



# Leveraging SOA for Defence

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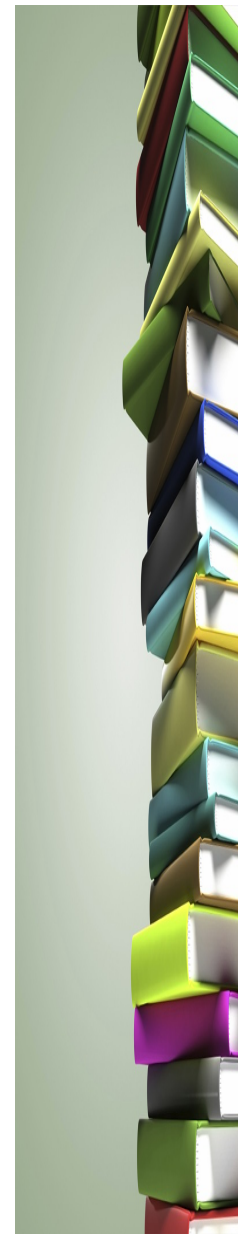


# The Agenda – *whither SOA!*

- UK and US IS Strategies and policies
- What's the problem?
- Why does the problem need fixing? (Drivers)
- Barriers to change
- What are the enablers
- Where and when can remedies impact.

# IS Strategies and Policies

- We have had:
  - MOD IA Strategy (MODIS)
    - MODIS2 awaited
  - UK Government ICT Strategy
    - Faster, more, agile, more cost effective,
  - MOD SOA Policy
  - MOD SOA Handbook
    - Still at draft 0.9(?)!
  - DoD IM & IT Strategic plan 2008-2009
    - Still extant



# What's the Problem?

- There are problems at all levels
  - Political
  - Business *(including the business of warfighting, peacemaking/keeping et al)*
  - Financial
  - Commercial
  - Technical
  - Infrastructure
  - .... And even more political

# What's the Problem? ....ctd-1

- Political
  - Advent of SOA means change
  - Reactionary forces
    - Don't like change, add uncertainty
  - Heavily short term focussed
  - Are very attracted by the potential benefits
    - .... But....Want them immediately
      - Predominantly all the financial benefits
    - ....And....do not want / appear unwilling to understand the technical foundation
      - Therefore are not able to understand the limitation of current systems and how this manifests as cost driver

# What's the Problem?

- Business
  - Current complex systems are poorly understood
    - People are promoted for being able to command this environment
      - It provides a discriminator
    - "Models do nothing to help the man in the frontline"
      - Previous lack of 'effect' by the 'Royal Corp of Business Modeller' has left a 'bad taste'.
  - Linkage between Business and IS/IT is not recognised and poorly understood.
  - Business incoherence has allowed equally incoherent acquisition and deployment of poorly interoperable IT.
  - Knowledge Representation is equated to 'just doing' IT
    - A Tower of Babel across defence and its supporting enabler domains



# What's the Problem?

...and...  
sometimes it  
goes wrong .....

