



DIGITAL THREADS AND DIGITAL TWINS

How to work with partners when your worlds don't look the same

PLM Road Map™ & PDT North America 2025

PLM's Integral Role in Digital Transformation From Strategy to Execution

*Elevating PLM to an Enterprise Business Solution,
the PLM Professional's Road Map to Success*

CIMdata®

May 7 & 8

-eurostep-

CAREER HISTORY



Phase 1 – Graduate 2006-2008

Manufacturing Improvement (B'Wick UK)
Design Engineering (Derby UK, Berlin DE)
Manufacturing Services (Hucknall UK)
Operations (Indianapolis US)
Logistics & Quality (Bristol, UK)



Phase 2 – Manufacturing 2008-2016

Production Operations (Inchinnan UK)
Production Operations (Derby UK)
MES Implementation (Derby UK, Singapore)
Central MES lead (Global, UK Based)



Phase 3 – IT 2017-Present

MES Solution Architect
Manufacturing Solution Architect
Solution Development Lead
Enterprise Architect (Engineering)
Head of Enterprise Architecture (Apps)
Digital & IT Strategy Lead



INSIDE ROLLS-ROYCE



Three Business Divisions

Partnerships

CIVIL AEROSPACE



Business Aviation



Widebody



Narrowbody

DEFENCE



Transport



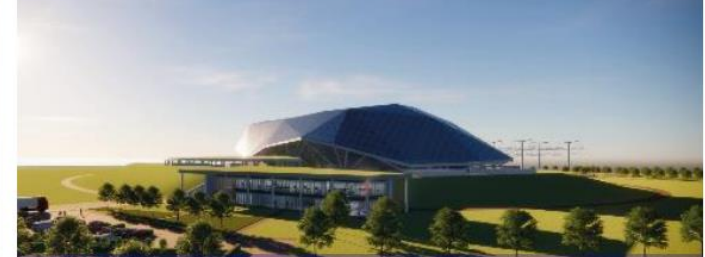
Combat



Submarines



Micro-Reactors



SMR

POWER SYSTEMS



Governmental



Marine



Power Generation & Battery Storage

This slide contains a video that will be shown on the day

Product Requirements

Preliminary Concept Definition

Full Concept Definition

Product Realisation

Define

Innovation & Opportunities

- Services
- Piece Part Manufacturing
- Product Assembly

NEW PRODUCT INTRODUCTION

IN-SERVICE SUPPORT

Verification & Validation

PRODUCTION

Aftersales Support & Maintenance Repair Overhaul (MRO)

Invoice & Treasury

Delivery

Logistics

Manufacturing Operations

Supply Chain

Enterprise Business Systems

Financial Systems

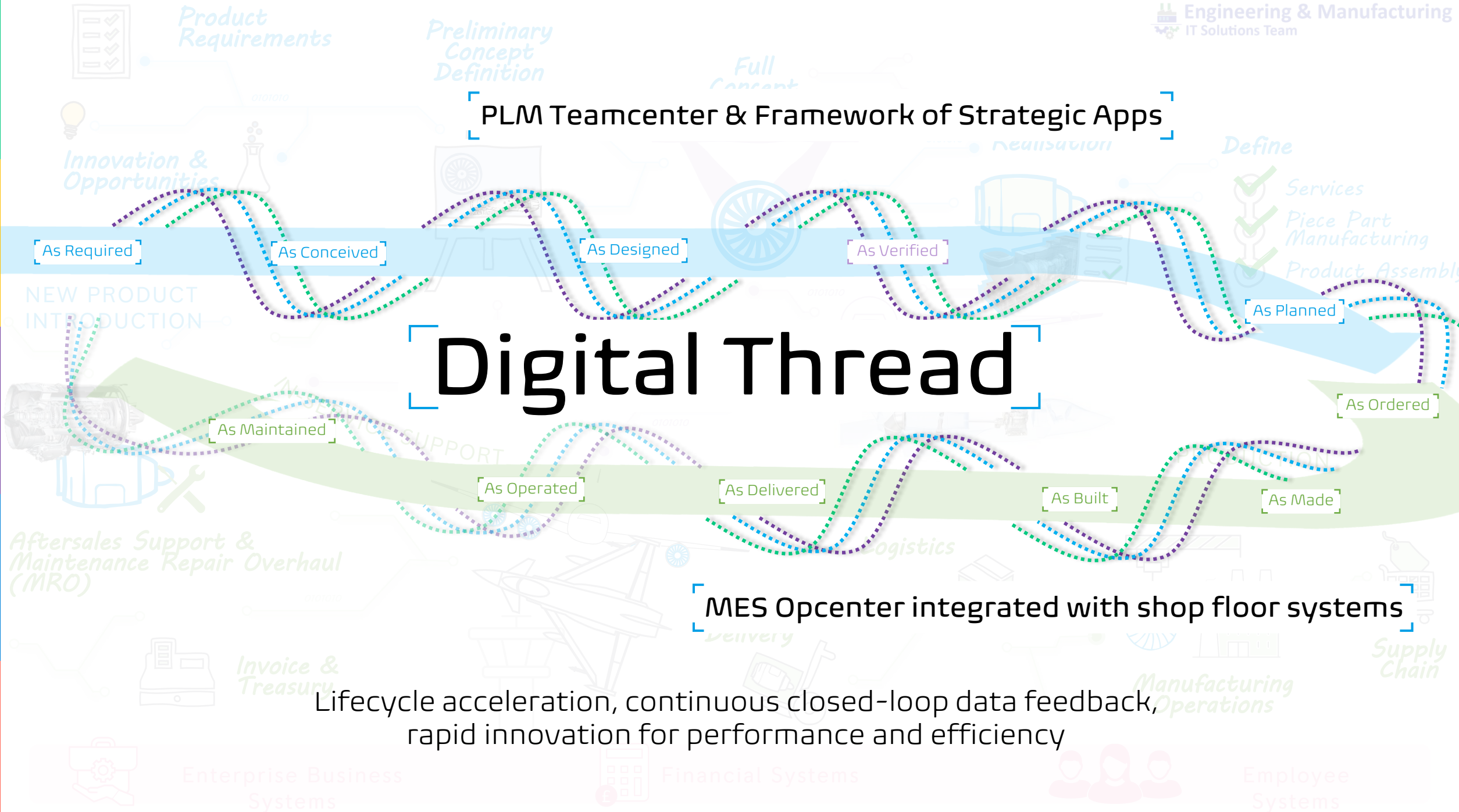
Employee Systems

PLM Teamcenter & Framework of Strategic Apps

Digital Thread

MES Opcenter integrated with shop floor systems

Lifecycle acceleration, continuous closed-loop data feedback,
rapid innovation for performance and efficiency











A man in a dark blue polo shirt is wearing a VR headset and safety glasses. He is standing in a factory or workshop, with a large, complex piece of machinery, possibly a jet engine component, in the background. The scene is brightly lit, and there are various cables and hoses visible. The overall atmosphere is industrial and high-tech.

