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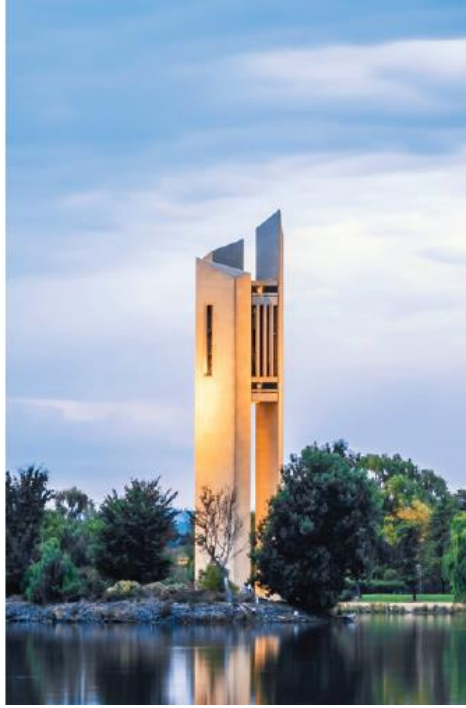
SYSTEMS ENGINEERING TEST AND EVALUATION CONFERENCE 2019

QT Canberra | Australia

29 April – 1 May 2019



SYSTEMS SCIENCE & ENGINEERING FOR A BETTER AUSTRALIA SETE2019.COM.AU

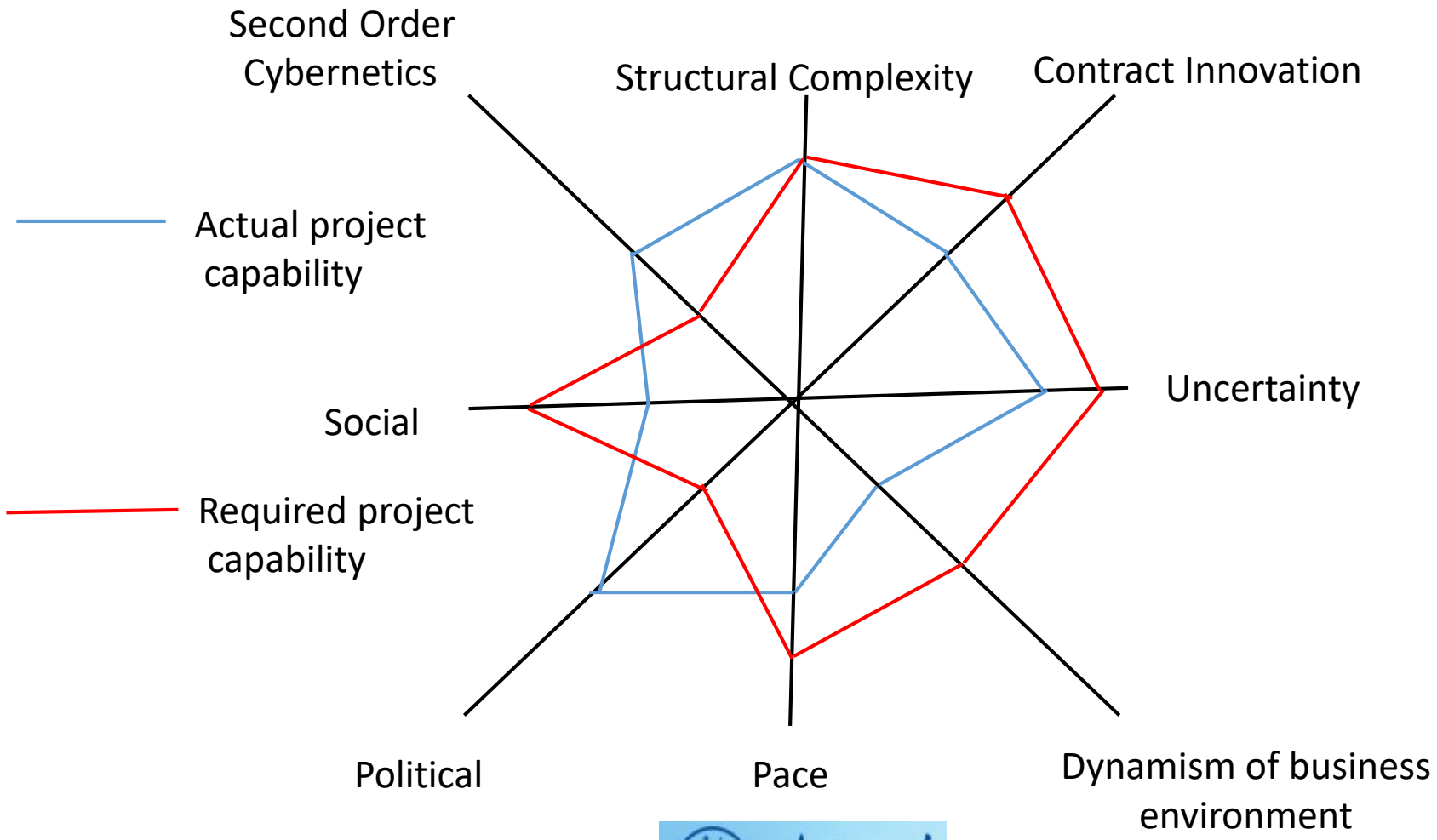
PAPER TITLE **Quality or Integrity of Complex Projects**