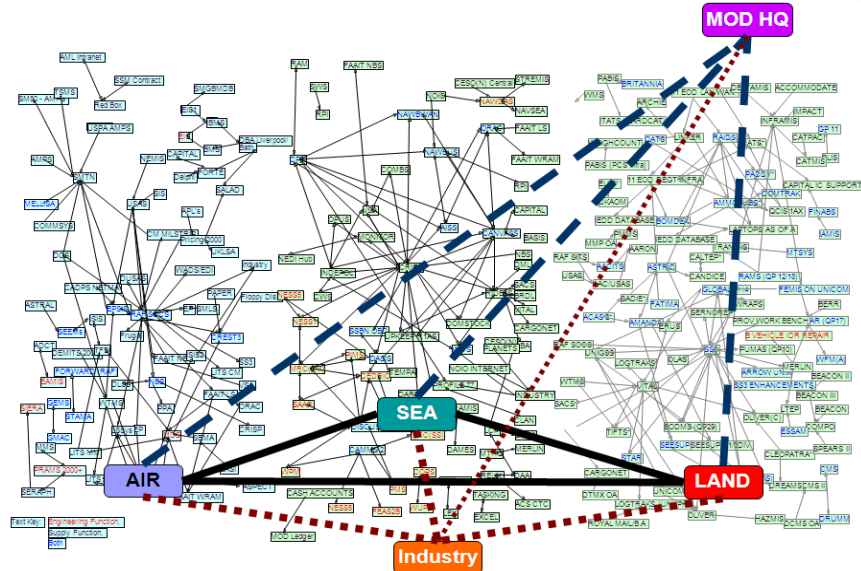




# What's the Problem?

- **Financial**
  - The UK Government pot of money is empty
  - Current Operations have to be resourced
  - VFM of IS/IT Systems and Applications difficult to identify
    - Technical basis of cost drivers not understood
    - Including enabler technologies for SOA
  - Applications rationalisation will hit vendor bottom lines
- **Commercial**
  - IS/IT vendor community business models built around 'conventional' (ie non-SOA) cost drivers
    - High maintenance and integration costs aided by lack of standardisation
  - Vested interest in maintaining the 'status quo'

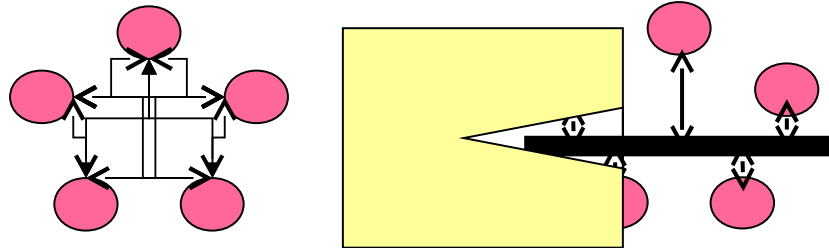
# What's the Problem?



- Technical
  - Too many stovepipes
  - Lack of standardisation
  - Business not in command of what they want
    - Poor requirements
  - How many IT professionals actually understand the ESB construct?
    - New skills
    - Potential for machine coding
    - Impact of increased agility
      - Job numbers?
  - The n2 paradigm
    - Who 'gets it'?

# What's the Problem?

- Technical



*Need to break the Semantic and Syntactic N2 models driving through life cost of data and applications  
Where 'N' is the number of applications or 'tight coupled' joins*

*Number of semantic and syntactic joins drive cost*

- **Point to Point**

- function of  $N^2$ . *....actually...  $N(N-1)$  ... but the square is still the driver!*

