

ELECTRIFICATION BUSINESS AREA | SEPTEMBER 2024

Model-Based Systems Engineering as Enabler to Build Bridges between Engineering Disciplines at ABB Smart Power

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ABB Electrification @ A Glance



Digital Engineering Transformation – Vision & Benefits

Digital Engineering as Foundation for Digital Twin...

establish harmonized processes and seamlessly interconnected digital tools based on our product data management backbone to foster collaboration, support standardization & re-use and enable Digital Twins of products and production processes across ABB Electrification globally.



Key Benefits of Digital Engineering



Innovative Processes for New Technologies

Ease of query, visualization and navigation of any data models, structures and relationships



Increased Value & Effectiveness

Digital Thread and traceability across all design and lifecycle states.



Eliminating development silos & enabling unified variability model across all design lifecycle states



Reduced Risk of Failure

Early identification & mitigation of risks that can lead to catastrophic failure







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CEM engineering **ABB** methods AG

Digital Engineering & MBSE – 360° Assessment

Digital Thread: The Model-Based Enterprise As One Target State



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Digital Engineering & MBSE – Systems Engineering and MBSE





Purpose is to inspire and guide the strategic direction of systems engineering for the global systems community to:

- Align Systems Engineering initiatives
- Address future Systems **Engineering Challenges**
- Broaden the base of Systems Engineering Practioners
- Promote Systems **Engineering Research**

Similar Research (Advanced System Engineering) completed by acatech (National Academy of Science & Engineering) - https://en.acatech.de/publications/

MEGATRENDS expected to influence systems engineering through 2035.



1. Sustainability





2. Interdependent 3. Digita Transformation World

4. Industry 4.0/ 5. Smart Systems Complexity Society 5.0 Growth

Selected MBSE project challenges... industrial companies struggle with the transformation!

> **Business Case vs. Do Nothing**

Tool Oriented Transformation

Lack of Awareness & Urgency

Poor Communication & High Expectation

Lack of Commitment

Resistance to adjust Processes & Methods

Linking the silos

Data Quality & Exchange

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Digital Engineering & MBSE – Digital Thread and MBSE





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Digital Engineering & MBSE – The MBSE journey at ABB Electrification Smart Power



The MBSE Journey at ABB Electrication **Smart Power**

Use case driven approach to adopt new methodologies & product development practices for a sustainable improvement by streamlined processes and enhanced cross functional collaboration.







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Implementation capabilities for selected use cases

Detailing of MBSE Roadmap and Review of

MBSE Journey & Target / Expectations

Insights on Pain Points & Feasibility for

Measures for Implementation of MBSE Capabilities & Commitment to Success Factors by Focus Group for (Pilot) Projects

Fit-Gap Analysis



Use Case selection & tailoring



MBSE Action Fields



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Digital Engineering & MBSE – MBSE Assessment



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Digital Engineering & MBSE – MBSE Pilot Projects and Deployment

1= 2= 3= Initial results towards MBSE for Smart Power products

(Pilot) Projects identified with ELSP stakeholders and deployment strategy for MBSE defined. MBSE Roll-out including Change Management started and ready to be delivered. ABB ELSP delivers solutions that make power supplies smart, connected and protected





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Contended Sector Contended Sector Cont



Current state assessment reveals opportunities to improve product development process, driving the need for change by leveraging a Systems Engineering methodology.

Transitioning from document-based to systematic & modelbased approach promises efficiency gains, a closed-loop development process, and deeper systems understanding.

Increasing efficiency of processes, methods and tools based on MBSE while improving quality & reducing time to market

Implementation and deployment plan focuses on action items, ensuring progress towards Digital Engineering and Digital Thread based on (Model Based) Systems Engineering approach and agile organization, processes, methods, tools

Thanks to DIGITAL TWIN & DIGITAL THREAD in future enabled by right business processes, Systems Engineeering and MBSE, we can scale engineering and production to deliver the right products & new business models... to the right quality... at the right time. Thank you very much for your interest!

Please visit our booth in the exhibition area.



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