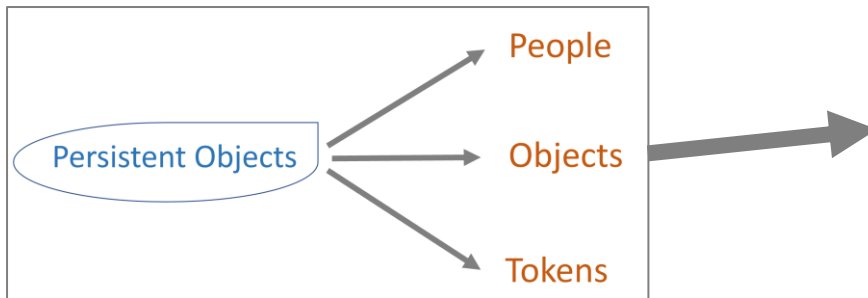
The Metaverse



The Metaverse



Blockchain



How?

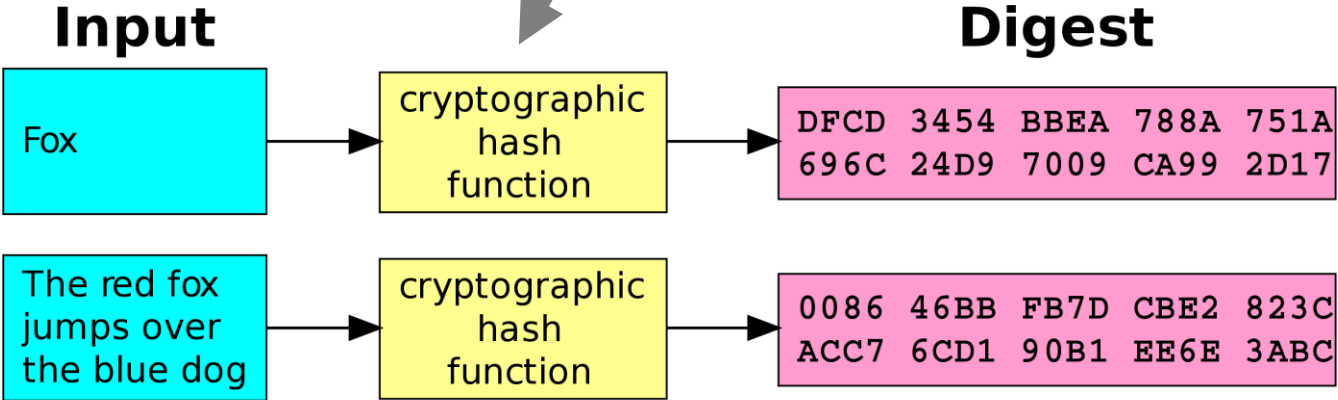
- Content Addressing (Blocks)
- Merkle Graphs (Chains)
- Consensus

Blockchain

- Content Addressing (Blocks)

- Merkle Graphs (Chains)

- Consensus



Address

Blockchain

- Provenance
- Ownership

- Content Addressing (Blocks)

- Merkle Graphs (Chains)

- Consensus

Input

Fox

cryptographic hash function

Digest

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

The red fox jumps over the blue dog

cryptographic hash function

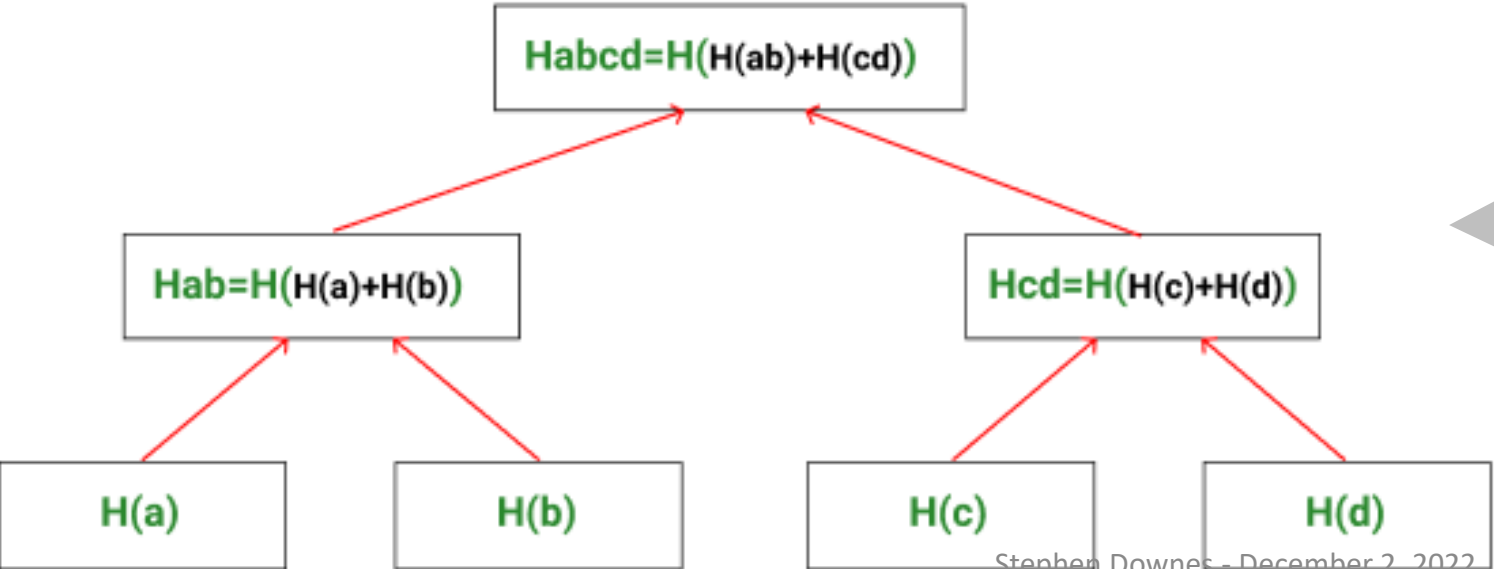
0086 46BB FB7D CBE2 823C
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- Openness
- Access

Address

Blockchain

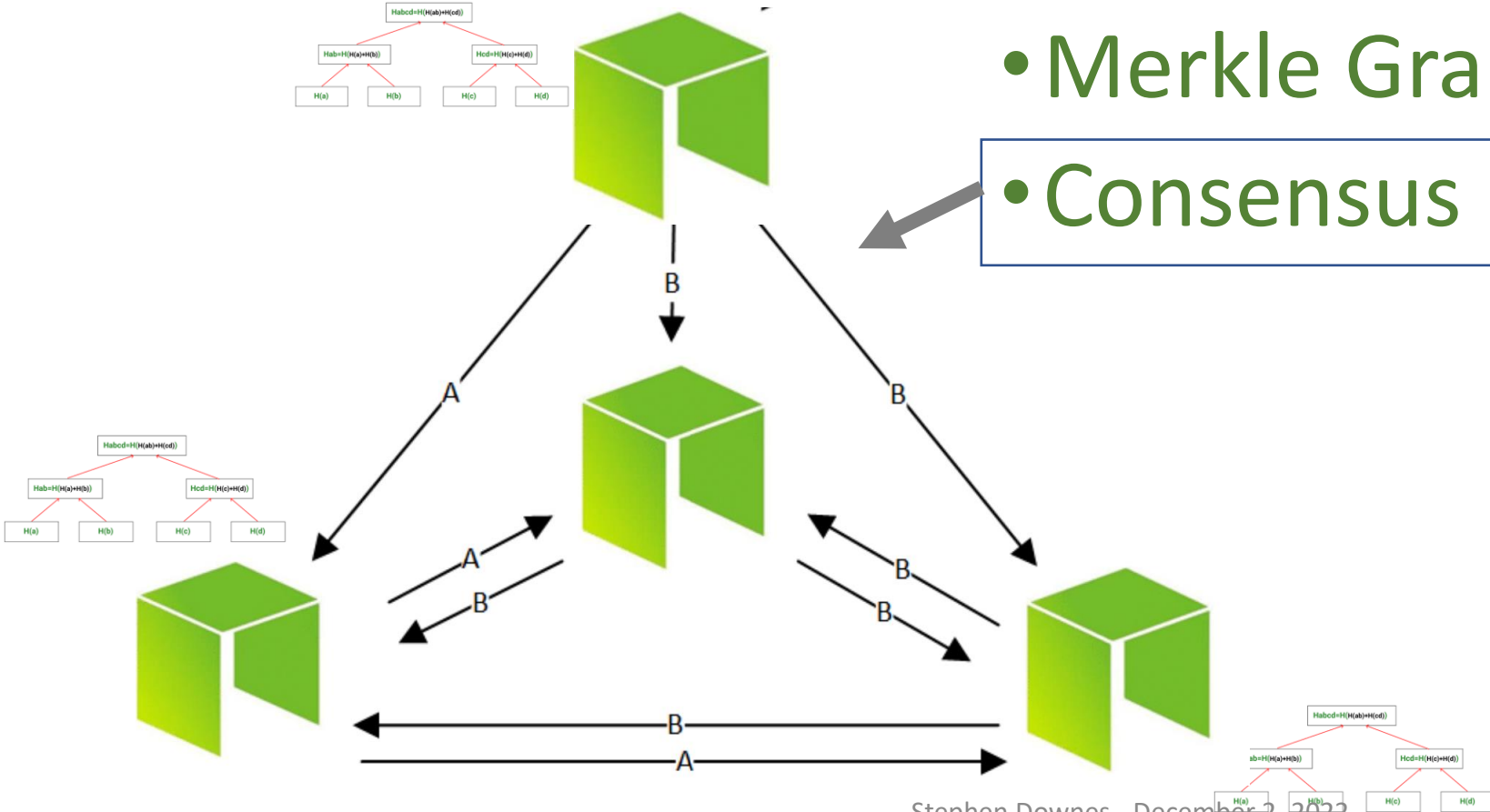
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- Consensus



