NWC 2015
NAFEMS WORLD CONGRESS

NAFEMS

Incorporating the 2nd

spdm
INTERNATIONAL CONFERENCE
Simulation Process & Data Management

The Changing Role of Simulation

Joe Walsh
intrinSIM, USA
Bradley Holtz
Cyon Research, USA

The Changing Role of Simulation

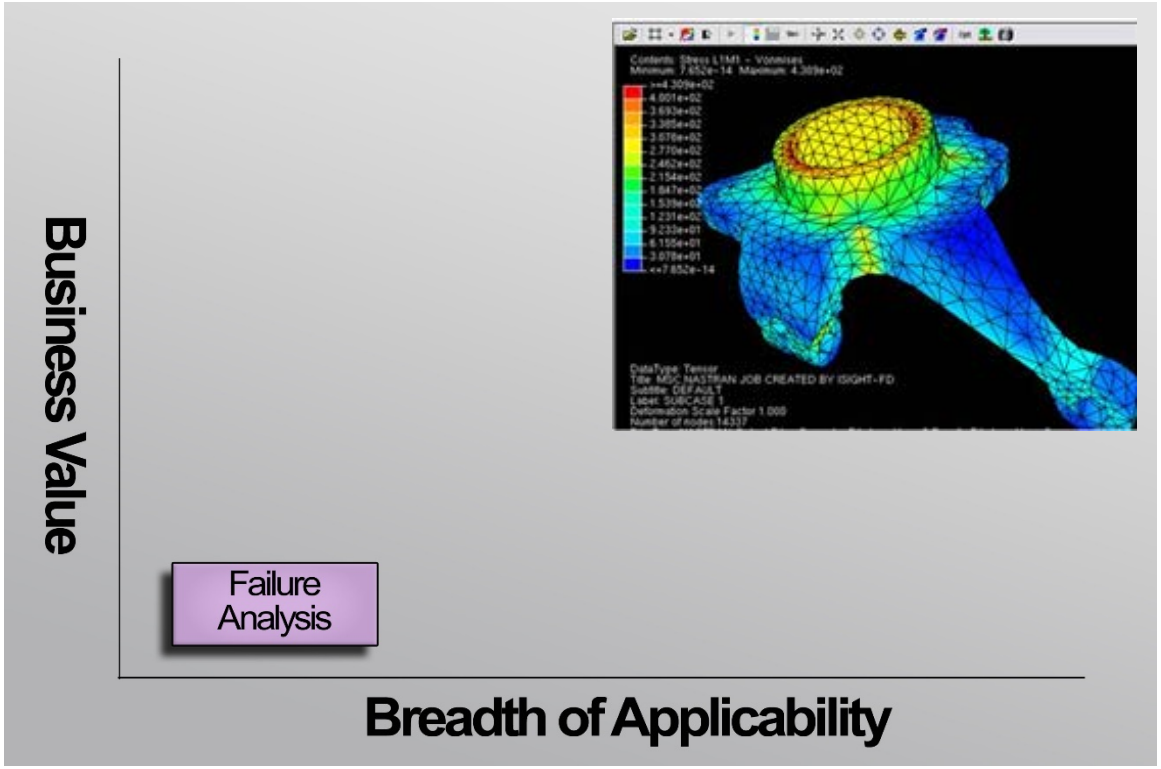
- The use of Simulation has seen continual double digit % growth annually for about 30 years until 2008
- This cumulative growth now means that Simulation is a significant portion of the Engineering Software Market and a driver for future growth
- This has resulted in increased focus and investment in simulation by major PLM software vendors

The Changing Role of Simulation

- This growth is coupled with increasing awareness that **Simulation is** the key enabler to **Increased Competitiveness**
- The changing role of simulation is more about it's role in business than the changes in technology
- Let's explore the Simulation as it relates to perceived Business Value and breadth of applicability

