IQPC International Armoured Vehicles Conference – Farnborough UK
7 February 2013

Training and Simulation for Decision Makers

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Overview

- Training and Education
- Simulation
- Live-Simulation Balance
- Beyond Simulation
- Beyond Training

Training and Education

UK Military Training and Education

- Scale - 257,160 Military/Civilian (2011)
- Depth – eg. Fighter Pilot, Reactor Operator
- Breadth – Apache Pilot through to Cook
- Flexibility – Changing Operations

Source DASA:- UK Defence Statistics 2011

How do the Armed Forces Achieve this Level of Training and Education Capability?

- The Military understands that training and education is fundamental to their endeavour
- People are assessed by how well they do in Training
- Career progression depends on training and education
- Much of military life is spent training and exercising
- Lessons Learnt are fed back

Armoured Vehicle Training and Education

- Individual
- Crew
- Collective
- Joint
- Combined
- Support and Maintenance
- *OA, Experimentation and Acquisition*

Simulation

What is Simulation?

Simulation is the imitation of the operation of a real-world process or system over time

Typically a military training simulation is interactive, with a “human in the loop”
eg. a flight simulator or driving simulator

Why Use Simulation?

Improve Training

Safety

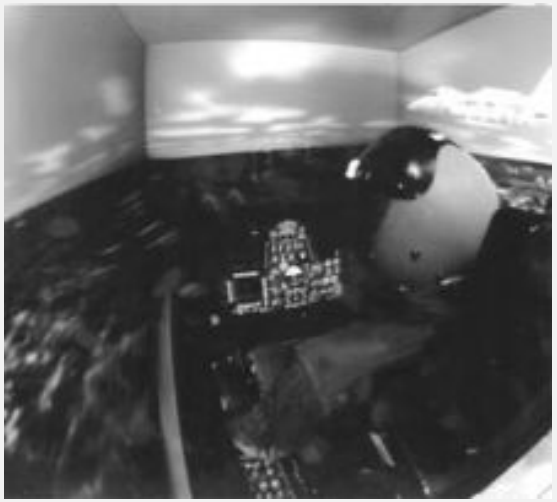
Reduce Costs

Reduce Environmental Impact

Reduce Time to Train

Nothing New? Predominantly Mechanical Era

Predominantly Bespoke Electronic Era



Images: Lockheed Martin

Networked Simulation – SIMNET – 1980s/90s

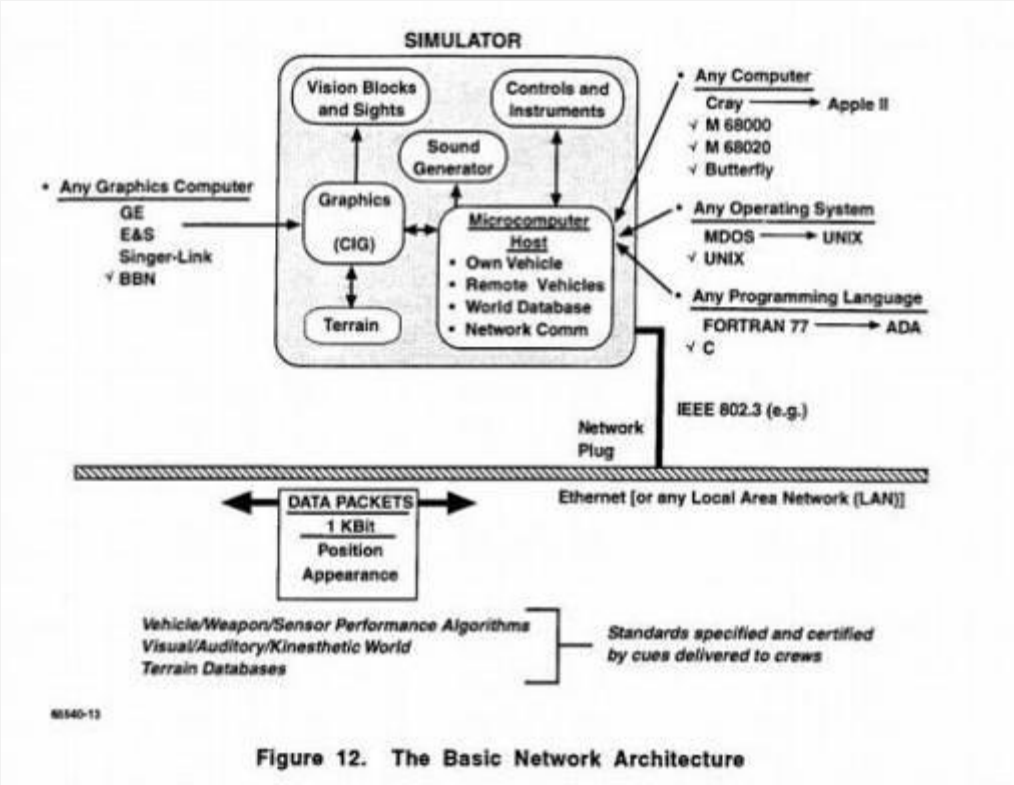


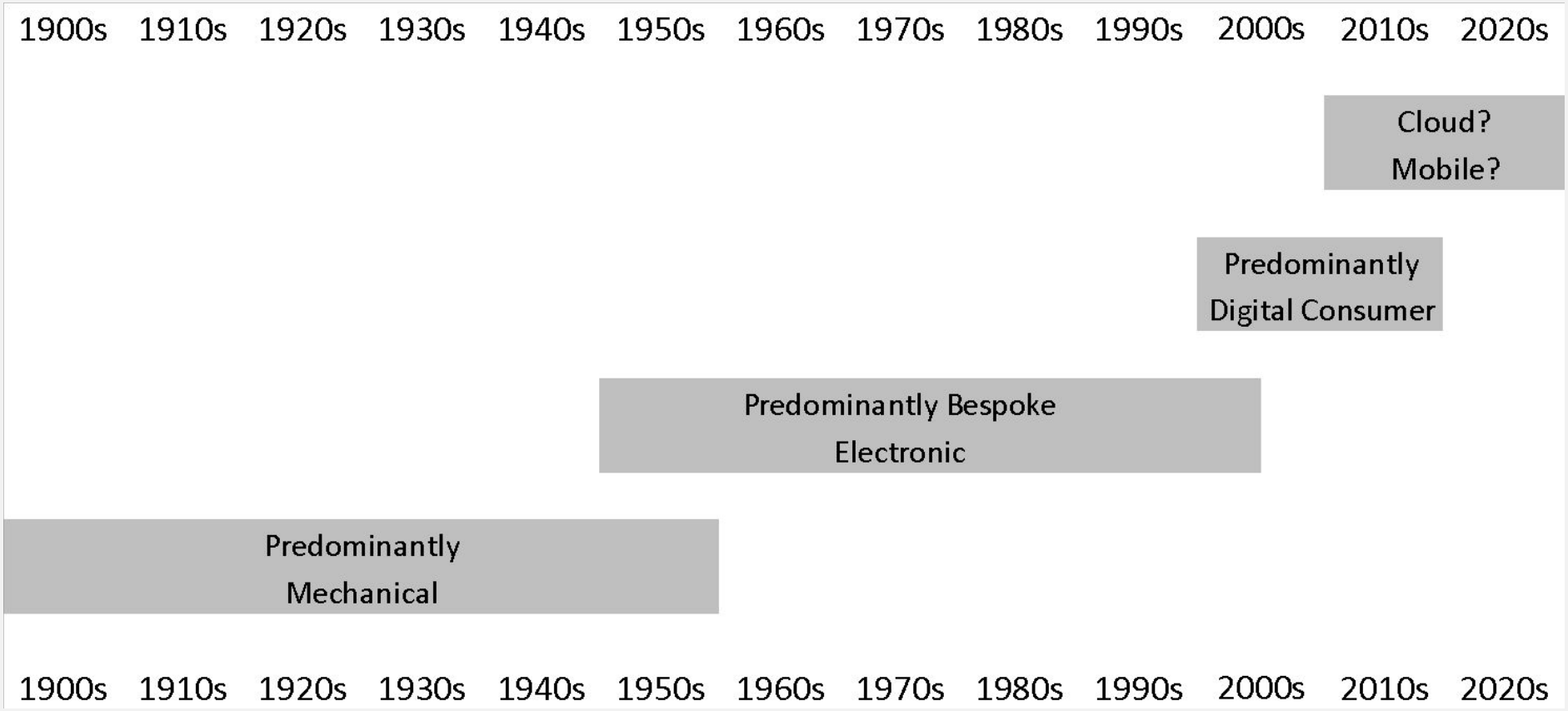
Figure 12. The Basic Network Architecture

