Work In Progress (WIP):

**Behavioural Barriers to Trustworthiness**

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Challenges to Trustworthy Software

• Most of techniques needed to Specify, Realise and Use Trustworthy Software have existed for many years (e.g. 1968 NATO “Software Engineering” paper)

• **Yet overall pattern of majority of software being untrustworthy persists**

• “Gaps in Achieving Software Trustworthiness” (Ian Bryant, ACSAC 2012) explored Economic Factors – mainly Externalities – for untrustworthy software culture

• Now interested in understanding Behavioural Factors that influence persistent untrustworthy software culture
Scoping Behavioural Factors Study

• I am an Engineer
• Therefore -- to modify a well known acronym (IANAL) -- “IANAPAS” :
  ▪ I Am Not A Psychologist, Anthropologist or Sociologist
• Study of Behavioural Factors will need an inter-disciplinary approach including (at least) these specialisms alongside Technologists
• This Work In Progress (WIP) is intended to provided Initial Scope
Analogy – Human Factors in Aviation

• Analysis of aviation incidents concluded 70%+ can be attributed to Human Factors, with major issues including:
  ▪ Boredom
  ▪ Communication problems
  ▪ Conformity
  ▪ Ego
  ▪ Fatigue and stress
  ▪ Learned, automated and regressive behaviours
  ▪ Perception and self-deception
  ▪ “Set” – exclusive concentration

• “Human Performance & Limitations” training mandatory
Possible Behavioural Factors

• Structural, including:
  ▪ Empires (e.g. “Value Chain”; “IT” vs “Digital”, ...)
  ▪ Exclusion (e.g. “Otherisation”, “Plausible Deniability”, ...)

• Personnel, including:
  ▪ Autism Spectrum Conditions (e.g. S Baron-Cohen et al 2011; ...)
  ▪ Cognitive Lateralisations (e.g. “Left vs Right–brain”; C P Snow; ...)
  ▪ Intelligence (e.g. “IQ”; System Thinking – Reductionism; Fox – Hedgehog; ...)
  ▪ Moral Framework (e.g. Besitzbürgertum / Bildungsbürgertum; Haidt’s differential Fairness views; ...)
  ▪ Personality (e.g. Jung → Belbin / Keirsey / Myers-Briggs; Freud → Relationship Awareness; Empathising – Systemising; ...)
  ▪ Reactance (opposition to constraints on "free behaviours“)
Possible Behavioural Shaping

• Organisational shaping to address Structural Factors:
  ▪ “Cultural Transformation”: an existing goal of UK Trustworthy Software Initiative (TSI)

• Practitioner shaping to address Personal Factors:
  ▪ Acceptance of behavioural diversity
  ▪ Acceptance of “Human Performance & Limitations”
  ▪ Targeting of messaging to audiences
  ▪ Human Factors based training
    • For the Technical community
    • For the Non-technical community
Any Thoughts?

• Behavioural Factors?

• Behavioural Shaping?

• Interdisciplinary Research Collaborators?
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