INSIGHTS. INSPIRE. INNOVATE.

SAP Digital Supply Chain Masterclass

Engineering Excellence with Product Lifecycle Management 4.0

Speaker's Name, SA02 P
Mar , 2021

THE BEST RUN **SAP**

Speakers

Praveen Ramamurthy
Director, Global Center of Excellence, Digital Supply Chain, SAP
Praveen.Ramamurthy@sap.com

Sankar Natarajan
Global Consulting Head – Digital Product Value Chain & Industry 4.0
Wipro Limited
Sankar.Natarajan1@wipro.com

Agenda

1 **A Dream Team brings unique value**

2 **Enabling Digitalization of Product Value Chain**

3 **Next Generation Integration**

Agenda

1 **A Dream Team brings unique value**

2 Enabling Digitalization of Product Value Chain

3 Next Generation Integration

THE BEST RUN **SAP** **&** **SIEMENS**
Ingenuity for life

The Dream Team.

Two industry leaders combine their expertise in product lifecycle, supply chain and asset management to deliver unprecedented new innovations and business models that remove silos, and accelerate industrial transformation.

The best of **both worlds**

SAP

The world leader in enterprise application software and end-to-end supply chain solutions, from product design to operations. Built on a digital platform that delivers a completely intelligent enterprise with the world's largest business network.

**SIEMENS**
Ingenuity for life

The leader in product lifecycle software and digital transformation, with expertise in mechanical, electronic and software engineering, Siemens Digital Industries Software is an innovation and technology leader in industrial automation and digitalization.

- Dramatically improve time to value

- Design products with real-time supply chain

- Create a sustainable product development process

- Create a single digital thread

The digital thread that ties everything together

The holy grail of product and asset lifecycle management is born.
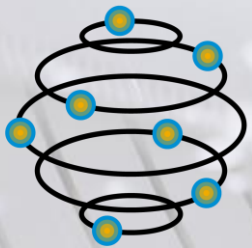
It's been the dream of every manufacturer, product design team, and service lifecycle manager to have a single digital thread that integrates all the real-time information, feedback, performance, and data on a product from cradle to grave. Now every downstream team will have in-the-moment access to what every other group is doing. Processes will go from reactive to predictive.

THE BEST RUN SAP & **SIEMENS** *Ingenuity for life*

How the Partnership will Work

- SAP to begin reselling Siemens Teamcenter software as its core platform for product data management.

- Siemens to begin reselling SAP Intelligent Asset Management and SAP Project and Portfolio Management.

- SAP and Siemens will provide an integrated digital thread across the product lifecycle for their customers.

- SAP and Siemens remain committed to supporting existing installed base customers throughout their lifecycle

- Industry 4.0 Alliance

INDUSTRY 4.0 – Future of Productivity

Revenue Secure - TTM, TTV

Cost Reduction - Production, Inventory, Maintenance

Cash flow - Days in Inventory

New Revenue Stream – New business model & Services

X+O

SMART FACTORY

Customers

Design

Sales

Planning * ML

EHS

* Block Chain

Logistics

Delivery

Operate / Services

Discrete & Process Industry

* IoT, ML, AR...

Idea & Requirements

Project & Portfolio

Master Data, BOM, Document

Robot, AGV...

PLC, OPC...

Predicitve Quality

Digital Twin

* ML

Predictive Maintenance

Mobile...

NETWORK
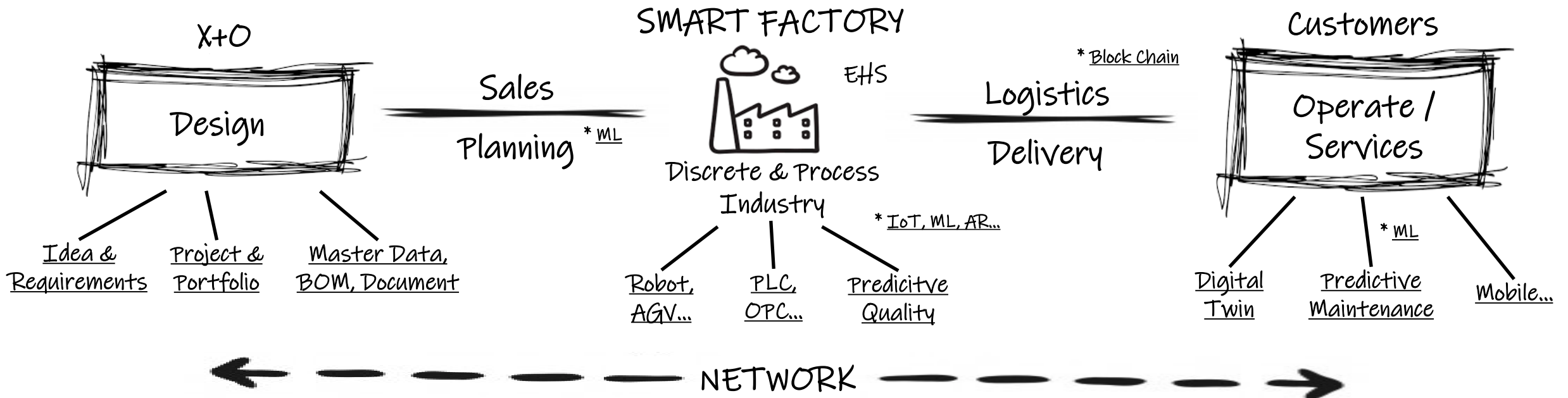
Siemens & SAP: Creating End-to-End Process Threads
Partnership and Synergistic Areas

Configuration
consistent configuration knowledge and handover across PLM & ERP

Supplier Collaboration
seamless collaboration combining engineering and business data across partners and business processes

Systems Engineering
a well-orchestrated and integrated environment to realize a model-based enterprise digital thread

Visualization
accelerating time to market through a seamless visual digital thread from design to operate

IMAGINE…

Portfolio & Project Management
accurate real-time tracking of product investments against planned budget and time constraints

Intelligent Service and Asset Lifecycle
Closed loop flow between IT and OT systems that delivers operational KPI improvements, enables new business models and improves product development fidelity

Seamless Digital Threads

- Both companies will continue to develop and sell their own manufacturing planning and execution applications. Customer will choose the best fit for their business needs.

