Democratization

Lessons Learned from an Enterprise Practitioner

Glenn Valine

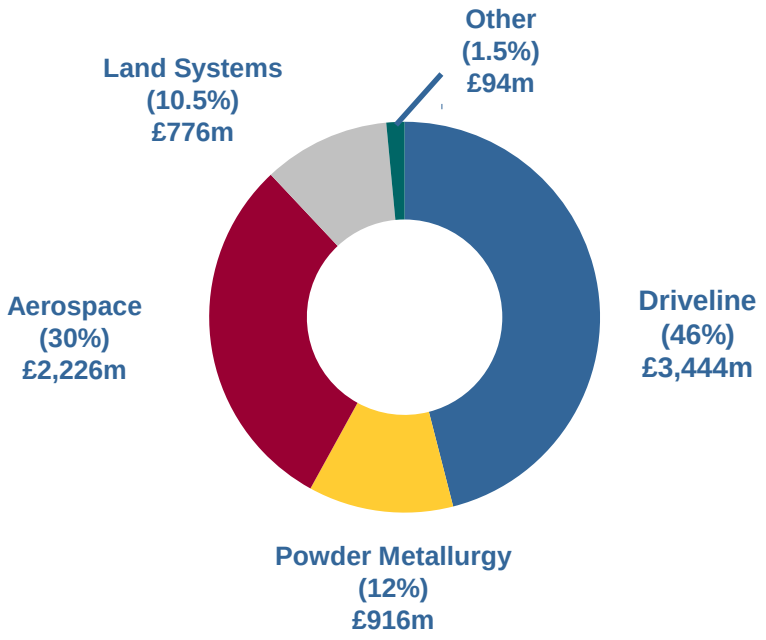
GKN Driveline North America, Inc.

GKN at a glance
Tier 1 Supplier to the major OE manufacturers

- Global engineering group
- Sales of £7.4 billion in 2014
- More than 50,000 people in more than 30 countries

Driveline – largest business

2014 - Sales by division



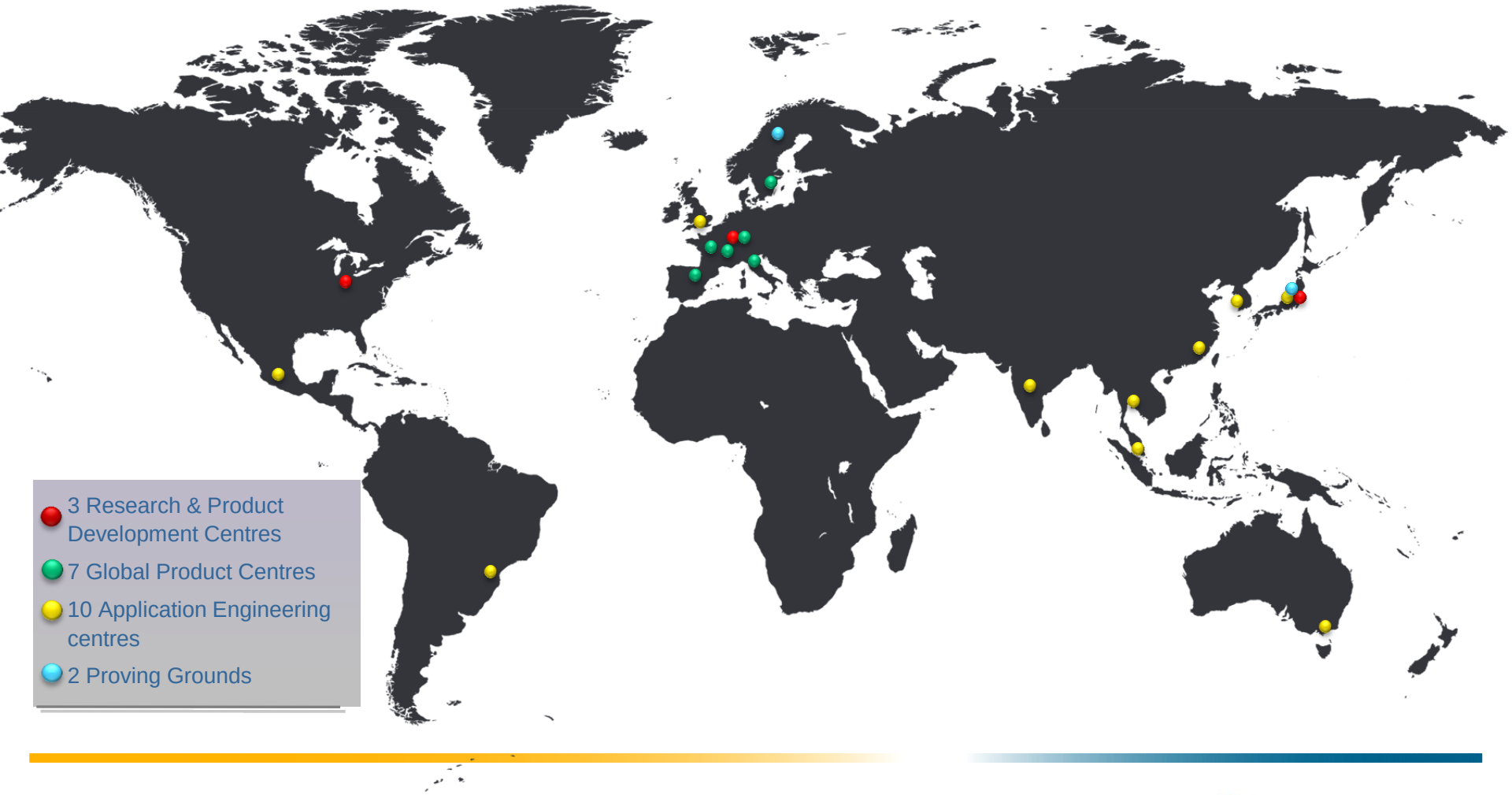
GKN Aerospace
A leading first tier supplier to the global aerospace industry.

