

Implementing **Lifecycle Standards** to **Automate Cost-Benefit Analysis** in Aerospace Product Design

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Cost-benefit analysis of new designs

BUSINESS

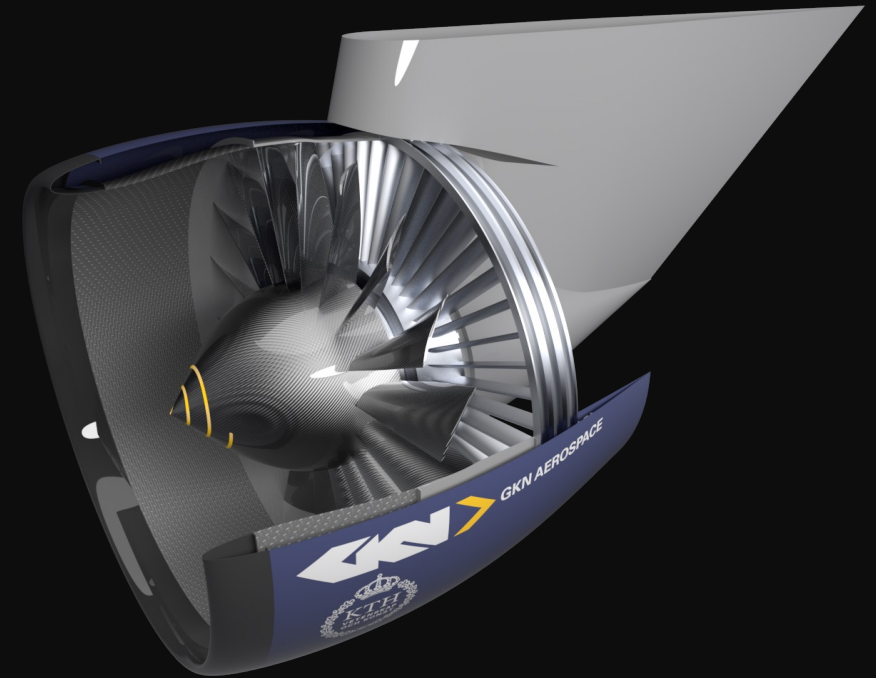
COMPONENT DESIGN

Quo Vadis Aeronautics

Particularity of Aeronautics

- Civil aircraft industry is not only a market driven business!
- To reach the financial breakeven of the cashflow for a new airliner takes typically **13 to 15 years** (details in next slide).
- The development costs of a new large aircraft (10+ billion €) can only be ensured by re-payable launch aid or guarantees by the Governments
- The high complexity and the challenging technologies of a modern civil aircraft require an excellent industrial team of **well educated engineers** for a successful product.
- The civil aircraft sector is a strategic industry for the USA and EU. It needs public back-up and risk-sharing support in technological developments.