Predominantly Consumer-Driven Digital Era

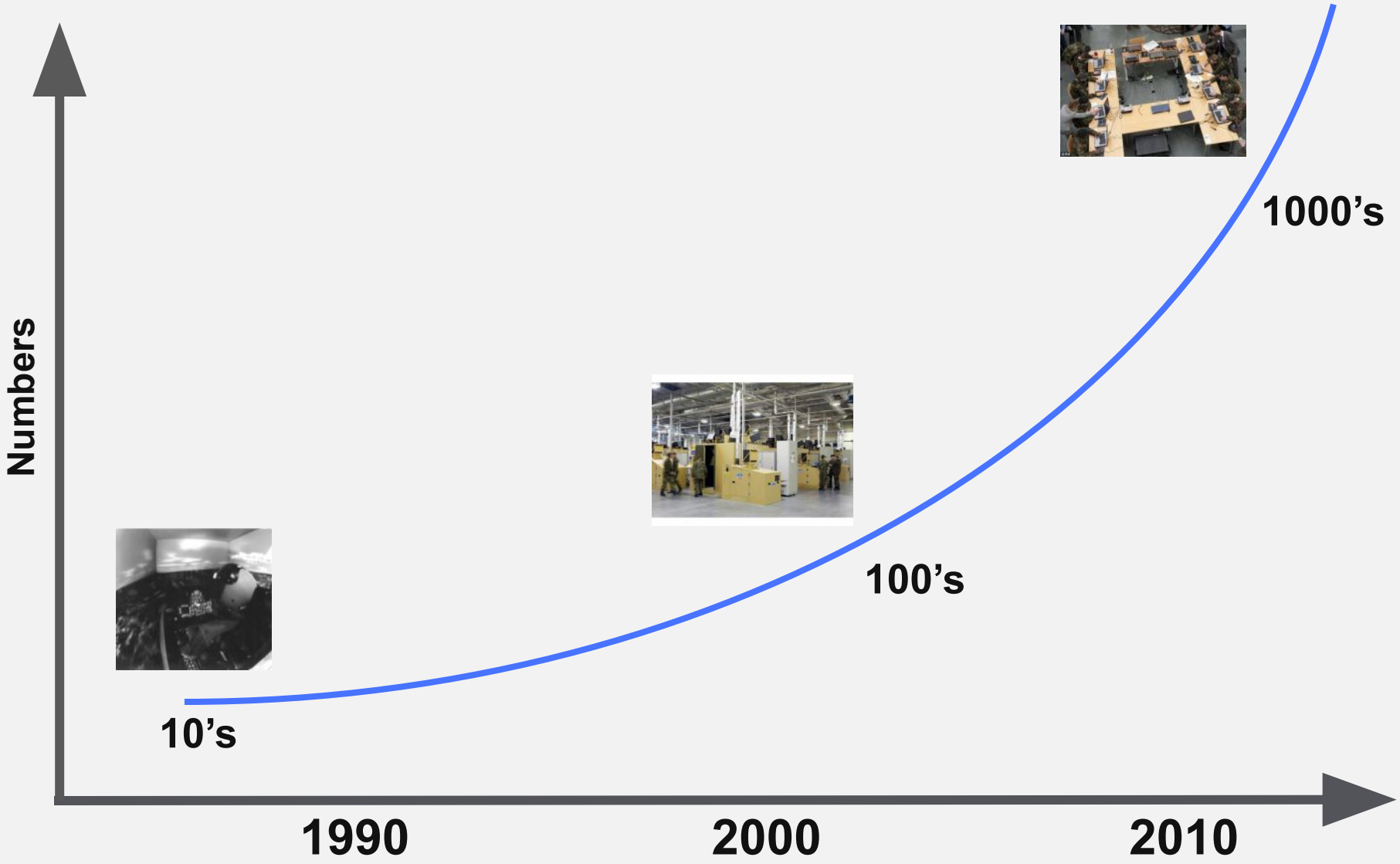
The Defence Equipment Plan 2012

Images: MoD, Royal Navy, Army, Bohemia

Trends

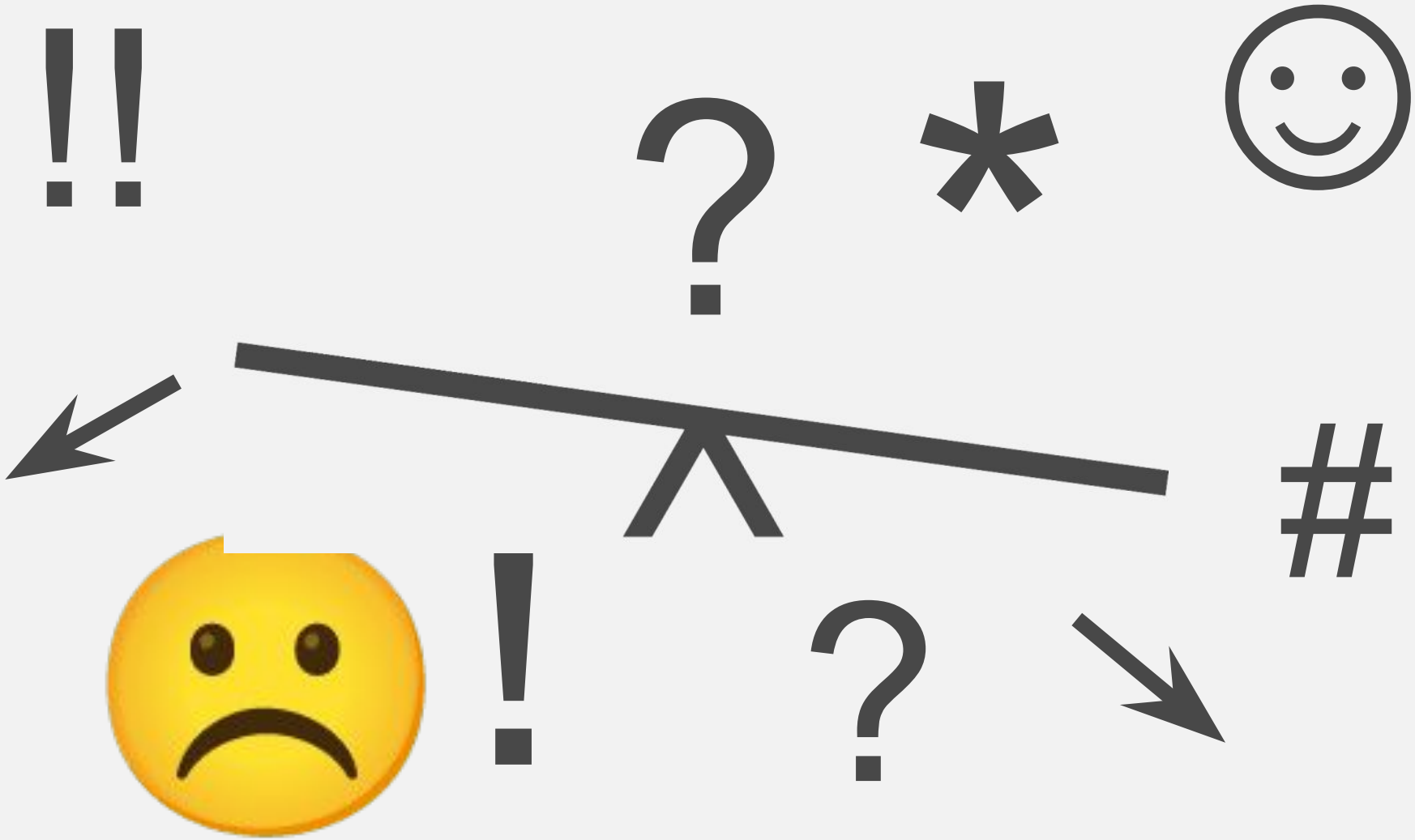

1900s
1910s
1920s
1930s
1940s
1950s
1960s
1970s
1980s
1990s
2000s
2010s
2020s
Cloud?
Mobile?
Predominantly
Digital Consumer
Predominantly Bespoke
Electronic
Predominantly
Mechanical
1900s
1910s
1920s
1930s
1940s
1950s
1960s
1970s
1980s
1990s
2000s
2010s
2020s