Staying safe

THE ORGANISATIONAL NEEDS



<p>Flexibility</p> 	<p>Flexibly work with experts</p>	<p>Flexibly work with suppliers</p>	<p>Flexibly work with customers</p>	
<p>Efficiency</p> 	<p>Make the easy thing to do the right thing to do</p>	<p>Allow our people to work on as much as they can</p>	<p>Transferable use of Niche expertise</p>	
<p>Cyber Security</p> 	<p>Comply to all national and international regulations</p>	<p>Know what we must protect and show that we have</p>	<p>Eliminate security risks</p>	
<p>IT</p> 	<p>Deliver new capability faster</p>	<p>Reduce the cost of ownership</p>	<p>Support a changing business</p>	

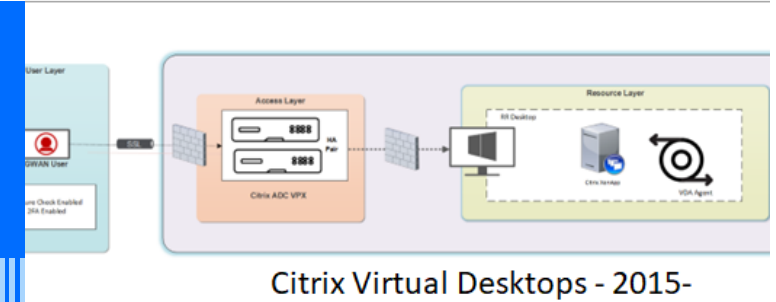
THREE ROUTES TO COLLABORATION



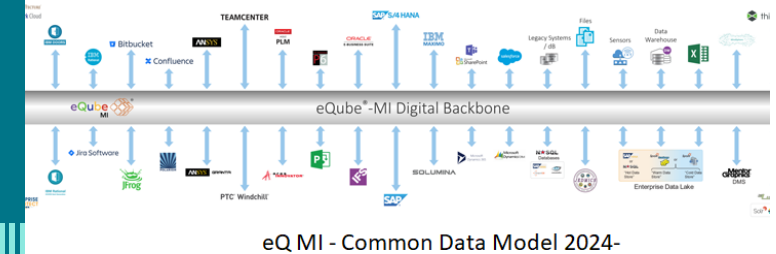
Uncomfortable Truths

- There is no one-size fits all solution for collaboration
- Collaborating securely isn't cheap
- We pick our partners because they can help us succeed faster... but if we enforce our way of operating on them, that might not be true

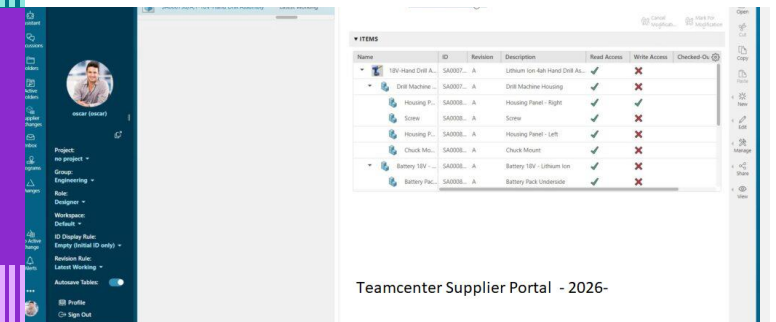
Collaboration when we need expertise and capacity from an Engineering Service Partner



Collaboration when we need to co-create products and they also have design authority



Collaboration with our supply chain where we want them to successfully make our designs



THE CHALLENGE



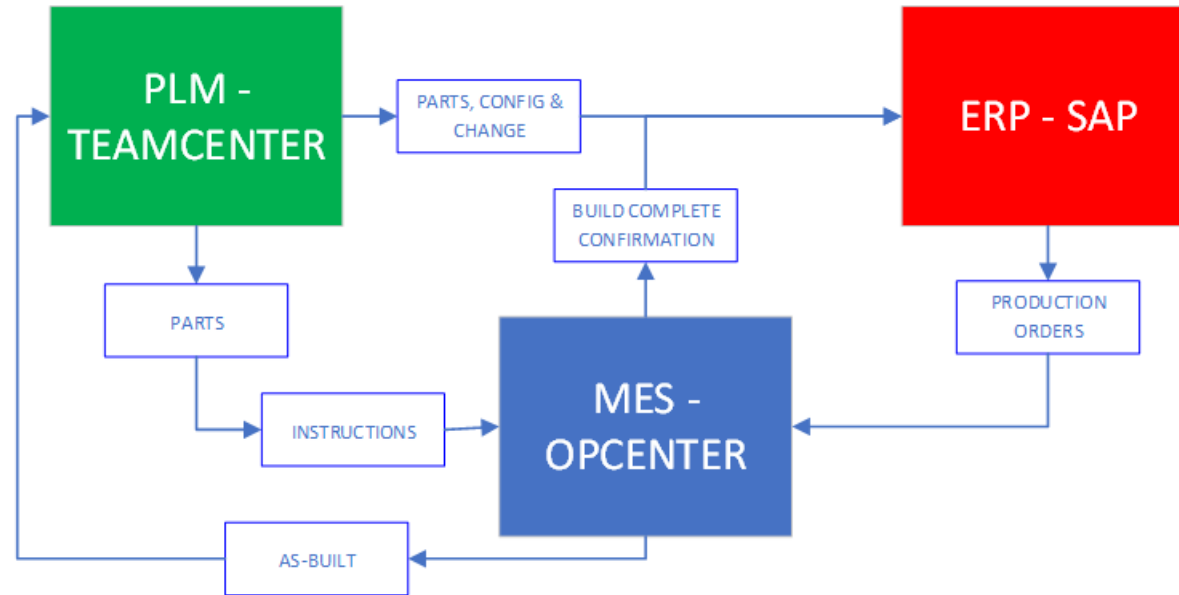
- A project requiring multiple partners to collaborate
- Sharing Design Data digitally between PLM systems
- Collaborate in-context
- Intellectual Property
- Each Partner has different methodologies.