- **Bus Based**

- linear costs – but only if standards adopted – *see IT Strategies*

- **The Semantic Standards** – the data people need

- Speak the same language – *or at least in a translatable manner*

- **The Syntactic Standards** – how the enabling infrastructure hangs together

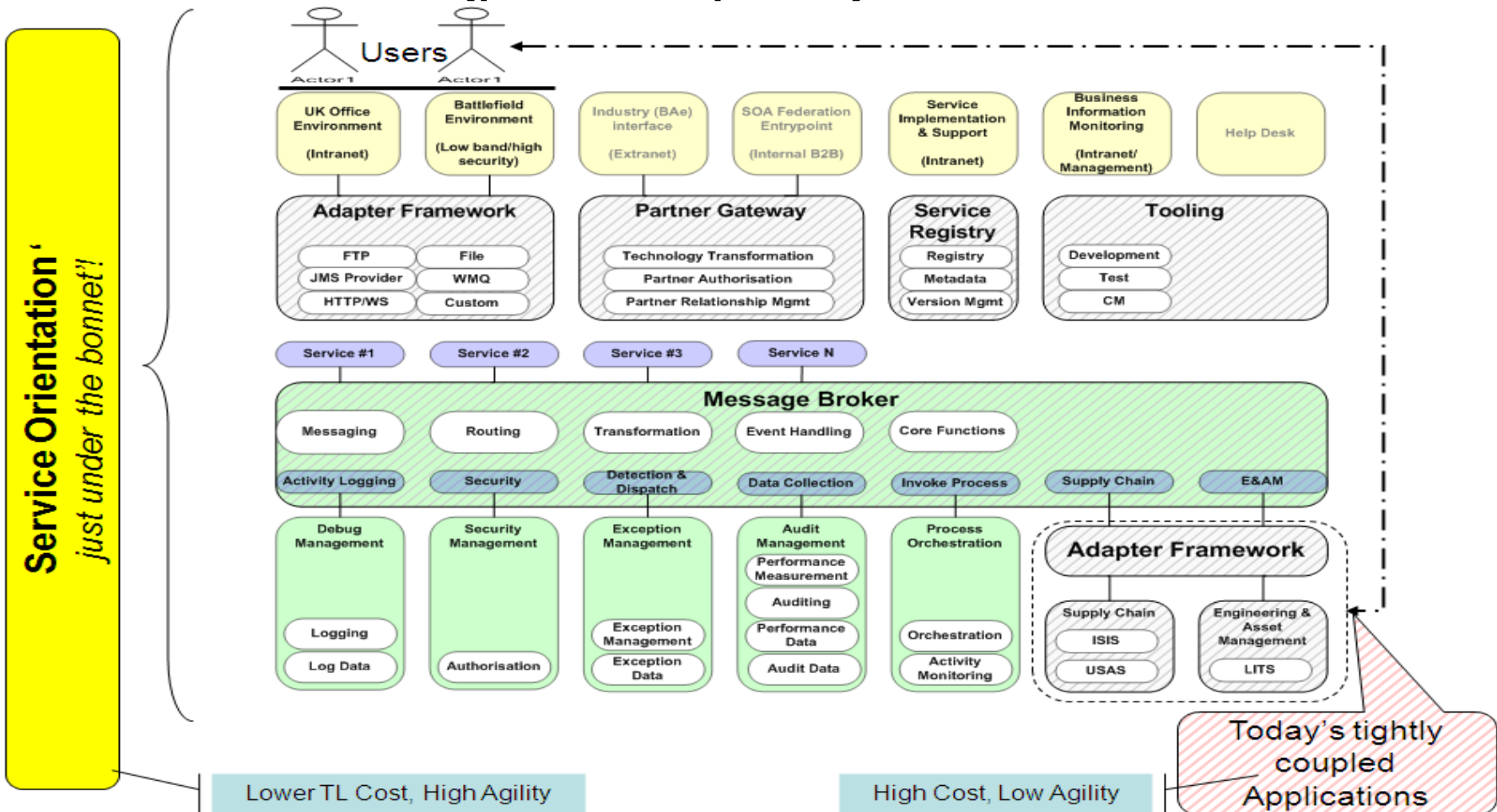
- Use the same standards for the infrastructure'
  - *Don't have different gauges of 'railway track'!*

# What's the Problem?

- Infrastructure
    - Next two slides will illustrate the difference between:
      - Tightly coupled application
        - ie today's conventional approach
- and...
- An ESB based approach to loose coupling and delivery of benefits from Service Oriented Approach