SPEAKER NAME **Professor Vernon Ireland**

Quality or Integrity or Complex Project Management

- The objective is to create a general model of complex projects
- This model provides a set of scales against which complex projects can assess the requirements of the project and the capability of the project team
- The approach attempts to recognize project capability required and actual capability of the project team
- The method of creating this has been to review a group of recent research papers of complex projects from Flyvbjerg, Morris, Saynisch, Stacey and others

The model


Second Order Cybernetics
Structural Complexity
Contract Innovation
Actual project capability
Uncertainty
Social
Required project capability
Political
Pace
Dynamism of business environment

The components of the model 1. STRUCTURAL COMPLEXITY AND MANAGEMENT

a. Size

b. Variety - Projects also need internal variety to address the variety of the external environment – (Sweetman and Conboy 2018)

c. Interdependence of systems

d. Newness of technology (London Heathrow vs Boeing 787

e. Recognition of project type (planned, Learning or Parallel, Selectionist Projects See notes on these three types from De Meyer et al (2006)

f. Large projects must have a proper governance framework (See notes from Greiman
2013) and Miller & Floricel (2001). A good governance regime is the Norwegian
Integrity at Entry See notes below from Samset & Volden (.2016)

g Systemic risk

h. Managing stakeholders

i. Human resource management

2. CONTRACT INNOVATION & STRATEGY

a. Diversity of finance (eg Channel Tunnel)
b. Novelty of contract requirements (eg Boeing 787) with complex outsourcing to 700 components
c. Risk profile to suppliers and sponsor (eg Boeing 787 versus using existing approaches or new approaches after pre-testing)
d. Disparity of cultures between sponsor and between suppliers

3. UNCERTAINTY

a. Novelty of project for the Sponsor/Deliverer's Enterprise
b. Use of new technology
c. Experience of the project team with this type of project
d. Availability of information

4. DYNAMIC SYSTEMS

a. New products and projects introduced and completing the existing
b. New competitors
c. Basis of Competitive Advantage changing
d. New overseas innovations

