The Changing Role of Simulation

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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
"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 Analysis, Simulation & Systems Engineering Summit 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

- Analysis, Simulation & Systems Engineering Strategy 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 (1\textsuperscript{st} or 2\textsuperscript{nd} 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

• **Analysis, Simulation & Systems Engineering Strategy (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