TRUST Over IP FOUNDATION

THE LINUX FOUNDATION

ToIP 3rd Gen Diagram

Evolution, Templates, Tools and Tips

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Version: 2.1

Date: 2025-10-02

Document Change Control Notes

Version	Date	Authors	Changes and Comments
1.0	2024-02-01	John Phillips	Initial release, and the version the training videos were based on
1.1	2024-02-09	John Phillips	1) Included a new slide (13) with the whole slide taken up by the framework (maximising space for comments on the slide etc. and making use as a canvas easier). Also this slide 13 framework fits the text into boxes to enable easier resizing. 2) Added a “Title only” slide layout to the theme 3) Added this document control slide (2).
1.2	2024-03-26	John Phillips	Incorporating comments and suggestions from the round of discussions following the 1.1 release and socialisation
2.0	2024-05-23	John Phillips	Definitive Release. Clean-up and alignment of images and text to incorporate the ToIP discussions since March. See GATF meeting minutes (https://wiki.trustoverip.org/display/HOME/GATF+Meeting+Index)
2.1	2025-10-02	John Phillips	Corrected the direction of the “Uses” and “Learns” arrows to reflect a dependency relationship (“B uses A” is shown as (A ← uses —B) rather than information / data flow

AGENDA

1. Evolving the ToIP diagram - why and how
2. How we went from the 2nd to the 3rd generation
3. The Products
4. How to use - an example stepwise build
5. What's next?
6. Tools Tips and Assets

Part 1:
Evolving the ToIP diagram

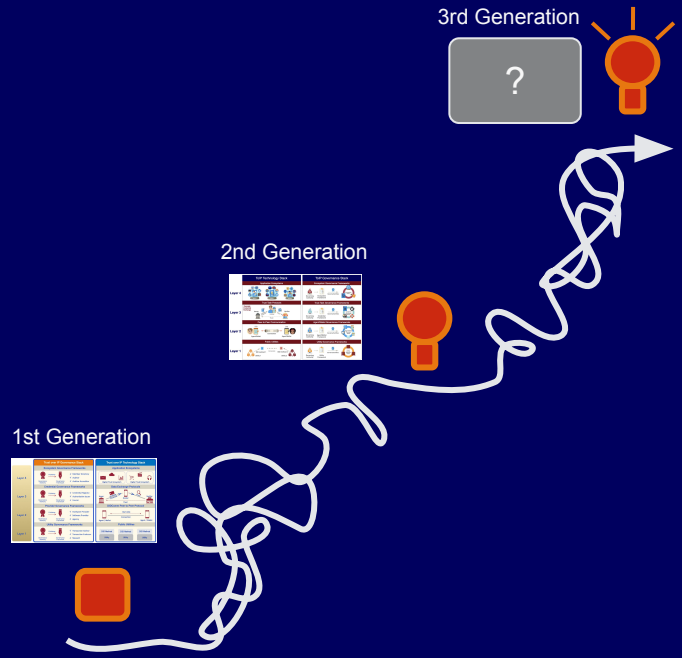
From our 2nd generation to our next generations

Why a new diagram?

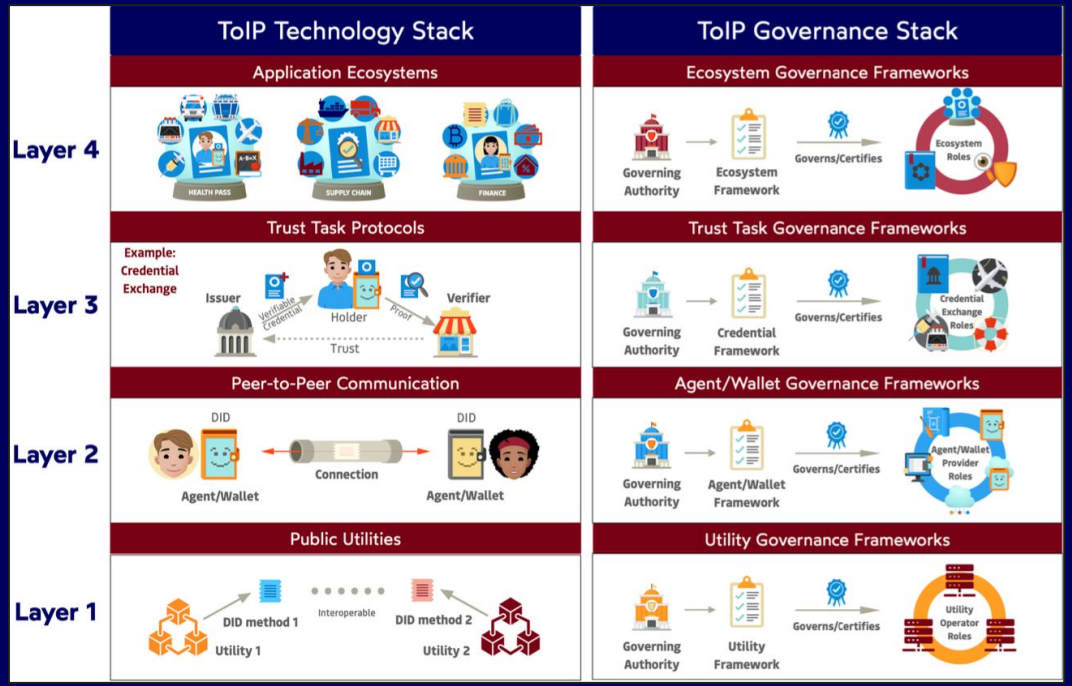
Since its formation in 2020, Trust over IP has been evolving. Through the efforts of a global group of volunteers, the thinking about how to define a trust architecture for the internet has been explored, challenged, refined and developed. In parallel to this, the technical and social environment in which we live and work is evolving and impacts how we understand, and need, trust.

As the thinking evolves, so does its representation.

In addition, ToIP has several working groups and task forces focused on different topics and audiences. Each needs to explain their contribution in ways that make sense to their audience.



This is the 2nd generation ToIP diagram



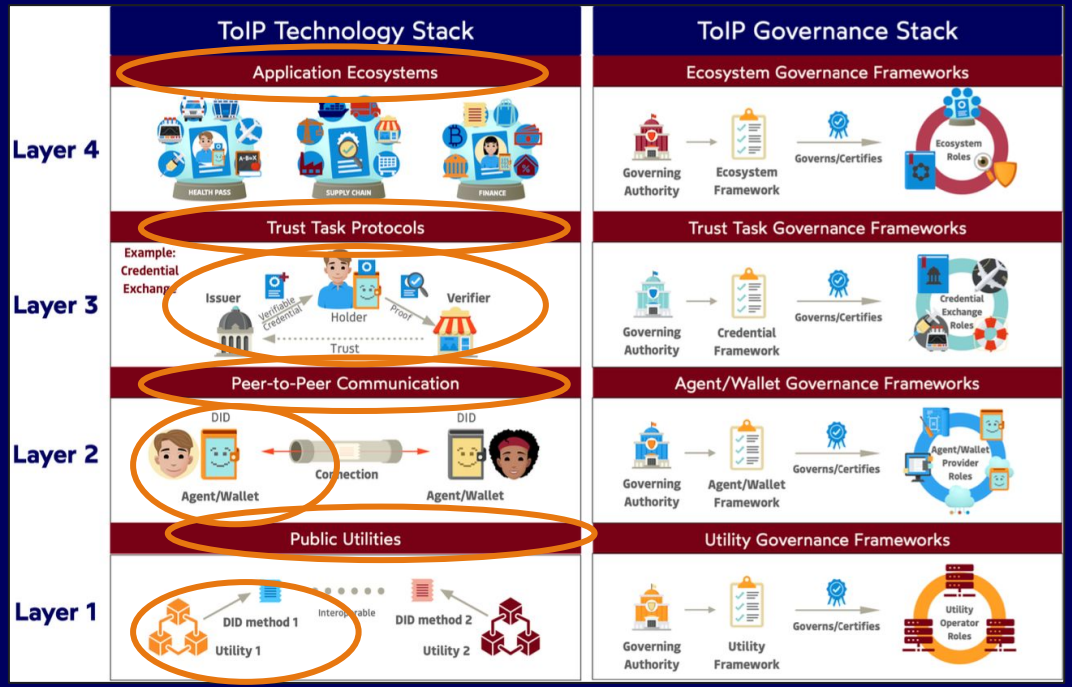
Wrongs and Rights with the Second Gen Diagram

Some Problems:

1. Technology layer definitions have changed
2. Issuer | Holder | Verifier interaction is not a protocol
3. Agents and Wallets are shown in the communication layer
4. Ecosystems are not just collections of applications
5. Utilities look too much like blockchain elements
6. Its detailed yet missing elements. Where are data standards defined? Where is key management? Cryptographic libraries?
7. You can't draw it, except by abstracting layers and stacks
8. **Put harshly, the pictures are architecturally meaningless and even misleading**

Some Good things:

1. Governance seems simple in that mostly it governs the defined technology elements (those in the images) with the exception of layer 3
2. The progression of pictures from ecosystem "down" to utility layer in the technology stack looks "logical"
3. It allowed us to describe the top two layers as "human trust" layers, and the bottom two as "technical" - which was nice
4. Its recognisable
5. People like pictures



Work started in 2023 and continued in 2024

In late March 2023, the Technology Stack Working Group (TSWG) started a collaboration exercise with all ToIP members on what the 3rd generation diagram might look like. Most of this work focused on the Technology Stack.

In October 2023 the Governance Architecture Task Force (GATF), part of the Governance Stack Working Group (GSWG), started work on what the governance architecture might look like.

Over time these two bodies of work were combined, and by the end of 2023 and into 2024 there was a collective ToIP effort.

Conclusion: Drawing things is easy, drawing things as simply, correctly, and as understandably as possible is hard!

Key realisation:

We don’t need one diagram, we need a set of diagrams for ToIP

In the same manner that the architect of a building creates a set of diagrams for each building they design, with each diagram serving a specific purpose and audience, we need to describe the elements of our trust architecture in ways that are relevant to their purpose and audience.

In fact we need **three types** of diagrams

1) **Glossy.** An image that works as the iconic “explainer”. Something people can look at, sense the meaning, and recognise as ToIP. Sufficient detail without overwhelming, this must not be misleading or “wrong”.

2) **Trust Canvas.** A blueprint or framework that we can use to define how ToIP things fit together, that we can use to produce diagrams that are architecturally meaningful

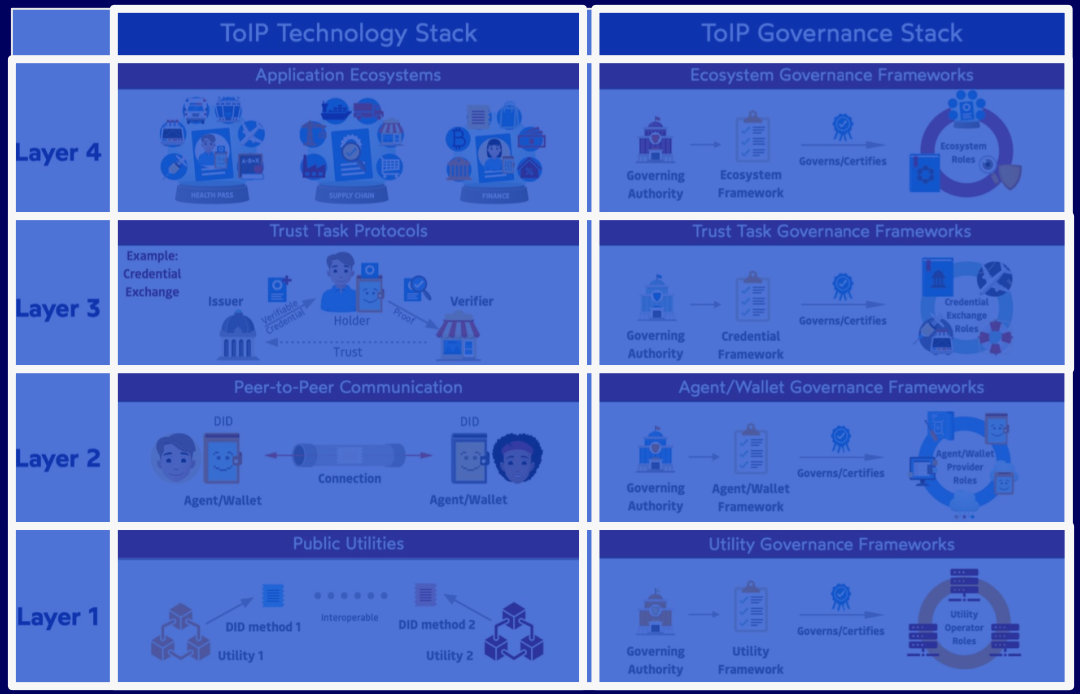
3) **Toolkit**. Diagrams/things that we provide others so that they can reason about and define their own trust ecosystem. E.g. a “Trust Canvas”, “Trust Checklist”, “Trust Calculator” (business case ready reckoner) etc.

Part 2:
The How

This section explains how the 3rd generation diagram was developed from the 2nd generation.

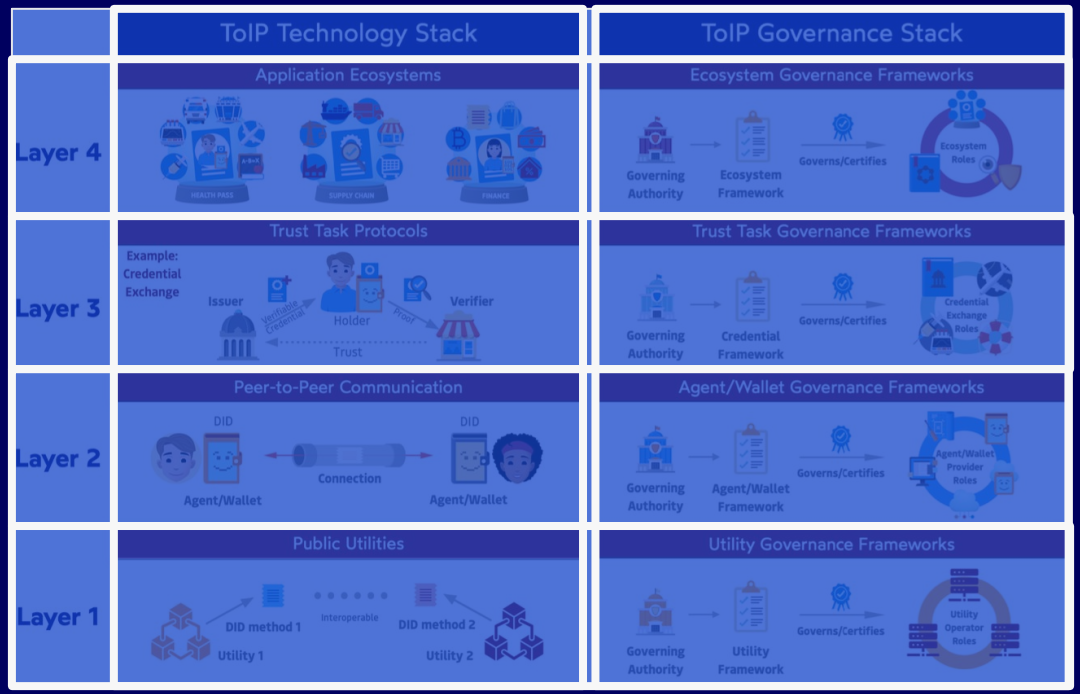
Part 4 later in this deck shows how you can build a 3rd generation explanation from scratch - if you didn’t know, or your audience doesn’t need to know, about the 2nd generation.

The 2nd Generation Diagram has two stacks (technology and governance) and four layers

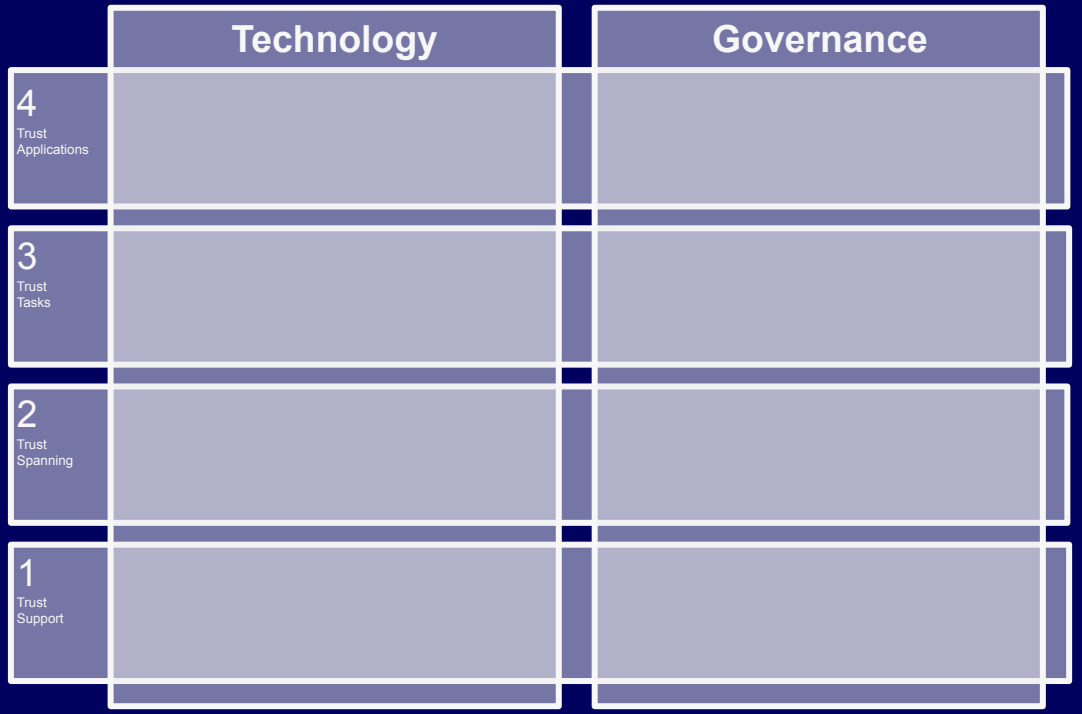


Work during 2023 by the Technology Architecture and Governance Architecture Task Forces proposed changes and offered new perspectives.