- SAP and Siemens remain committed to supporting existing installed base customers throughout their lifecycle

Enterprise Portfolio & Project Management

Accurate real-time tracking of product investments against budget and time constraints

Capture Voice of Customer

Prioritize Investments

Plan & Execute Work

Deliver Products
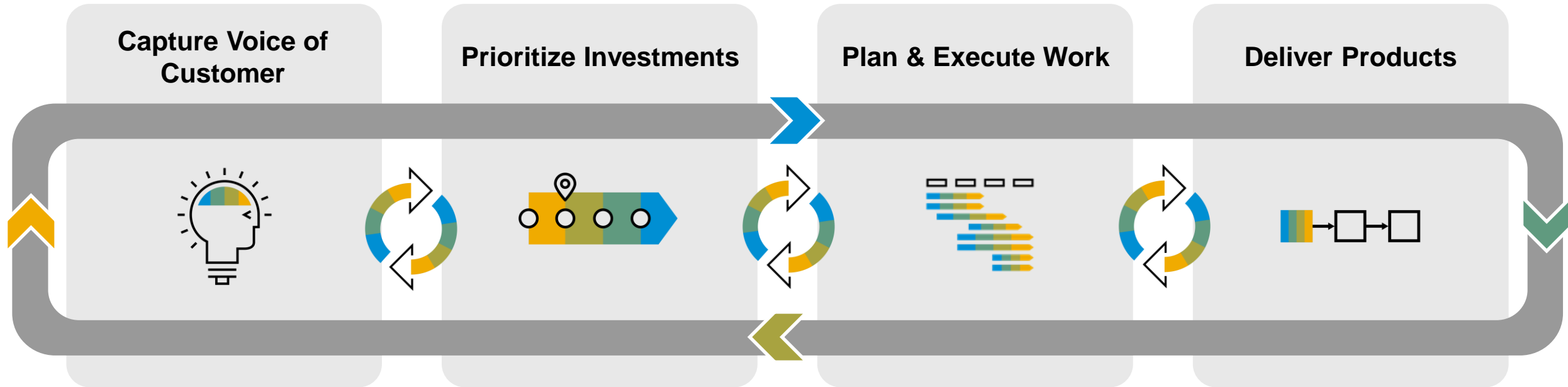
Execute Business Strategy

Align project and product investments with corporate goals

Increase Project Efficiency

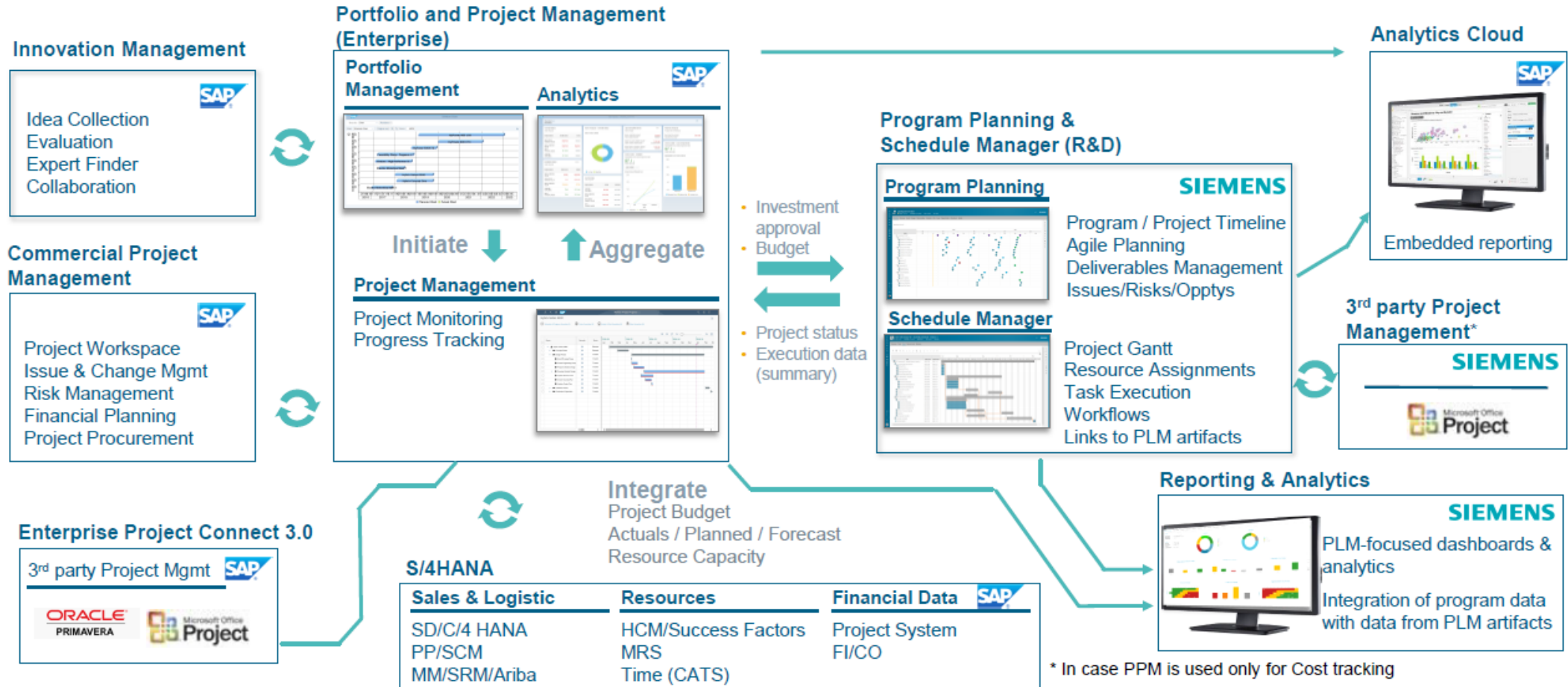Execute projects in a collaborative environment enriched with design data

Drive Profitable Projects

Provide real time cost and progress insights to all stakeholders

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Example Solution Landscape

Portfolio and Project Management
Example: Solution Landscape

SIEMENS
Ingenuity for life

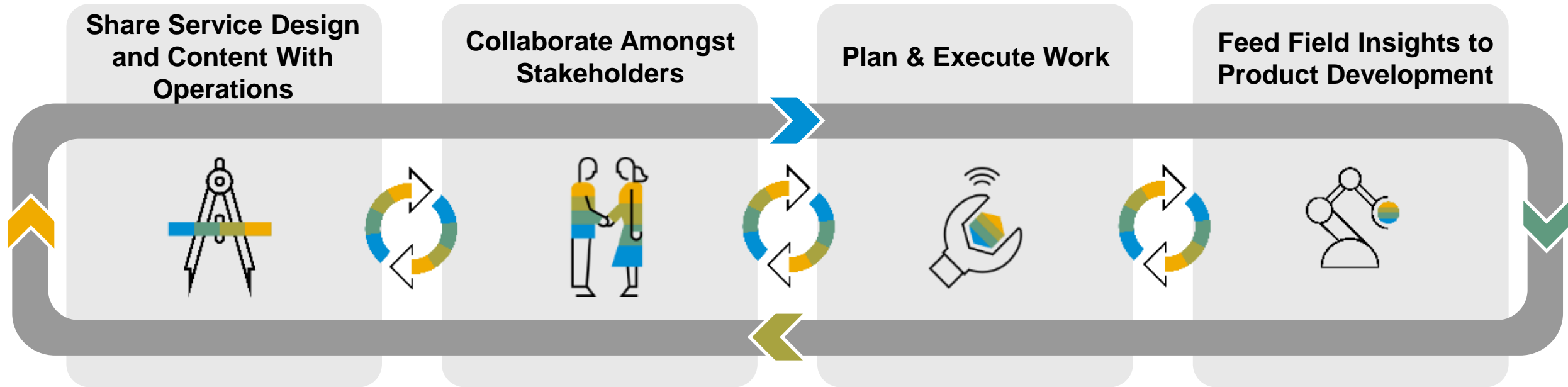**Innovation Management** — SAP
- Idea Collection
- Evaluation
- Expert Finder
- Collaboration

