



QT Canberra | Australia

29 April – 1 May 2019

SYSTEMS ENGINEERING TEST AND
EVALUATION CONFERENCE 2019



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

*You can lead a stakeholder to water but you can't make them drink:
Guidance on how to relieve major pain points of Systems Engineering
Practitioners*

James Scotter - Public Transport Victoria - MIRO, MINCOSE, MIET



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OVERVIEW

1. A Typical Systems Engineering Story – Where the pain begins
2. The ASEW sessions
3. Pain Point 1 – Interface Management
4. Pain Point 2 – Stakeholder Engagement
5. Pain Point 3 – Collaborative Environments
6. Principles, Recommendations & Guidance Document






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A Typical Systems Engineering Story – Where the pain begins

The typical story



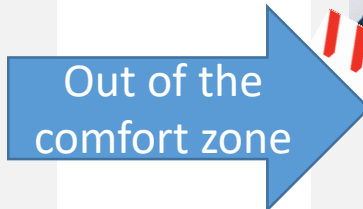
BAE SYSTEMS

Freshly graduated systems engineer, starting life in the defence industry...

Everything is awesome as systems engineering underpins all projects...

Supported well as a graduate and flowers into a fully fledged & competent engineer, but starts to look for pastures new...

COMFORT ZONE – Low inspiration



Great opportunity awaits this plucky systems engineer in the transport industry...

But systems engineering is not the norm, or has only just been adopted..

Accepts the challenge of trying to cement systems engineering practices within the transport industry, but has many 'painful' years ahead...

PAIN ZONE – High motivation



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A Typical Systems Engineering Story – Where the pain begins

System Engineers

Moving from a SE intense environment to an SE disparate environment is a cultural shock for a systems engineer

One is always having to justify their existence

Tends to not be a strict conformance to plans/processes/rules with cultural behaviours that are difficult to change

Behaviour of the client is not always predictable

Feel as though you are speaking a foreign language



CEOs / Directors

What is the benefit of taking onboard this capability?

Why am I being forced to do what Defence does? What we do isn't broken, so why fix it?

What you're selling is just good project management?

Why am I taking on additional cost over and above what my customers are asking to be delivered?

We have standards that tell us how to design our product, why all the extra work?



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A Typical Systems Engineering Story – Where the pain begins

There's no need to suffer alone...



...most SEPs suffer the same issues, so you are not the only one...

...a problem shared is a problem halved...

MISSION:

- Develop & run a workshop to determine what are the causes of the biggest 'pain points' experienced by SEPs today & discuss ways in which to mitigate the issues



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The ASEW Sessions



Roger McCowan



Emma-Rose Tildesley



Martin Griffin

Session 1 – Group Brainstorm



PAIN POINTS	
- PAIN 1	- PAIN 6
- PAIN 2	- PAIN 7
- PAIN 3	- PAIN 8
- PAIN 4	- PAIN 9
- PAIN 5	- PAIN 10

CAPTURE



PAIN POINTS	
- PAIN 1	●●●● - PAIN 6 ●
- PAIN 2	● - PAIN 7 ●●
- PAIN 3	●● - PAIN 8 ●●●
- PAIN 4	- PAIN 9 ●
- PAIN 5	● - PAIN 10 ●●●