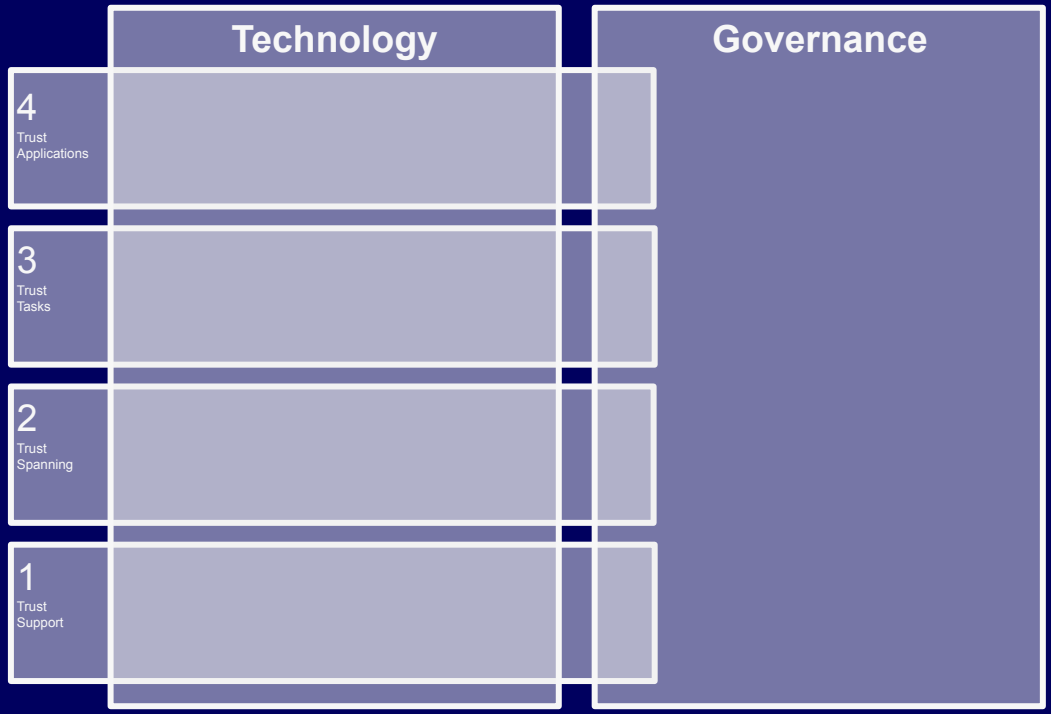
We needed a way to accommodate these views.



Sticking to the 4x2 framework, we can separate the shapes and use partial transparency to show how they are layered.



We create extra space for Governance since Governance considers both governance of technology and more than technology.



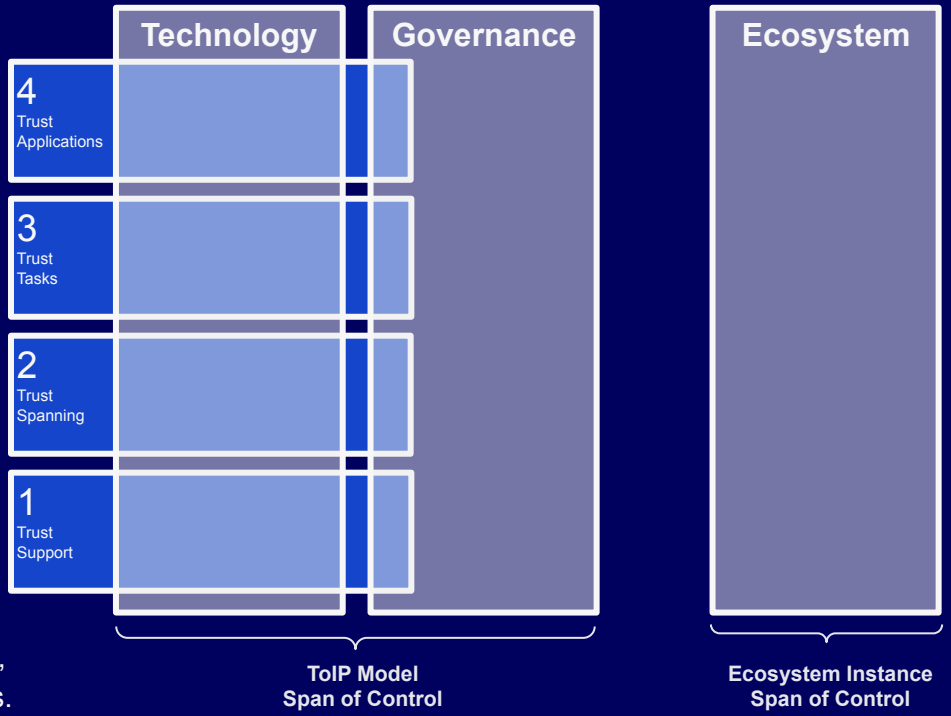
How should we show Ecosystems?

The V2 diagram showed ecosystems as collections of applications at layer 4. We no longer see this as an accurate or helpful representation.

We want to encourage ecosystem designers, builders and operators to choose and use ToIP architecture elements for their ecosystem builds.

BUT we recognise that ecosystems have free choice, they will need to use and refer to other systems too, and their work is separate to ours.

So in the 3rd Generation we show a separate ecosystem stack



This means we can clarify responsibilities, shown here by the “span of control” labels.

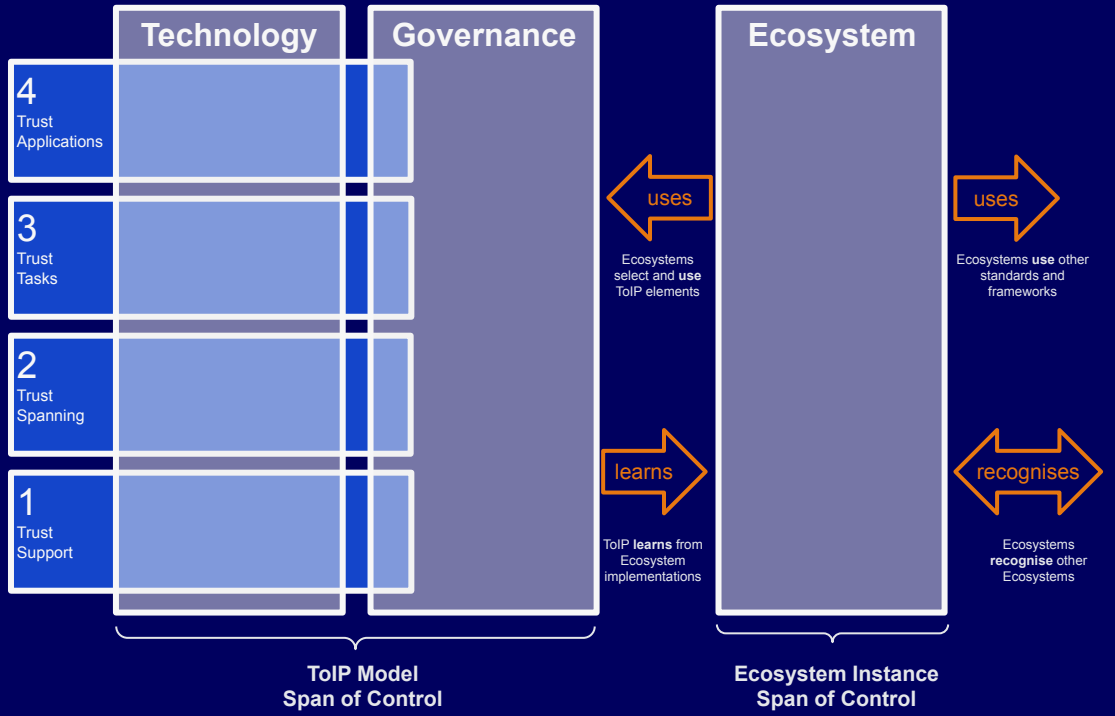
Clarifying ToIP's relationship with Ecosystems

uses | learns

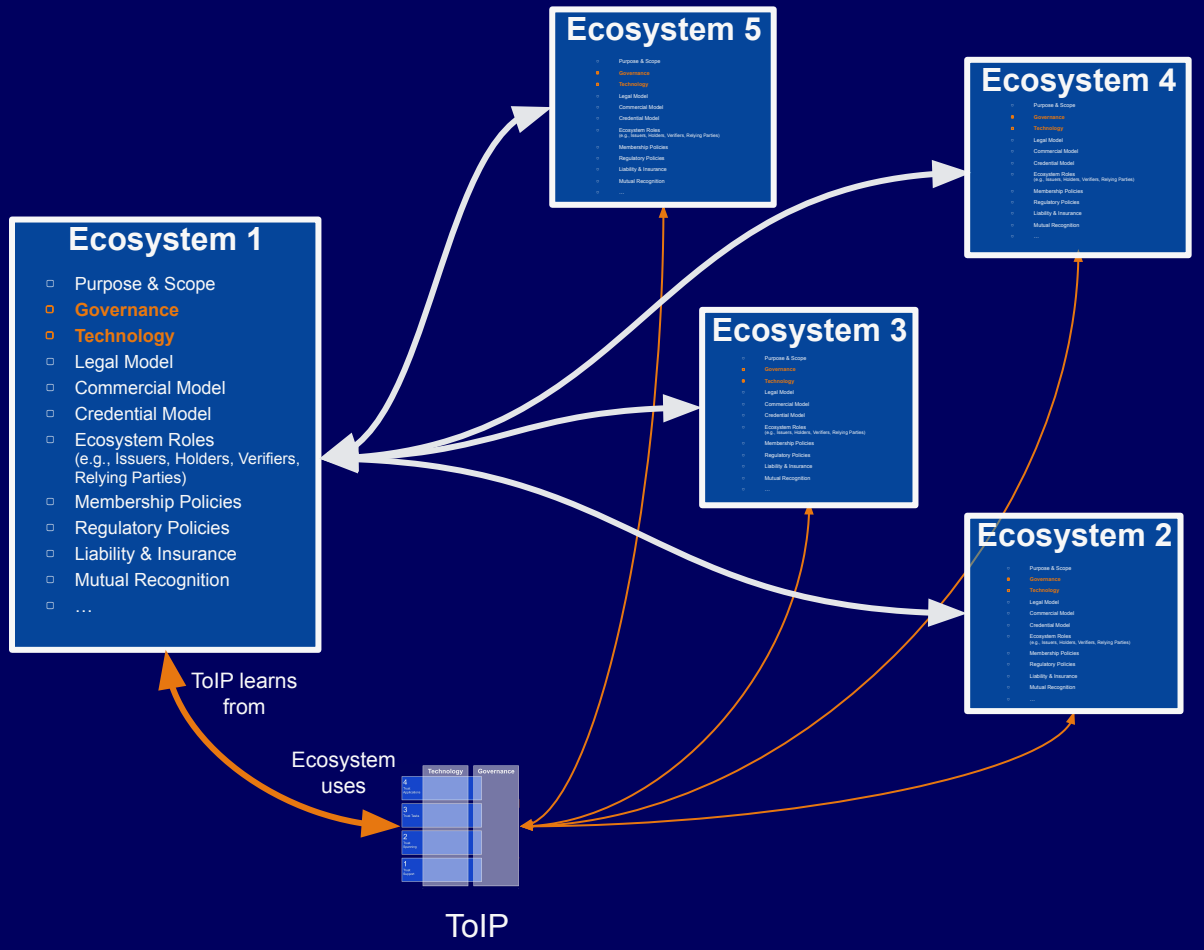
Here we are showing that an ecosystem instance can use elements from the ToIP architecture and that ToIP can learn from these uses.

uses | recognises

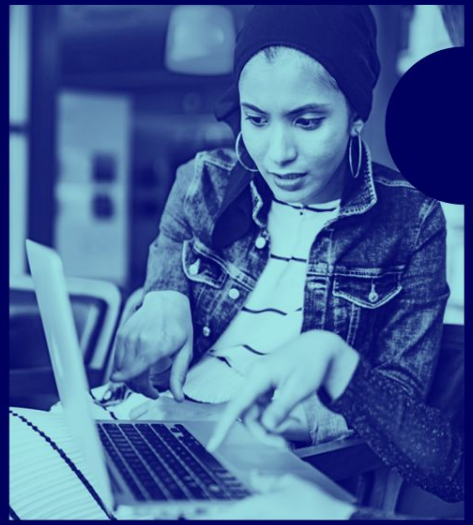
We are also showing that ecosystem instances will necessarily use other frameworks and standards as well as TOIP, and may well recognise ("trust") other ecosystems in part or in whole.



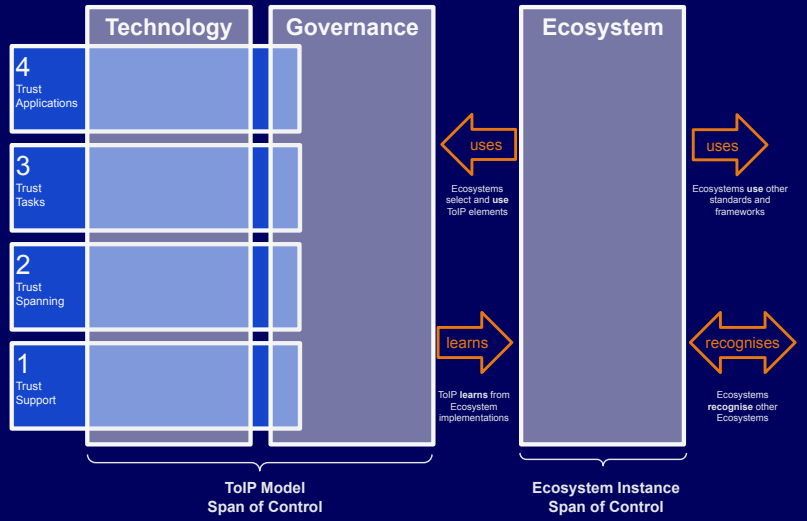
Allowing ecosystems to “draw their own” instance