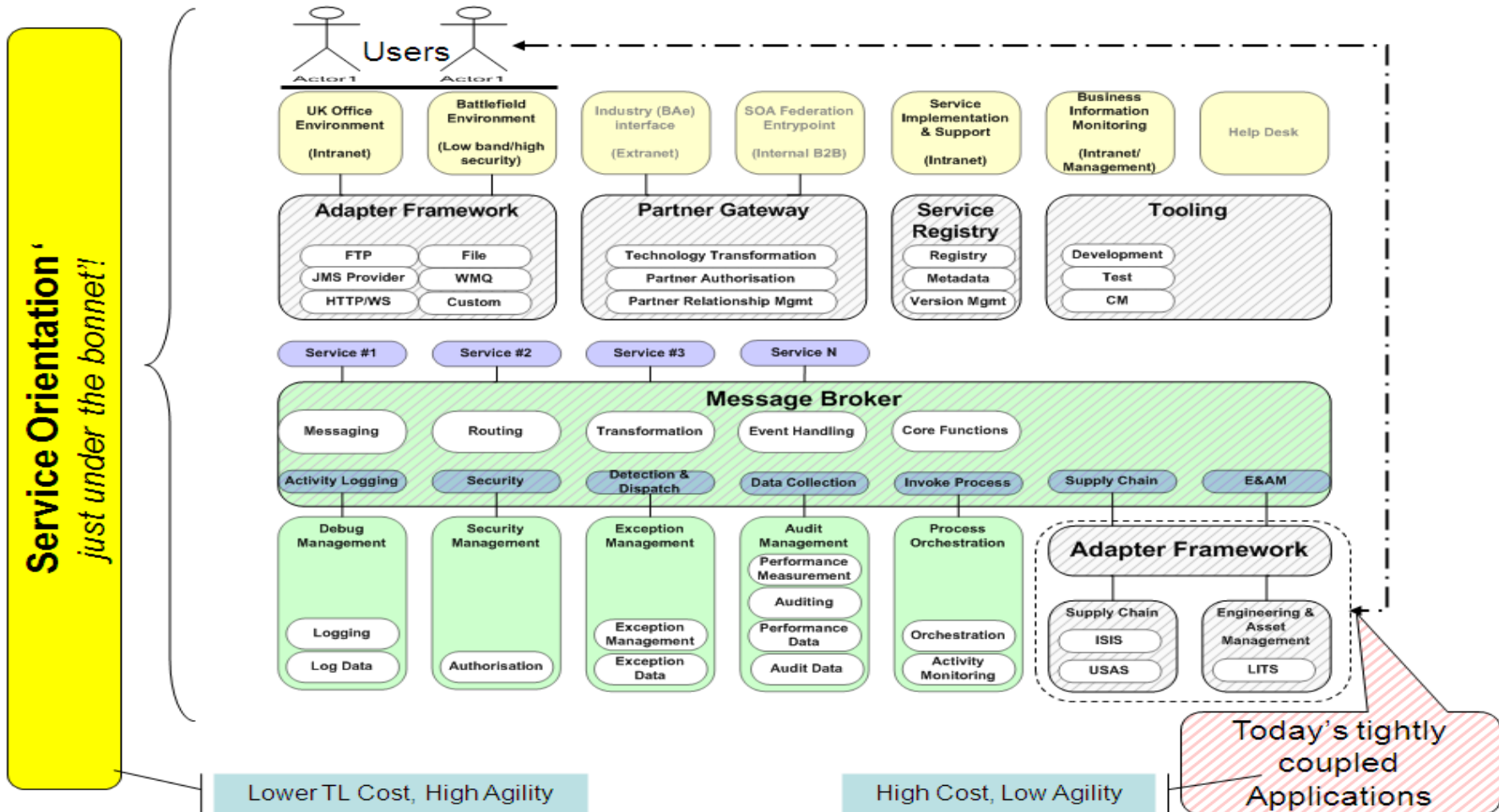
# What's the Problem?

- Conventional (point to point) based architecture:



# What's the Problem?

- ESB-based architecture:



# What's the Problem?

- **Infrastructure** *(with reference to previous two slides)*
  - The 'stuff in the middle' is needed to do what is done manually (and at significant expense) today.
  - Conventional Apps Integration is not easy
    - If it was/is, why is it costing so much?!
  - ...and the ESB infrastructure needs to do much of this on the fly
  - It needs the business to understand:
    - What it is trying to achieve (outcomes)
    - Its processes
    - What information it needs and for what purpose
  - There is a start-up cost *(to put ESB Infrastructure in place)*
    - Defence needs scalability
    - Short term cost drivers and limited 'vision' impact solution choice
    - Solution decisions need to consider the medium and long term needs

# What's the Problem?

- Back to the Politics!
  - 'Gravy-trains' to perpetuate the old style 'big apps'
    - ERP systems, Battlespace C4ISTAR etc
  - Entry costs for ESB start-up
    - Cheapest wins – not yet 'real' VFM-based decision-making
      - Cheapest only works for mature commodities...  
*(as VFM already generally assured)*
      - SOA space and ESB technology not a mature commercial situation...  
*(even if conventional IS/IT is!)*
        - » *This is not understood by the decision-makers*
    - Scalability and maintainability issue?
  - Companies know - loose coupling will open up the User App space to SME vendors *(see UK Govt ICT Strategy)*
  - The **key** to next generation IS/IT is.....  
**the integration platform 'in the middle'**

