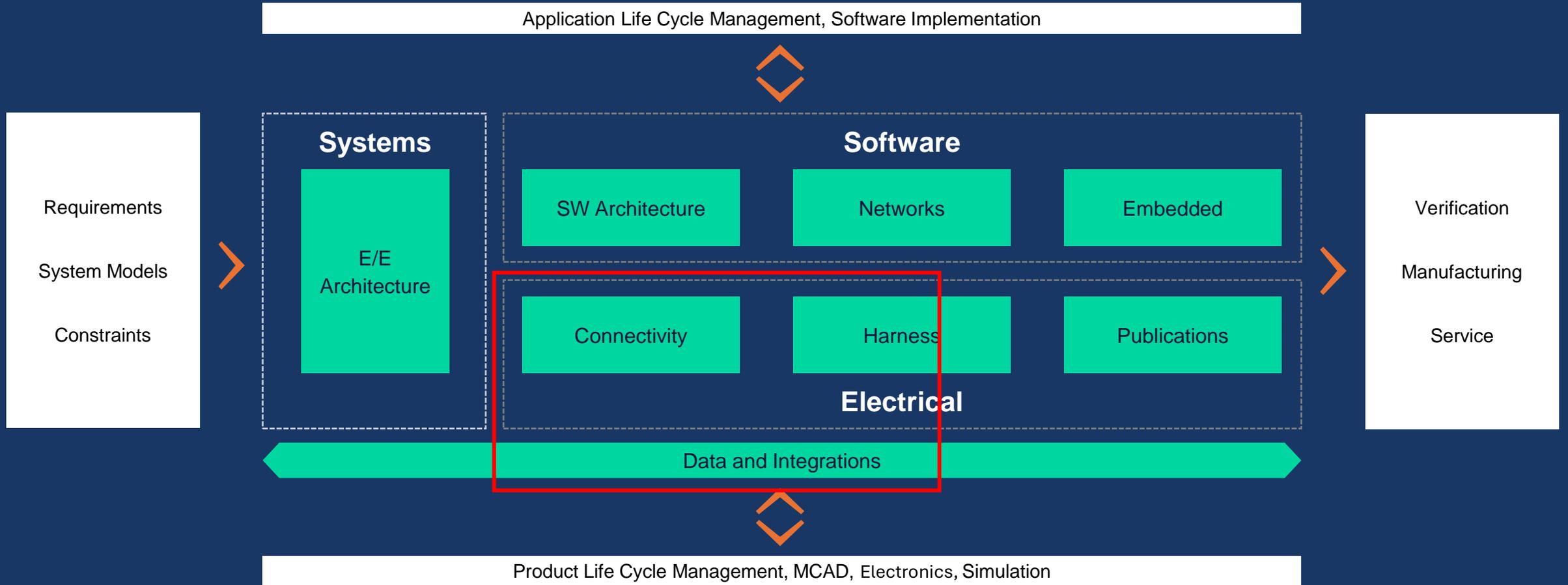


# Capital Platform Interactive



# 1. Electrical Schematic design

# 2. Component Library Management

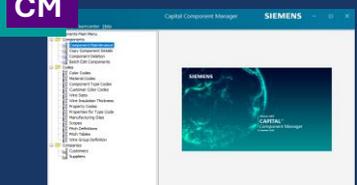
# 3. Topological Design

# 4. Schematic-to-3D Data Exchange

# 5. Harness Flattening and Harness Engineering

# 6. Publish to Teamcenter

2) **CAP CM** Capital Component Manager



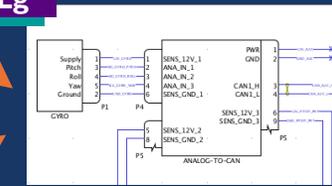
Component Library Management

**CAP DM** Capital Device Modeler



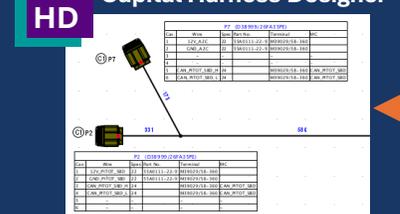
Interface Control Definition

1) **CAP Lg** Capital Logic Designer\*



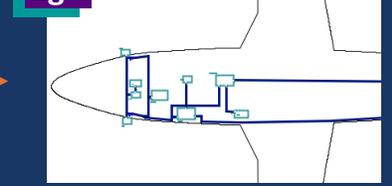
Electrical Schematic Design

5) **CAP HD** Capital Harness Designer\*



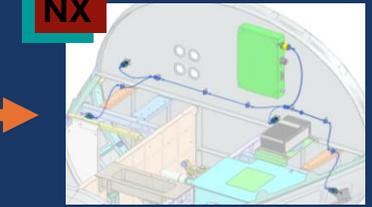
Harness Design

3) **CAP Lg** Capital Wiring Integrator\*



Topological Design

**NX**



3D Design

6)  Teamcenter



Product Lifecycle Management

\*TC remains up-to-date throughout the process; links not drawn to simplify the diagram

# 1. Electrical Schematic design

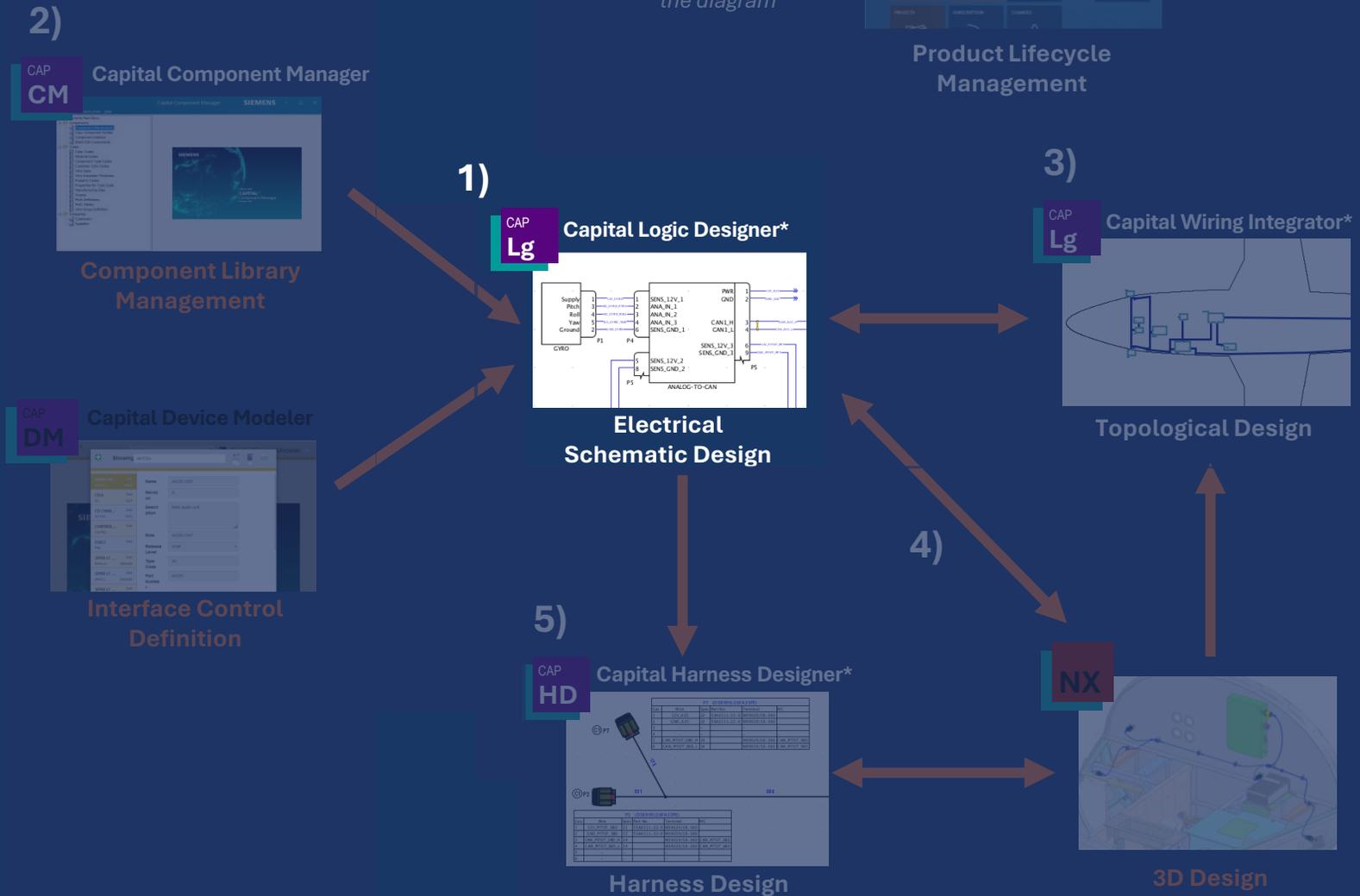
# 2. Component Library Management

# 3. Topological Design

# 4. Schematic-to-3D Data Exchange

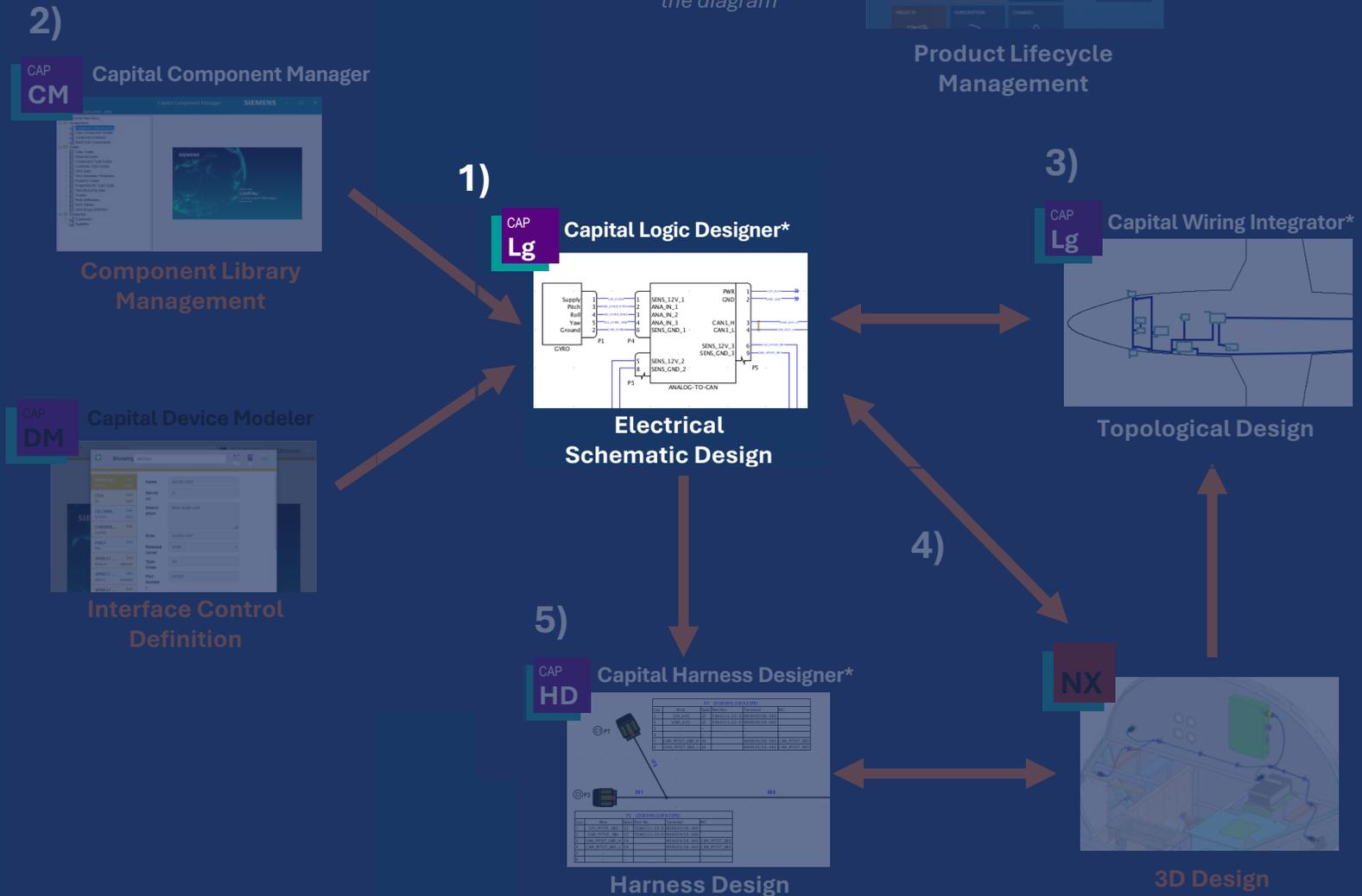
# 5. Harness Flattening and Harness Engineering

