

Introducing Granta Design

Towards material intelligence

April 2018



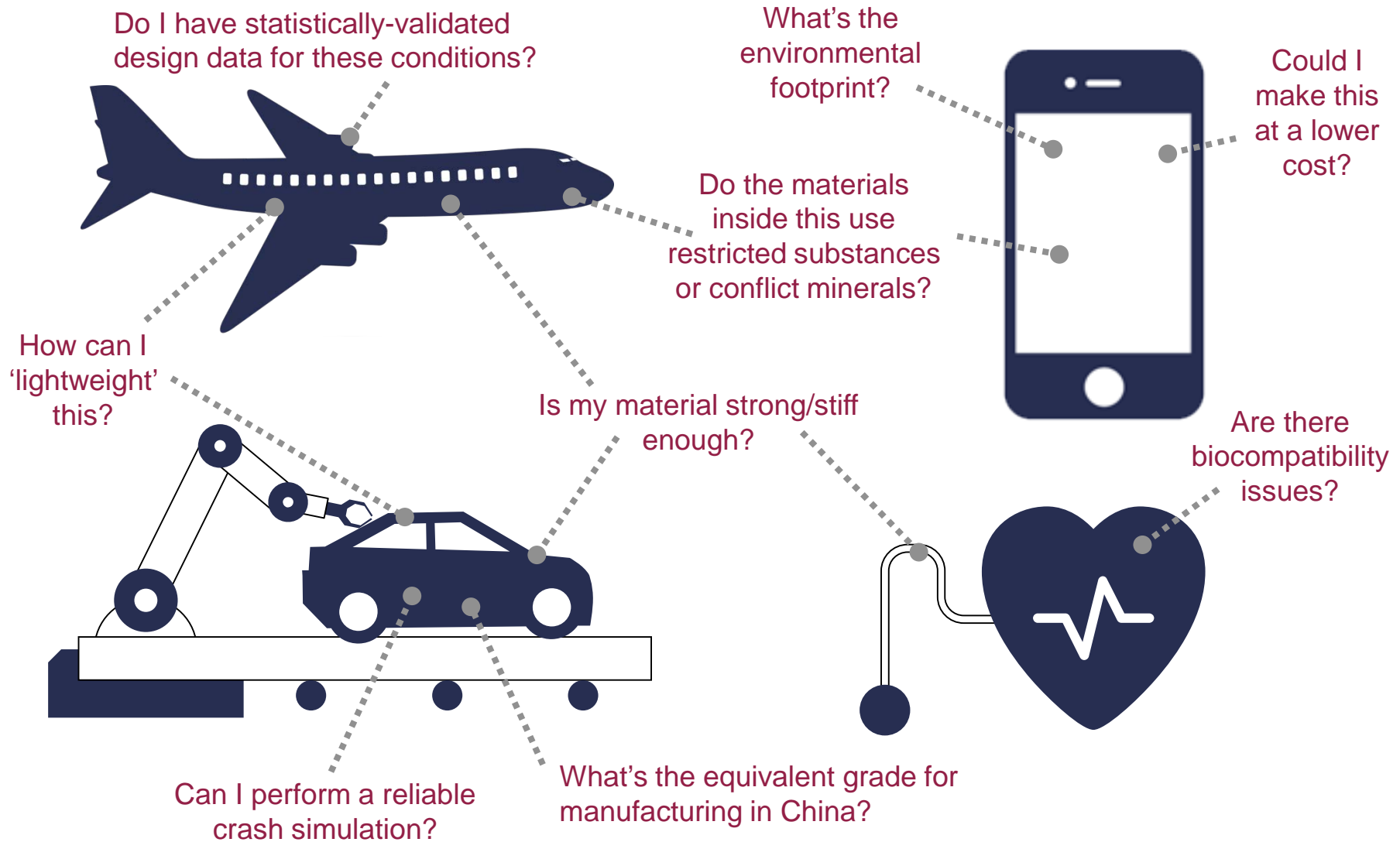
GRANTA
MATERIAL INTELLIGENCE

www.grantadesign.com

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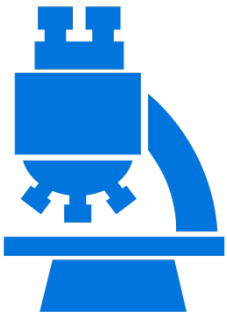
- Materials information
 - Why is it important?
 - The challenges of digitalization
- Introducing GRANTA MI
- Example 1: Support for design and simulation
- Example 2: Additive Manufacturing
- Summary

Why does materials information matter?



Corporate materials information

RESEARCH



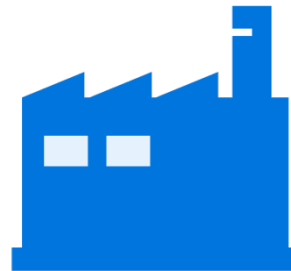
- Test data
- Handbook properties
- Statistical analysis
- Risk assessment
- Certification data
- Process / property relationships
- Specialist data (AM, composites...)

DESIGN & ANALYSIS



- Certified design data
- Knowledge about past applications
- Simulation inputs / outputs
- Cost data
- Preferred materials
- Restricted substance & eco data (design for compliance)
- Colour and aesthetics

PROCUREMENT & PRODUCTION



- Equivalent grades
- Batch test results
- SPC data
- Comparison with specs
- Process improvement
- Compliance reports
- Process specifications
- Heat treatment data

SERVICE / END OF LIFE



- Failure reports
- In-service testing
- Empirical knowledge
- Materials substitution
- Cost reduction
- Materials aging
- Recycling and disposal
- Remanufacturing

