Digital Twin as a Service Software Platform

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WHAT IS THE PROBLEM WE ARE ATTEMPTING TO SOLVE?

DTaaS

How can users collaborate to:

- Build digital twins (DTs) using existing DT components
- Share them
- Provide DTs as Service

How can the DT software platforms:

- Support DT lifecycle
- Scale up rather than scale down (flexible convention over configuration)

WHAT IS OUR APPROACH?

DTaaS

- Support for transition from existing workflows to DT frameworks
- Create DTs from reusable assets
- Offer DT as a service
- Integrate with external systems
- Separate configurations of independent system components

What is DTaaS ?

It is a platform to:

Create, Use, and Share Digital Twins

Support Digital Twins from Many Engineering Domains

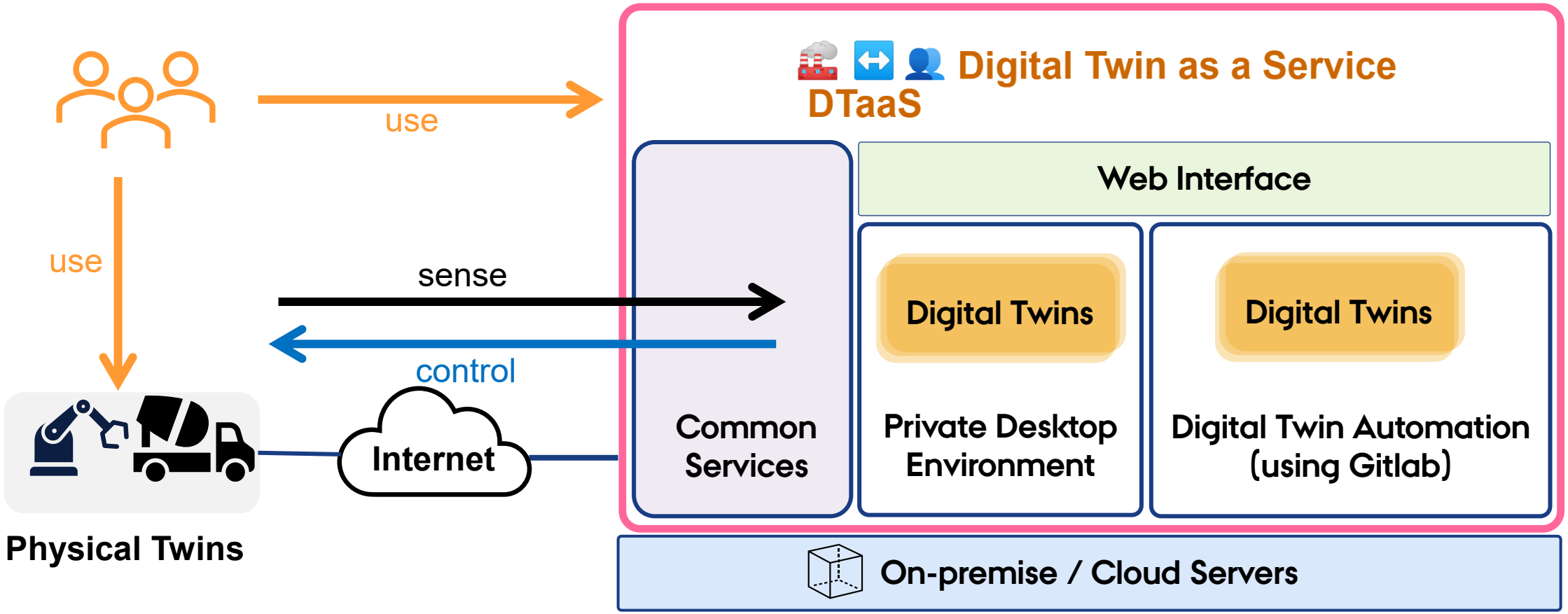
Provides private workspaces

Run Digital Twins as Services

Scalable execution of Digital Twins

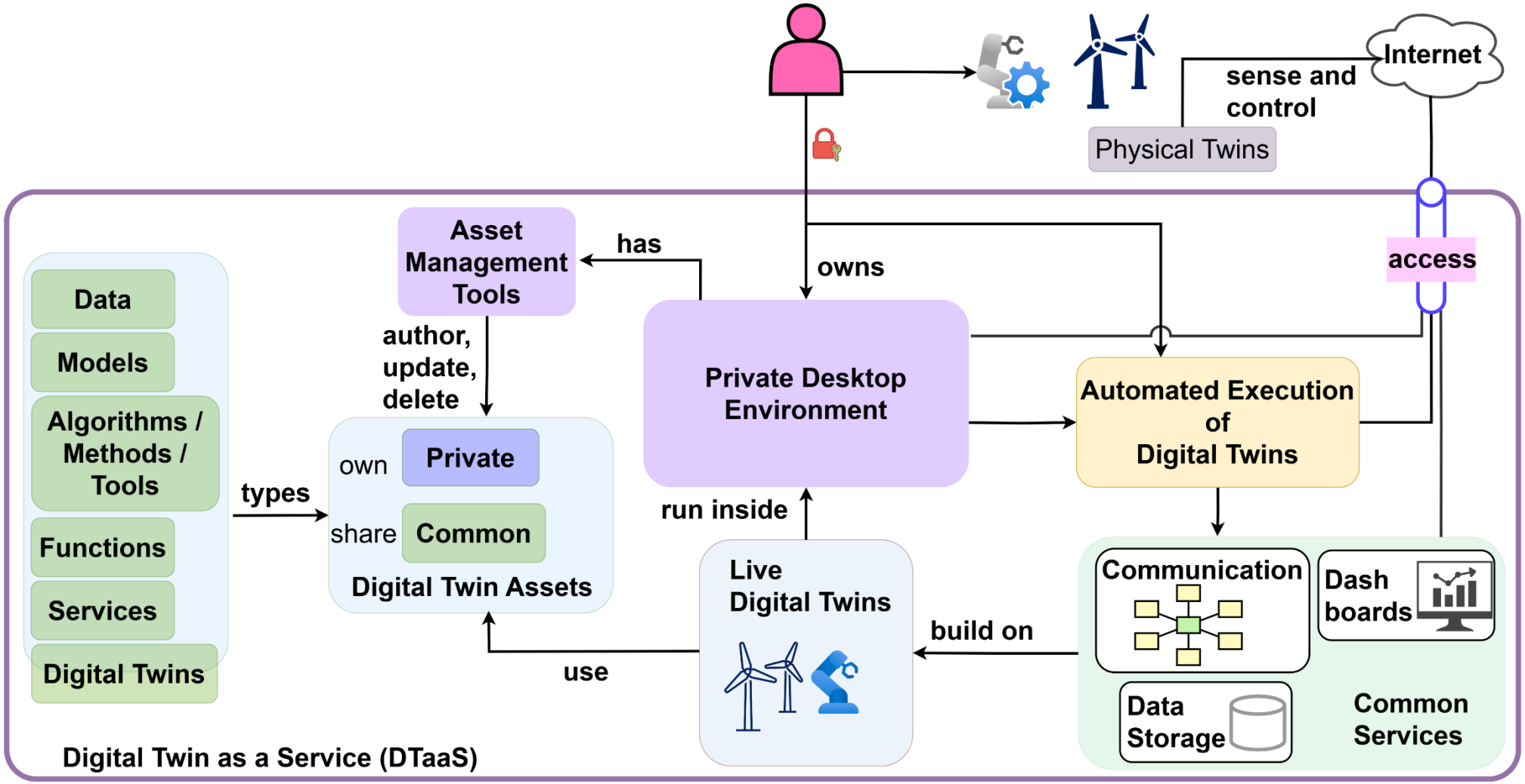
Easy to use: familiar desktop environment