Portfolio and Project Management (Enterprise) — SAP
- **Portfolio Management**
- **Analytics**
- Initiate / Aggregate
- **Project Management**
  - Project Monitoring
  - Progress Tracking

- Investment approval
- Budget
- Project status
- Execution data (summary)

Commercial Project Management — SAP
- Project Workspace
- Issue & Change Mgmt
- Risk Management
- Financial Planning
- Project Procurement

Program Planning & Schedule Manager (R&D) — SIEMENS
- **Program Planning**
  - Program / Project Timeline
  - Agile Planning
  - Deliverables Management
  - Issues/Risks/Opptys
- **Schedule Manager**
  - Project Gantt
  - Resource Assignments
  - Task Execution
  - Workflows
  - Links to PLM artifacts

Analytics Cloud — SAP
- Embedded reporting

3rd party Project Management* — SIEMENS
- Microsoft Office Project

Enterprise Project Connect 3.0
- 3rd party Project Mgmt — SAP
- ORACLE PRIMAVERA
- Microsoft Office Project

Integrate
Project Budget
Actuals / Planned / Forecast
Resource Capacity

S/4HANA — SAP

Sales & Logistic	Resources	Financial Data
SD/C/4 HANA	HCM/Success Factors	Project System
PP/SCM	MRS	FI/CO
MM/SRM/Ariba	Time (CATS)	

Reporting & Analytics — SIEMENS
PLM-focused dashboards & analytics

Integration of program data with data from PLM artifacts

* In case PPM is used only for Cost tracking

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Example Workflow Scenario

Scenario 1: Portfolio-driven planning

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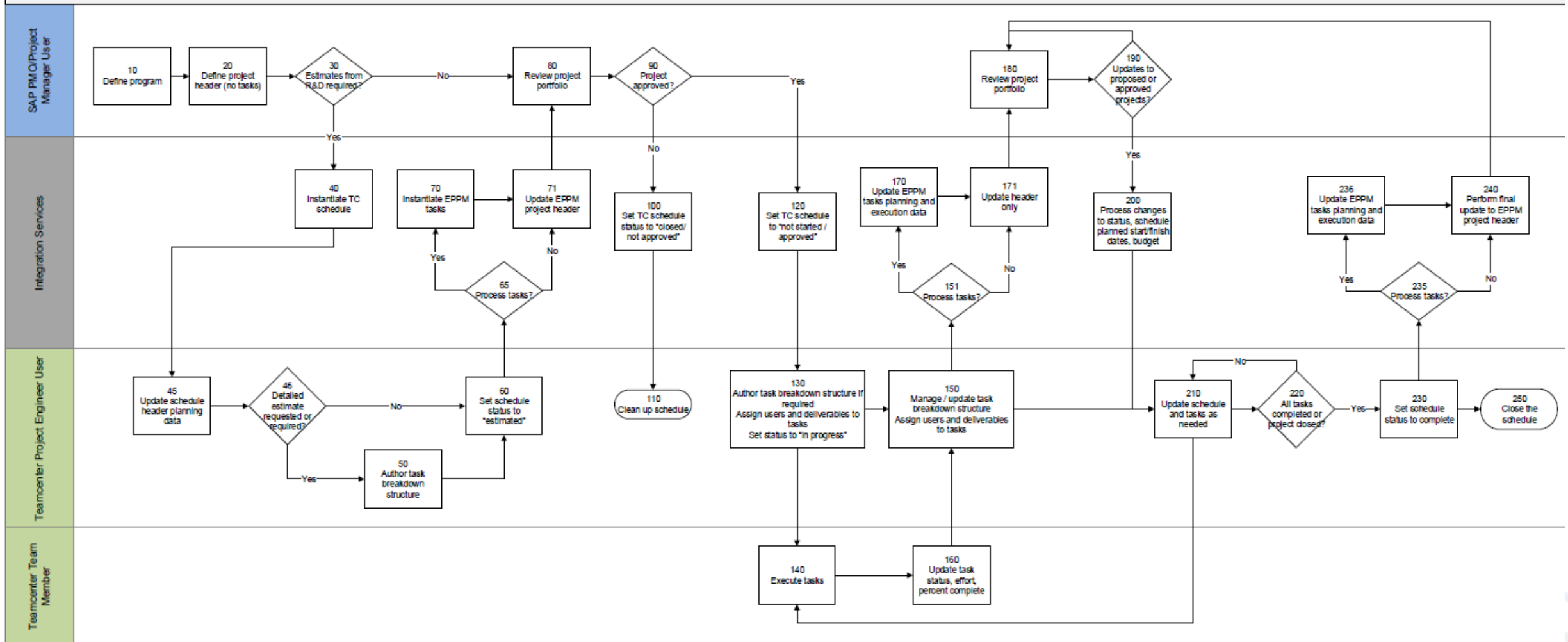
Intelligent Service and Asset Lifecycle

an integrated flow of asset information between product development and asset operations

Share Service Design and Content With Operations

Collaborate Amongst Stakeholders

Plan & Execute Work

Feed Field Insights to Product Development

Improve Asset Reliability

Manage assets more effectively through integrated service planning and engineering content

Lower Maintenance Costs

Increase asset uptime & drive maintenance cost efficiencies through risk, criticality and predictive maintenance solutions

Increase Design Efficiency

Leverage field operational data to drive product improvements and solution innovations

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SAP & Siemens – A New Paradigm for Product Lifecycle Management, with customer choice

Our Approach

SAP and Siemens have partnered to integrate their leading PLM and ERP solutions through a new product that will be available from both companies. Organizations will be able to choose which tools to use, and how to implement, without worrying about the complexity of integration.
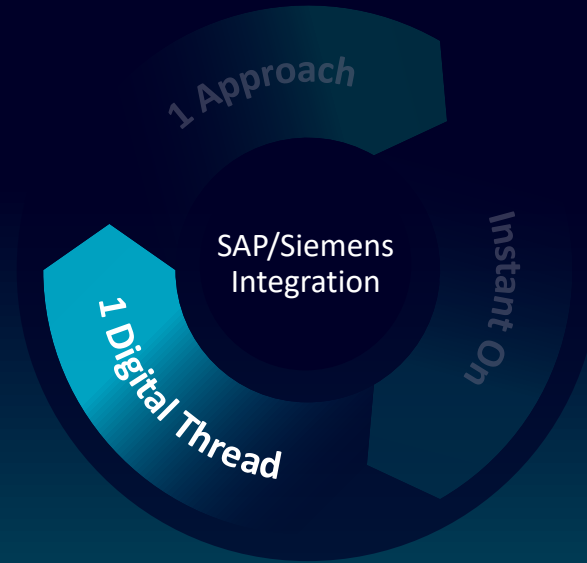
The Digital Thread

