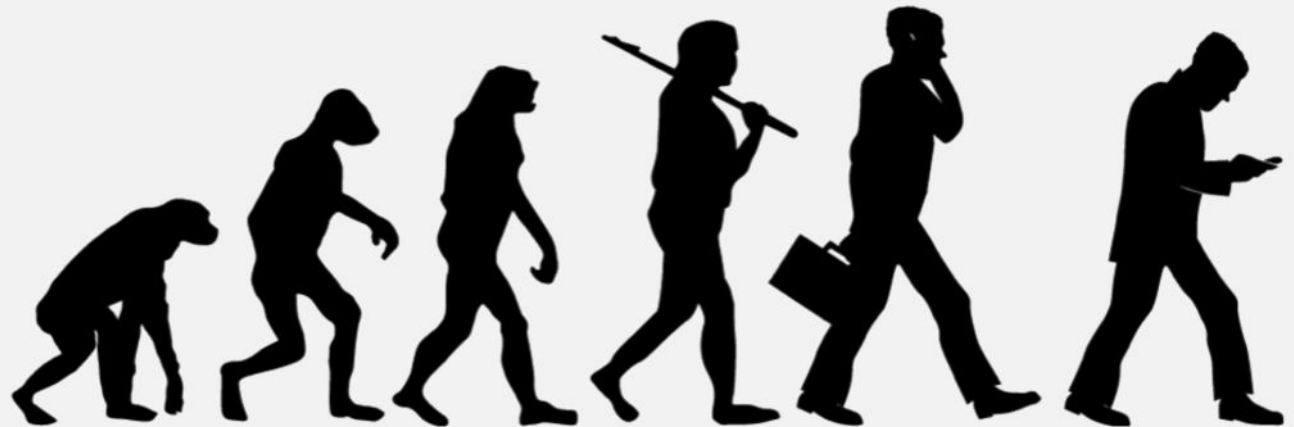


Revolution and Evolution: Learning Technology Strategies in a Changing World

Andy
Fawkes



Training Needs



Training Systems

Technology

Talk Outline – Training and Education Technologies

Revolution or Evolution?



The Future?



Your Strategy?





5000 Years Ago - Cuneiform Clay Tablet 3100–2900 B.C.

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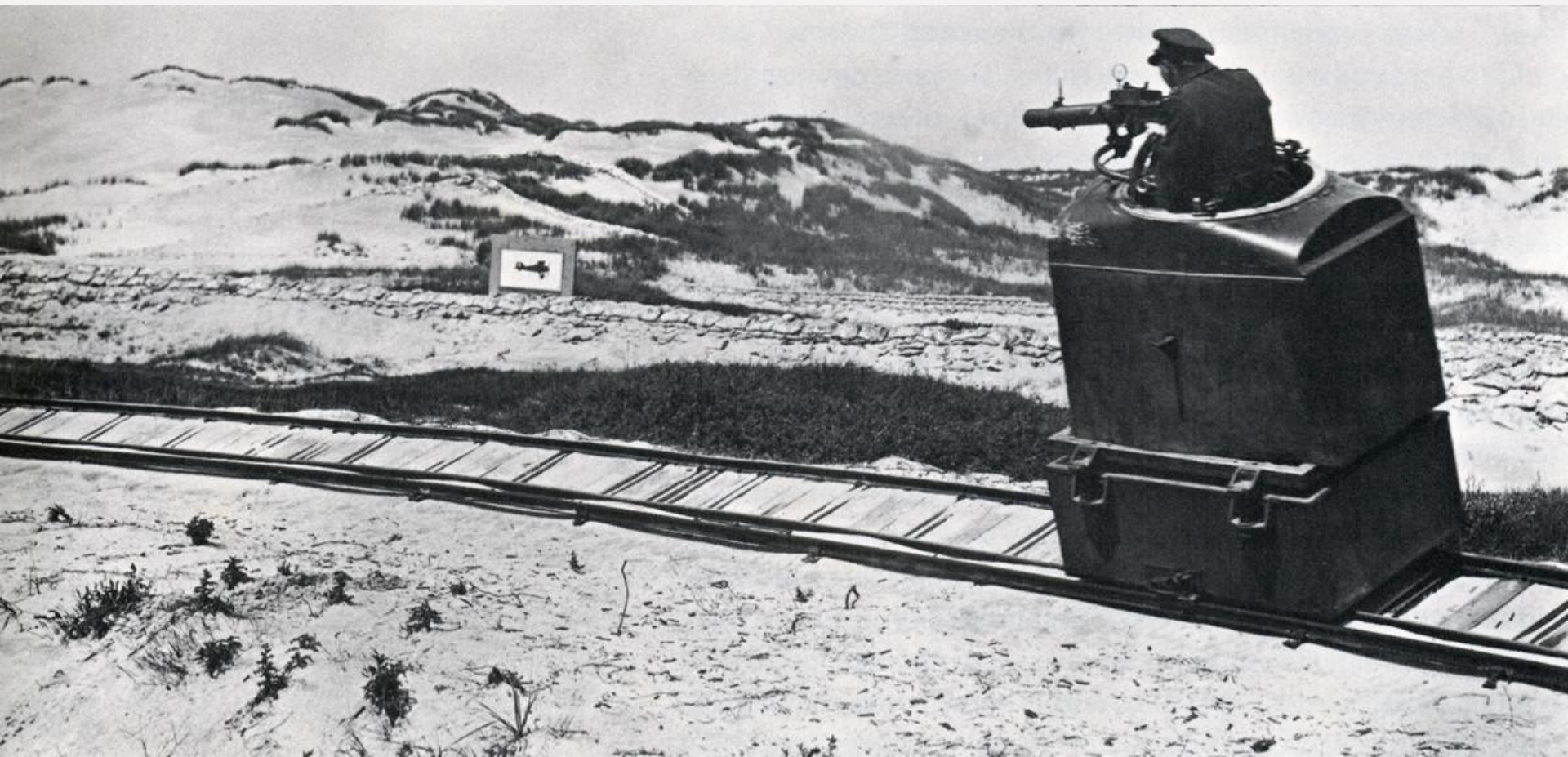
560 Years Ago - 1450 Gutenberg Press Replica