A User Centric View of DTaaS



USER WORKSPACE IN DETAIL

DTaaS

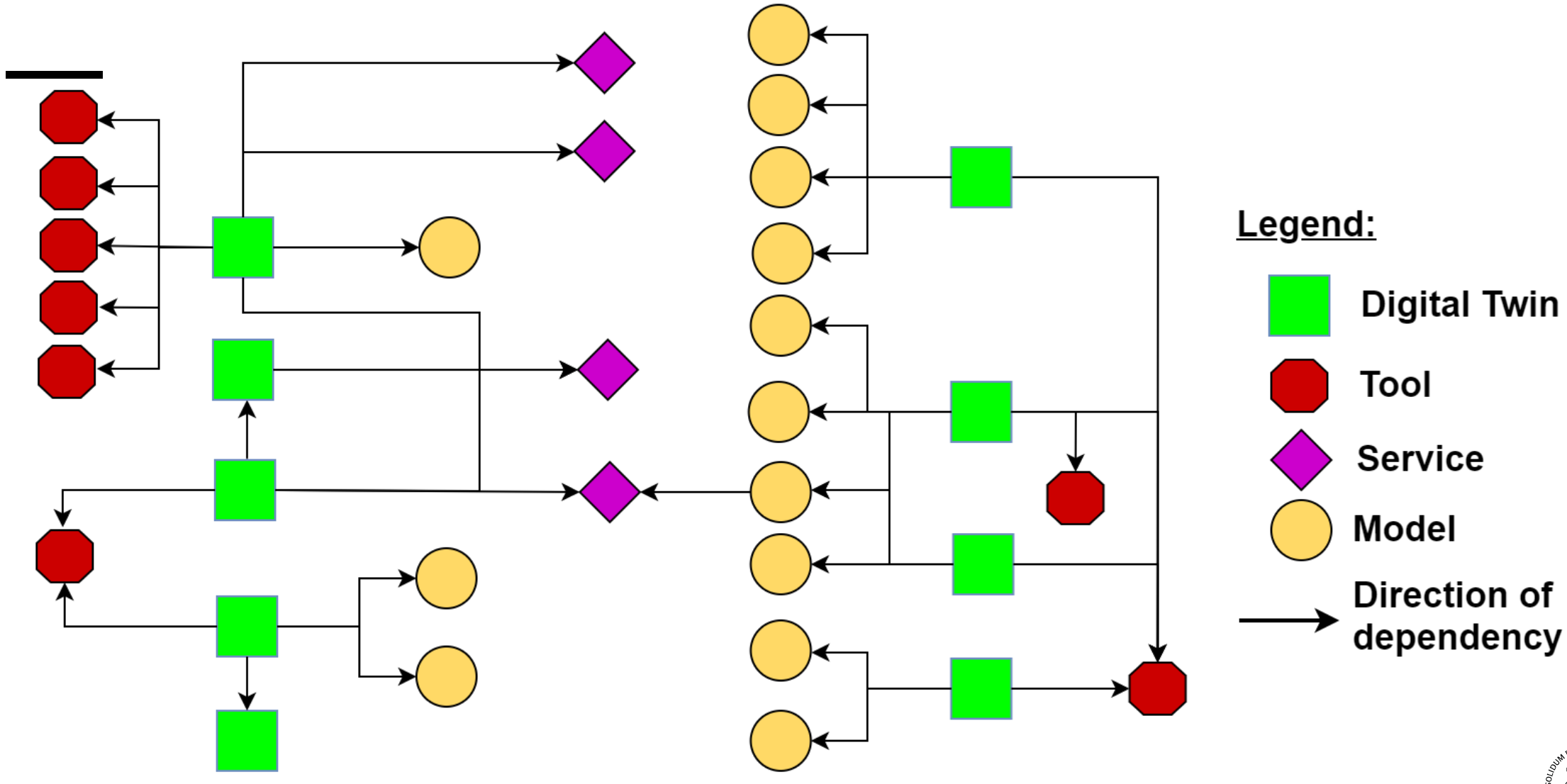


Ref: Adapted from Jensen, A. M. D., Schoerghofer-Queiroz, A., Ulriksen, M. D., Tcherniak, D., Damkilde, L., Talasila, P., Larsen, P. G., and Abbiati, G., *'Digital twin as a service for damage prognosis of offshore wind turbine foundations'*, Aarhus University, ISMA 2024