The Siemens and SAP partnership delivers a digital thread that runs through product engineering, manufacturing engineering and manufacturing execution – going beyond standard integrations to comprehensively connect data and processes.
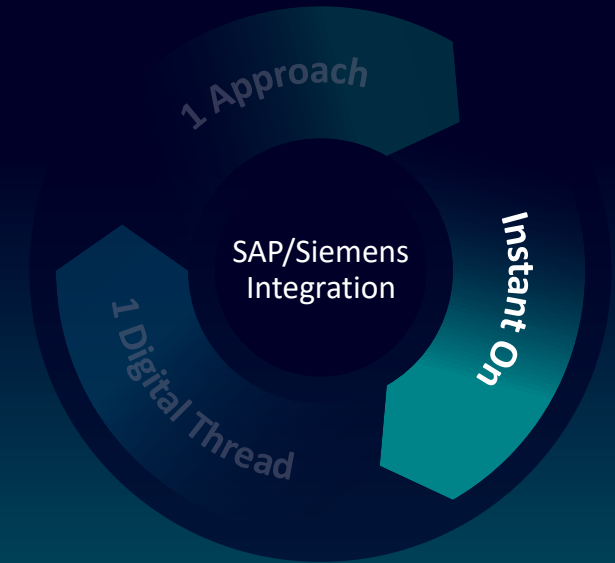
On the road to Instant Value

SAP and Siemens have released an integration roadmap, and over the next 3 releases will connect Teamcenter and S/4 HANA so that customers can realize instant-on value from their solutions.

SIEMENS

Agenda

INDUSTRY4.**NOW**

Enabling Digitalization of Product Value Chain
Powered by Siemens Teamcenter and SAP Suite

Sankar Natarajan
Global Consulting Head – Digital Product Value Chain & Industry 4.0, Wipro Limited

THE BEST RUN **SAP**

The context:
Teamcenter PLM,
The Foundation for Digital Tread

The context

Over **75% of new products fail** to reach markets on time.

Of the 25% of products reaching the markets,
2/3rd fail to meet their original expectations.

● Profit & Cost Containment Pressures

● Fragmented People, Processes, Data & Systems

● Increased Product Complexity & Quality Product Demands

● Increased Regulatory & Environmental Requirements

Companies are realizing the value of
Integrated Digital Product Value Chain
powered by
Digital PLM & Digital Thread
as the enabler to overcome these challenges.

Product Value Chain & Silo impact
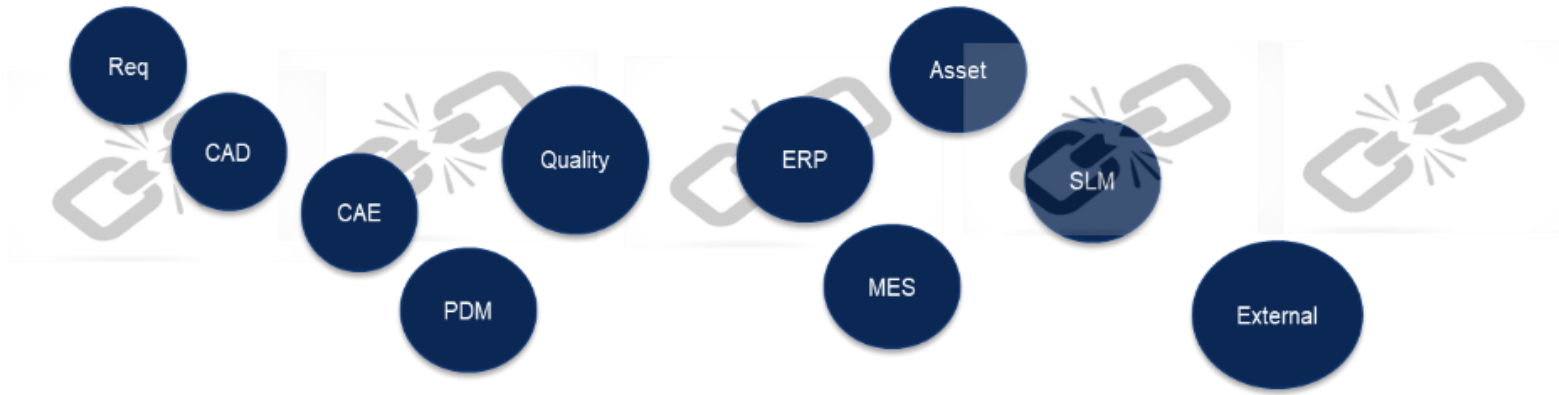
Ideation

Design & Development

Manufacturing

Service

Dispose

Req

CAD

CAE

PDM

Quality

ERP

MES

Asset

SLM

External

- Throw over the wall approach
- Not connected processes, data & systems
- Broken closed loop systems
- Lack of Requirement visibility & Misunderstanding
- Different tools & data models

- Delay in customer's problem acknowledgement/response
- Increased Cycle Time & Cost
- Quality issue
- No or less Global Collaboration
- No option to generate metrics & dashboards

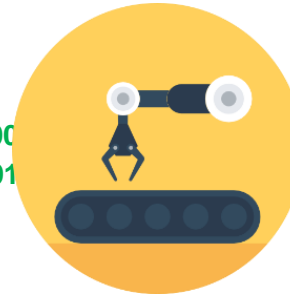# Digital Thread in Product Value Chain & Teamcenter Fitment
Powered by Wipro's WipACE DPVC Framework

Ideation

Design & Development

10001101010 101
0001101010 10101

Manufacturing

1010100001000100
1010000100010001

10101010101 1001 1
101010101 1001 101

Sustainability

101010 10100
1010 1010010

Dispose

Analytics

MCAD & CAE

ECAD

Digital Simulation & Validation - Product	Digital Simulation & Validation - Process

Software, System Engg etc..	IOT – gateway to Smart products & Smart Factory

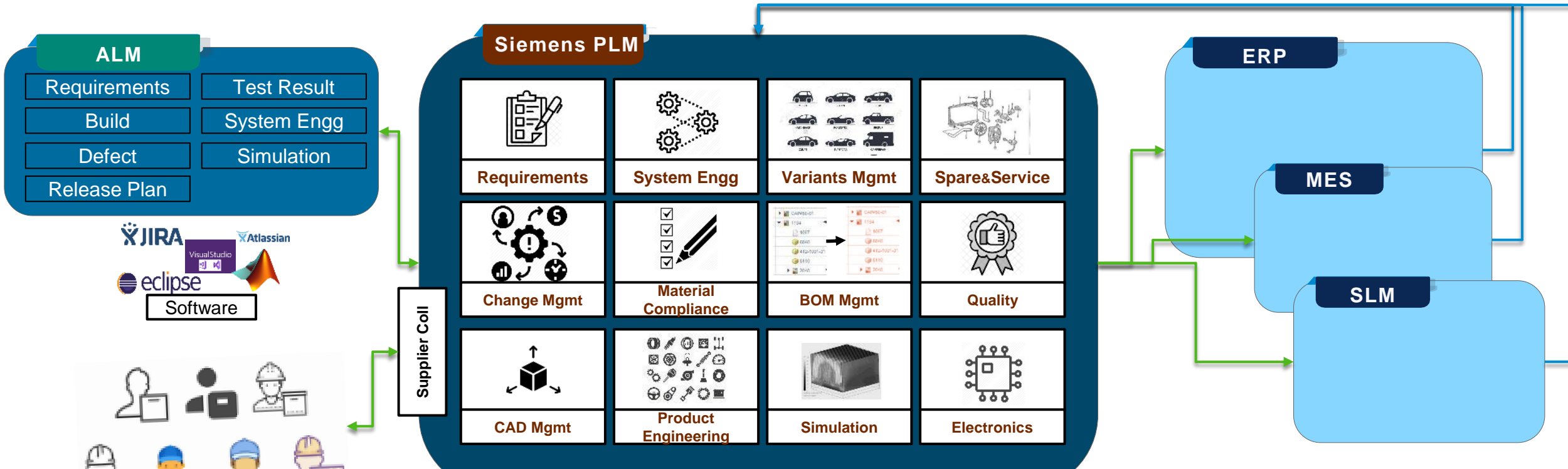| ALM (Software lifecycle)	Manufacturing Operation Mgmt (MOM/MES)	SLM (Service Lifecycle)