Cashflow of an aircraft production

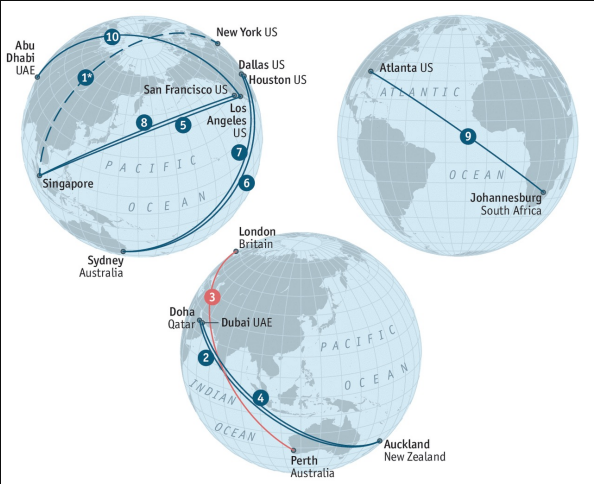


Fan Outlet Guide Vane Assembly

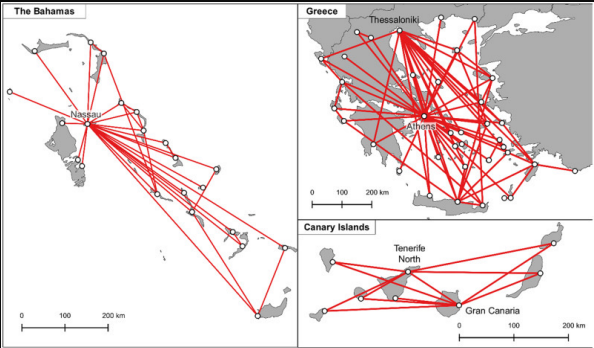
keynote, EASN Conference 2022

Challenge 1: Case specificity

BUSINESS



Ultra long-haul

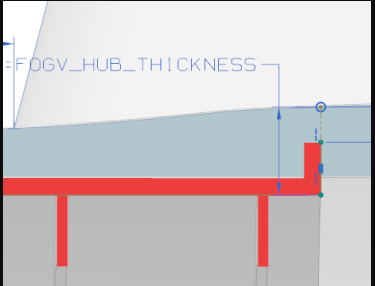
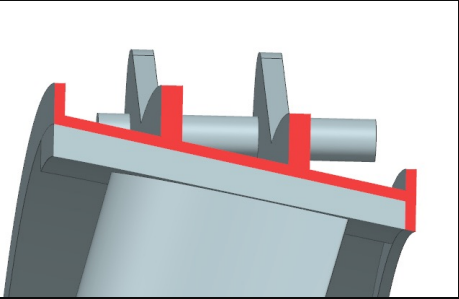
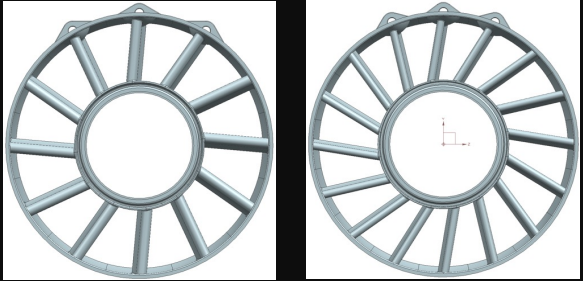


