

Enterprise Digital Twins & Maintenance 4.0, the winning combo

Jean Goutierre - Renault
Michel Morvan - Cosmo Tech

Webinar
15 April 2020



Get ready to engage with us

- All participants are in listen-only mode
- Q&A will be at the end of the presentation but submit your questions at any time using the question box
- Apologies if we experience technical or connection issues. Bear with us!
- The recording of the webinar will be sent to all attendees tomorrow





Agenda



Welcome & Introduction

Stephanie Kidder



A new approach to obsolescence management under capex constraints

Jean Goutierre & Michel Morvan



Enterprise Digital Twins

Michel Morvan



Q&A

Jean Goutierre & Michel Morvan



Welcome & Introduction



Jean Goutierre

Expert Leader Industrial Systems 4.0

Groupe Renault



Michel Morvan

Executive Chairman and Co-Founder

Cosmo Tech



Stephanie Kidder

CMO & Moderator

Cosmo Tech



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Asset Obsolescence Management under Capex Constraints in Manufacturing



About Cosmo Tech

We are a global software vendor of Enterprise Digital Twin solutions for industrial companies that simulate and optimize operational efficiency.

COSMOTECH



Key Dates & Figures

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2010

Founded
Lyon, France



2014

\$4M Series A



2016

Gartner Cool Vendor in
Data Science

EY Most Innovative
Software Company
France



2017

Cleantech Global 100

Red Herring 100
Global Europe/
North America



2018

\$21M Series B

Cleantech Global 100



2019

EY
Born Global Award



RENAULT

AIRBUS

ALSTOM



Our solutions in production

Non exhaustive list

About Renault

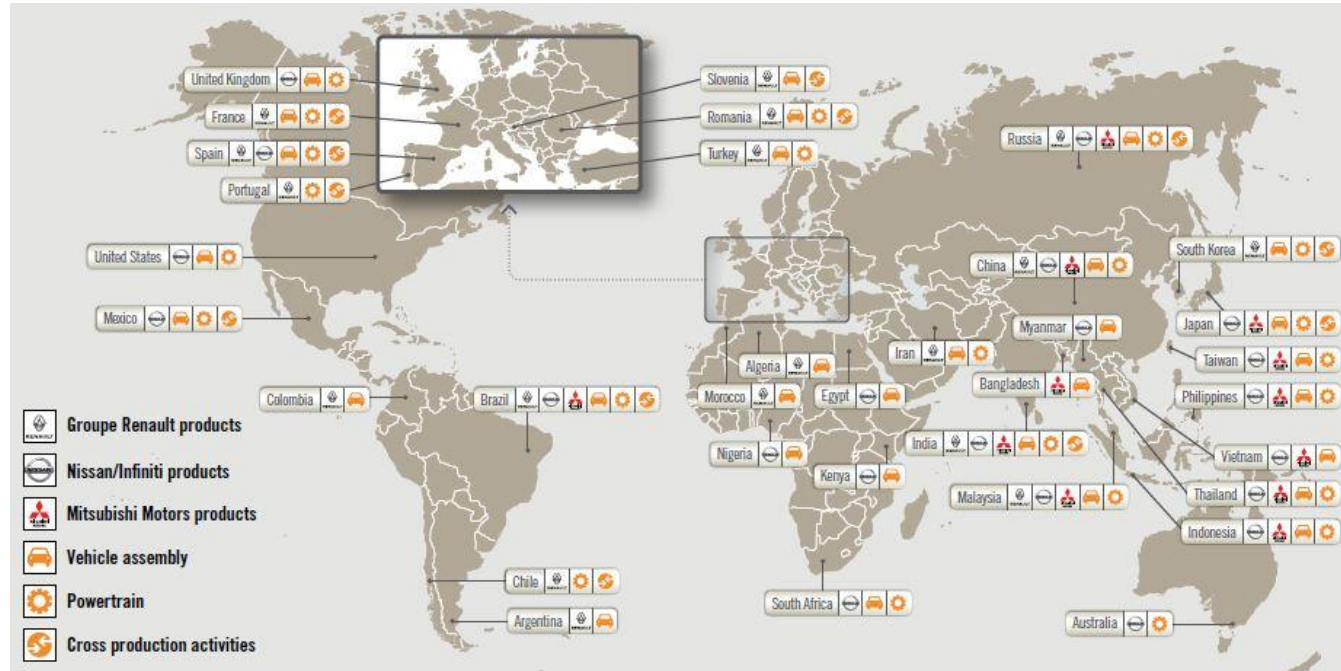


Alliance Global Industry Footprint

122 Manufacturing plants
(Vehicle & powertrain)

More than **6000** suppliers

Increasing **cross productions**



**A New Approach to
Obsolescence Management
under Capex Constraints**

COSMOTECH



Main Challenges for Asset Obsolescence under Capex Constraints

- Operating asset obsolescence
- Skill depreciation
- Scarcity of spare parts
- Limited visibility on the entire value chain
- Constrained environment





How to **optimize the lifecycle** of industrial assets while **maximizing the return on investment**?