# 6. Publish to Teamcenter



# 1. Electrical Schematic design

- Explanation of Nets vs Wires
- Create a new logical (schematic) design
- Place devices and pins on-the-fly
- Connect devices
- Create multicores
- Add shields, shield drains and braids
- Nets-to-wires



# Live Demo

# 1. Electrical Schematic design

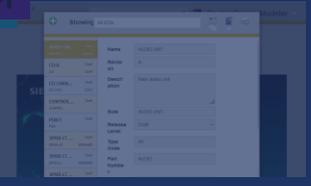
## Flexible and intuitive schematic design

2) **CAP CM** Capital Component Manager



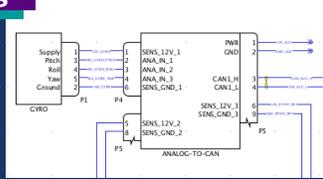
Component Library Management

**CAP DM** Capital Device Modeler



Interface Control Definition

1) **CAP Lg** Capital Logic Designer\*



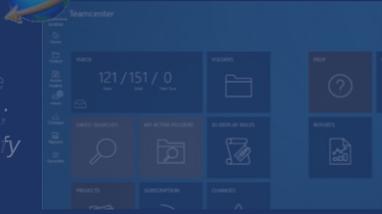
Electrical Schematic Design

5) **CAP HD** Capital Harness Designer\*



Harness Design

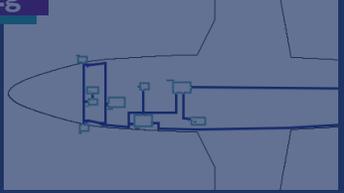
6) **Teamcenter**



Product Lifecycle Management

*\*TC remains up-to-date throughout the process; links not drawn to simplify the diagram*

3) **CAP Lg** Capital Wiring Integrator\*



Topological Design

4) **NX**



3D Design

# 1. Electrical Schematic design

# 2. Component Library Management

# 3. Topological Design

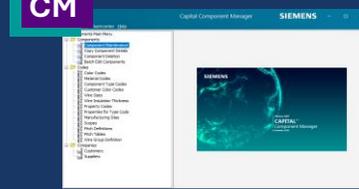
# 4. Schematic-to-3D Data Exchange

# 5. Harness Flattening and Harness Engineering

# 6. Publish to Teamcenter



## 2) Capital Component Manager



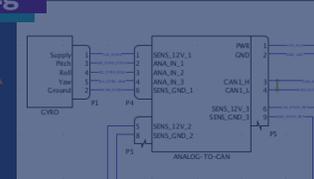
Component Library Management

## CAP DM Capital Device Modeler



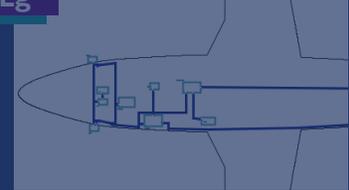
Interface Control Definition

## 1) CAP Lg Capital Logic Designer\*



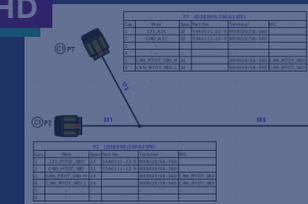
Electrical Schematic Design

## 3) CAP Lg Capital Wiring Integrator\*



Topological Design

## 5) CAP HD Capital Harness Designer\*

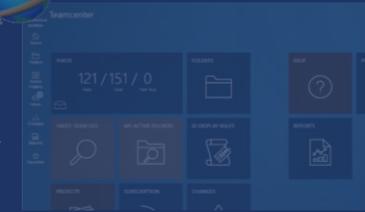


Harness Design



3D Design

## 6) Teamcenter



Product Lifecycle Management

\*TC remains up-to-date throughout the process; links not drawn to simplify the diagram

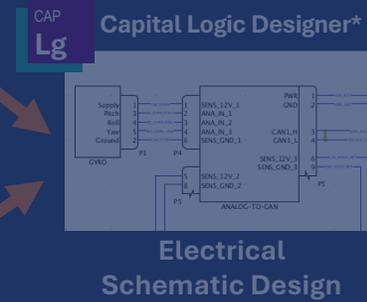
## 2. Component Library Management

- Components and relationships in Capital Component Manager
- Library parts in Capital Logic
- Automatically generate harness connectors
- Automatic filtering to select mating halves for inline connectors
- Design Rule Checks

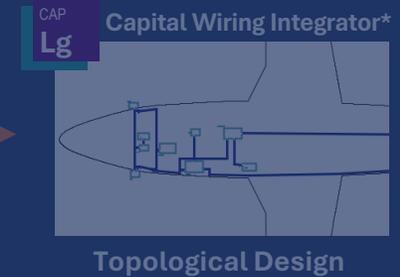
2)



1)

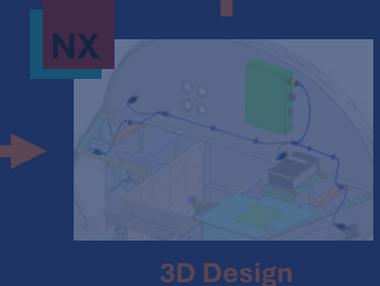
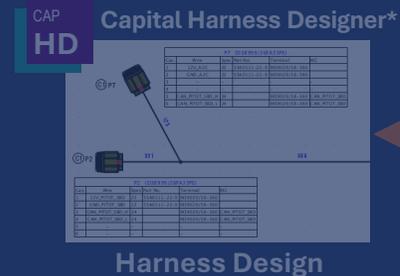


3)



4)

5)



6)



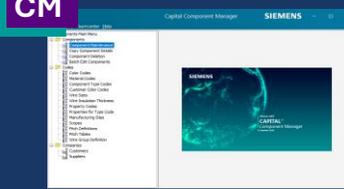
\*TC remains up-to-date throughout the process; links not drawn to simplify the diagram

# Live Demo

## 2. Component Library Management

# Correct by construction schematics

### 2) Capital Component Manager



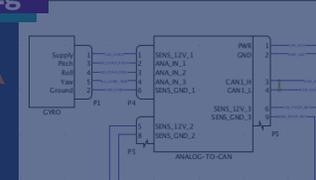
Component Library Management

### CAP DM Capital Device Modeler



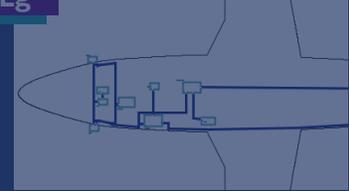
Interface Control Definition

### 1) CAP Lg Capital Logic Designer\*



Electrical Schematic Design

### 3) CAP Lg Capital Wiring Integrator\*



Topological Design

### 5) CAP HD Capital Harness Designer\*



Harness Design



3D Design

### 6) Teamcenter



Product Lifecycle Management

\*TC remains up-to-date throughout the process; links not drawn to simplify the diagram