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300 Years Ago?

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100 Years Ago - WW1 Air Gunnery Simulator

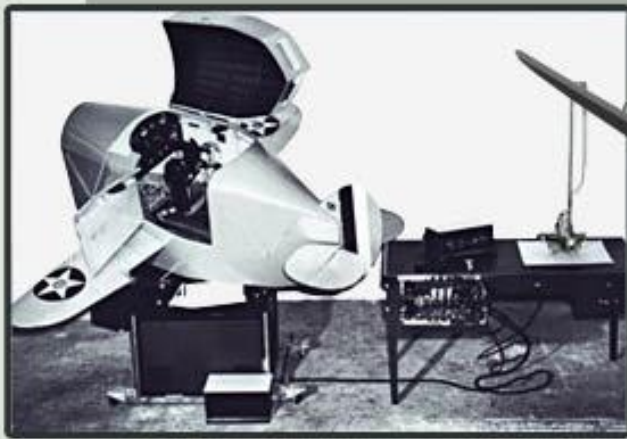
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are faithfully and accurately traced on a map or chart by the Automatic Recorder on the Instructor's Desk





70 Years Ago

Source - The UK Urban Exploitation Forums - Crail Airfield [HMS Jackdaw/HMS Bruce/JSSL]

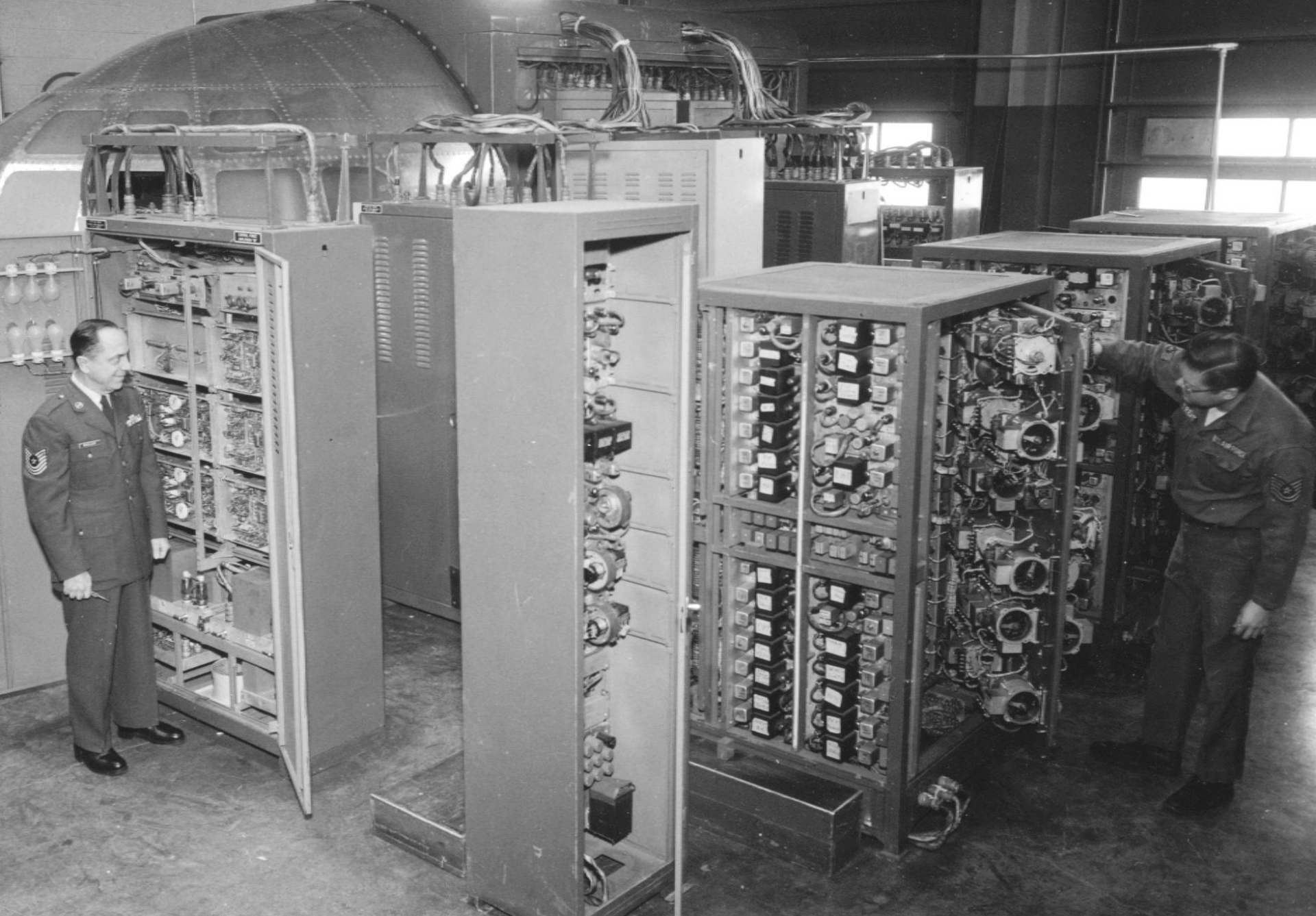
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60 Years Ago