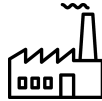


Implementing Cosmo Tech Asset at Renault



3 countries

France
Spain
Slovenia



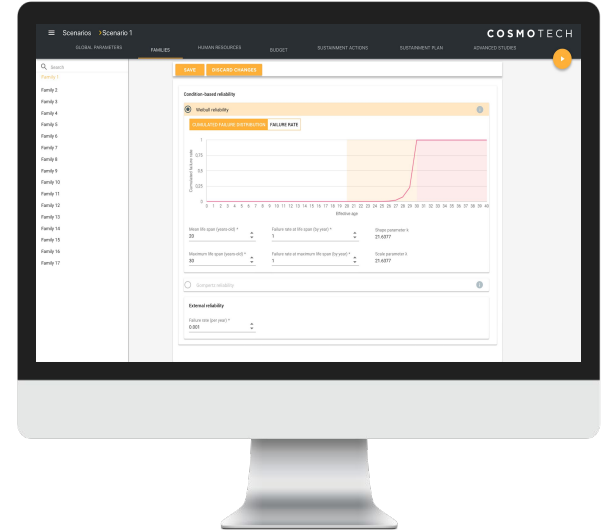
8 Factories

5 in France
2 in Spain
1 in Slovenia



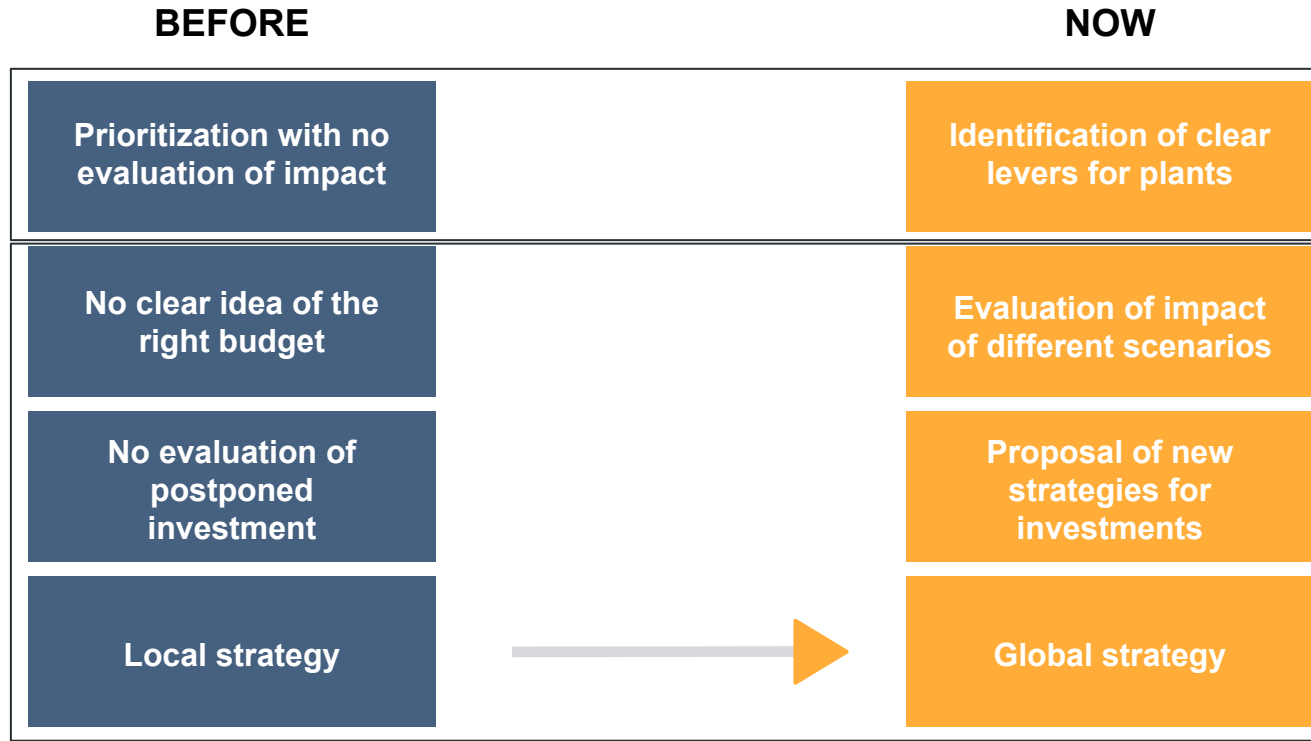
523 sub components

5000 Assets





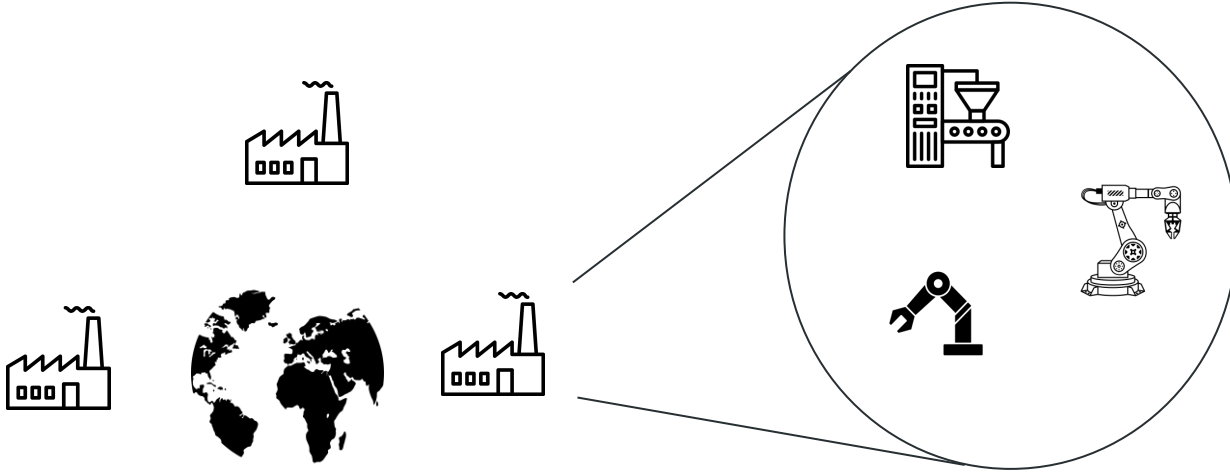
Implementing Cosmo Tech Asset at Renault





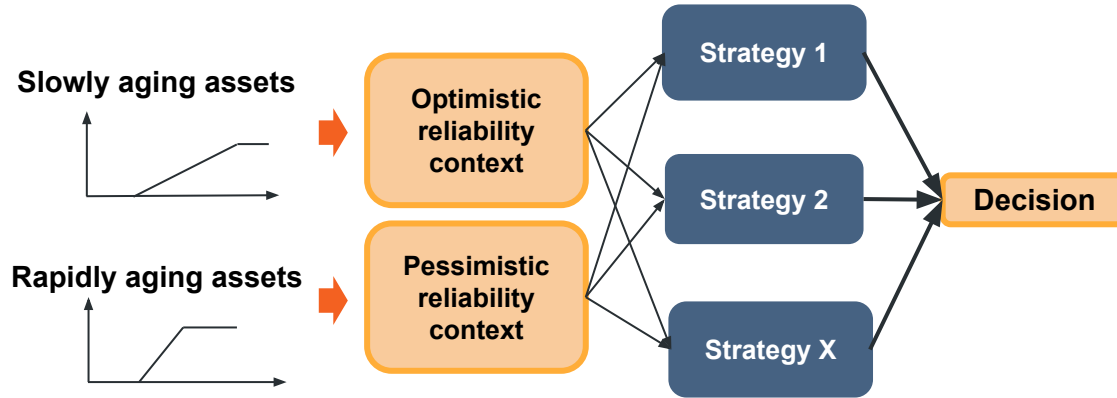
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The context



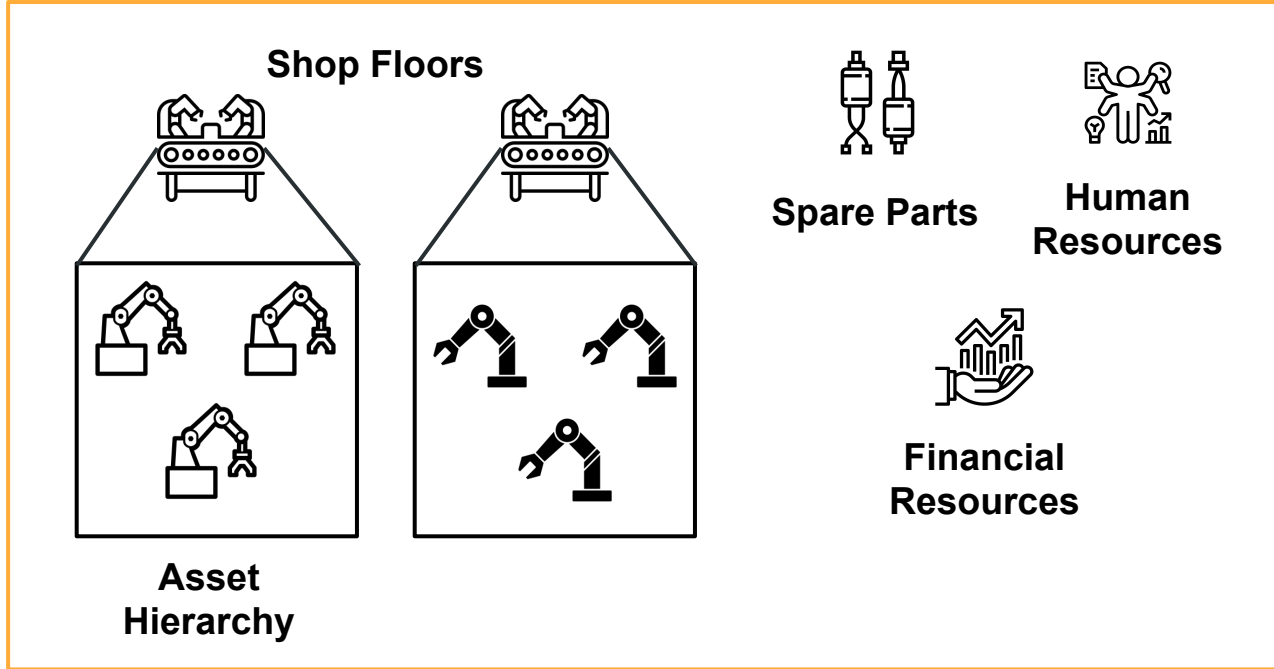


How to identify the most robust strategy in an uncertain future?





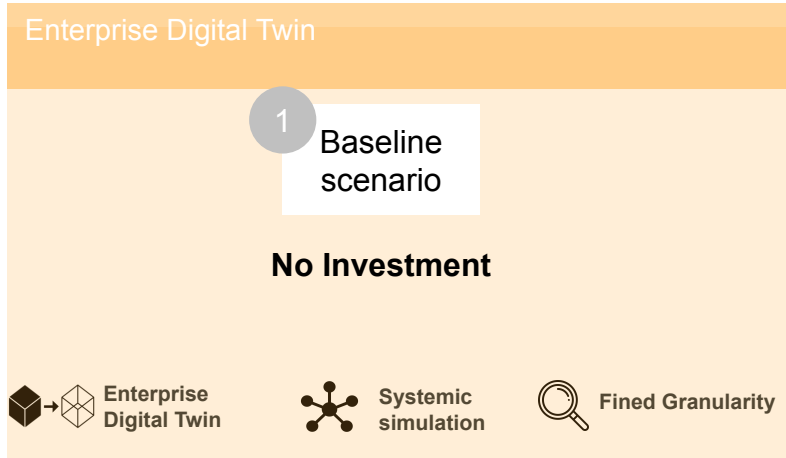
What's included in the Enterprise Digital Twin?