Part 3:
The products



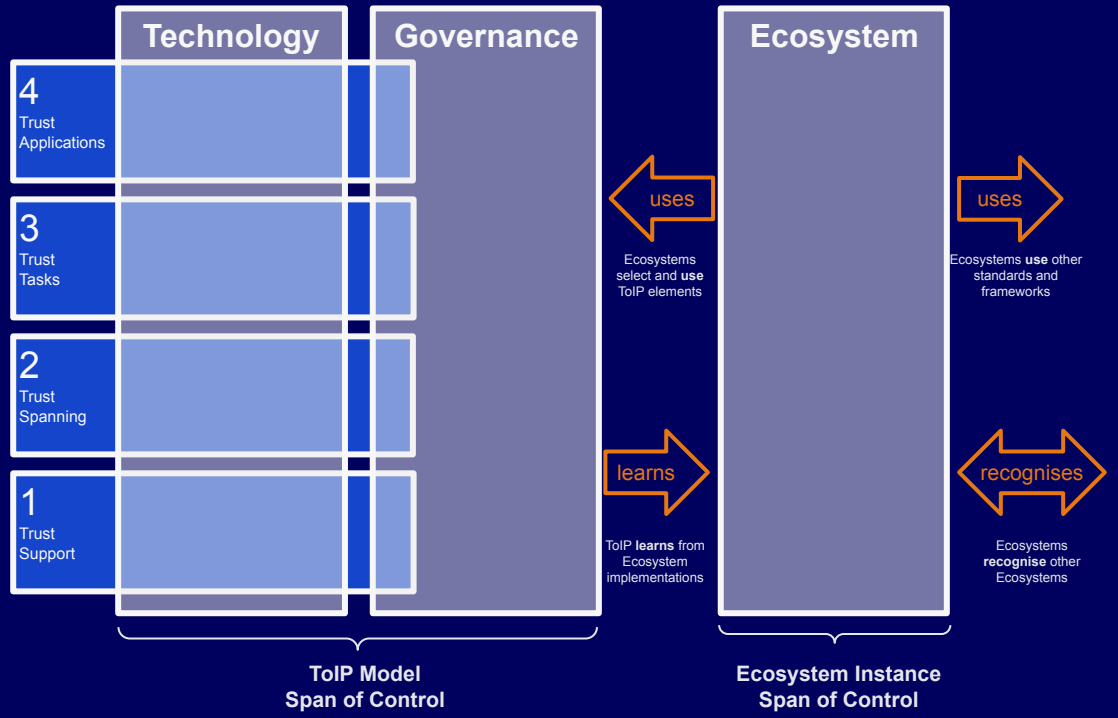
The ToIP Trust Canvas

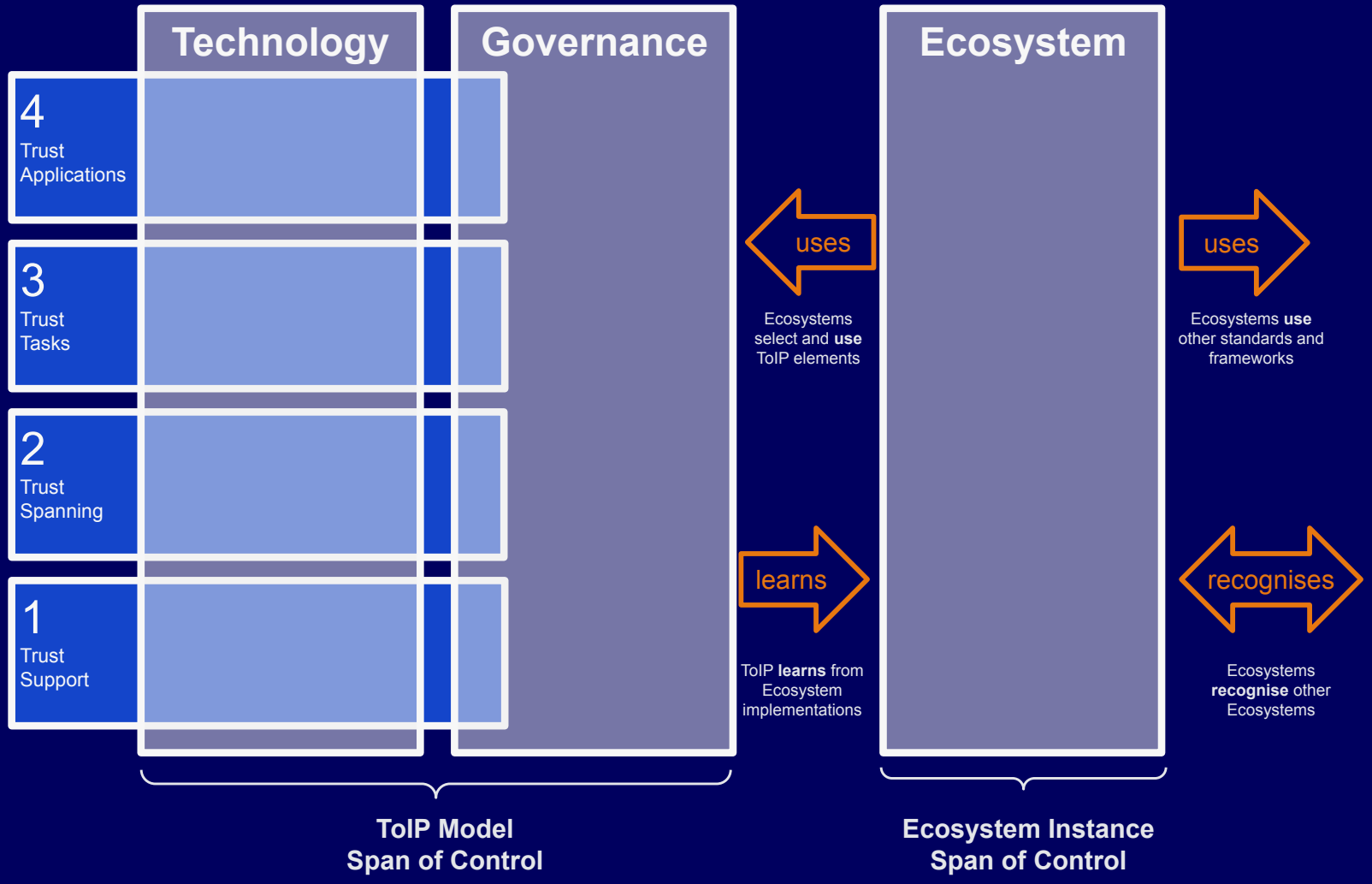


The ToIP Trust Canvas

This is a “trust canvas” on which we can think and draw (and encourage others to do the same). It is also a “blueprint” that can be used as the basis for other diagrams that explore other perspectives.

The next slide has the same schematic, but scaled up to fill the available space and in an editable format.




Technology
Governance
Ecosystem
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Trust
Applications
3
Trust
Tasks
2
Trust
Spanning
1
Trust
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Ecosystems
select and **use**
ToIP elements
uses
Ecosystems **use**
other standards and
frameworks
learns
ToIP **learns** from
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implementations
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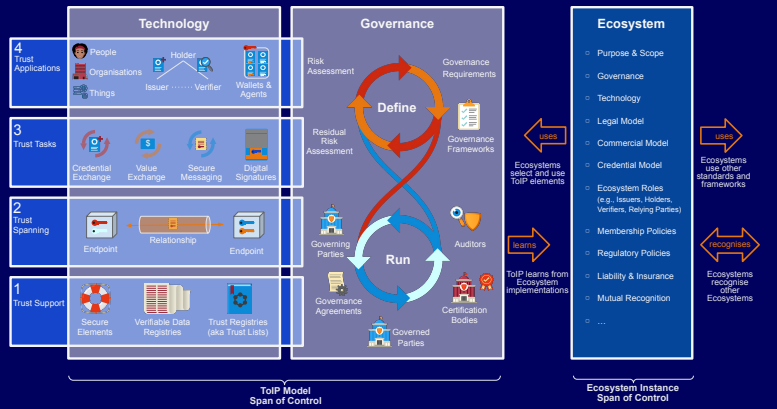
Ecosystems
ToIP Model
Span of Control
Ecosystem Instance
Span of Control

The ToIP Glossy

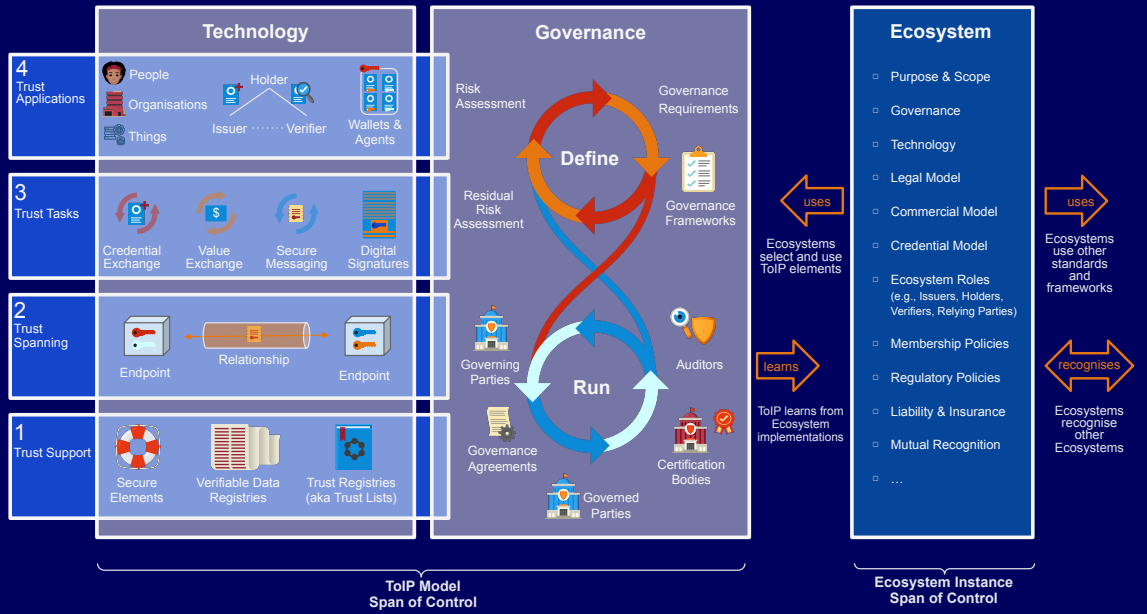


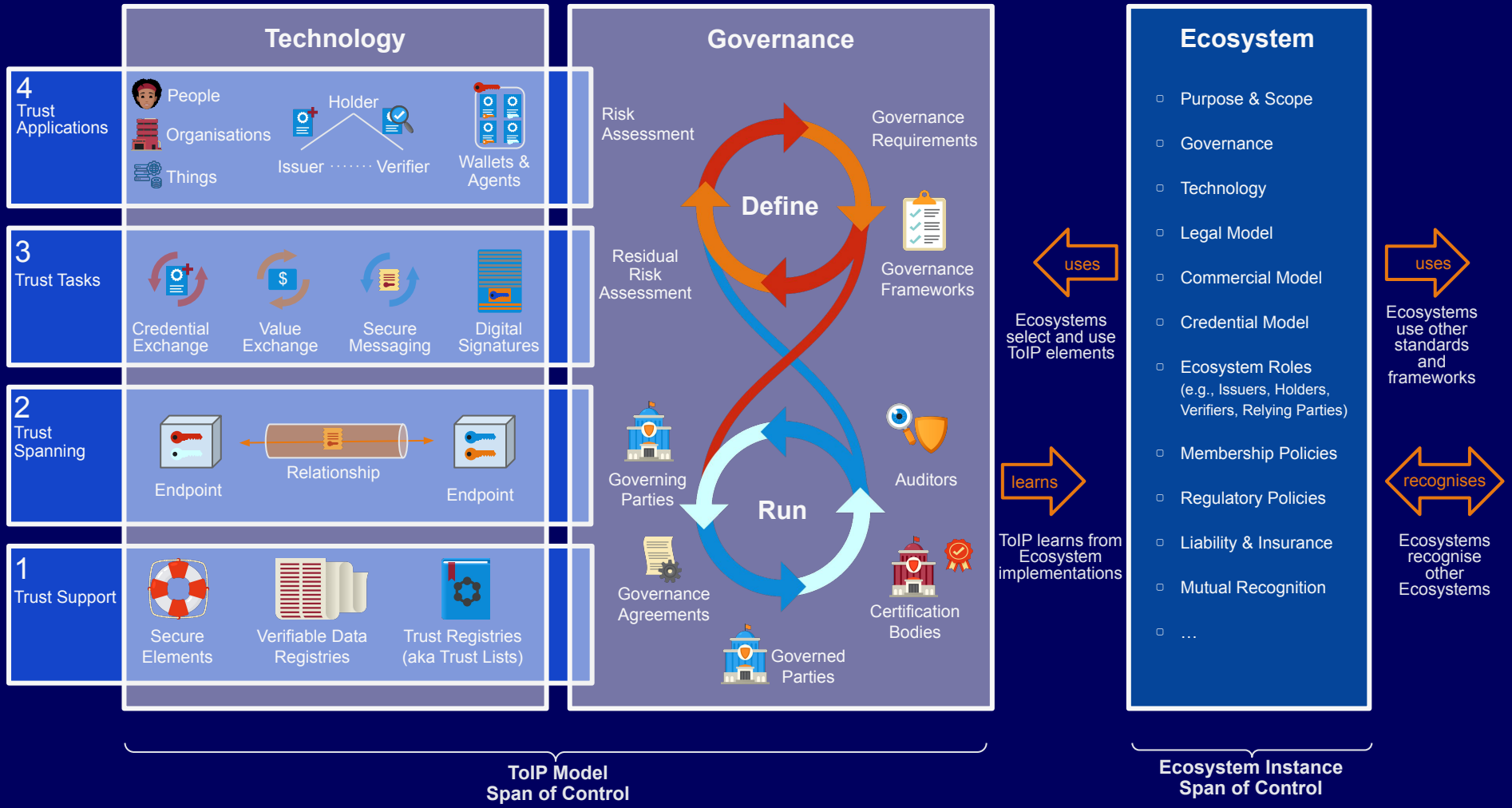
The ToIP Glossy

This is the new, 3rd generation, ToIP cover image, the “glossy”.

Given the density of information it presents, the ideal way to introduce it is to use a build process that explains the logic behind the structure before populating the structure with example elements (see Part 4: How to use this).

The next slide has an expanded and editable version of this image.




Technology
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Trust Tasks
Credential
Exchange
Value
Exchange
Secure
Messaging
Digital
Signatures
2
Trust
Spanning
Endpoint
Relationship
Endpoint
1
Trust Support
Secure
Elements
Verifiable Data
Registries
Trust Registries
(aka Trust Lists)
Risk
Assessment
Governance
Requirements
Define
Residual
Risk
Assessment
Governance
Frameworks
Governing
Parties
Auditors
Run
Governance
Agreements
Certification
Bodies
Governed
Parties
uses
Ecosystems
select and use
ToIP elements
learns
ToIP learns from
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Legal Model
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ToIP Model
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Part 4:
How to use this?

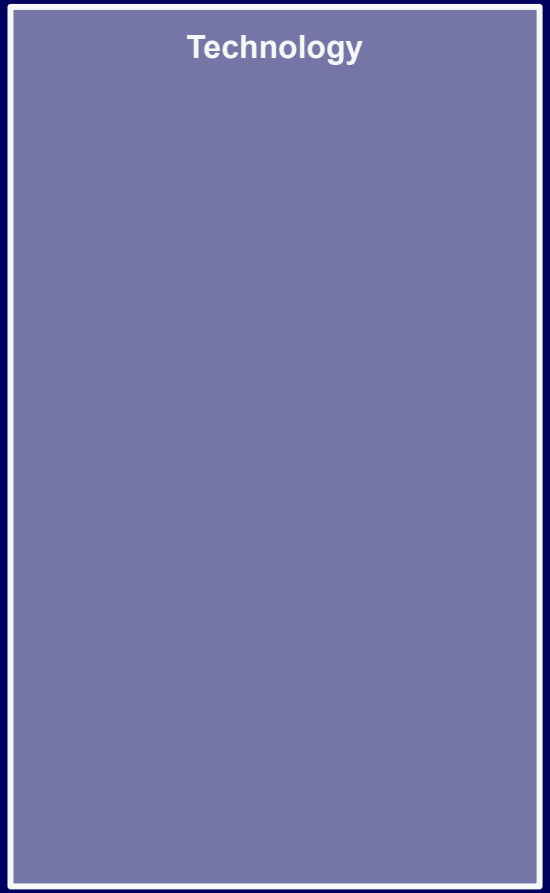
This section walks through a step by step build of the 3rd generation diagram, showing how the elements can be used in a narrative on what we need to consider to ensure trustworthy digital systems.

If introducing this to a new audience…

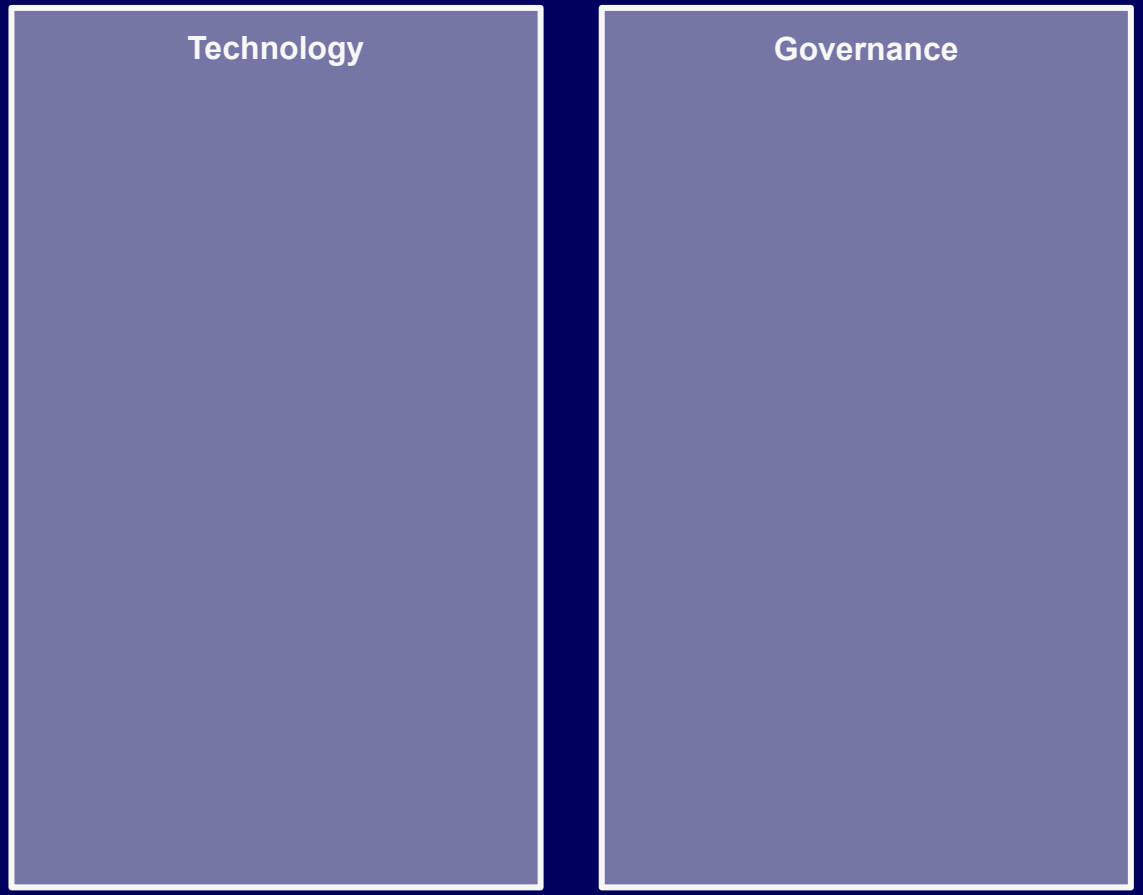
Take it slowly, introduce each element one at a time and allow the significance / meaning to sink in and/or be discussed.