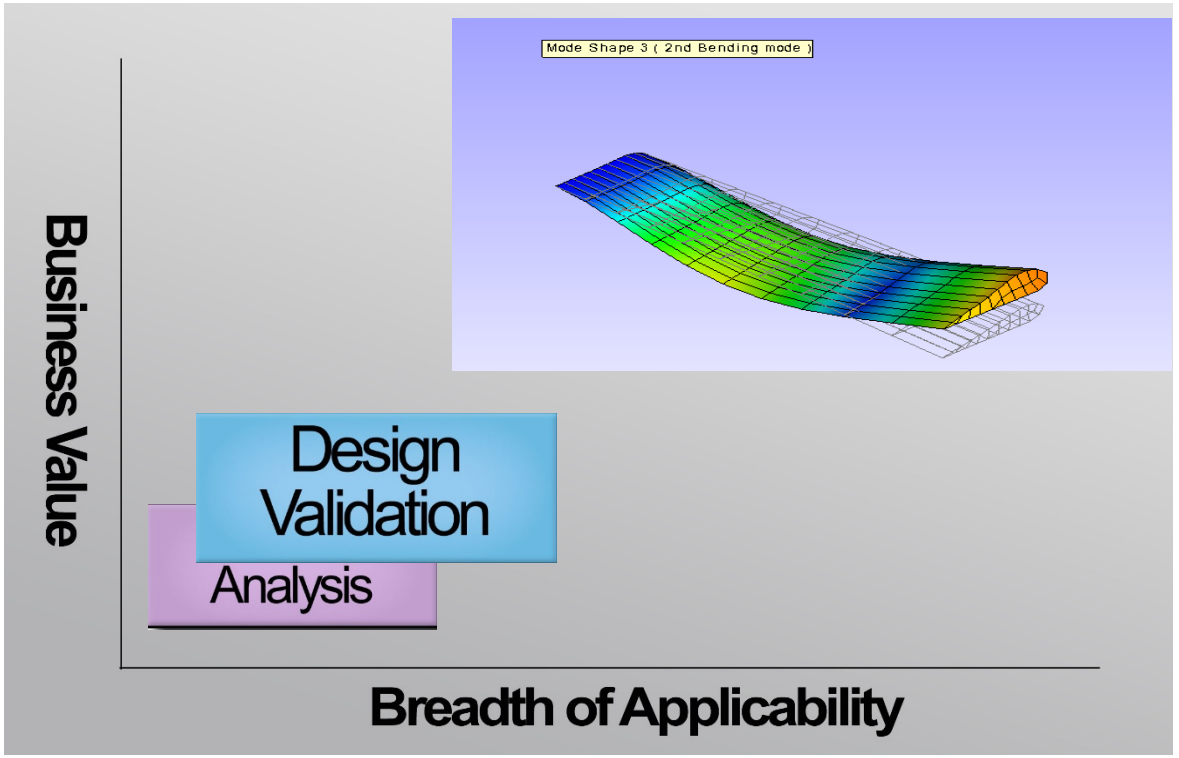
Failure Analysis

- This is where it begins
  - Understanding "why it failed"
- Run by a few "experts"
- Dominated by test vs analysis comparisons



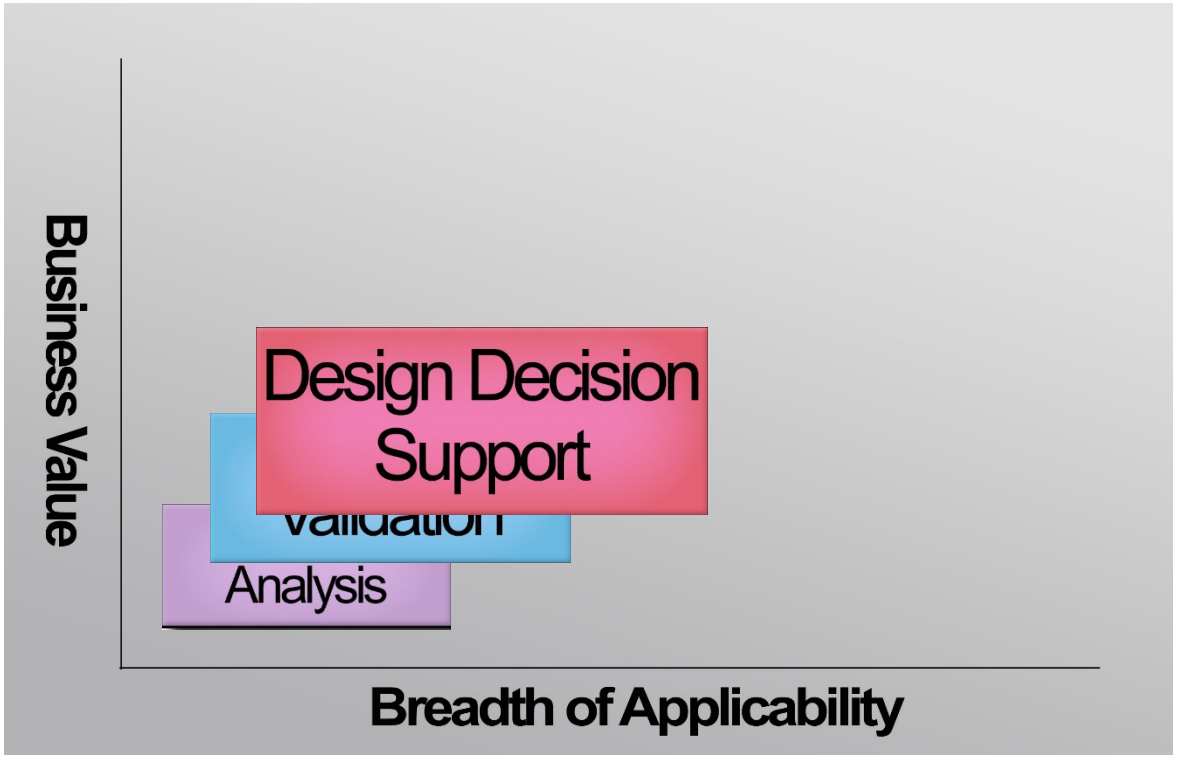
Design Validation

- Checking before it fails
- The dawn of Virtual Prototyping
- Broader use of simulation



