Delivering Economic and Efficient System Engineering

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Introduction

• System engineers need to be more resourceful than ever

• We need to Reflect on Our Practices
  Where might opportunities might lie to improve system engineering delivery in this climate?

• We need to think about how we put the Case for SE in the current climate
  What arguments might convince the sceptical stakeholder?
Reflecting on our Practices
Duplication of Effort in the Supply Chain

- SE effort is probably duplicated through a complex supply chain
- Reducing duplication needs a level of trust and interaction between the parties
- ... but the prize is worth considering.
Optimising the Scope of System Engineering on a Project

• Tempting to try to apply SE to the whole project scope.
• **But not all system components are equal**
• Can simply employ standard engineering practices in some areas.
• Reduces SE costs and the tension that can arise when trying to impose SE in a low risk area where SE concepts are alien
Case Study: New Service Control Centre

1. Input key requirements into scope
2. Allow normal civil engineering/E&M processes to operate
3. Periodic System Design Reviews
4. Check key requirements met
Critically Examining SE Processes

• As with all management systems, SE processes tend to grow over time.
• Can add to process complexity without a corresponding increase in value.
• A critical review of processes, using tools such as Six Sigma can identify process improvements
• GOAL: Eliminate or reduce low value process elements.
Institutionalising Lessons Learned on Projects

- Mistakes, inefficiency and ineffectiveness cost money, quality and time.
- Also affect less tangible capital such as morale and reputation.
- “Lessons Learned” can seem like a soft skill, but actually has hard consequences.
- Lessons Learned reports are easily forgotten.

- Lessons can only really be learned when they are reflected in day to day processes.
Critically Examining Customer Requirements

- Not visible to end user and customer organisations what the true cost of specific requirements is
- Nor is it visible to suppliers what the true cost of not delivering a requirement is to the customer.
- Hence, **collaboration** is needed to review this.
Building Resilient Teams of Competent System Engineers

- Matters more than ever to recruit, retain and develop in-house SE resource and a tailored SE tools.
- Requires patience, energy and time from senior practitioners.
- Opportunity to further integrate SE into other areas
- Strong system thinkers can be found in many places.
Case Study: TL Engineering Competence Management System

- Specialist SE Competences
- But also general competences for SEs
- System Thinking in ALL competences
Putting the Case for SE in the current climate
Putting the Case

• SE in the rail industry is increasingly recognised as a critical element.
• But SE is not a silver bullet and can still be patchily practised
• Need to show that we understand and have control of cost drivers and that we can quantify business benefits of SE
• This also means putting our house in order rather than wait for the axe to fall arbitrarily!
Things to avoid …

Overselling
SE

Hoping there won’t be any budget cuts

Making things over-complicated
Things to do...

Show how SE relates to the bottom line
- cost drivers as well as
- risk avoidance
- business benefit

Keep it simple
And relevant

Be proactive
Conclusion

• Current climate demands **resourcefulness**
• We need to critique our own processes and look for opportunities to focus on what delivers value – to “**System Engineer our SE**”
• We need to act ourselves rather than wait for others to act for us!