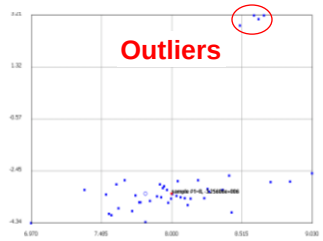


Decision Incite Inc

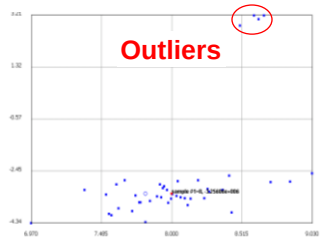
Make Better Decisions – Faster!

ASME
34TH Design Automation Conference

USING SIMULATION
TO SUPPORT
DECISIONS

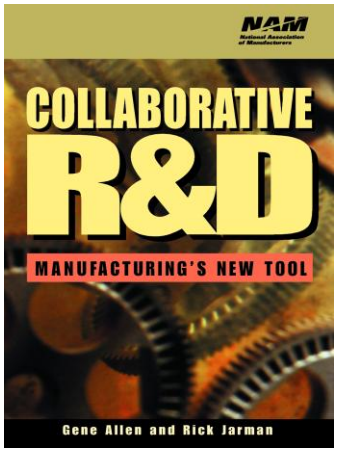
Gene Allen

August 5, 2008

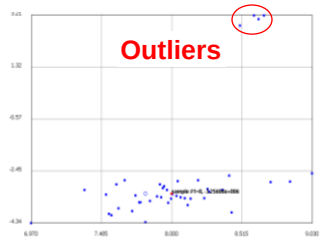


Decision Incite Inc
Make Better Decisions – Faster!

Gene Allen - Introduction



- Started Decision Incite in 2008
- Established/managed > $400 million in R&D programs
- Director, Collaborative Development, MSC (15 yrs)
  - Establish & manage CAE research projects
  - Co-Authored "Collaborative R&D: Manufacturing's New Tool"
- Director, Collaborative Development, NCMS (3 yrs)
- Economic Development & Defense Procurement Assistant, Senator Robert C. Byrd, U.S. Senate Majority Leader (2 yrs)
- Associate, Booz, Allen & Hamilton (3 yrs)
  - SSBN Acquisition
- U.S. Navy, Officer (5 yrs)
  - Active (5 yrs) - Qualified Nuclear Engineer, CGN Command Duty Officer, Wartime OOD, Training Officer
  - Reserve Officer on CNO staff (15 yrs)
- B.S. Nuclear Engineering, MIT, 1978



Decision Incite Inc
Make Better Decisions – Faster!

Decision Incite Introduction Background in Collaboration

Edward Ladzinski

IBM

CATIA Brand Sales Executive, PLM Americas

Previously - Global Engineering Innovation Framework Marketing Leader

Gene Allen

Decision Incite Inc.

Started in May 2008

Previously - Director, Collaborative Development at MSC Software and NCMS

Jacek Marczyk, Ph.D.

Ontonix

Founder and Chief Technical Officer

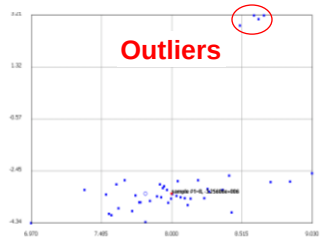
World leader in complexity management and stochastic simulation

Siu Tong and Company

Engineous

Founder and Chairman of dominant Process Integration and Design Optimization (PIDO) company

Sold to Dassault in June



First Generation Development

U.S.

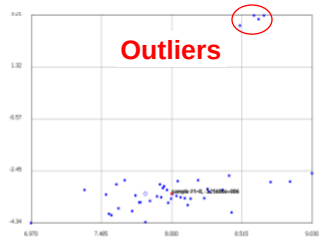
DARPA Rapid Design Exploration & Optimization Program

- Robust Design Computational System (RDCS)
  - Rocketdyne development, Ford applications, MSC to commercialize
  - Matured Rocketdyne code developed in 1980
- iSight
  - Engineous development and commercialization
  - Matured code developed by Siu Tong at GE in 1980's
- Both Tools provide a variety of design exploration methods for a multidisciplinary math model run multiple times over in a distributed computing environment

E.U.