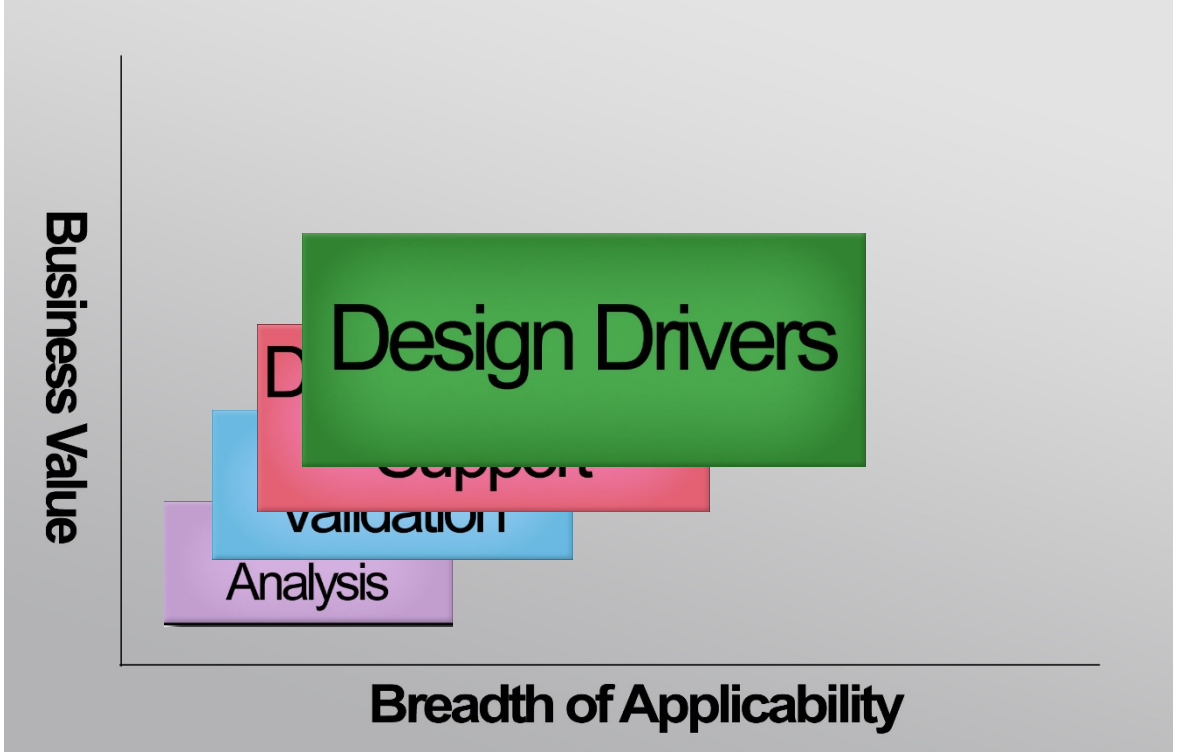
Design Decision Support

- Why not use simulation to make better design decisions
- Why not ask designers to run simulations



Design Drivers

- Simulation making design decisions

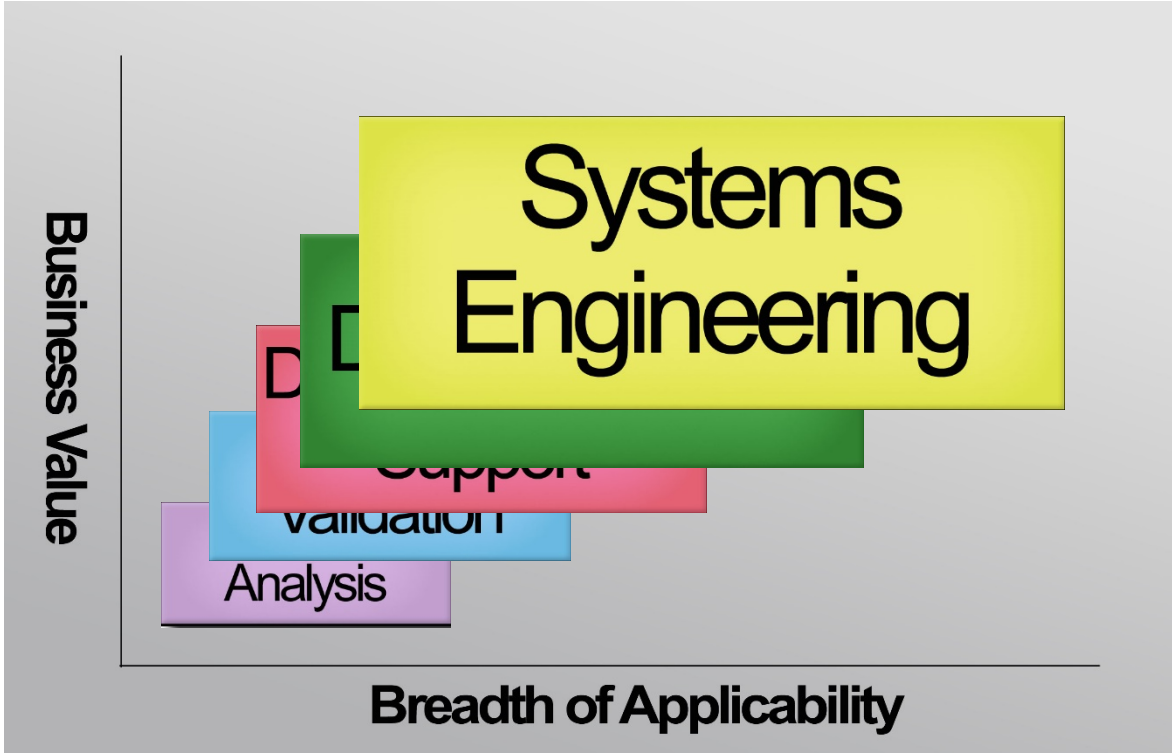


"We are only at the verge of the era where simulation generates, rather than evaluates, geometry."