GKN Driveline
A world leading supplier of automotive driveline systems and solutions.

GKN Powder Metallurgy
One of the world's largest manufacturers of metal powder and sintered components.

GKN Land Systems
A leading supplier of engineered power management products, systems and services.

Driveline enterprise – engineering footprint

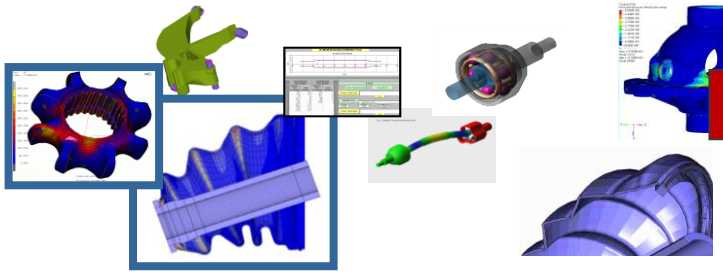


Lessons learned (1)

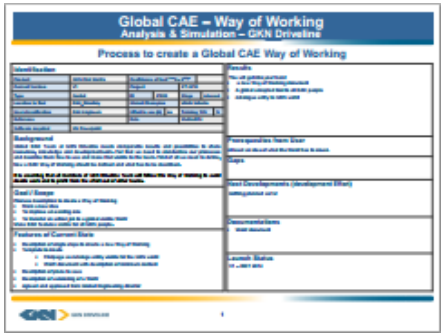
- **Democratized CAE are not bolt-on's, to your existing Simulation group's Way-of-Working**
  - They are part of a spectrum of approaches to augment simulation opportunities in your company.
  - They are about the role in your business, not simply changes in software technology. (credit to joe walsh)

Simulation Approaches
and path to Democratization

Classic or Individual



Standardized Way of Working (WoW)
Verified, agreed and comparable results



1

1

2

2

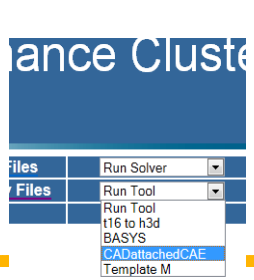
1 – Methods Dev. & Adhoc (Sr. Analyst)