Enterprise Digital PLM	Enterprise Resource Planning (ERP)

TEAMCENTER As Foundation for Digital Thread

PCo & PLC

Integrated Digital Thread using Siemens Teamcenter
Powered by Wipro's WipACE DPVC Framework

ALM
Requirements	Test Result
Build	System Engg
Defect	Simulation
Release Plan	

JIRA • Atlassian • VisualStudio • eclipse • Software

Siemens PLM

Requirements	System Engg	Variants Mgmt	Spare&Service
Change Mgmt	Material Compliance	BOM Mgmt	Quality
CAD Mgmt	Product Engineering	Simulation	Electronics

Supplier Coll

ERP
MES
SLM

Digital Thread = Connected Data & Connected Processes
+
Connected System

…resulting in seamless evolution & exchange of product information across value chain in a closed loop manner and enabling increased collaboration & innovation

As Designed ← → As Planned ← → As Manufactured ← → As Performed

Enterprise level collaboration & innovation powered by Digital PLM & Digital Thread

Enabling faster Time-to-Quality & Time-to-Market by 30-50% in the Digital & Industry 4.0 era

Case Study

Digitalization of Product Value Chain for a Global Whitegoods manufacturer using Teamcenter

7 Product lines and **300+** active product variants

Enabled Collaborative Product Development at **36** Sites across 1**16** countries using Teamcenter

Accelerated product development and faster time to market by **30%**

Reduction in design iteration by **20%**

Transformed after market support by establishing **Product Twin** through **IoT**

PLM Strategy, Blueprinting, Implementation and Global Rollout

Enabling global & unified Product Design, Development and Launch/Commercialization processes
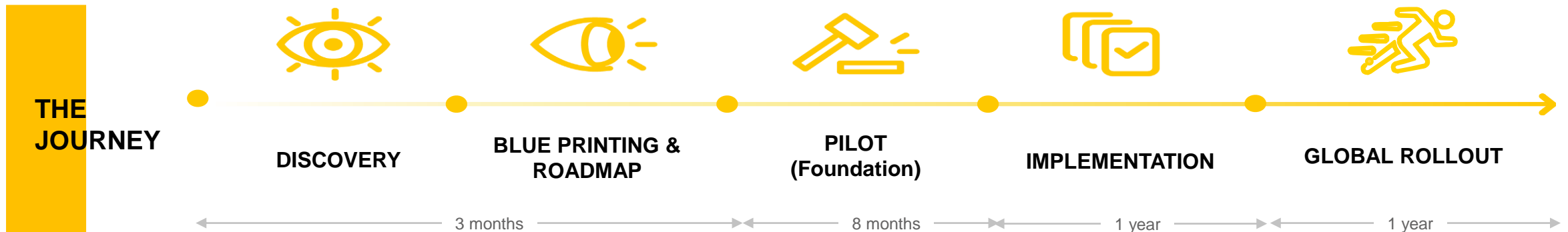
OPPORTUNITY

- Need for a global unified PLM to address modularization challenges and global collaboration needs
- 7 Product lines, 300+ active product variants – Spread across 36 sites across 16 countries
- 4500+ PLM users - Designers 1000+ , Doc Authors 2000+, Viewers 1500+
- Global PLM for unified Product Development processes - End-to-End PLM Implementation on Teamcenter UA Platform
- Huge Legacy data in desperate system accumulated through mergers & acquisition

SOLUTION

- Consulting & implementation of PLM solution to drive product modularization concepts
- Business requirements analysis through Consolidation and streamlining of the design processes of various plants
- Rapid blueprinting & pilot realization
- Defining a unified Change Management Process and CAD/EBOM/MBOM Mgmt.
- Establish Digital manufacturing solutions built on PLM
- Global deployment involving site specific data migration & multi language training

BUSINESS BENEFITS

- Enabled global collaboration across R&D and External partners/suppliers
- Implemented common Engineering Change process
- Secured and controlled storage of design data
- Enabled seamless process for managing eBOM → mBOM → BOP
- Enabled journey towards Industrie 4.0 initiative through Digital Manufacturing
- ~500,000 Parts/BOMs/Docs migrated and migration ongoing