Access to Simulation



Live-Simulation Balance

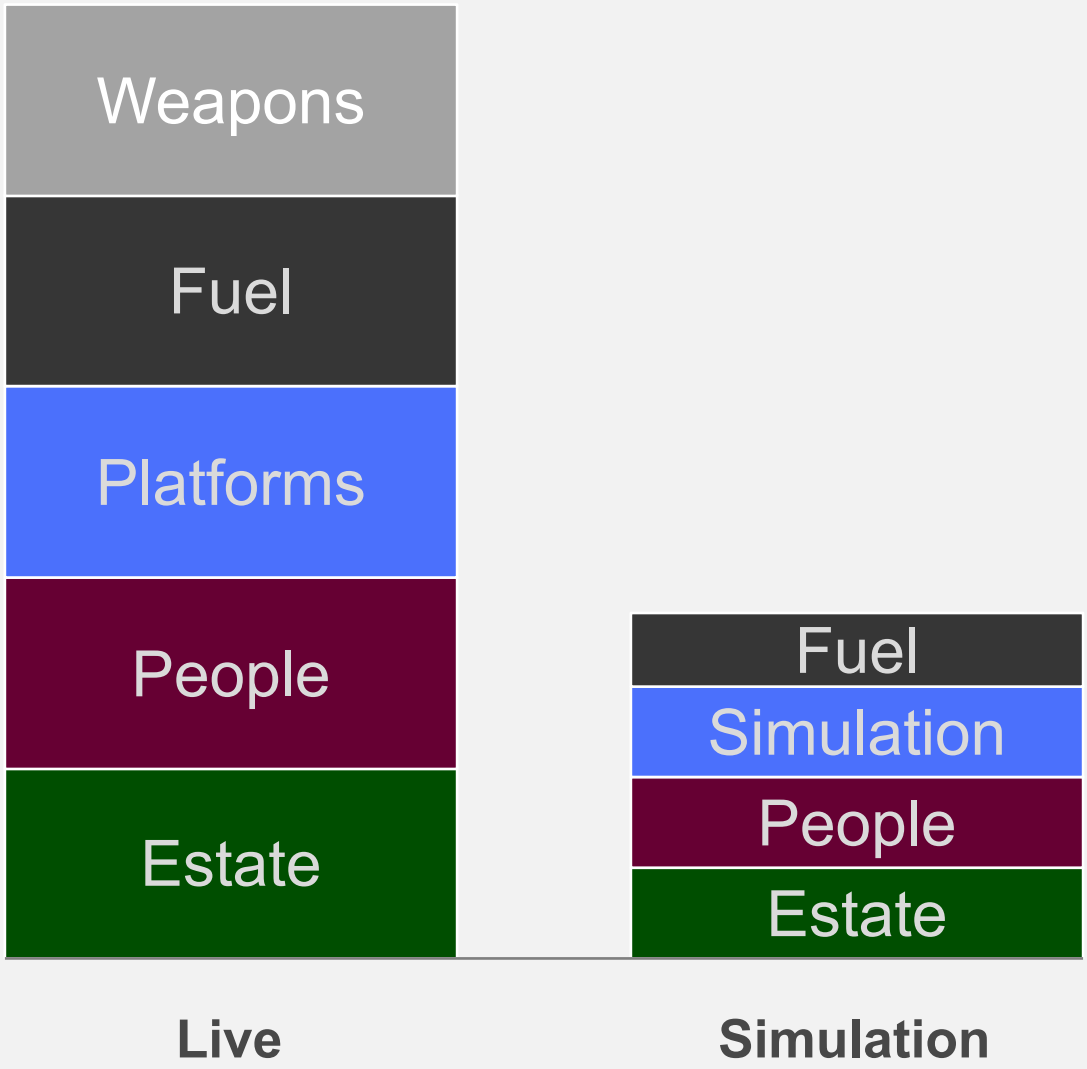
Live-Synthetic Balance



The Mysteries of Simulation

SOAP
CGF
VV&A
LVC
SEDRIS
DIS
MSHTF
TENA
Agent-based
DTEC
HLA
RTI
Architectures
ASP
Federate
SISO
SCORM
CORBA
CBML
AI
DLP
MCTS
AR
DTED
Serious Gaming
CATT
SEBA
Distributed M&S
AVCATT
VR
Monte Carlo
FOM
NMSG
Human-in-the-loop
DoDAF
DSALT
ITEC
synthetic environment
Latency
BOM
I/ITSEC
Emulation
Constructive
Accreditation

Cost of Training?



How much?

?

- “Cost Simulation 20% of Live Training”

$

£

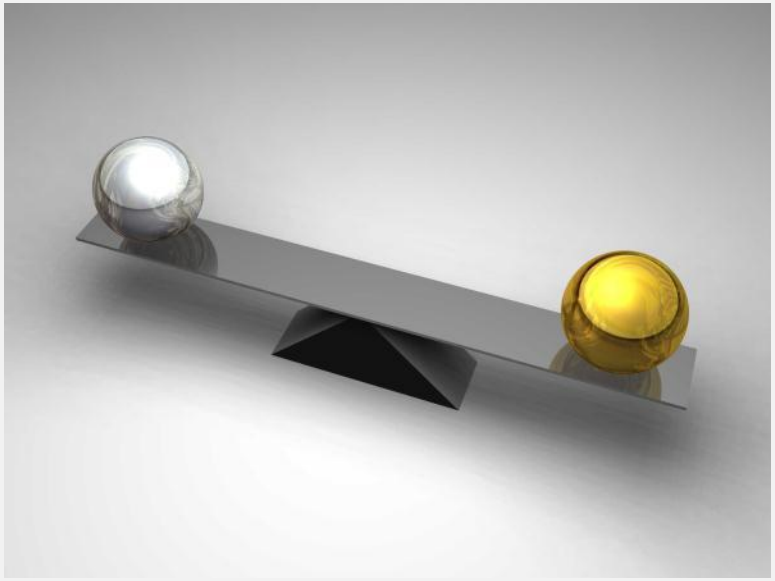
- “Save £100m’s”

- “Cost Simulation 5% of Live Training”

- “Training 20% of Defence Budget”

