



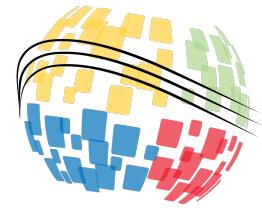
27th annual **INCOSE**
international symposium

Adelaide, Australia
July 15 - 20, 2017



Systems Engineering To Go

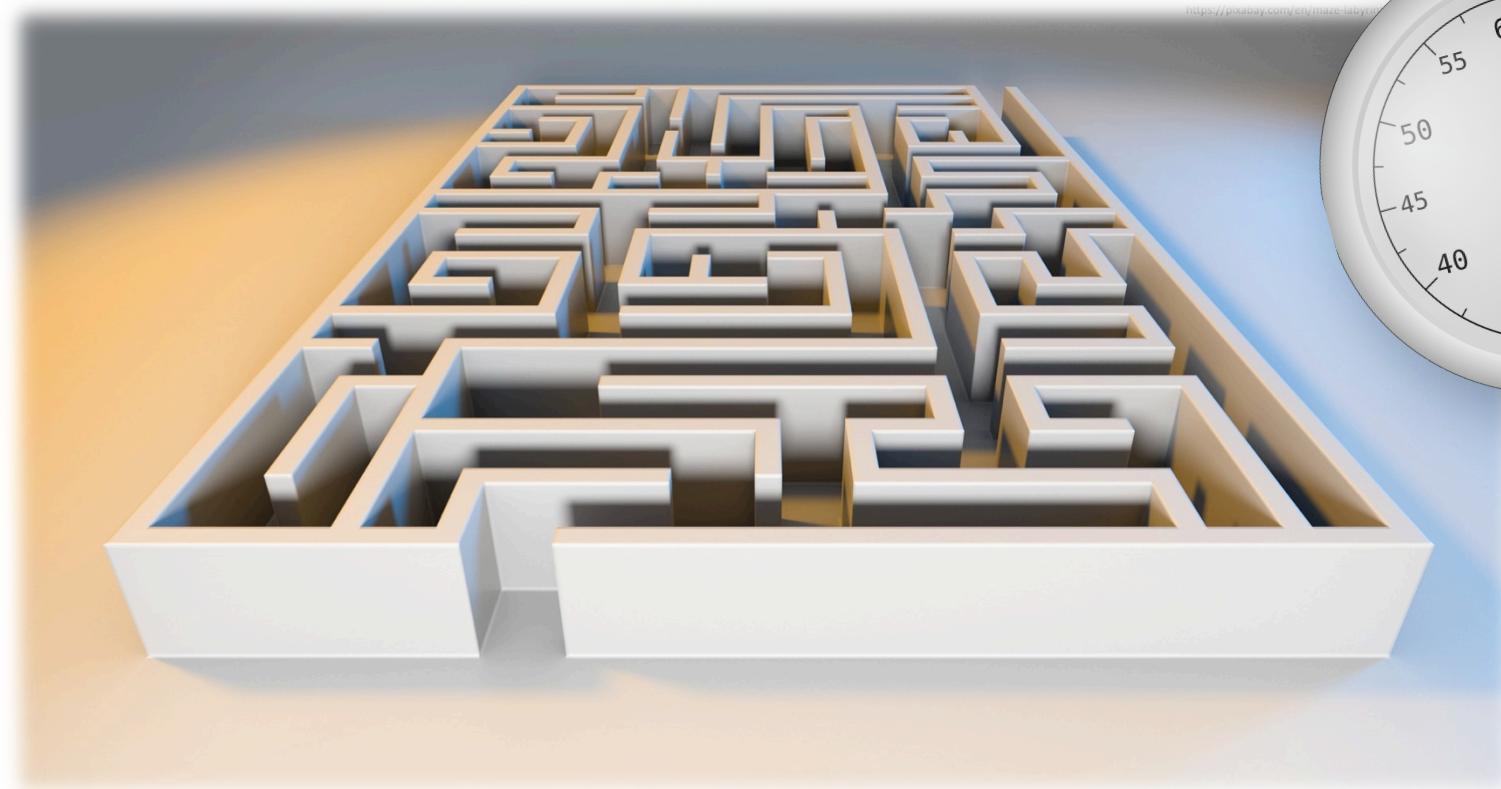
Breaking Out



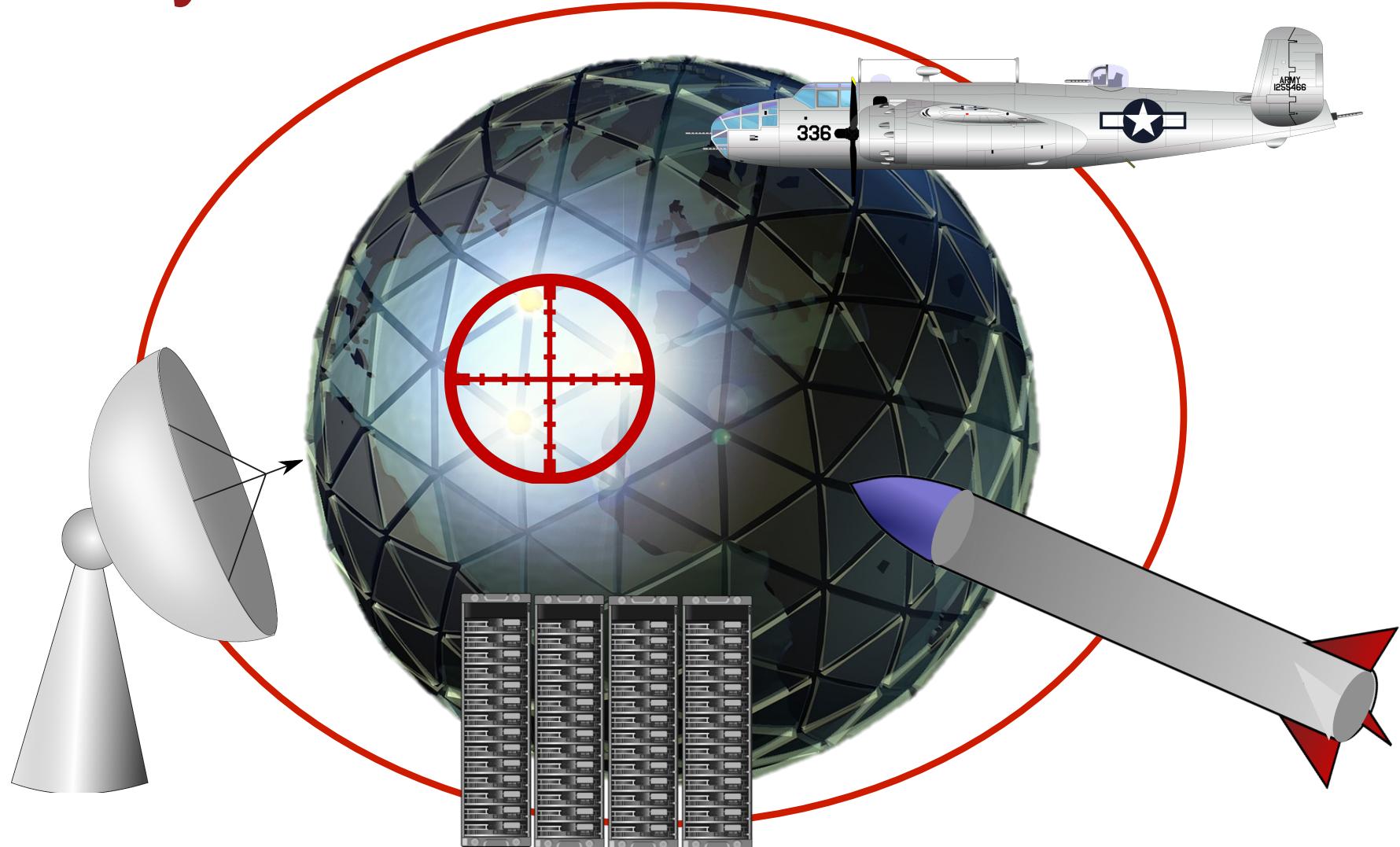