Source – Air National Guard - Stratotanker Simulator 1953

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60 Years Ago

Source – Air National Guard - Stratotanker Simulator 1953

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Games

- 1962 - Spacewar!
 - Ran on a DEC PDP-1 mini-computer and generally considered the first Shooter game





1960/70s



40 Years Ago

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SPECIFICATION OF INTERNET TRANSMISSION CONTROL PROGRAM

December 1974 Version

1. INTRODUCTION

This document describes the functions to be performed by the internetwork Transmission Control Program [TCP] and its interface to programs or users that require its services. Several basic assumptions are made about process to process communication and these are listed here without further justification. The interested reader is referred to [CEKA74, TOML74, BELS74, DALA74, SUNS74] for further discussion.

The authors would like to acknowledge the contributions of R. Tomlinson (three way handshake and Initial Sequence Number Selection), D. Belsnes, J. Burchfiel, M. Galland, R. Kahn, D. Lloyd, W. Plummer, and J. Postel all of whose good ideas and counsel have had a beneficial effect (we hope) on this protocol design. In the early phases of the design work, R. Metcalfe, A. McKenzie, H. Zimmerman, G. LeLann, and M. Elie were most helpful in explicating the various issues to be resolved. Of course, we remain responsible for the remaining errors and misstatements which no doubt lurk in the nooks and crannies of the text.

Processes are viewed as the active elements of all HOST computers in a network. Even terminals and files or other I/O media are viewed as communicating through the use of processes. Thus, all network communication is viewed as inter-process communication.

Since a process may need to distinguish among several communication streams between itself and another process [or processes], we imagine that each process may have a number of PORTs through which it communicates with the ports of other processes.

Since port names are selected independently by each operating system, TCP, or user, they may not be unique. To provide for unique names at each TCP, we concatenate a NETWORK identifier, and a TCP identifier with a port name to create a SOCKET name which will be unique throughout all networks connected together.

1974: The beginning of TCP/IP and the "inter-network"

SIMNET Vision - 1978

Networks of simulators that would be used for combat planning, rehearsal, and execution

1



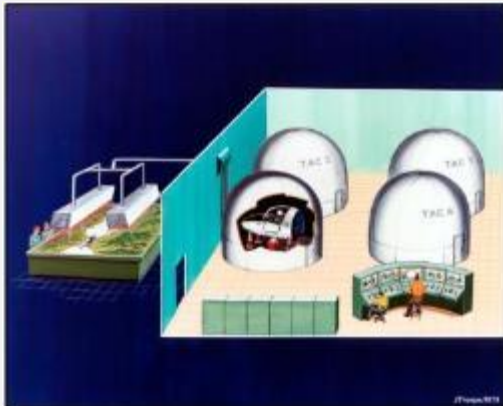
Enemy aggression detected

2



Planning a response

3



Rehearsal and analysis

4



Real time mission observation



12 Years Ago
Source – UK MoD

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Games!