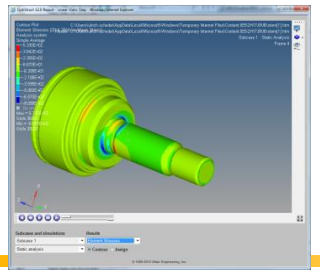
2 – Guided/Recipes (Analyst)

3 - CAD attached CAE (Designer)
Small CAE loops earlier in the design period

4 – Democratized Tool Apps (Engineer)

Individual templates for comparable design loops
Minimal CAE knowhow for CAD necessary





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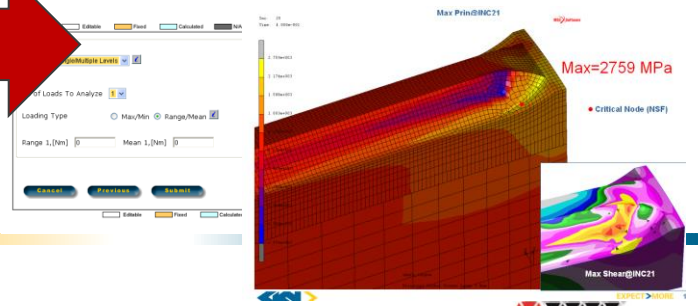
CAE for regular engineers – intuitive front end
Verified automation of CAE jobs (absolute correlations)
Analyst knowhow for user unnecessary



GKN DRIVELINE

NAFEMS

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- **Engineer Analyst has a new important role**
  - Define, commonize and validate your worldwide processes/workflows before you start
  - Your Experts need to be available for the duration of the project, deployments and non-Expert support

Engineer Analyst (Expert) – New Role

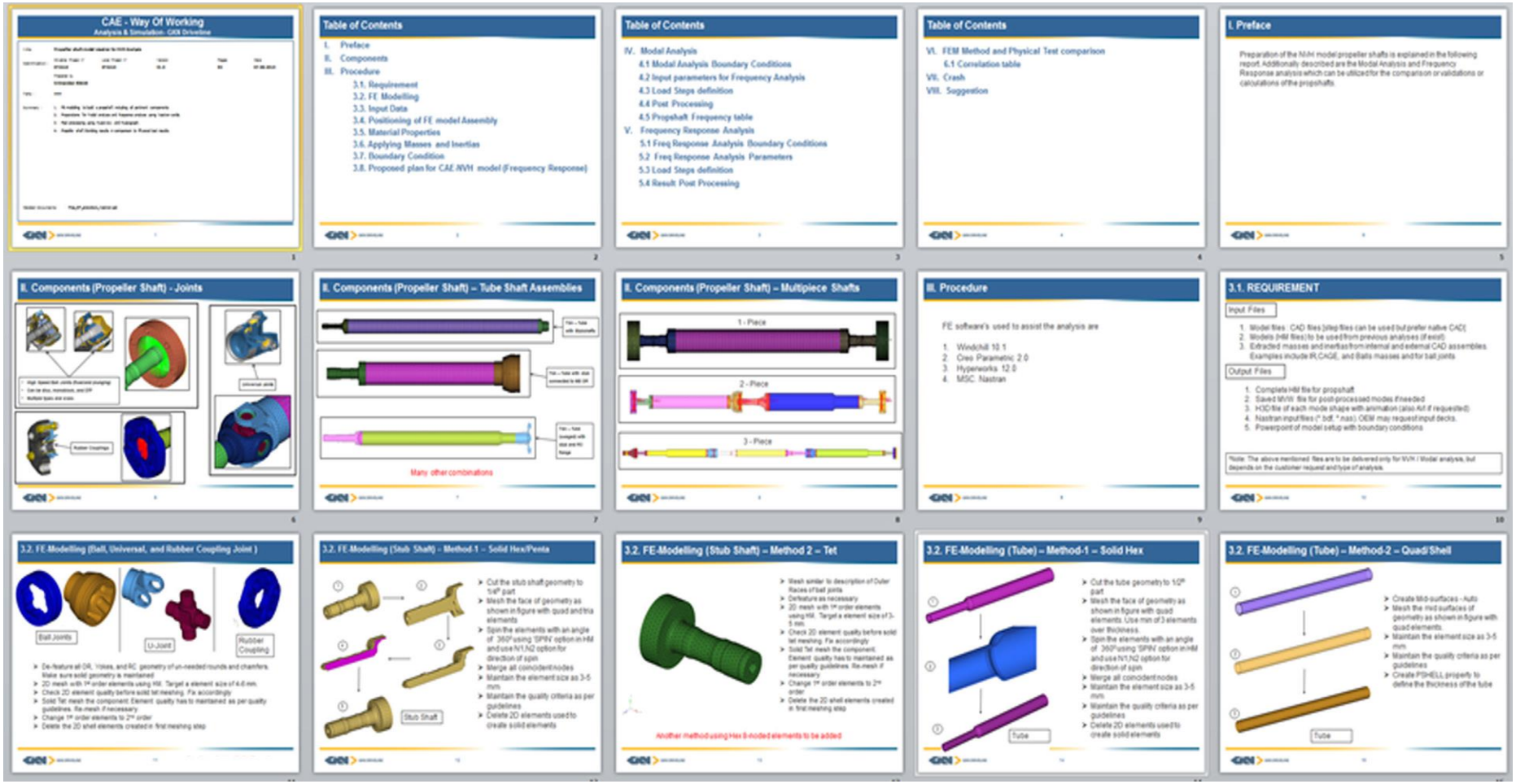
- **Participate within a global team of Expert Analysts**
  - **Synchronize worldwide CAE knowledge, recipes and processes**
  - **Lean up processes and drive new developments in one common direction**