- Findable
- Accessible
- Interoperable
- Reusable

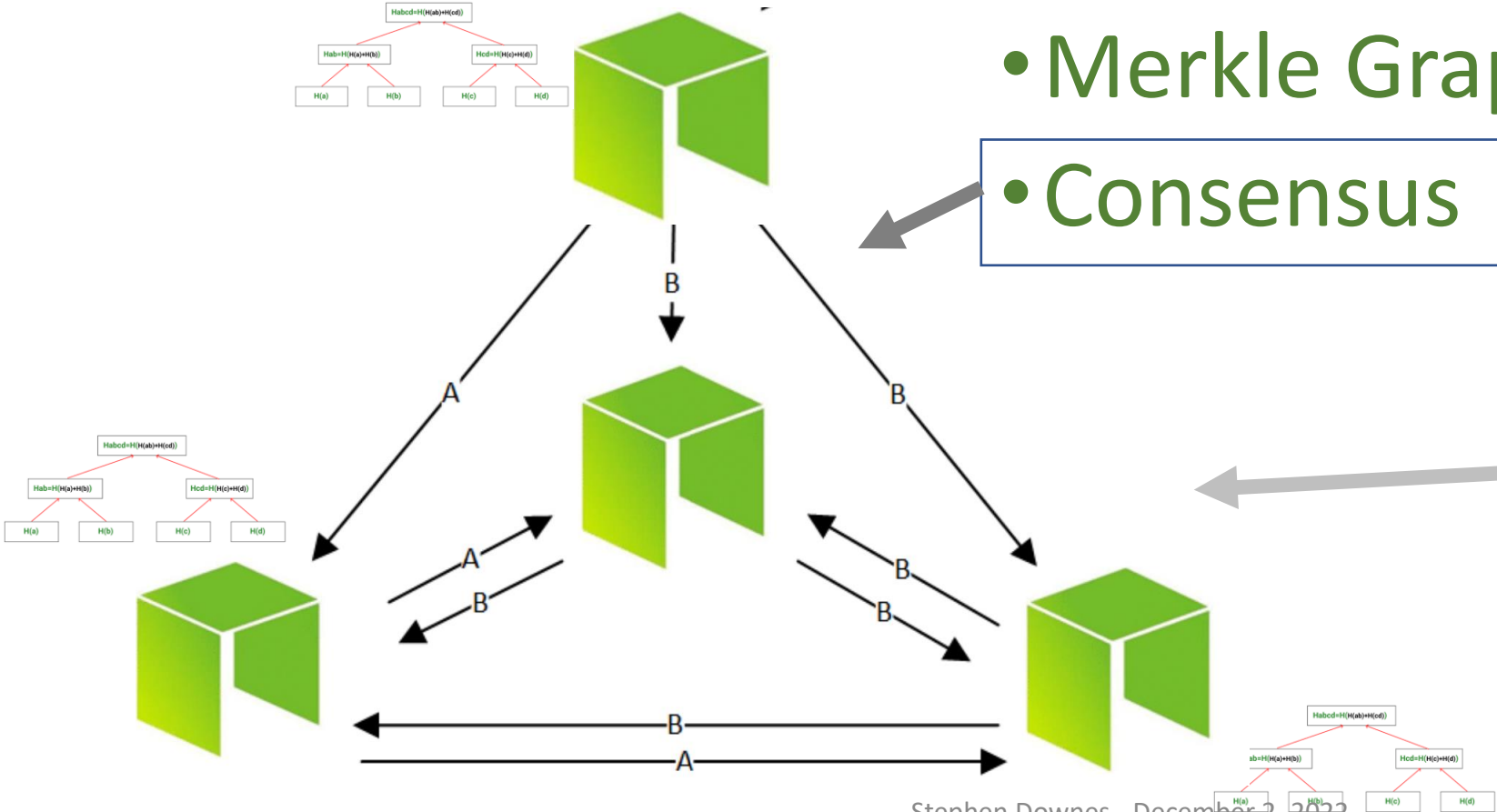
Blockchain

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- Merkle Graphs (Chains)
- Consensus



Blockchain

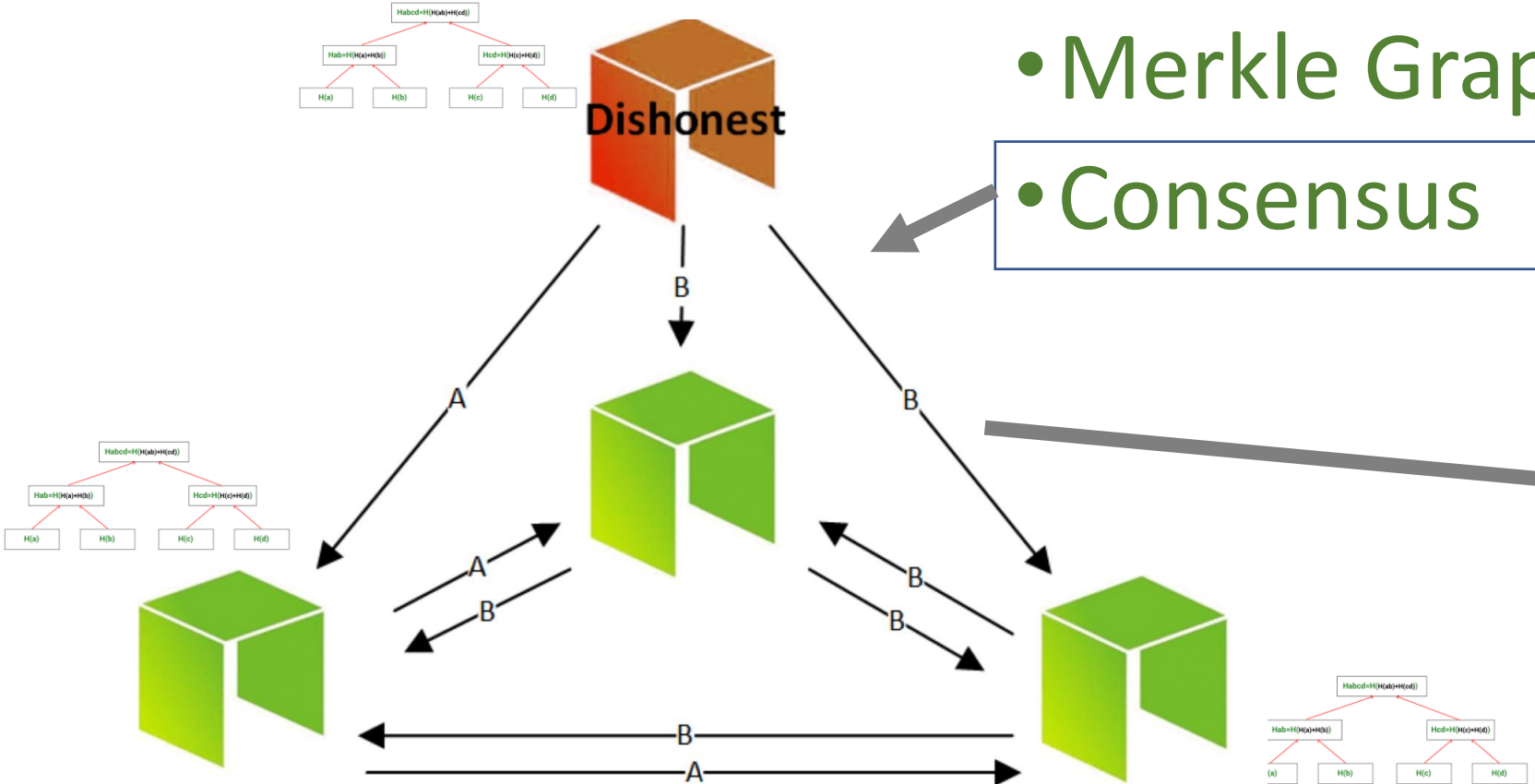
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- Consensus