5. PACE

Speed of project completion

6. POLITICAL

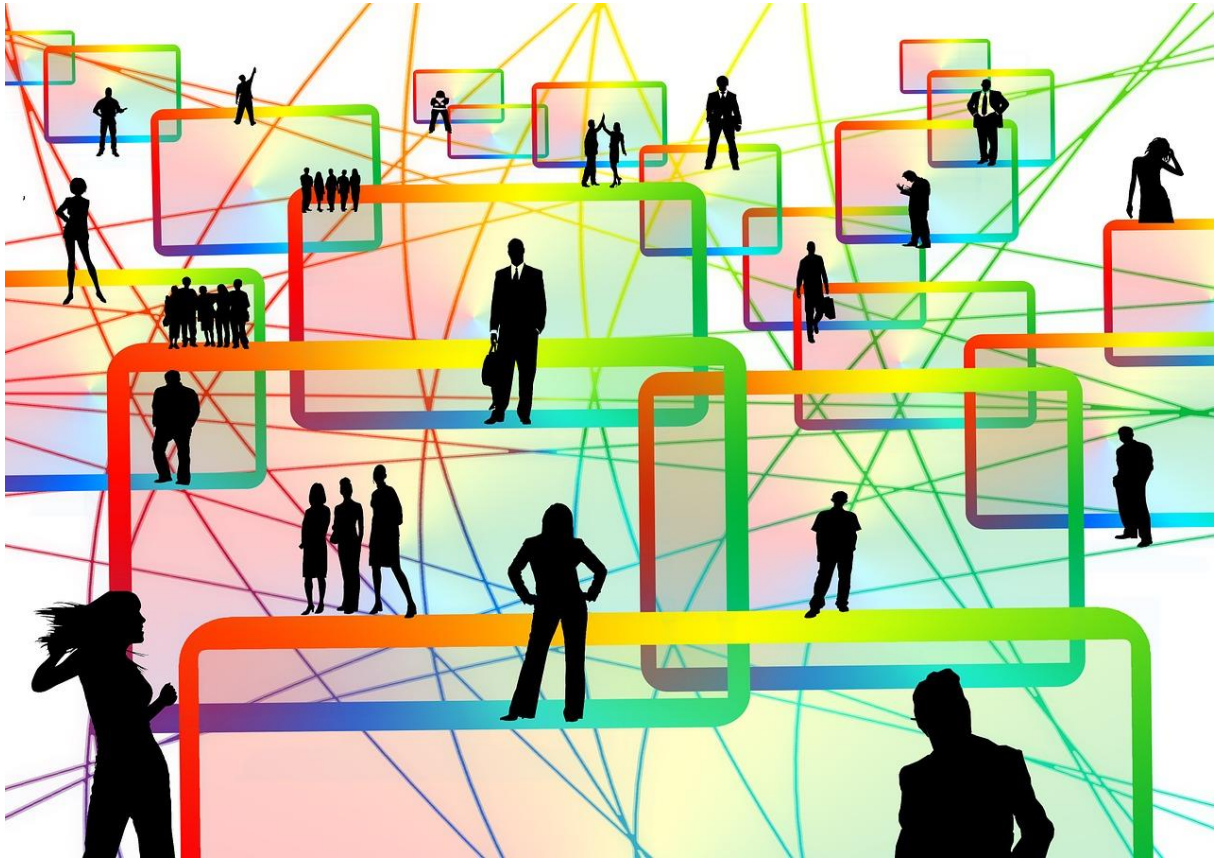
a Importance of project nationally

b Hidden agenda

7. SOCIAL

a Project support from stakeholders

b Community response



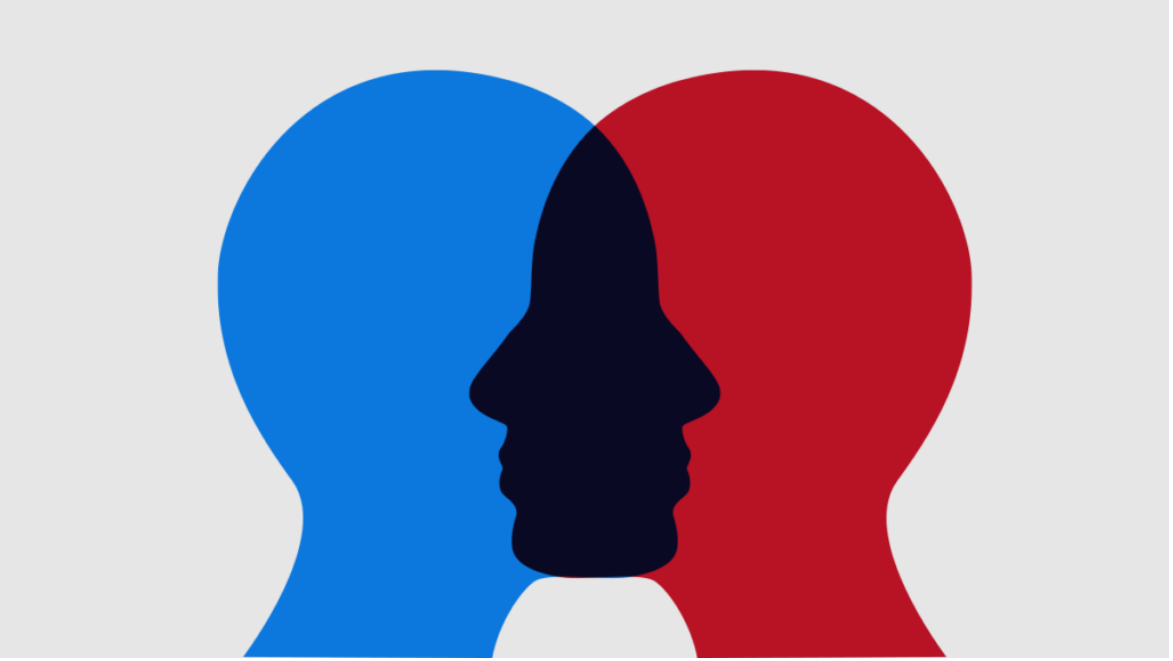
8. SECOND-ORDER CYBERNETICS

a. Complex Responsive Process of Relating (CRPR)

a. Support for delivery team by the planners and designers

c. Empathy from designers and planers to deliverers

d. Emotional Intelligence of team members



- Second order cybernetics was initiated by Manfred Saynisch (2010 a & b), on the basis thay top-down planning is the first order cybernetics
- Saynisch's view is that productivity of project management teams would be vastly improved if planners and designers spent more time attempting to see delivery from the point of view of deliverers