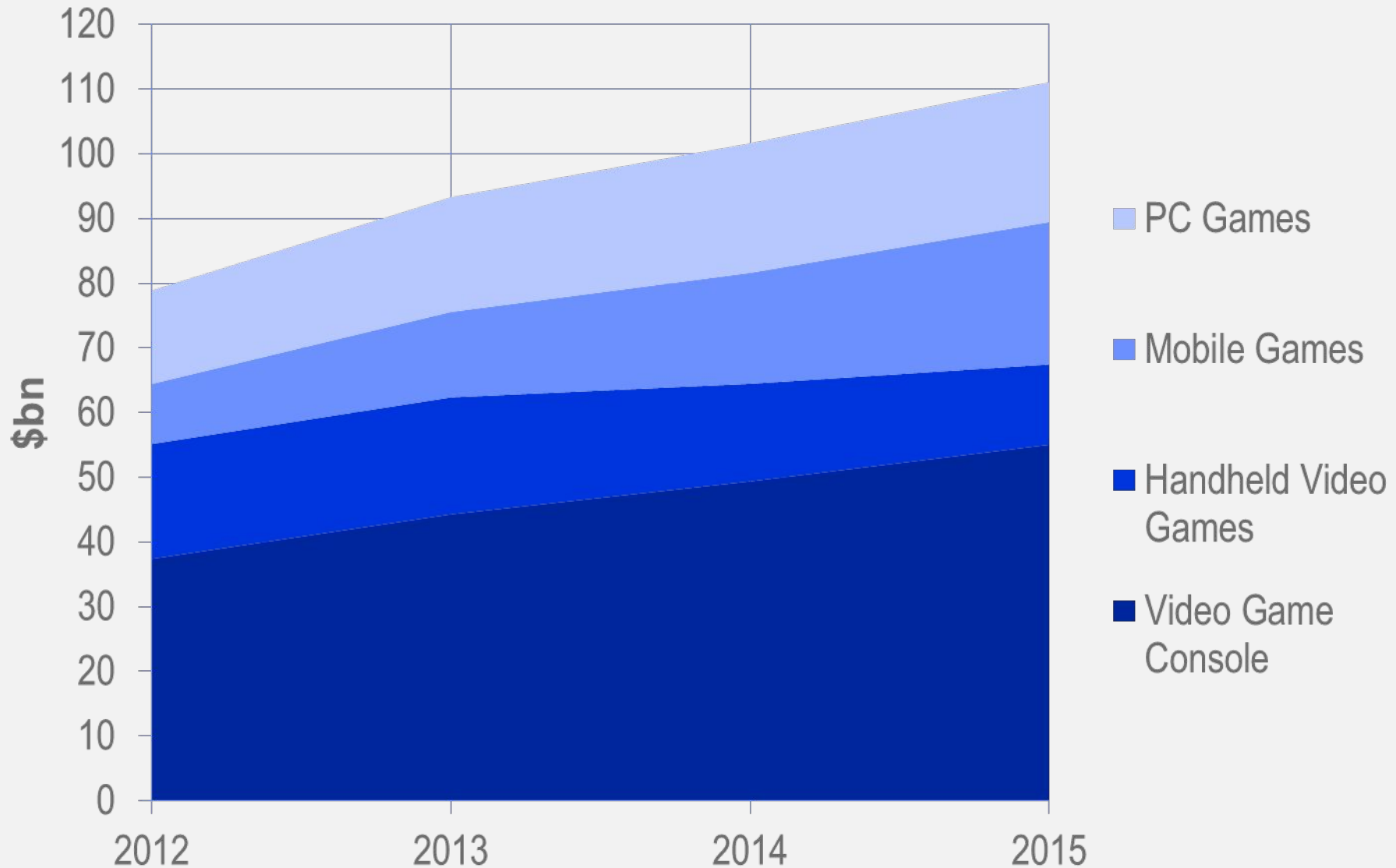
10 Years Ago

Source – Half life Counter-Strike - <http://youtu.be/mex00PAACyk?t=4m13s>

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Worldwide Video Game Market Revenue (\$Bn)

(Gartner Oct 13)



UK is 3rd Largest Market in the World (Wikipedia)

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Big Business

- Grand Theft Auto V
 - five years' work by a team of over 1,000 people
 - game's combined development and marketing budget over US\$265m
 - US\$1 billion sales within first 3 days



- Candy Crush Saga
 - Daily Revenue est. US\$826k
 - Daily Installs 30,090
 - Daily Active Users 8,031,750
 - On Facebook and Smartphones

Modern Simulation



Modern Simulation



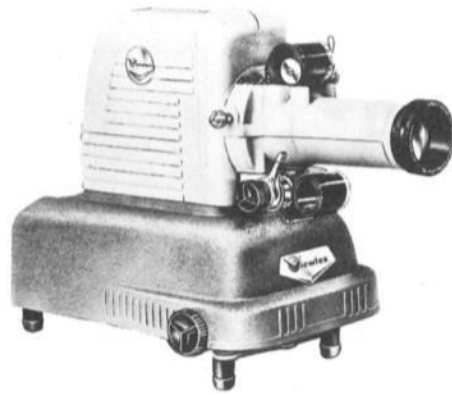


Not Only Simulation

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Coloured Slides
on Loan for 3s.
GRAND
EFFECTS
NOVELTIES.



Late 1800s



1925



1960s



1980s



The Rise of the Mobile in Training



Source - iPad in Real Life: Erik Hess, F-5N Tiger II Pilot

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Source - BAE Systems (Hawk Trainer)

19TH & 20TH CENTURY SCULPTURE
LONDON 21 MAY 2014

> VIEW E-CATALOGUE



Sotheby's

EasyJet Pushes Tablets, Drones on Planes to Trim Costs

Save +

By Kari Lundgren | May 7, 2014 2:11 PM GMT | [0 Comments](#) [Email](#) [Print](#)

EasyJet Plc (EZJ) plans to replace paper charts and manuals with tablets in the cockpits of all its jets by the end of this month as Europe's second biggest discount carrier seeks to lower fuel costs and reduce delays.

Removing heavy log books and other printed **materials** from cockpits will reduce EasyJet's fuel bill by about \$500,000 a year, the Luton, England-based airline said today. The carrier is also developing drone **technology** capable of inspecting planes for damage, which may be introduced as early as next year.

EasyJet is using technology to help trim expenses and eradicate delays and cancellations caused by mechanical failures by 2020, Ian Davies, head of engineering, said at a press conference in Luton today. An overnight delay can cost the carrier as much as 15,000 pounds (\$25,455), he said, and each kilogram (2.2 pounds) of paper removed saves about \$20,000 in fuel costs each year.



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Helpouts by Google

+Andy

Browse Helpouts Your Helpouts About Helpouts Give your own Helpouts

Real help from real people in real time

Play video

I need help with...

Browse Helpouts

Art & Music

Computers & Electronics

Cooking

Education & Careers

Fashion & Beauty

Computers & Electronics

Apple Mac and Mobile Devices Support

Nicola Minichiello

If you need assistance to troubleshoot an issue with any Apple product you came to the right place. I can provide help with Apple Macs, iPhone, iPa...