# 1. Electrical Schematic design

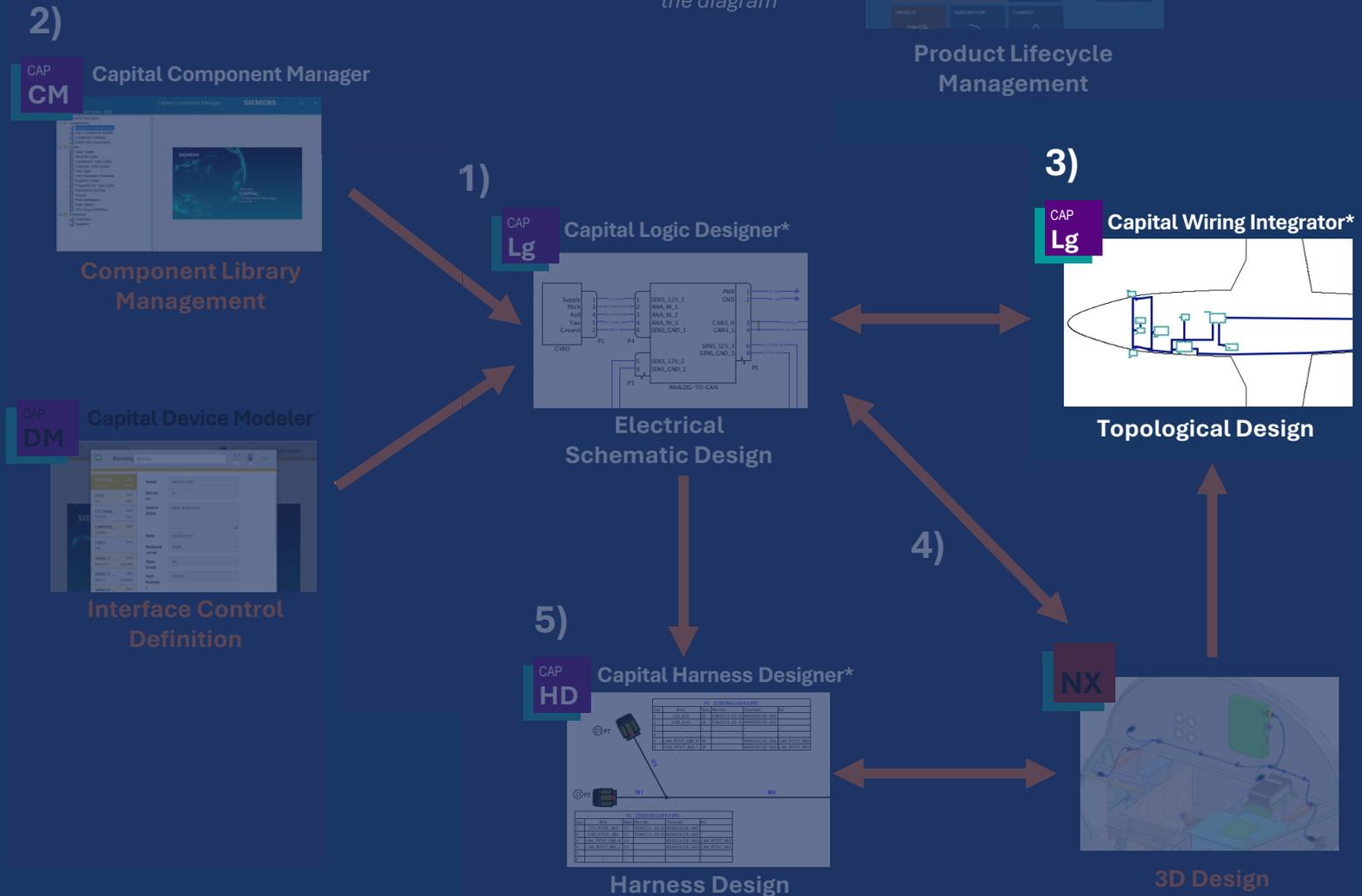
# 2. Component Library Management

# 3. Topological Design

# 4. Schematic-to-3D Data Exchange

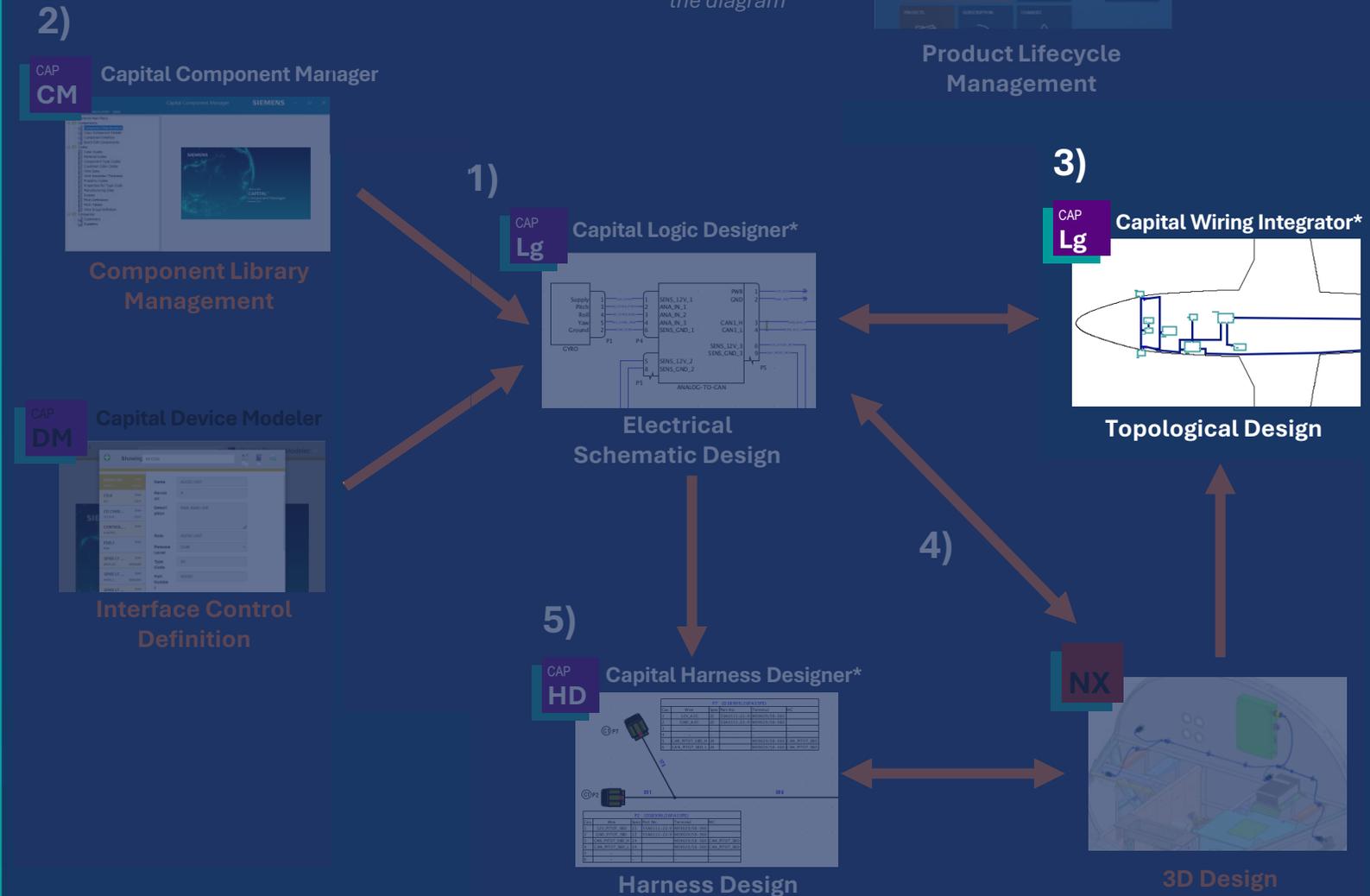
# 5. Harness Flattening and Harness Engineering

# 6. Publish to Teamcenter



### 3. Topological Design

- Introduce the role of the topology abstraction
- Associate and trace between the topology and schematic abstractions
- Reconcile inline connectors
- Apply routing constraints using Rules
- Back-annotate harness attributes into the schematic designs
- Study to compare impact of new topology on cost



# Live Demo

### 3. Topological Design

# Optimise full aircraft wiring installation

2) **CAP CM** Capital Component Manager



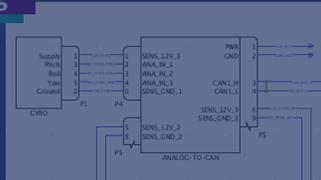
Component Library Management

**CAP DM** Capital Device Modeler



Interface Control Definition

1) **CAP Lg** Capital Logic Designer\*



Electrical Schematic Design

5) **CAP HD** Capital Harness Designer\*



Harness Design

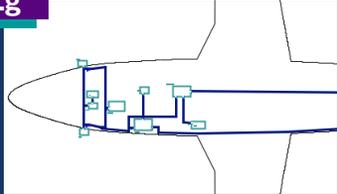
6) **Teamcenter**



Product Lifecycle Management

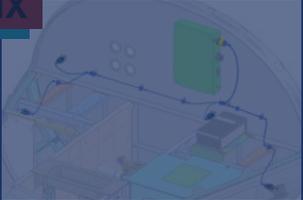
*\*TC remains up-to-date throughout the process; links not drawn to simplify the diagram*

3) **CAP Lg** Capital Wiring Integrator\*



Topological Design

4) **NX**



3D Design

# 1. Electrical Schematic design

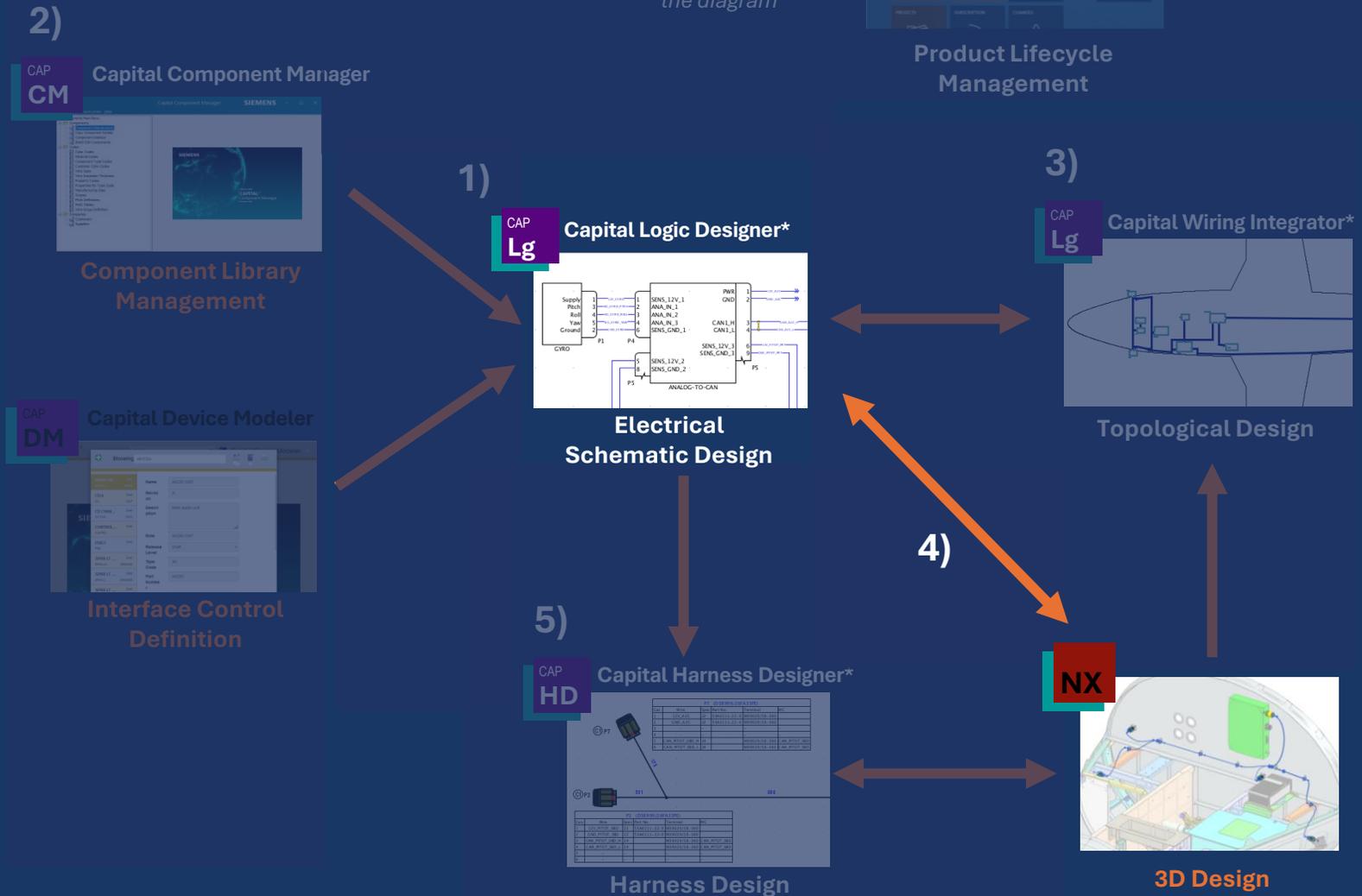
# 2. Component Library Management

# 3. Topological Design

# 4. Schematic-to-3D Data Exchange

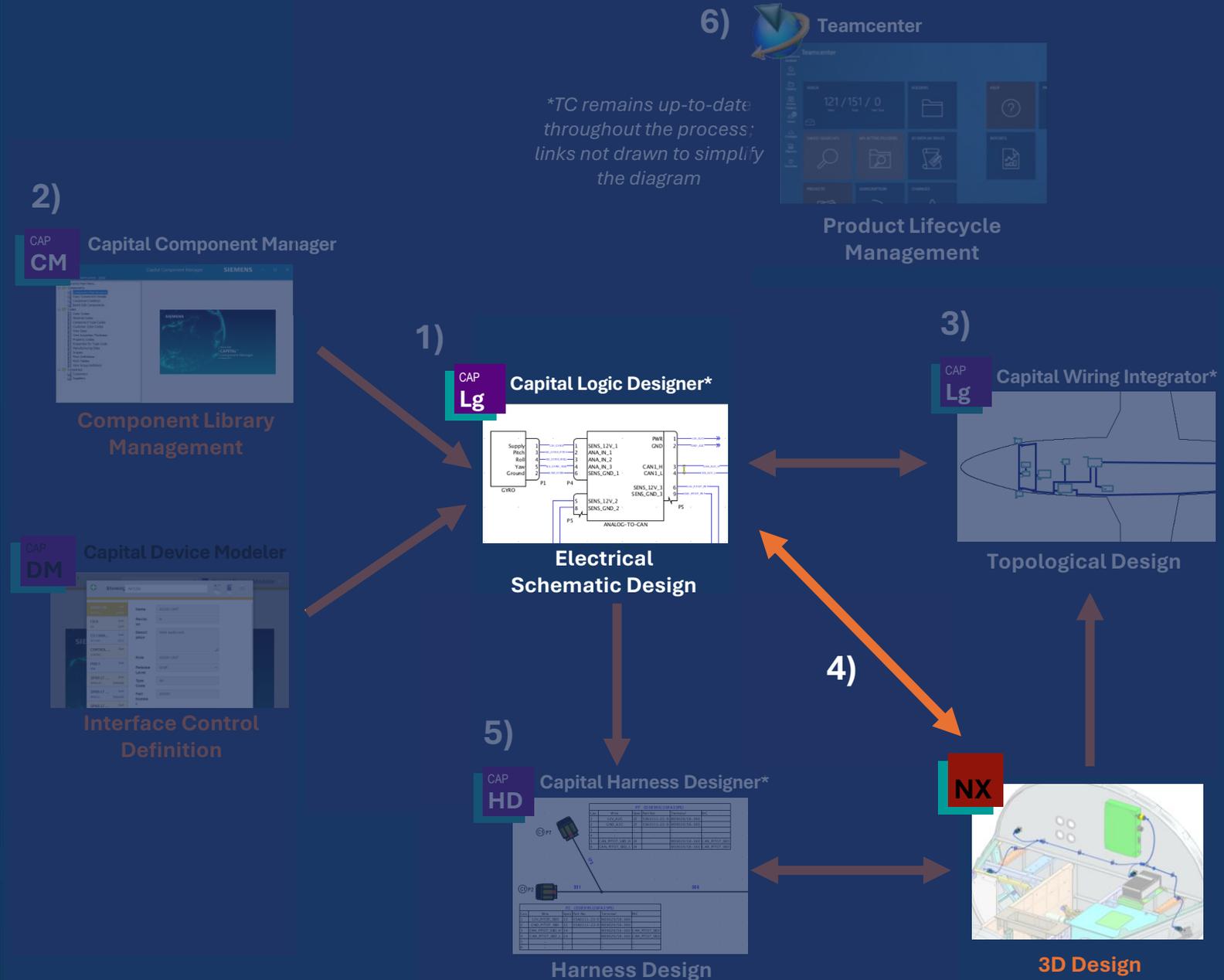
# 5. Harness Flattening and Harness Engineering