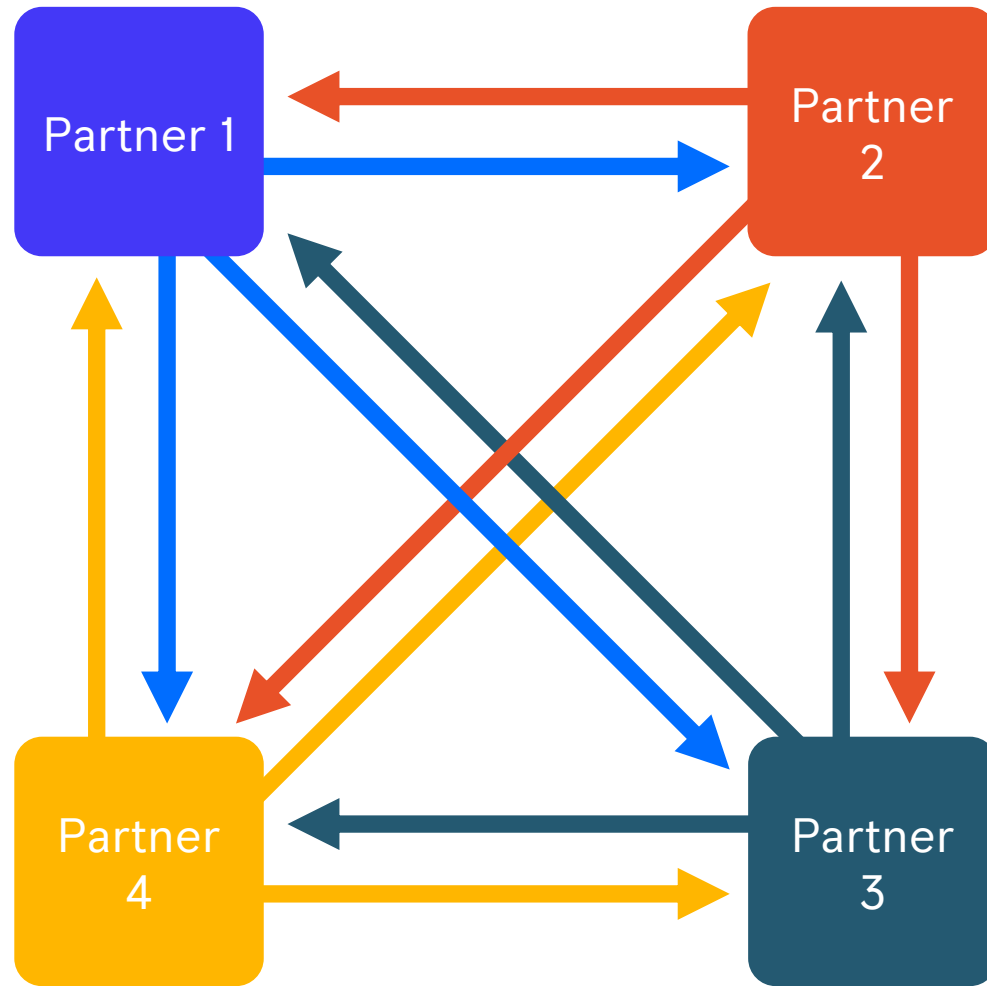
CLOSED LOOP



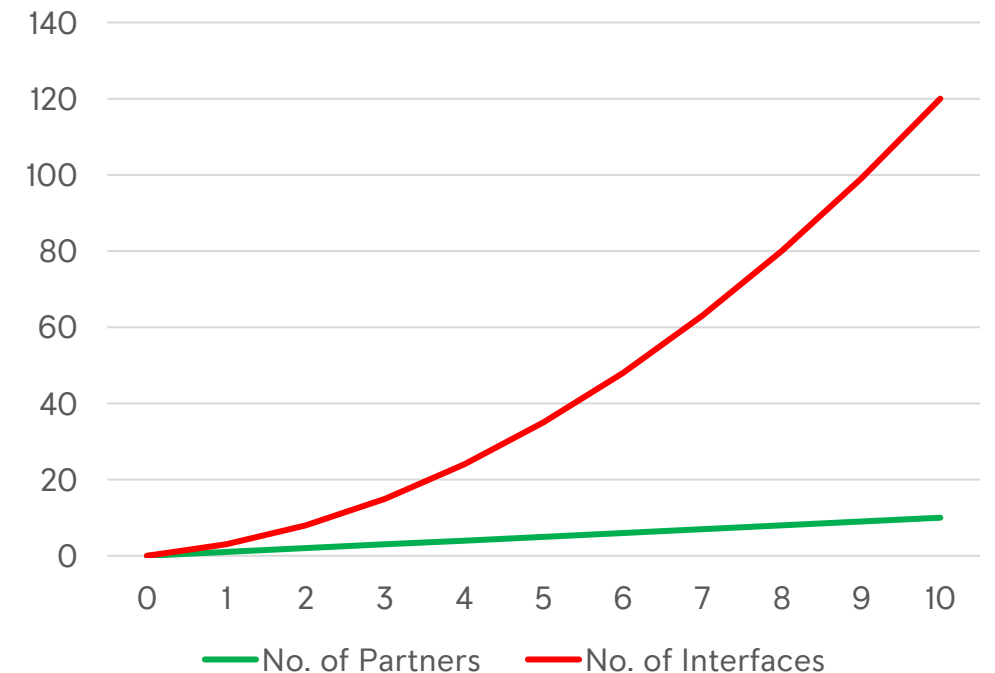
- Systems are different
- Processes are different
- PLM Data Model is different
- How the data is connected is different