★★★★★ 39

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Biology & Life Sciences 66

Business & Management 61

Chemistry 19

CS: Artificial Intelligence 29

CS: Software Engineering 30

CS: Systems & Security 21

CS: Theory 28

Economics & Finance 61

Education 63

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Health & Society 68

Humanities 98

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Analytic Combinatorics
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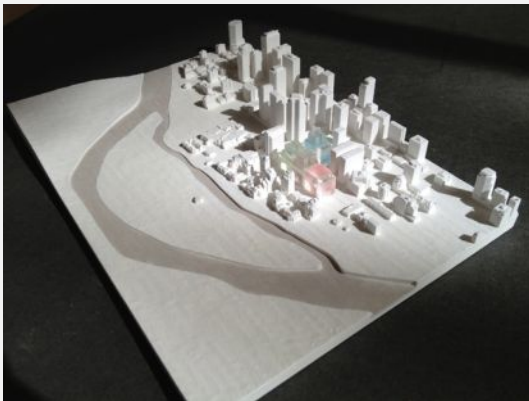
École Polytechnique Fédérale de Lausanne
Principles of Reactive Programming
with Martin Odersky, Erik Meijer & Roland Kuhn
Nov 4th 2013
7 weeks long
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The Future?



Looking Ahead

- Robots/AI
- Internet of Things/"Connected Life"
- Wearable Computers
- Sensors
- Augmented Reality
- 3D Printing/3D Scanning
- "Generation C"





TARGET INFO

Distance: 1.9 km
H-difference: 300m
Field: wood
Visibility: 30%
Danger: 85%

Group 3
2 Soldiers

Group 2
4 Soldiers

Dock

Group 1
6 soldiers



AREA MAP





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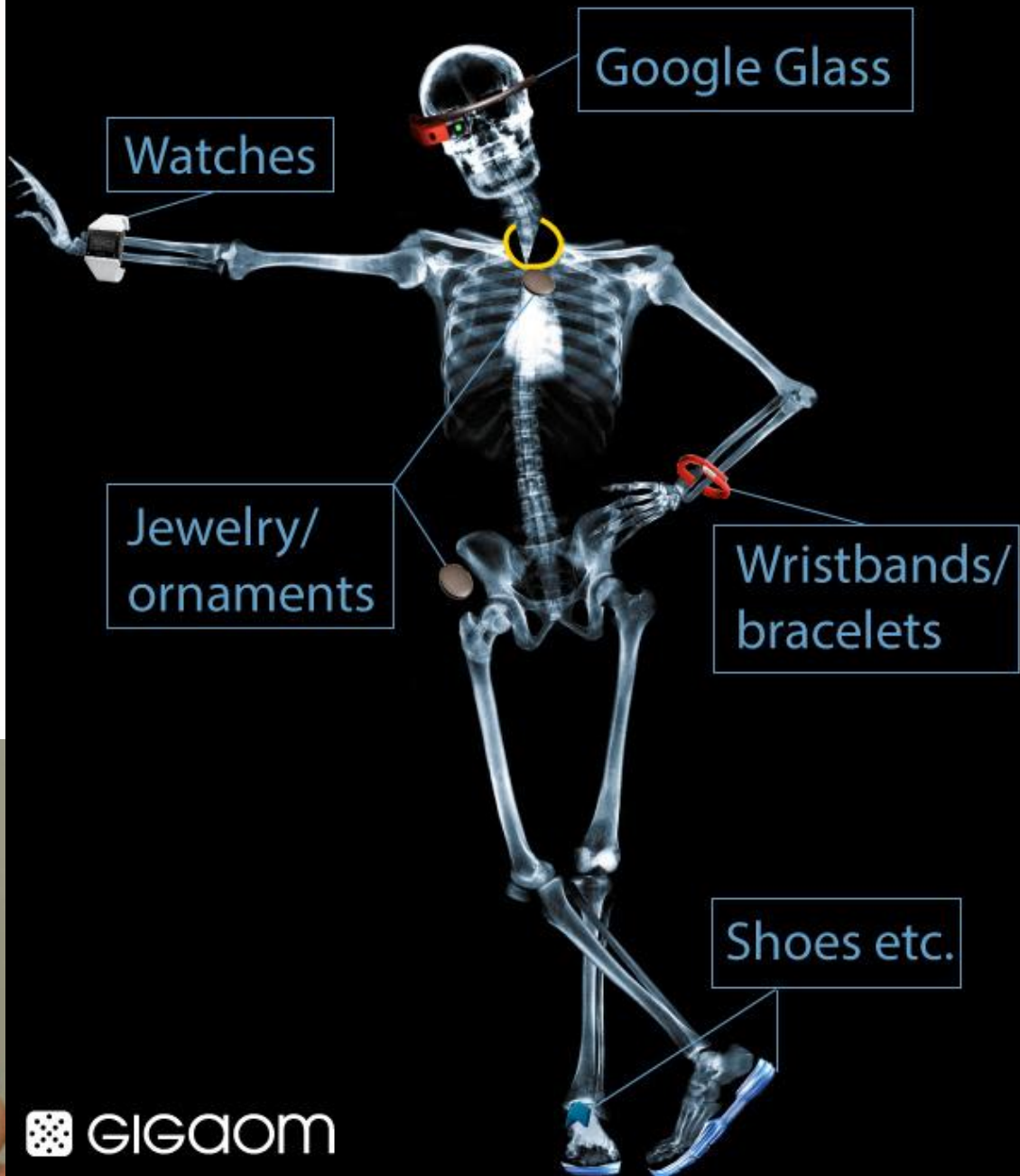


[Home](#) > [Photography](#) > Oculus-controlled dual-camera drones could be the...