The approach suggested in the next slides should be simple enough that you could repeat the explanation by hand on a whiteboard, or even a large napkin (but probably not a coaster, they’re too small, several coaster would work though)

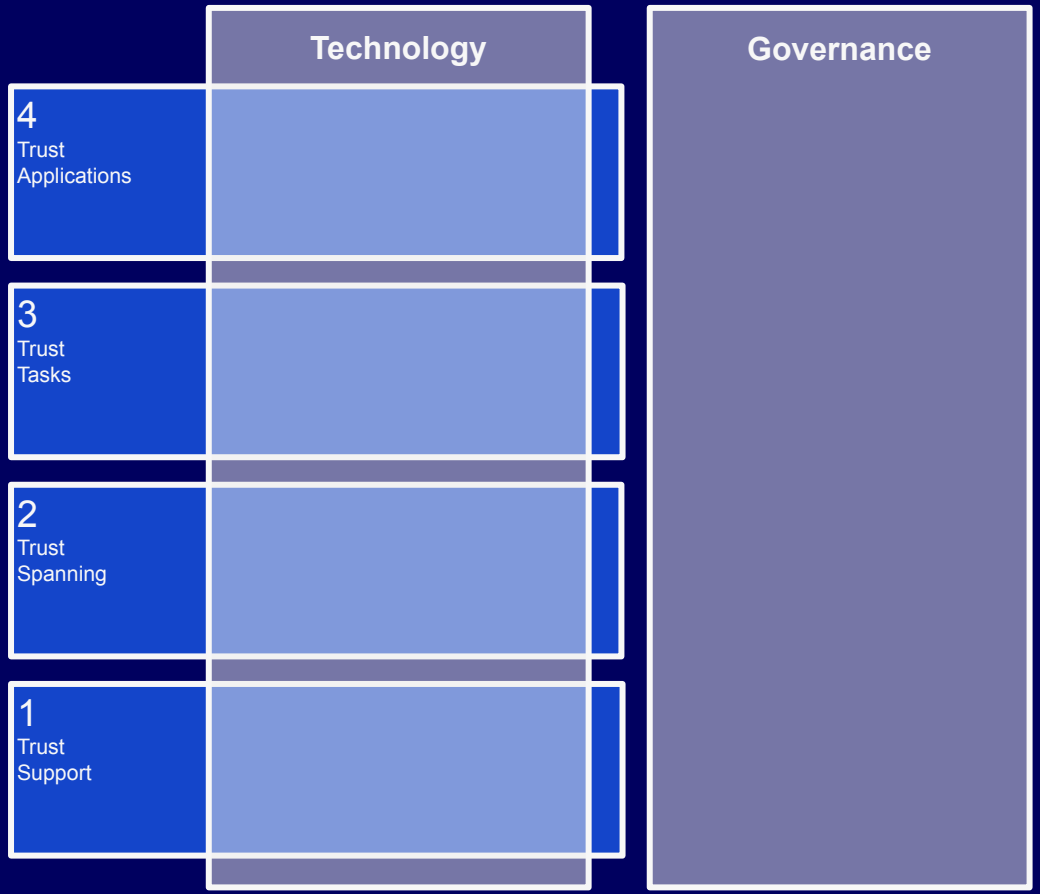
We are defining an architecture for digital trust on the internet, so we need technology…



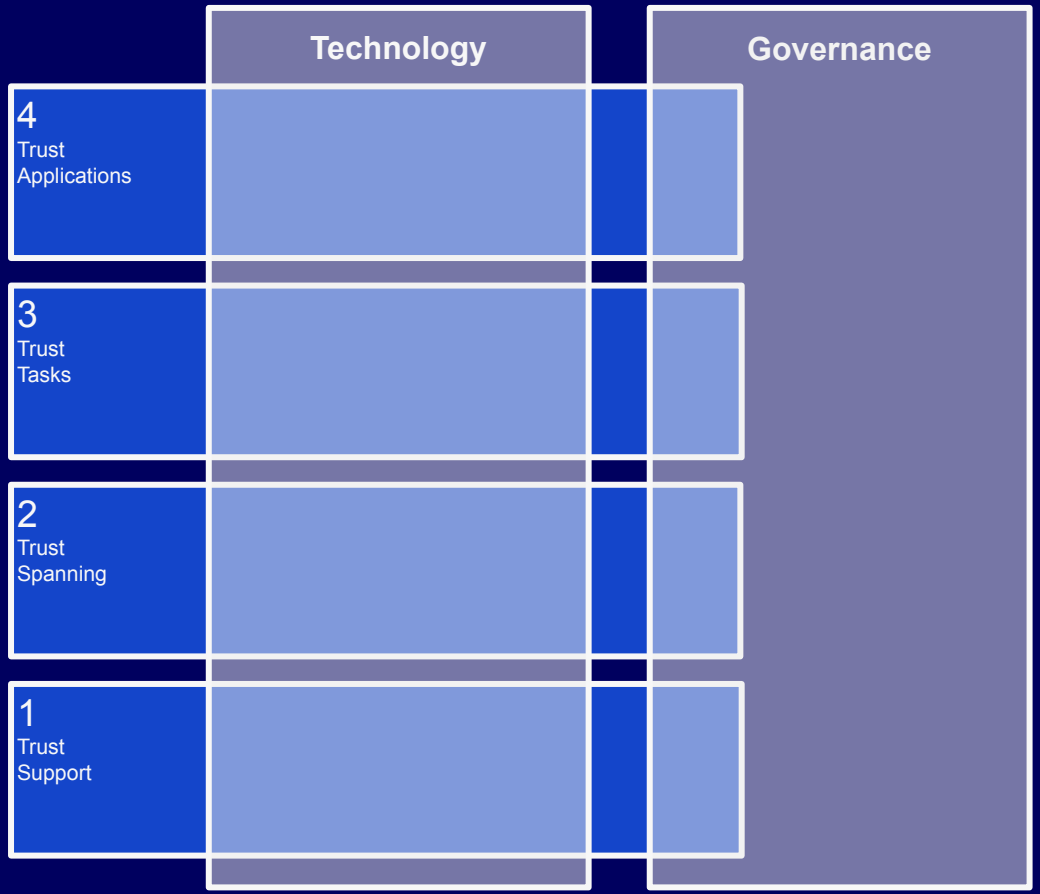
Experience has taught us that for technology to be trustworthy, we need to understand how it is governed



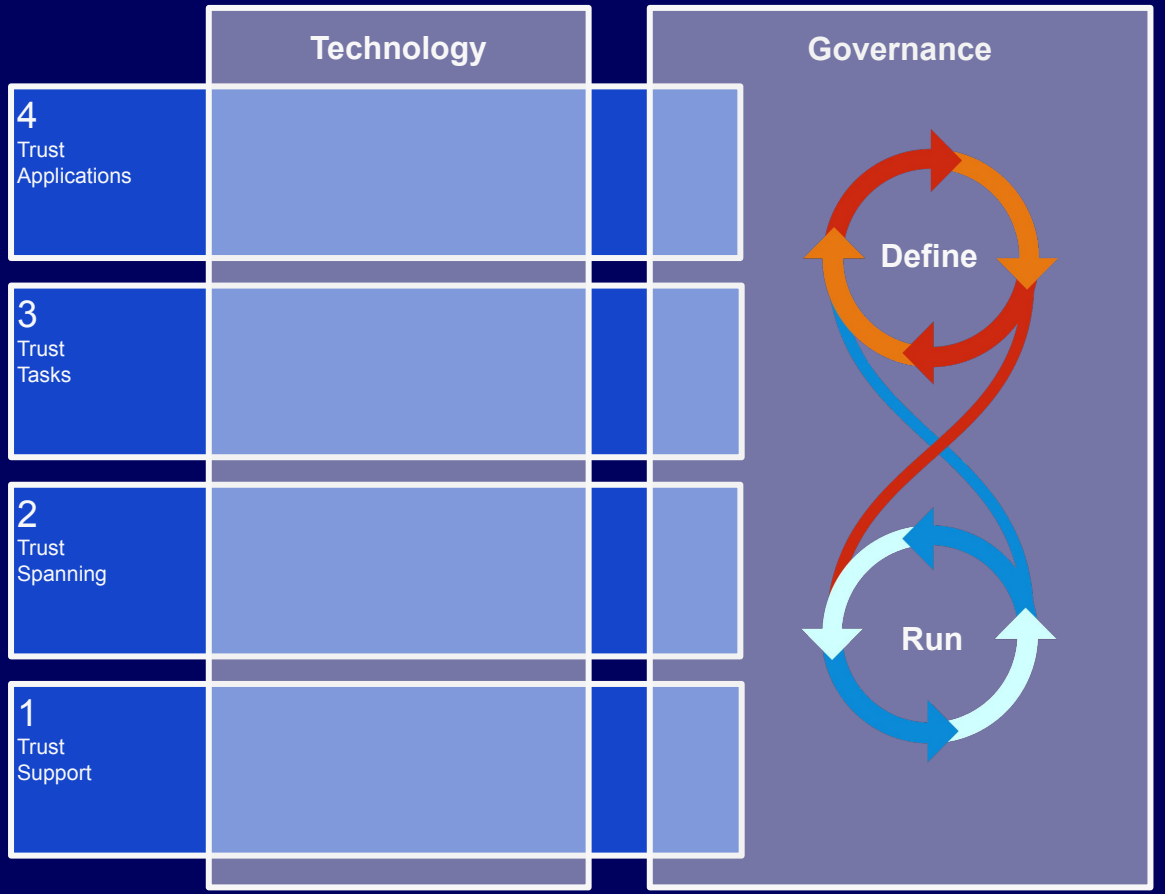
Using layers helps to describe how technology systems are built, each layer providing specific capabilities to the next



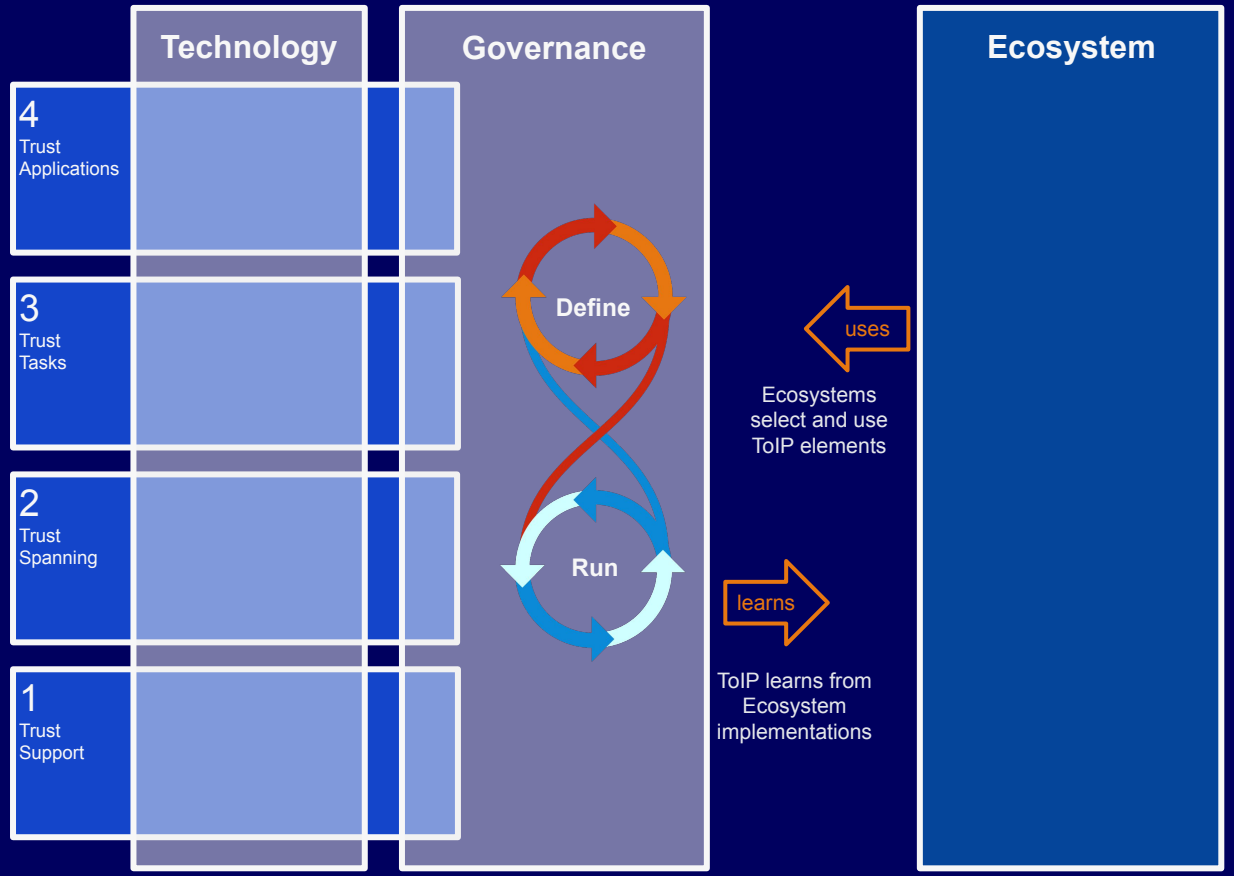
We need to consider governance of each layer and of the system as a whole



Governance is a continual process, cycling through define, run, and then (re)define cycles as risks and purpose evolve

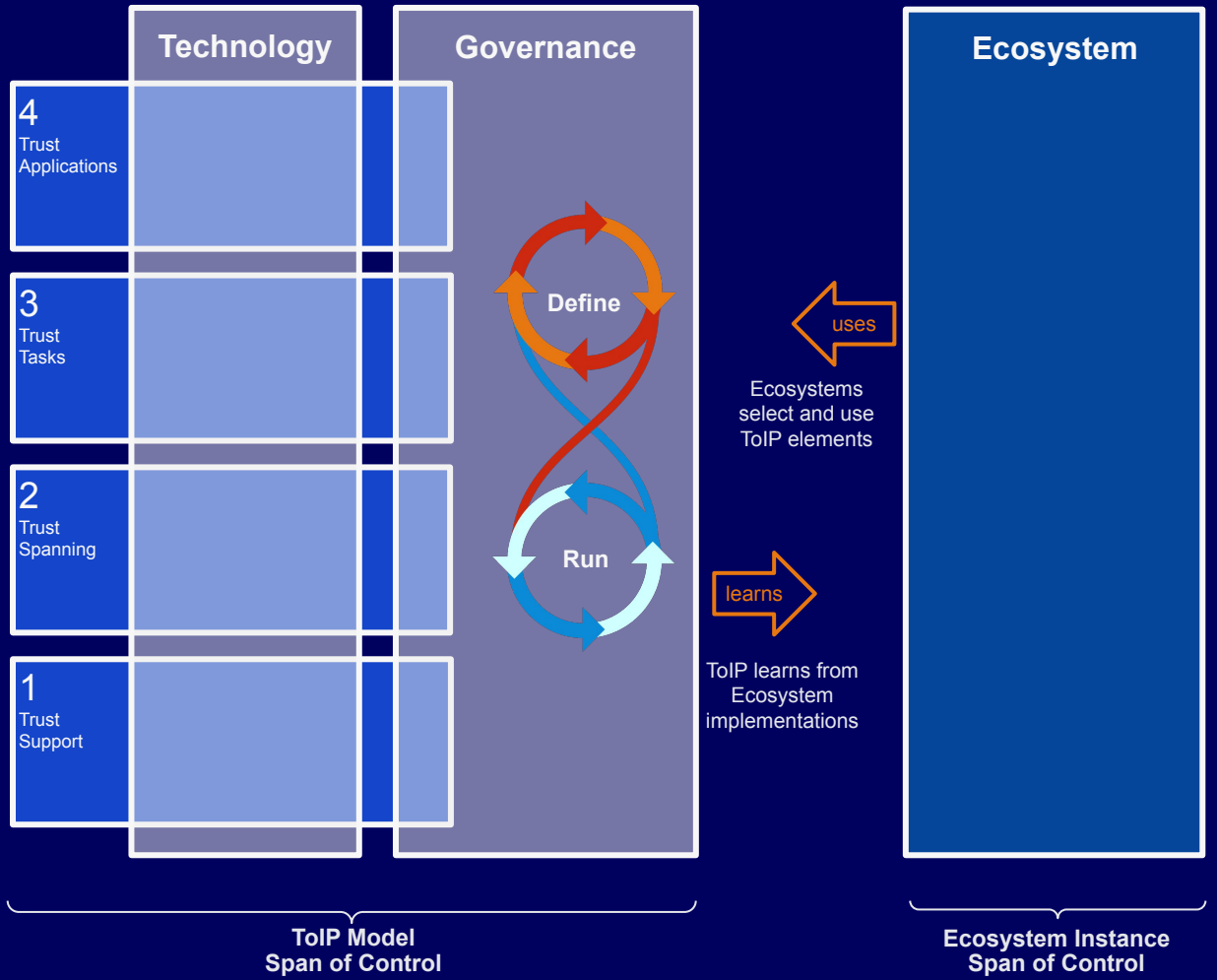


Ecosystem implementations will use ToIP elements, and ToIP will learn from how they are used.