Cosmo Tech Asset Workflow

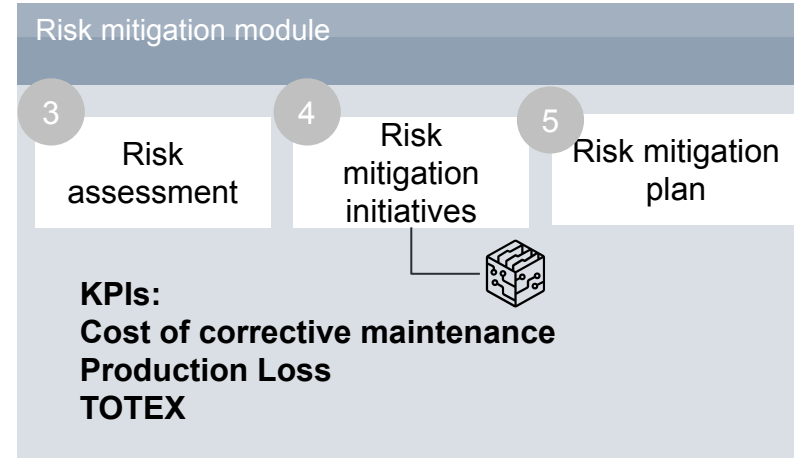
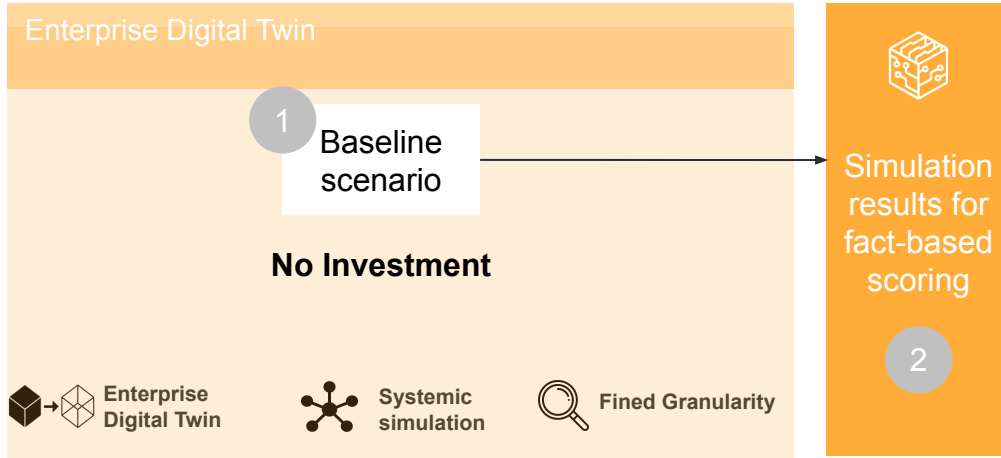
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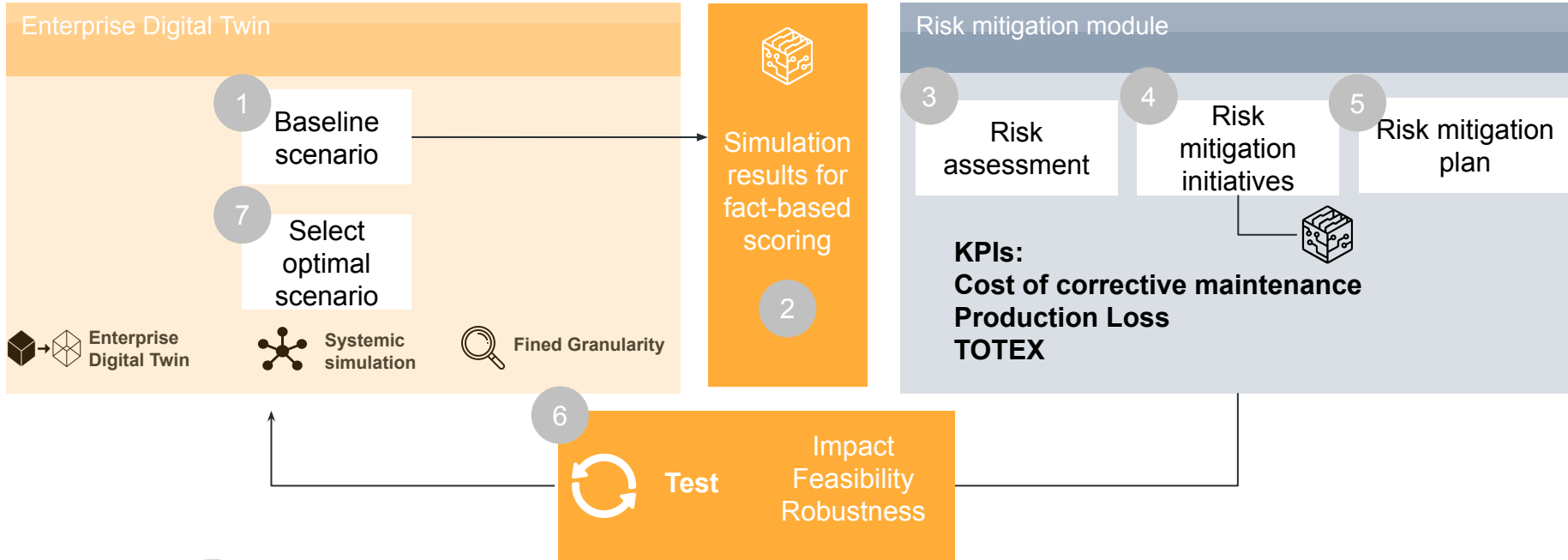
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Cosmo Tech Asset Workflow

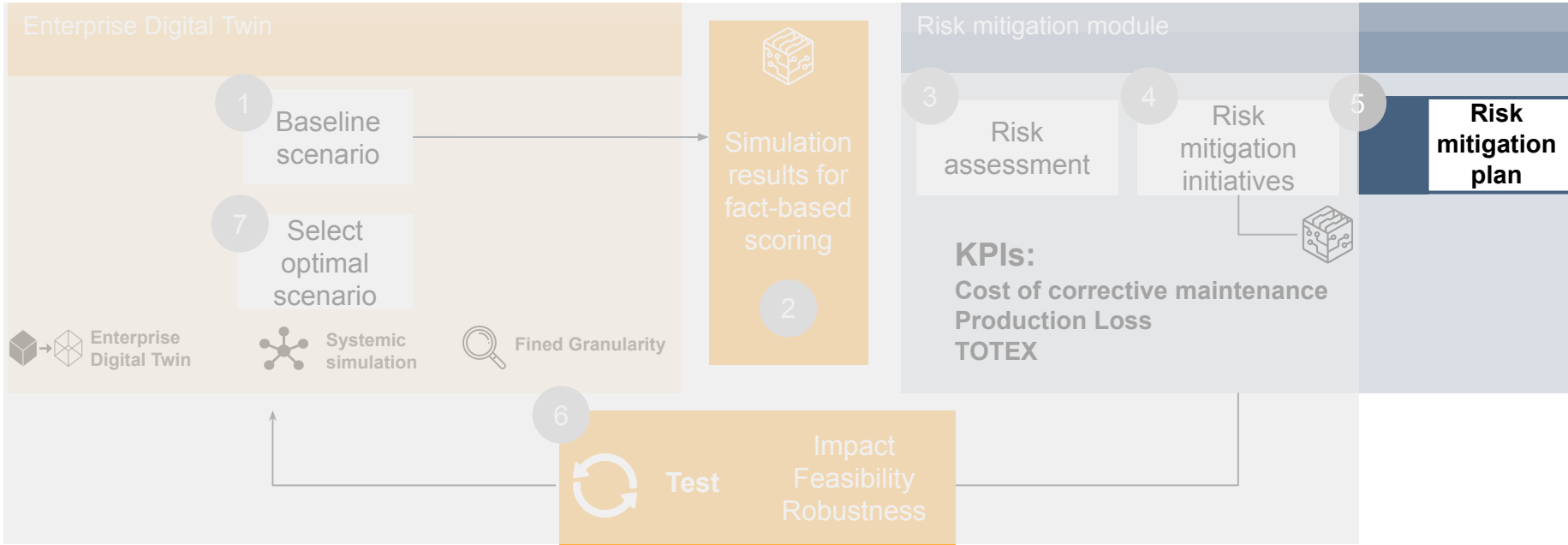
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Cosmo Tech Asset Workflow

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Testing different strategies with Cosmo Tech Asset

Strategy 1

- **Degraded Skills**
- **Increasing** spare price
- **10 M Euros / year**

Strategy 2

- **Degraded Skills**
- **Increasing** spare price
- **2 M Euros / year**

Strategy 3

- **Maintained Skills**
- **Negotiated** spare price
- **10 M Euros / year**

Strategy 4

- **Maintained Skills**
- **Negotiated** spare price
- **2 M Euros / year**



Fill dataset



DATABASES



- Range of renewal dates
- Asset installation dates
- Asset by workshop / factory
- Racks
- Maintenance skills (of the team)
- CAPEX budget
- Reliability curve for each asset family
- Cost of unavailability
-