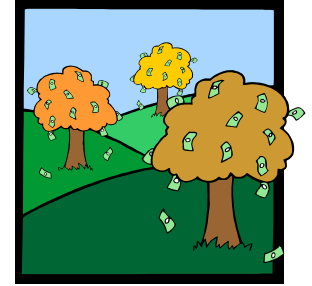


# Why Fix the Problem?

- Need to make the money available to Defence go further
- Moral duty to ensure best VFM for warfighters
  - Note the legalising of the 'Military covenant' (*at last!*)
- Policy, strategy and doctrine recognise the benefits of a standards-based approach – *needs mandating – JFDI!*
- Nature of military 'business' and commercial business requires increasing agility
  - Need ability to react rapidly to the unforeseen
    - This has to be designed in. Point to point too costly and NOT agile enough
  - Make maximum use/re-use of 'best practice' solutions that conform to standards
- Baseline for MOD – work in coalition with NATO partners
  - Increase need for interoperability of information & use of shared processes
  - Tighter UK LoI collaboration with specific EU members (EDTIB) – GE, FR, SP, IT, SW  
(EDTIB – European Defence Technology and Industrial Base – Inter Government Treaty)
- *....and.....its the right thing to do!*



# Barriers to Change



- Summarising from the earlier slides:
  - Commercial (vendor) resistance
    - Loss of stovepipe/bespoke lock-in
  - Decision-maker lack of understanding
    - Inc inadequate development of Business Cases for change
    - Benefits – for User/Warfighter, through-life cost reduction
  - Cost of entry to establish initial enabler solution (eg ESB)
  - IS/IT Work-force resistance to change
  - Business unable to adequately describe:
    - What it wants to achieve (particularly wrt the Enterprise models)
    - How it works today (the basis for engineering change)
      - What is not working today and unwilling to admit to problems
  - Need to 'architect' coherently across the Enterprise
  - Funding locked into stovepipes (need to free up)

# Enablers



- Key to interoperability
  - Standards, standards, standards (see policy & strategy documents)
    - Semantic and syntactic
  - People – shared understanding, common goals
  - Understanding of shared processes
    - Often, not realised as being integral with most 'information standards' – they are architectural in nature – ie multi layered
    - Some process standards do not have associated data definition (eg SCOR)
  - Adaptable Integration Platform (eg ESB)
    - Need to be able to operate across different vendor (ESB) solutions
      - 'FredSpec' in old money (MOD Interoperability profile)
        - » Needs to be an 'open standard'
    - Able to integrate legacy and emerging standards and applications
  - Robust Management .... Issues of: risk averse & blame averse

# When & Where - Impact

- Domains for development:

Aim: Reduce Operational Business Process 'friction':

- Coalition interoperability – default case
  - Interoperability (external with coalition partners)
    - With NATO – ISAF (Afghanistan), Op Unified Protector/Op ELLAMY (Libya)
    - With EU – Op Atalanta (Horn of Africa)
    - Other Troop Contributing Nations (TCNs)
    - Partner for Peace
    - AUS, NZL, CAN, USA grouping
- UK national systems - re-engineer UK stovepipes for coalition working
  - Applications and infrastructure
    - Rationalisation & Enhancement
    - Interoperability
      - » inside UK Defence (includes Industry)
      - » With OGDs (particularly; FCO, Home Office, Health)
    - Build on extensive and enduring UK investment in NATO (NC3A)

# When & Where - Impact

- The Headmarks for Interoperability
  - Standards driven – in descending order of priority
    - Open Standards
      - Issue of competing standards bodies
    - NATO Standards
      - Generally pragmatic realisations of 'open standards'
      - Developed NATO Mil Standards – to be made available in Open Community
    - Vendor inspired – presented as 'National Standards'
    - Vendor specific and *ad hoc* (non)standards (*Bain of interoperability!*)
  - Maximum leverage of UK investment in NATO applications
    - Baseline for removal of incoherent applications & duplicate functionality from UK MOD portfolio
      - Includes X-Gov coherence (across OGDs)
  - Enable improvement to the warfighter cross-cutting mission threads.  
C-IED – defeat the device, attack the network, train the force

# When & where - impact

- Domains

Actively implementing or having potential for SOA and ESB technologies

- Track Interoperability (real/near real time) – know location of:
  - Blue (friendly forces) – Operational Command & prevent 'blue-on-blue'
  - Green (Non-combatant/civilian) – prevent 'collateral damage and effects'
  - Yellow (not sure/unknown)
  - Red (adversaries)
- ISR (Intelligence, Surveillance & Reconnaissance)
  - Both real-time (RT) and non-real-time (NRT)
  - Enabling decision-making at all levels of operation
    - Eg. Provision of FMV to mobile front line troops
    - Eg. Off-line Analyst assessment to HQ Commanders
- Logistics & Medical
- Command & Control (C2)
  - Common Operating Picture – decisions made on know version of the truth