THE JOURNEY

DISCOVERY — BLUE PRINTING & ROADMAP — PILOT (Foundation) — IMPLEMENTATION — GLOBAL ROLLOUT

3 months — 8 months — 1 year — 1 year

Key Capabilities & High-Level Architecture

Key Business Capabilities enabled

- CAD Data Management
- Part & Document Management
- Variant Management
- BOM Management
- Change Management
- Quality Management
- Electronics & Electrical Data Mgmt.
- ERP Integration
- Supplier Collaboration
- Material Management
- MBOM & BOP Management
- Digital Simulation & Validation
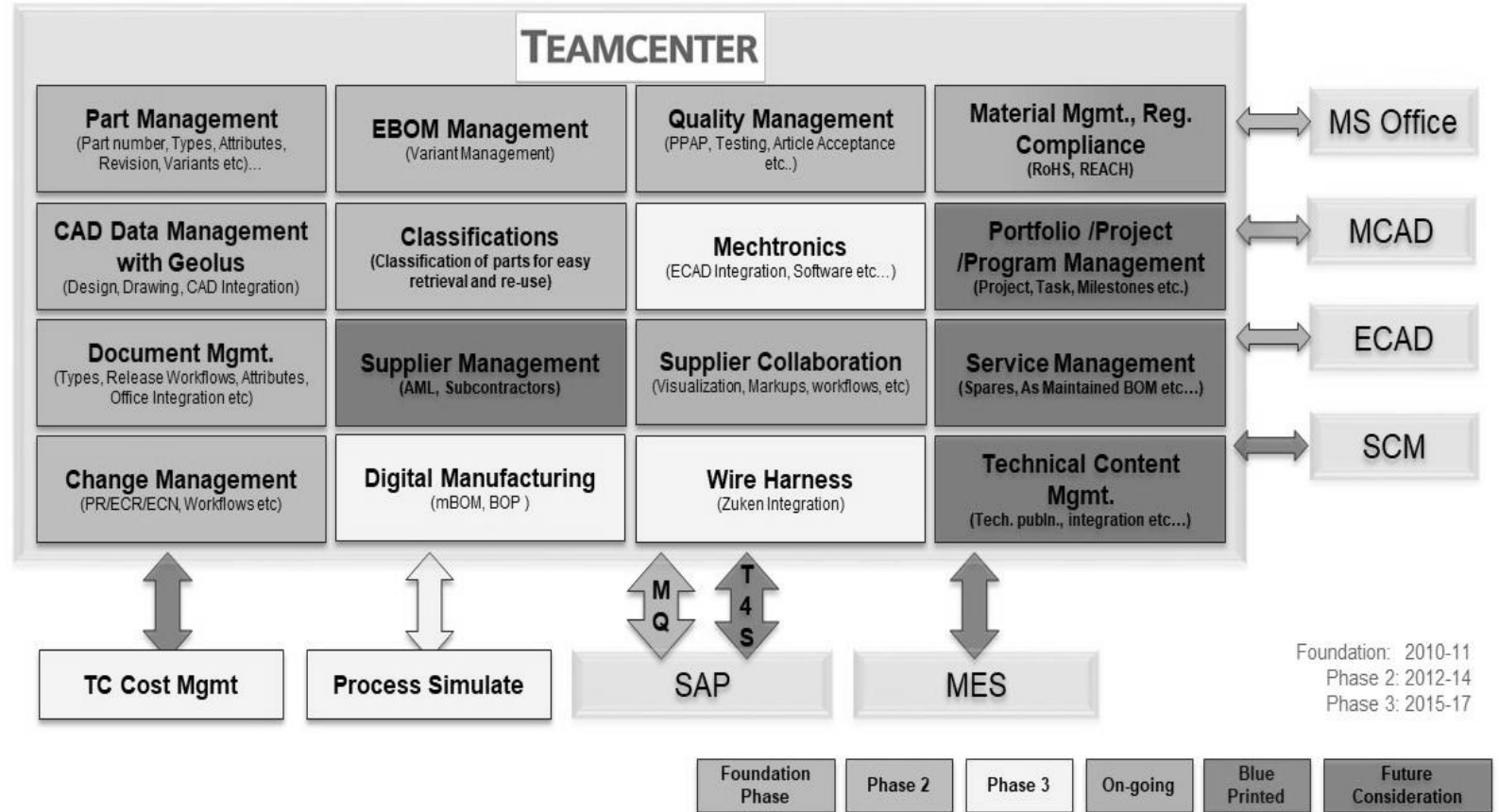
About Wipro

Wipro's Digital Product Value Chain & PLM Practice

200+
customers

4000+
practitioners

25+
years as dedicated Practice

40+
countries

Top 3
globally ranked service provider

With over **100+ global end-to-end digital transformations**, Wipro is fully equipped and ready to enable companies **optimize and transform** the way products are designed, developed & launched to market in the Industry 4.0 era

What we do

NPD & NPI Transformation & Optimization in the Digital & Industry 4.0 era: With Wipro's Digital Product Value Chain and Digital Thread Model and our strategic acquisition of ITI (a niche interoperability solution provider), we help companies optimize, harmonize and transform the product design, development, manufacturing, launch and sustenance processes, data and systems by implementing digital technologies in CAx (CAD, CAE), xLM (ALM, PLM & SLM), 3D Printing, Digital Twin, MOM, IIoT, AR/VR, AI and ML to become Digital & Industry 4.0 enterprises and improve NPD and NPI performance by 20-50%.

Digital Manufacturing & Plant Lifecycle Management: We help companies integrate all aspects of manufacturing and plant operations, starting with Plant Instrumentation, Operation and Supervision, implementation of MOM / LIMS / EBR solutions and integrating them with enterprise-wide systems such as PLM and ERP.

AI-driven Data Platform Engineering: Build and deploy platforms by leveraging AI and Machine Learning technologies and tools; platform that can serve and orchestrate end-to-end product value chain leveraging AI models and model lifecycle management. Smart Factory Applications and Low Latency Messaging Platforms.

Siemens Strategic Partnership & Expertise

Solution Partner — SIEMENS — PLM
Technology Partner — SIEMENS — Digital Industries Software

SOLID EDGE
NX
POLARION
Mentor Graphics
OPCENTER Smarter Manufacturing
mx mendix
TEAMCENTER
TECNOMATIX

CAD, CAE, ALM, PLM, SLM, MES, DM

INDUSTRY4.NOW

Thank you.

Sankar Natarajan
Global Consulting Head – Digital Product Value Chain & Industry 4.0
Wipro Limited
www.wipro.com
Sankar.Natarajan1@wipro.com