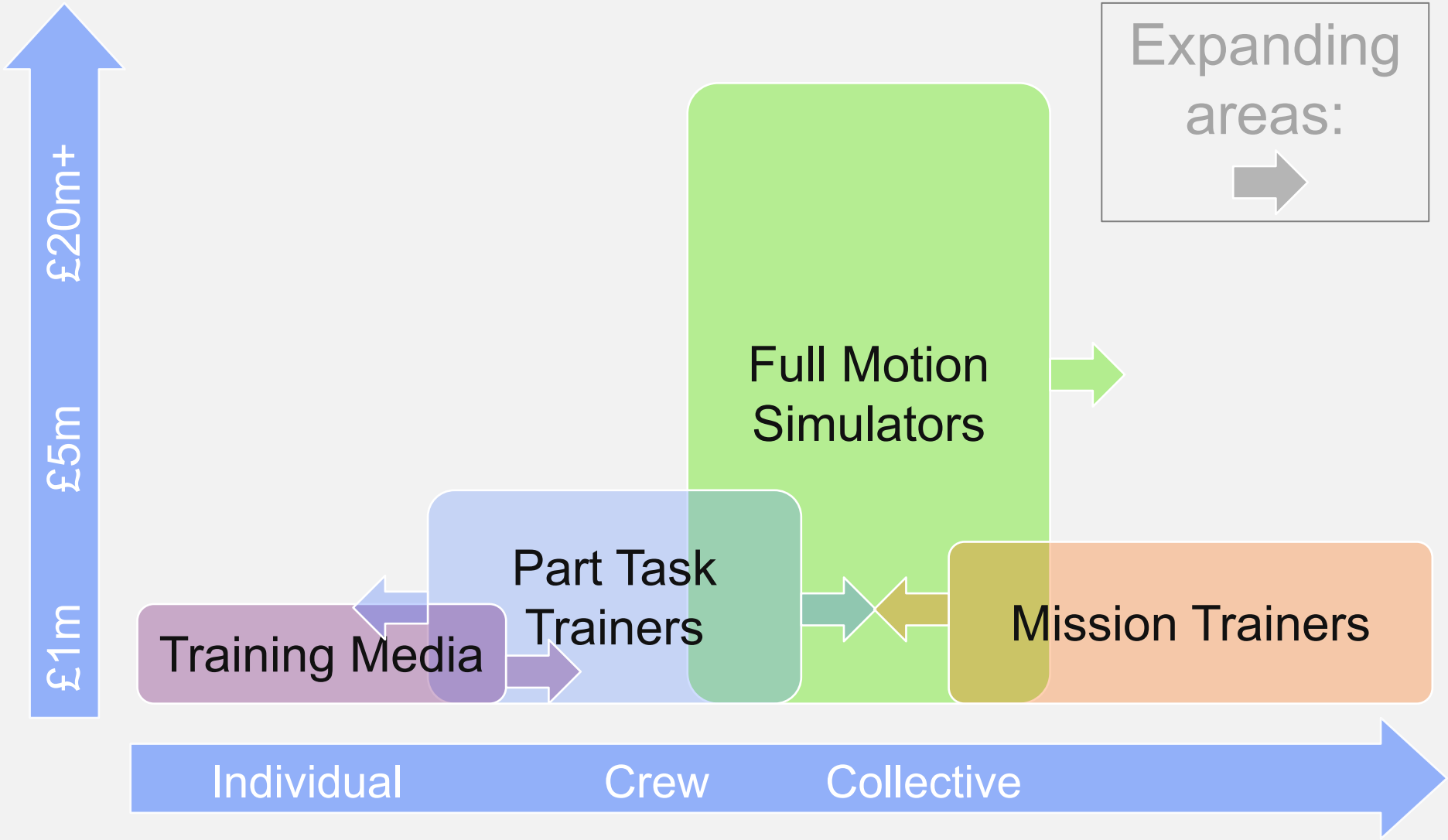
€

The Live Synthetic Balance



- Language – What does the word “Synthetic” Convey?
- Culture - “Live will never be replaced”
- Assessing Training Cost Effectiveness is Difficult
- The simulation needs to be in place first
- Technology is Changing and so do Operations
- How often do we change the Way we Manage?

Simulation Cost/Capability Spectrum

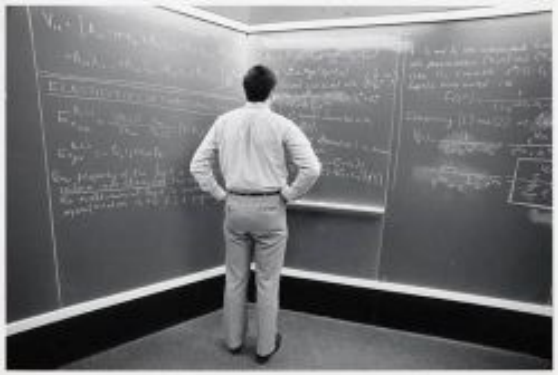


Tomorrow's Conflict

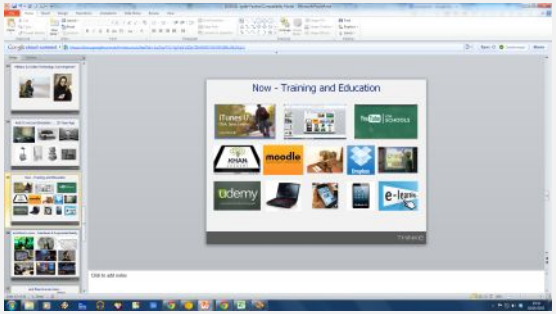
Nature of Conflict	Role of Simulation
• Joint/Combined	Competency/Familiarity
• Preparation	
– Short notice	Deployed, in theatre training
– Distributed planning/training	Course of Action analysis
• Duration	No planned Msn Specific Training
– Shorter than HERRICK(!)	
• 'More-from-less'	Max efficiency thru rehearsal
• Area of Operations	Familiarisation (database)
– Unfamiliar	
– (non/semi)permissive?	Force-on-Force preparation
• Political complexities	Minimising risk (rehearsals)