THE TRADITIONAL INTERFACE APPROACH



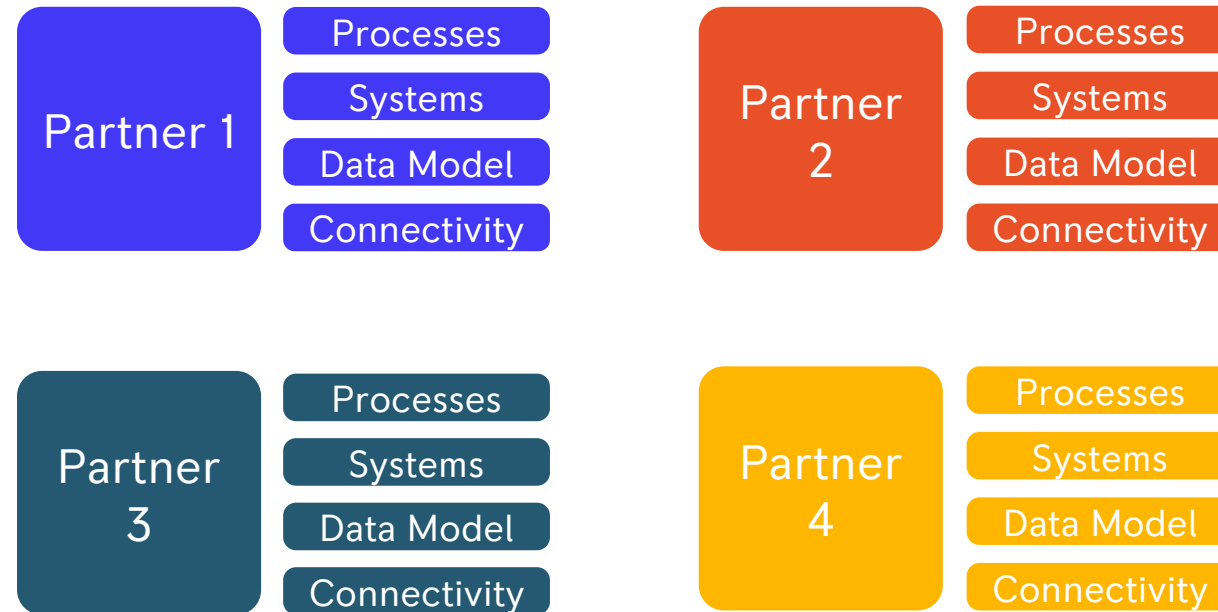
- Scalability is limited, each partner that is added to the collaboration increases the number of interfaces exponentially.



THE SOLUTION – COMMON DATA MODEL

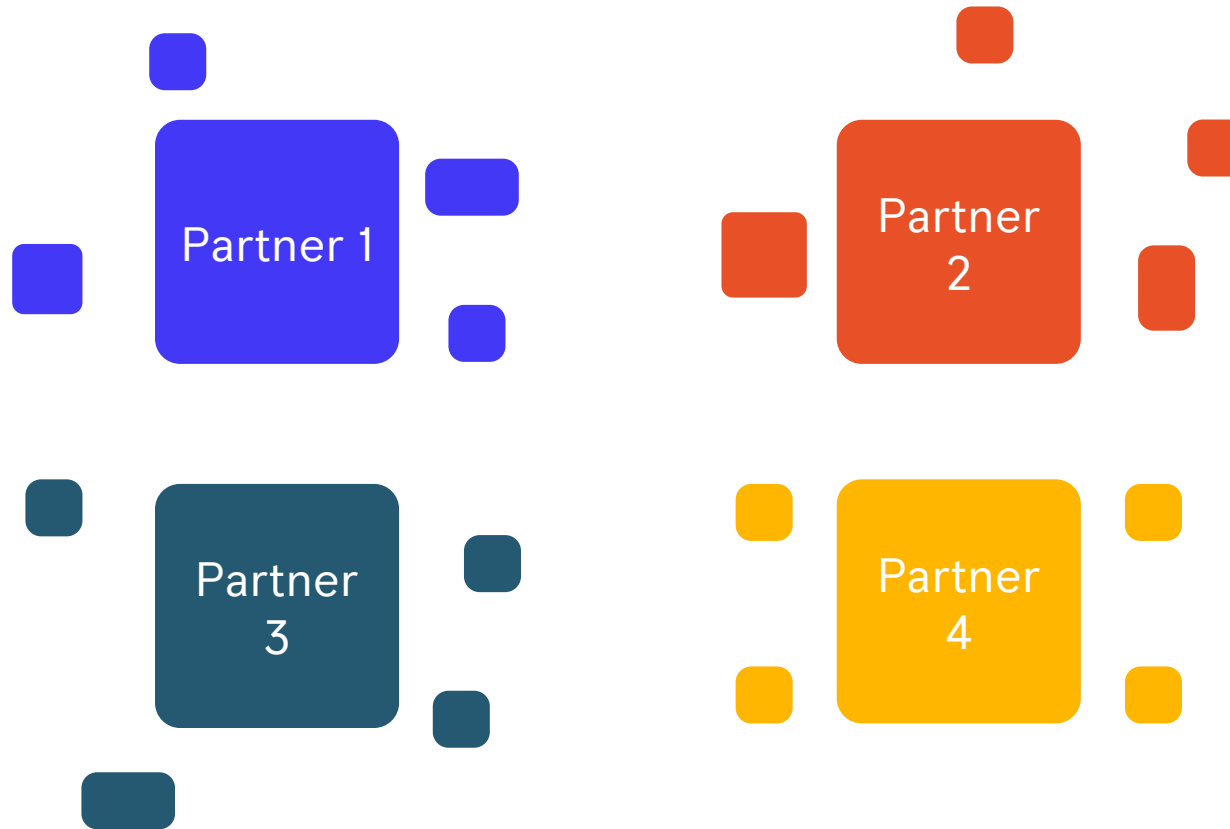


THE SOLUTION – COMMON DATA MODEL



Continue to work the way you do today within your own Processes,
Systems, Data Model and Connectivity

THE SOLUTION – COMMON DATA MODEL



Each partner maintains operational control over their own
tried and tested approach

THE SOLUTION – COMMON DATA MODEL



Partner 1

Partner 2

Partner 3

Partner 4

Each partner maintains operational control over their own
tried and tested approach

THE SOLUTION – COMMON DATA MODEL



Each partner maintains operational control over their own
tried and tested approach

THE SOLUTION – COMMON DATA MODEL



Partner 1

Partner 2

Common
Data
Model

Partner 3

Partner 4

Each partner maintains operational control over their own
tried and tested approach