• Data Federation Issues & Principles

Blockchain

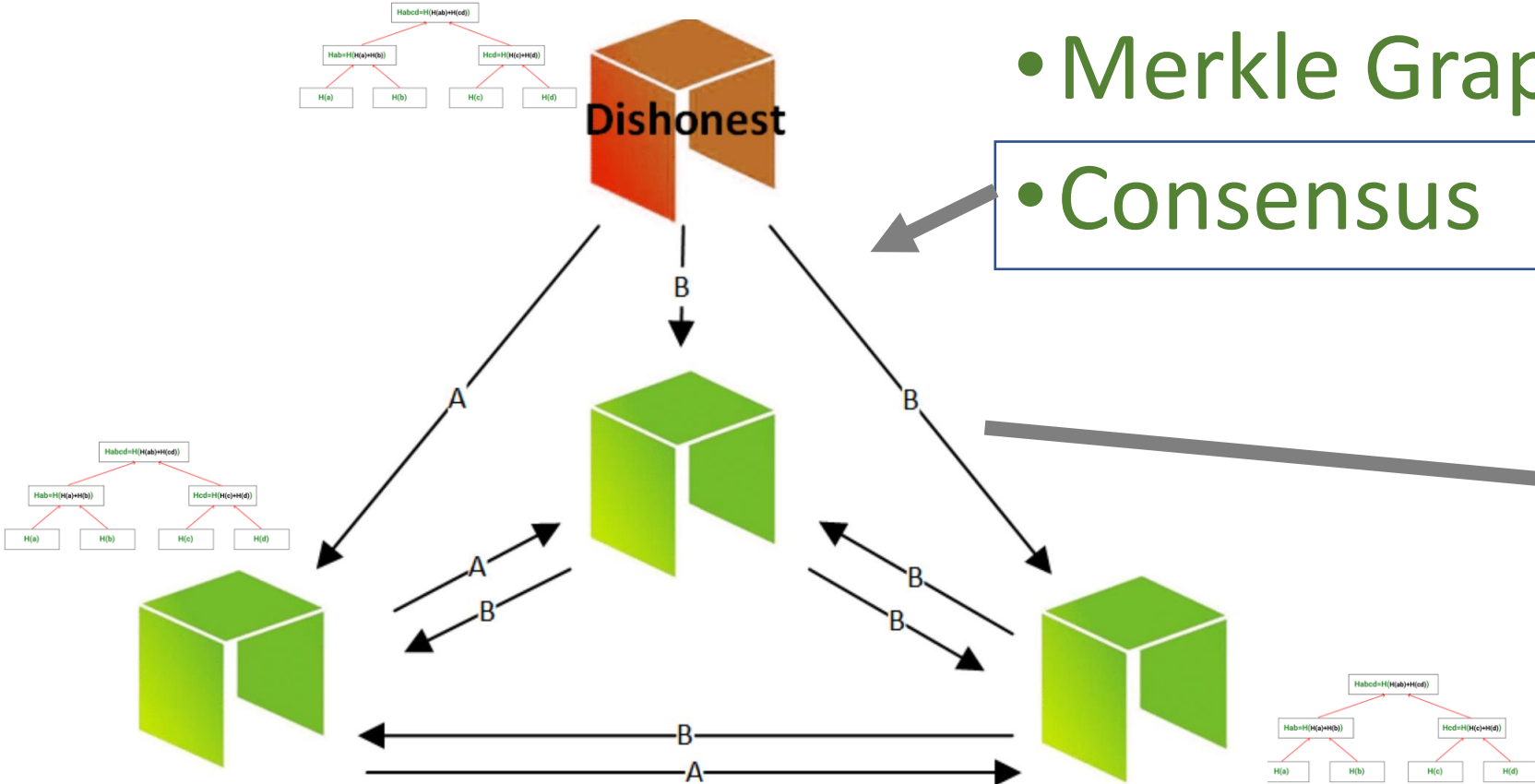
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- Merkle Graphs (Chains)
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- Proof of Work
- Proof of Stake
- Proof of Authority

Blockchain

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



Environment

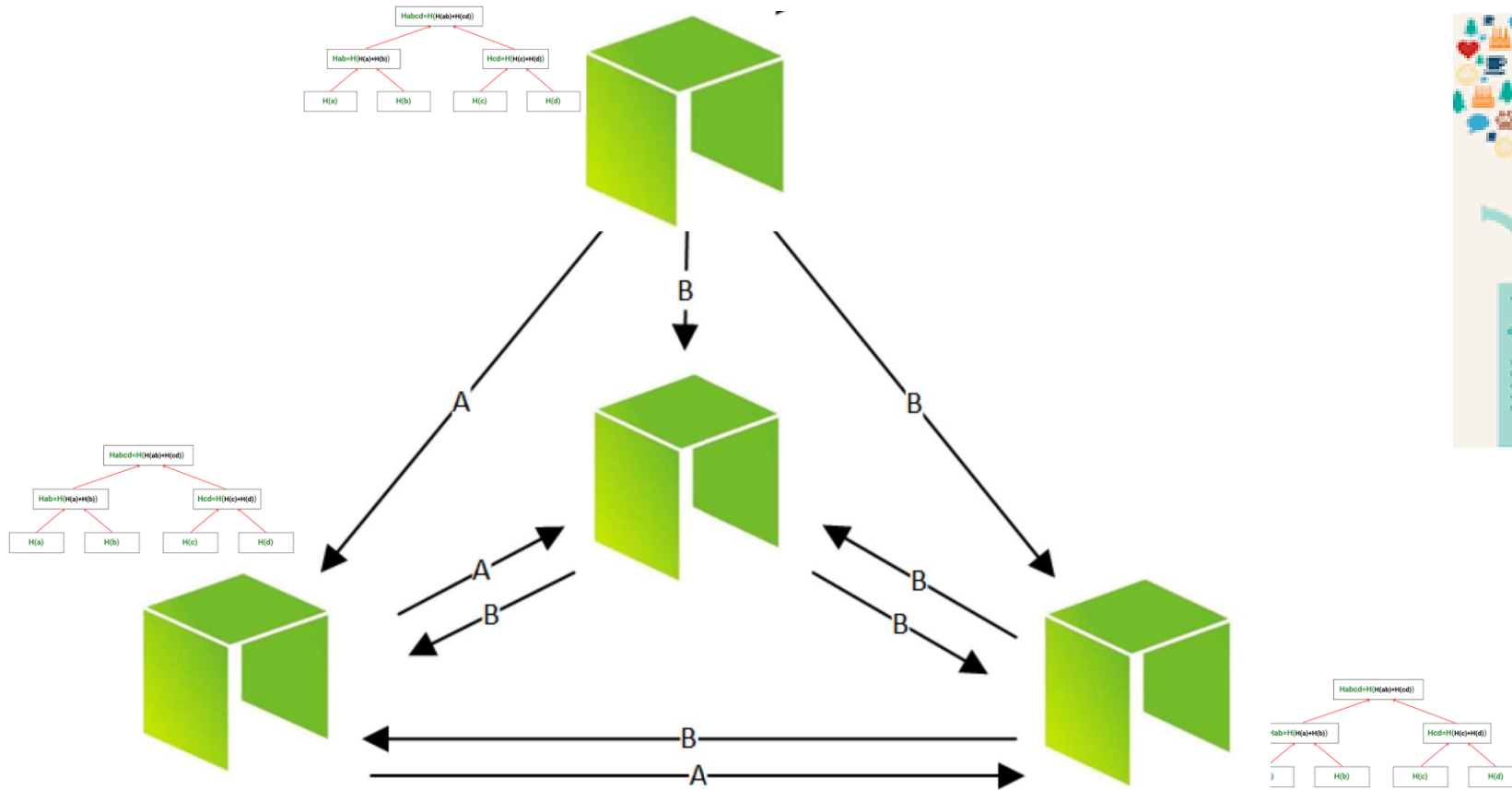
- Proof of Work
- Proof of Stake
- Proof of Authority