Esprit Program

- Promenvier
  - CASA effort to develop stochastic simulation for Finite Element Models led by Jacek Marczyk



First Generation Commercialization

RDCS

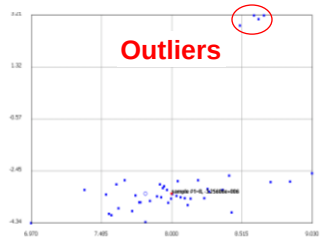
- MSC commercialization proved too complex for Sales Force
- Rocketdyne deployed at several sites in Boeing, including 787

iSight

- Engineous commercialized
- Follow-on NIST funding through FIPER

Promenvier

- Pilot program with BMW in 1997 demonstrated applicability with car crash/NVH
- Introduced Stochastic Design Improvement
- Commercialization rights acquired by EASi
  - Renamed STORM
  - Deployed at Audi, BMW, Jaguar, Mercedes, Nissan, Toyota, others



Second Generation

MSC Robust Design Development

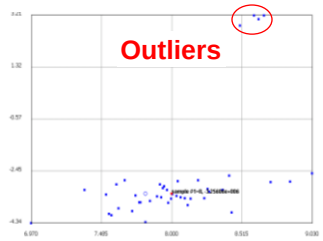
- MSC CTO Ed Stanton focuses MSC efforts on probabilistic analysis following:
  - Boeing experience in RDCS deployments in using method for validation
  - Attending 2001 Stochastic Simulation Conference in Germany
  - Crystal Ball use
- Hired Dr. Jacek Marczyk in 2002

MSC Robust Design Commercialization

- 2003 Innovation of the Year Award - German CAD-CAM Magazine
- Extremely easy to use
  - Know-how in Monte-Carlo methods or stochastics theory not needed
- Insight Maps used to condense and filter results
- Limited to Nastran applications

MSC Robust Design Feedback

- Need ability to change geometry
- Need to run with other solvers



Third Generation

Ontonix releases OntoSpace to manage complexity

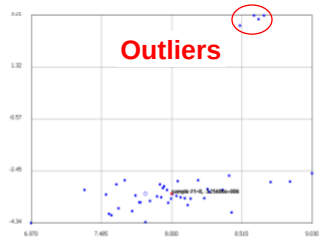
- Advanced Decision Map technology deployed
  - OEM to Engineous
- Automatic Outlier Detection capability
- Contracted to incorporate variability into MD Nastran

MSC transitions technology to Engineous

- i-Sight-FD 2.0 incorporates Insight Maps, Stochastic Design Improvement
- Addresses market feedback

MSC-IBM Strategic Partnership Announced

- Weekly IBM-MSC-Engineous calls to market stochastics
- NAFEMS Stochastics Webinar/World Congress presentation
- IBM CAE Symposium and COE presentations
- Repackaged process to Simulation-Supported Decision Making



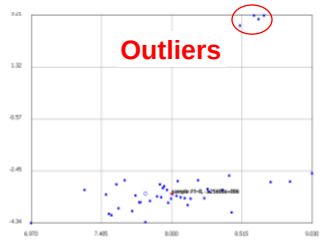
Decision Incite Inc

Make Better Decisions – Faster!

Fourth Generation Decision Incite provides Simulation for Learning and Decision Making

- **Quickly Identify and Understand How a Product Functions:**
  - **What are the major variables driving functionality?**
  - **What are the combinations of variables that lead to problems in complex systems?**
- **Ability Now Exists**
  - **Due to advances in compute capability**