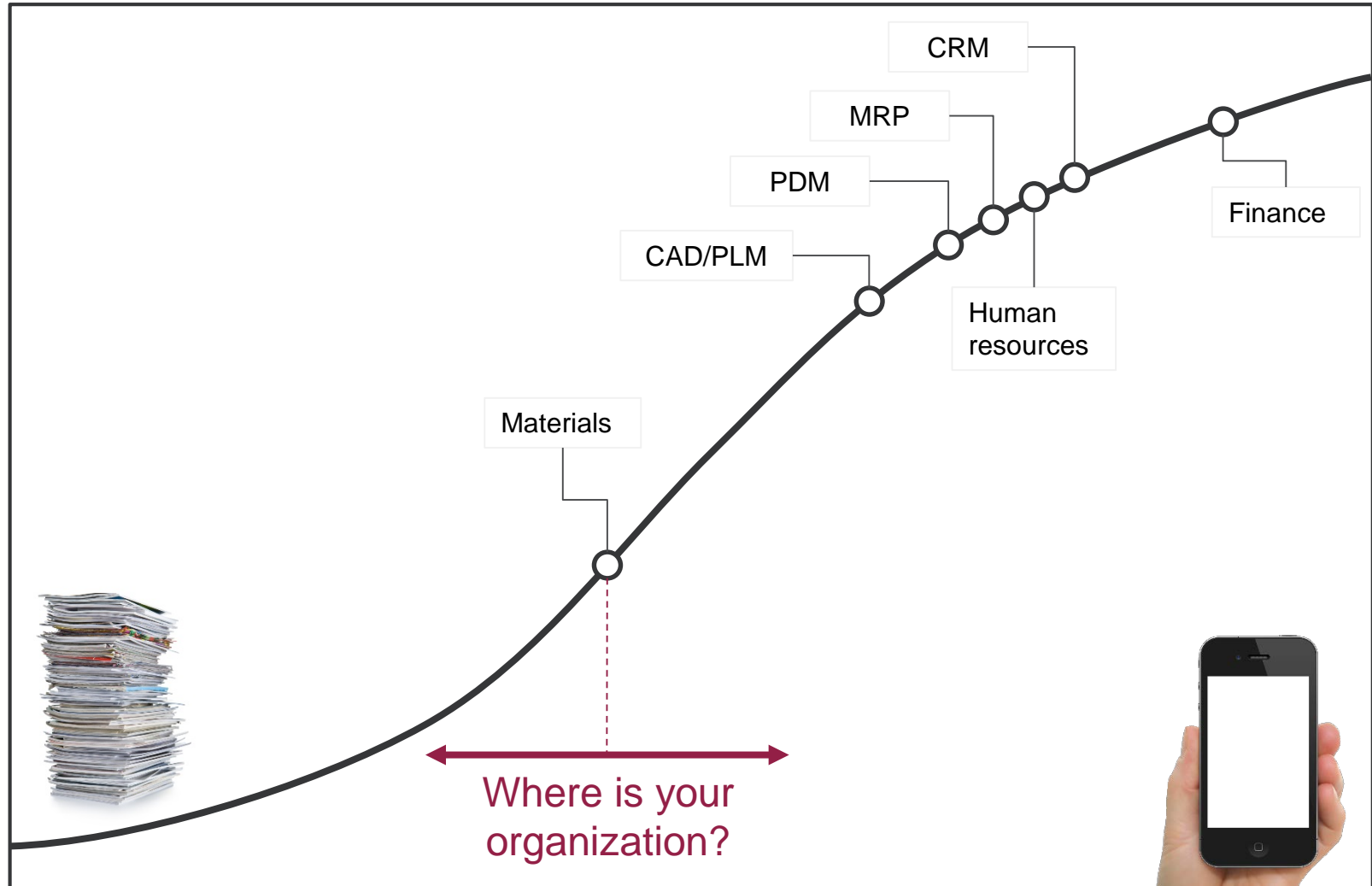
A typical materials information environment



- Data scattered in spreadsheets, databases, hard copy, file systems...
- Islands of information
- No systematic access control, security, versioning

'Digitalization' of business processes

Degree of 'digitalization'



Time

The cost of lagging behind

The average engineer
spent

**30 MINS PER
WEEK**

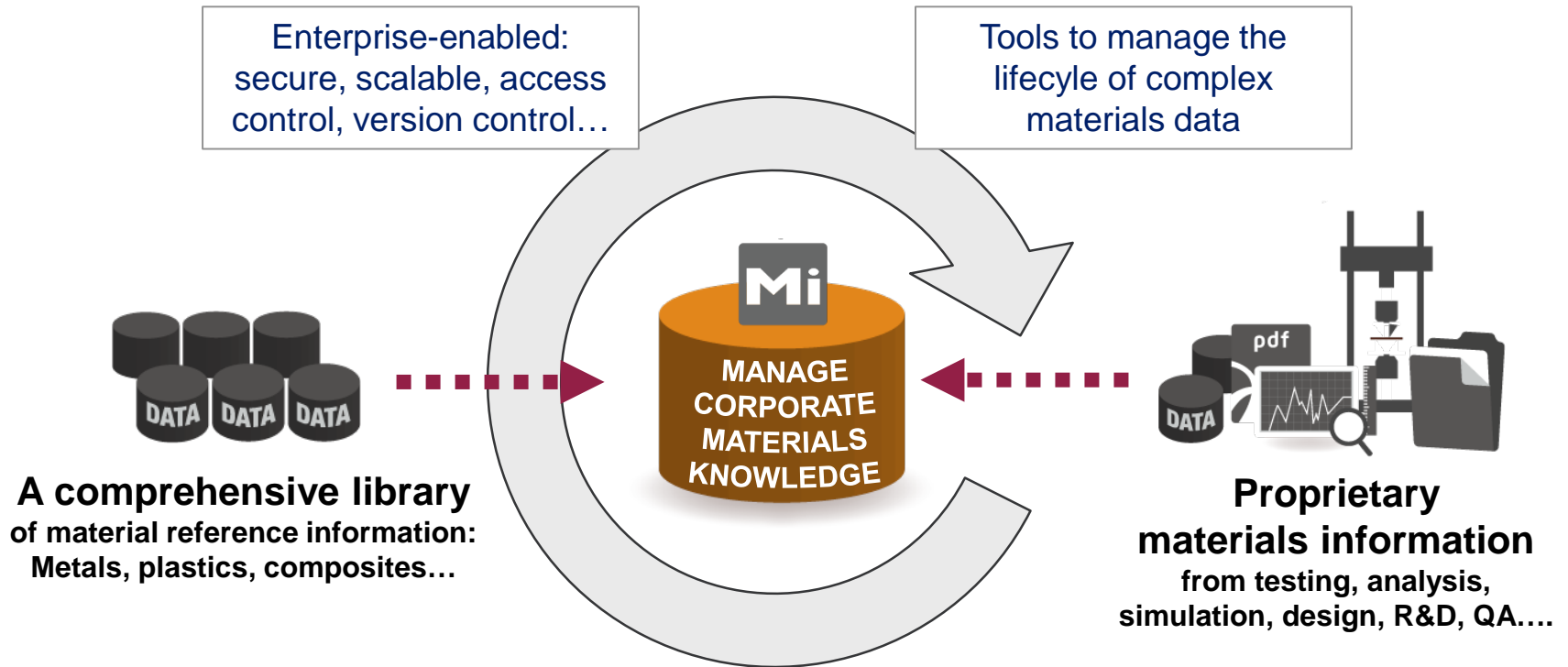
just looking for
materials data.

Typically,
20%
of materials tests
DUPLICATE
existing work.

50% of this
expensively-acquired
data was
USED ONCE
and **NEVER**
RE-USED.