Inclusion

Trusted Data

vs

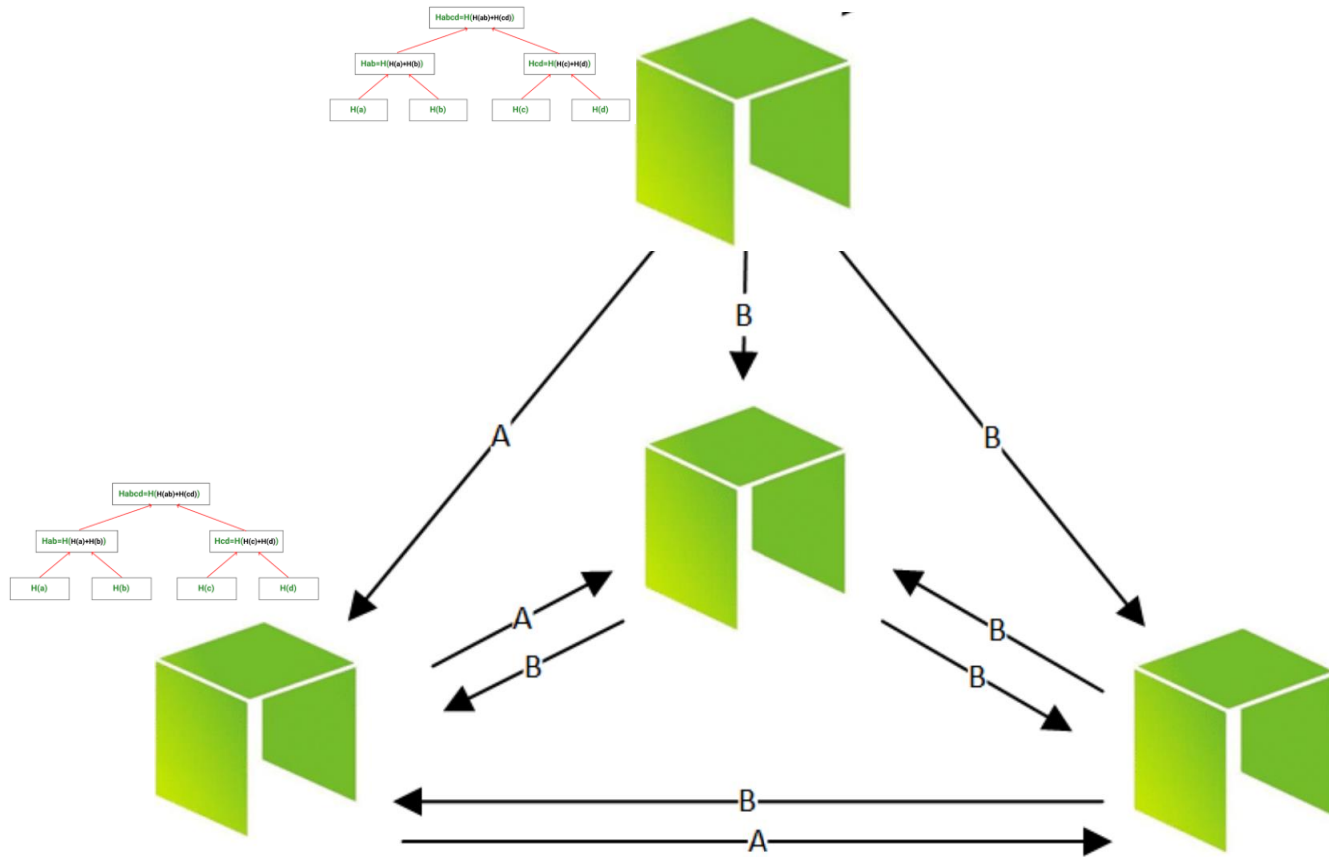
Untrusted Data



Trusted Data

vs

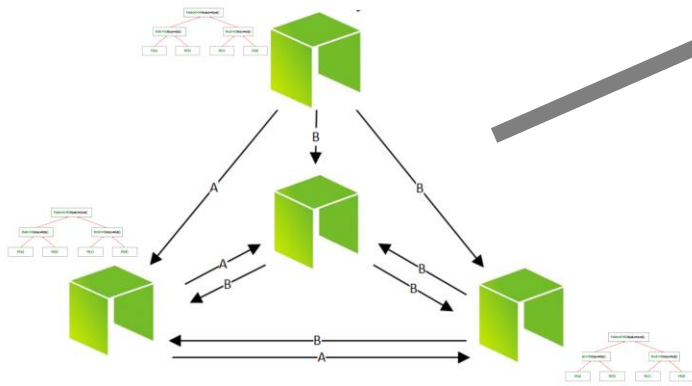
Untrusted Data



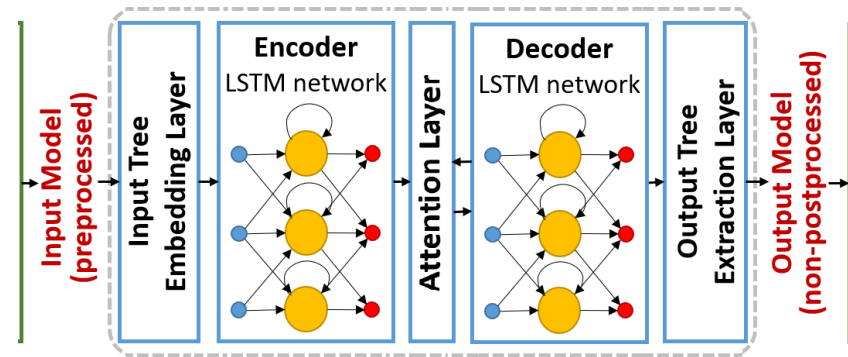
Data bias, representation, consent and inclusivity

Artificial Intelligence

Trusted Data



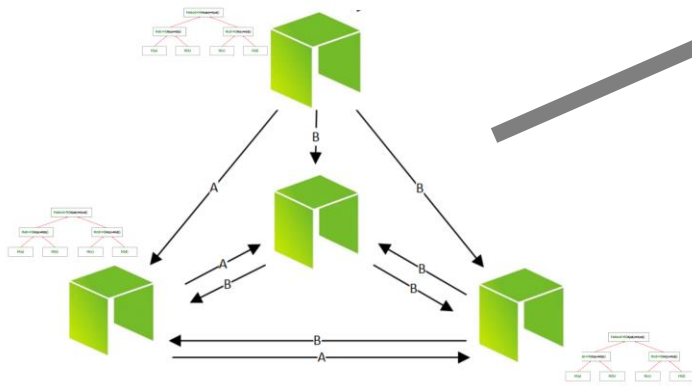
- Data Models
- Algorithms
- Application



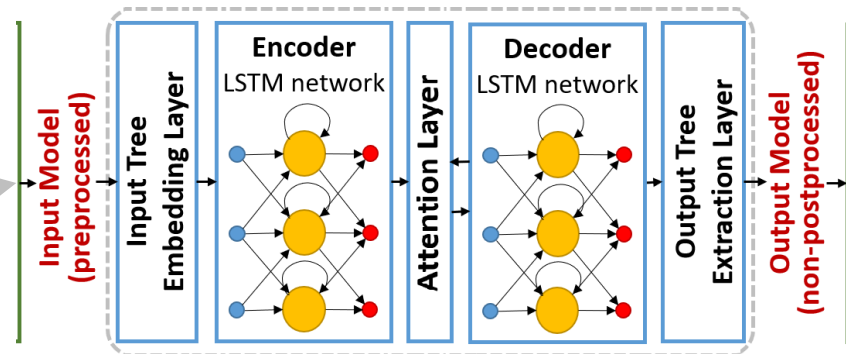
Artificial Intelligence

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- Application

Trusted Data

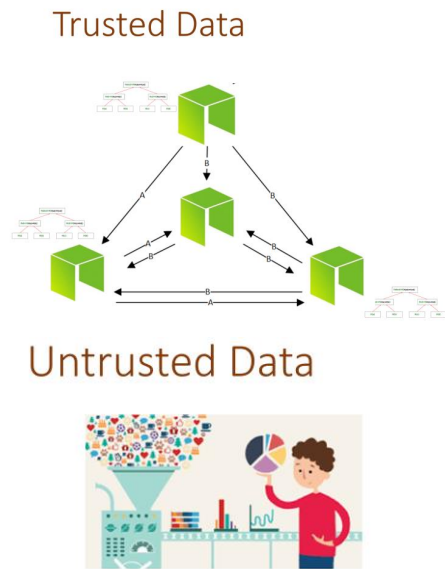


Model Selection
Explainability
Appeal and Accountability



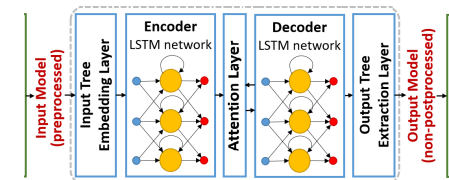
Artificial Intelligence

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

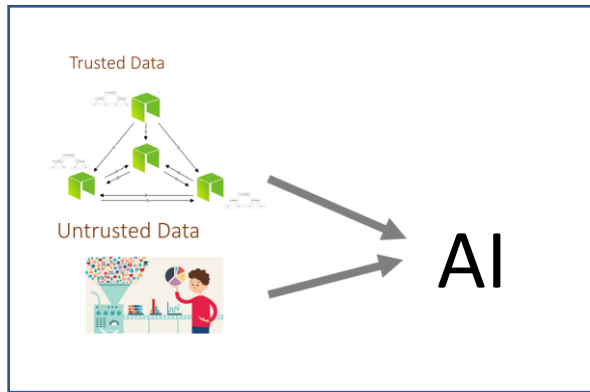


- After this year: generative
- Future: deontic analytics

The domain of universities?



Artificial Intelligence



• Generative Analytics

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

Images

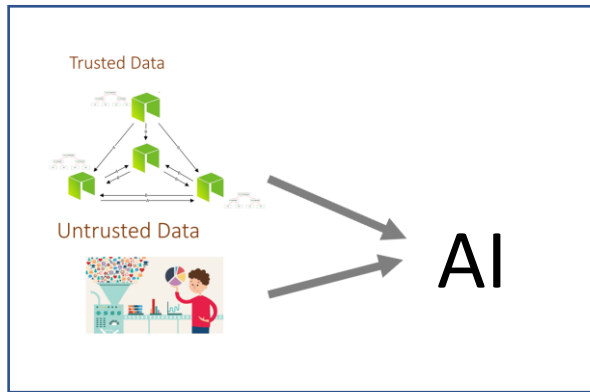
Music

Software

Text

Research

Artificial Intelligence



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

Images

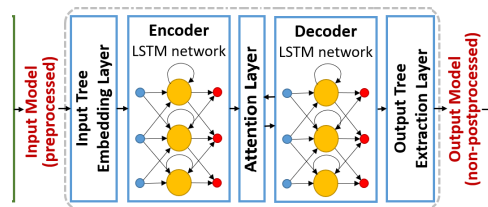
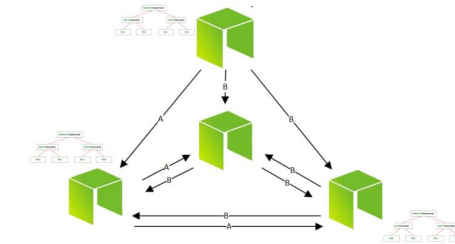
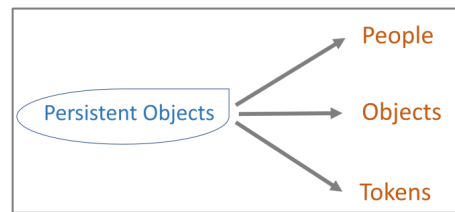
Music