Keith Meintjes, CIMdata

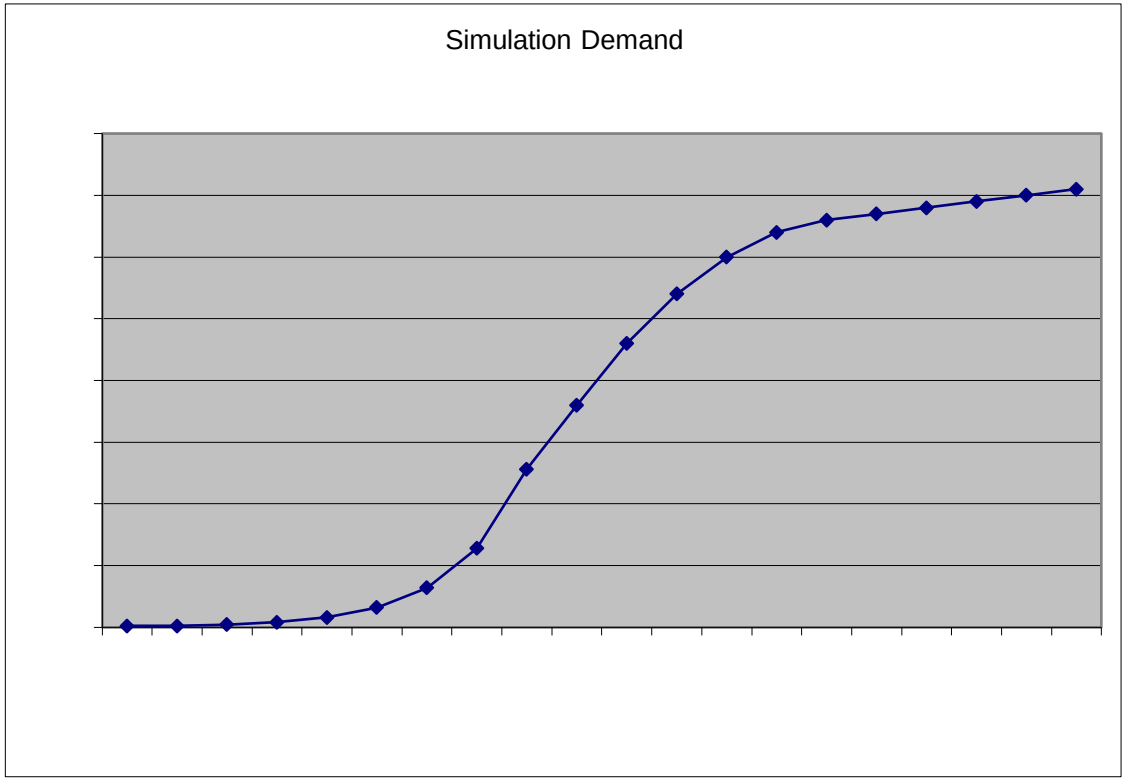
Systems Engineering

- Driven by growth of embedded software
- Heavily used in EDA world
- Design drivers extended to systems



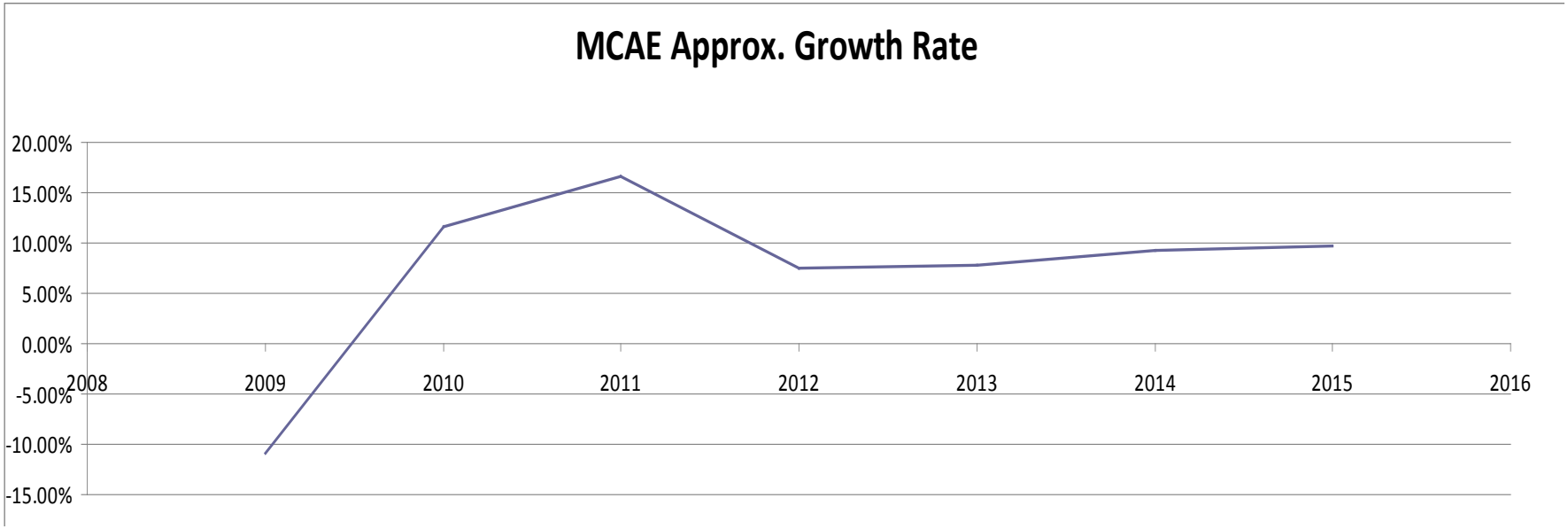
Business value = broader demand

- Demand should be increasing on a classic S curve
- Is simulation at an inflection point to break through ?