# 6. Publish to Teamcenter



## 4. Schematic-to-3D Data Exchange

- Connect Capital to NX
- Import the electrical data into NX
- Auto-assign components
- Cross-highlight between NX and Capital
- Auto-route the wiring
- Bridge In wire lengths back to Capital



### Connected Mode



Real time data import, export & cross application exploration

- Cross-highlighting
- Interactive Change Manager
- Bi-directional exchange of data

### Direct Navigator Mode



Access to Capital data within NX via embedded Capital navigator

- No Capital installation required
- Cross-highlighting
- Simultaneous data access

### Teamcenter Mediated File Based Mode



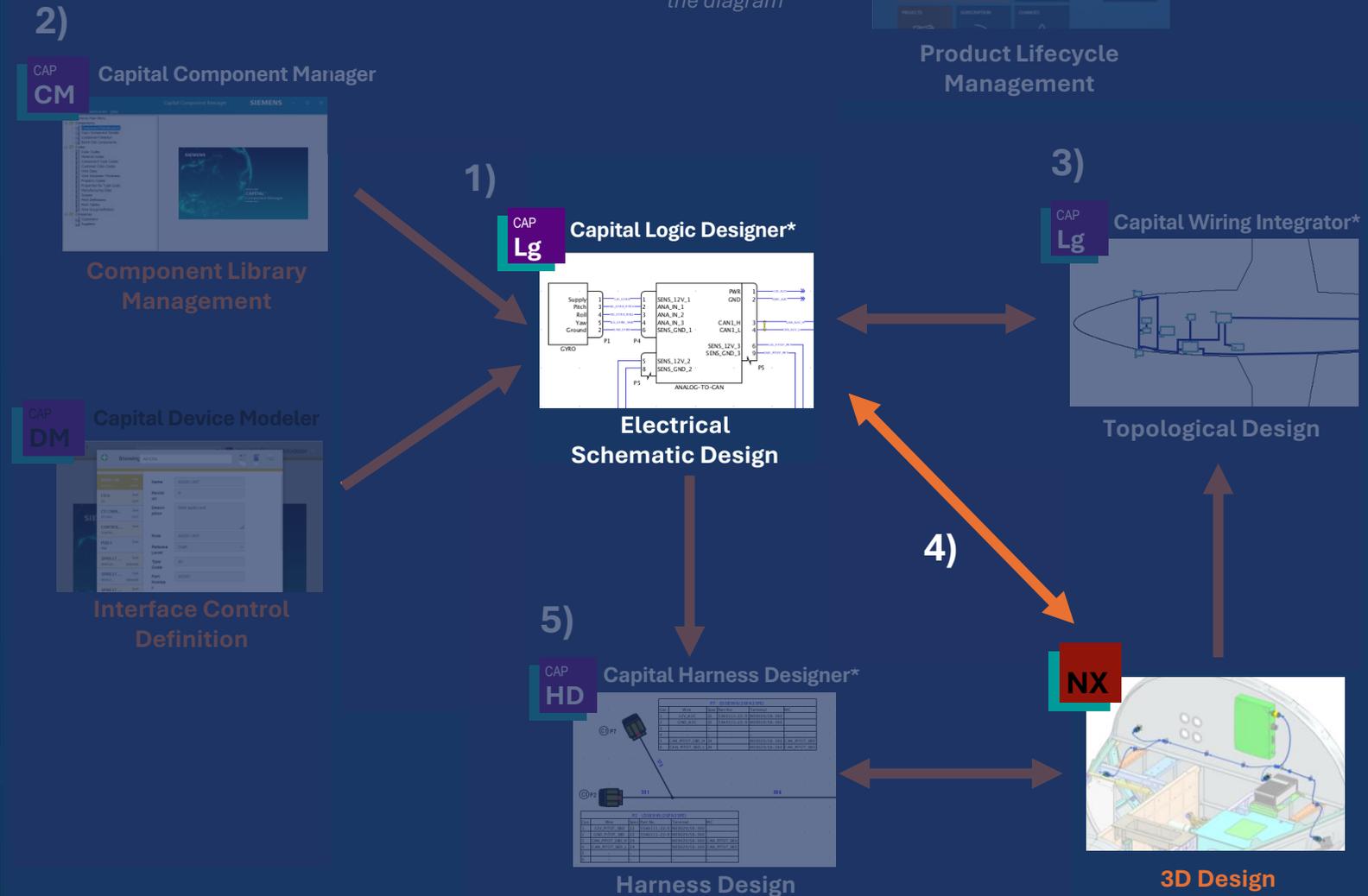
Teamcenter used to mediate the file exchange between Capital and NX

- Configuration controlled access
- Data exchange tracked and version controlled
- Embedded Active Workspace
- Workflows to notify users of new content

# Live Demo

## 4. Schematic-to-3D Data Exchange

Break down silos and remove manual steps



# 1. Electrical Schematic design

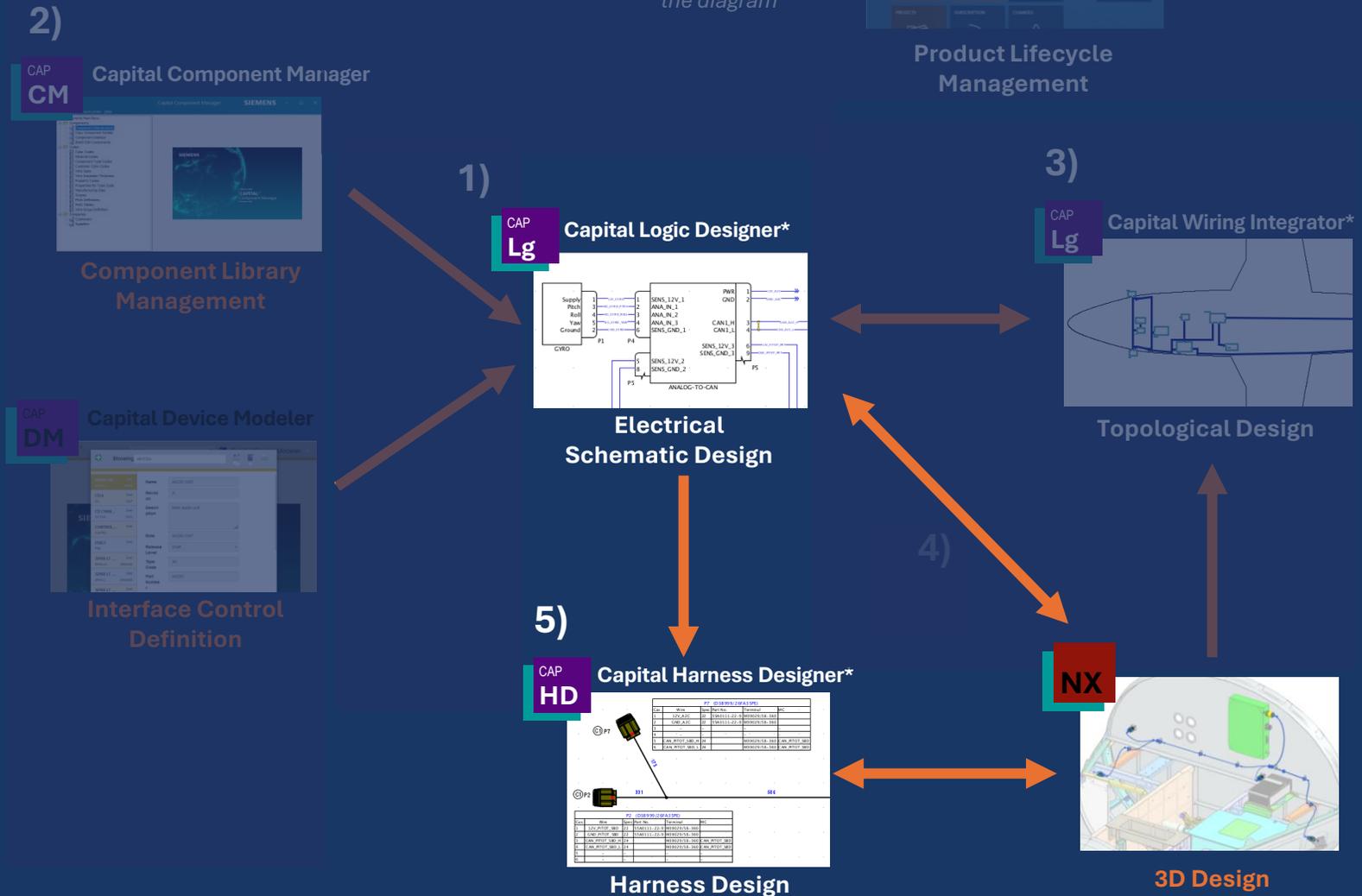
# 2. Component Library Management

# 3. Topological Design

# 4. Schematic-to-3D Data Exchange

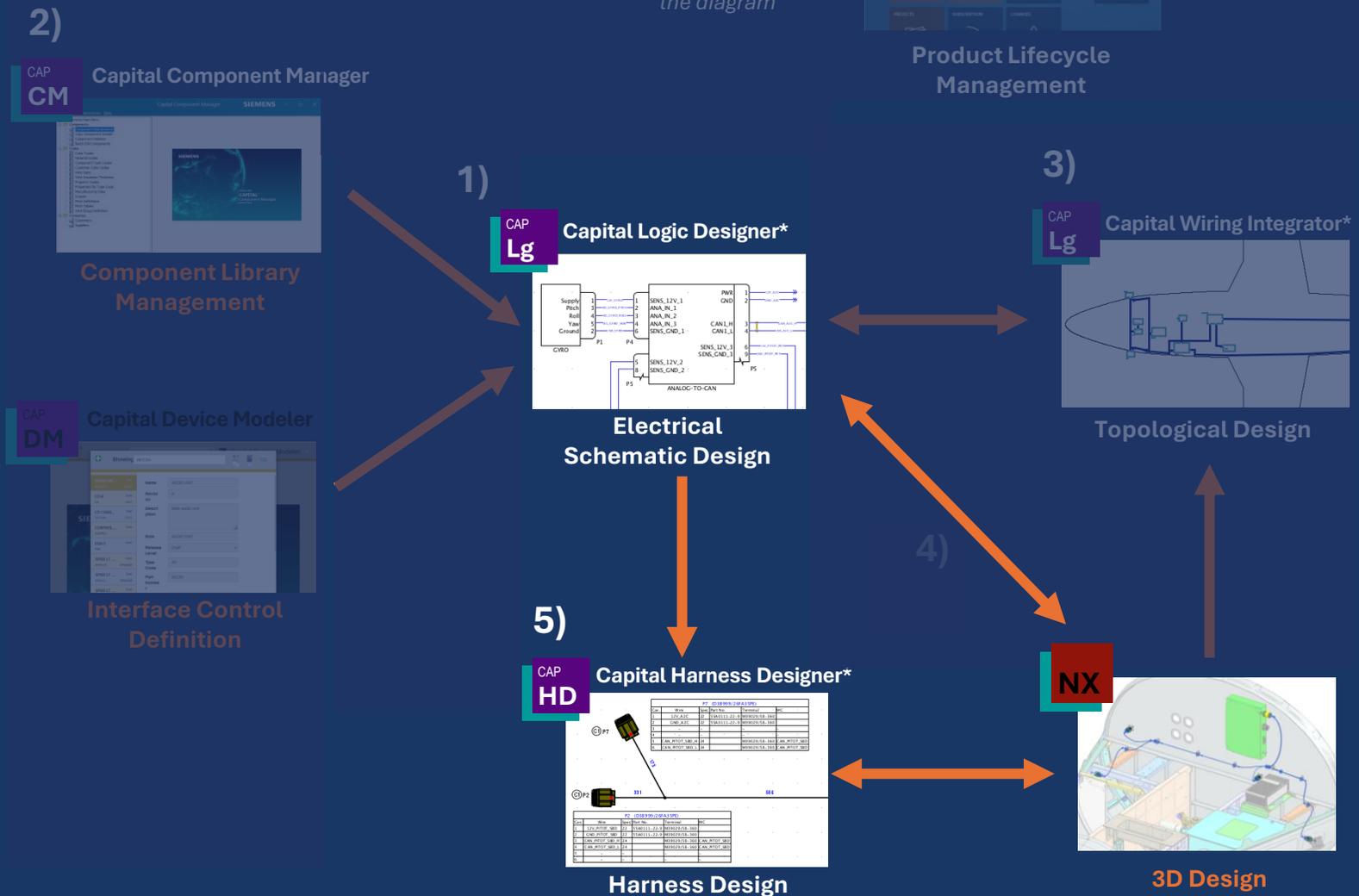
# 5. Harness Flattening and Harness Engineering