Software

Text

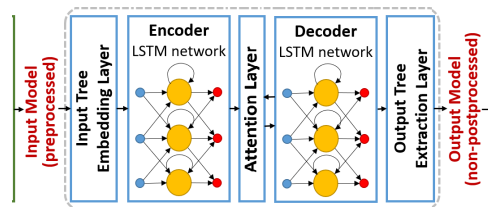
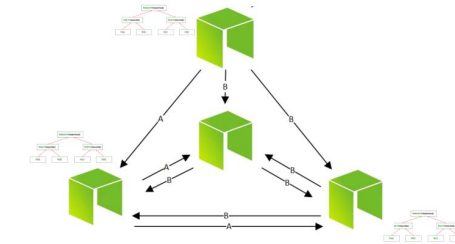
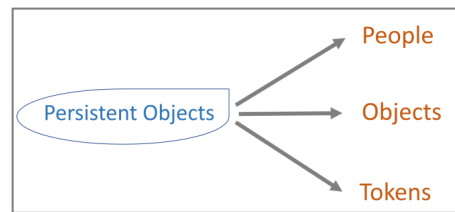
Research

Institutions



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

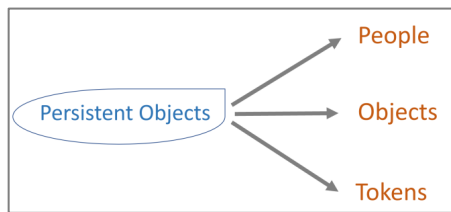
Institutions



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

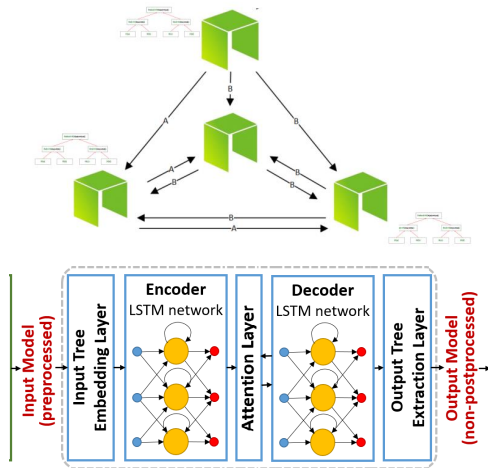
Our roles are changing

Teaching and Learning

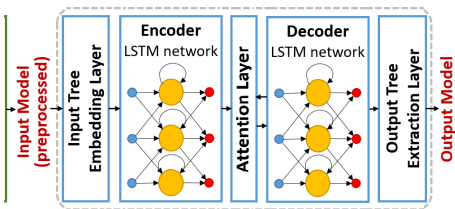
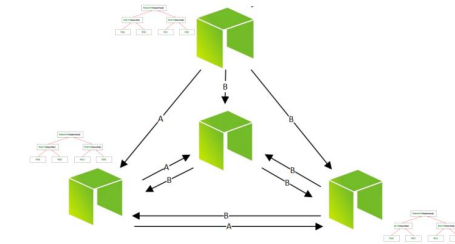
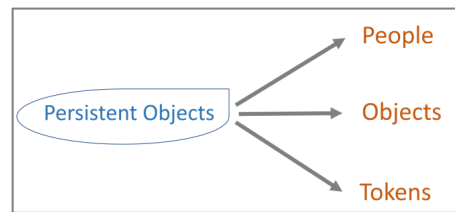


Persistent Objects

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



Teaching and Learning

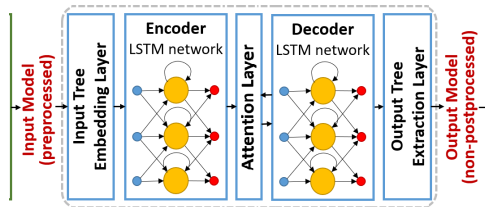
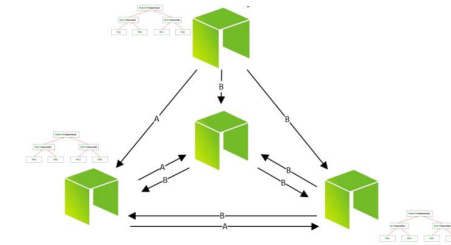
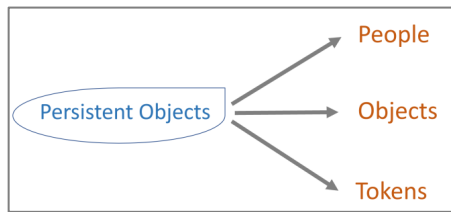


Persistent Objects

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

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

Teaching and Learning

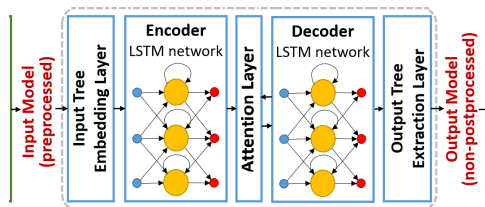
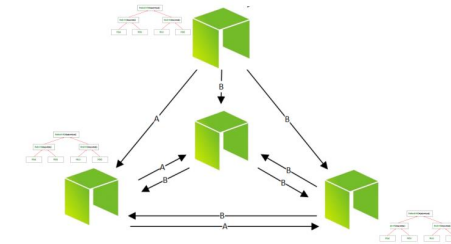
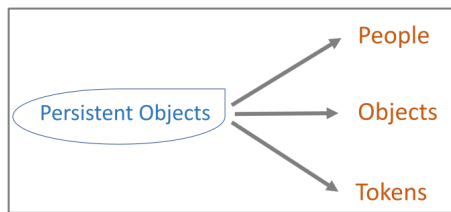


Persistent Objects

- Distributed ID (DID)
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- Badges and Credentials

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

Teaching and Learning

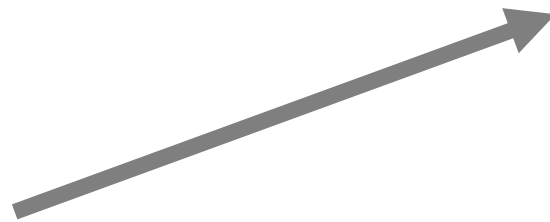
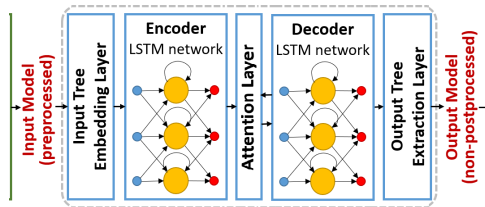
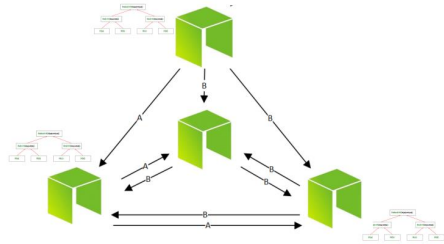
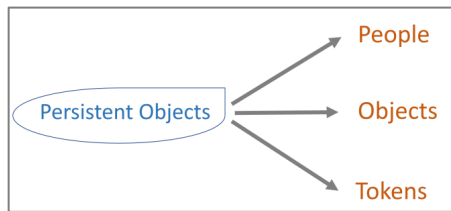


Persistent Objects

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

- Bridging the link to employability
- Facilitating knowledge recognition networks

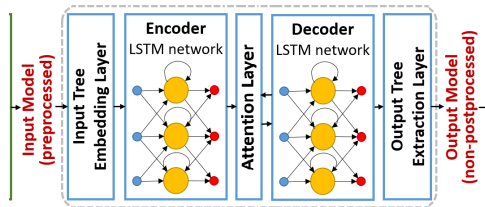
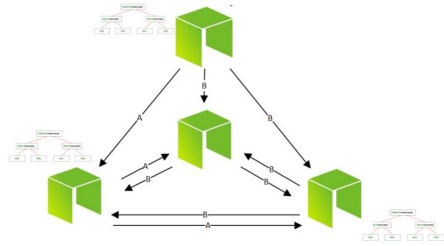
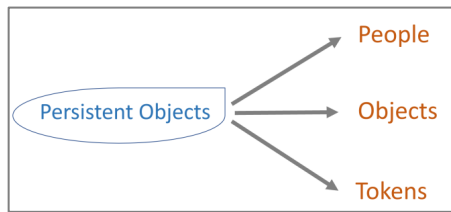
Teaching and Learning