OCULUS-CONTROLLED DUAL-CAMERA DRONES COULD BE THE FUTURE OF AERIAL VIDEOGRAPHY

By Felix Esser — April 28, 2014



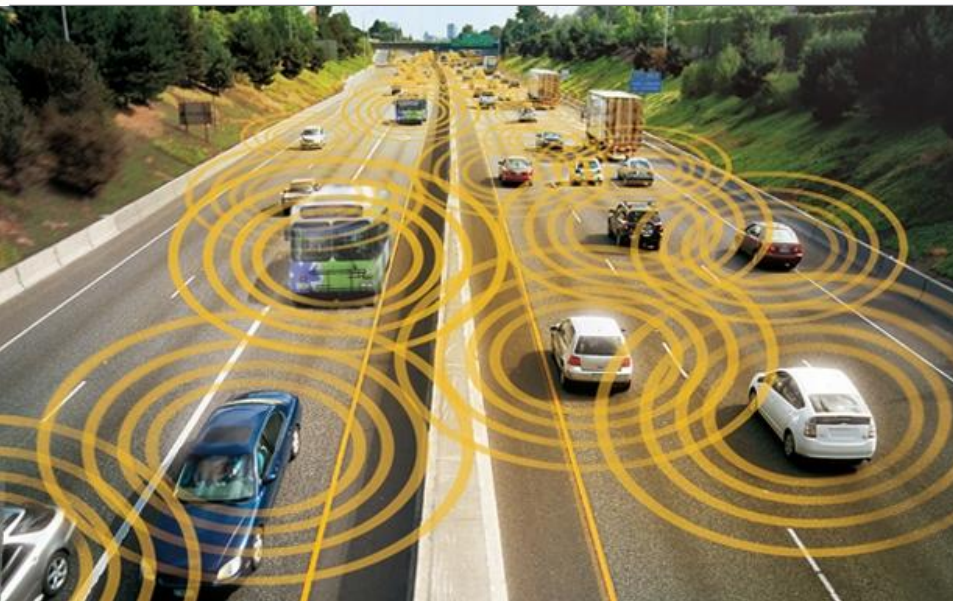




THINKE

World on the brink of 'new industrial revolution' says David Cameron

'Internet of things' will allow everyday objects like fridges to talk to each other and will transform the world, the Prime Minister tells a trade fair



The development of the technologies necessary to support the 'Internet of Things' has come a long way in the past year. Photo: (c) John Rensten

By **Holly Watt**, Whitehall Editor, Hanover, Germany

5:45PM GMT 09 Mar 2014

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David Cameron has announced that the world is on the brink of "a new industrial revolution," where the internet will allow everyday objects like fridges to "talk to each other."

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Internet of Things

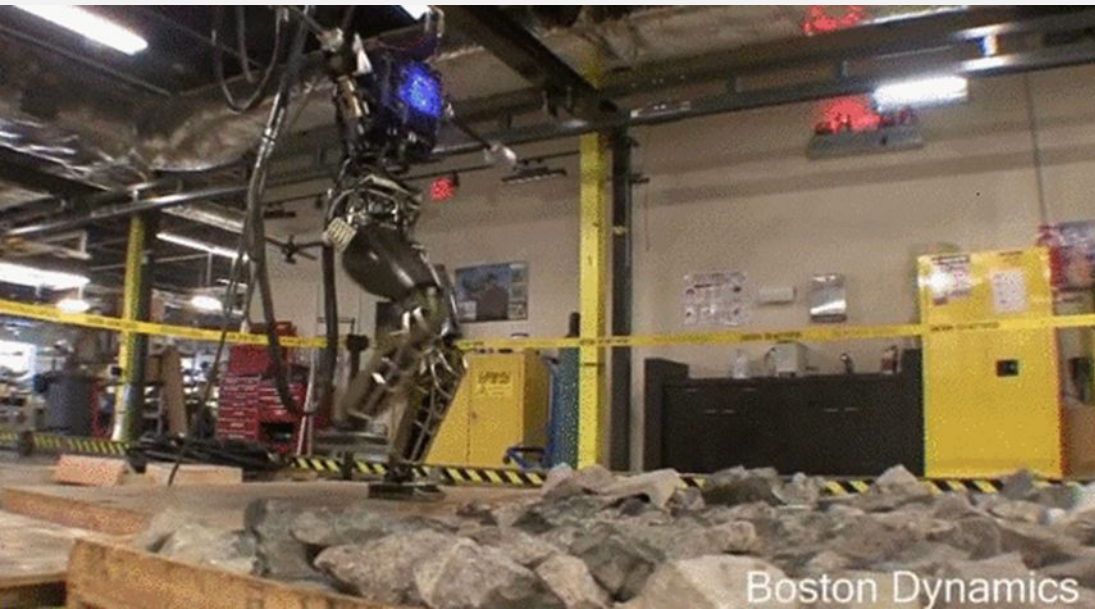


HLA/DIS Simulation as a Test Bed and Training Environment?