COSMO TECH
ASSET
DATASET

Tasks

Fill dataset

Upload data

Configure

Simulate baseline scenario

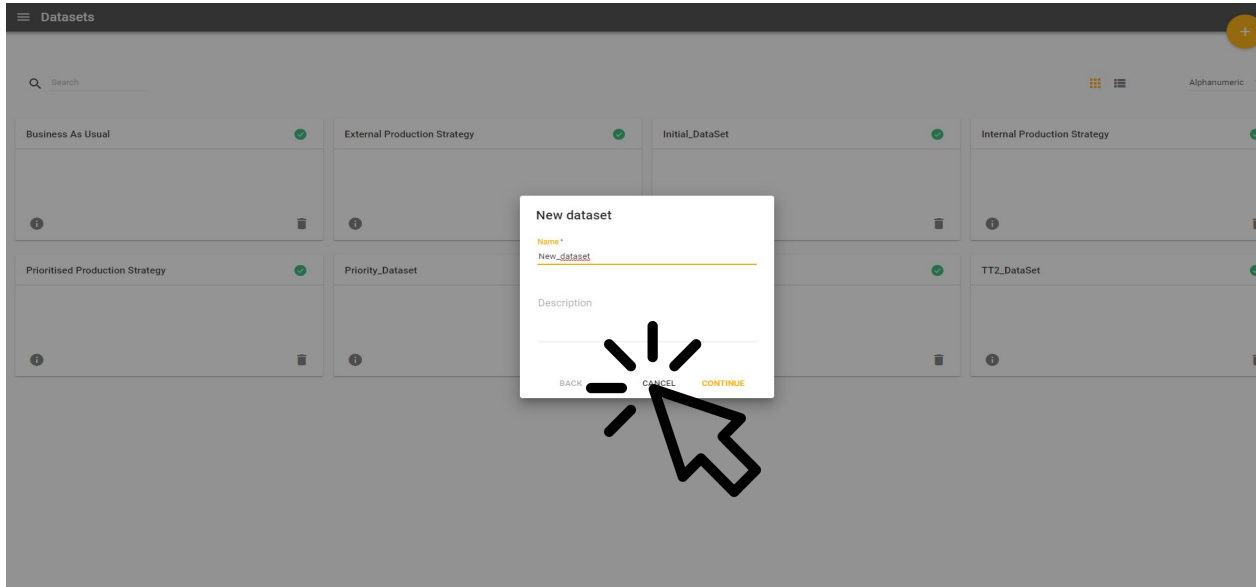
Risk analysis

Compare results

Export



Upload data



Tasks

Fill dataset

Upload data

Configure

Simulate baseline scenario

Risk analysis

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Export



Configure

Scenarios

COSMOTECH

Search

ALL SCENARIOS MASTER PLANS

Alphanumeric All ownerships

Optimiste - Strat 1 - No Invest
2020 - 2039

BASELINE Scenario

Tasks

Fill dataset

Upload data

Configure

Simulate baseline scenario

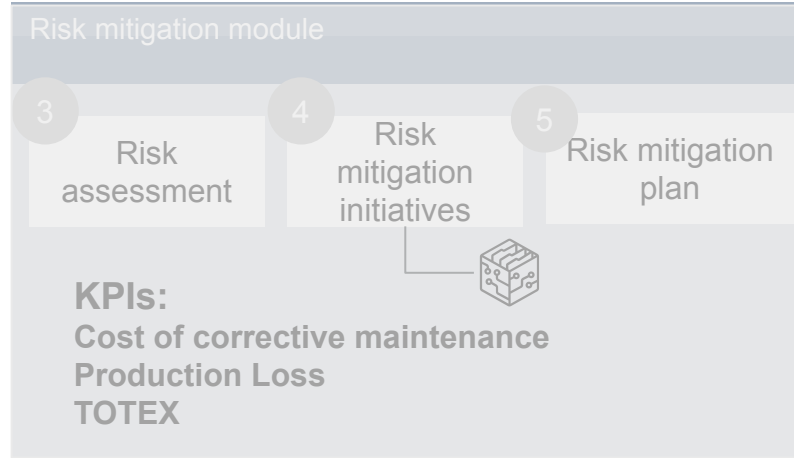
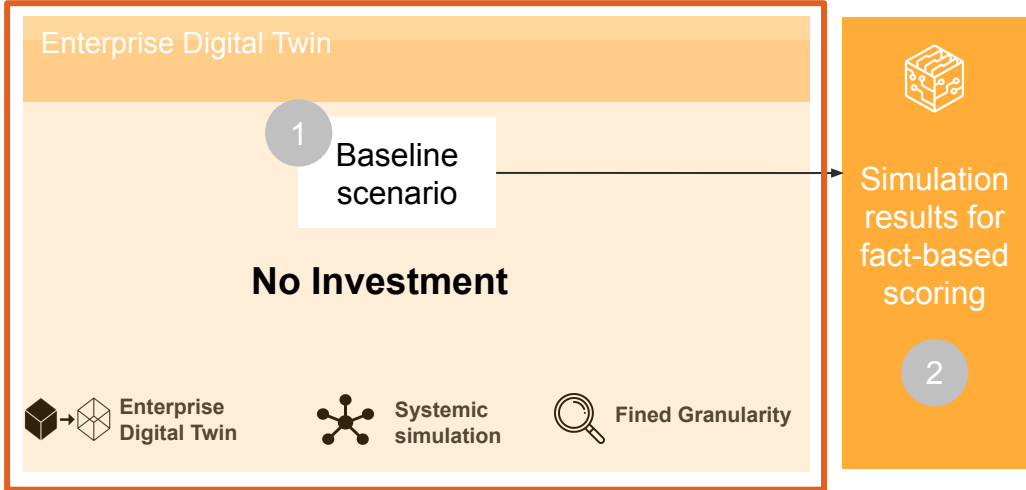
Risk analysis

Compare results

Export



Cosmo Tech Asset Workflow





Configure the reliability context of your baseline scenario

Scenarios > Optimistic - Strat1 - 10ME/An COSMOTECH

GLOBAL PARAMETERS FAMILIES HUMAN RESOURCES BUDGET SUSTAINMENT ACTIONS SUSTAINMENT PLAN ADVANCED STUDIES

Q Search

ASSET LIST:

- Asset_A 1_ShopFloor_B
- Asset_LA 1_ShopFloor_B_noObs
- Asset_LA 2_ShopFloor_B
- Asset_LA 2_ShopFloor_B_noObs
- Asset_LA 3_ShopFloor_B
- Asset_LA 3_ShopFloor_B_noObs
- Asset_LA 4_ShopFloor_B
- Asset_LA 4_ShopFloor_B_noObs
- Asset_AA
- Asset_B 1_ShopFloor_A
- Asset_B 1_ShopFloor_A_noObs
- Asset_B 2_ShopFloor_A
- Asset_B 2_ShopFloor_A_noObs
- Asset_B 3_ShopFloor_A
- Asset_B 3_ShopFloor_A_noObs

Reliability model

Probability distribution*
Weibull

CUMULATED FAILURE DISTRIBUTION FAILURE RATE

Y-axis: Cumulated failure distribution (0 to 1.0)
X-axis: Apparent age (0 to 120)

Parameters:

Minimum life span 15 year(s)	Failure rate at minimum life span 0.16 by year	Shape parameter 2.8946	Scale parameter 16.0030
Maximum life span 60 year(s)	Failure rate at maximum life span 2.21184 by year		

Tasks

Fill dataset

Upload data

Configure

Simulate baseline scenario

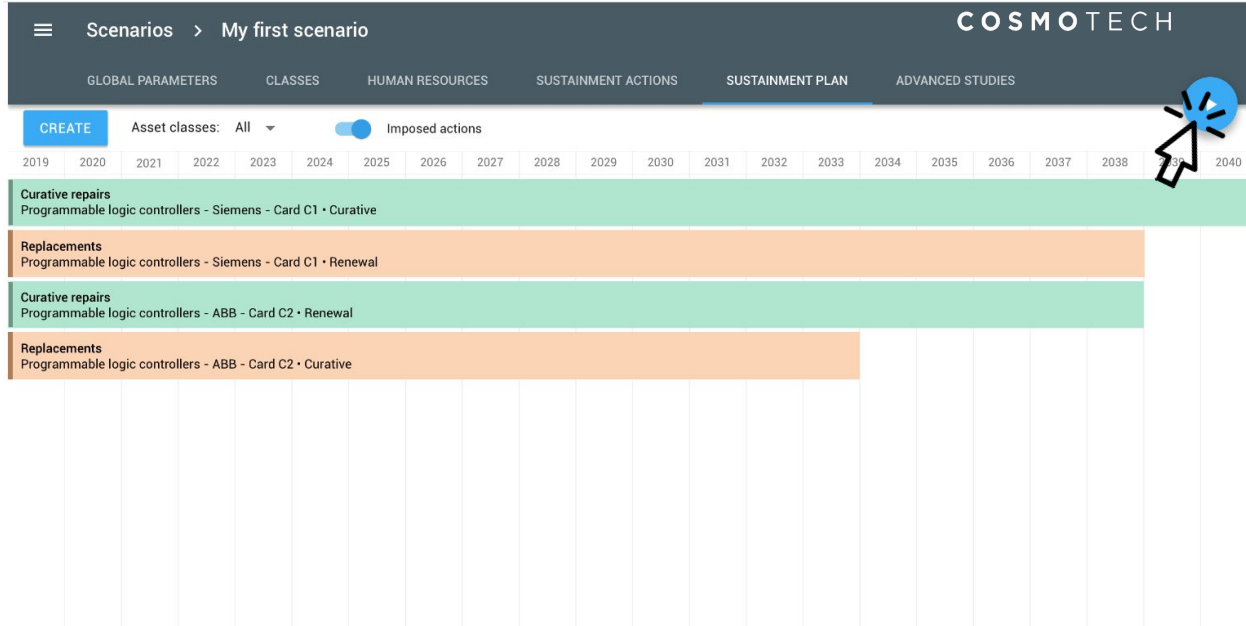
Risk analysis

Compare results

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Configure & simulate baseline scenario