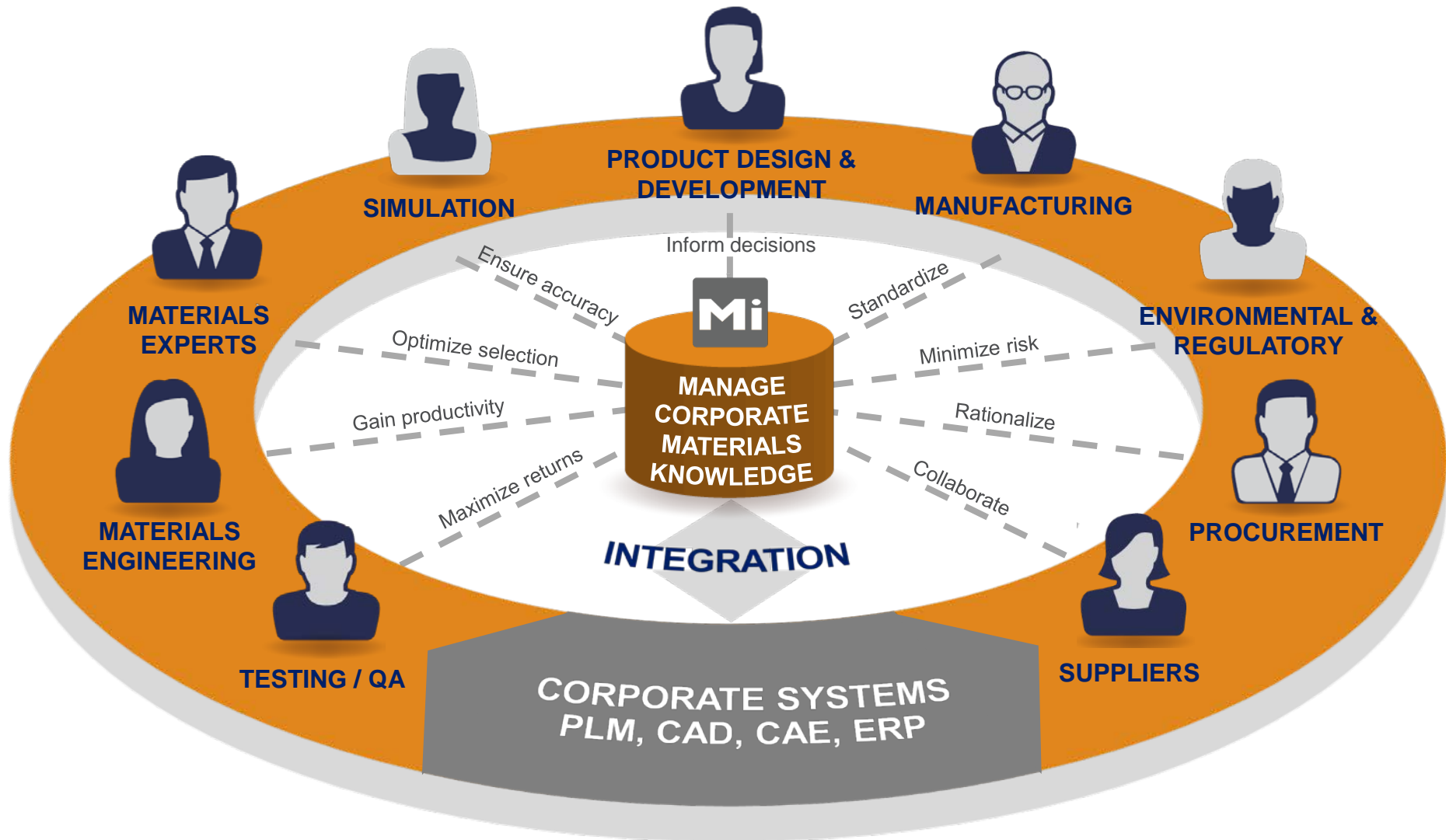
Granta Design 2016 survey
300+ respondents