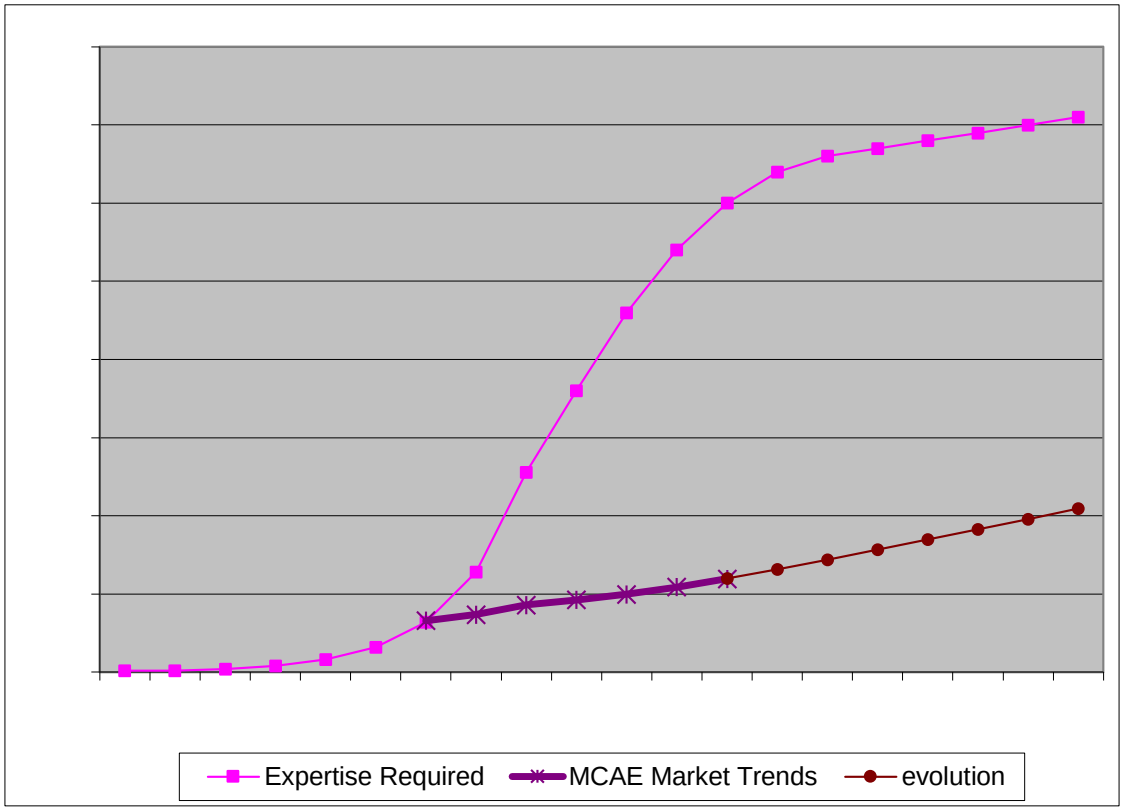
Business value = broader demand

- intrinSIM looked at actual & projected MCAE Market growth since 2009 (Courtesy of Cambashi data observatories)



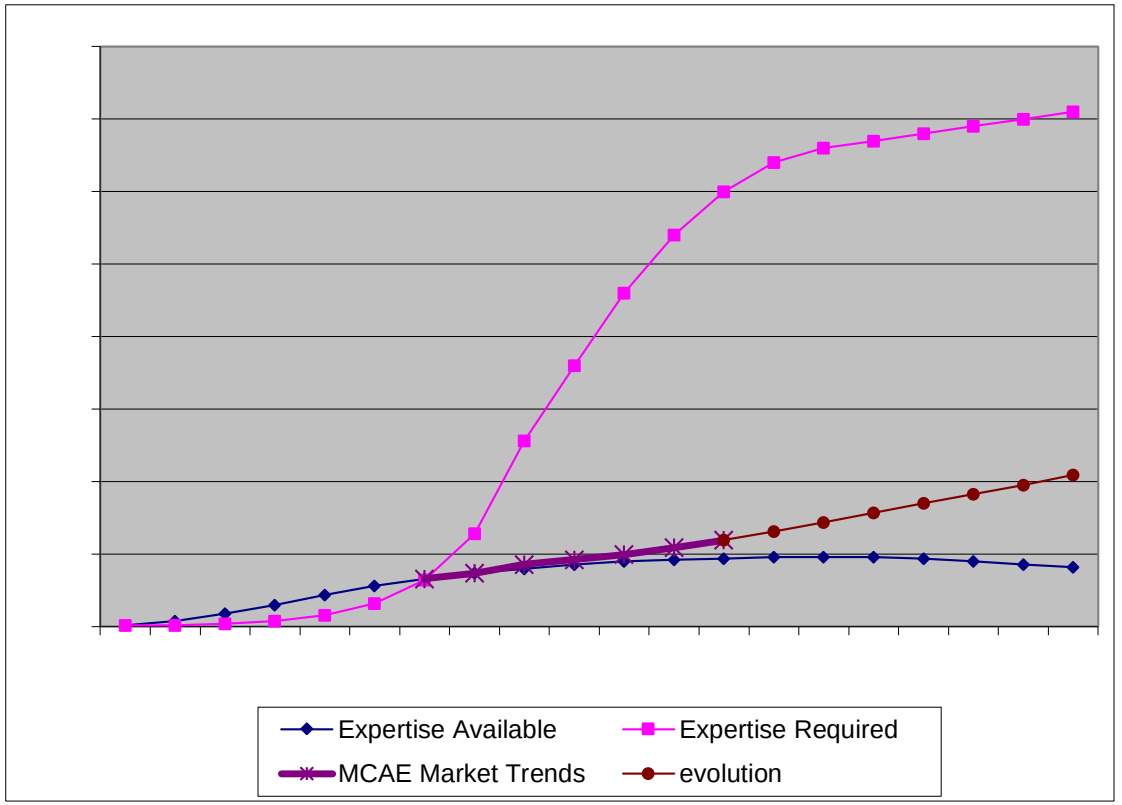
Business value = broader demand

- Inserted MCAE growth and evolution based outlook
- This does not look like an inflection point
- What happened?