# 6. Publish to Teamcenter



## 5. Harness Flattening and Harness Engineering

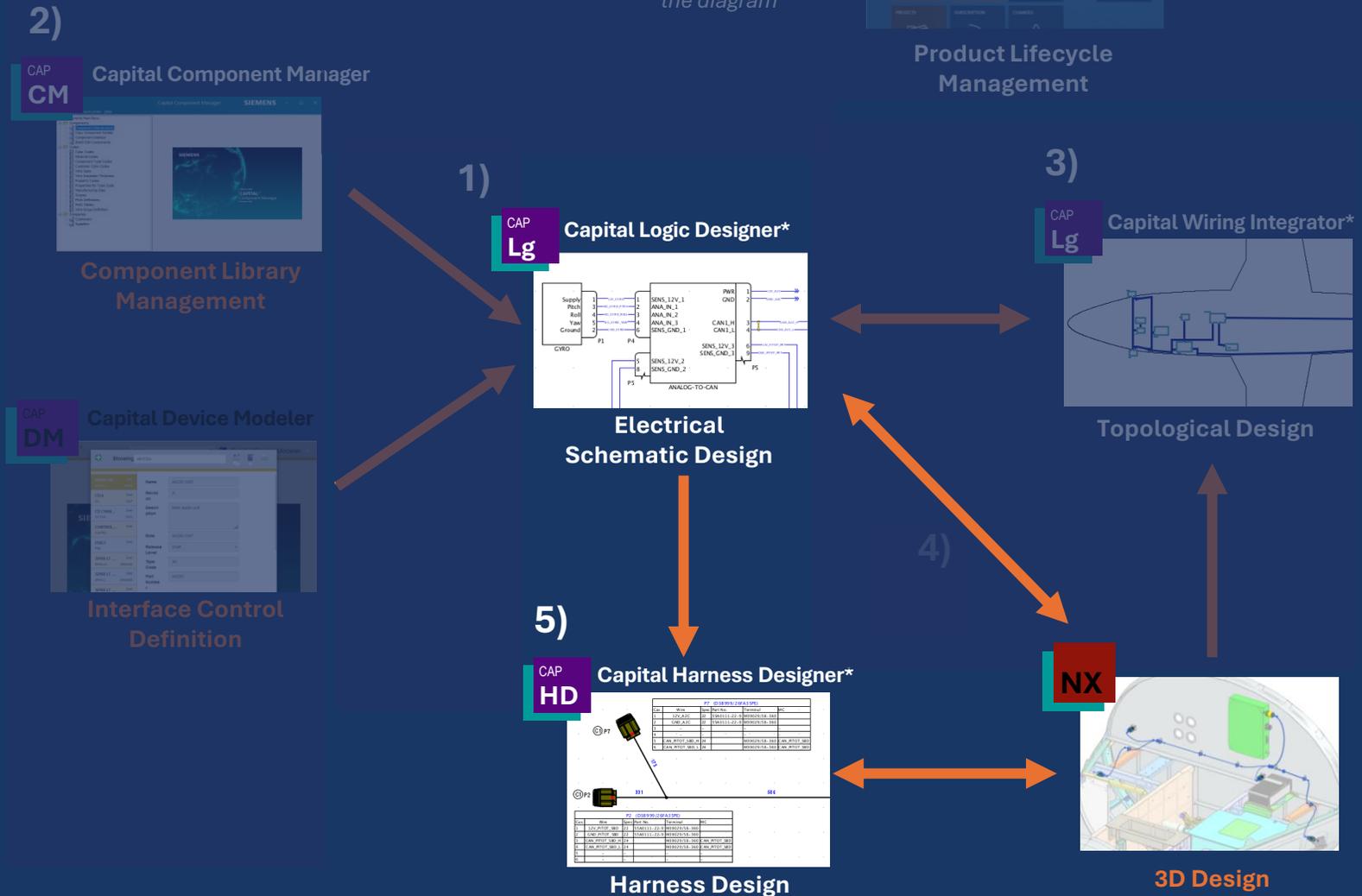
- Connect NX to Capital
- Export and flatten harness from NX to Capital
- Cross-highlight between Capital and NX
- Synchronise wiring data
- Optimise splice positions and push new splice positions to NX
- Harness engineering



# Live Demo

## 5. Harness Flattening and Harness Engineering

Automate to increase productivity and accuracy



# 1. Electrical Schematic design

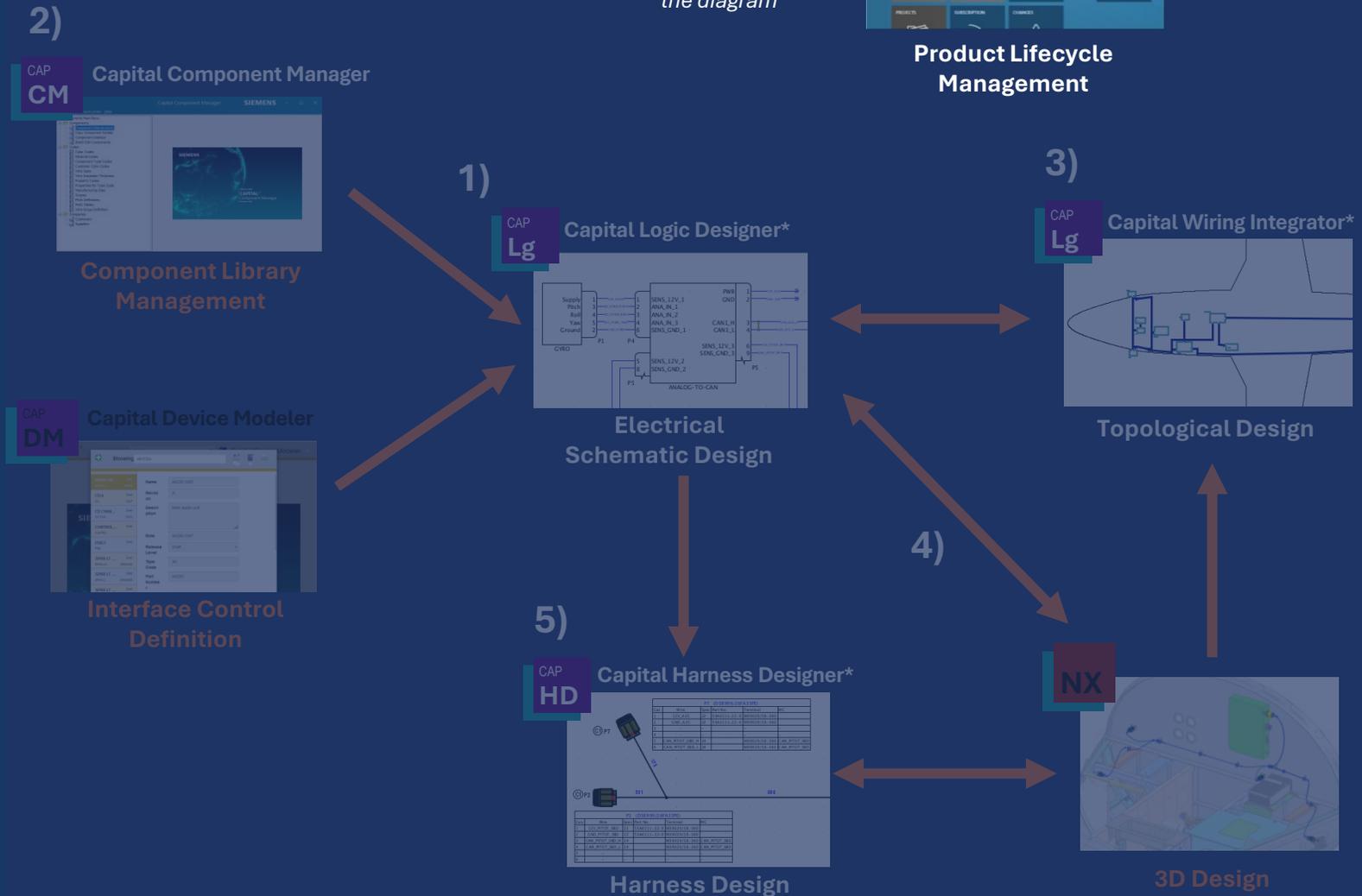
# 2. Component Library Management

# 3. Topological Design

# 4. Schematic-to-3D Data Exchange

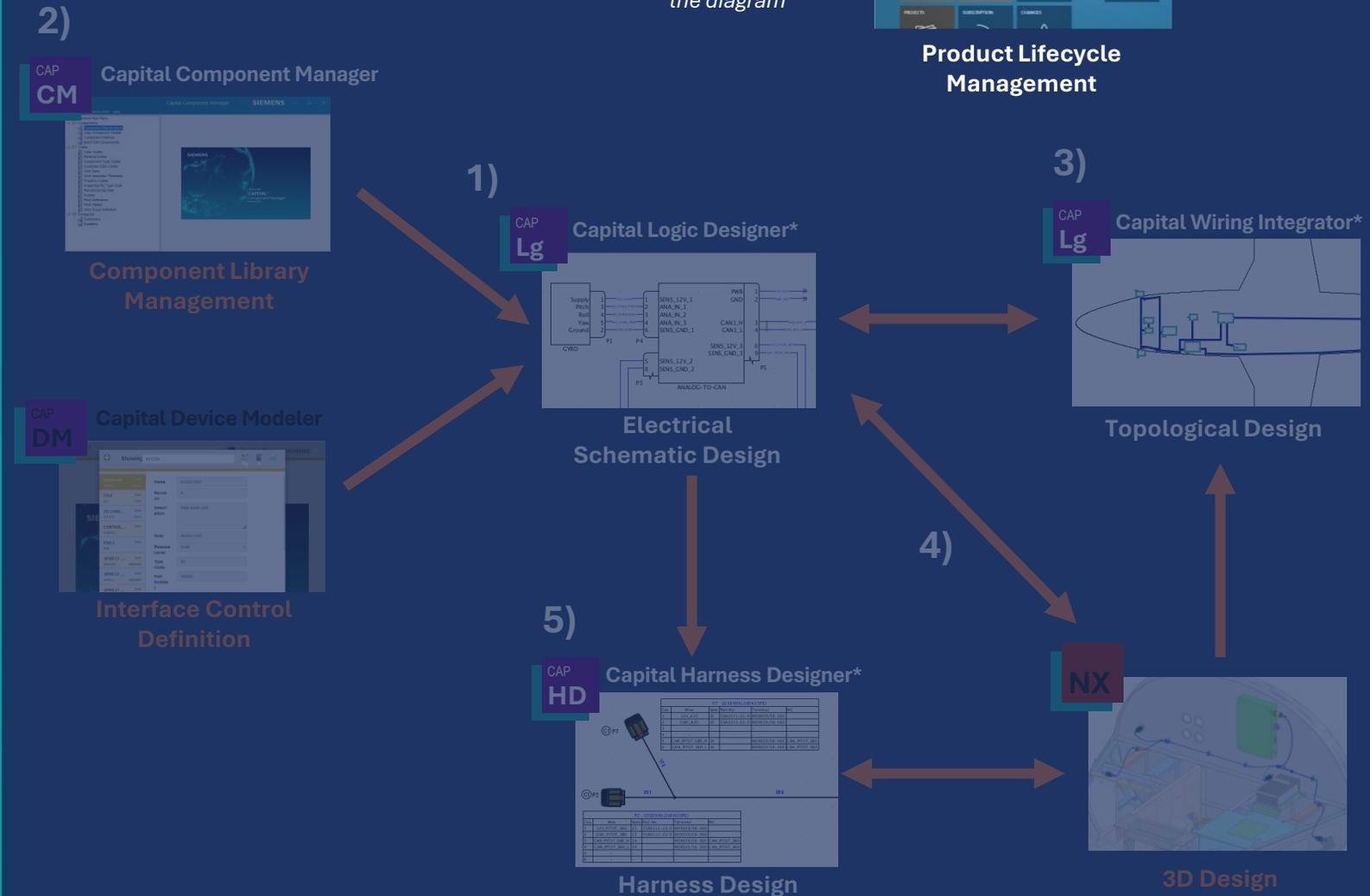
# 5. Harness Flattening and Harness Engineering