Historical background



Drivers = complexity + speed



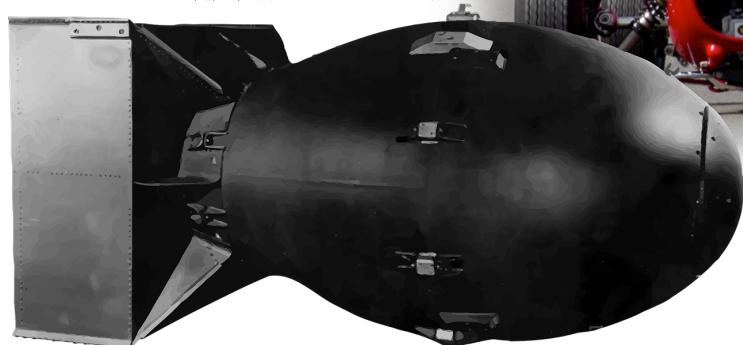
Complexity



Pace-Race



SPACE



ARMS



Application-based transfer



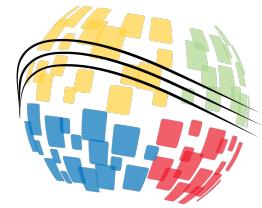
Rockets

Ships

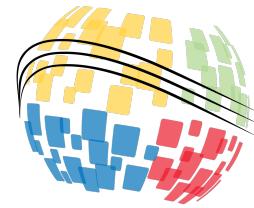
Vehicles

Space

Submarines



Issues and Problems



Baked-in

Product

Heuristics Processes Algorithms



Software

Vocabulary



Expansion

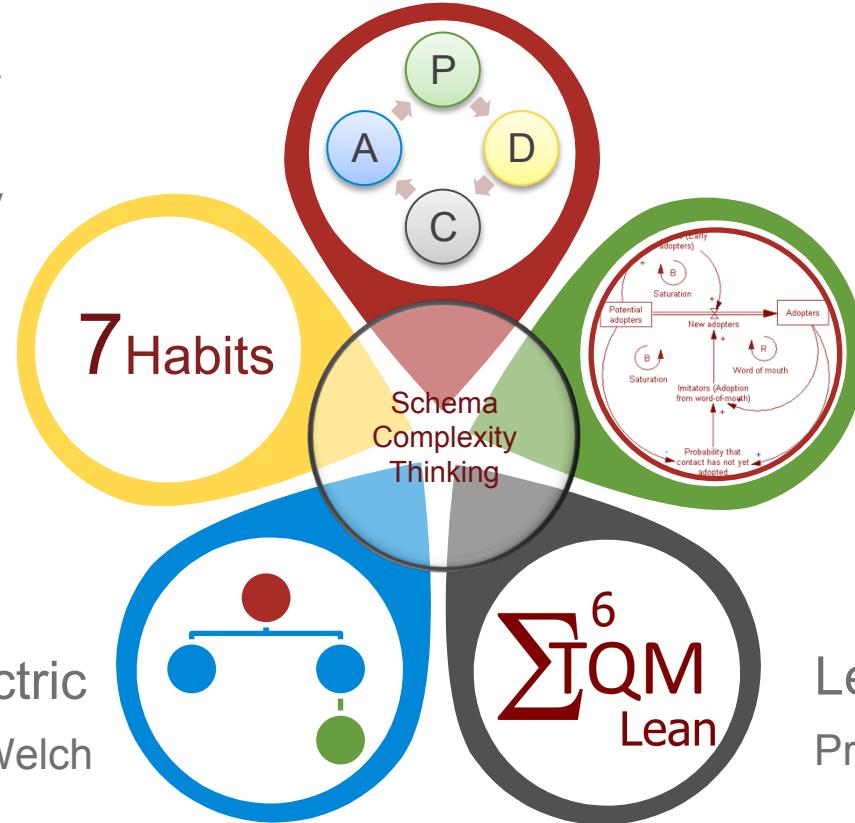


Concepts Map To:



PDCA
Plan, Do, Check, Act

7 Habits of Highly
Successful People
Steven Covey



Systems Dynamics
5th Discipline
Peter Senge

General Electric
Jack Welch

Lean Six Sigma/TQM
Process improvement

Impediment



Language/Vocabulary



Path Forward



Path Forward- Step 1

Reproductive Thinking



Incremental





Path Forward- Step 2

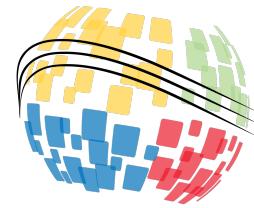
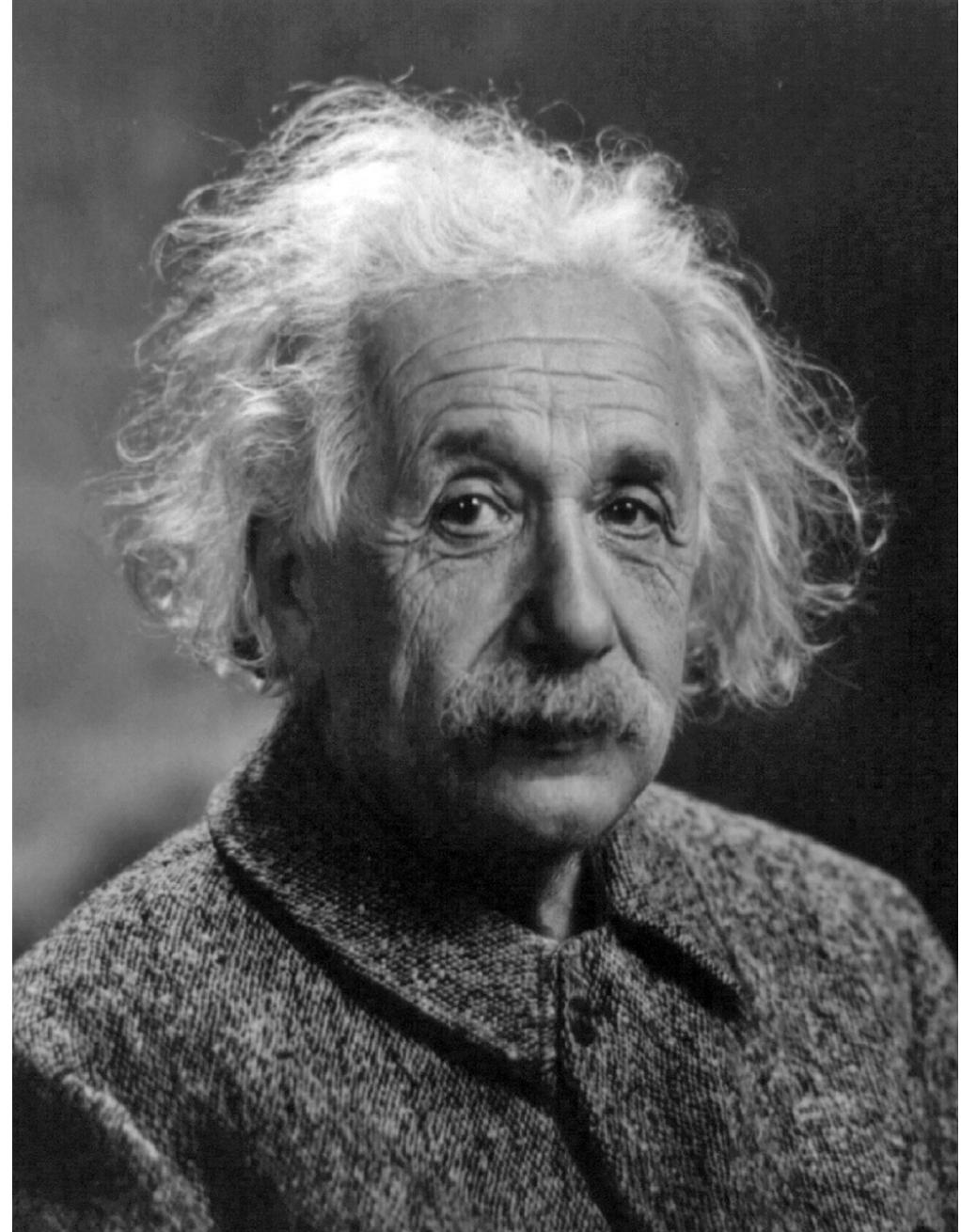
Productive Thinking



<https://pixabay.com/en/backpacking-traveller-man-146573/>

Combinatorial Play

“The first [principle is] that an idea is nothing more nor less than a new combination of old elements.” (Vilfredo Pareto, 1935)



James Webb Young

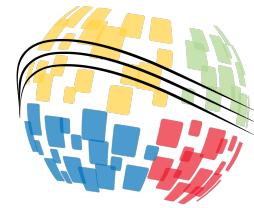


Five Steps for generating ideas:

1. Gather material
2. Digest material
3. Process unconsciously
4. Ah-Ha moment of insight
5. Tailor the idea to reality



Curiosity



Warning!

- “But you didn’t offer examples of other areas”
- On purpose!
 - Encourages reproductive thinking
 - Plenty of examples (e.g.- *A World In Motion*)



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www.incose.org/symp2017



Breaking Out: Systems Engineering To Go
Presented by Ron Kratzke, Vitech Corporation
Paper by Zane Scott, Vitech Corporation

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