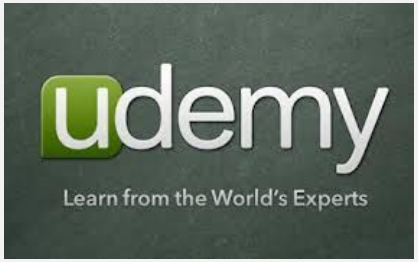
Beyond Simulation

And it's not just Simulation….. 20 Years Ago

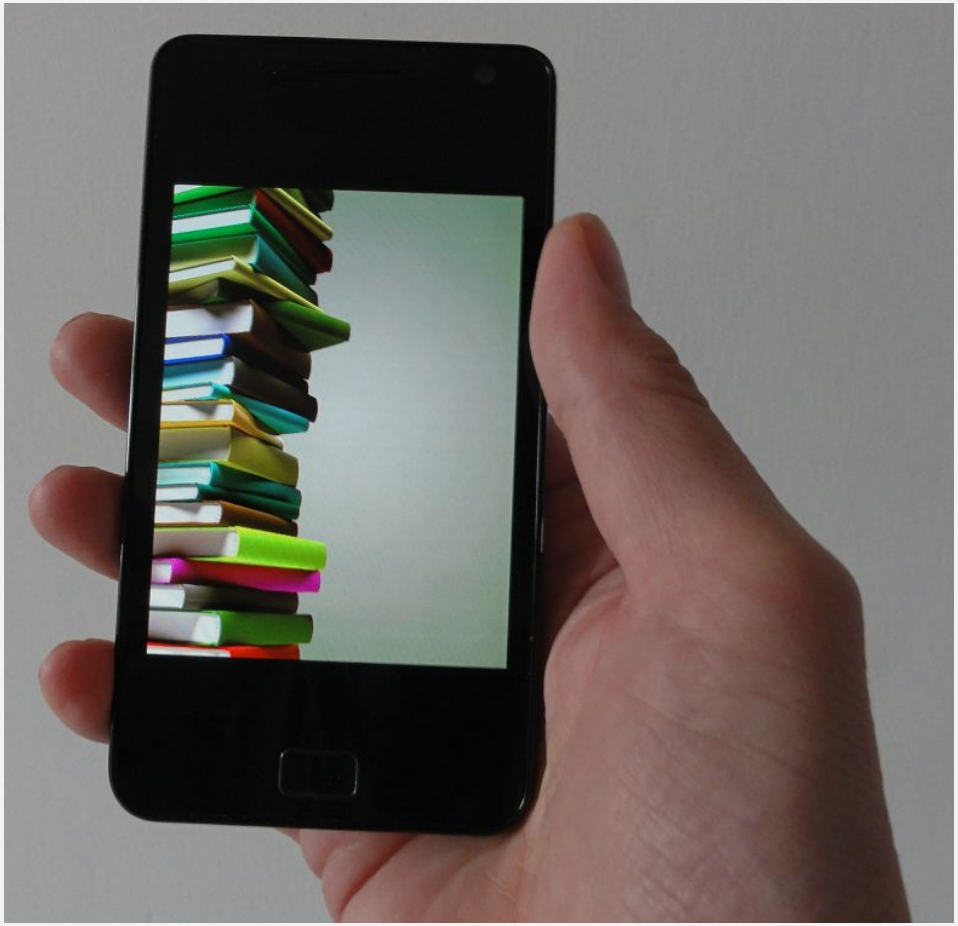


Now - Training and Education





Knowledge in Your Hands



Digital and Online Classrooms

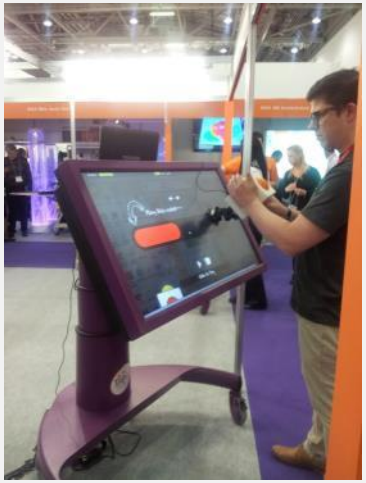
South Korea 2015

Florida 2015

Stanford University

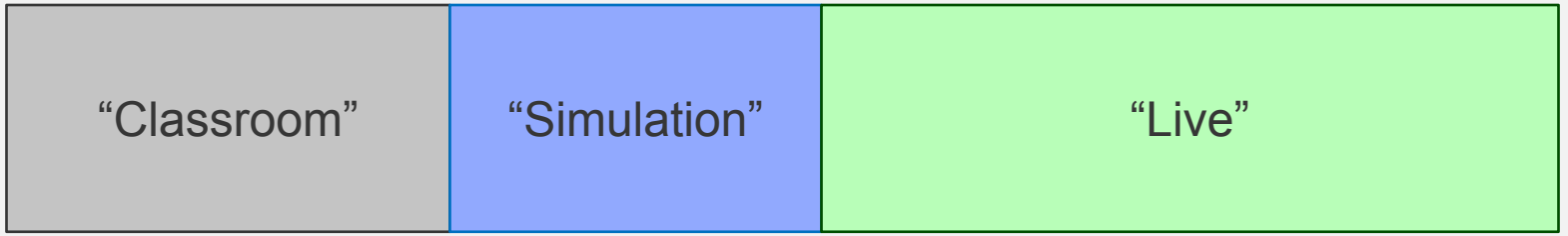
2012 - 23,000 Graduates

Recruit Expectations

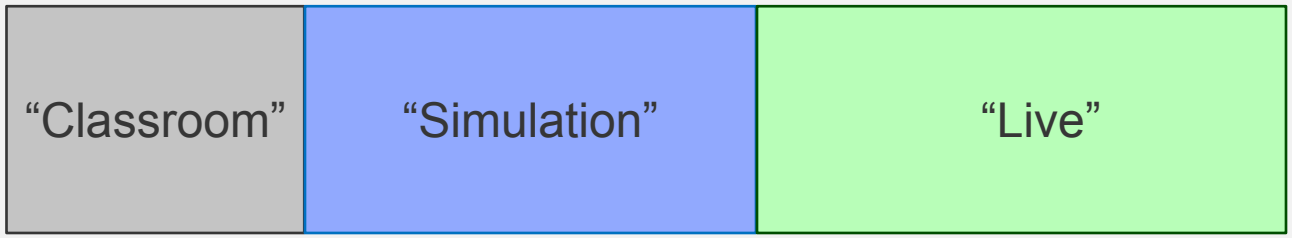


Time Spent in Training and Education?