THE SOLUTION – COMMON DATA MODEL



Partner 1

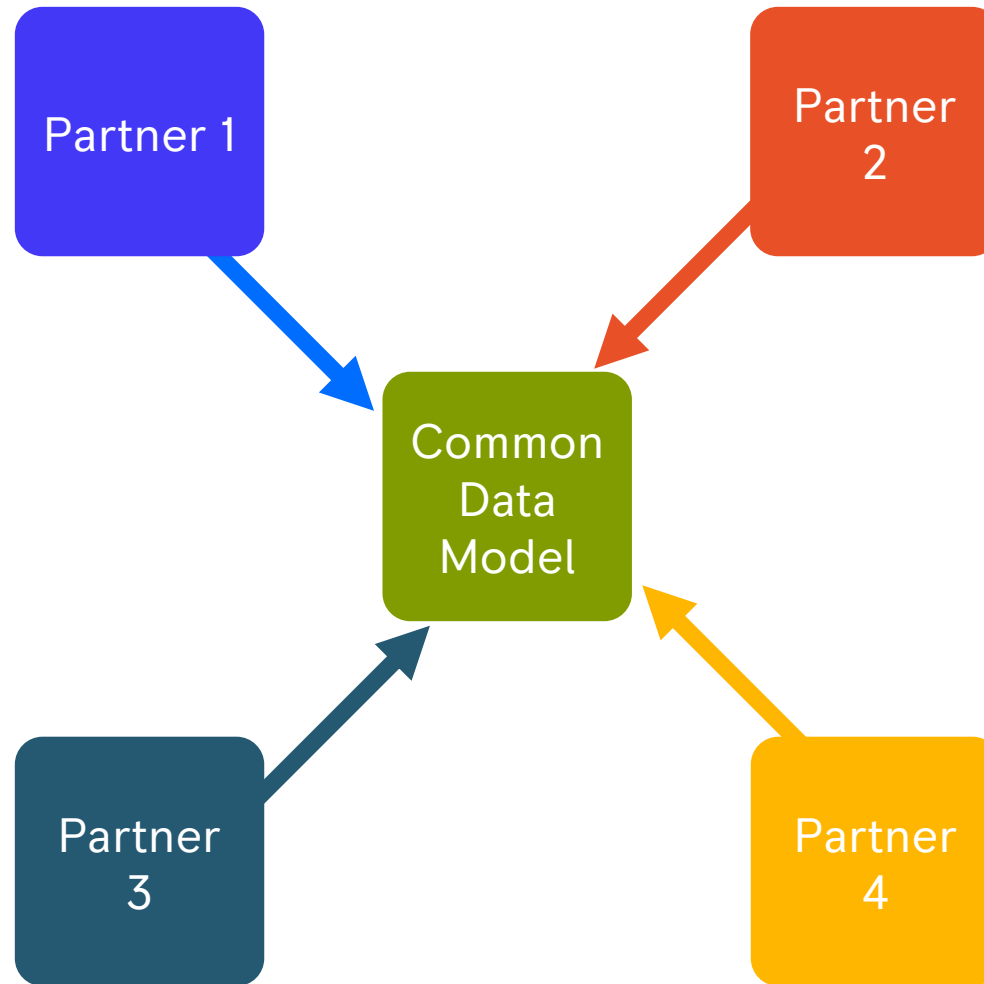
Partner 2

Common
Data
Model

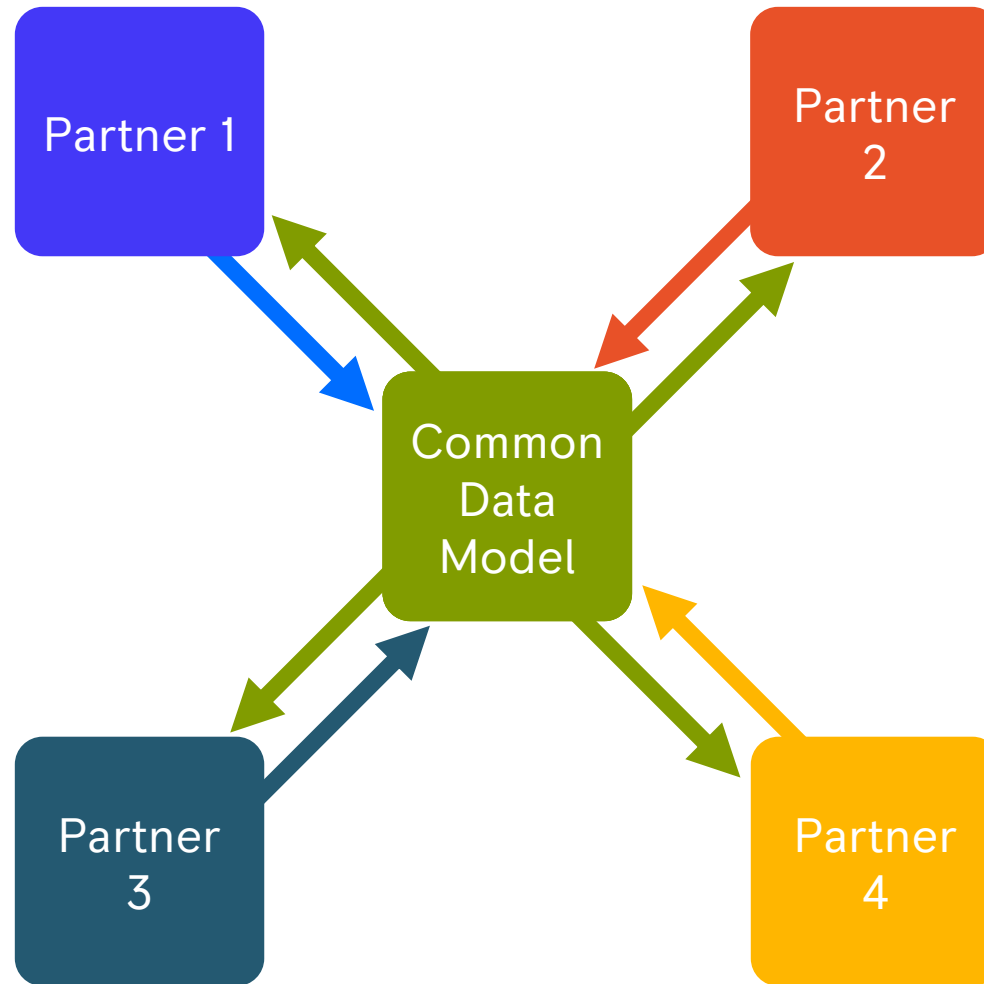
Partner 3