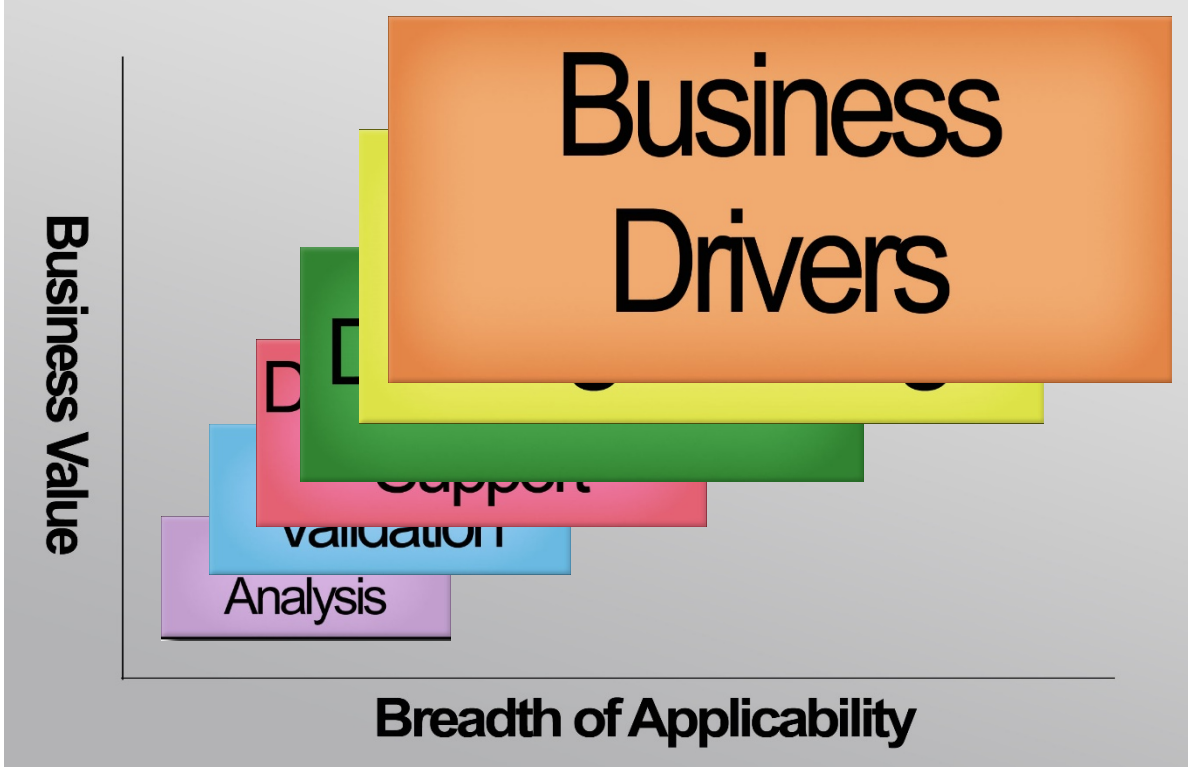
Business value = broader demand

- Simulation is still done primarily by specialized Analysts
- Growth of MCAE market is tempered due to lack of expertise available



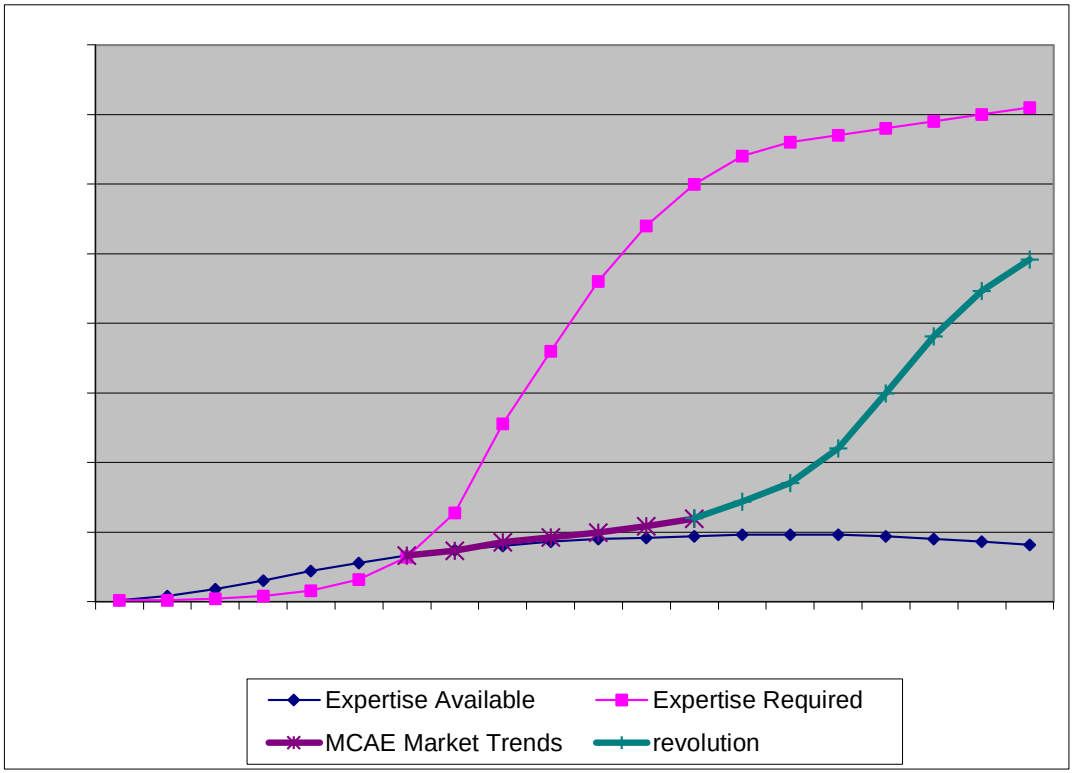
Business Drivers

- Business Drivers are going to force a "**revolution**" to overcome the expertise based limitation
- Simulation will be forced to find a way