Consensus

- Peer Networks
- Fediverse (Mastodon)
- Open Community

Teaching and Learning

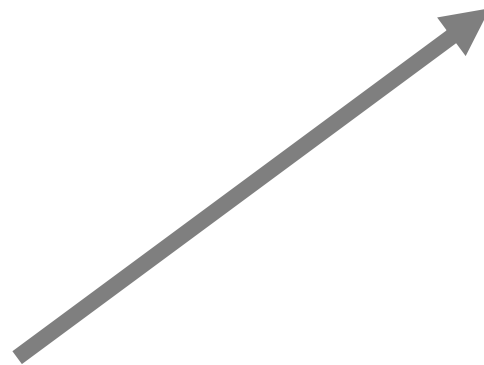
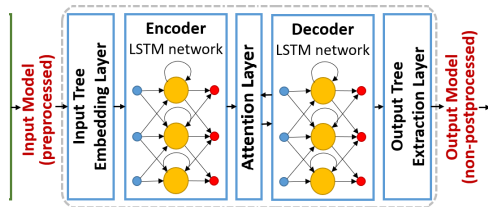
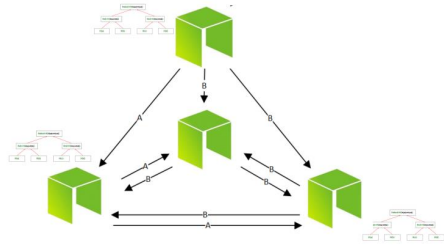
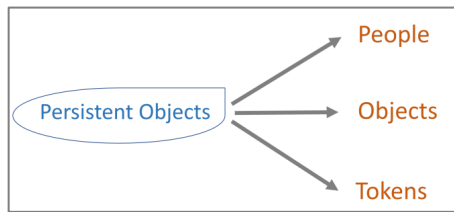


Consensus

- Peer Networks
- Fediverse (Mastodon)
- Open Community

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

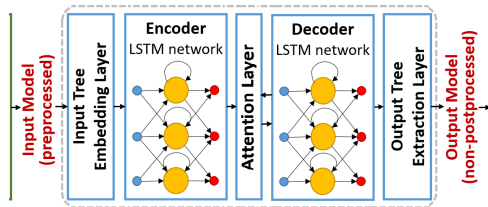
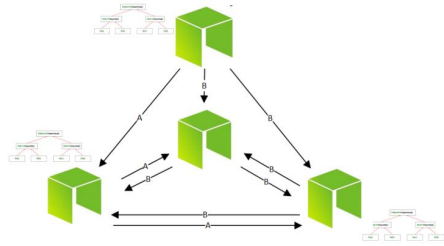
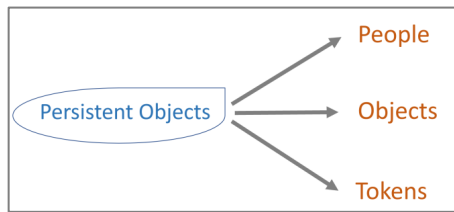
Teaching and Learning



Artificial Intelligence

- Resource Creation
- Coaching and Tutoring
- Automated Assessment

Teaching and Learning

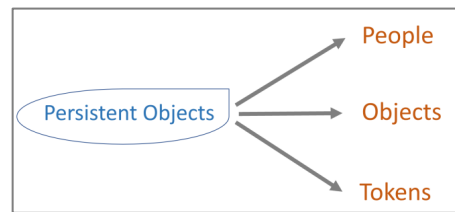


Artificial Intelligence

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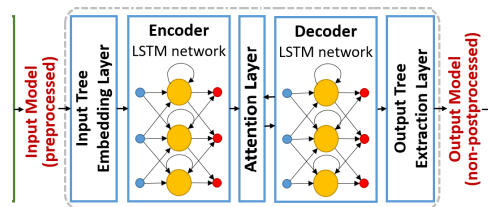
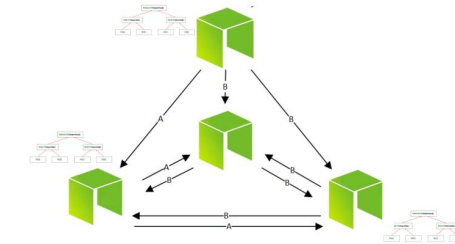
- Build quality trusted data networks
- Assess and validate AI models
- Automated resource development
- Support public access to the technology

Research and Development

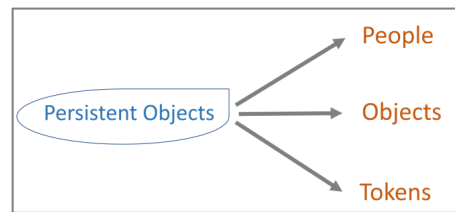


Persistent Objects

- Open Access Publications
- Open Data

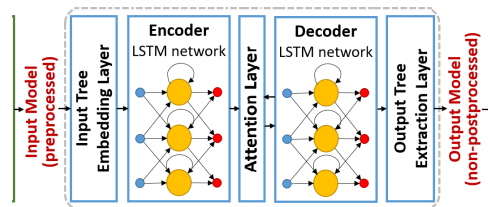
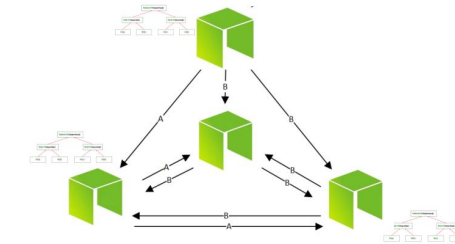


Research and Development



Persistent Objects

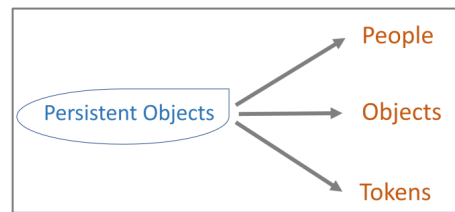
- Open Access Publications
- Open Data



The university's new role: as *stewards* rather than creators and owners

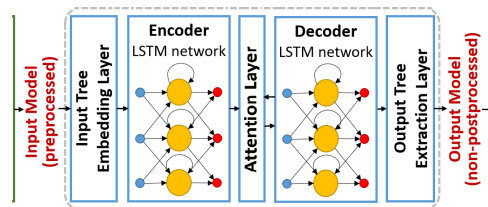
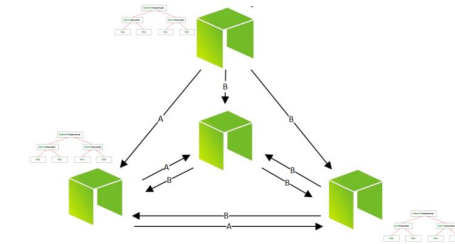
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Research and Development

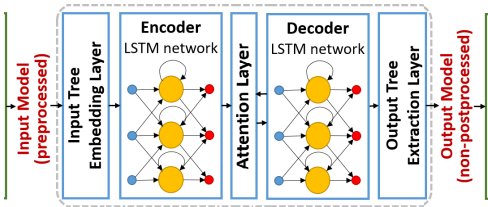
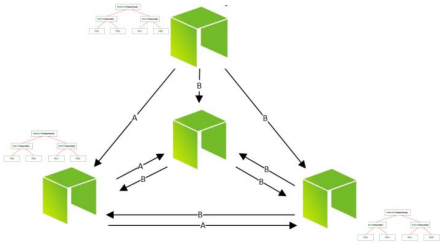
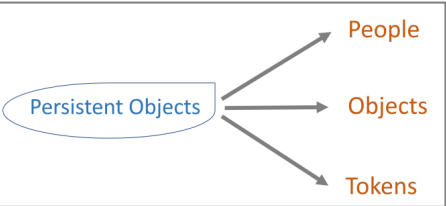


Consensus

- Research Networks



Research and Development

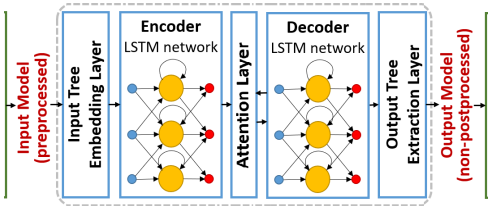
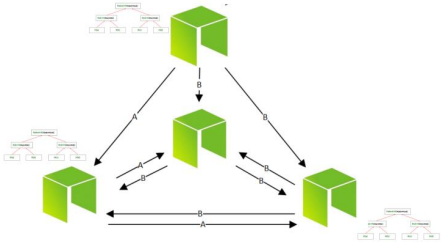
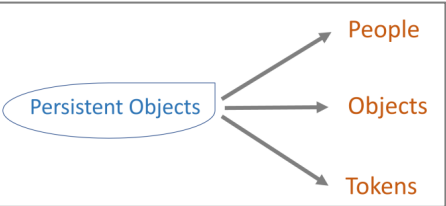


Consensus

- Research Networks

We face an immediate and pressing need to redefine how *consensus* about facts and truth are determined in society