The alternative: GRANTA MI™

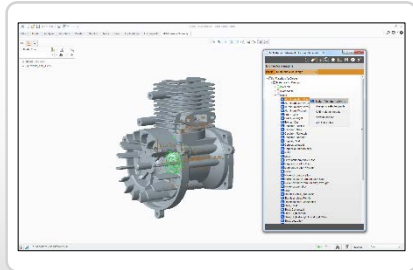


Developed over ~20 years of working with top engineering enterprises

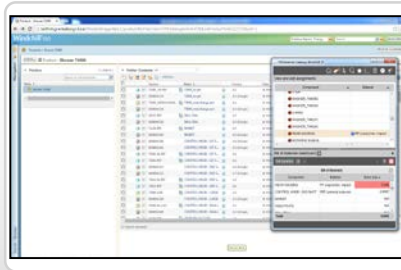
The alternative: GRANTA MI™



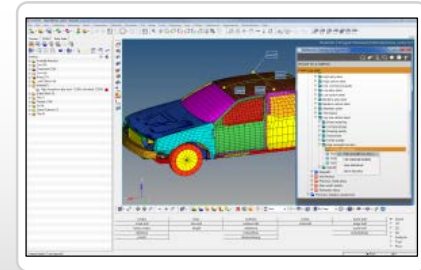
Example 1: Design and simulation



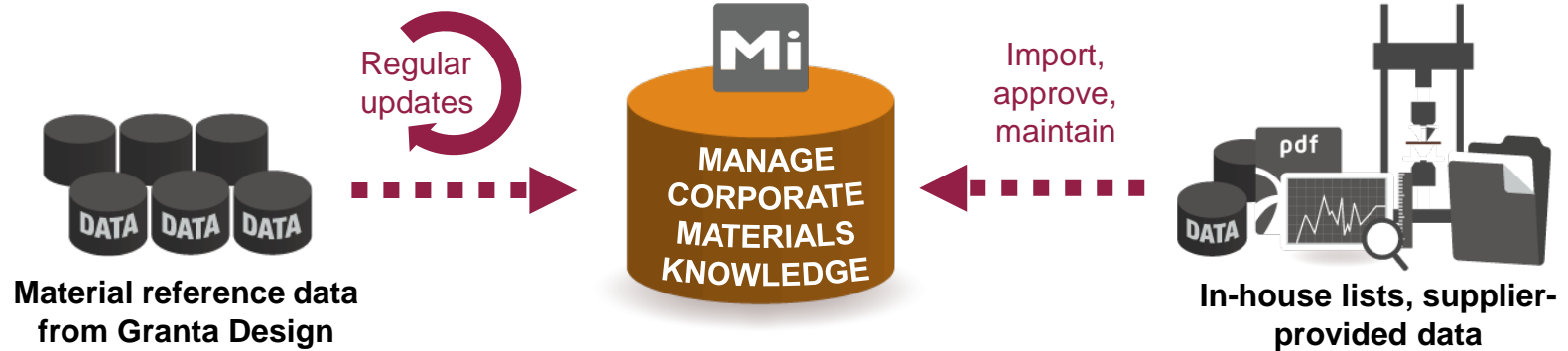
MATERIAL
ASSIGNMENT IN CAD



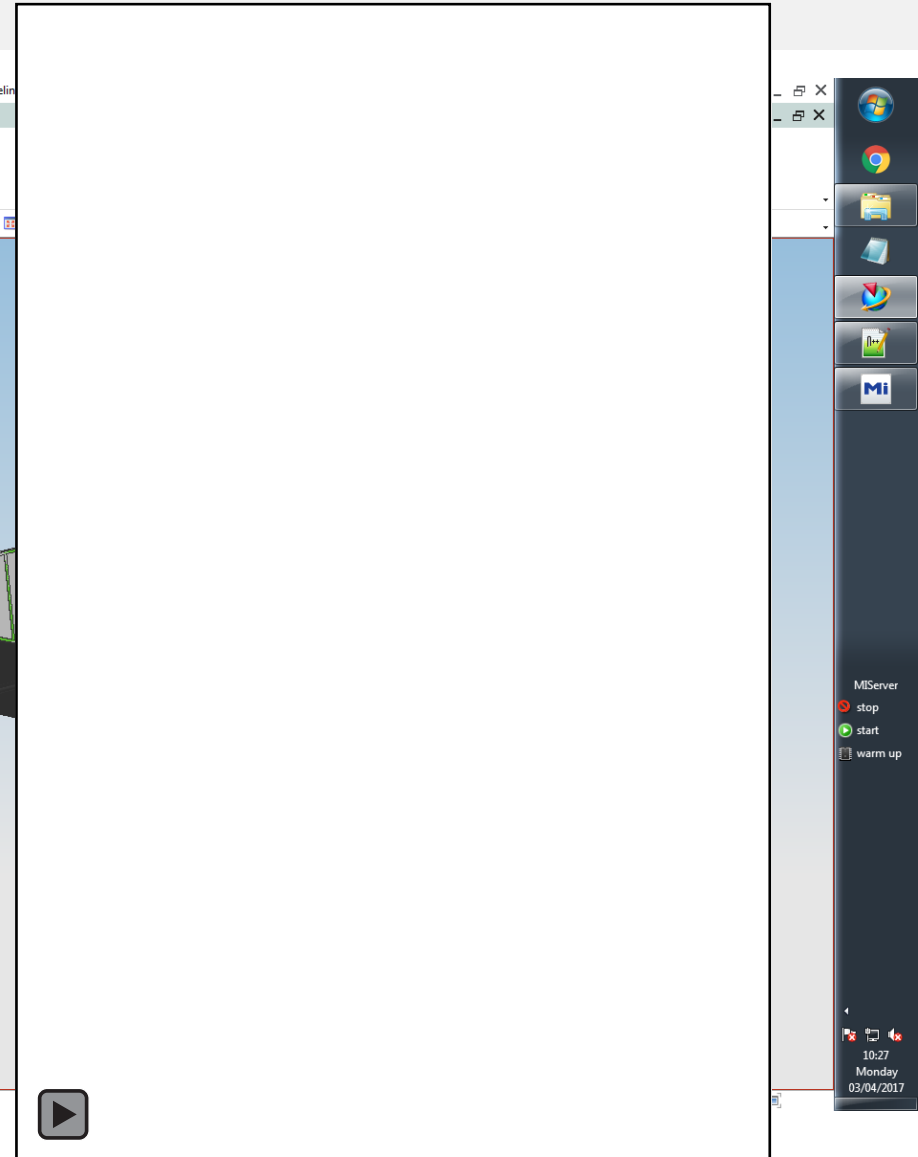
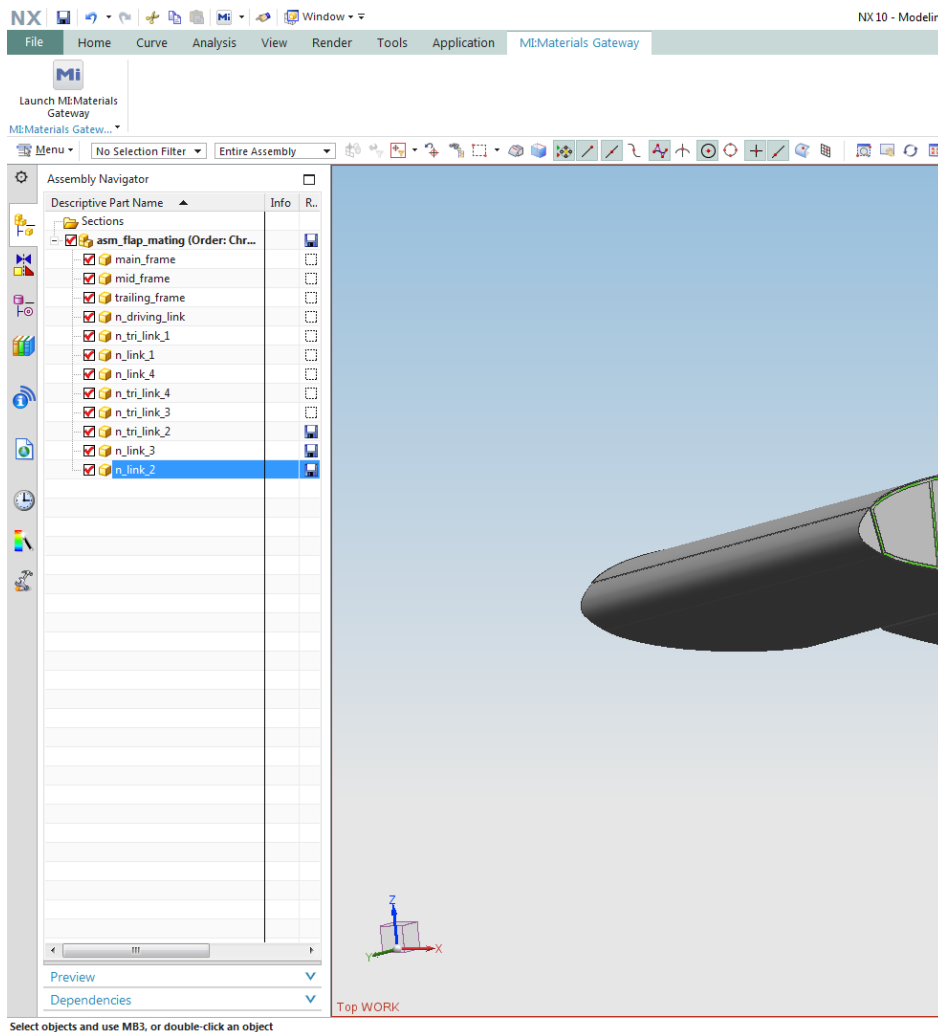
PART-MATERIAL
LINKING IN PLM