New Capabilities | Efficiency | Productivity

- **These are the underpinnings of Democratized CAE!**

- **You will likely realize that your existing WoW/recipes are not robust and/or repeatable for process automation. Once you address this, you'll have a much improved manual WoW - as well.**

Global CAE – Way of Working
Analysis & Simulation – GKN Driveline



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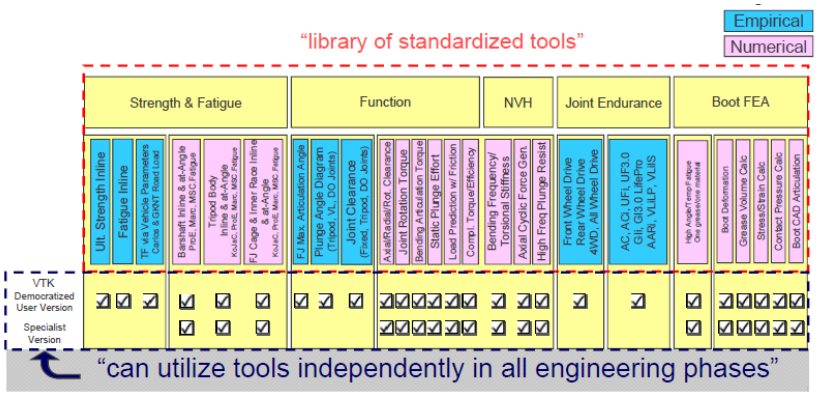
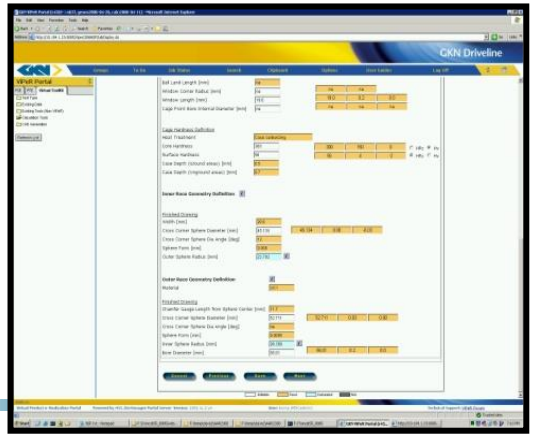
  - Let's take a look…