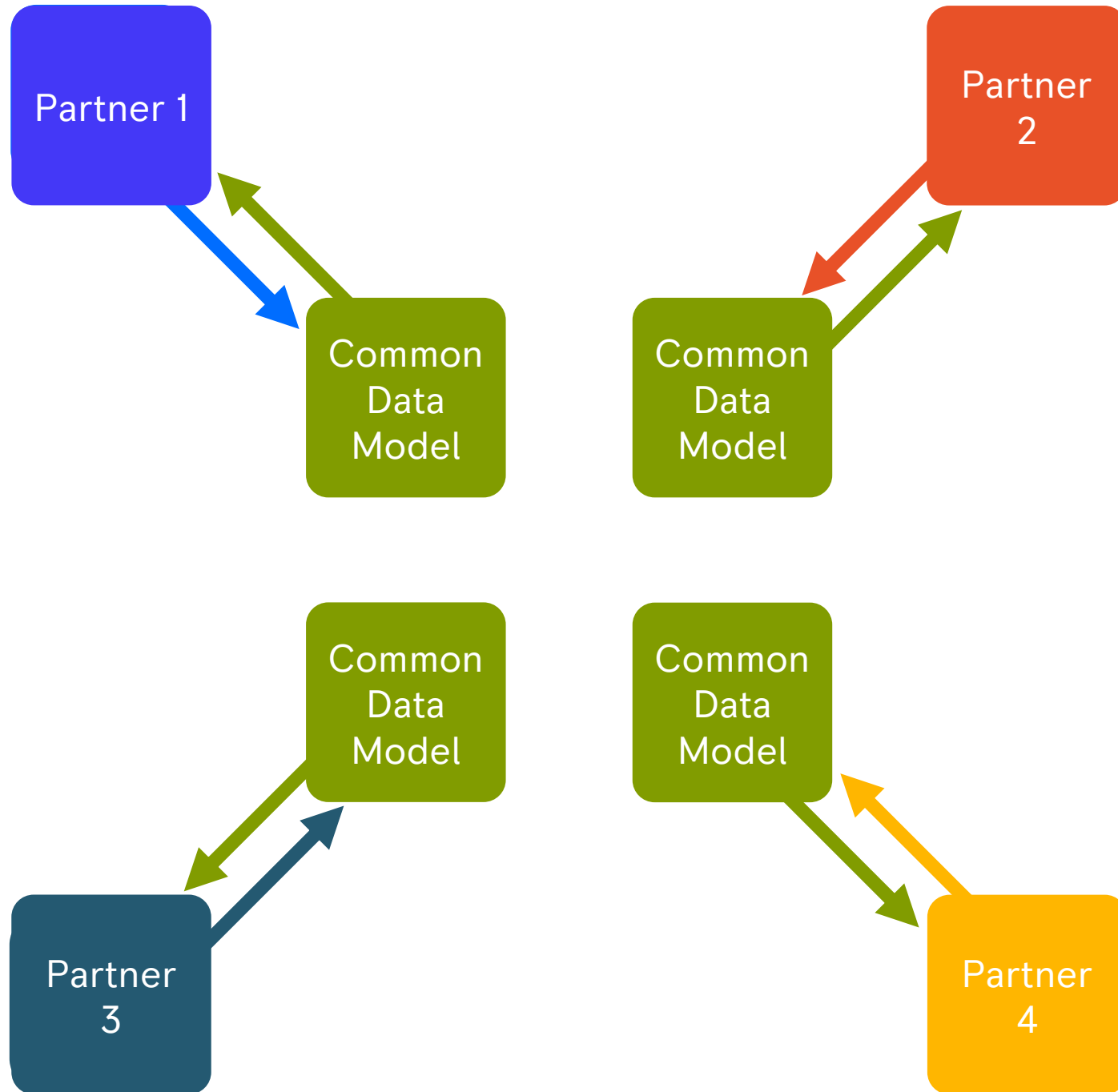
Partner 4

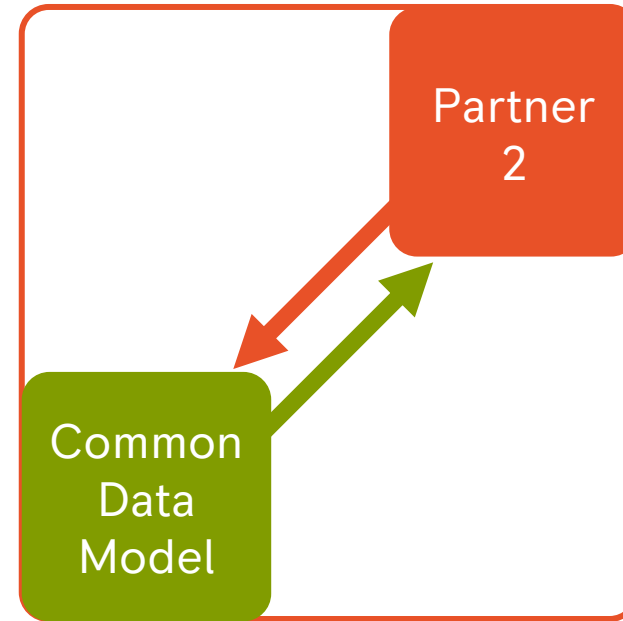
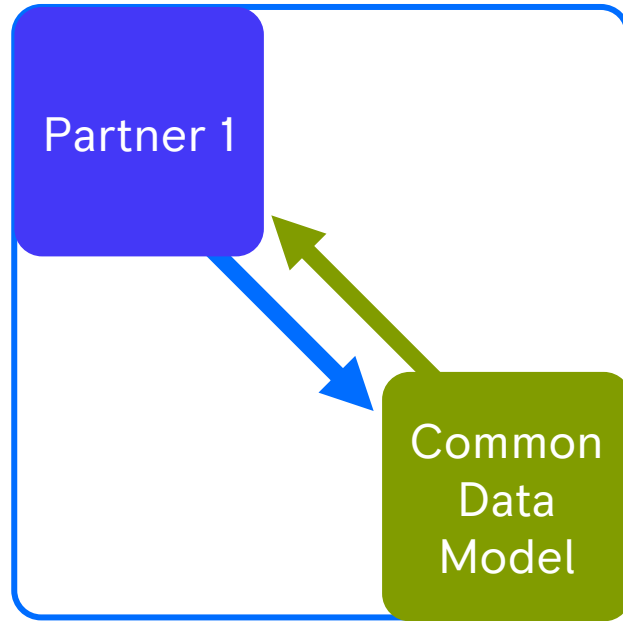
THE SOLUTION – COMMON DATA MODEL