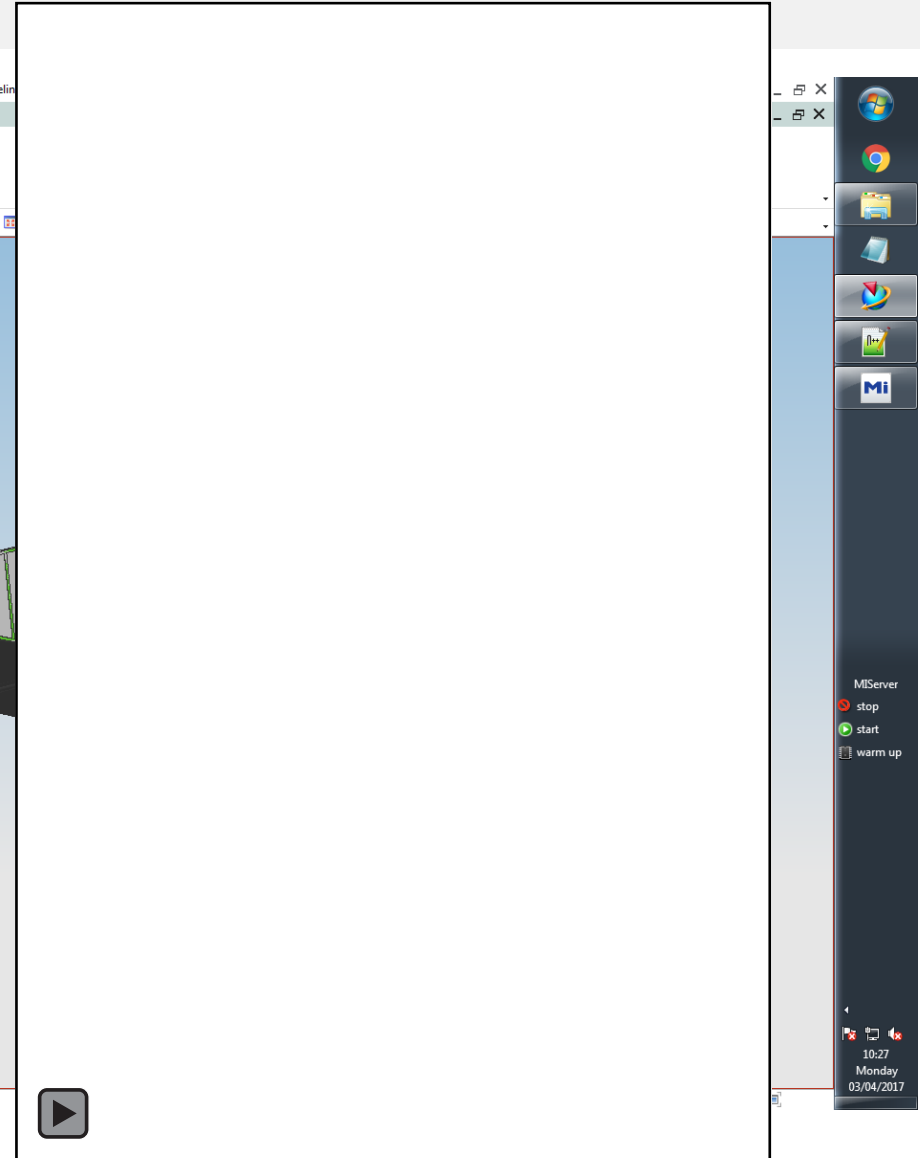
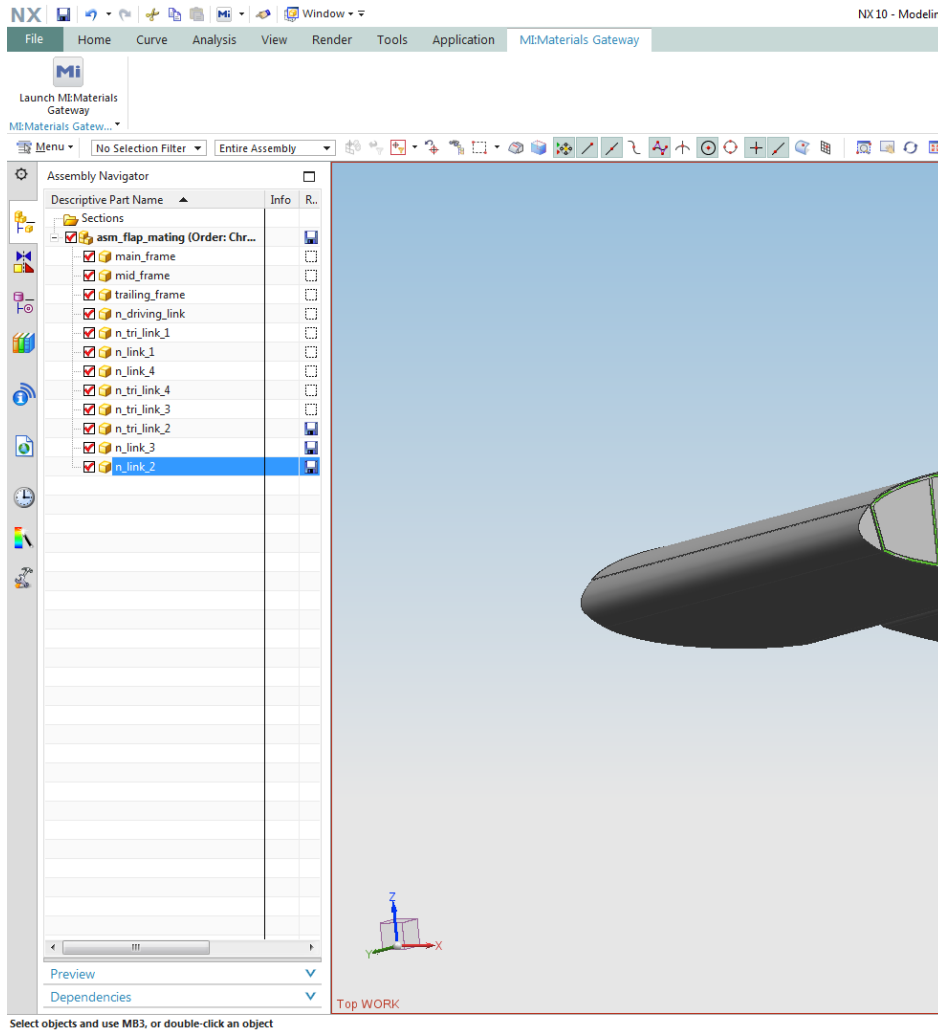
MATERIALS DATA
FOR CAE