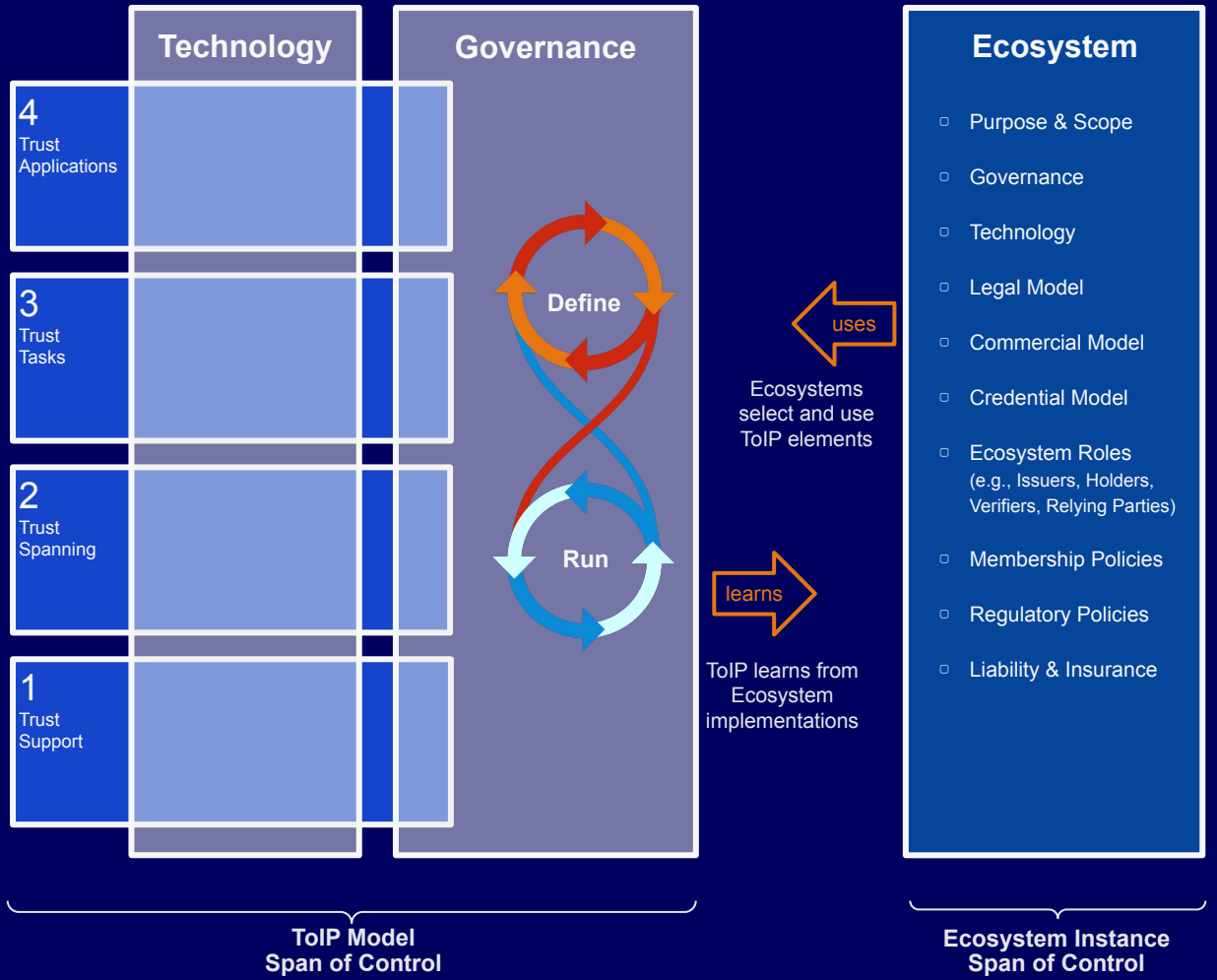


Ecosystem implementations are separate to ToIP.

They have control over their work, ToIP has control over its work.

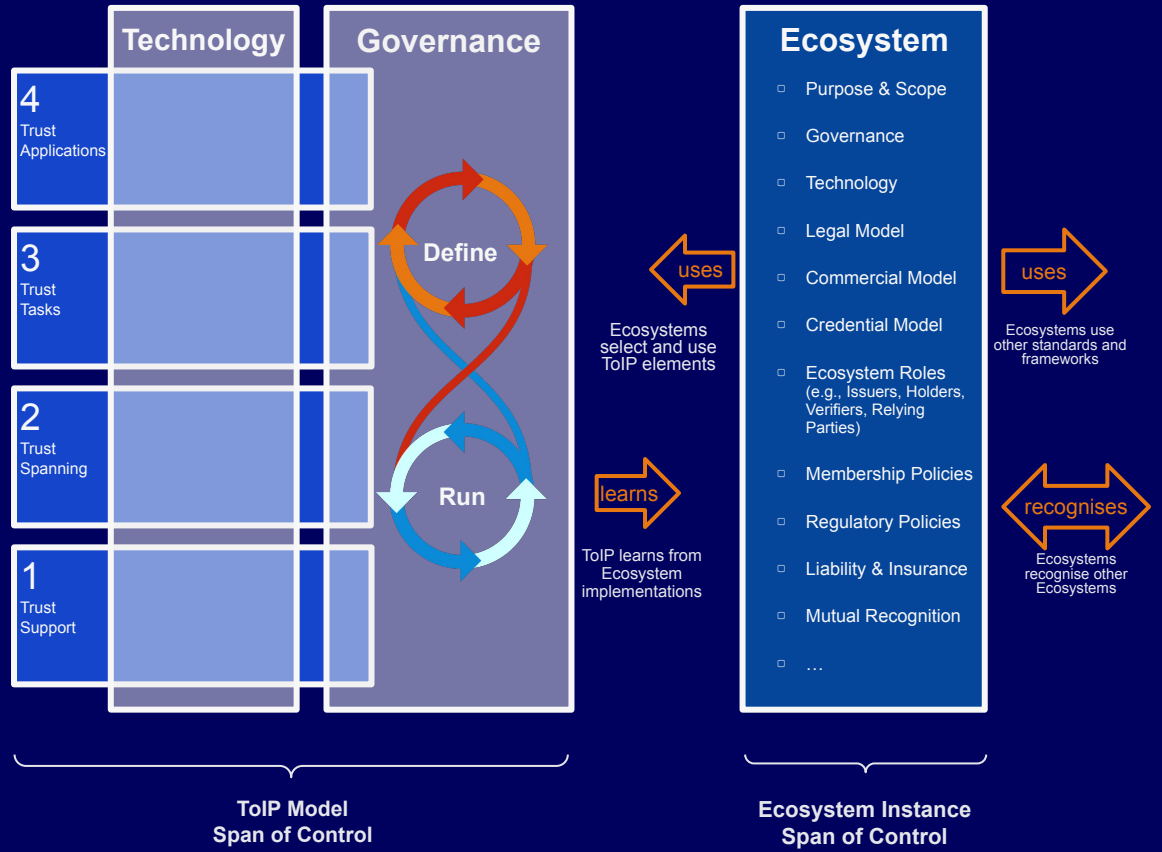


Each ecosystem will have specific concerns and interests defined by their purpose and context

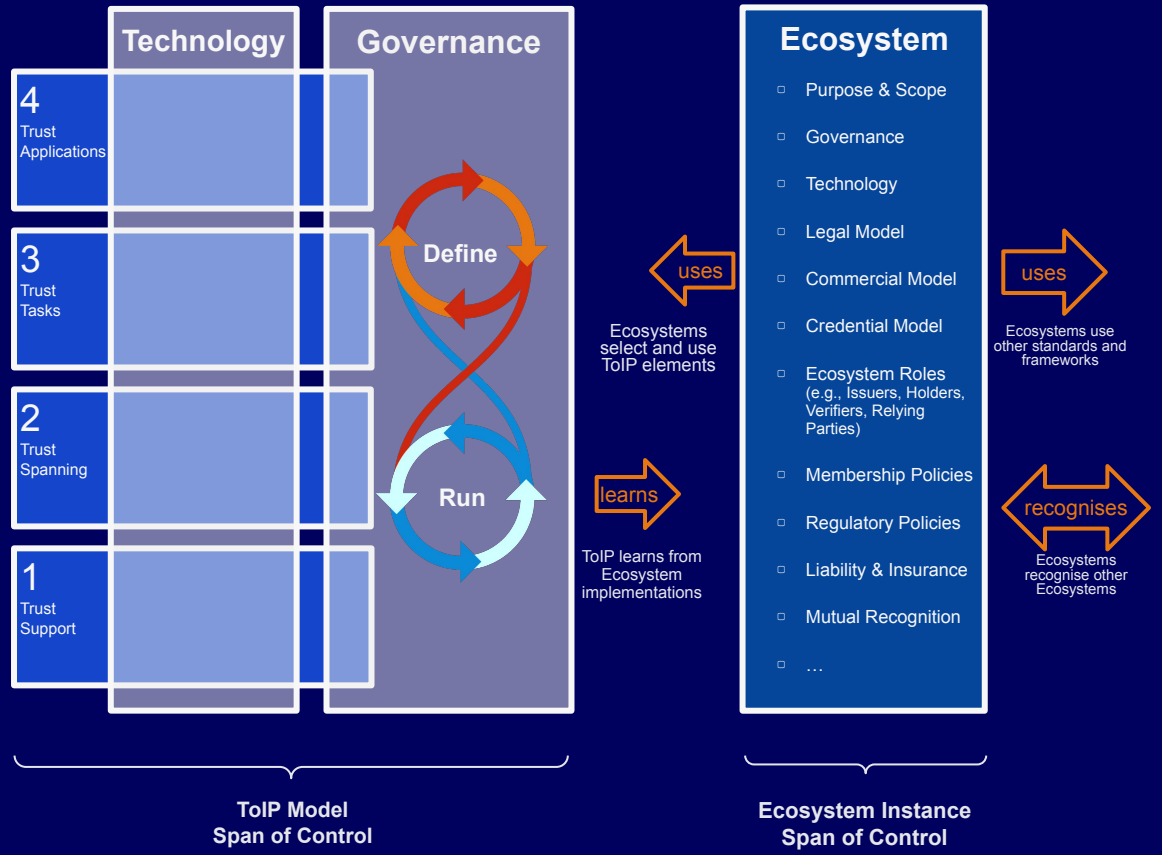


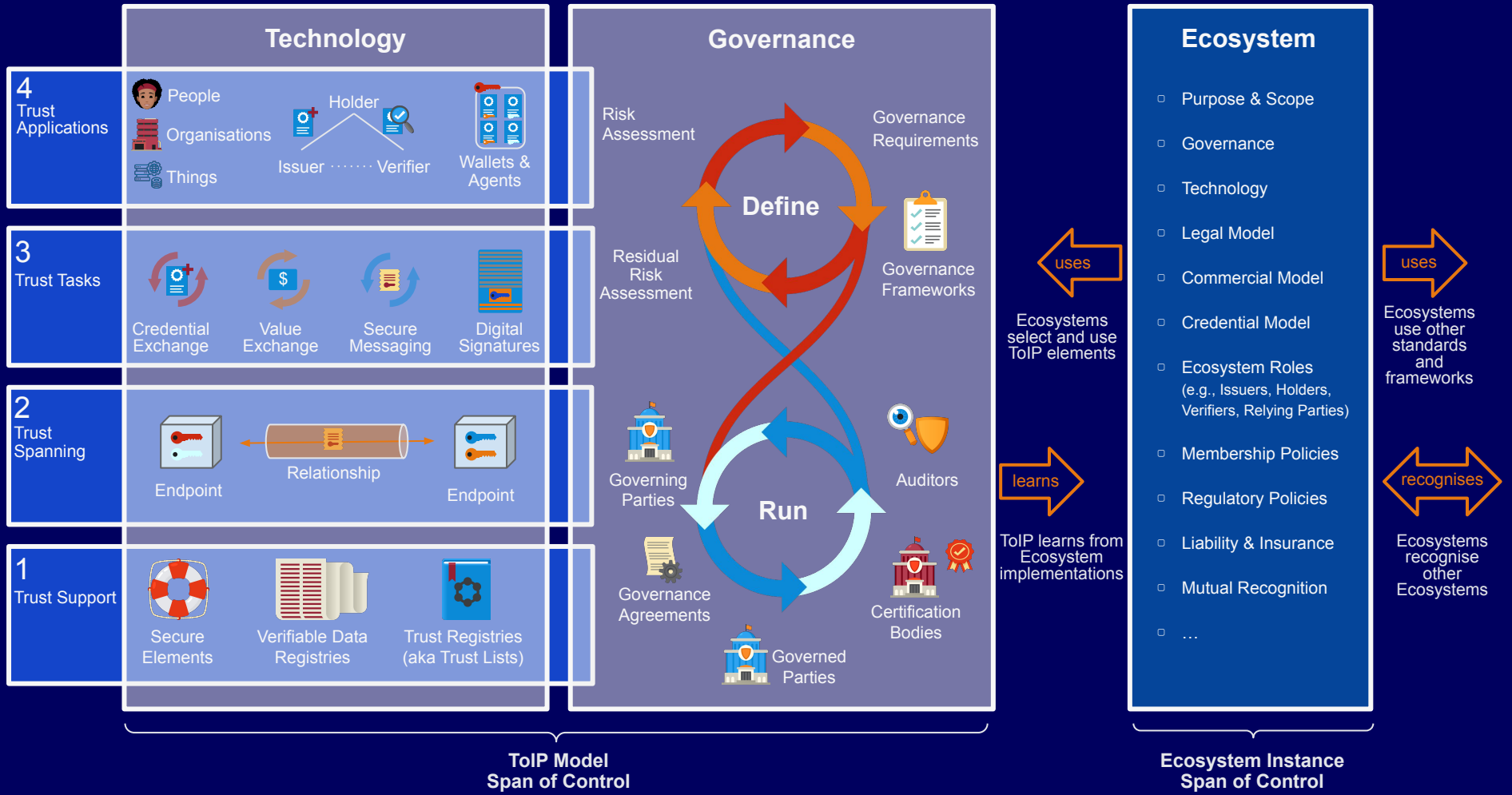
Ecosystem implementations may make use of other systems in addition to ToIP.

Ecosystems may have relations with other ecosystems



And we use the concrete representations of artefacts and parties to illustrate how it works…

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Value
Exchange
Secure
Messaging
Digital
Signatures
2
Trust
Spanning
Endpoint
Relationship
Endpoint
1
Trust Support
Secure
Elements
Verifiable Data
Registries
Trust Registries
(aka Trust Lists)
Risk
Assessment
Governance
Requirements
Define
Residual
Risk
Assessment
Governance
Frameworks
Governing
Parties
Auditors
Run
Governance
Agreements
Certification
Bodies
Governed
Parties
uses
Ecosystems
select and use
ToIP elements
learns
ToIP learns from
Ecosystem
implementations
Purpose & Scope
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and
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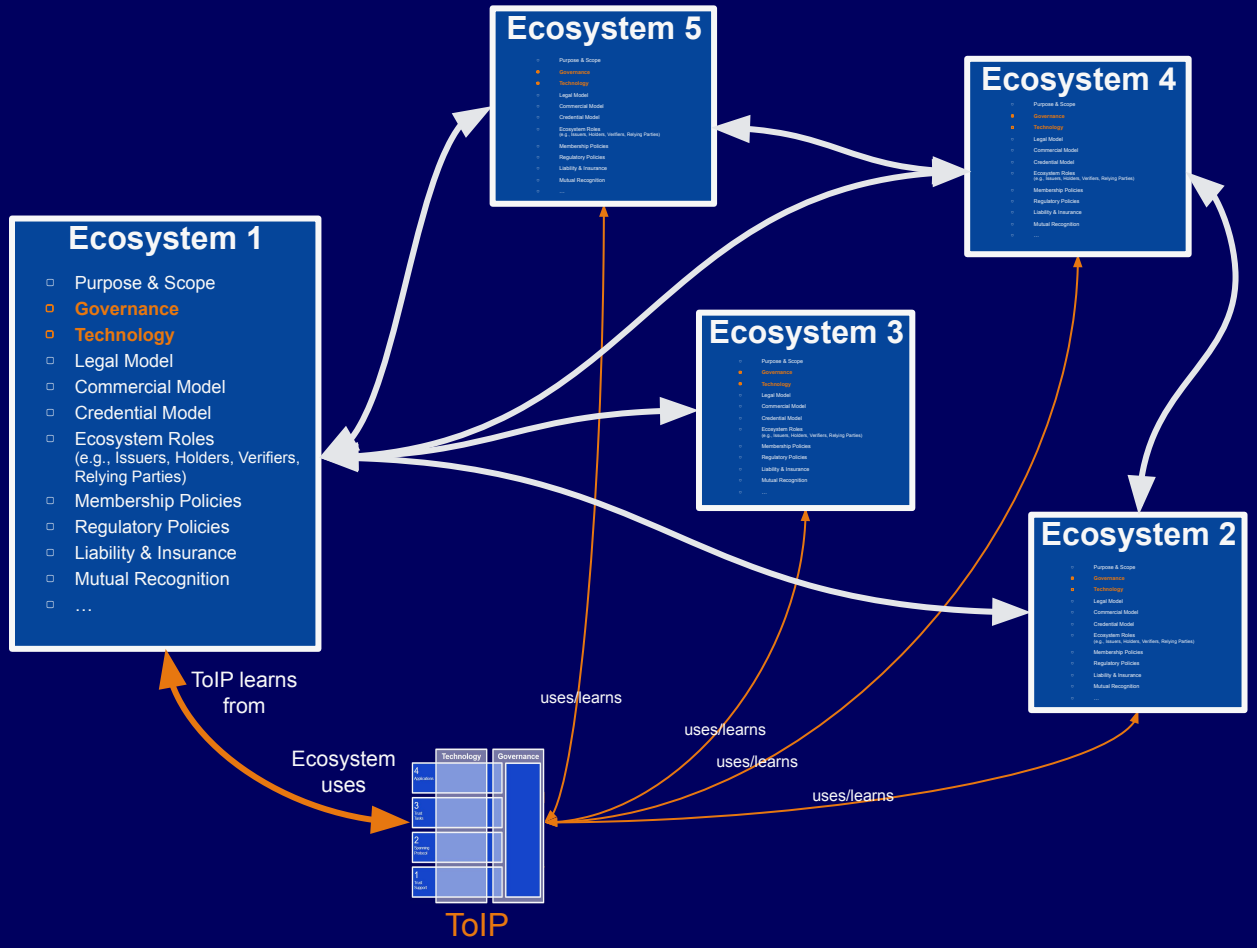
recognises
Ecosystems
recognise
other
Ecosystems
ToIP Model
Span of Control
Ecosystem Instance
Span of Control

With ToIP, the Internet can become a world of interconnected & interoperable trustworthy ecosystems



Part 5:
What's next?