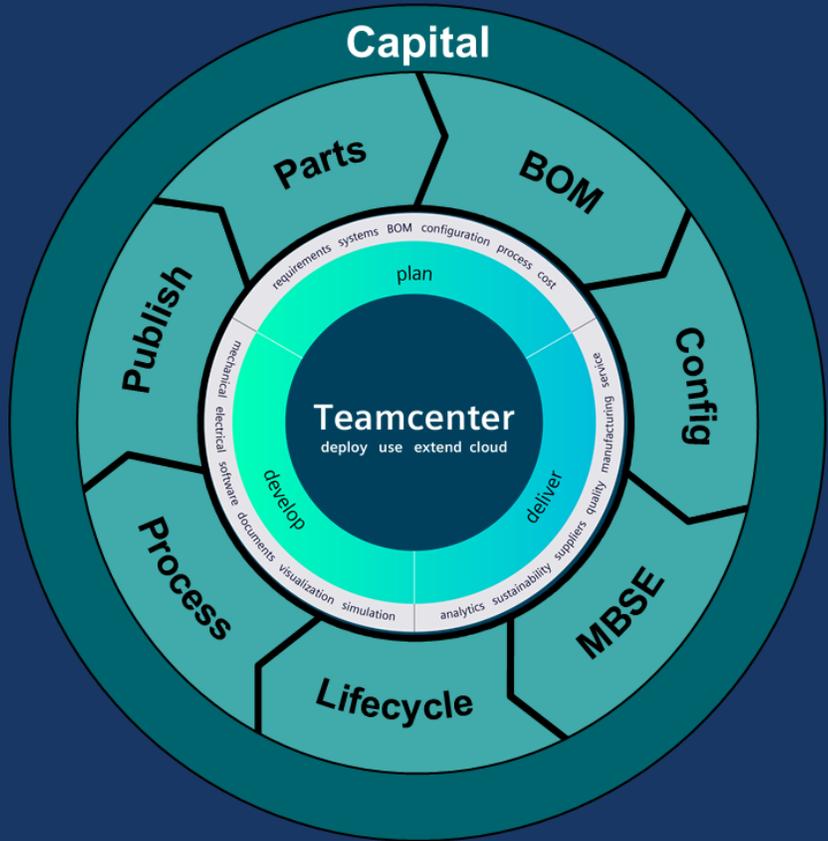
# 6. Publish to Teamcenter



## 6. Publish to Teamcenter

- Introduce the Capital and Teamcenter integration
- Publish a completed design from Capital to Teamcenter
- Workflow automatically kicked off in Teamcenter
- Select a reviewer to check the design slated for release
- Once approved and released in Teamcenter, the release state in Capital is also updated





## Orchestrate E/E systems in whole product context

Publish E/E design to multi-domain BOM

Control E/E design lifecycle and configuration

Balance autonomy and concurrency

Drive overall process via Workflows

# Teamcenter – Capital Alignment

## Clear lines of responsibility in an integrated environment

MAY 28<sup>th</sup>

Teamcenter

Capital

The screenshot displays the Teamcenter software interface for a 'Door Assembly'. The main window shows a BOM table with columns for Element Name, ID, Revision, and Quantity. The table lists various components like 'Door Module Assembly', 'Windows Assembly', 'Mirror-Side Assembly', and 'Panel- Inner Assembly', along with their respective IDs and quantities. The interface also includes a navigation pane on the left and a properties panel on the right.

| Element Name          | ID      | Revis... | Quantity     |
|-----------------------|---------|----------|--------------|
| Door Assembly         | 027025  | A        |              |
| Door Module Assembly  | 027026  | A        | each         |
| Windows Assembly      | 027029  | A        | each         |
| Mirror-Side Assembly  | 027031  | A        | each         |
| Panel- Inner Assembly | 027032  | A        | each         |
| Door-Harness-Assembly | 027034  | B        |              |
| Connector x4.0000     | C-71483 | A        | 4.0000 each  |
| Connector x1.0000     | C-70908 | A        | 1.0000 each  |
| Connector x3.0000     | C-71392 | A        | 3.0000 each  |
| Connector x1.0000     | C-81333 | A        | 1.0000 each  |
| Connector x2.0000     | C-81340 | A        | 2.0000 each  |
| Connector x2.0000     | C-81329 | A        | 2.0000 each  |
| Connector x1.0000     | C-70718 | C        | 1.0000 each  |
| Connector x1.0000     | C-81330 | A        | 1.0000 each  |
| Connector x1.0000     | C-61276 | A        | 1.0000 each  |
| G-70190 x1.0000       | G-70190 | A        | 1.0000 each  |
| T-54084 x12.0000      | T-54084 | A        | 12.0000 each |
| T-54072 x29.0000      | T-54072 | A        | 29.0000 each |

The screenshot displays the Siemens Capital software interface for a 'Door-Harness-Assembly'. The main window shows a complex harness diagram with various components and connections. The interface includes a navigation pane on the left and a properties panel on the right. The diagram shows a network of electrical components and their interconnections.

- Master of Design, Library and BOM lifecycle
- Governs Change and Release Processes
- Controls Multi Domain Information

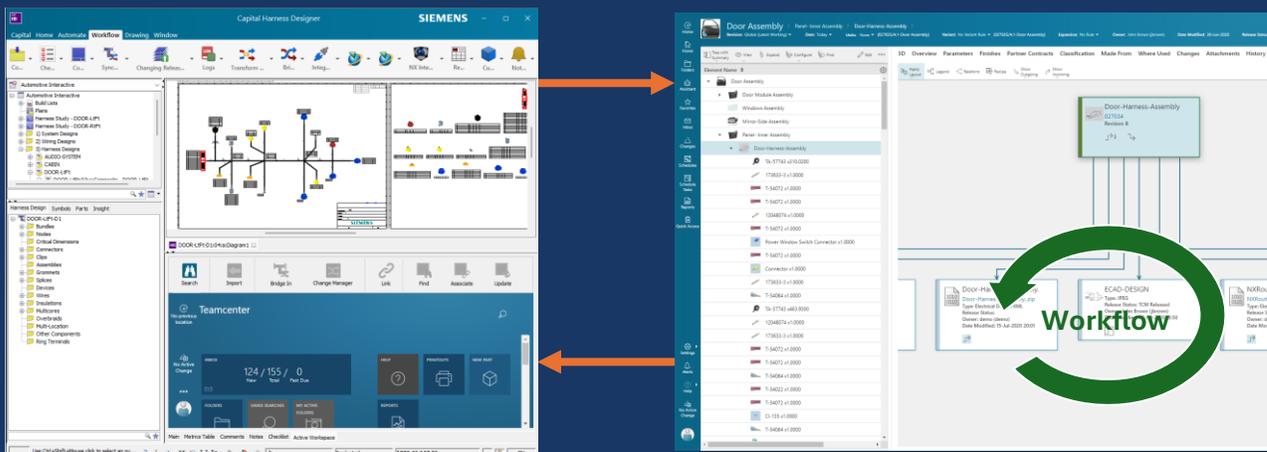
- Provides Design environment for Electrical Systems
- Follows Teamcenter Change and Release process

## Integrate Electrical into company-wide workflows

Capital

Publish Design  
and BOM

Teamcenter



Update design State via  
Teamcenter Workflow

- Capital design lifecycle is controlled via Teamcenter Workflow
- Teamcenter is the owner of the change process to control design revision creation

### Connected Mode



Real time data import, export & cross application exploration

- Cross-highlighting
- Interactive Change Manager
- Bi-directional exchange of data

### Direct Navigator Mode



Access to Capital data within NX via embedded Capital navigator

- No Capital installation required
- Cross-highlighting
- Simultaneous data access

### Teamcenter Mediated File Based Mode



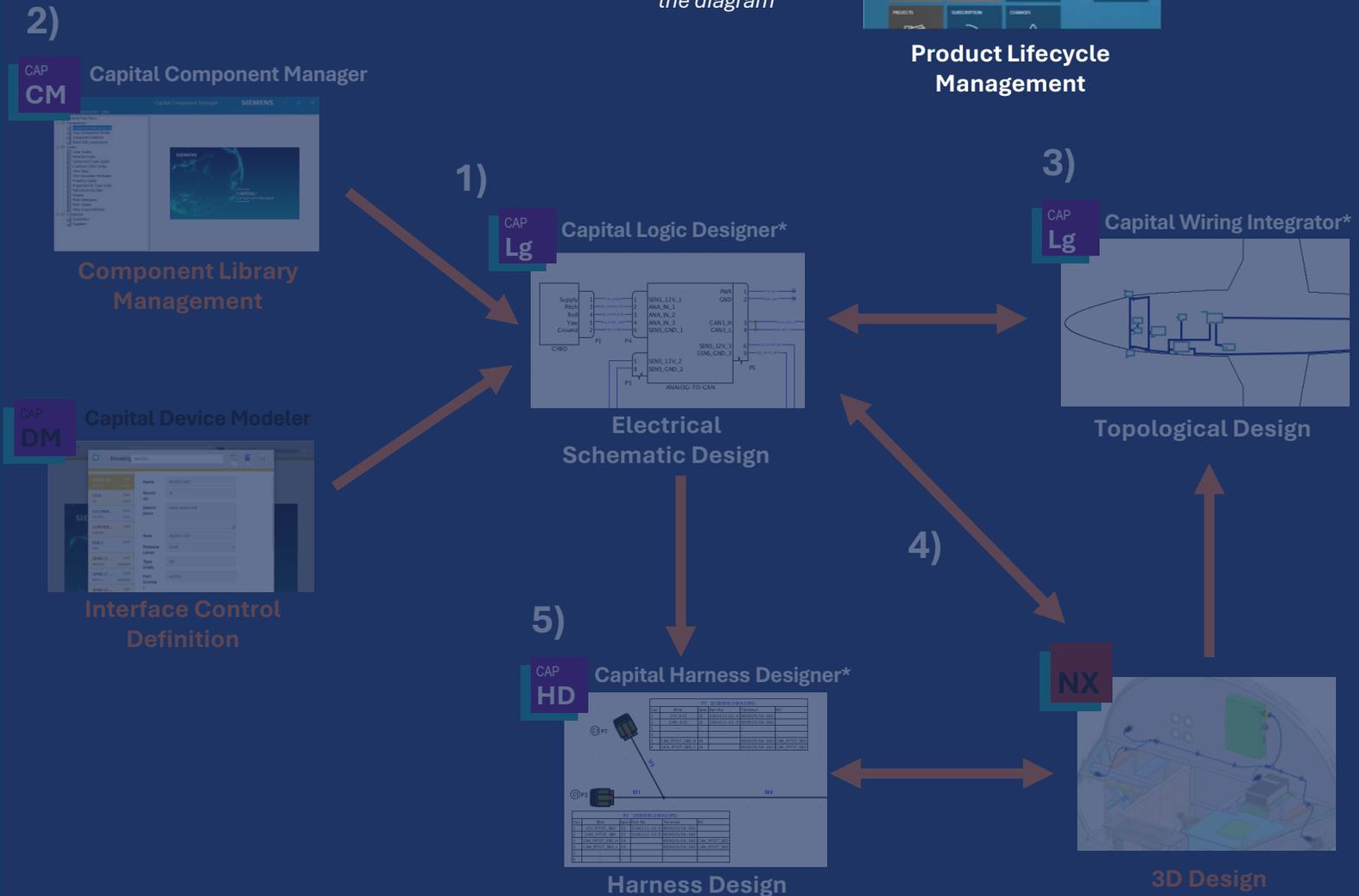
Teamcenter used to mediate the file exchange between Capital and NX