Ultra-short regional

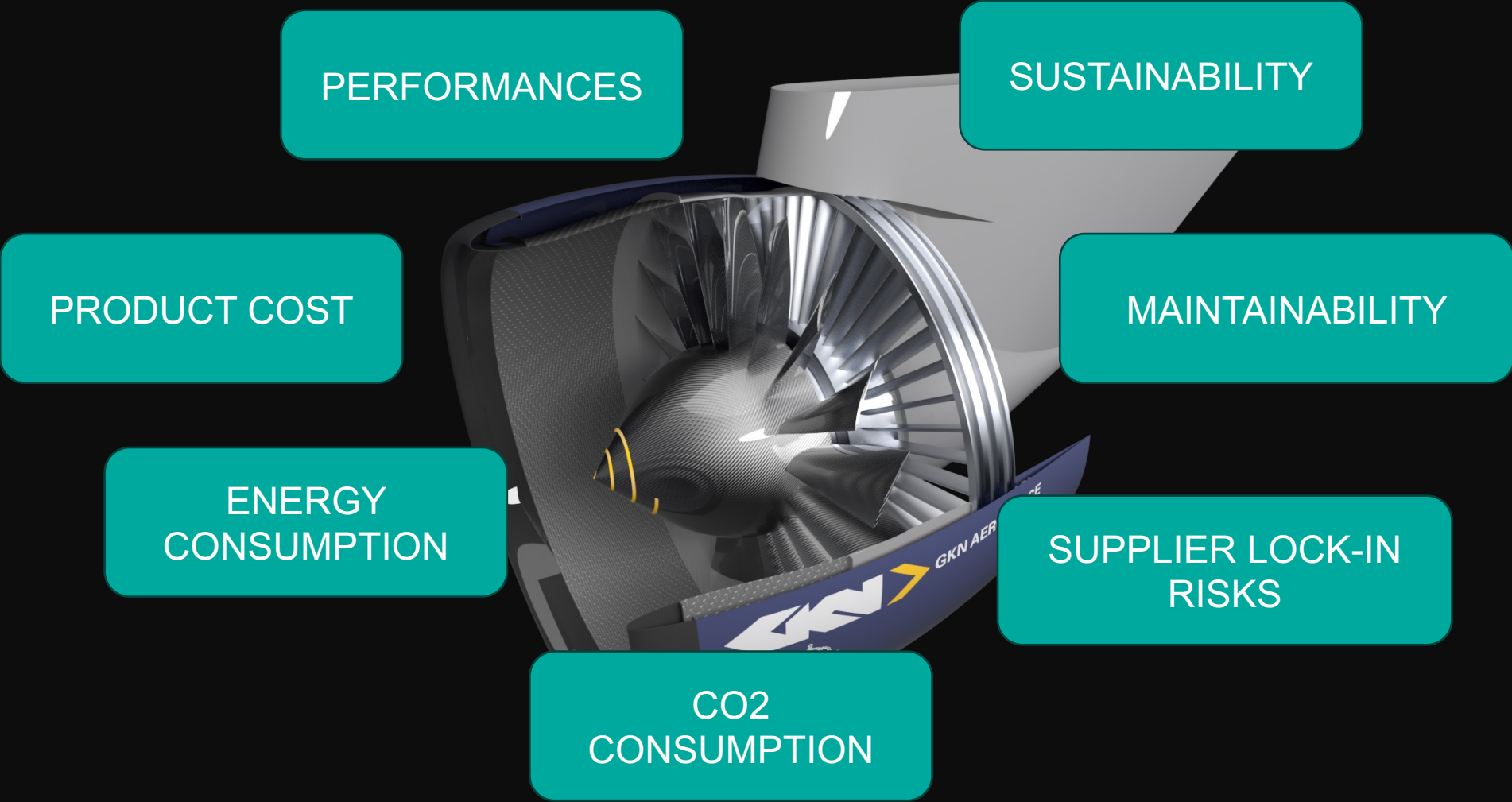
SYSTEM



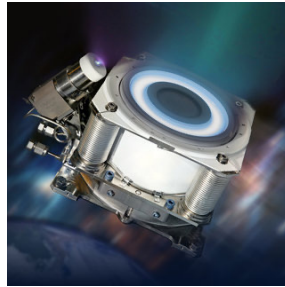
COMPONENT



Challenge 2: from “words” to money



COST-BENEFIT SIMULATION



Option 3 allows to generate higher revenues due to