Now that we have a 3rd Generation diagram, what are the next steps?

Next steps for the 3rd Gen diagram work

1. ToIP documentation to be brought into alignment with the new diagram (e.g. Technology Architecture)
2. Website content to be brought into alignment. This will require consideration of how best to introduce in text and graphical content
3. ToIP Guide Book to be produced using 3rd Gen design. This is expected to be a chapter book with the first Introductory chapter reusing the build explanation presented in this deck and then subsequence chapters expanding on the elements of the Trust Canvas.

Part 6:
Tools Tips and Assets

And suggestions on how to use them

Toolbox

Primary Drawing: Google Slides

Complex/Engineering drawings: draw.io

Presentation formats: Preferably present in Google Slides. If required for a conference or immutable copy, download a final version to PowerPoint or PDF.

ToIP Folder:
https://drive.google.com/drive/folders/1B3Fy8kHJh8rIvSMlANKwpGf5oc-vW8J8

Warning. Conversion can be lossy. Do not download from Google to PowerPoint, edit in PowerPoint and then convert back to Google. Do not edit PowerPoint formats in Google Docs.

Google Slides isn't perfect (nothing is), but it is good enough when used well.

Google Slide Templates

Dark (blue) background	Light Background
https://docs.google.com/presentation/d/1Jfnh1CadAUiih09TflhiaSYRw9PR7mNFiTINtEbDG1g	https://docs.google.com/presentation/d/1IRFnEPatn6YmRVXLPa9U0X7eOqaan3pz1bQTIOSKS4Y

DO NOT EDIT THESE DOCUMENTS.

MAKE A COPY IN THE RIGHT SPACE FOR YOUR WORK, RENAME AND THEN EDIT THE COPY.

Tool Tips: Themes, Palettes, and Layouts

Google Slides uses the concept of “themes” to define specific palette’s, fonts and slide layouts for presentations. This is basically equivalent to PowerPoint’s Theme and Slide Master View.

There are two themes for ToIP slides: light and dark. These use the existing ToIP brand colours and slide structures. The main difference is in the first four colours of the theme palette (which toggle between dark and light), and the background colour for the slides (which is midnight blue for the dark theme and white for the light theme).

Using themes means that you can create a presentation using one theme, and then import another theme and all your slides will inherit the new fonts, colours, layouts etc.

This **ONLY** works if you stick to the theme. Use existing theme layouts for slides, choose colours from the top (theme) row and don’t fiddle with fonts and you will have magically adaptive presentations.

The font is Arial since this is native to Google Slides and PowerPoint and converts well in PDF.

The full ToIP palette is given on the next slide.

Two Google Slide Themes for ToIP: light and dark

ToIP dark theme

ToIP light theme

ToIP Palette

COOL

LIGHT

#D0FFFF	#A3E8E8	#89CFCF	FROSTED MINT

MID TONES

#2EA4F0	#0B8BD7	#0072BE	CELESTIAL BLUE

DARK

#1445CA	#002CB1	#000087	#00005F	MIDNIGHT BLUE

TERTIARY

#AB1EF5	#8D1BD7	#6918A3	GRAPE

WARM

ALERT / HIGHLIGHT

#FF461E	#E63716	#CC2910	VERMILLION

SECONDA

#FB8B24	#E77710	#D36300	PRINCETON ORANGE

TERTIARY / DARK

#B43D52	#961F34	#780116	BURGUNDY

GREY NEUTRALS

LIGHT-TO-MID TONES

#E4E6E9	#BCBDBF	#818385	LOGO GREYSCALE

DARK TONES

#636566	#3B3D3E	#1D1F20

EARTH NEUTRALS

SUBDUED

#EAE6D5	#D6D2C1	#AEAA99	#9A9685	SENECA ROCK

BRIGHT

#FAEAB8	#F7DC89	#B9A567	#9C8257	FLAX

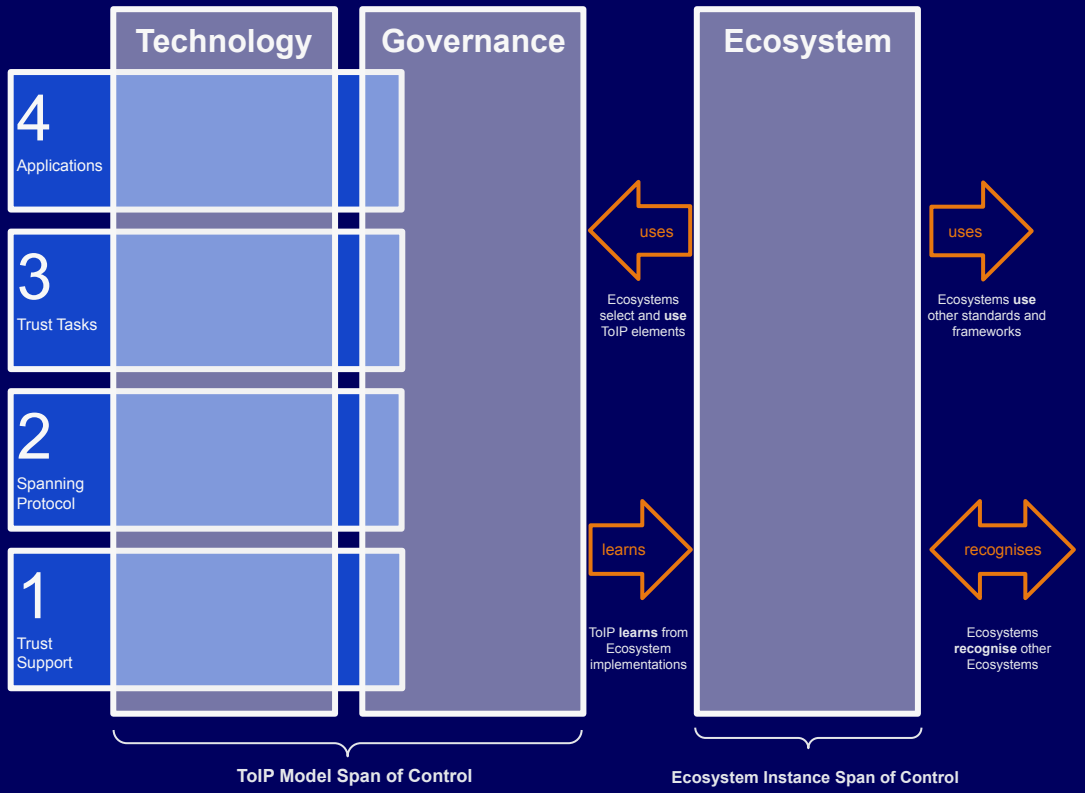
Borders, Fills and Transparency

The base diagram has shapes with borders that use theme colours “Text and Background 1” and “Accent 4”. These are in position 1 and 8 from the left on the theme palette.

The opaque shapes have a fill of #e4e6e9 with 50% transparency. The layers are solid and #1445ca

The border thickness is related to the size of the shape. Larger shapes have thicker borders.

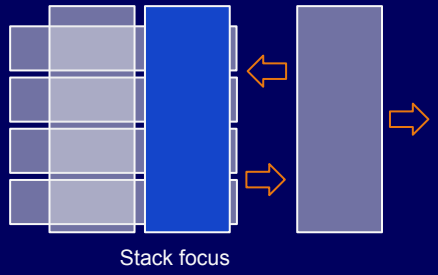
The font is Arial because that works in both Google and Microsoft and pretty well everywhere else.



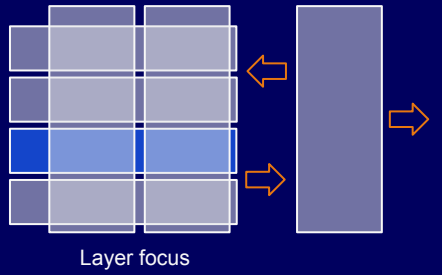
Examples of highlights and scope

Here are some examples of using the base diagram to highlight single elements (stacks or layers), intersections between stacks and layers and concepts that involve more than one layer and/or stack element (for example “wallet”, “trust registry”, “human experience”)

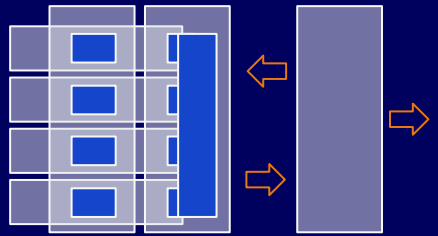
Each representation should be relevant to the topic and its intended audience.



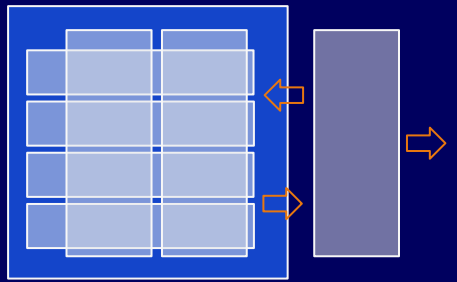
Stack focus



Layer focus



Wallet



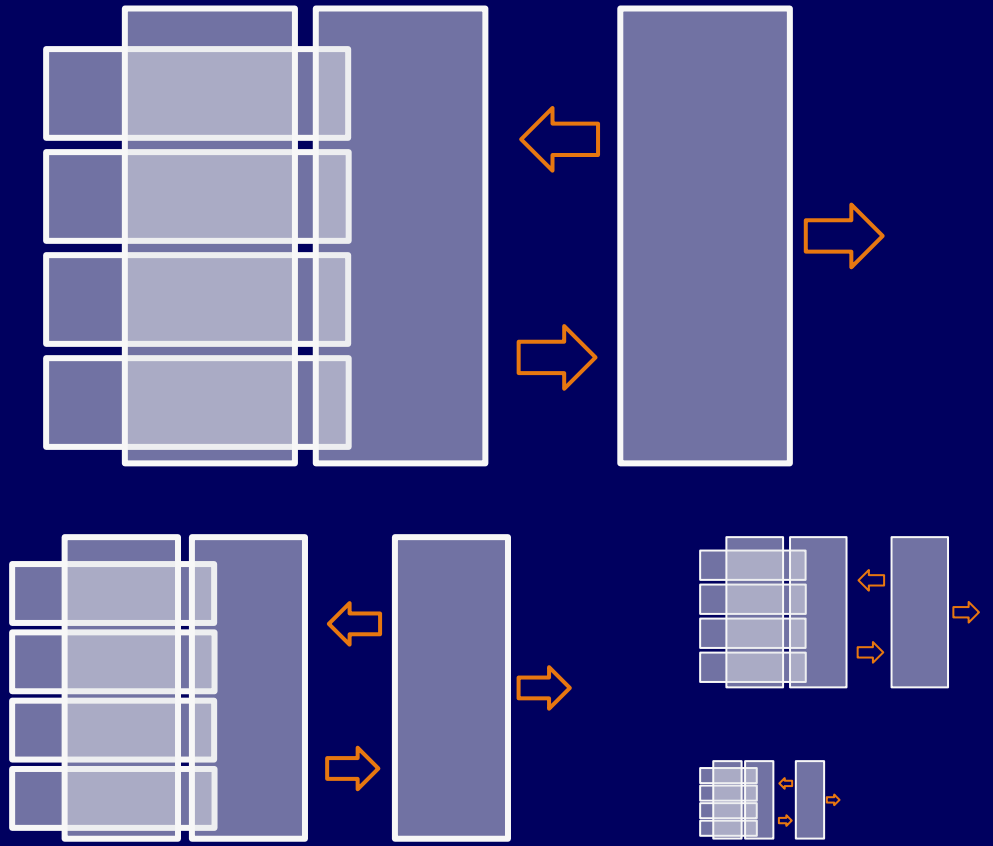
Human experience

Scaling

Edit and add to the diagram to emphasise the point(s) you need to make and/or the focus area you want to point out.

Feel free to choose and use different colours for borders and/or fills - selecting from the theme colours.

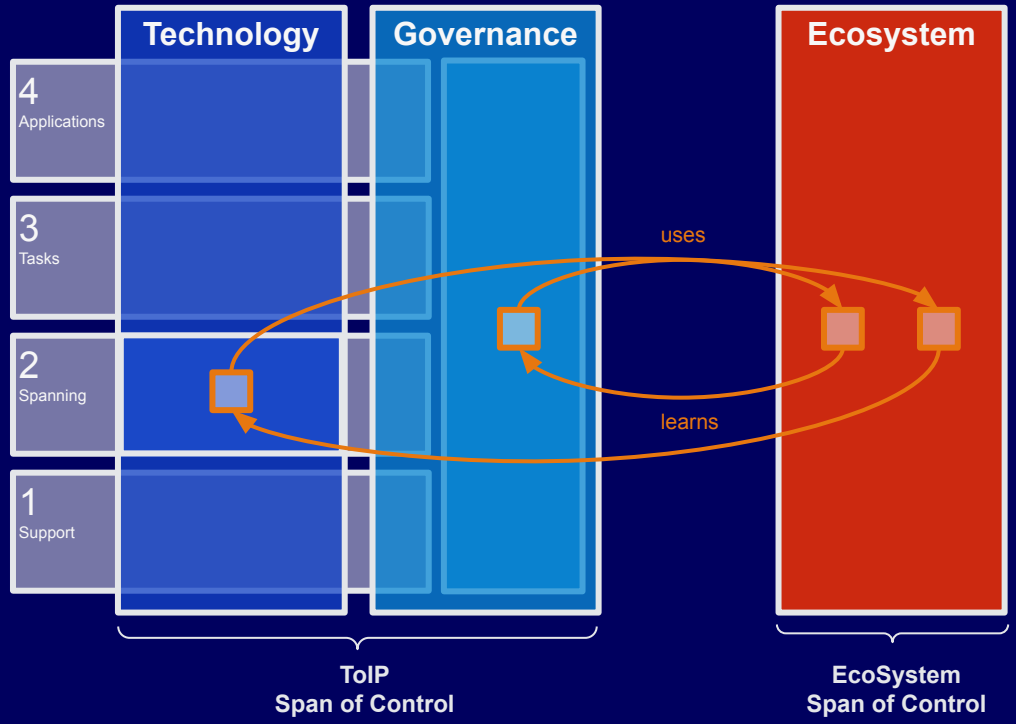
For resizing, group the elements, and resize the group with a locked aspect ratio and scale object (see “Format Options -> Size and rotation”) when you have the group selected. If aiming for a significantly scaled down version, remove the text to reduce clutter.



Explain using a common visual language

The aim is to be expressive within recognisable guidelines.

This example uses solid fills and shows how elements from ToIP might be selected by an Ecosystem for use in their operational model. It also shows another way to represent the feedback loop, where ToIP learns from the use of elements by the Ecosystem.



Complex diagrams - Draw io

Most diagrams can be created using Google Slides. This is a relatively simple tool, and we should always use the simplest tool and representation possible.

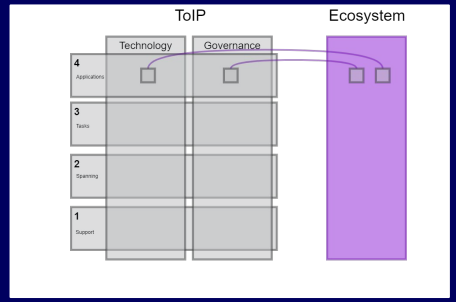
However we sometimes want more power/control with things like diagram layers, dynamic layouts, data driven diagrams etc. For this we need a more powerful drawing tool. We need something that supports multiple import and output formats, web collaboration and free account access, and integration with Atlassian (for our Confluence pages). draw.io fits these constraints.

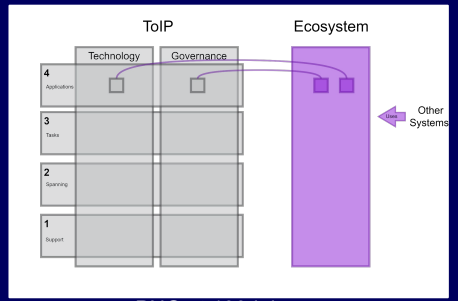
Here is a file created with draw.io that includes the ToIP pallet and some template objects and diagrams: https://drive.google.com/file/d/1XCu0eF6BEMeiO1r3Zymd4unohvbQ3Z5d/view?usp=drive_link [you'll need to open with the draw io app]

This is a direct link via app.net: https://app.diagrams.net/#G1XCu0eF6BEMeiO1r3Zymd4unohvbQ3Z5d

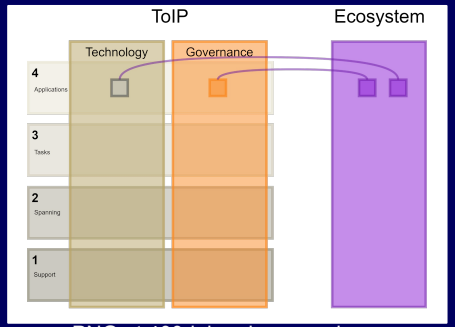
Draw io will need access to Google Drive to edit files that are stored there.