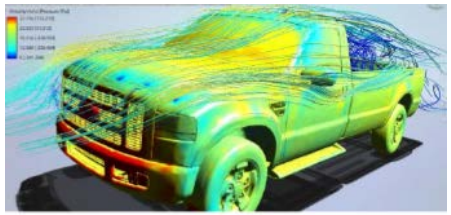
Business Drivers

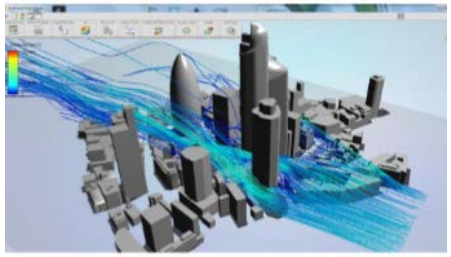
- The demand is not going away
- A Simulation revolution will occur:
  - “Fit for purpose”
  - “Smart”
  - “Integrated”
  - “Transparent”

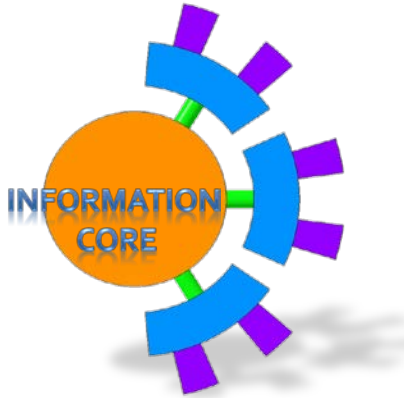


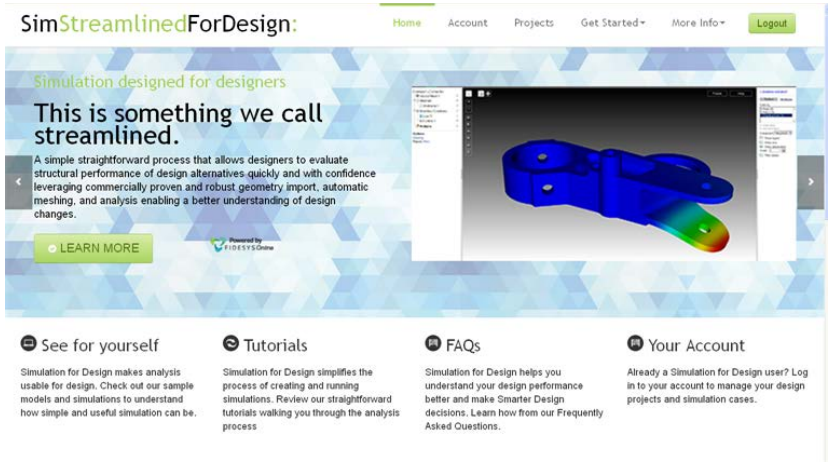
Enabling the Revolution

- Increased emphasis on purpose built applications
- Increased emphasis on Systems Engineering
- Emergence of simulation knowledge capture & reuse
- Emergence of near real time / near physics approaches
- Unlimited access for the appropriate “performance” evaluation needed









ASSESS is Born

- **"… we should have a separate conference just on this topic."**
  – Rod Dreisbach, Boeing
- Lunch with Brad Holtz
  (Cyon Research)
  - **"…let's start with a Summit"**
  - Several discussion and a few months later and the **A**nalysis, **S**imulation & **S**ystems **E**ngineering **S**ummit was born

http://c4uc.org/News/Summit.aspx

ASSESS is Born

- January 2015
- Santa Fe Institute as a host
- 40 people for a summit
  - Analysis & Simulation focus
  - System Engineering focus
  - Design focus
  - Industry Analysts
  - Financial Analysts
  - End users
  - Software Vendors
  - Domestic & International representation

ASSESS at COFES

- ASESS had a strong presence at COFES (Congress On the Future of Engineering Software) 2015
  - Summary overview of the Summit
  - Presentations on Key Issues from the Summit
  - Roundtable discussion regarding ASSESS next steps

Key Issues from the Summit

- Design-centered Workflow
  Keith Meintjes
- Ease of use & usability
  Malcolm Panthaki
- Pre-CAD analysis and optimization
  Steve Levine on behalf of Dipankar Choudhury
- Impact of web/cloud/mobile
  Jon Hirschtick