Tasks

Fill dataset

Upload data

Configure

Simulate baseline scenario

Risk analysis

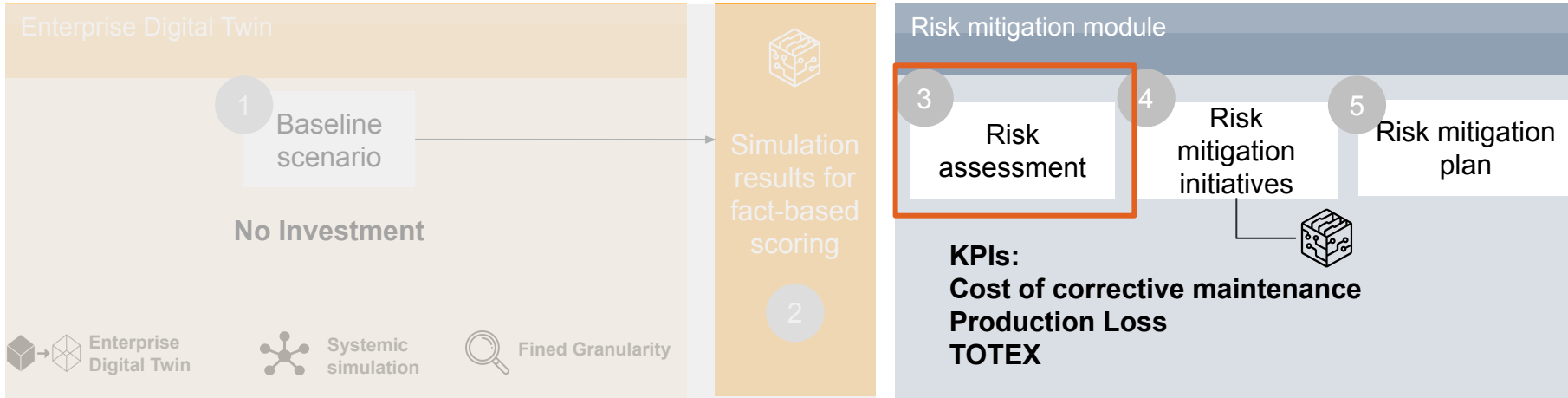
Compare results

Export



Cosmo Tech Asset Workflow

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Risk Analysis

Risk mitigation module COSMOTECH

1 Risk assessment — 2 Risk mitigation initiatives — 3 Risk mitigation plan

Baseline scenario selection

Scenario: No invest in PLCs

Simulation timeframe: 2019-2049

Risk assessment timeframe

Year start: 2020 | Year stop: 2042

Value categories

Safety: 0% | Compliance: 0% | Reliability: 0% | Financial: 0% | Environment: 0% | Customer satisfaction: 0%

Search Active

FINANCIAL X ENVIRONMENT X SAFETY X

Metric: _____

RISK SCORE | RISK VALUE | DETAILS

Consequence	1	2	3	4	5
4	Low	Medium	High	Critical	Critical
3	Low	Medium	High	Critical	Critical
2	Low	Medium	High	High	High
1	Low	Low	Medium	Medium	High

Next

Tasks

Fill dataset

Upload data

Configure

Simulate baseline scenario

Risk analysis

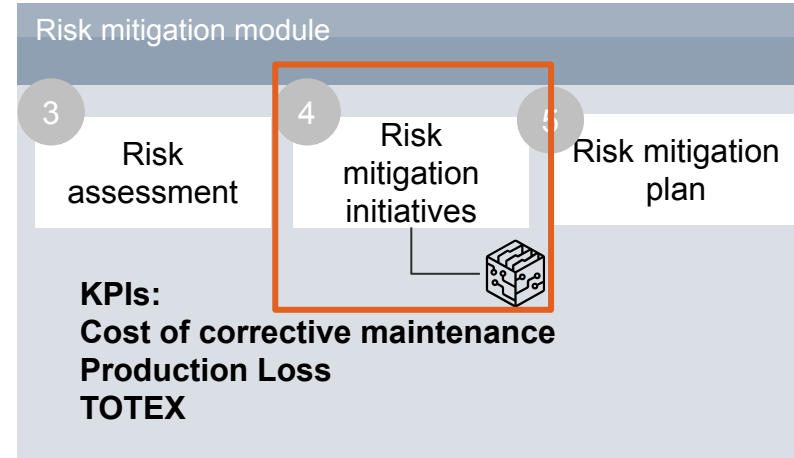
Compare results

Export



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Risk Analysis

☰ Risk mitigation module

1 Risk assessment — 2 Risk mitigation initiatives — 3 Risk mitigation plan

Baseline scenario selection

Scenario: Baseline Scenario
Simulation timeframe: 2019-2049

Risk mitigation initiatives

Initiatives	Category of Initiative	Total cost, k\$	Scope	Scoring status
Spares purchase contract	Spares policy	300	All plants	New
Invest in new PLCs - Plant 1	Renewal project	3,000	Plant 1, Plant 2	Scored
Worker training program - Repairs	Corporate level	500	All plants	Scoring pending
Increase PLC inspection frequency	Maintenance policy	500	Validated	Scored

Simulations completed: 2/20 (10%)

Launch scoring simulation

Search: Active

SPARES POLICY X RENEWAL PROJECT X MAINTENANCE POLICY X
CORPORATE LEVER X

Scope:



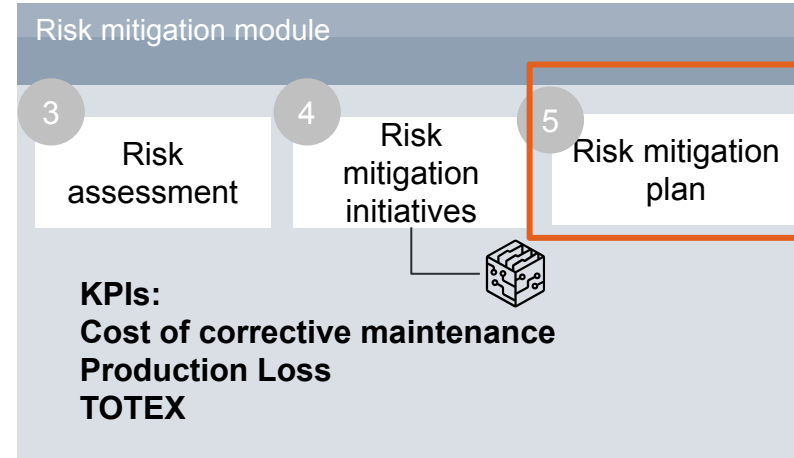
Tasks

- Fill dataset
- Upload data
- Configure
- Simulate baseline scenario
- Risk analysis
- Compare results
- Export



Cosmo Tech Asset Workflow

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Risk Analysis

Risk mitigation module

1 Risk assessment — 2 Risk mitigation initiatives — 3 Risk mitigation plan

Baseline scenario selection

Scenario: No invest in PLCs

Simulation timeframe: 2019-2049

Risk mitigation initiatives

Initiative	Category of initiative	Scope	Lever selected
Invest in new PLCs - 10M€/year	Renewal policy	All plants	<input checked="" type="checkbox"/>
Invest in new PLCs - 2M€/year	Renewal policy	All plants	<input checked="" type="checkbox"/>
Skills plan - worker training	Corporate lever	All plants	<input checked="" type="checkbox"/>
Spares purchase contract	Spares policy	All plants	<input checked="" type="checkbox"/>

[Simulate alternative](#)

IMPACT REPORT DETAILS

TOTEX (M€)

Legend: pessimistic, OPEX optimistic, CAPEX

2030: Baseline No Invest

2042: Baseline No Invest

[Create scenario +](#)

Tasks

- Fill dataset
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- Compare results
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Risk Analysis