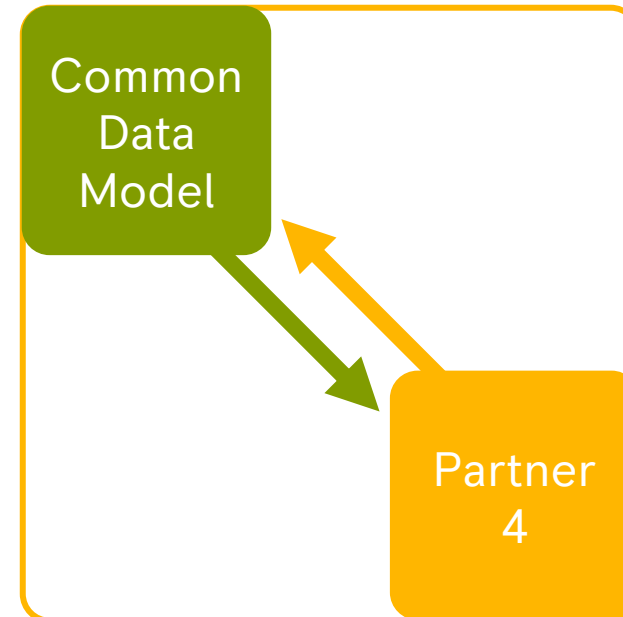
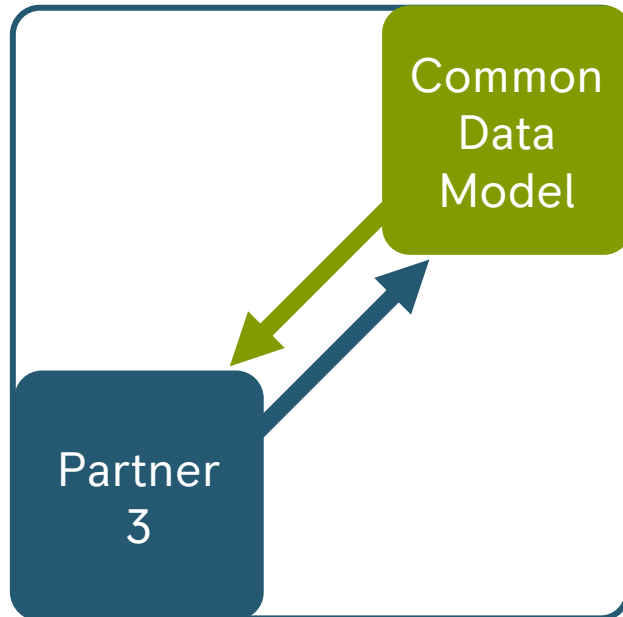
THE SOLUTION – COMMON DATA MODEL