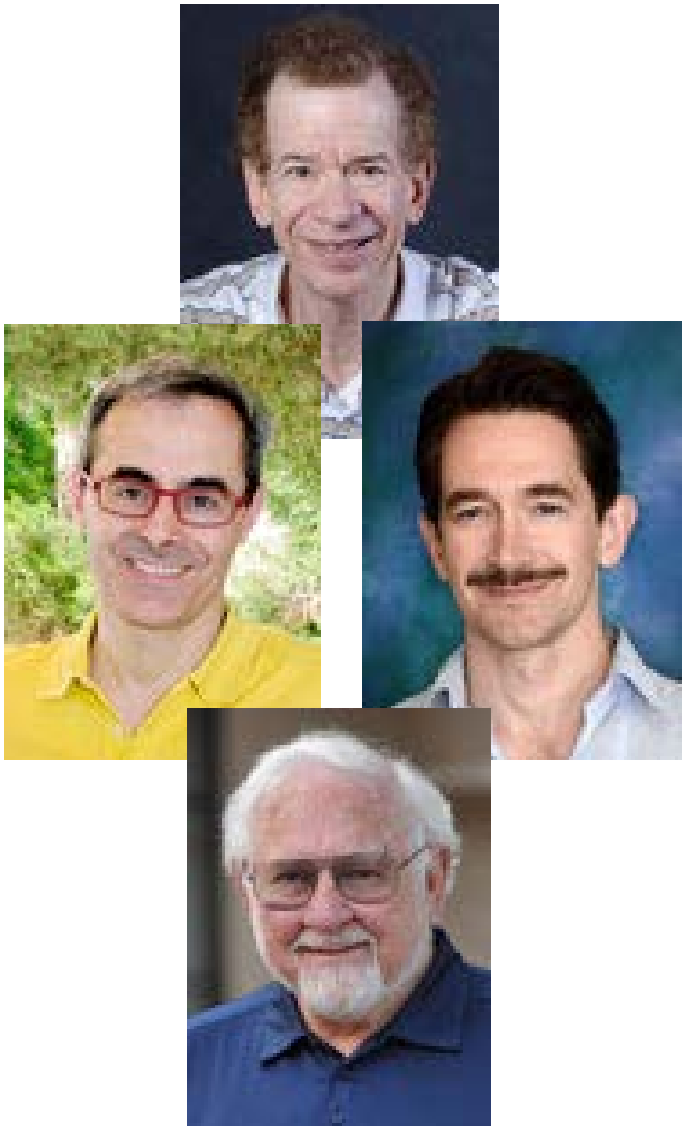

Key Issues from the Summit

- Knowledge capture & reuse

  Marc Halpern
- Ability to combine heterogeneous models in a systems approach

  Steve Coy & Hubertus Tummescheit
- Appropriate model fidelity & role of **unsexy** stuff

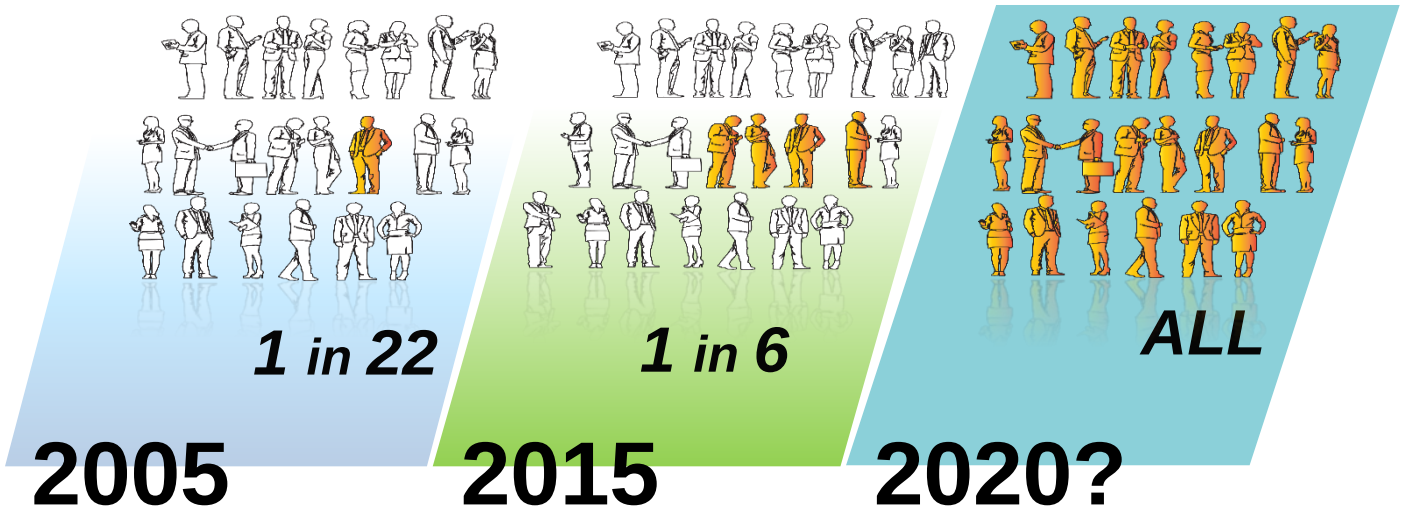
  Jack Ring on behalf of Mary Fortier
- Licensing models need to be revisited



ASSESS Next Steps

- **A**nalysis, **S**imulation & **S**ystems **E**ngineering **S**trategy initiative
  - First pass at mission statement

    "Expanding the use and benefit of Model Based Simulation, Analysis and Systems Engineering"



ASSESS Next Steps

- Establish a community for communication
  - Creating multiple ASSESS LinkedIn groups
- Investigate organizational form going forward
  - Consortium / or part of an existing organization
  - intrinSIM working with AES and others to explore potential government funding

ASSESS Next Steps

- ASSESS Symposium/ Conference planned
  - Joint activity by Cyon Research and intrinSIM
  - Currently targeted for January 2016 (1st or 2nd week)
  - Target larger audience than the Summit (100-120)

Summary

- The Role of Simulation is changing
  - Growth is limited by available expertise
  - Simulation is increasingly being seen as a key enabler for Competitive Advantage
  - Business Drivers are going to force a Revolution
  - Technologies are emerging to enable the Revolution

Summary

- **A**nalysis, **S**imulation & **S**ystems **E**ngineering **S**trategy (**ASSESS**) initiative has been started to address this changing role
  - Collaborative industry wide effort

"Expanding the use and benefit of Model Based Simulation, Analysis and Systems Engineering"

Summary

- **ASSESS** activities
  - Sponsored by Cyon Research and intrinSIM
  - Initial Summit was January 2015
  - COFES 2015 sessions covering Summit Report & ASSESS next steps
    - Summit report
  - Creation of ASSESS LinkedIn Groups
  - Next ASSESS event is being planned for Jan 2016

  - Contact us to become part of ASSESS