Mind Over Mechanics



Robotics and Autonomy

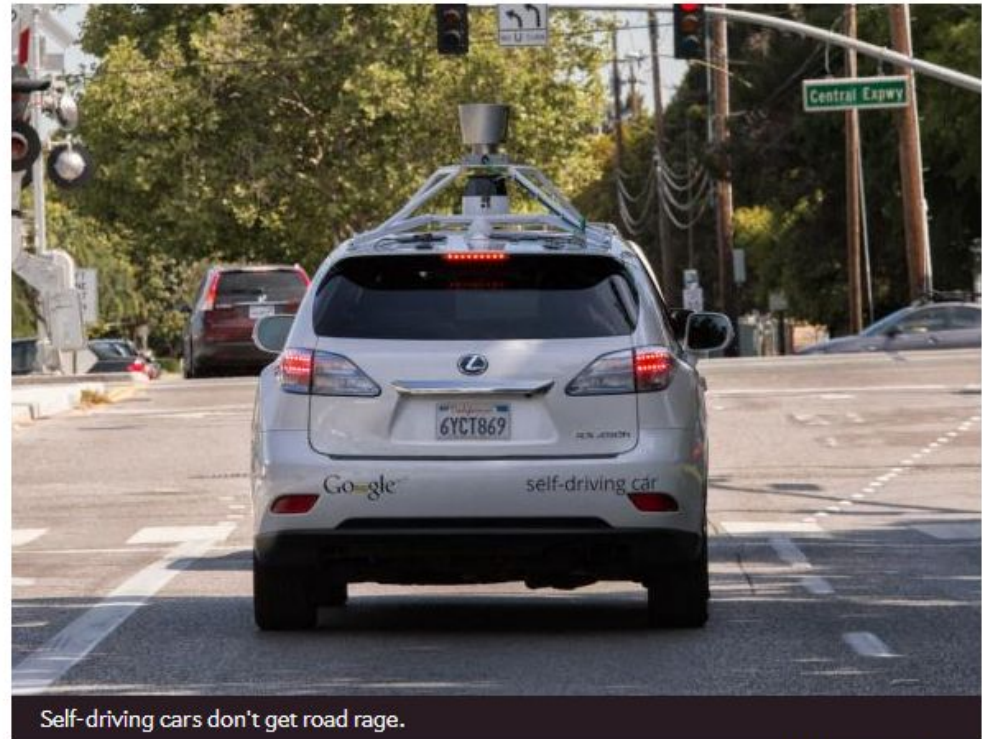


Google's Self-Driving Car Already Drives Better Than You Do

By Will Oremus



Why Train?



Self-driving cars don't get road rage.

Image courtesy of Google

What is the Future Role of the Human?



News | Sport | Comment | Culture | Business | Money | Life & style

News > Technology > Artificial intelligence (AI)

2029: the year when robots will have the power to outsmart their makers

Ray Kurzweil, Google expert in artificial intelligence, predicts that by 2029 robots will make jokes and flirt

Nadia Khomani
The Observer, Saturday 22 February 2014 21.00 GMT
[Jump to comments \(361\)](#)



Garry Kasparov versus Deep Blue in 1997. The computer won - as Ray Kurzweil predicted. Photograph: Stan Honda/AFP/Getty Images

Computers will be cleverer than humans by 2029, according to Ray Kurzweil, Google's director of engineering.



Simulation Singularity?

When Simulation Mirrors the Real World



Exciting Times!

Simulation

Computing

Games

Sensors

Robotics

Psychology

Training

Virtual Reality

Performance Arts

Telepresence

Mobile

Education

Artificial
Intelligence

Internet



Revolution!



We are in a Period
of Unprecedented
Digital Change

Your Strategy?

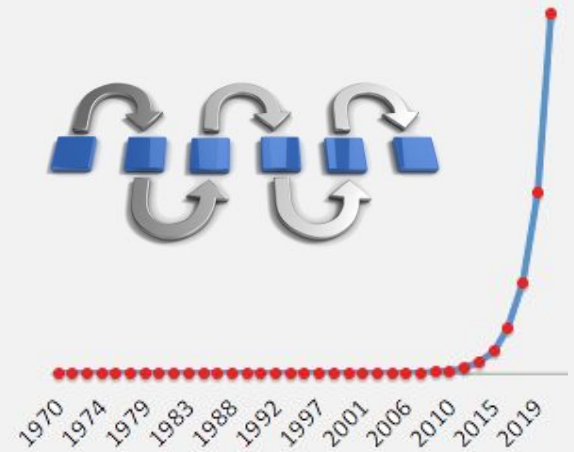


What is Driving Your Technology?



Are your Decision Cycles compatible with Digital Technology Advances?

Process v Moore's Law



Balance of Investment – Choose One or Both?



Decide your Training & Education Technology Operating Model

Organisation Integration	<u>Co-ordination</u> • Diverse Software, Shared Data & Network	<u>Unification</u> • Single Infrastructure and Services
	<u>Diversification</u> • Diverse Software, no Data Sharing & Network	<u>Replication</u> • Similar Software, no Data Sharing & Network
Organisation Standardisation		