☰ Risk mitigation module COSMOTECH

1 Risk assessment ————— 2 Risk mitigation initiatives ————— 3 Risk mitigation plan

Baseline scenario selection

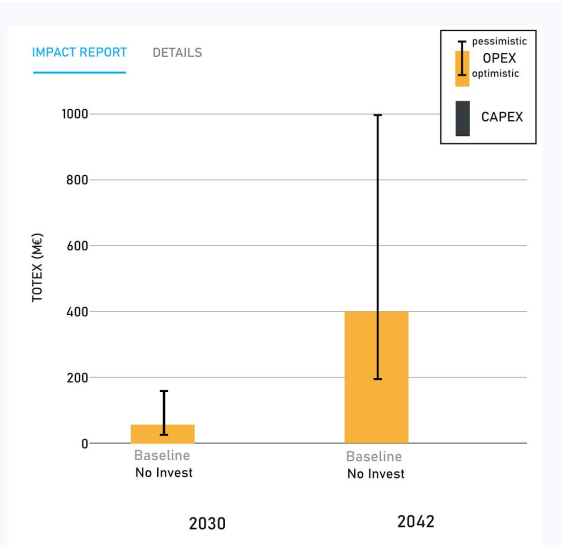
Scenario:

Simulation timeframe:

Risk mitigation initiatives

Initiative	Category of initiative	Scope	Lever selected
Invest in new PLCs - 10M€/year	Renewal policy	All plants	<input checked="" type="checkbox"/>
Invest in new PLCs - 2M€/year	Renewal policy	All plants	<input checked="" type="checkbox"/>
Skills plan - worker training	Corporate lever	All plants	<input checked="" type="checkbox"/>
Spares purchase contract	Spares policy	All plants	<input checked="" type="checkbox"/>

Simulate alternative ▶



Tasks

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Simulate baseline scenario

Risk analysis

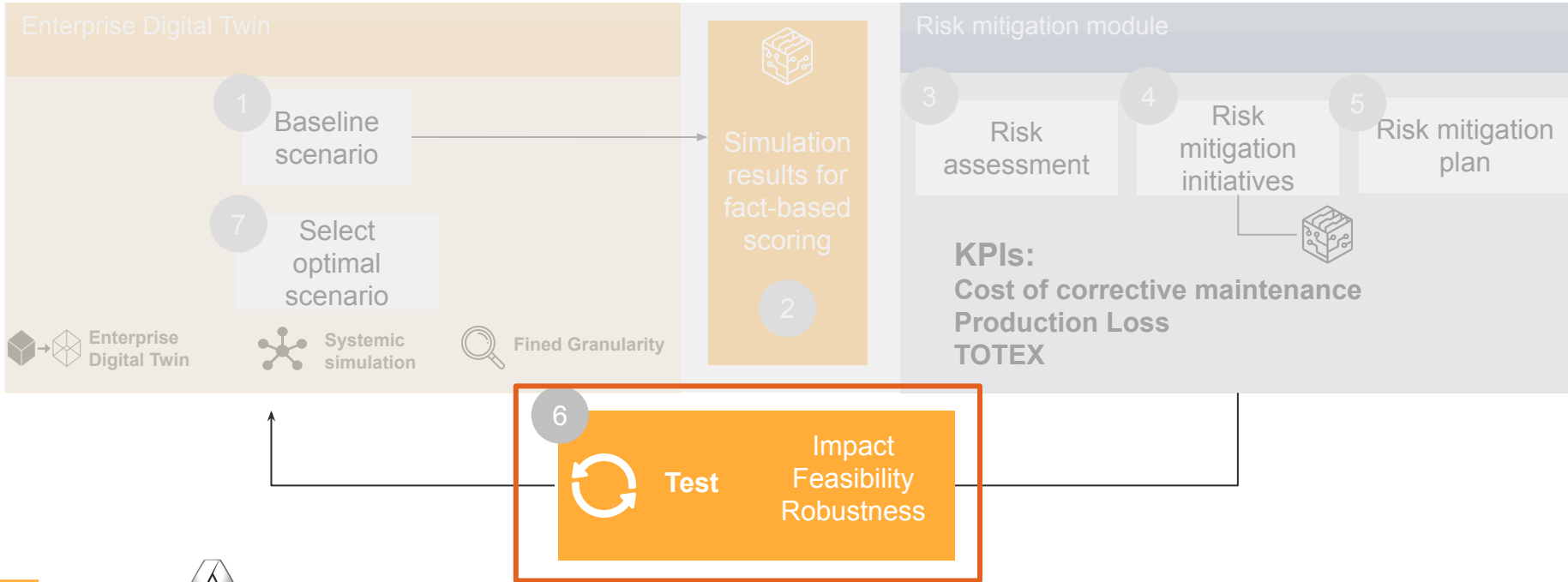
Compare results

Export



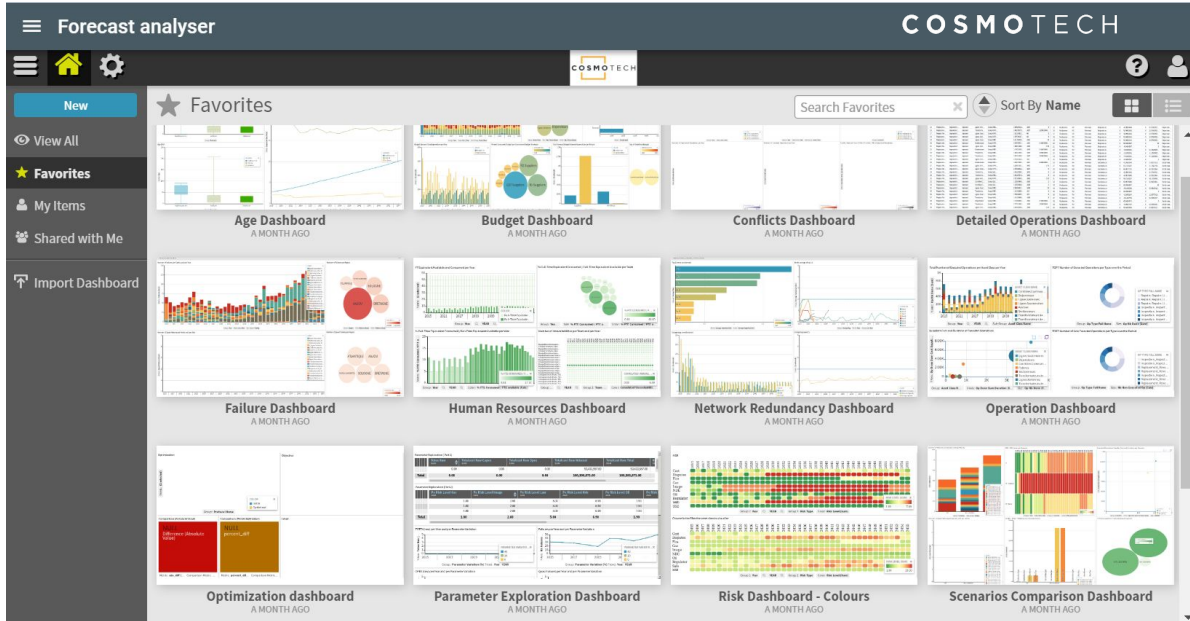
Cosmo Tech Asset Workflow

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Compare results in our BI tool