8. SECOND-ORDER CYBERNETICS

- A similar approach was taken up by Stacey (2001 & 2012) with his *complex responsive process of relating* in which he sees the process and quality of relating being the MOST important aspect of business on enterprise and project teams
- Support is provided on the importance of relating by Pentland (2014), Shaw (2002), Luomo (2007), Davidson (2010)
- Part of the issue is the way men (88% of the engineers in EA) speak
- Men speak to report whereas women speak to build relationships (Susan Faludi)
- The cost the design, planning and delivery team is minimal compared with the cost of ships and planes
- Emotional Intelligence is supported by Goleman (1995)

The benefits of second order cybernetics

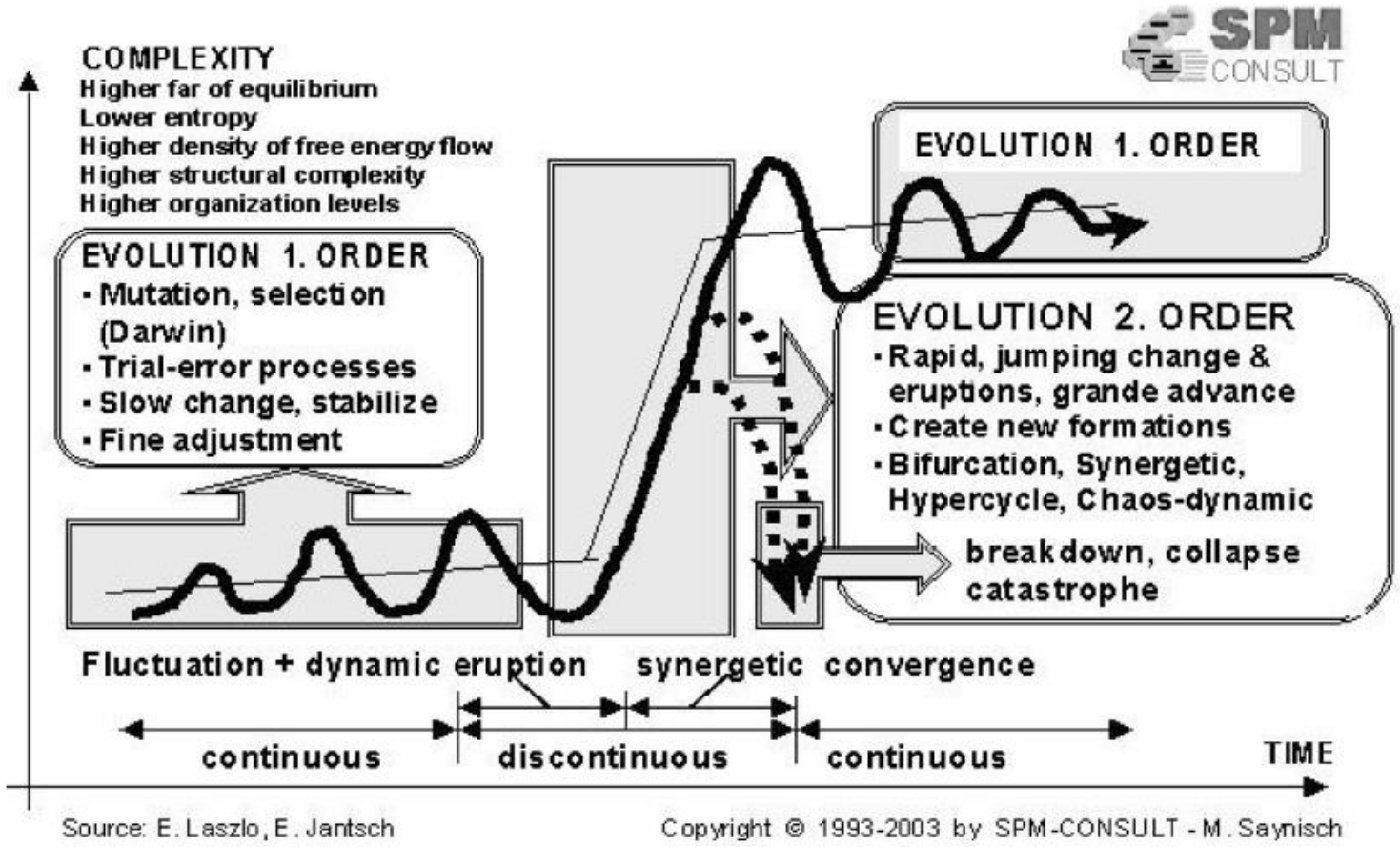


Figure 3. The principle-definition and foundation of "Evolution of 1st and 2nd Order."

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Questions and comments

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