# When & where - impact

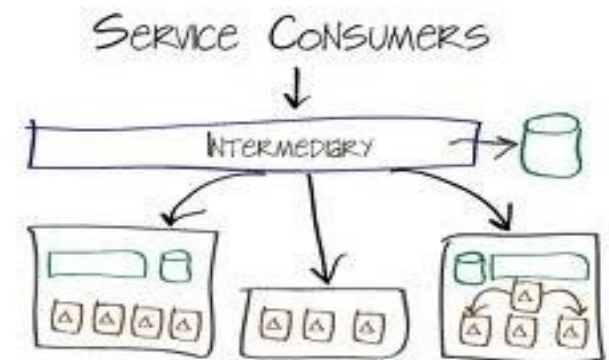
- Role of SOA and ESB Technology

- SOA

- Enable agile effects based delivery
- Enable component re-use (inc legacy)
- Allows focus on what needs to be changed
- Needs strong foundation in 'design'
  - EA & Requirements disciplines

- ESB technology

- Enables 'componentisation' and de-coupling of applications
- Consistent platform for delivery to user
- Foundation in maximising re-use of prior components
- Increased agility of solution delivery at reduced cost
- Incremental transition from current apps environment
  - Co-existence with legacy solutions – the tin and wire only sees TCP-IP!
- Applicable across the 'Front' and 'Back-Office' of Defence



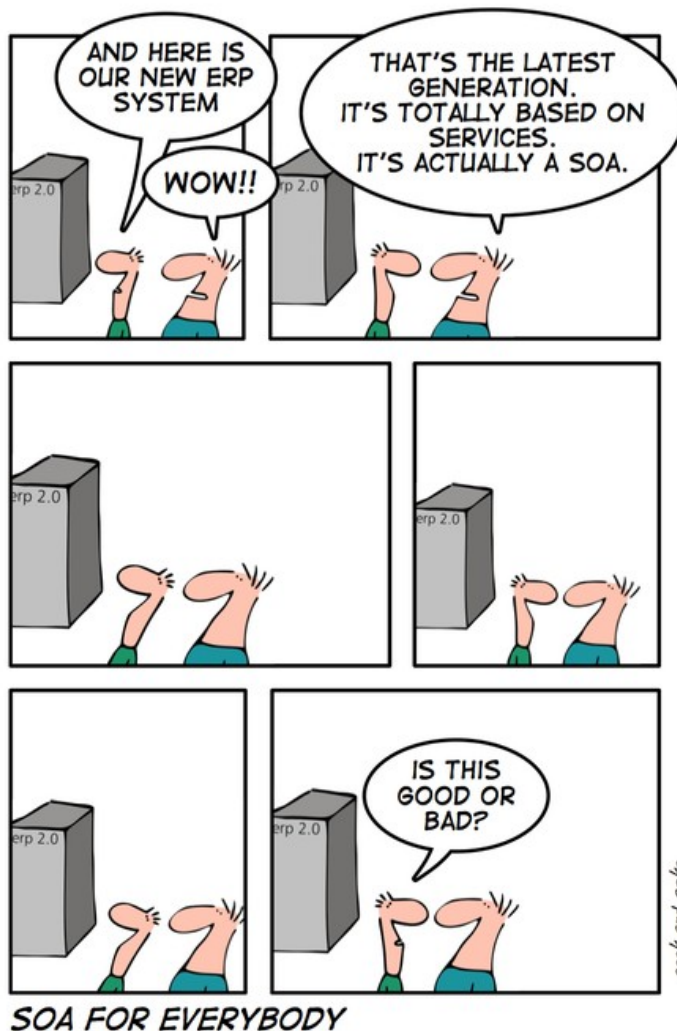
# Final thoughts.....

**“The information age is not about doing the industrial age faster or better but about freeing ourselves from the intellectual and paper based constraints that were need to commission, deliver and make use of the industrial age technologies.”**

Adoption of a Service Oriented Approach, supporting delivery of business effect enabled through adoption of ESB and associated technologies, will provide the first major step in that direction; the current information systems paradigm is too limiting and is unaffordable.



# Questions and discussion.....



Now You Know!

and....  
Spot the Mistake!