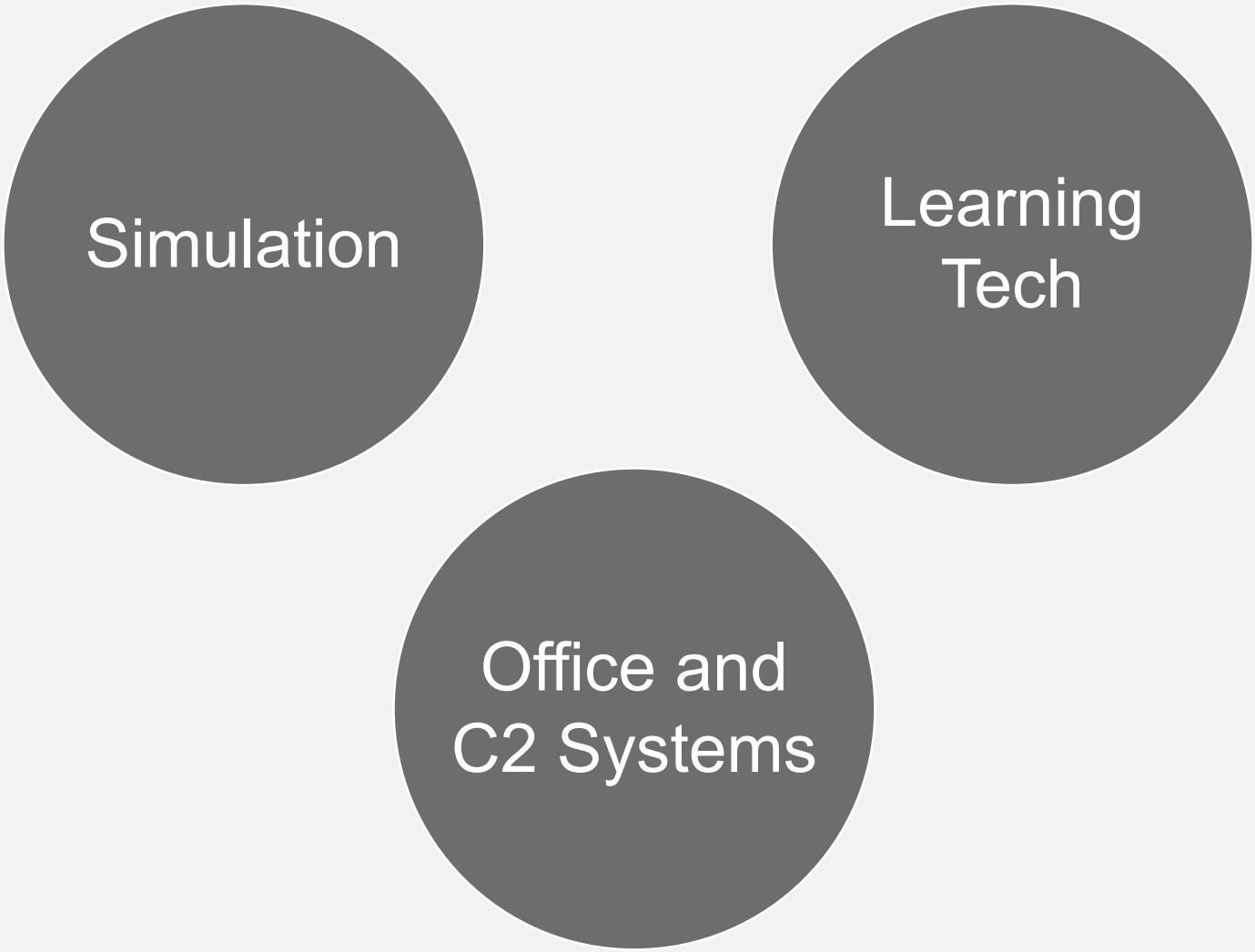
Now



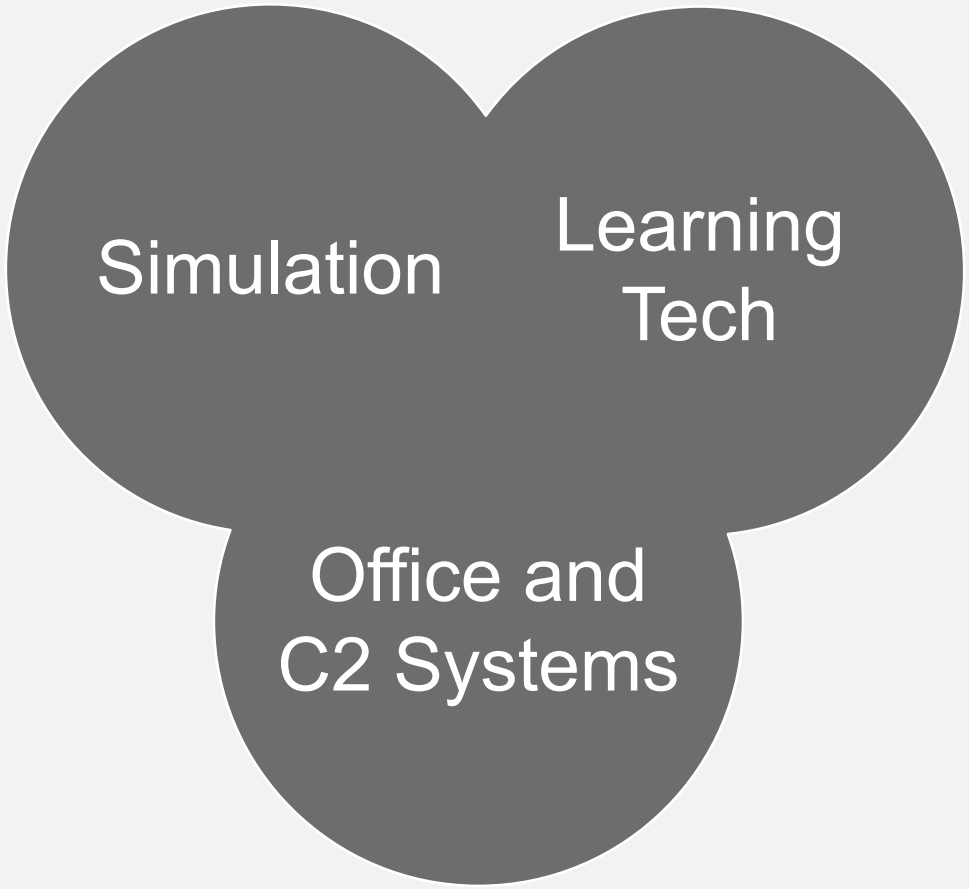