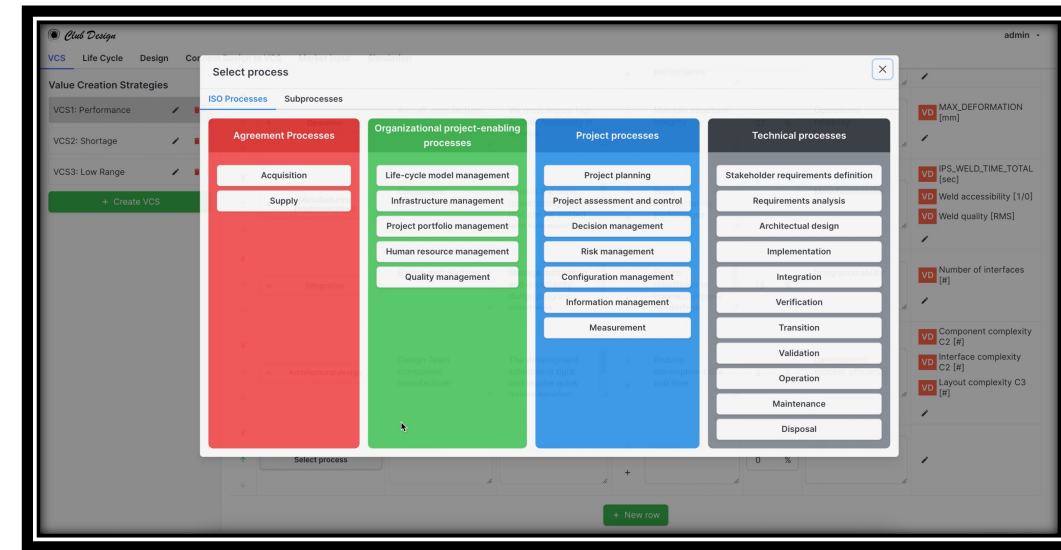
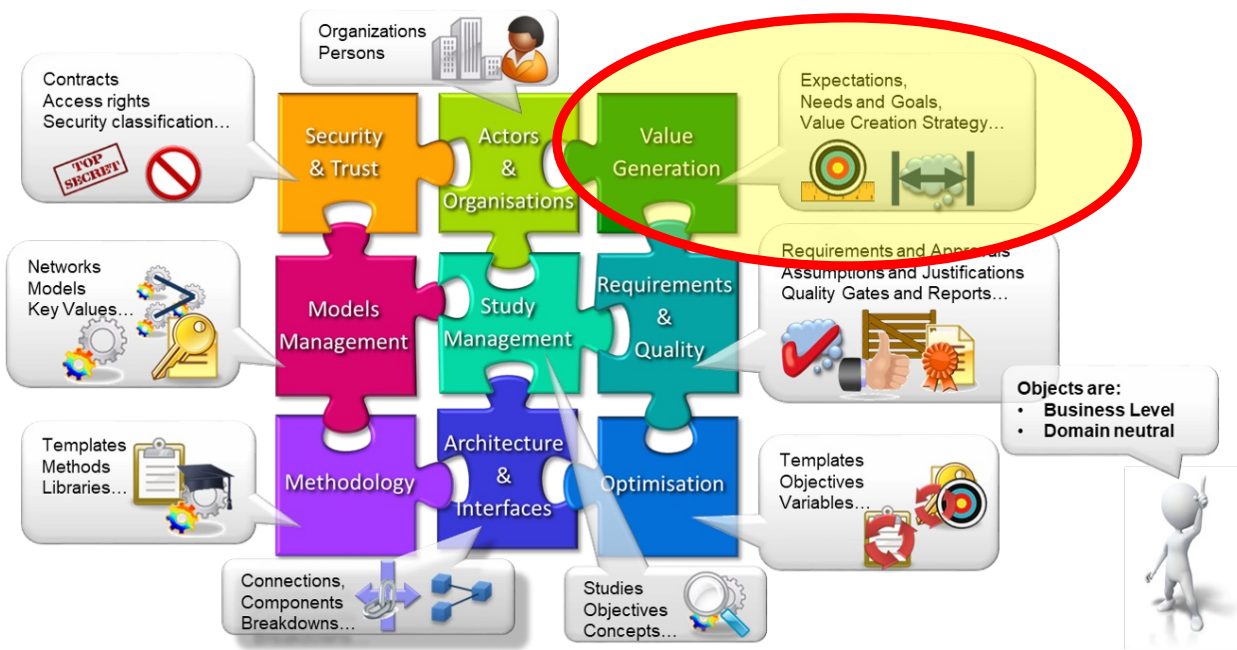
- high thrust (**earlier enter in orbit**)
- **low mass**

However, the pay back is longer due to

- **higher complexity** (a more innovative and risky concept)