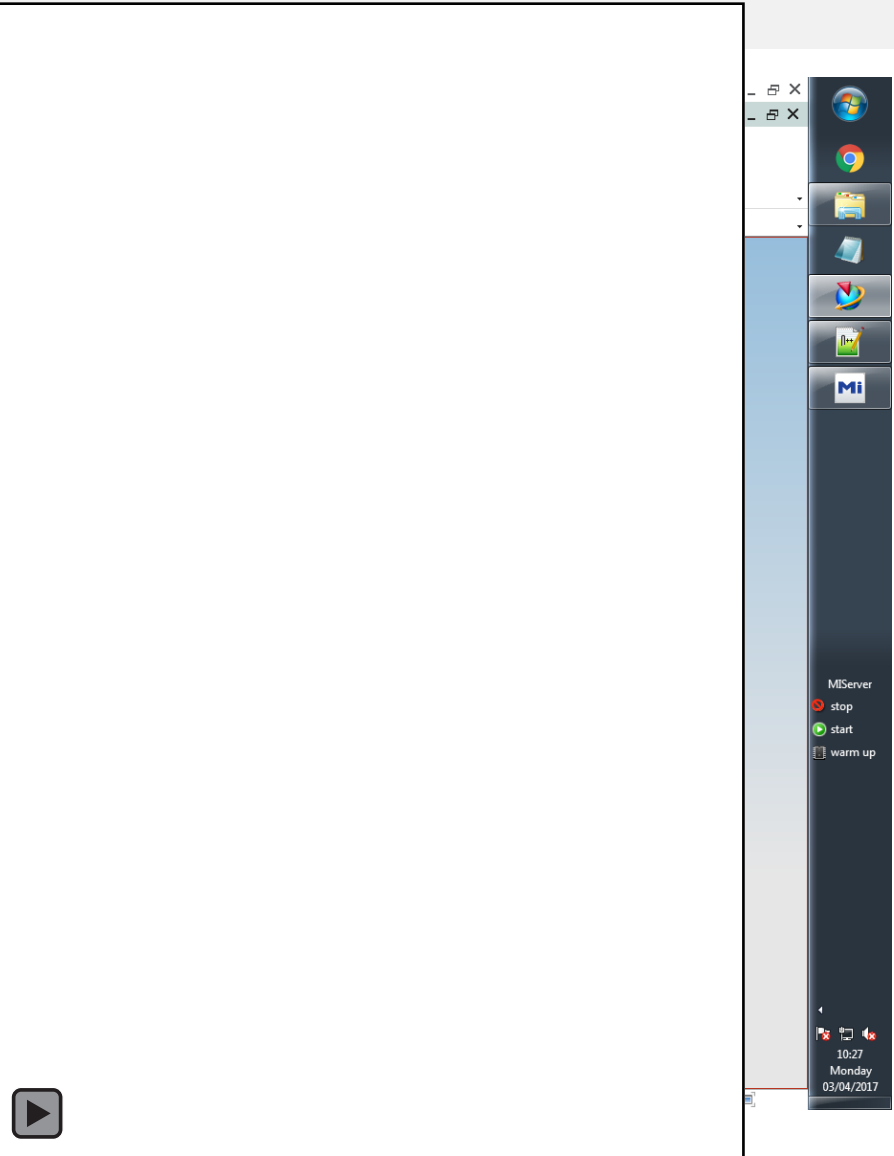
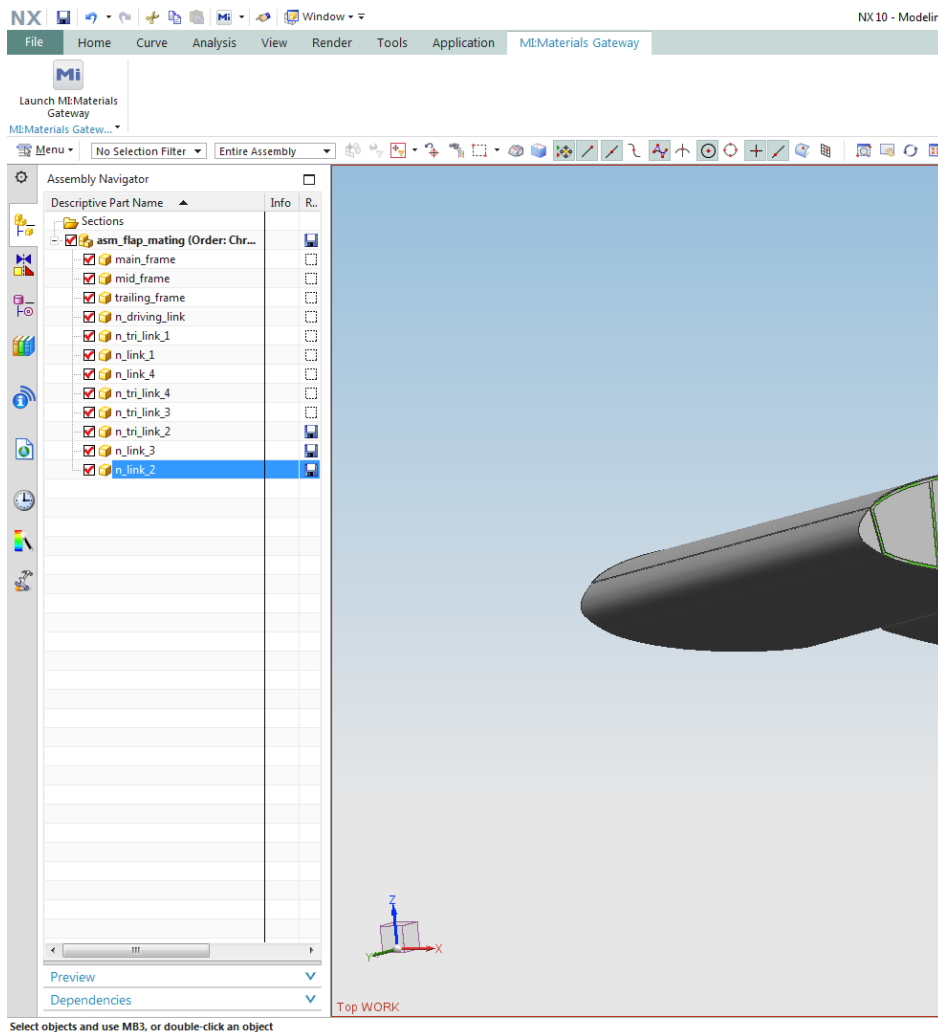
Material assignment within CAD