Future?



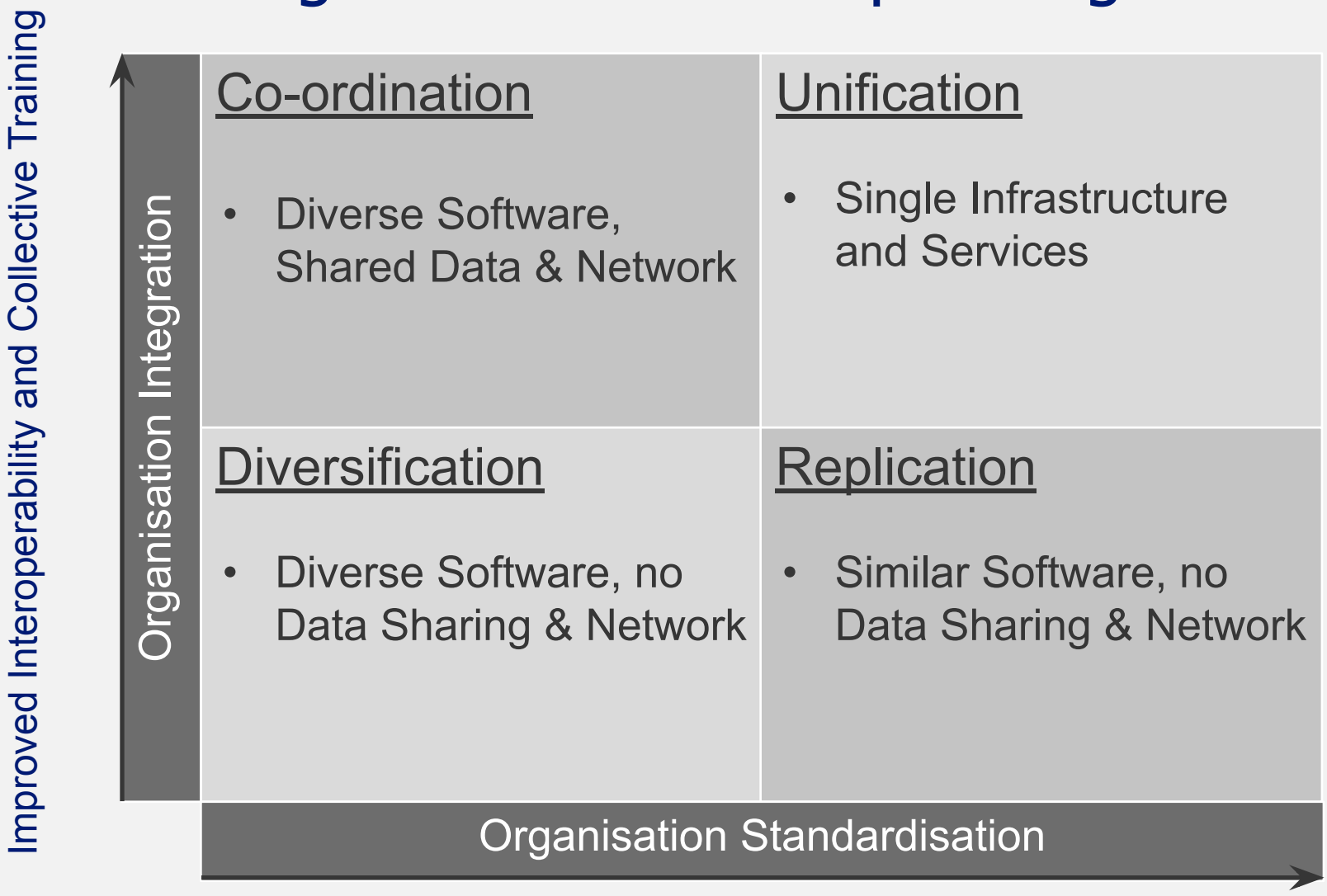
Barriers



Convergence?