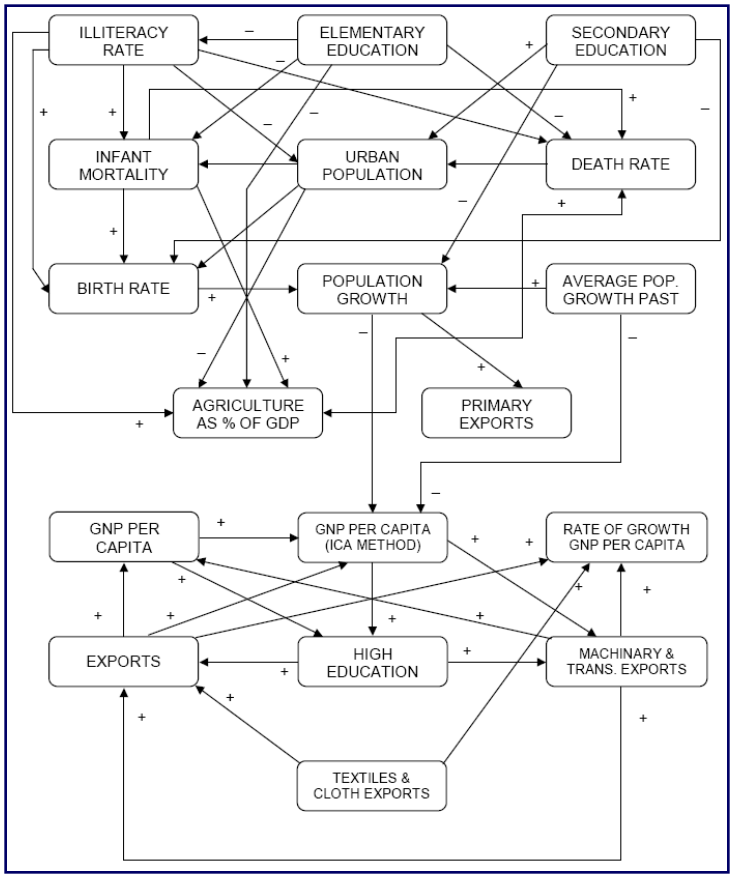
Tool is an Insight Map

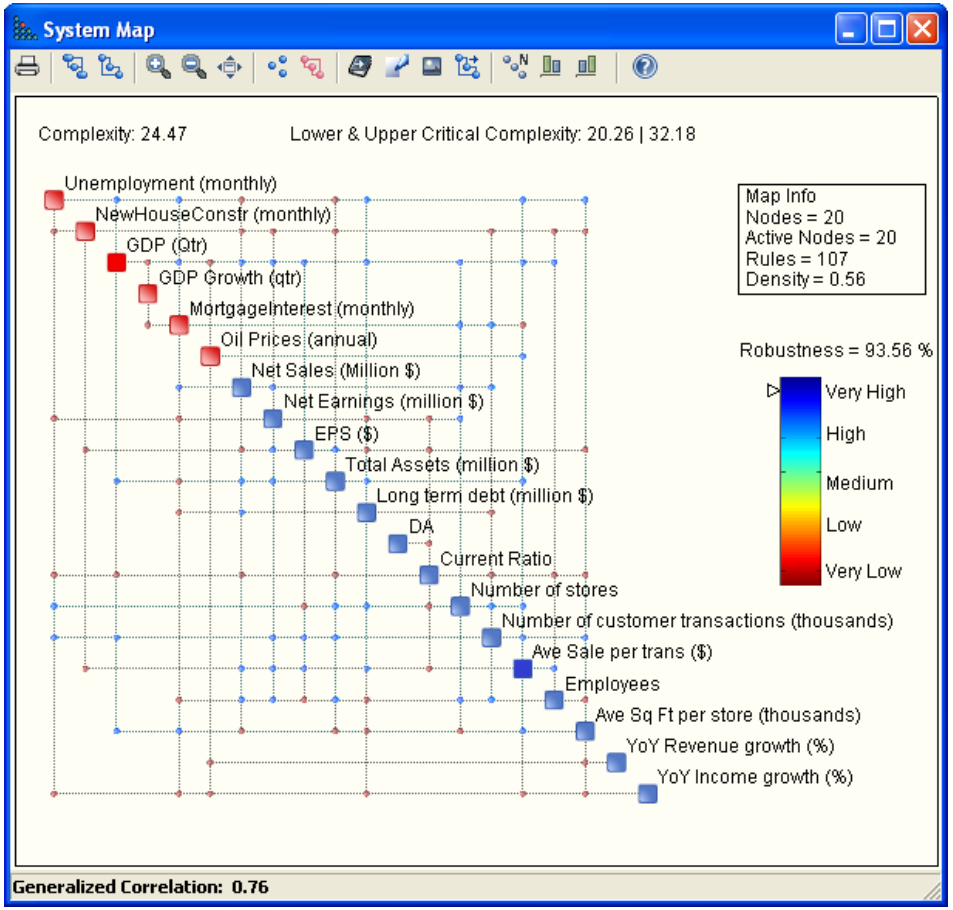


Decision Incite Inc

Make Better Decisions – Faster!

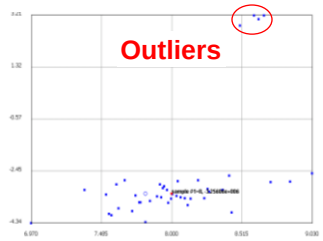