Material assignment within CAD

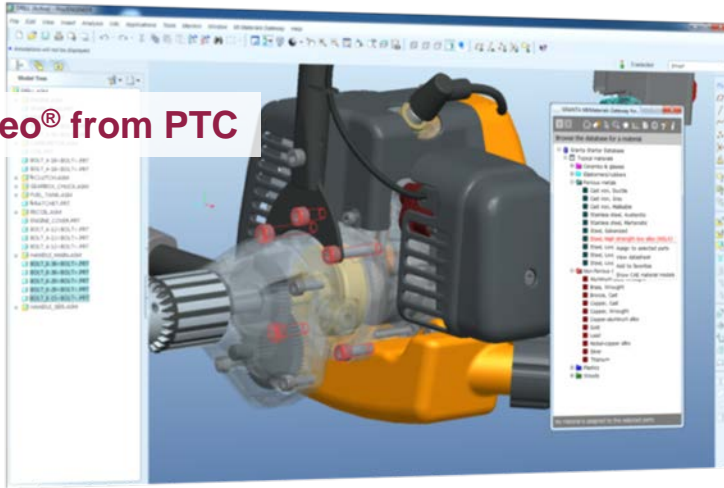


Material assignment within CAD

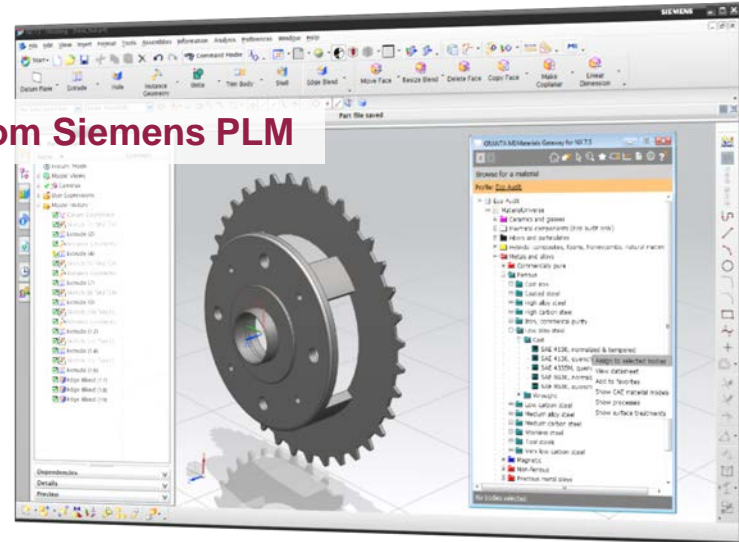


GRANTA MI:Materials Gateway™ for CAD

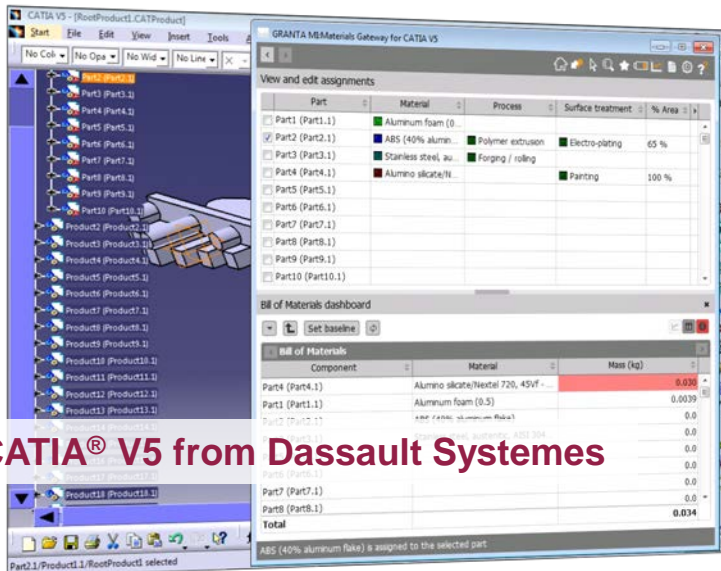
Creo® from PTC



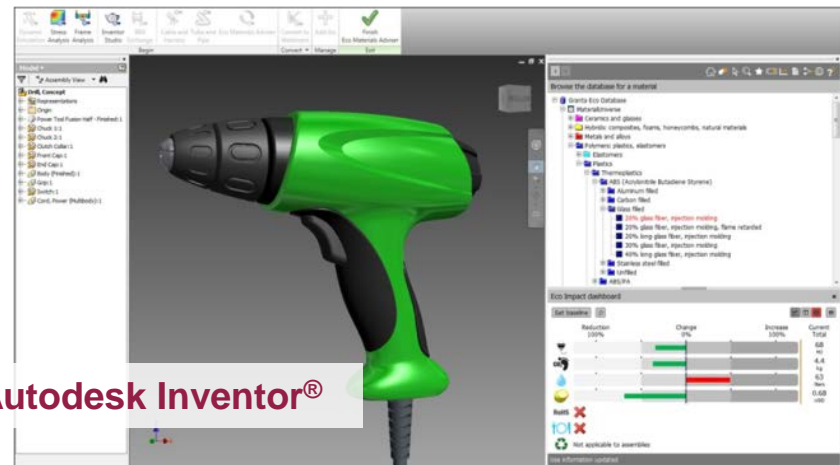
NX® from Siemens PLM



CATIA® V5 from Dassault Systems



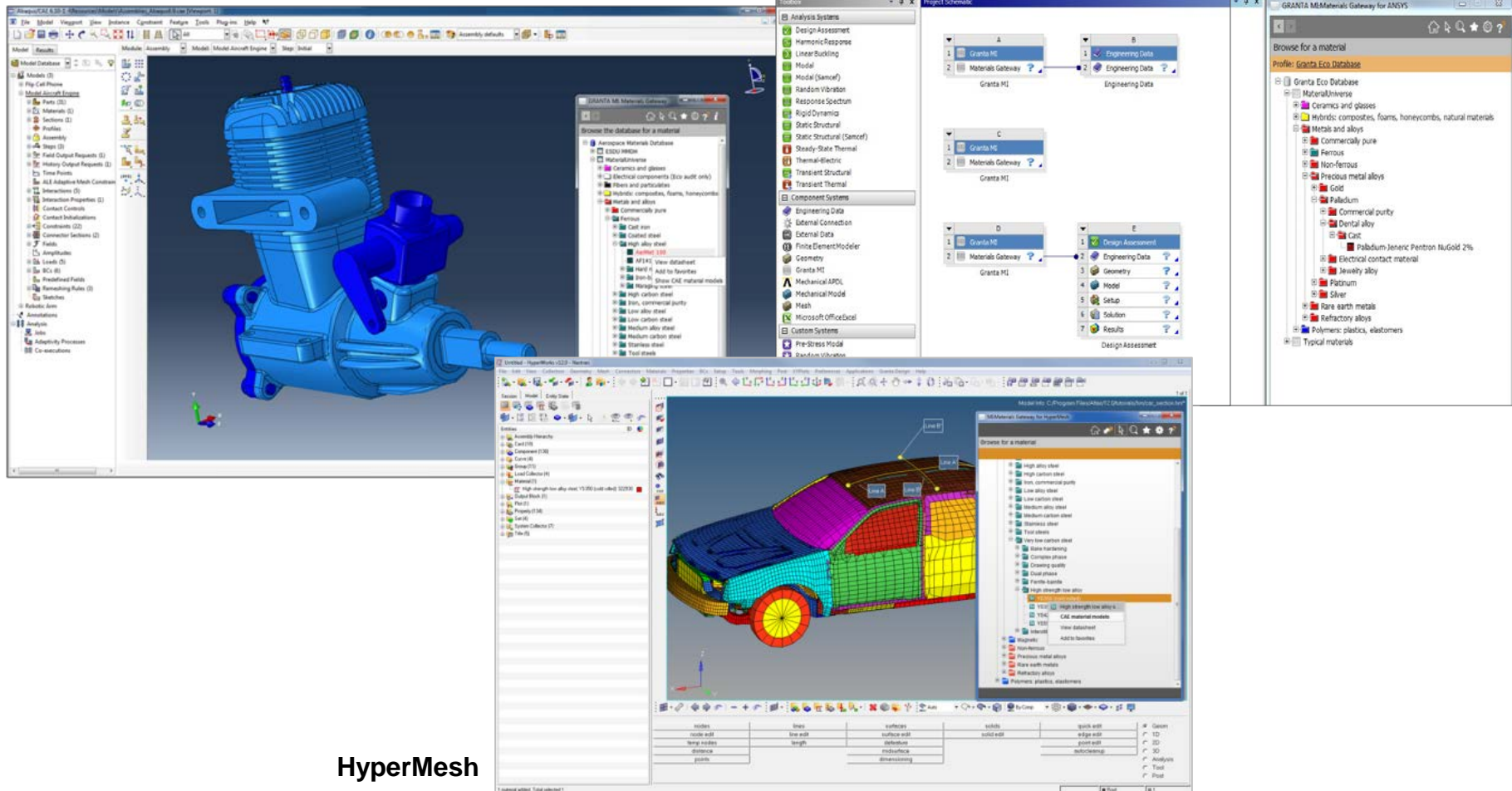
Autodesk Inventor®



GRANTA MI:Materials Gateway™ for CAE

ANSYS Workbench

Abaqus/CAE from Dassault Systèmes / SIMULIA



HyperMesh

Benefits in design and simulation

- A single, consistent source for corporate materials data
- The right materials data, when and where you need it
- Save time and avoid error
- Link CAD / CAE datasets to avoid delay and inconsistency

Case study



Denise Massa
*Global Process Lead for
Materials Lifecycle
Management*
Web seminar, Jan 2016*



- Multi-year, enterprise-wide project to manage materials information with GRANTA MI and 'author' to PLM
- Key goals: save time, ensure consistency

“After we finish each project, we go back and check that we have met our metrics. So far, we are about 50% of the way through the project and have met all of our metrics.”

Further case study



JLR discussed its implementation of a materials information management system in a Granta web seminar

<http://www.grantadesign.com/auto/on-demand.htm>

Why is JLR using GRANTA MI?

‘Zero prototype’ internal goal – more emphasis on CAE

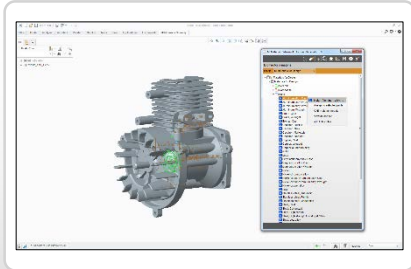
CAE tools demand a more rigorous & complete materials dataset

JLR had recently invested in a new PLM system but, as Manager of Materials Engineering Andrew Haggie explains:

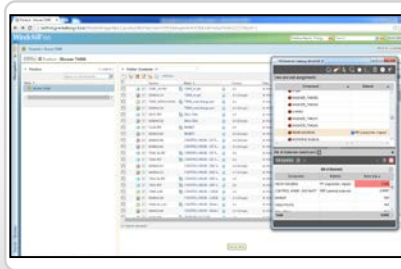
“Materials data management to the level of detail that we need has to stand outside of PLM” but must be integrated with “the various simulation, CAE, and CAD systems within the PLM framework”

“Our solution is Granta”

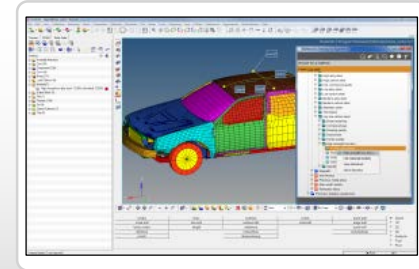
Example 2: Additive Manufacturing



CERTIFICATION
Follow standards and
ensure error-free reports



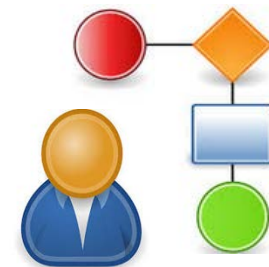
ANALYSIS
Explore property / process
relationships