How to get to CAE Democratization

- Identify your target user community – Product Development, Application, and/or Test Engineers
- Agree on a globally available delivery platform/application – Thick / Thin / Web / HTTP / Tablet
- Present a User interface in the terminology that they already speak
  - Design an intuitive front end/user interface and process that mimics the non-analyst way of working (i.e., resembles the physical domain)
  - The easier it is (e.g., less mouse clicks), the more likely the Democratized user is to become self-starter
  - Don't make it too easy – offer enough technical capability, robustness and correlation to deliver accuracy/insight in order to expand the use of simulation in the product development process
- Consider bundling your Democratized Tool App's into a toolkit





User Interface – non specialist

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- **Don't underestimate the organizational challenge**
  - In a multi-site / multi-national operation, people will resist to keep their local way of working
  - These business transformations will challenge some users, however the overall effect will be postive for the organization once fully adopted and supported appropriately
  - You could address this challenge by...

Don’t Underestimate the Organizational Challenge

- **You could address this challenge by…**
- **Formation of a Global Engineering IT group**
  - Experienced product development and process engineers, that are IT savvy
  - To handle your enterprise engineering Ecosystem of applications
    - PLM/PDM, CAD, CAE, Democratized Tool App’s, etc.
  - Provide a bridge between the Experts, your external partners and your Corporate IT Group
  - To translate your Expert knowledge and make it accessible through appropriate means to a broader group of users
    - e.g. into templates for process automation
  - Keep your Tool App’s relevant, as your product designs and processes evolve
- **Your Corporate IT Group handles systems hosting and IT infrastructure, etc.**

Lessons learned

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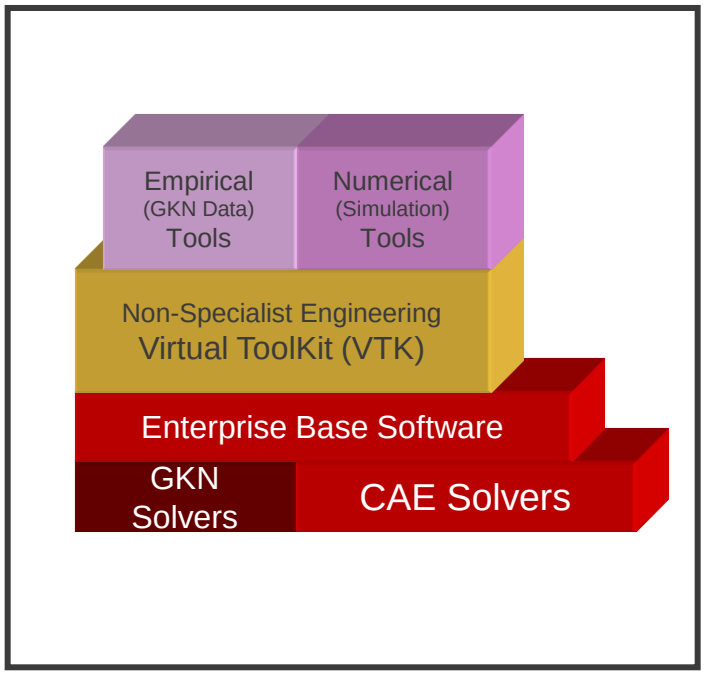
- **It is vital to have executive sponsorship for enterprise standardization projects, because...**
  - Democratized CAE are medium-to-long term enablers of intrinsic value within your engineering organization, versus short term cash generators
  - Some key benefits and business value...

Enterprise Democratization

Key Benefits & Business Value



-Non Expert engineers can use complex analytical solutions, for standard use cases – Safely!

-Simulation process automation manages inputs and outputs

-Solutions are handled using input templates (ease-of-use) developed by Expert Analysts for non-Experts

-Each process step contains embedded rules and logic for the tool or use case (i.e. knowledge capture and reuse)

-Global teams can manage interpretation of predictions – as required

- by Helen Hayes

Thank You!