Research and Development

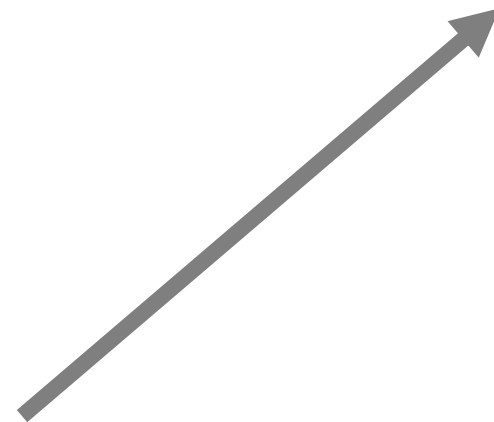
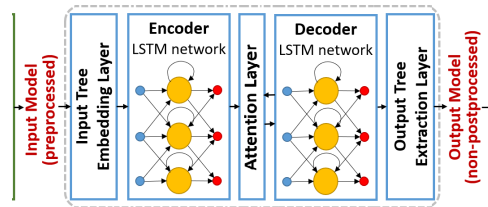
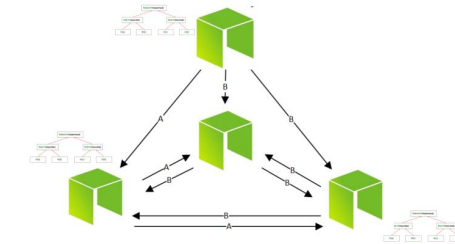
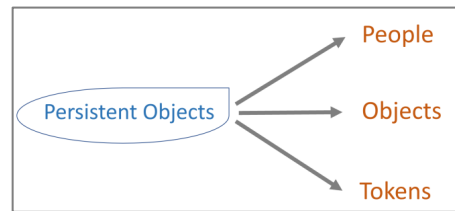


Consensus

- Research Networks

- Transparency and open research networks
- Include the public in the research process
- Ensure the benefits of research are shared by all, not only corporations

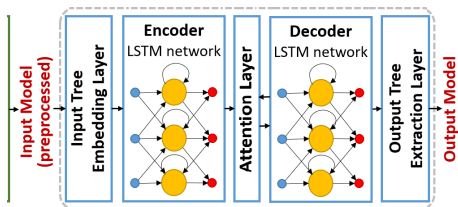
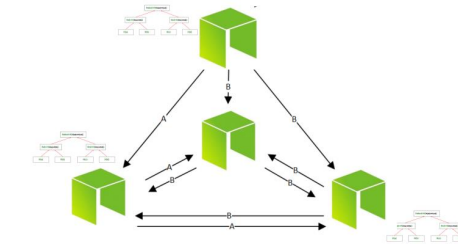
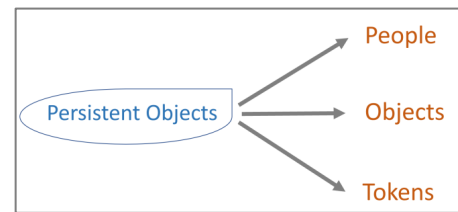
Research and Development



Artificial Intelligence

- Software Development
- Concept Formation
- Prediction

Research and Development

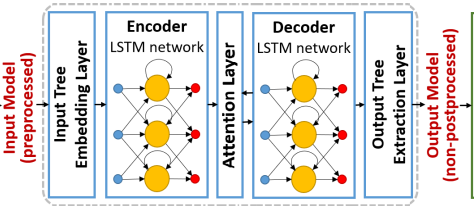
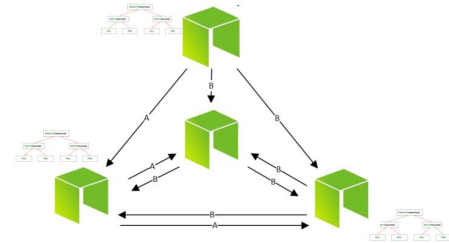
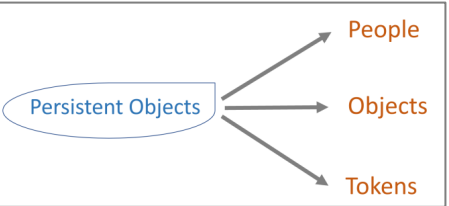


Artificial Intelligence

- Software Development
- Concept Formation
- Prediction

- Software validation techniques
- Optimization and efficiency

Research and Development

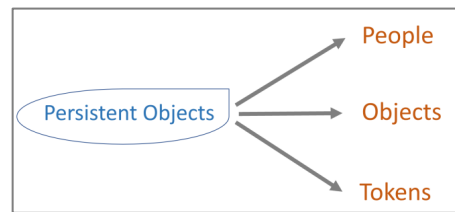


Artificial Intelligence

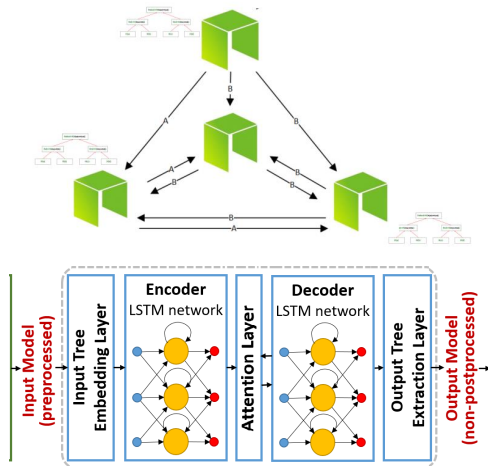
- Software Development
- Concept Formation
- Prediction

- Research ethics review
- What we need vs what we want vs what we can do

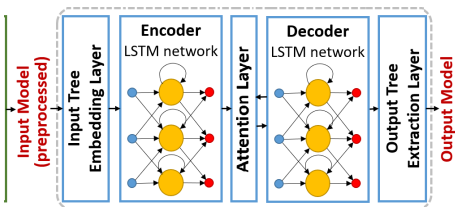
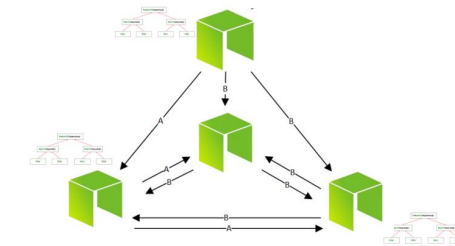
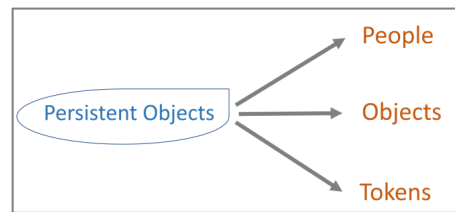
Innovation and Growth



- Market and Assets
- Performance Indicators
- Tokens and Recognition



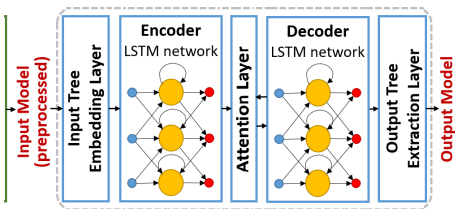
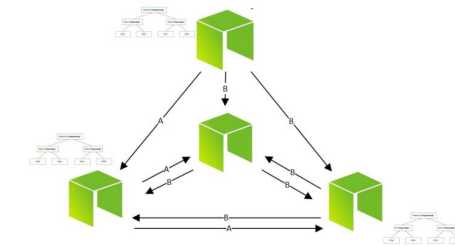
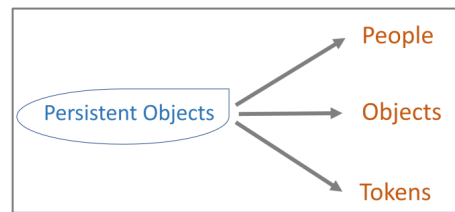
Innovation and Growth



- Market and Assets
- Performance Indicators
- Tokens and Recognition

- Based on consent and inclusion
- Definition of non-monetary assets, e.g., happiness, sustainability
- Reflection of these in data

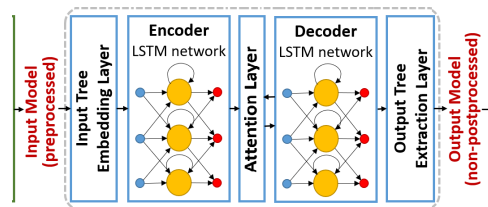
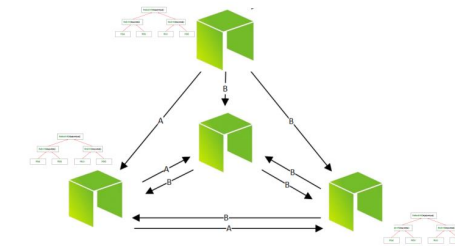
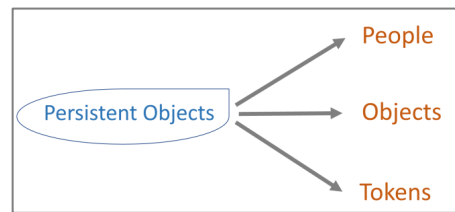
Innovation and Growth



- Market and Assets
- Performance Indicators
- Tokens and Recognition

- How can we include non-quantitative?
- Diverse perspectives, contexts
- Monitoring and feeding into data