ENGINEERING

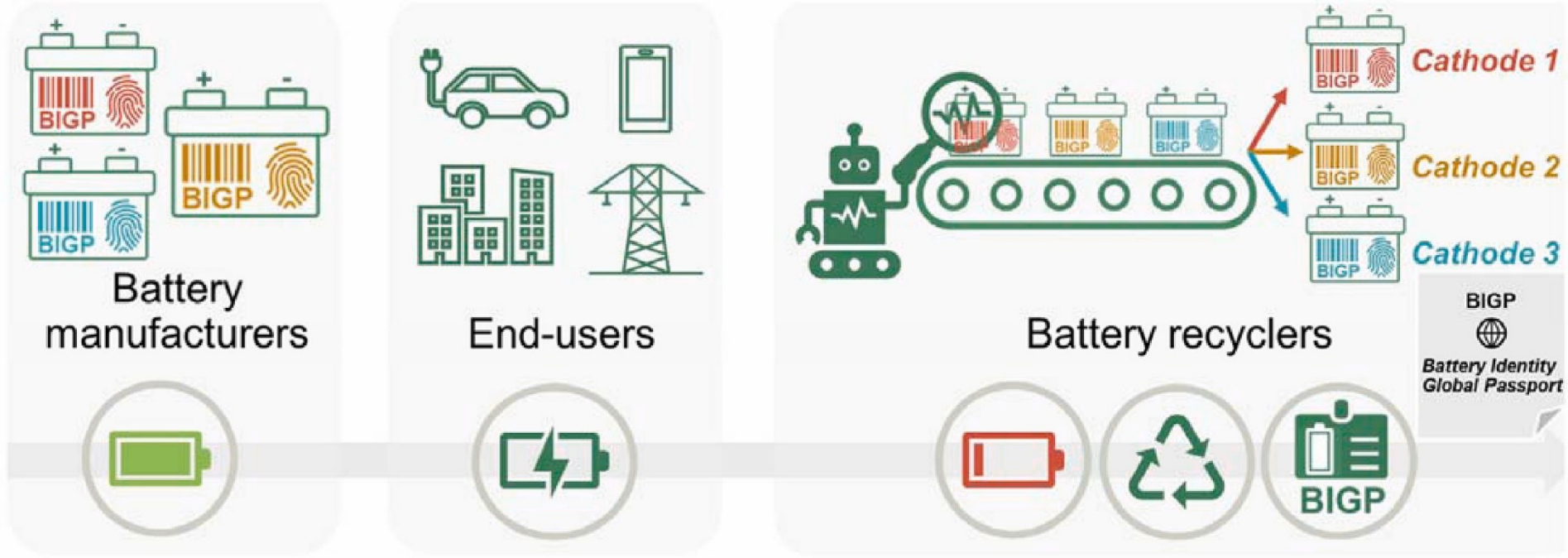
COMPOSITION OF REUSABLE DT ASSETS

DTaaS



DTaaS

An Example of DT/PT Lifecycle

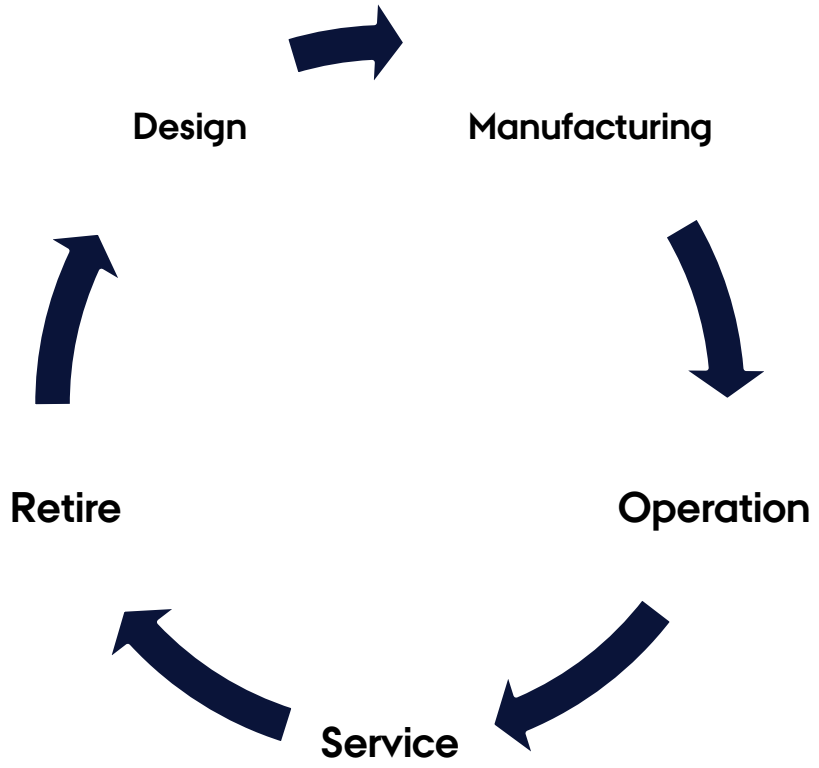


Lifecycle

Ref: F. Naseri, S. Gil, C. Barbu, E. Cetkin, G. Yarimca, A.C. Jensen, P.G. Larsen, C. Gomes, Digital twin of electric vehicle battery systems: Comprehensive review of the use cases, requirements, and platforms, Renewable and Sustainable Energy Reviews, Volume 179, 2023,