TRACEABILITY
Capture complete AM
process information

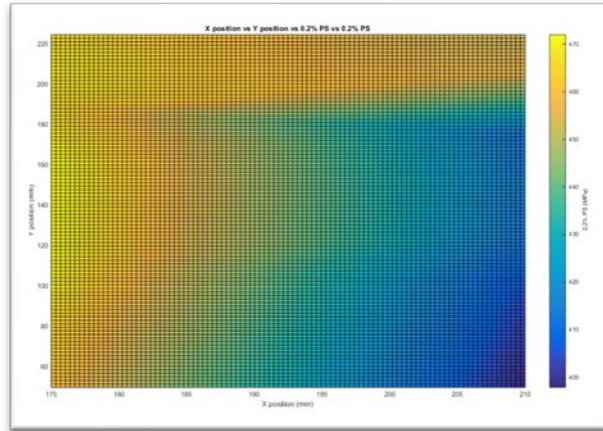


Project data

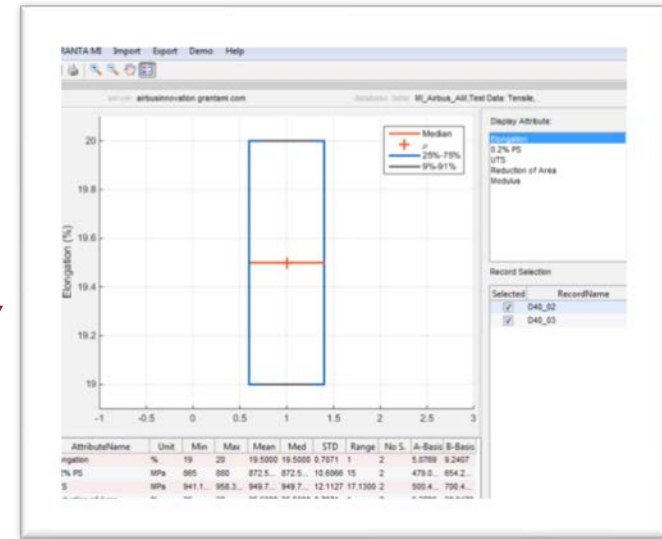


Workflow

Analysis: insight into process / property relationships



Machine-material-part-test parameter study



Test data averaging

Visualization

Statistical Analysis

Integration



MATLAB

ABAQUS
SIMULIA

python™

ANSYS®

Process simulation (ICME)

Additive Manufacturing case study



- The largest consortium ever assembled on this topic:
 - Increase quality, dimensional accuracy and build rate
 - Reduce scrap rate
- 28 partners, €20M
- Granta provided the data management solution
 - Standardize data gathering
 - Avoid duplicated data
 - More effective benchmarking
 - Leverage more value from data



Granta: towards material intelligence

Our mission is to lead materials information technology –
to advance materials engineering and education,
and to enable better, greener, safer products.



Build your company's material intelligence

Material intelligence integrated throughout R&D and the product lifecycle. Information when & where you need it. Smart decisions. Capture and re-use of resulting knowledge.

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Building society's material intelligence

Help to inspire the next generation of engineers, scientists, and designers to engage with a subject that is vital to technological advances and sustainability.

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Selected customers



Honeywell



Vestas



Sulzer



amazon
Lab126



TIMKEN

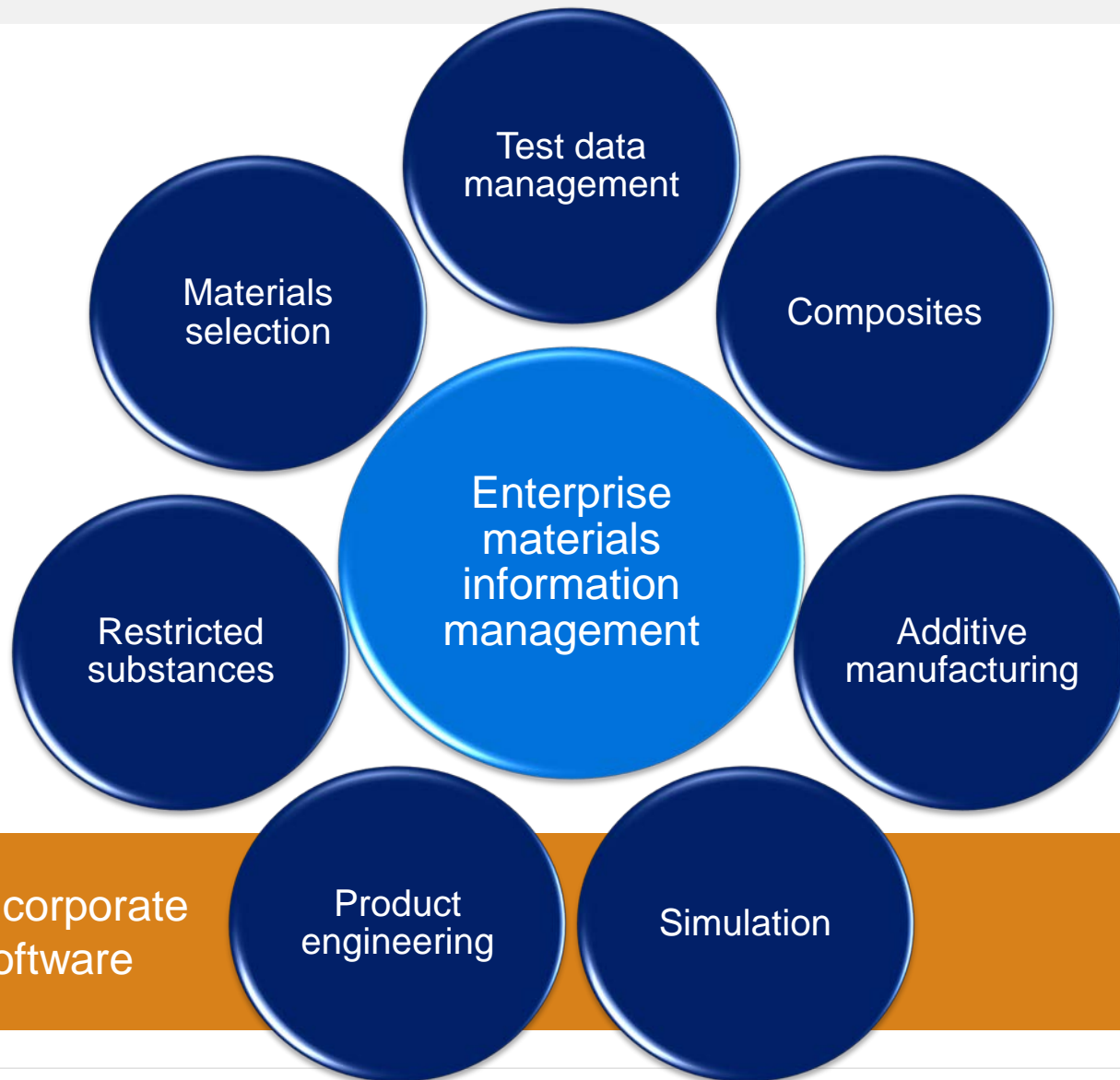
PHILIPS



stryker



Granta Design – How can we help you?



Integrate with corporate engineering software