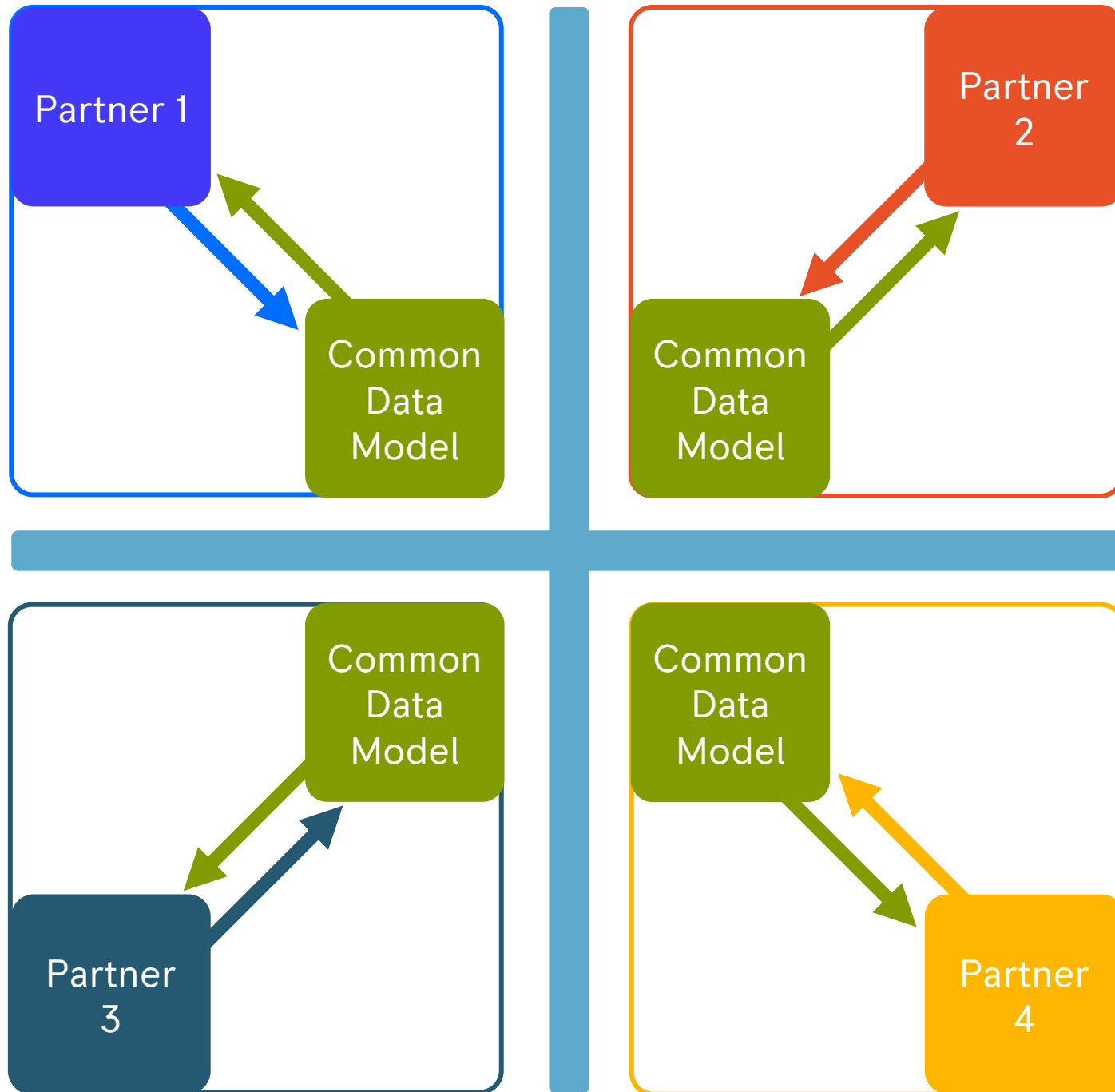




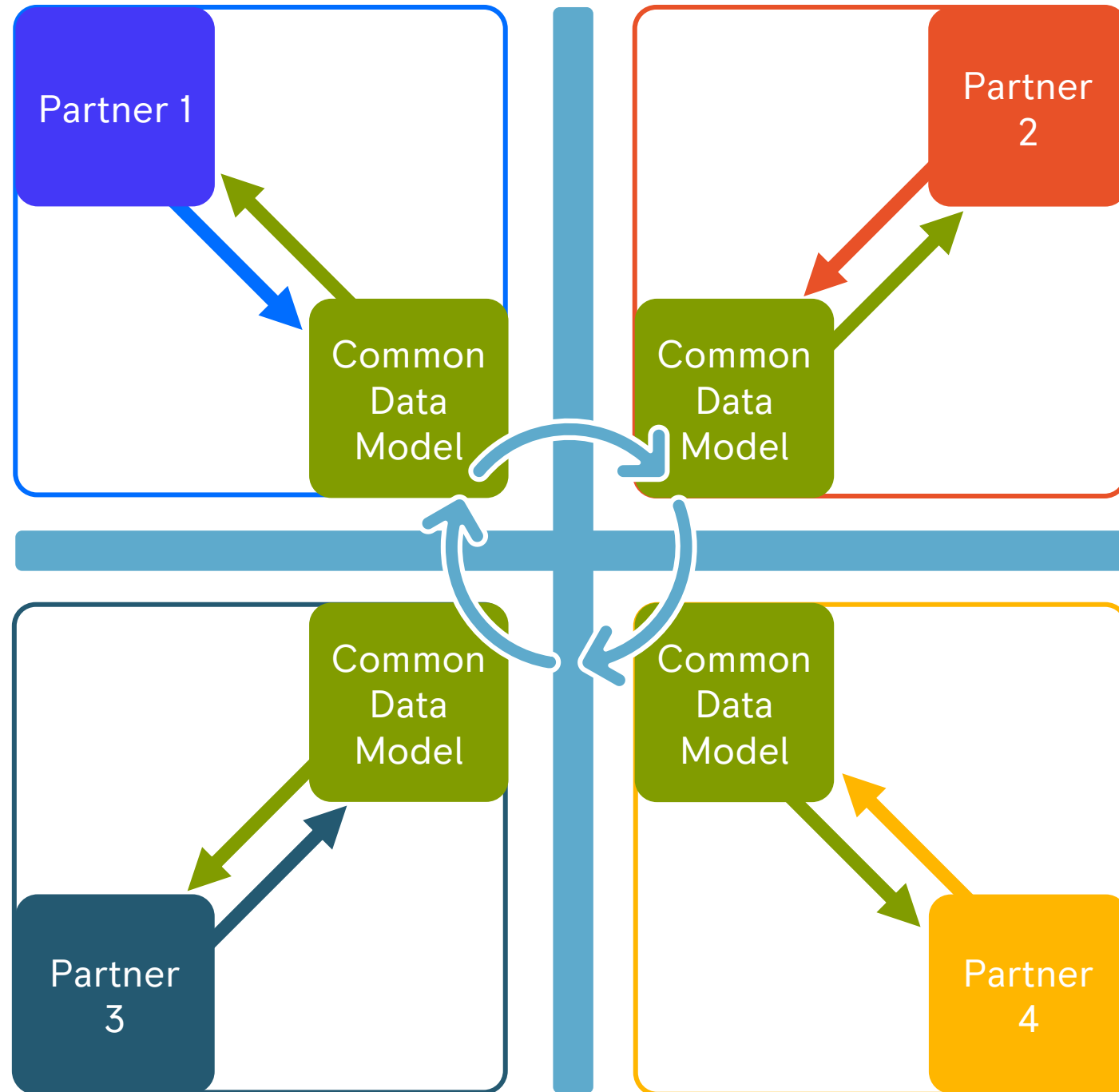
Each partner maintains their own security setup

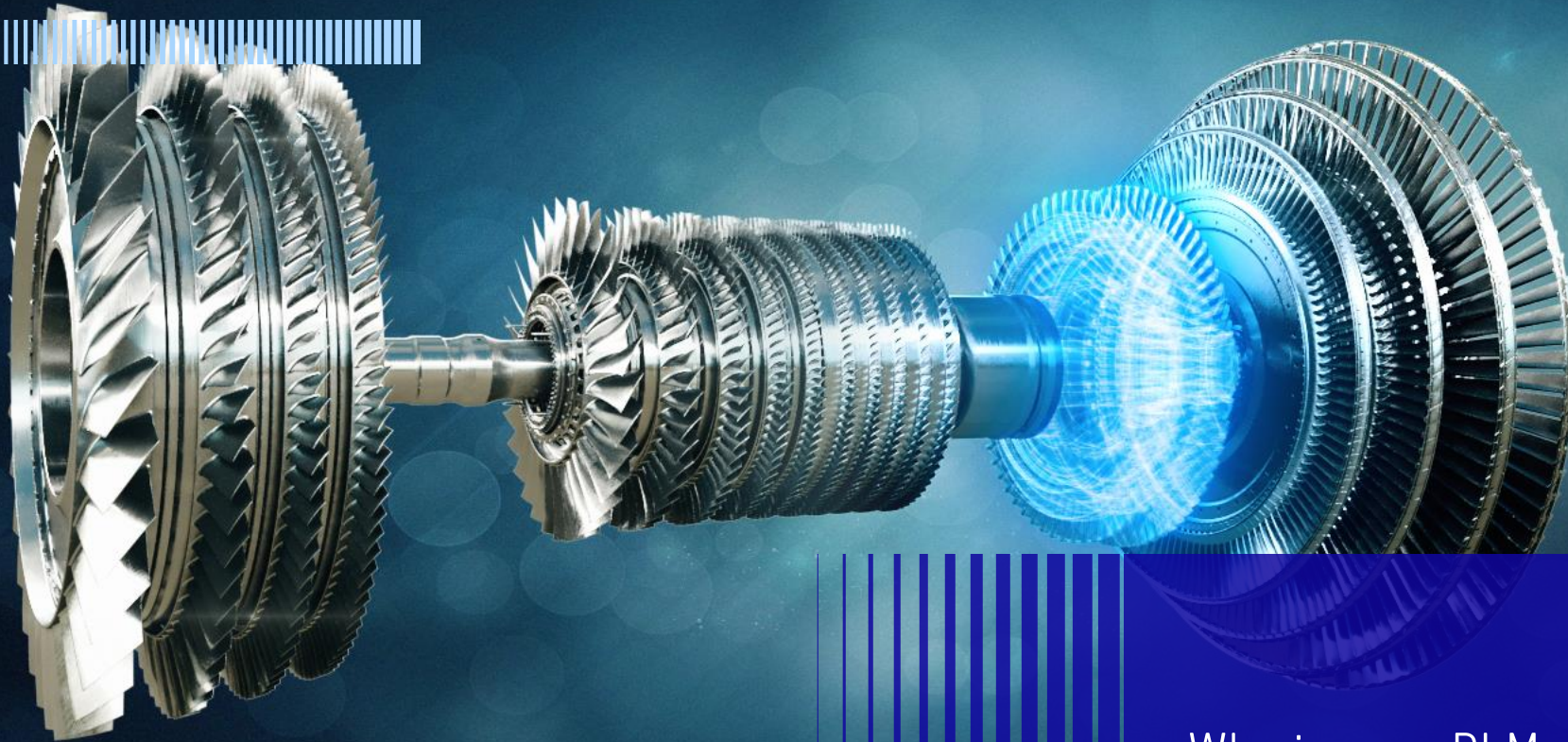


Encrypted
Data
Transportation



Encrypted
Data
Transportation





Why is your PLM vendor relationship important?

LETS GO BUY A VEHICLE...





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