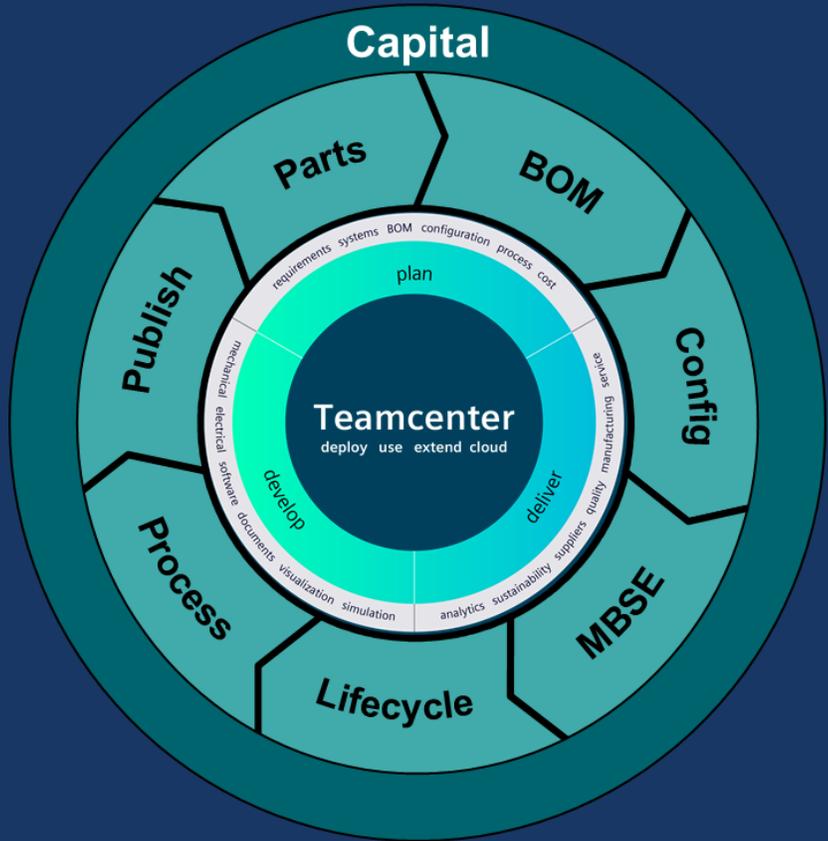
- Configuration controlled access
- Data exchange tracked and version controlled
- Embedded Active Workspace
- Workflows to notify users of new content

# Live Demo

## 6. Publish to Teamcenter

Fully integrated ecosystem with a single source of truth





## Orchestrate E/E systems in whole product context

Publish E/E design to multi-domain BOM

Control E/E design lifecycle and configuration

Balance autonomy and concurrency

Drive overall process via Workflows

# 1. Electrical Schematic design

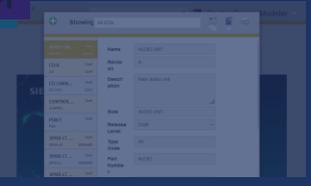
## Flexible and intuitive schematic design

2) **CAP CM** Capital Component Manager



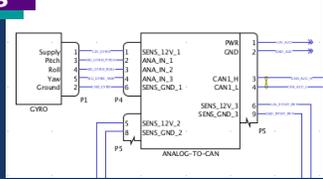
Component Library Management

**CAP DM** Capital Device Modeler



Interface Control Definition

1) **CAP Lg** Capital Logic Designer\*



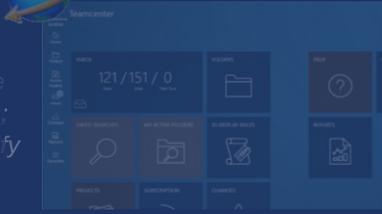
Electrical Schematic Design

5) **CAP HD** Capital Harness Designer\*



Harness Design

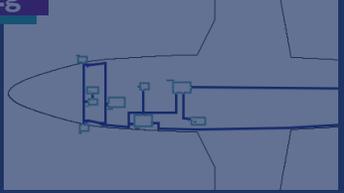
6) **Teamcenter**



Product Lifecycle Management

*\*TC remains up-to-date throughout the process; links not drawn to simplify the diagram*

3) **CAP Lg** Capital Wiring Integrator\*



Topological Design

4) **NX**

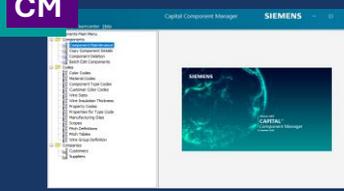


3D Design

## 2. Component Library Management

Correct by construction schematics

### 2) Capital Component Manager



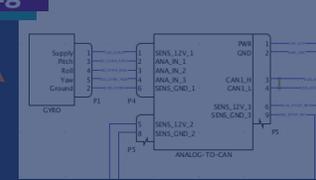
Component Library Management

### CAP DM Capital Device Modeler



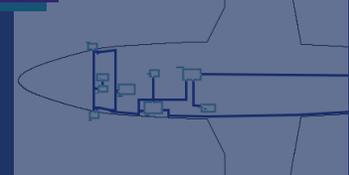
Interface Control Definition

### 1) CAP Lg Capital Logic Designer\*



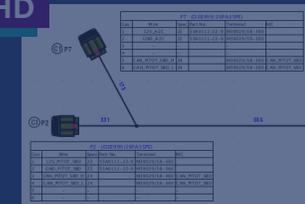
Electrical Schematic Design

### 3) CAP Lg Capital Wiring Integrator\*



Topological Design

### 5) CAP HD Capital Harness Designer\*



Harness Design



3D Design

### 6) Teamcenter



Product Lifecycle Management

\*TC remains up-to-date throughout the process; links not drawn to simplify the diagram

### 3. Topological Design

# Optimise full aircraft wiring installation

2) **CAP CM** Capital Component Manager



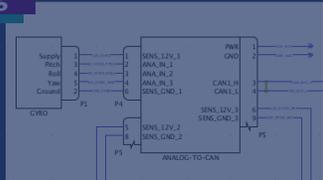
Component Library Management

**CAP DM** Capital Device Modeler



Interface Control Definition

1) **CAP Lg** Capital Logic Designer\*



Electrical Schematic Design

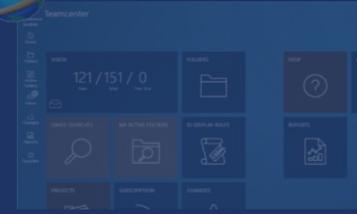
5) **CAP HD** Capital Harness Designer\*



Harness Design

| Wire | Part No. | Quantity | Notes   |
|------|----------|----------|---------|
| 1    | WIR_001  | 10       | 100% OK |
| 2    | WIR_002  | 5        | 100% OK |
| 3    | WIR_003  | 15       | 100% OK |
| 4    | WIR_004  | 8        | 100% OK |
| 5    | WIR_005  | 12       | 100% OK |
| 6    | WIR_006  | 7        | 100% OK |
| 7    | WIR_007  | 9        | 100% OK |
| 8    | WIR_008  | 6        | 100% OK |
| 9    | WIR_009  | 11       | 100% OK |
| 10   | WIR_010  | 4        | 100% OK |

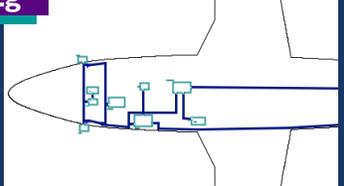
6) **Teamcenter**



Product Lifecycle Management

\*TC remains up-to-date throughout the process; links not drawn to simplify the diagram