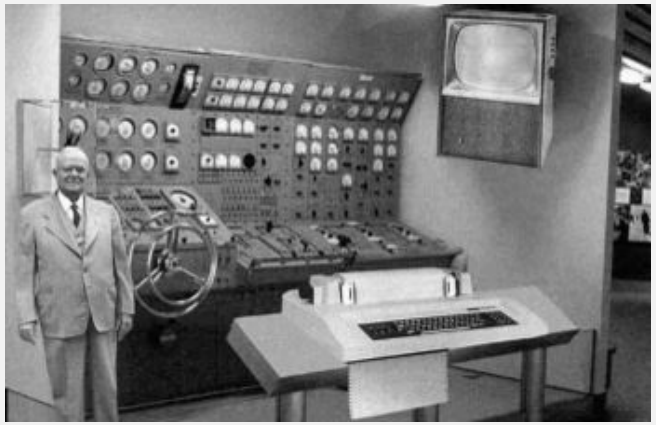


Training and Education Operating Model?



Getting it Wrong

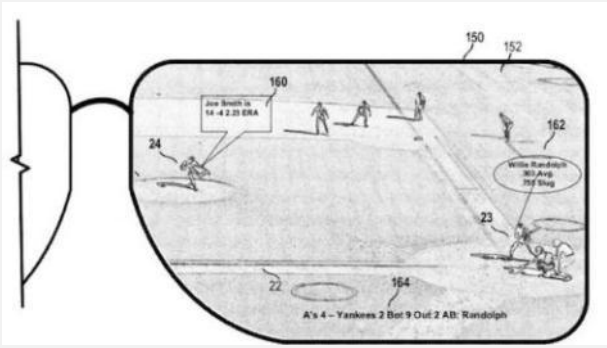
Photograph: Alamy



Beyond Training

Military & Civilian Technology Convergence?

and there's more… Interfaces & Augmented Reality



Images: Microsoft, Organic Motion

and there's even more…

Sensors

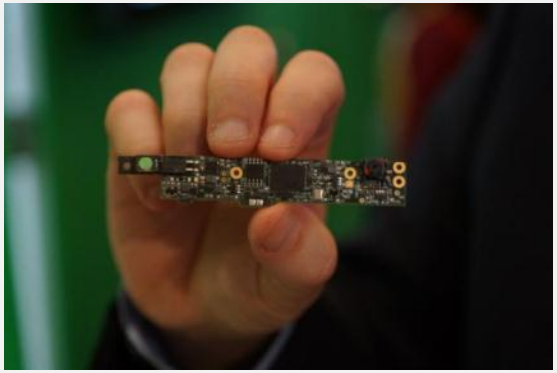
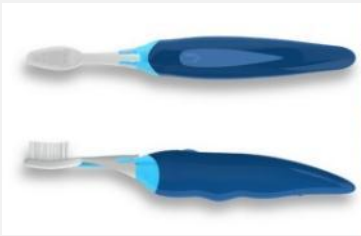


Image Paul Sloan/CNET



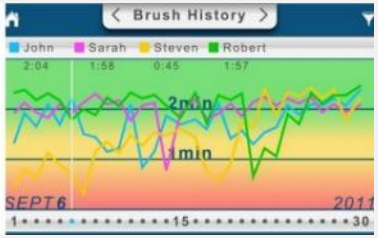


Image Beam Technologies

Image CES

"Internet of Things"

The Future of Knowledge and Skills?

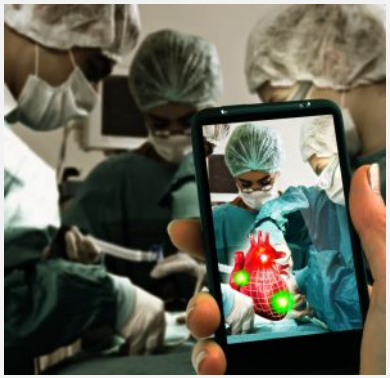
Larry Page - 2004

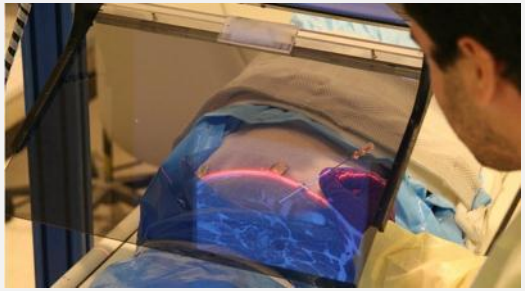
"Search will be included in people's brains…. Eventually, you'll have the implant, where if you think about a fact, it will just tell you the answer.“

Sergey Brin – 2012

“You'll ride in robot cars within 5 years”

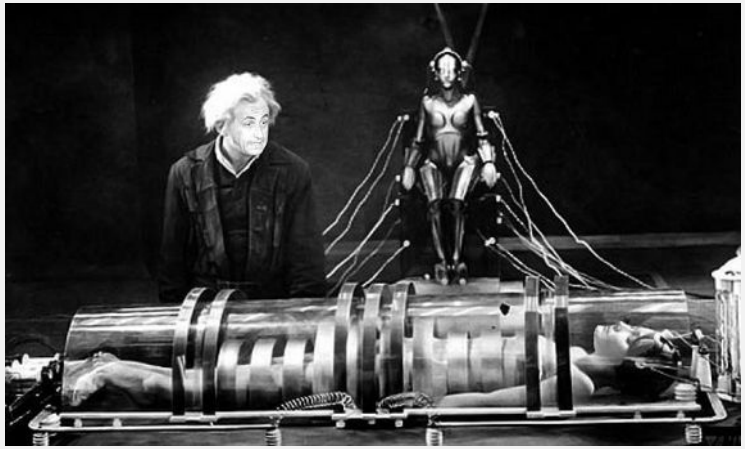
Train Less.. Train at All?





Diluting the Human Experience?

Retaining the Ability to Manage the Human Aspects of Warfare



Who/What is the Technology Benefitting?

- The Organisation
  - eg. improved cost effectiveness
- The Trainee
  - eg. 24/7 access to knowledge
- The Trainer
  - eg. audio/visual aids
- All of the Above

Questions

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