Insight Maps for Understanding





Manually made, subjective

Computer generated, extracts information from data



Decision Incite Inc

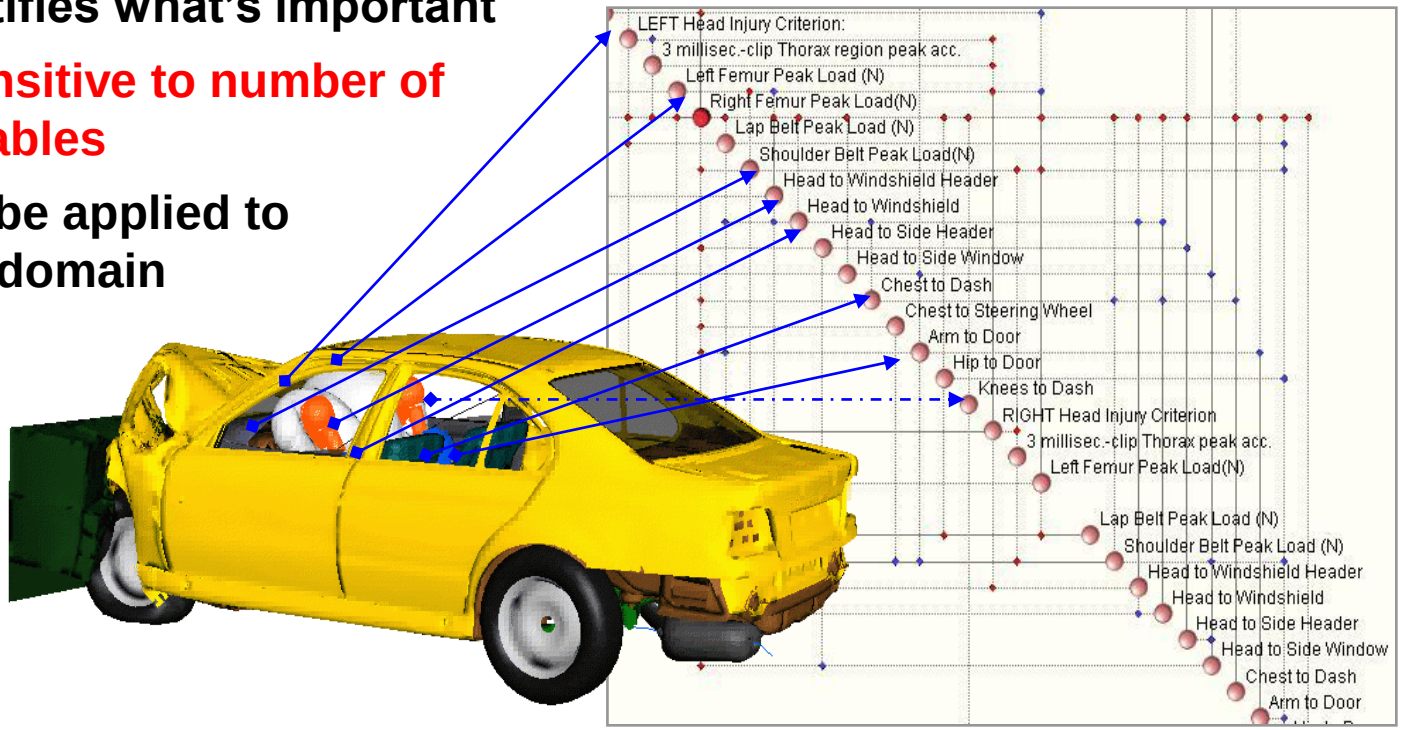
Make Better Decisions – Faster!