DTaaS

A dedicated script/program to represent one lifecycle phase

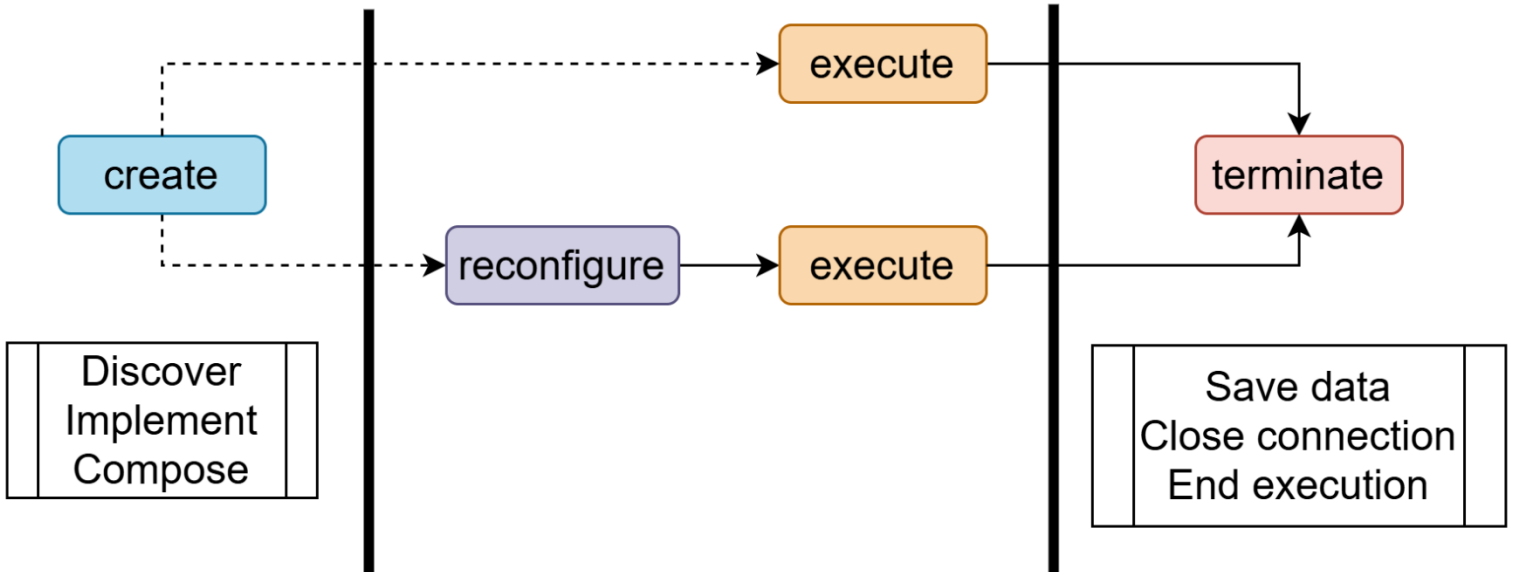


[Please see existing examples]

Digital Twin Automation Workflow

DTaaS

1. Go to **Workbench → Library** Page Preview
2. Select required Digital Twin assets and click **Proceed**
3. Add new files, edit configuration and **Save** the new Digital Twin
4. If you wish to update existing Digital Twins, go to **Digital Twins → Manage** tab
5. Edit the Digital Twin and Save
6. Go to **Execute Tab** and **Execute** the required Digital Twin
7. See the **Logs** of execution



AARHUS UNIVERSITY

Ref: Frasheri, Mirgita, Prasad Talasila, and Vanessa Scherma. "Towards Federated Digital Twin Platforms." *arXiv preprint arXiv:2505.04324* (2025).

RELEVANT LINKS

Use existing installation:

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Research Paper

https://doi.org/10.1177/00375497241298653

Docs

https://into-cps-association.github.io/DTaaS/

Software

https://github.com/INTO-CPS-Association/DTaaS/releases

Examples

https://github.com/INTO-CPS-Association/DTaaS-Examples