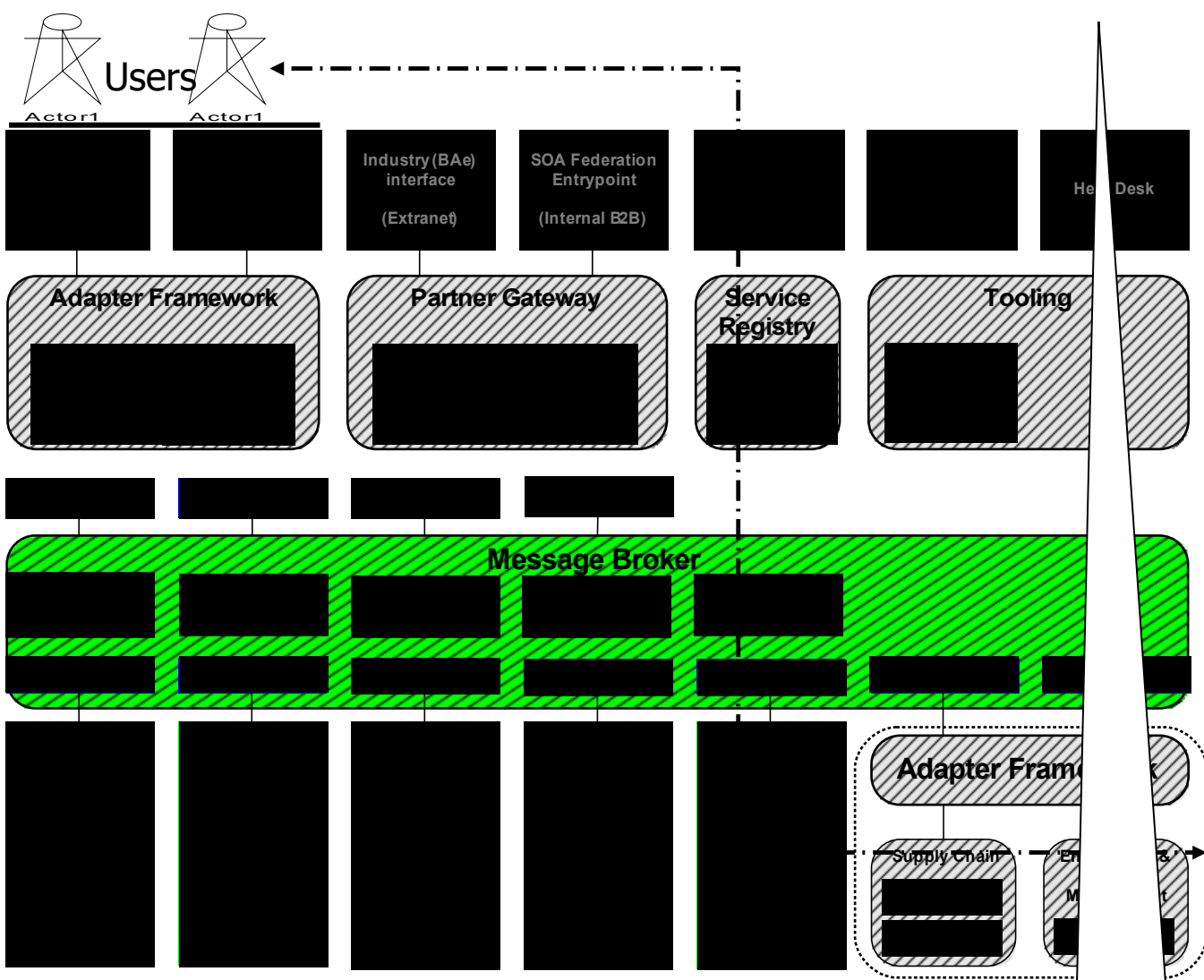
# Additional information

- **EDTIB**

## European Defence Technology and Industrial Base

- Inter Government Treaty
- Not an EU Institution
- Six Committees:
  - Harmonisation of Military Requirements – GE (DEU)
  - Treatment of Technical Information (ITAR et al) – UK (GBR)
  - Export Procedures – FR (FRA)
  - Security of Information – SP (SPA)
  - Security of Supply – IT (ITA)
  - Group of Research Directors – SW (SWE)

Lower TL Cost, High Agility



Today's tightly coupled Applications

Lower TL Cost, High Agility

High Cost, Low Agility