Here are some example draw io png exports from the draw.io file





PNG at 100dpi



PNG at 400dpi and more colours

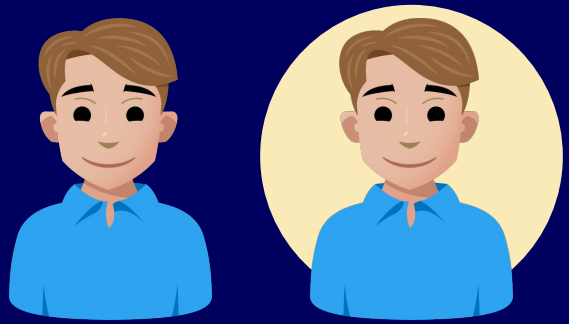
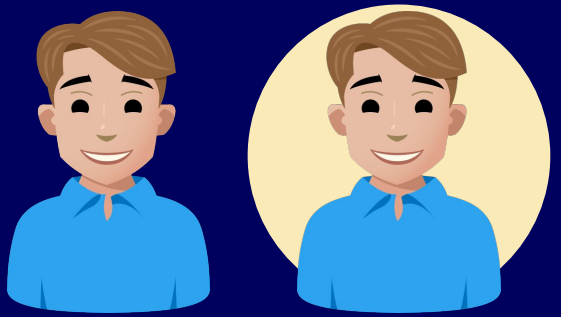
Assets

Assets from the ToIP Brand Guide

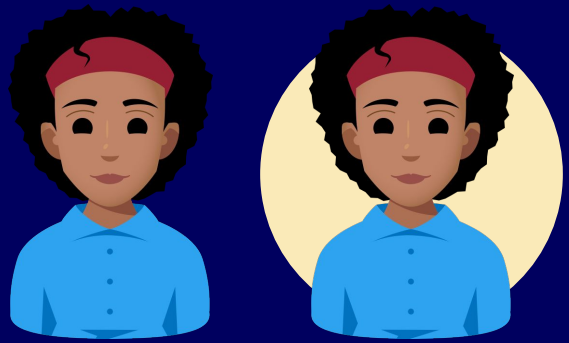
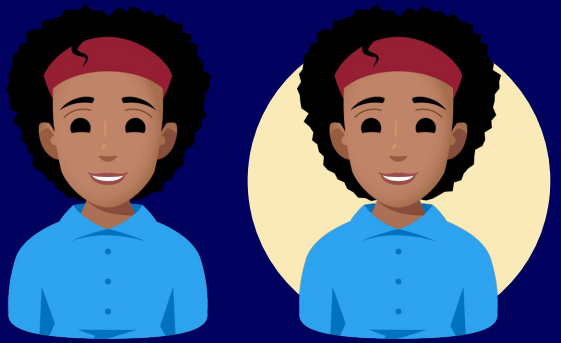
The following slides contain assets from the ToIP brand guidelines. These reflect the version 2 concept diagram, but many are still relevant and can also allow a indication of things that have changed (if this is relevant).

The assets include icons for characters, objects, and actions.

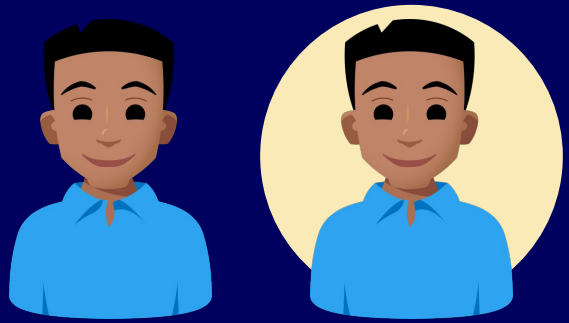
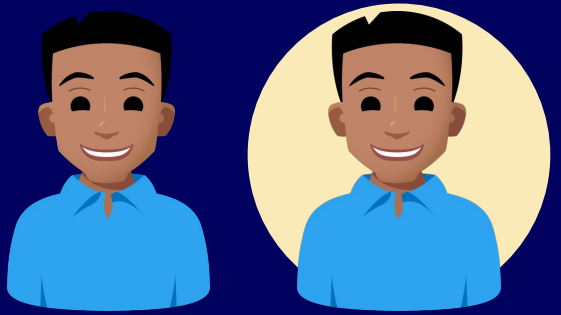
Some are grouped. For example, the characters on this slide with a background can be ungrouped and the background colour can be changed.

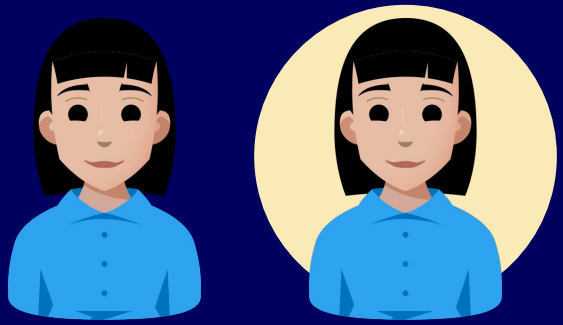
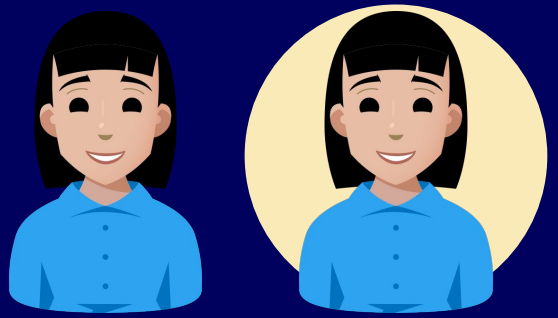


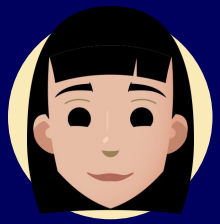



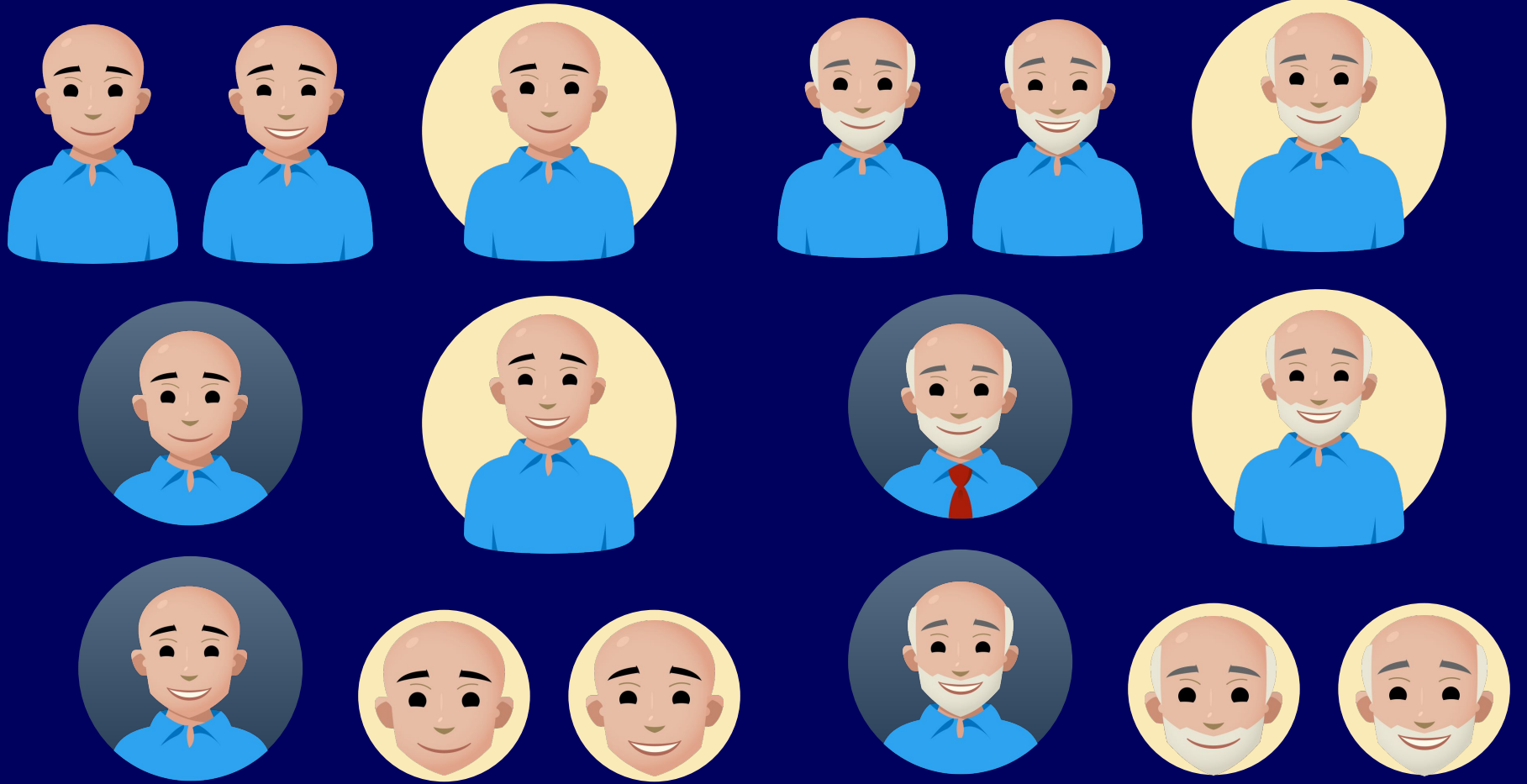


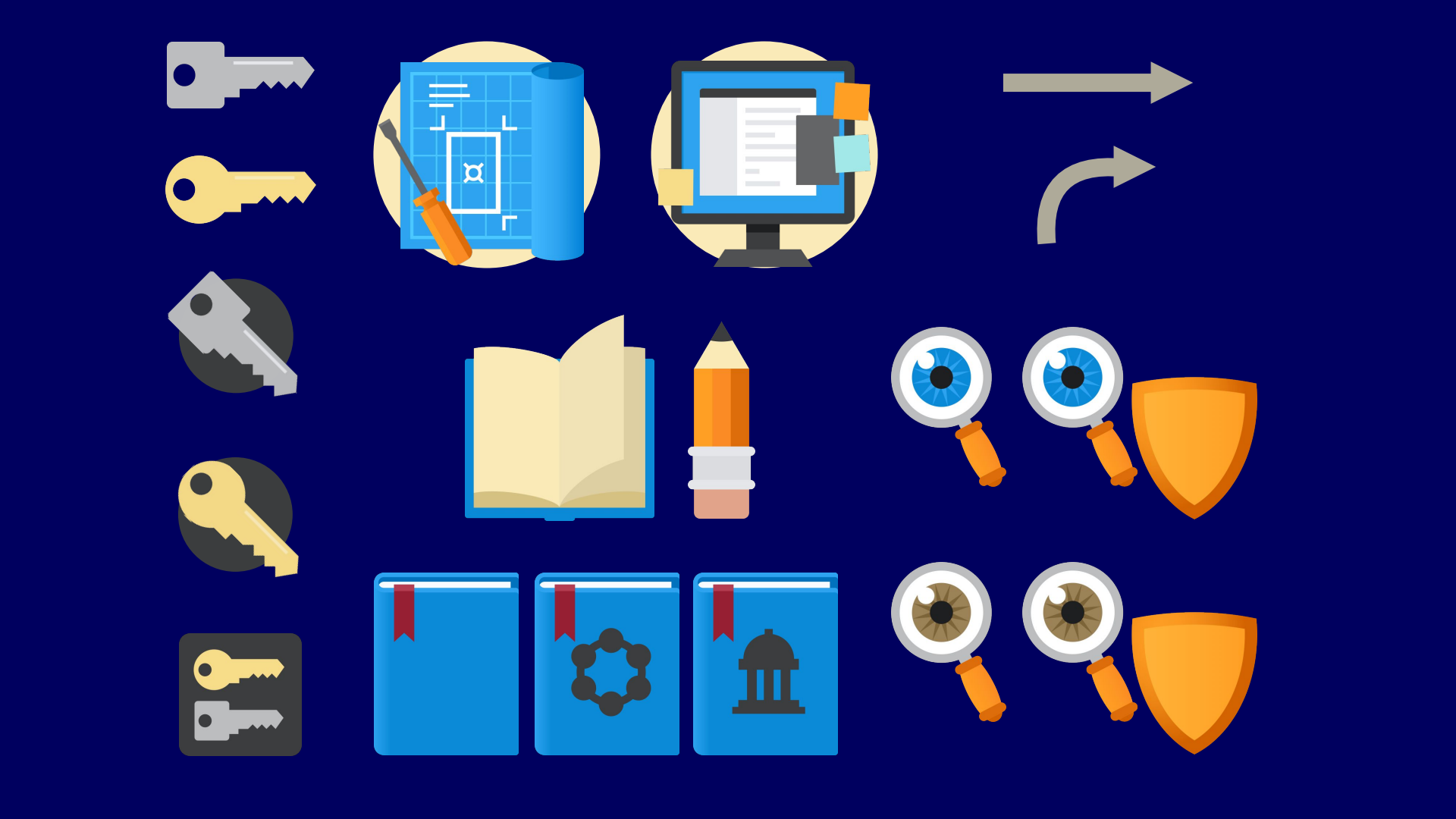



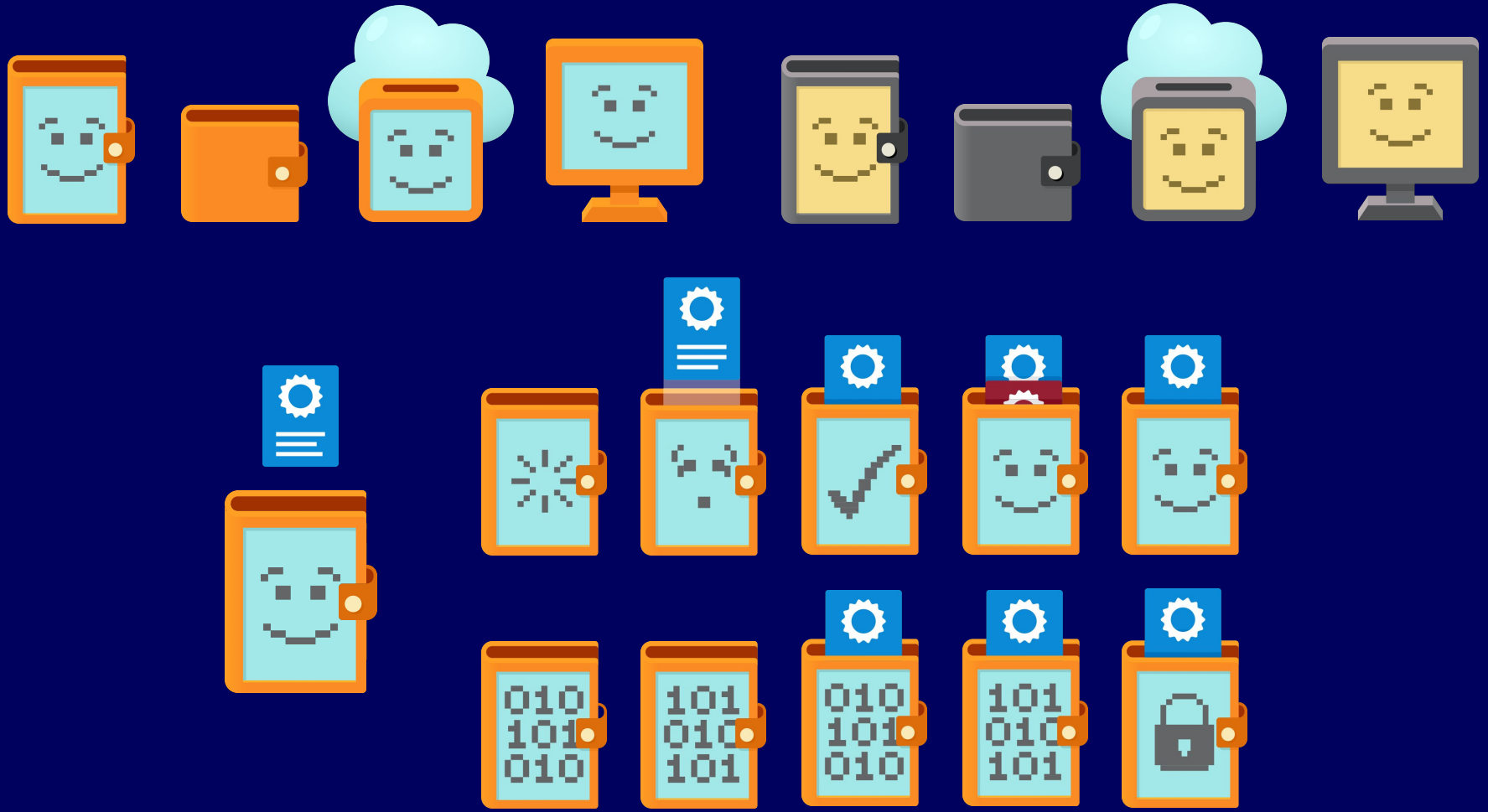


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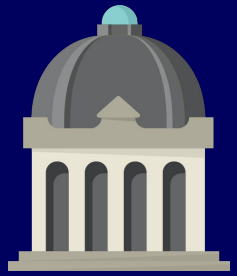
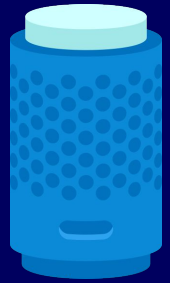
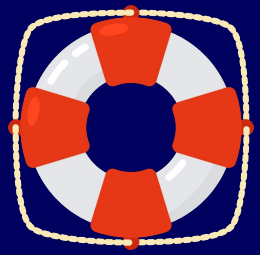
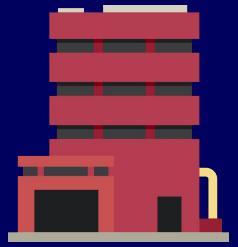
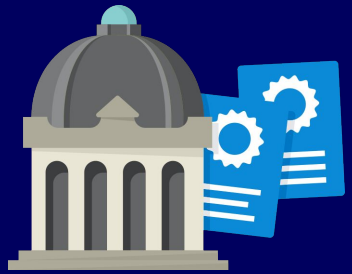
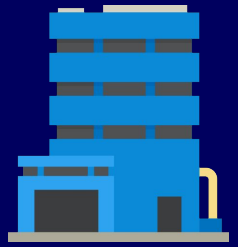
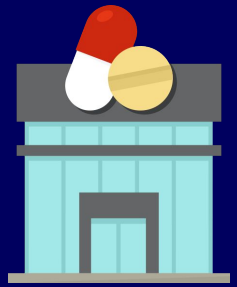
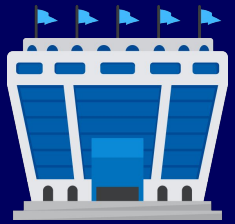








Infographics

Example elements for infographics

The following slides contain infographic elements produced for ToIP for the previous generation of diagrams.