Tasks

Fill dataset

Upload data

Configure

Simulate baseline scenario

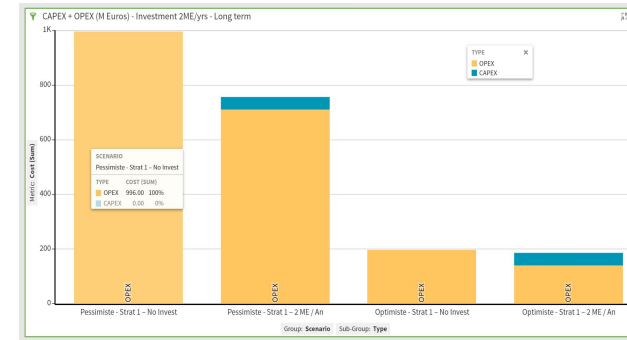
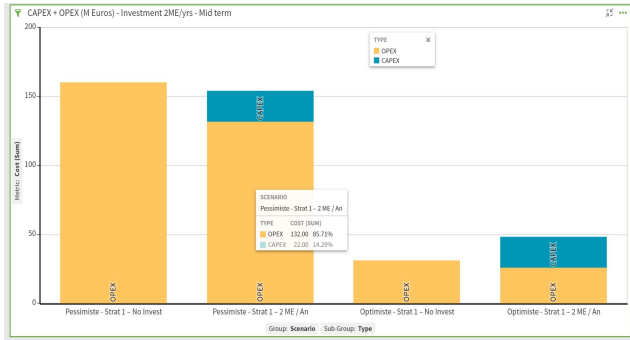
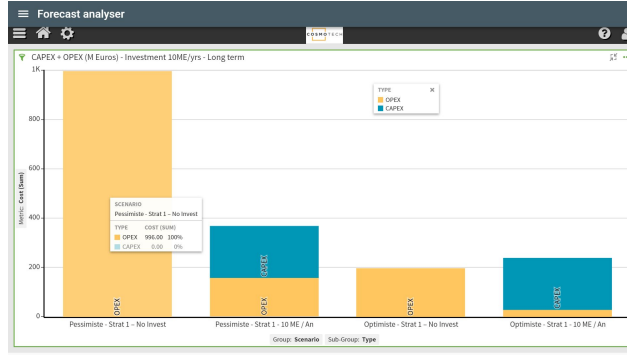
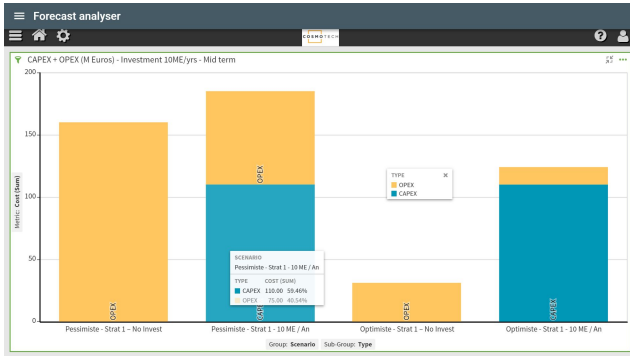
Risk analysis

Compare results

Export



Compare results in our BI tool



Tasks

Fill dataset

Upload data

Configure

Simulate baseline scenario

Risk analysis

Compare results

Export



Compare results

Strategy 1

- **Degraded Skills**
- **Increasing** spare price
- **10 M Euros / year**

Strategy 2

- **Degraded Skills**
- **Increasing** spare price
- **2 M Euros / year**

Strategy 3

- **Maintained Skills**
- **Negotiated** spare price
- **10 M Euros / year**

Strategy 4

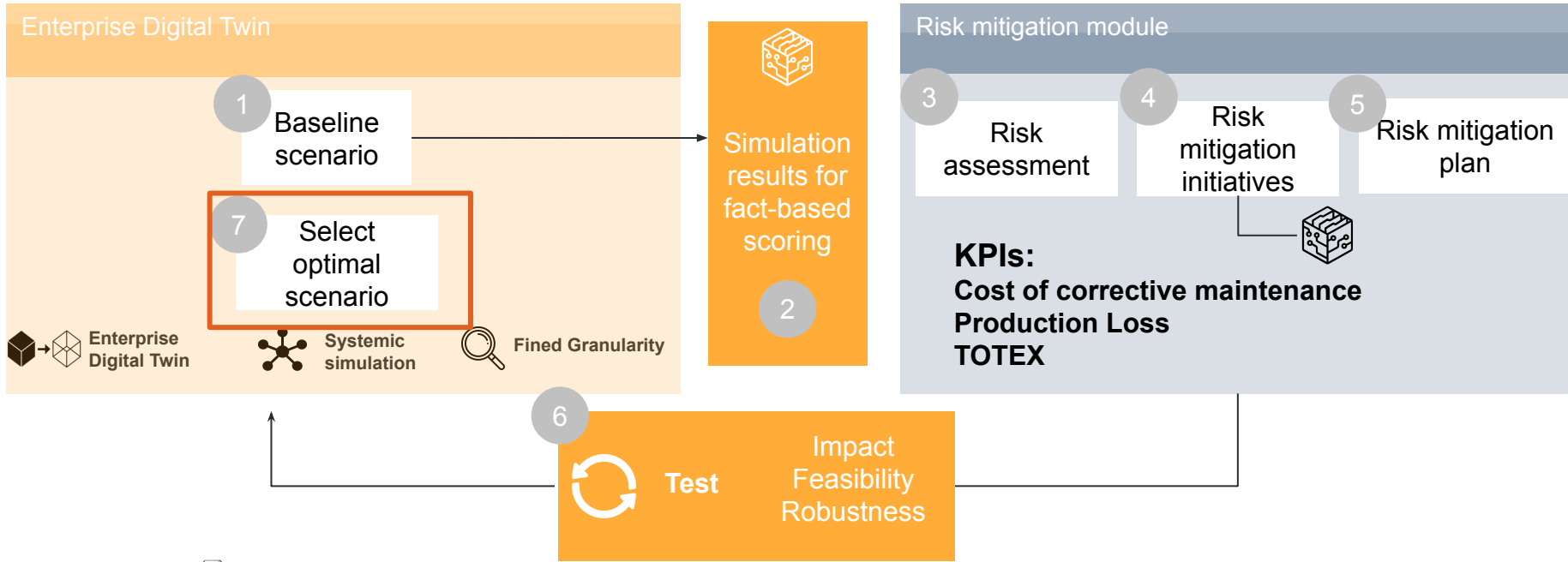
- **Maintained Skills**
- **Negotiated** spare price
- **2 M Euros / year**

On the mid term – 5yrs: cost control
On the long term – 10yrs: up to 25% cost savings
Additional levers : up to an extra 30% cost savings



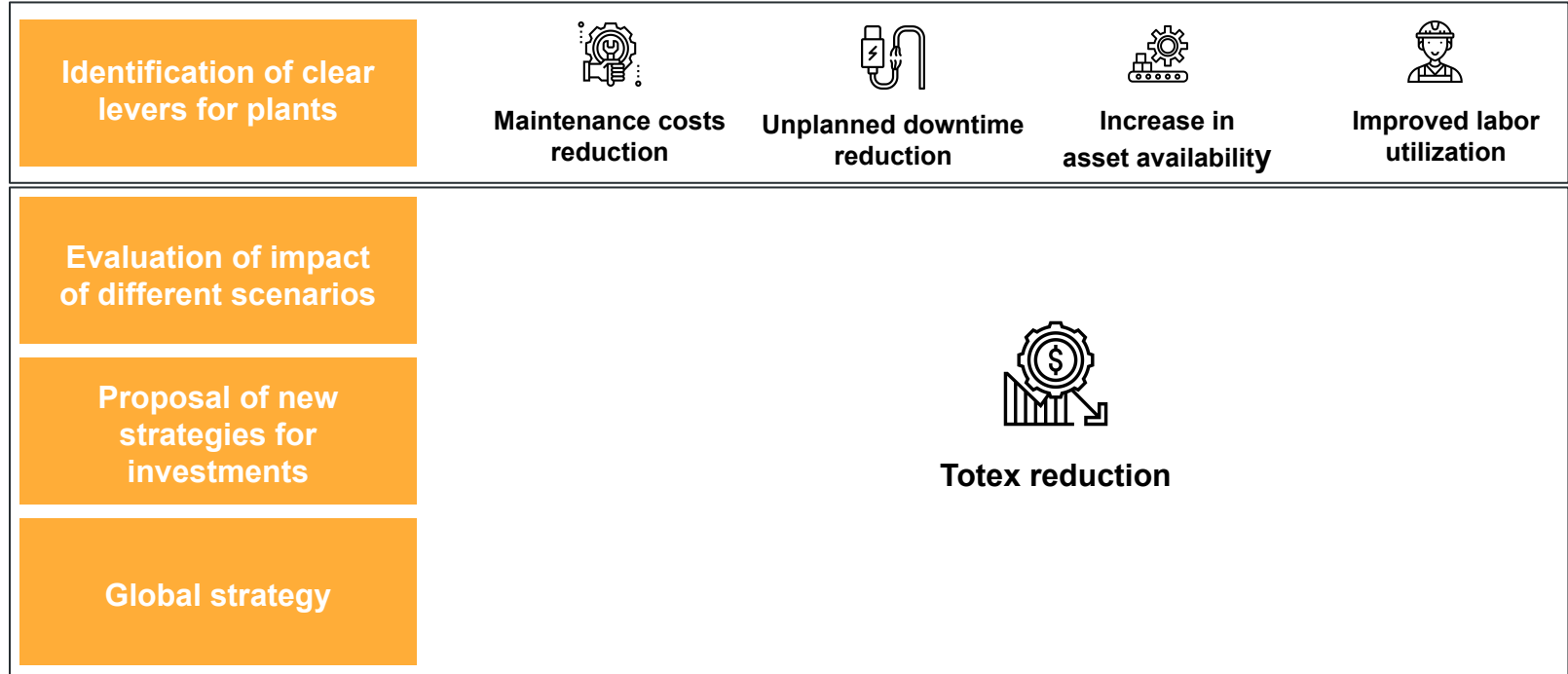
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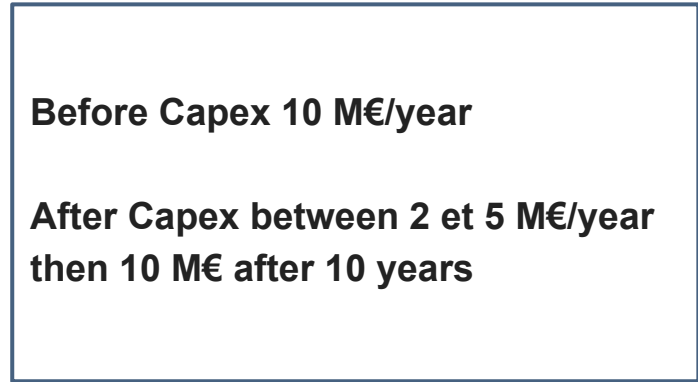


Overall benefits





Overall benefits



Enterprise Digital Twins

COSMOTECH

“By 2021, half of the large industrial companies will use **digital twins**, resulting in those organizations gaining a **10% improvement** in effectiveness over current approaches.”