PRIORITISE



Session 2 – Drilling Down into the Detail



- PAIN POINTS
- INTERFACE MANAGEMENT
 - STAKEHOLDER ENGAGEMENT
 - COLLABORATIVE ENVIRONMENTS
- DEFINE PAIN POINTS

Session 3 – Produce Principles, Recommendations & Guidance



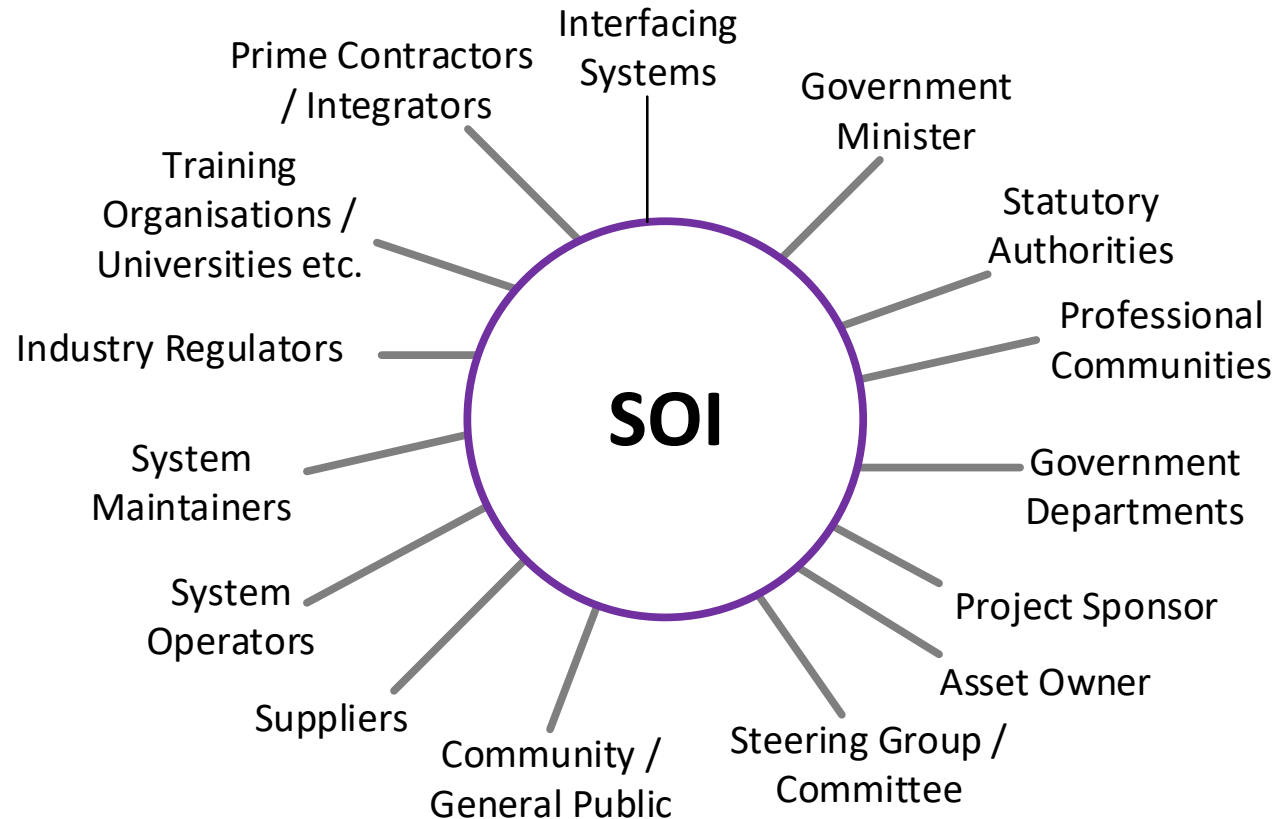


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Pain Point 1 – Interface Management

Key Principle 1 – Identify all stakeholders at the start and consider their interfaces (and how they're managed) throughout the Project/Programme lifecycle





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Pain Point 1 – Interface Management

Key Principle 2 – Ensure all Organisational and Technical Interfaces are Properly Documented and Understood

$$\# \text{ of Interfaces} = \# \text{ of Nodes}(\# \text{ of Nodes} - 1)/2$$

EXAMPLE: a transport project may involve three government departments (Transport, Environment and Finance), four contractors (covering design, construction, systems and testing/validation), giving rise to 21 separate relationships, typically managed with contracts.

This leaves aside the added complexities when any of the major contractors engage sub-contractors. It is important to ensure that all interfaces are identified.

Suggest starting with the exhaustive list of $N(N-1)/2$ interfaces and explicitly eliminating the interfaces that do not exist or which are mediated by one of the other parties.