3) **CAP Lg** Capital Wiring Integrator\*



Topological Design

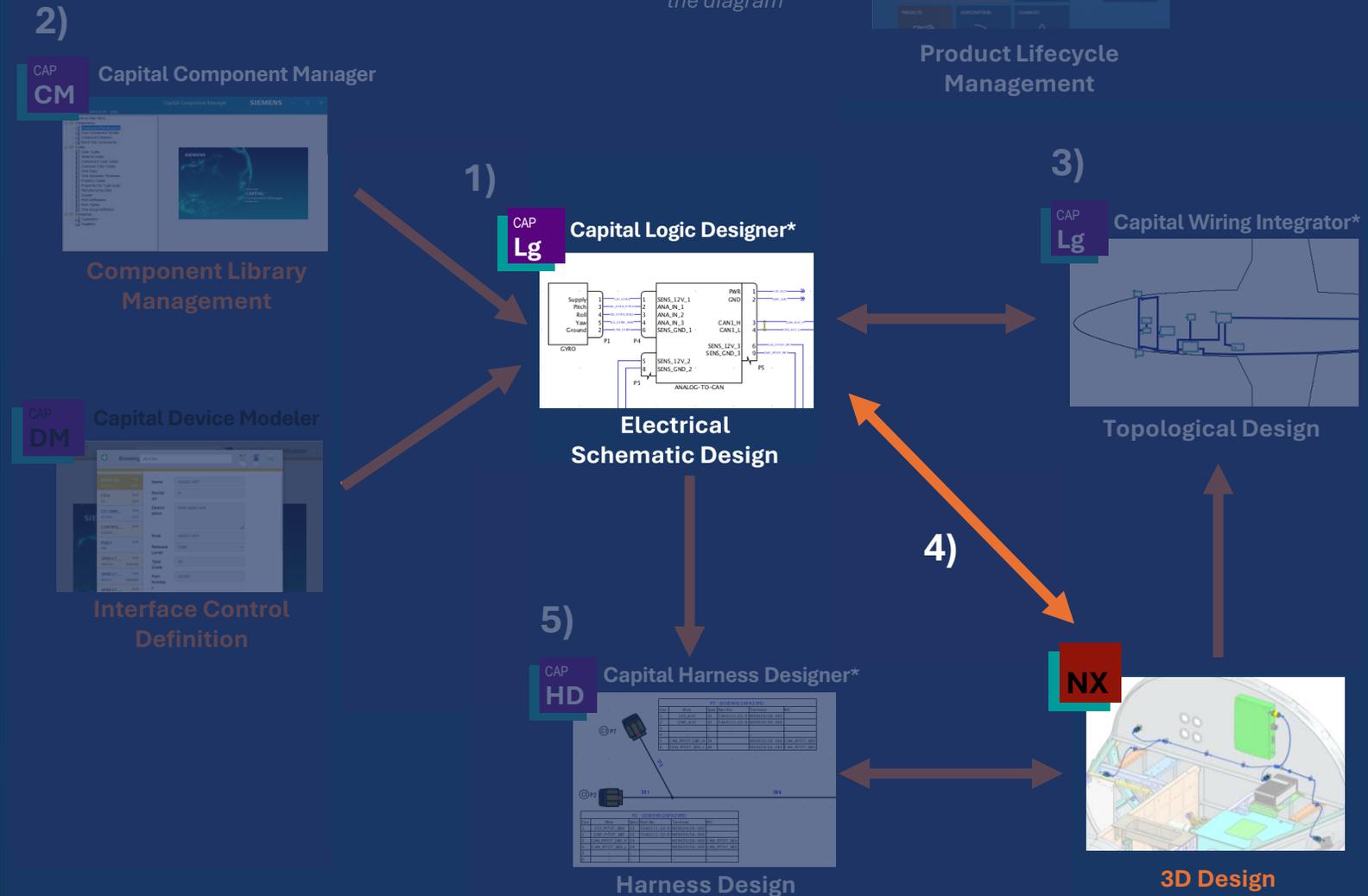
4) **NX**



3D Design

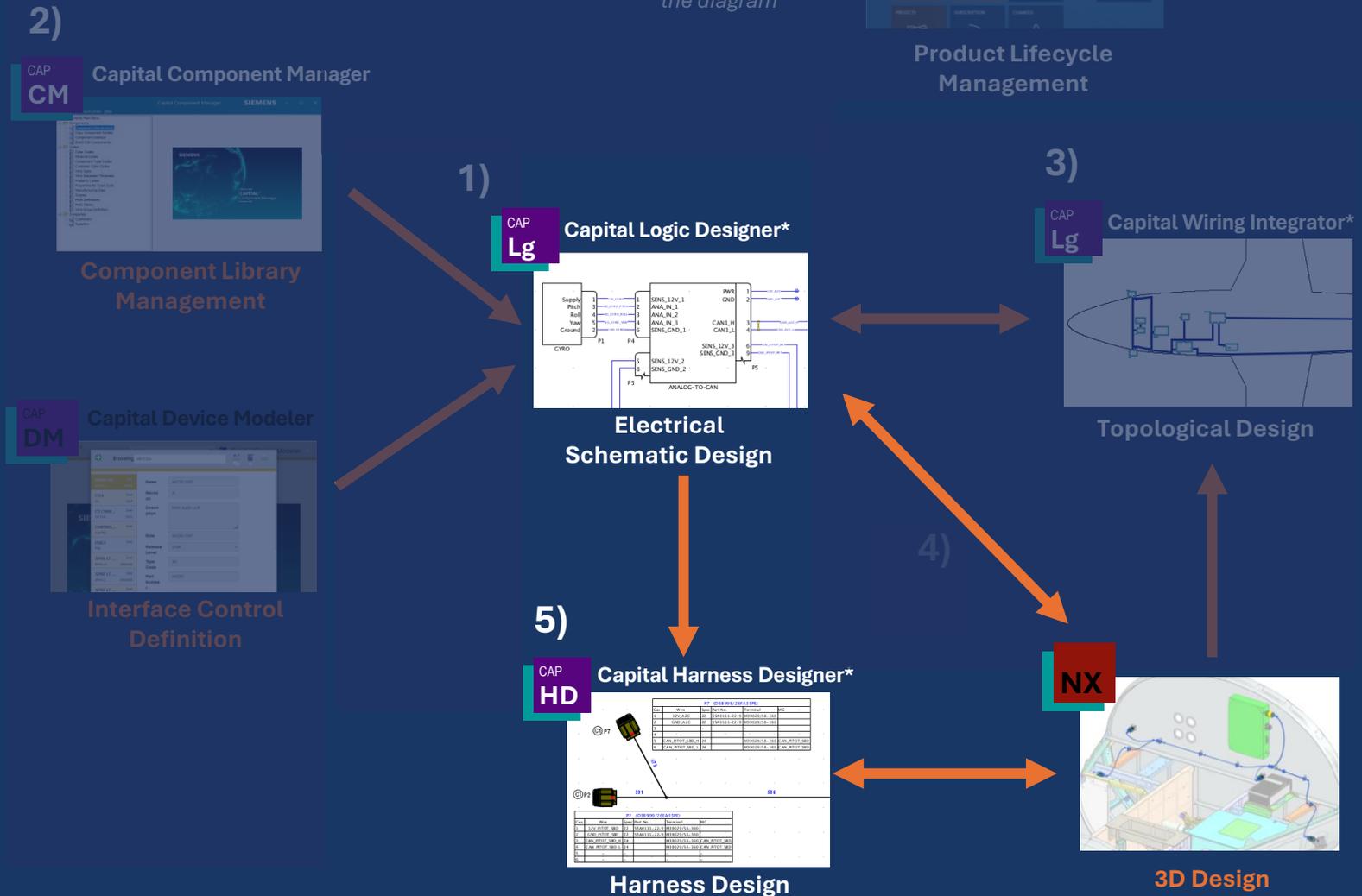
## 4. Schematic-to-3D Data Exchange

Break down silos and remove manual steps



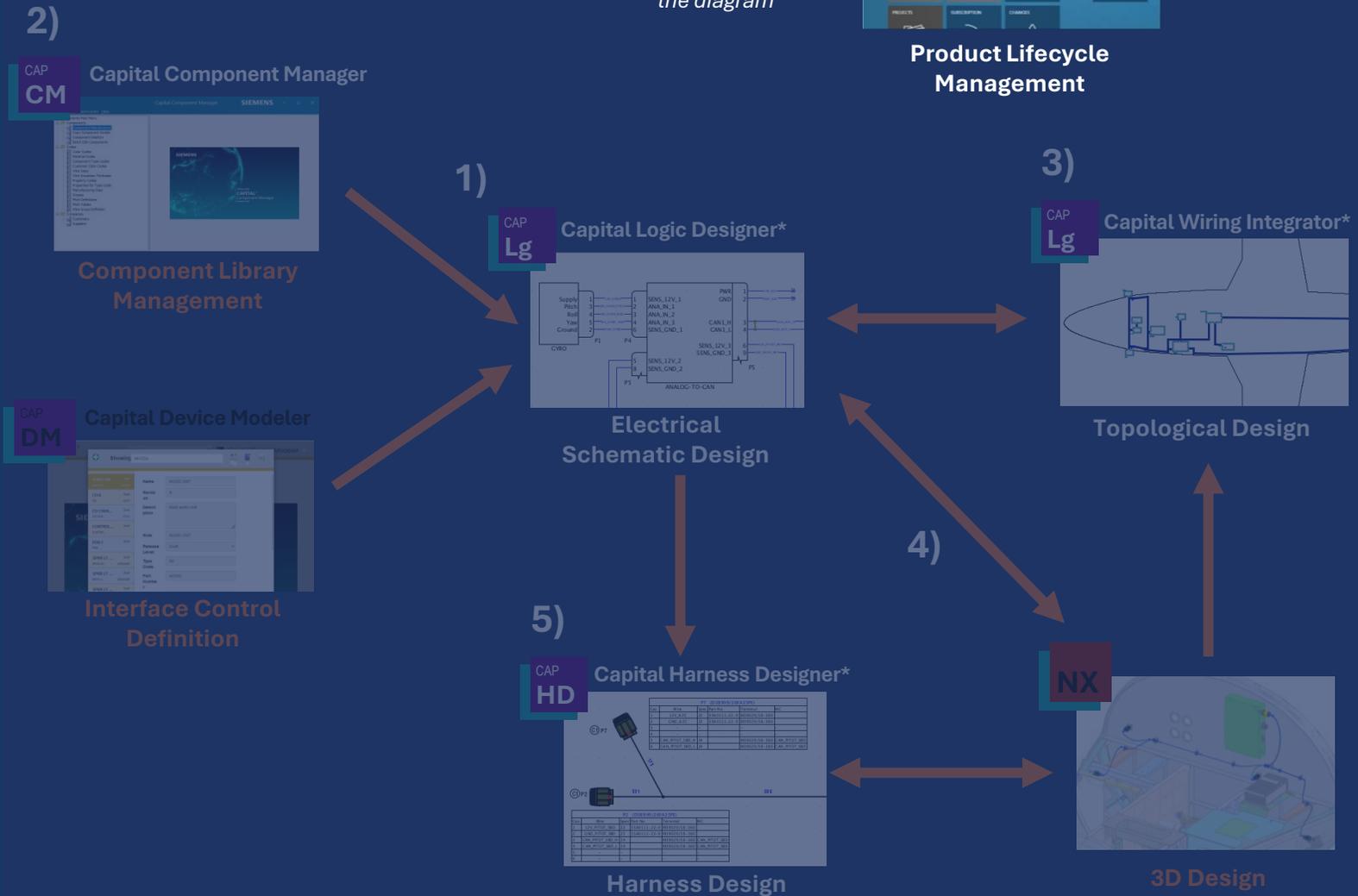
## 5. Harness Flattening and Harness Engineering

Automate to increase productivity and accuracy



## 6. Publish to Teamcenter

Fully integrated ecosystem with a single source of truth



1. Electrical Schematic design

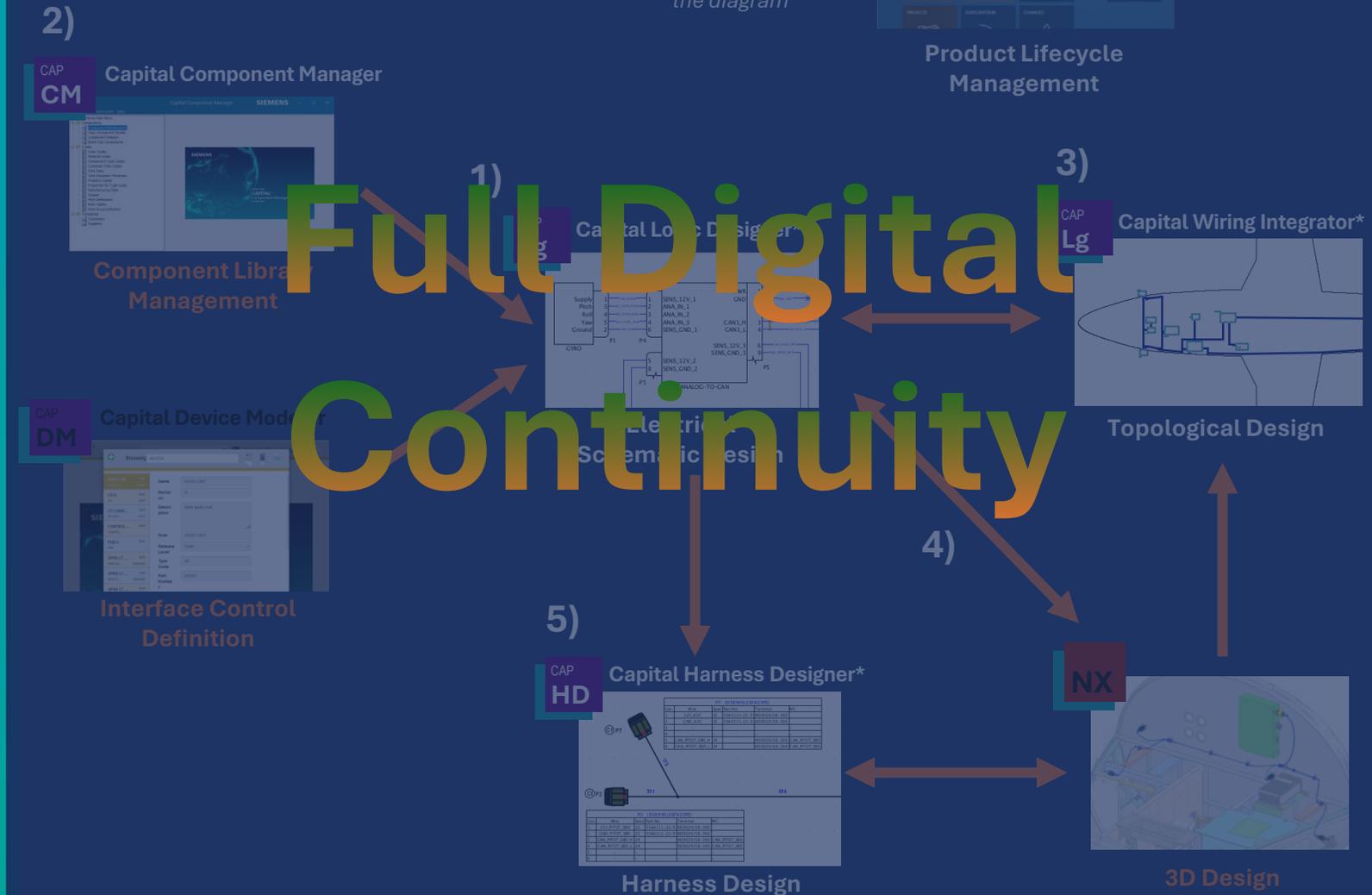
2. Component Library Management

3. Topological Design

4. Schematic-to-3D Data Exchange

5. Harness Flattening and Harness Engineering

6. Publish to Teamcenter



# QUESTIONS ?