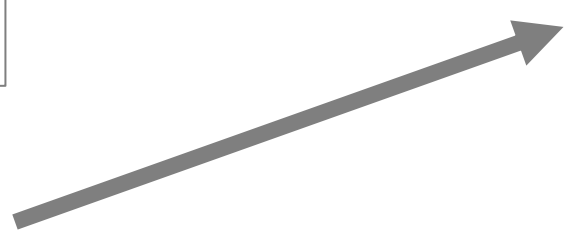
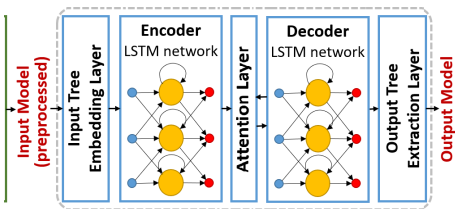
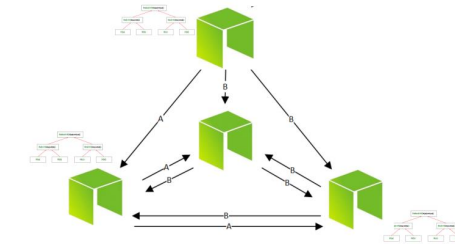
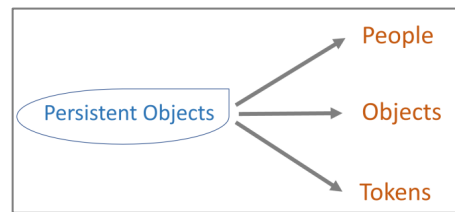
Innovation and Growth



- Market and Assets
- Performance Indicators
- Tokens and Recognition

- Redefining wealth as a negative indicator
- Social good (vs. 'social credit')

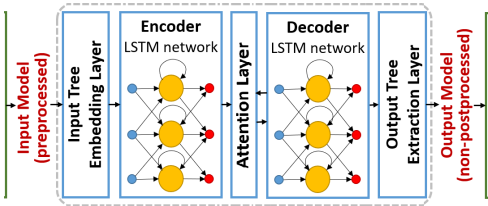
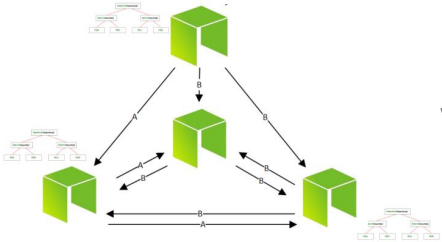
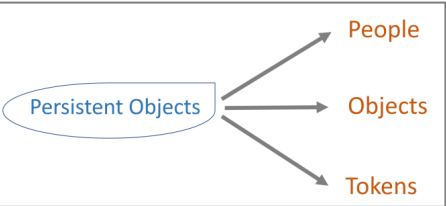
Innovation and Growth



Consensus

- Innovation Networks
- Needs Assessment

Innovation and Growth

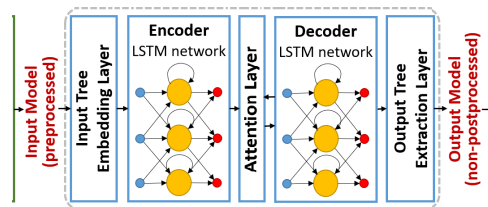
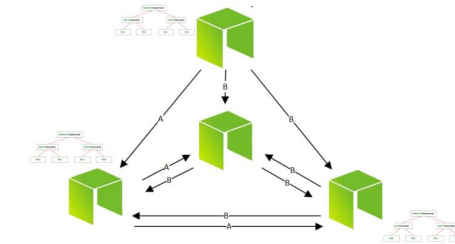
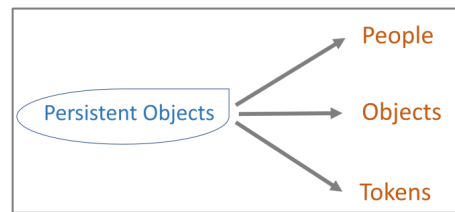


Consensus

- Innovation Networks
- Needs Assessment

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

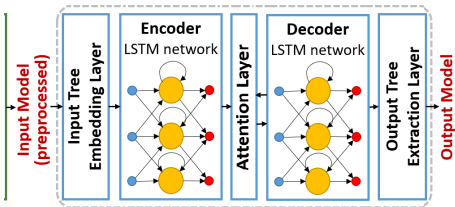
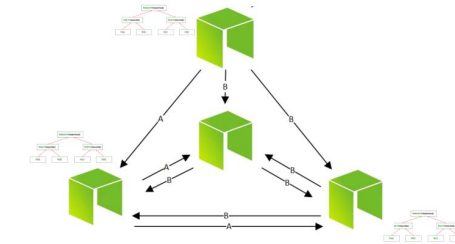
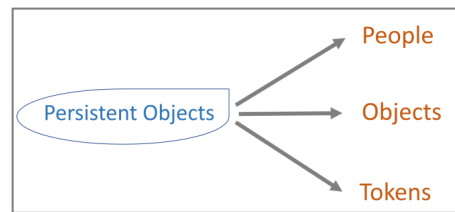
Innovation and Growth



Artificial Intelligence

- Product Development
- Logistics and Distribution
- Management and Admin

Innovation and Growth

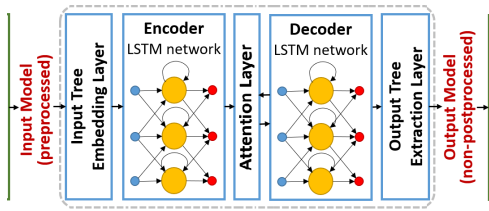
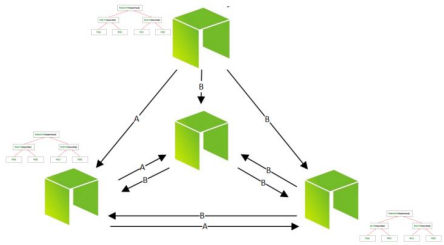
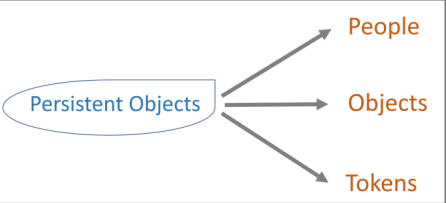


Artificial Intelligence

- Product Development
- Logistics and Distribution
- Management and Admin

- Redefining 'productivity' and share of benefits
- Require definition of entire product cycle
- Consider impact on communities

Innovation and Growth

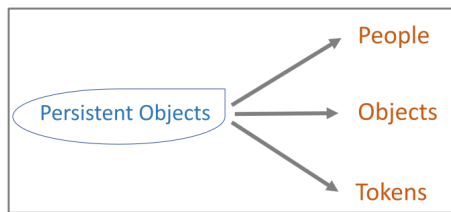


Artificial Intelligence

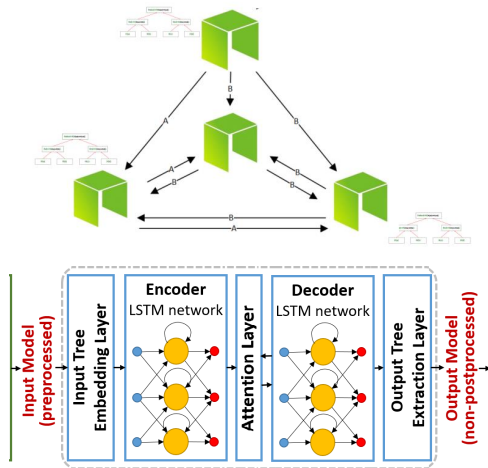
- Product Development
- Logistics and Distribution
- Management and Admin

- Management for sustainability
- Redefine wages as benefit, not cost
- Consider impact on communities

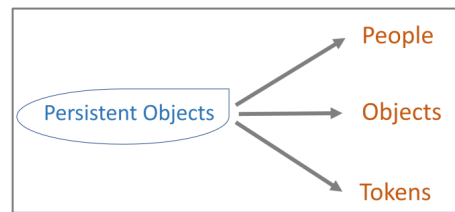
Concluding Remarks



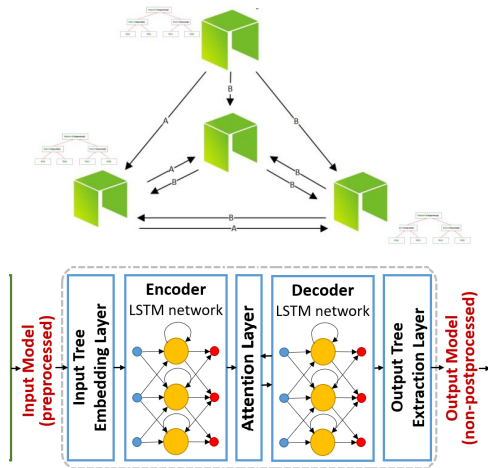
← This is us



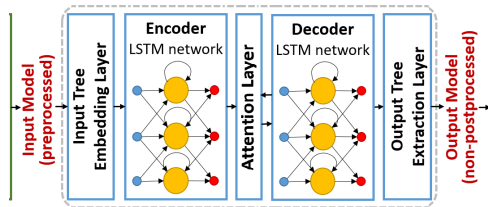
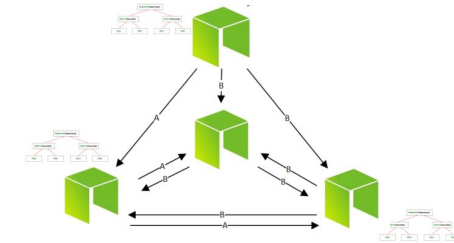
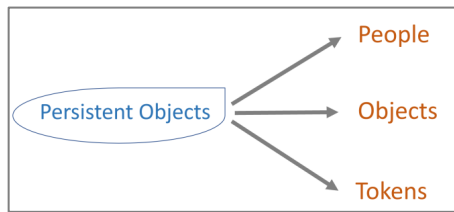
Concluding Remarks



Everything this does depends on what we do



Concluding Remarks



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

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