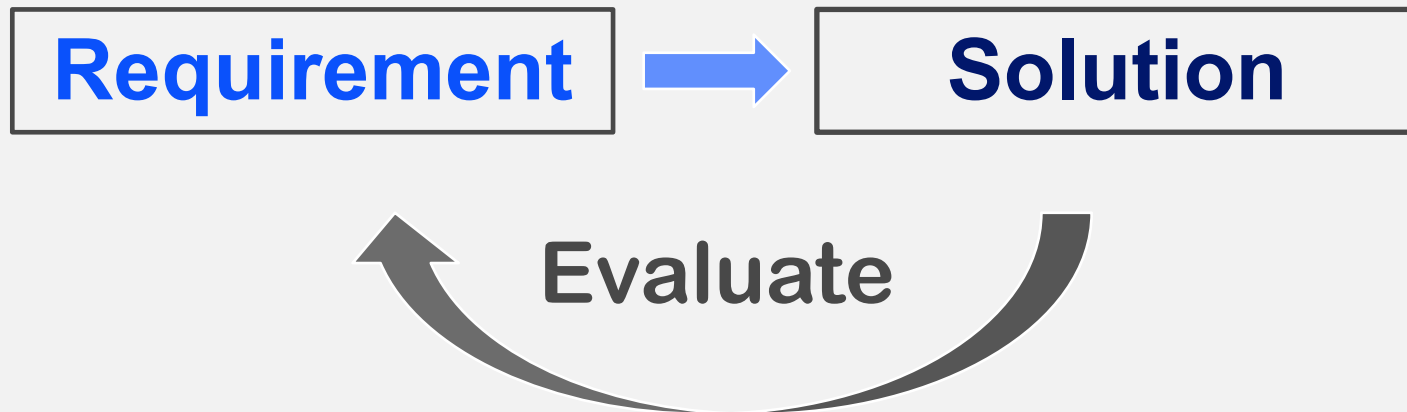
Decide your Training & Education Technology Operating Model

Organisation Integration



Organisation Standardisation

Continuous Experimentation with Trainer/Trainee!



Training Needs



Training Systems

Technology

Training Needs



Training Systems

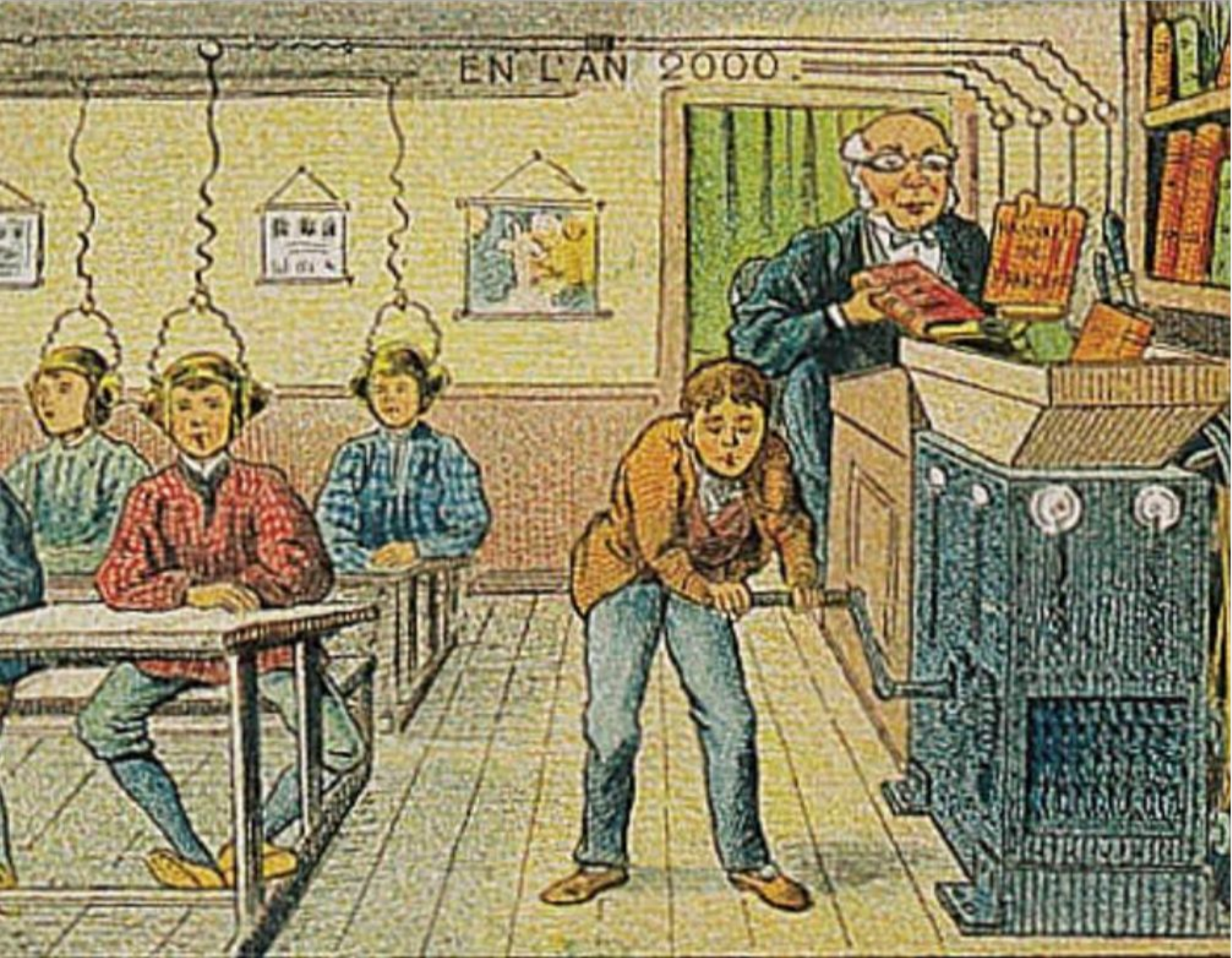
Technology

User



Procurement

Research



Questions?