Traditional Digital Twins



Single Asset
IoT + Sensor Driven



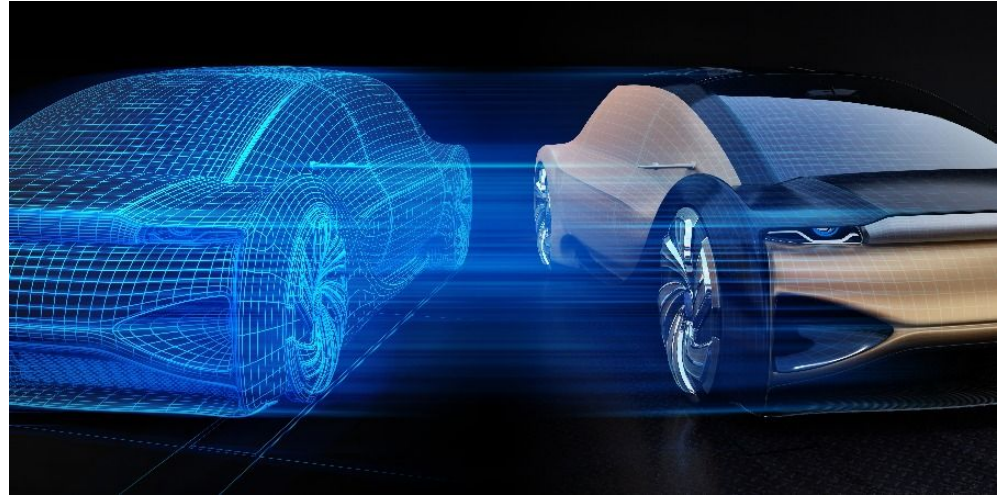
Focused on Current State



Homogeneous Data Sources



Future State Based on Past





Cosmo Tech Enterprise Digital Twins



Simulate the dynamic evolution of a system



Real-time operational simulation



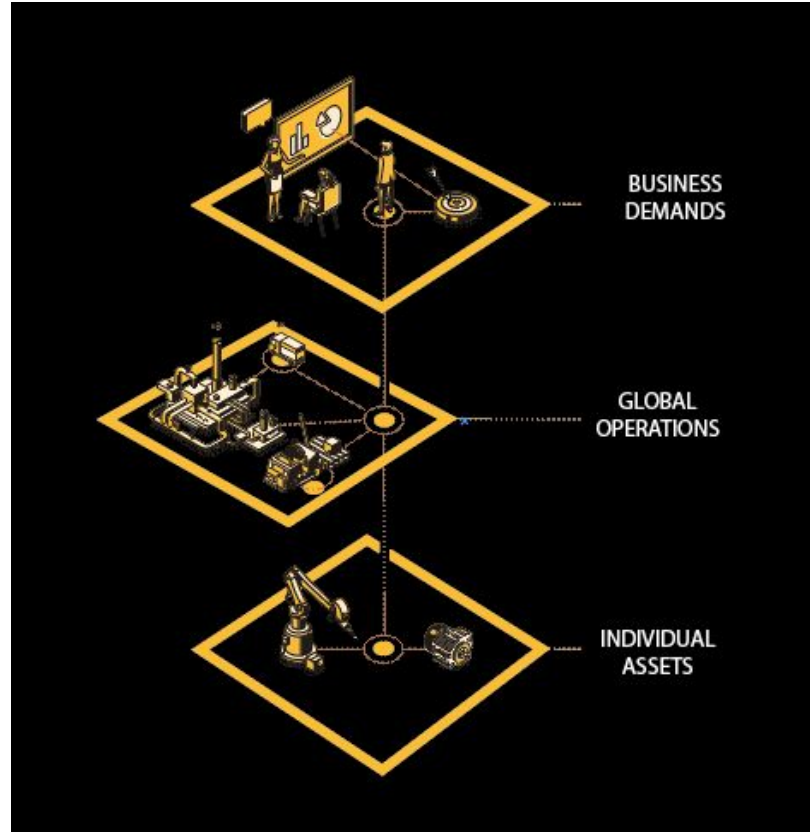
Integrate Physical, Human, Financial constraints



Draw from heterogeneous data sources

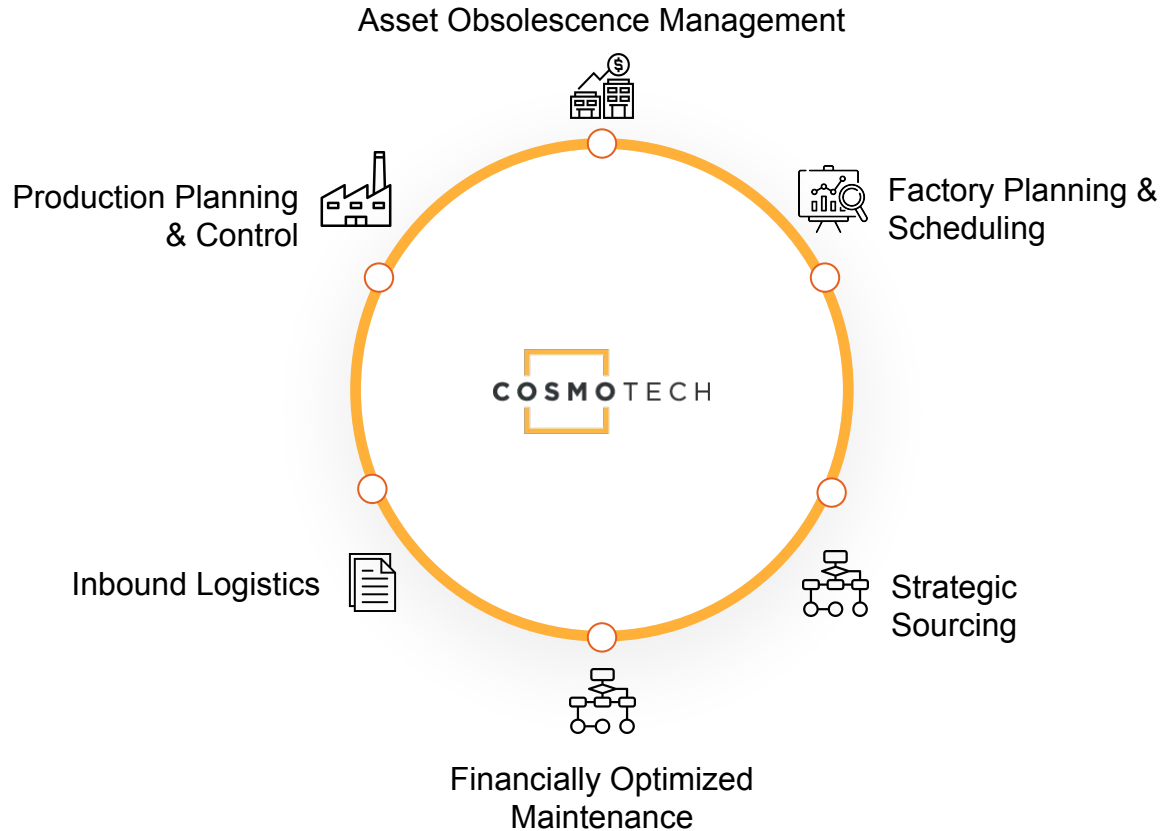


Identify causalities





Examples of use cases addressed by the Manufacturing Suite





Cosmo Tech Restart Offer to Support Rapid Recovery





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Q&A





WEBINAR 2020

Webinar: Building for resilience

Coming out of the manufacturing crisis on top!

MAY 14, 2020



Serge Yoccoz

CEO

DigitforHuman



Jérôme Fournier

Corporate VP Innovation

Nexans



Michel Morvan

Executive Chairman and Co-Founder

Cosmo Tech



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Thank you!

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