Many of these elements, icons and representations are still relevant.

Minor edits have been made to these representations to ensure that all text is legible (uses theme based colours) and fits in the anticipated spaces.

	TECHNOLOGY	GOVERNANCE
4	APPLICATION ECOSYSTEM	ECOSYSTEM FRAMEWORKS
3	DATA EXCHANGE PROTOCOLS	CREDENTIAL FRAMEWORKS
2	PEER-TO-PEER PROTOCOLS	AGENT FRAMEWORKS
1	PUBLIC UTILITIES	UTILITY FRAMEWORKS

DATA EXCHANGE PROTOCOLS

TECHNOLOGY

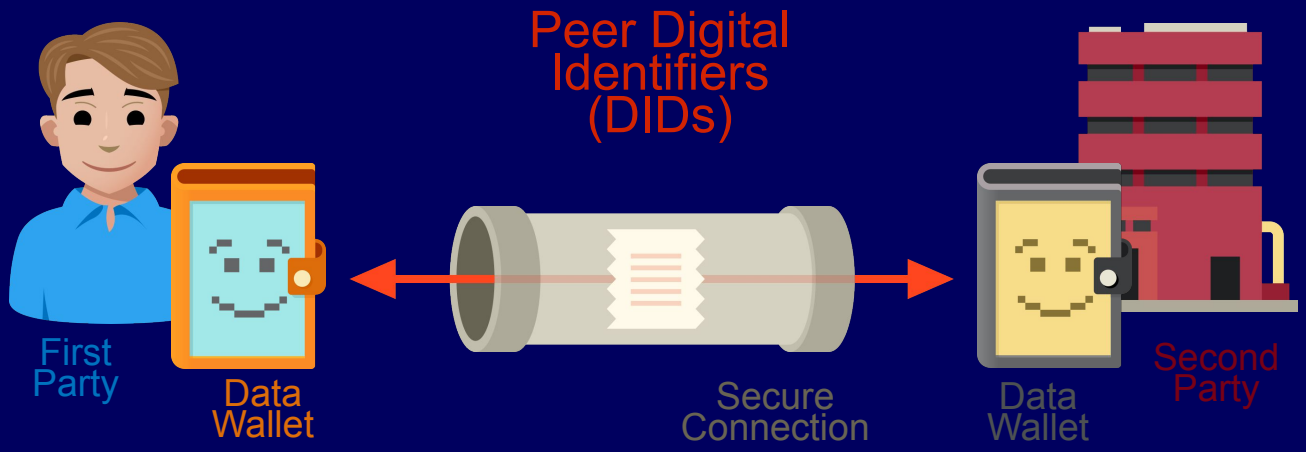
PEER-TO-PEER PROTOCOLS

CEREMONY

Secure connection is established and persists until one party opts out

EXCHANGE

Data wallets interoperate to exchange peer Decentralized IDentifiers (DIDs)



TECHNOLOGY

PUBLIC UTILITIES

TECHNOLOGY

INTEROPERABLE

Decentralized Identifiers (DIDs)

are created according to

DID Methods

optimized for different

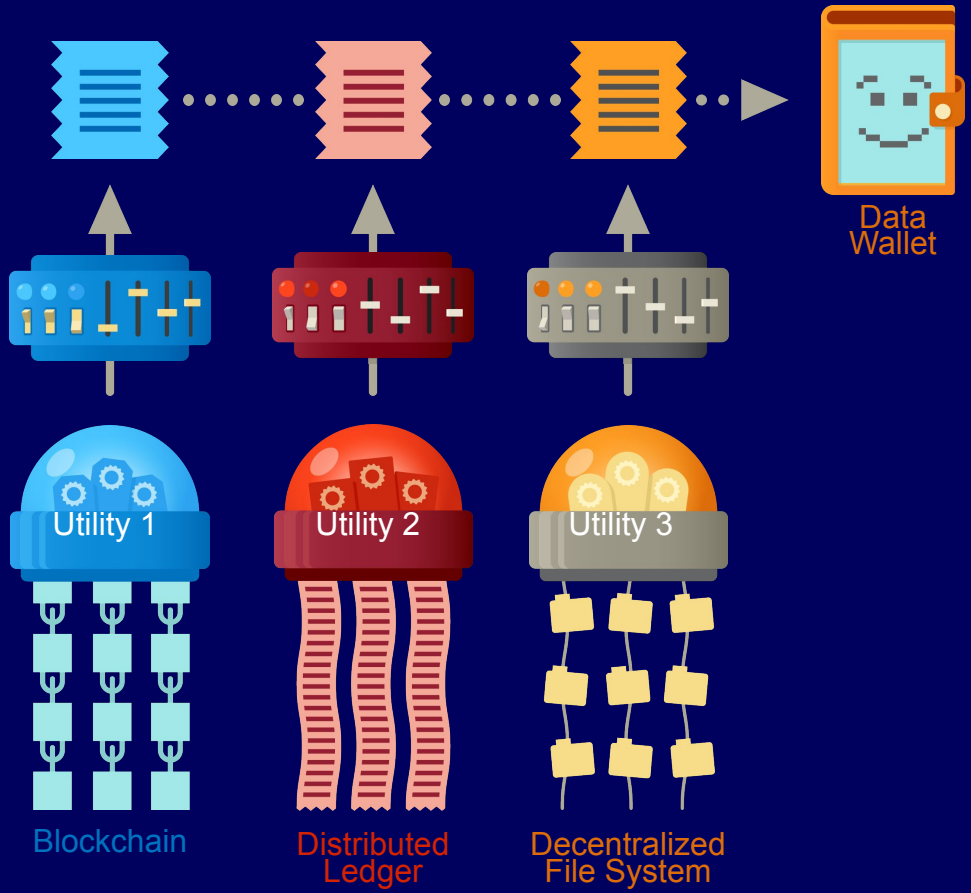
Credential Types

by Utilities

which can use various

Decentralized Record-keeping Technologies

Such as



APPLICATION ECOSYSTEM

ADOPTION

A critical mass is reached with wide-spread use within a sector or jurisdiction, yet may spread beyond

Ecosystem Example

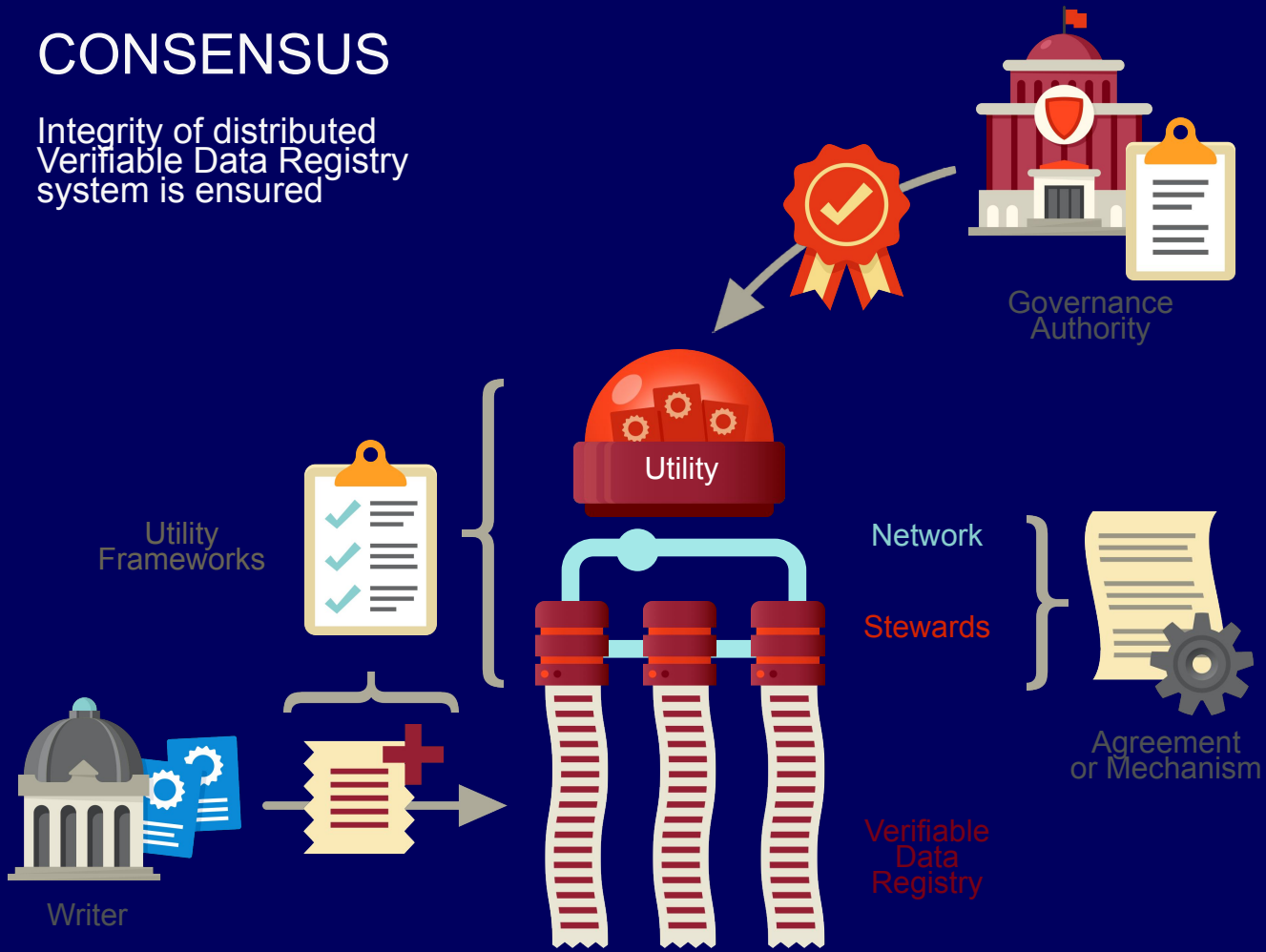
TECHNOLOGY

4

UTILITY FRAMEWORKS

CONSENSUS

Integrity of distributed Verifiable Data Registry system is ensured

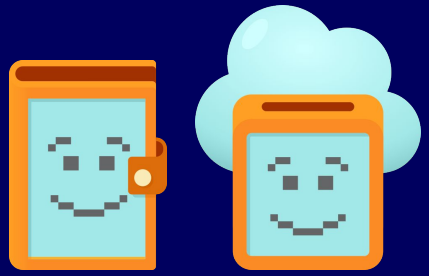


GOVERNANCE 1

AGENT FRAMEWORKS

Governance Authority

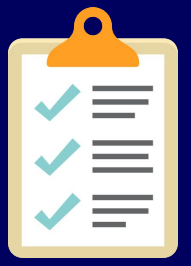
Data Wallet with Agent



Cloud Data Wallet with Agent

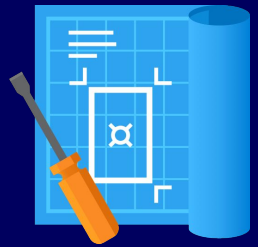
CERTIFY

Data wallets are built to standards for security, privacy, and data protection



Agent Frameworks

Software Provider



Hardware Provider

Agency

GOVERNANCE

CREDENTIAL FRAMEWORKS

ASSURE

Trusted authorities put their weight behind credentials and issuers (and registries thereof) if requirements are met

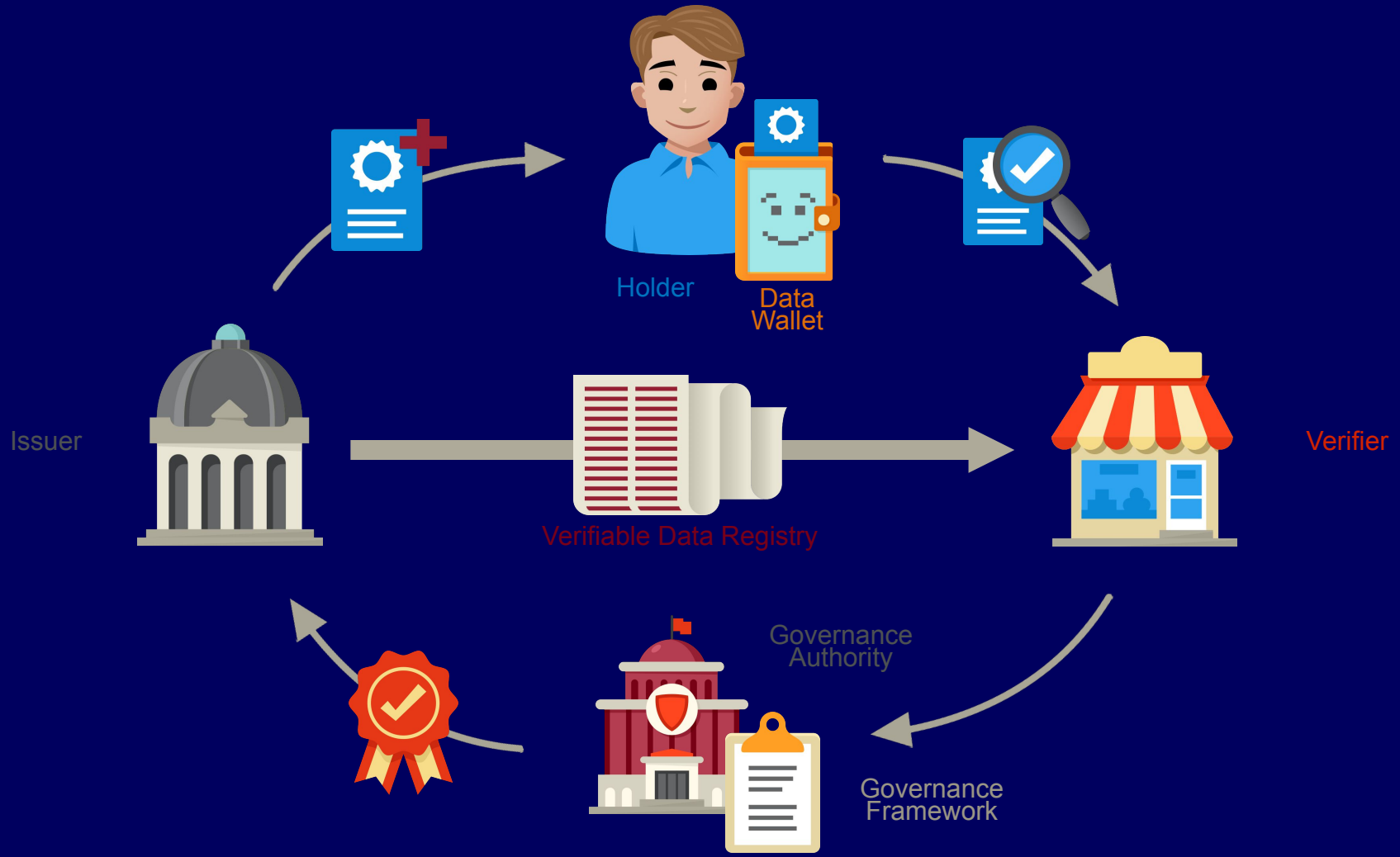
GOVERNANCE 3

ECOSYSTEM FRAMEWORKS

OVERSIGHT

An entire ecosystem is overseen by an authority to ensure interoperability and audit compliance

GOVERNANCE 4


Holder
Data Wallet
Issuer
Verifiable Data Registry
Verifier
Governance Authority
Governance Framework