RECOMMENDATIONS:

1. **Define clear responsibility and accountability for all parties**
2. **Design for Re-use**



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Pain Point 2 – Stakeholder Engagement

Key Principle 3 - Establish and Maintain a Common Stakeholder Understanding

- Establishing organisational champions (domain experts with the ability to explain technical complexities in the vernacular of their audience);
- Providing an environment that enables trust (safe and inclusive);
- Ensuring there are clear and open communications channels;
- Providing clear understanding of authority and responsibility (i.e. how to escalate an issue when necessary);
- Providing targeted competency frameworks and associated training;
- Providing and maintaining applicable tools, techniques and practices to best suit the needs of staff;
- Encouraging the training of staff;

RECOMMENDATIONS:

- 1. Engage all relevant stakeholders**
- 2. Establish and foster Integrated Project Teams (IPTs)**
- 3. Avoid information overload**
- 4. Promote the value of the project**



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Pain Point 3 – Collaborative Environments

Key Principle 4 - Establish an Over-arching Framework and Culture of Collaboration

SILO MENTALITY RECOMMENDATIONS

1. Create a Unified Vision
2. Work Towards Achieving a Common Goal
3. Motivate and Incentivise
4. Collaborate and Create

INFORMATION MANAGEMENT RECOMMENDATIONS

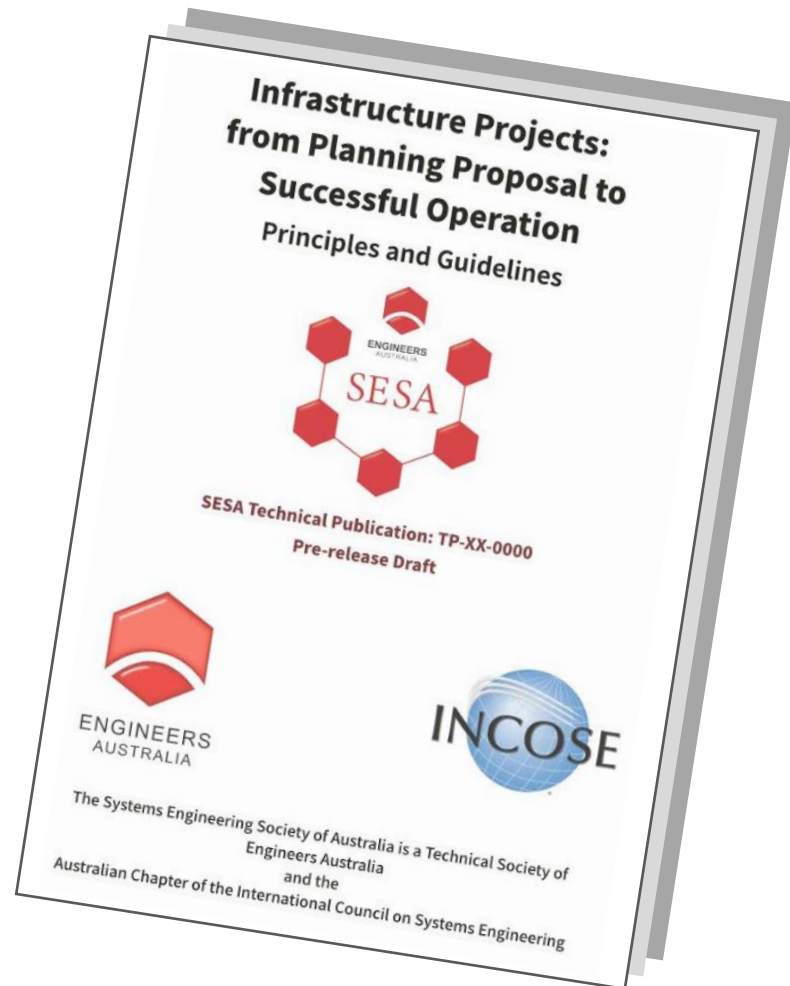
1. Establish Information Governance
2. Maintain Project Information



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Principles, Recommendations & Guidance Document



- Grab a draft copy from us today (limited numbers)
- To be socialised via SESA & EA in the near future
- Possibility to focus on other pain points during the next ASEW

THANKYOU FOR LISTENING