wipro

THE BEST RUN SAP

Agenda

1 A Dream Team brings unique value

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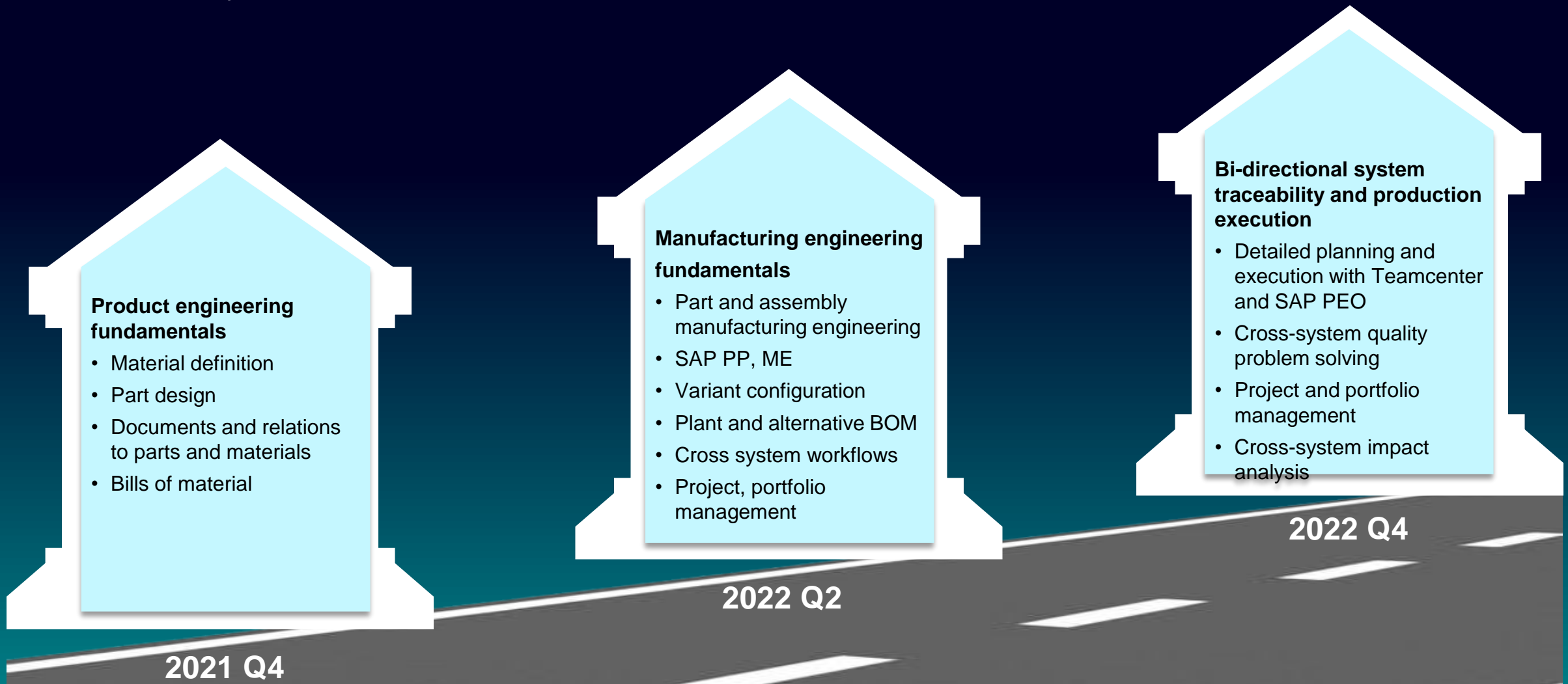
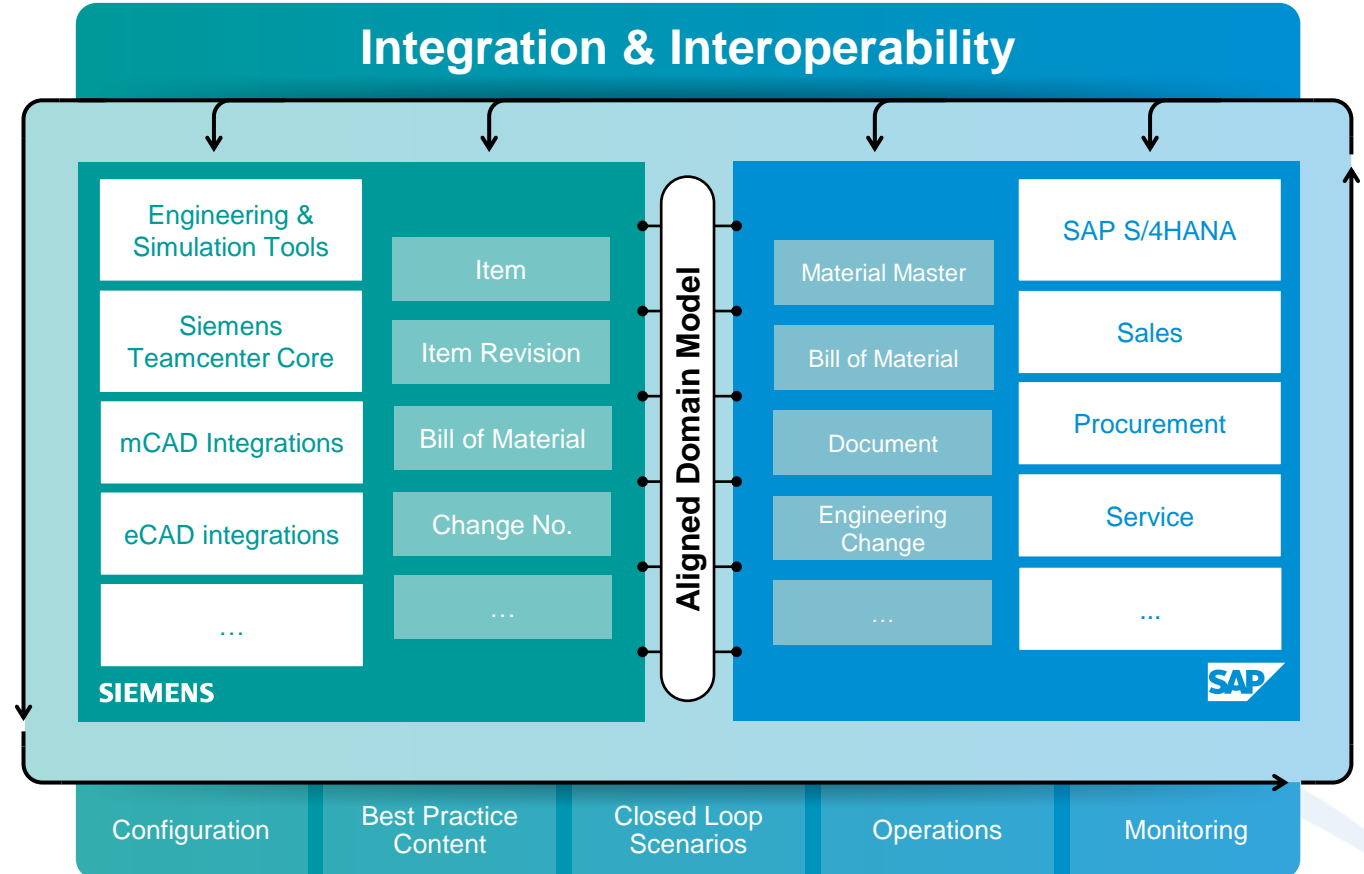**3** **Next Generation Integration**

Siemens – SAP partnership
The roadmap for foundation value

Product engineering fundamentals

- Material definition
- Part design
- Documents and relations to parts and materials
- Bills of material

2021 Q4

Manufacturing engineering fundamentals

- Part and assembly manufacturing engineering
- SAP PP, ME
- Variant configuration
- Plant and alternative BOM
- Cross system workflows
- Project, portfolio management

2022 Q2

Bi-directional system traceability and production execution

- Detailed planning and execution with Teamcenter and SAP PEO
- Cross-system quality problem solving
- Project and portfolio management
- Cross-system impact analysis

2022 Q4

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The foundation of our vision: Best in class integration and interoperability

One <u>joint integration</u> solution which:

- Builds on SAP and Siemens know-how
- Aligns on a common domain model
- Comes with proven integrations
- Provides access to data across solutions
- Supports seamless setup and operation
- Offers existing customers a path
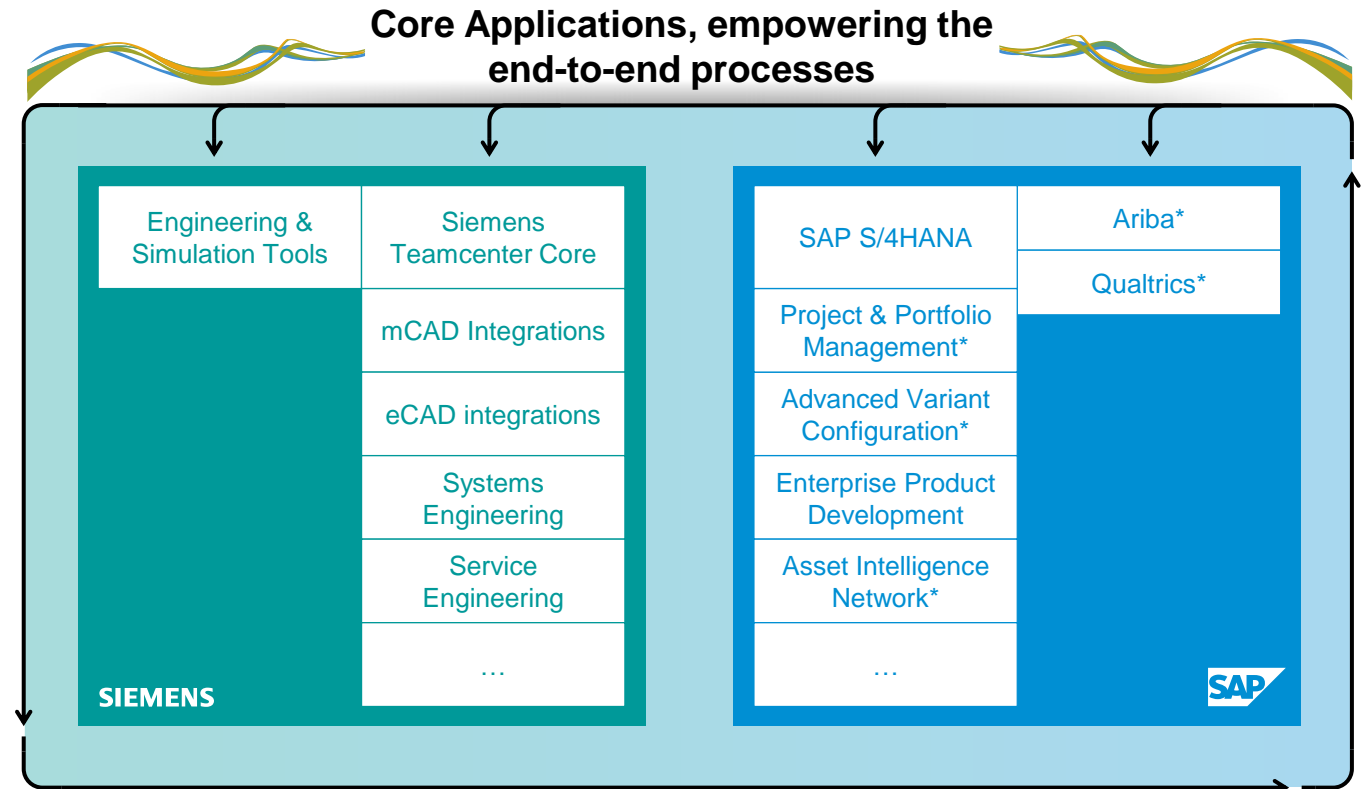- Supports on-premise, hybrid, and cloud

Characteristics of the planned integration solution

Guiding principles:

- Focus on integrated **end-to-end processes**
- Outstanding **performance, robustness, and security**
- Deliver **traceability**, federation, and relations
- **Common concepts** and artifacts wherever possible

User experience:

- **"Live" product data:** Access to master product data at any time in the preferred environment
- **Flexibility on process execution:** Initiating product development process and workflow without system boundaries
- **Insights "Across the Border"**: Live federated data sharing for fast and efficient decision making
- **Simple processes** of buying, support, deployment; Common and highly automated installation and operation
- **First realization** of a true digital thread across product development and business leading to a richer **digital twin**

Core Applications, empowering the end-to-end processes

SIEMENS		SAP	
Engineering & Simulation Tools	Siemens Teamcenter Core	SAP S/4HANA	Ariba*
	mCAD Integrations		Qualtrics*
	eCAD integrations	Project & Portfolio Management*	
	Systems Engineering	Advanced Variant Configuration*	
	Service Engineering	Enterprise Product Development	
	…	Asset Intelligence Network*	
		…	

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SAP Teamcenter by Siemens Integration to S4/HANA (TCI)

Integration Features and Benefits

End to End Digital Thread, Enterprise integration
- Bi-Directional integration of Teamcenter with SAP.
- End to End closed loop configuration of business processes.

Bill of Material Management
- Bi-Directional integration of Bills of Material
- Efficient handover from engineering the manufacture
- Complex Product structure management across systems.

Performance and Quality
- Simplified architecture to reduce implementation and operational costs.
- Efficient handling of error without impacting data transfer or stopping transactions
- Bi-directional authoring

Integrated Change Management
- Integrates Engineering, manufacturing or operational changes with a common closed loop process.
- Smooth and effective impact analysis across systems

Integrated Document Management
- Bi-Directional document exchange to support end to end process.
- Document associativity is maintained between systems.
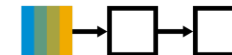
Workflow
- Automate any process
- Controlled approval
- Triggered Data Transfer and Integration
- Verify transfer and conversion

SAP Teamcenter Integration to S4/HANA

Engineering Configuration in Teamcenter, Sales Configuration in SAP

Engineering BOM with Geometric Data and Configurations, Configurator Rules

Cross System Manufacturing Planning and Execution

PEO Integration, Engineering Versioned BOM, Snapshots, Rough and Shop floor Routings

Cross System Workflows, Impact Analysis, Project and Portfolio Management

SAP Multi-tenant Cloud & Teamcenter Cloud

Better Performance through Batching and Parallelization, Single Sign-on

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The Digital Thread that ties everything together!
From product to asset lifecycle management

| CAD/CAE, eBOM, Configuration | Planning, mBOM, sBOM | Production and Execution | Asset & Resource Utilization |
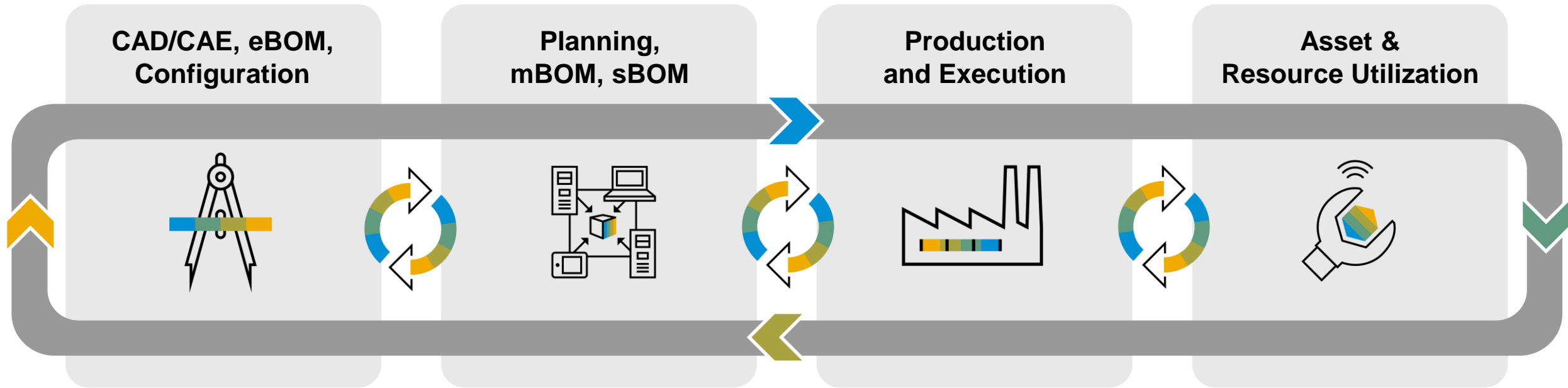
Single Product Master
Pervasive product information federated across the entire product lifecycle

Transparent Change
Visibility to all stakeholders to manage the impact of change from workgroup to enterprise

Seamless Digital Thread
Pervasive product information federated across the entire product lifecycle

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THE BEST RUN SAP

Q & A

Thank you.