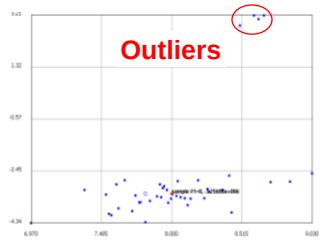
Identify Key Features

Learn how different combinations of product characteristics affect functionality with Insight Maps

Insight Maps Filter Complexity while Simulating Reality

- **Addresses natural variation**
- **Identifies what's important**
- **Insensitive to number of variables**
- **Can be applied to any domain**

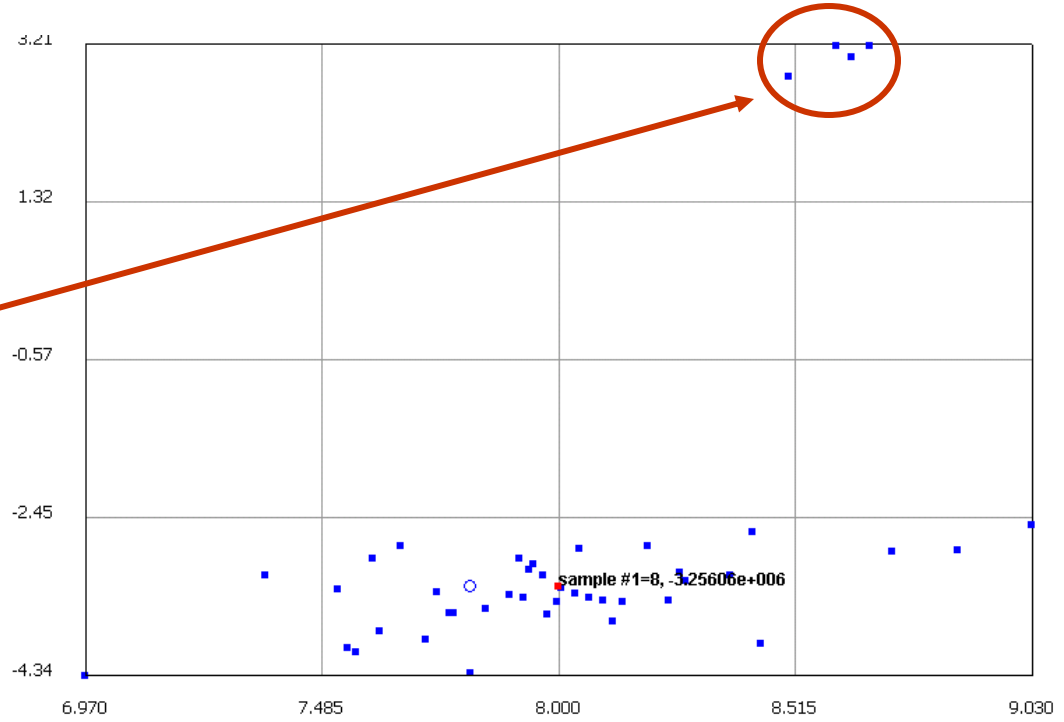


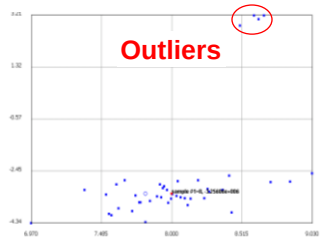


Outliers Identified

Identify how some combinations of product characteristics cause unanticipated results - Outliers

Usually non-intuitive, Outliers can be problems or improvements.