KEY IN CLUB DESIGN: LIFECYCLE STANDARDS



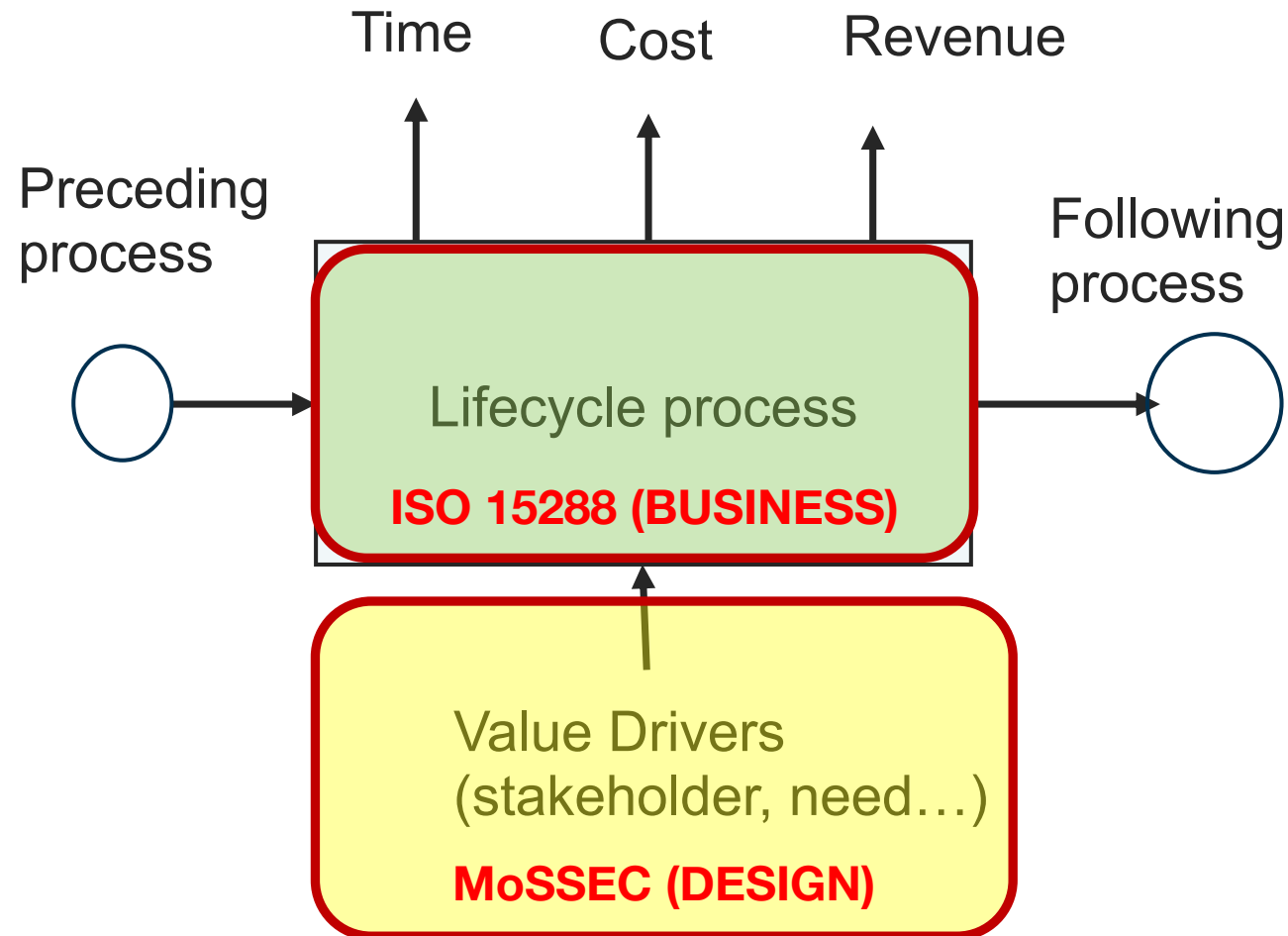
ISO 10303-243 – MoSSEC*
Modelling and Simulation information in a collaborative Systems Engineering Context



ISO/IEC/IEEE 15288:2015
Systems and software engineering – System life cycle processes

*Value Generation proposed for integration but not yet implemented

KEY IN CLUB DESIGN: LIFECYCLE STANDARDS



Allows the discrete-event simulation of cost-benefits for all designs!!!

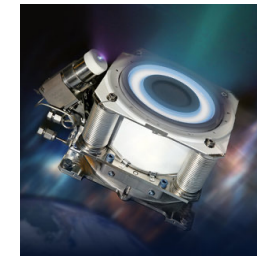
CONCLUSION



CHALMERS



Club Design as enabler to go from “words” to money (and from money to words!!)



ISO 10303-243 – MoSSEC*

ISO/IEC/IEEE 15288:2015

Lifecycle standards as enabler for cost-benefit automation

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DEFAINE (Design Exploration Framework based on AI for front-loaded Engineering)



Thank you!!!

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