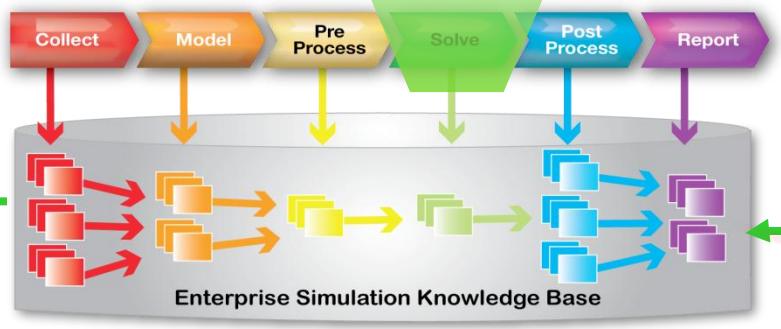
Decision Incite Inc

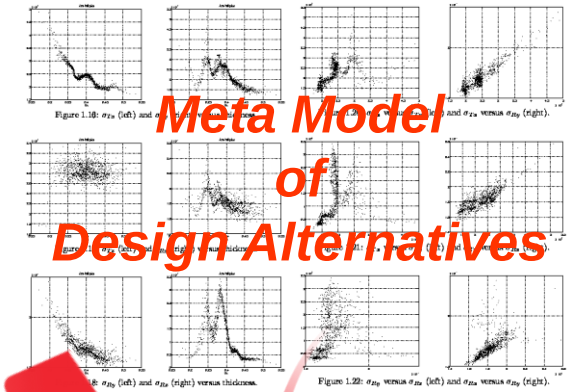
Make Better Decisions – Faster!

Generation of Insight Maps

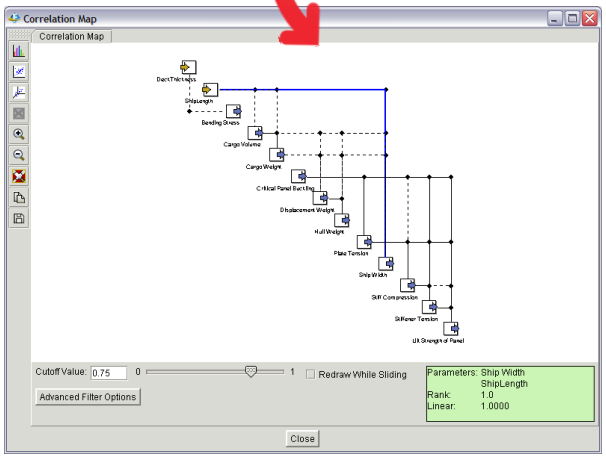
Stochastic Simulation Template

100 MCS runs





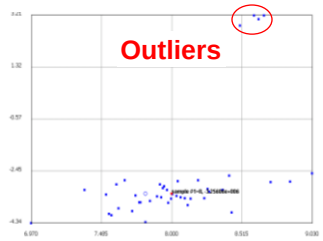
Meta Model of Design Alternatives



Correlation Map:

- Includes All Results

- Highlights Key Variables



Decision Incite Inc

Make Better Decisions – Faster!

Decision Incite Capability

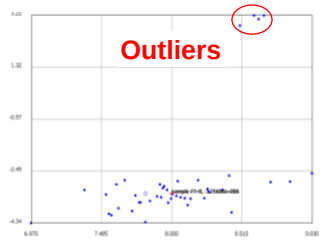
Quickly run hundreds of analysis scenarios and compare results to identify:

- **Influential characteristics**
- **Outliers**
- **Model verification & validation**

Brings together:

- **High Performance Computing**
- **Engineering Analysis Software**
- **Domain Expertise**

Reduces Risk by Learning through Simulation



Perspectives on Future

- Need for Multi-Discipline Expertise
- Need confidence in information
- Need improved ease-of-use
- Need new business models
- Envision autonomous agents
  - Each with a specific analysis capability
  - Operating in a Eclipse-like open environment
  - Through Web 2.0 user interface