

Parliament ICT Lunchtime Friday
House of Lords - London
7 March 2014

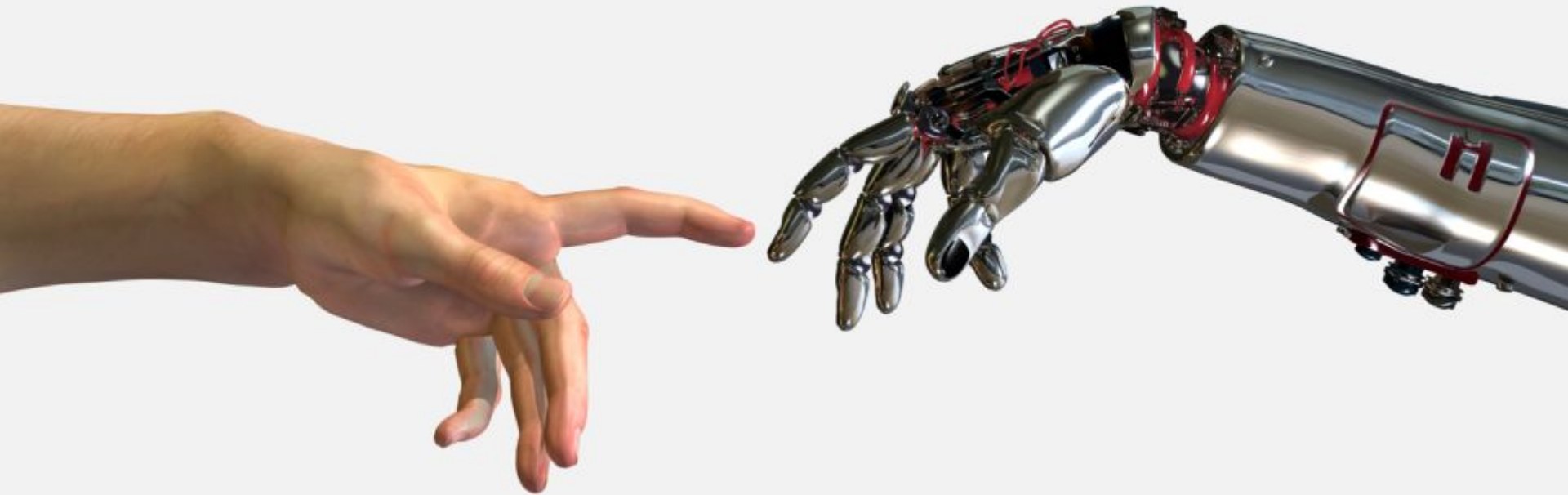
Changing Times

A Perspective on Digital
Technology and Innovation

Andy Fawkes



People and Technology



My Background

Previously

- MoD Simulation Policy
- NATO Modelling & Simulation Group



Now

- Independent Consultancy
- Academic Liaison

THINKE



Outline

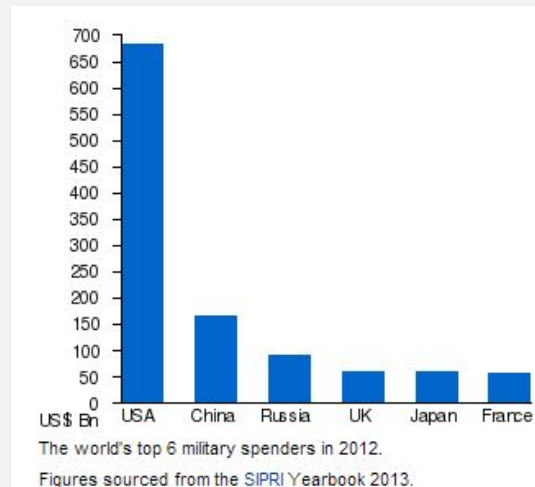
- Training and Education in Defence
 - An overview
- Simulation and Training
 - Why Simulation and a bit of History
- Games!
 - How Video Games changed Military Training
- Military and Civilian Technology Convergence
 - Digital Technology Convergence
- Humans, Machines and Inbetweenies
 - New Interactions
- So What?
 - Some ICT Challenges and Opportunities

Defence Training and Education

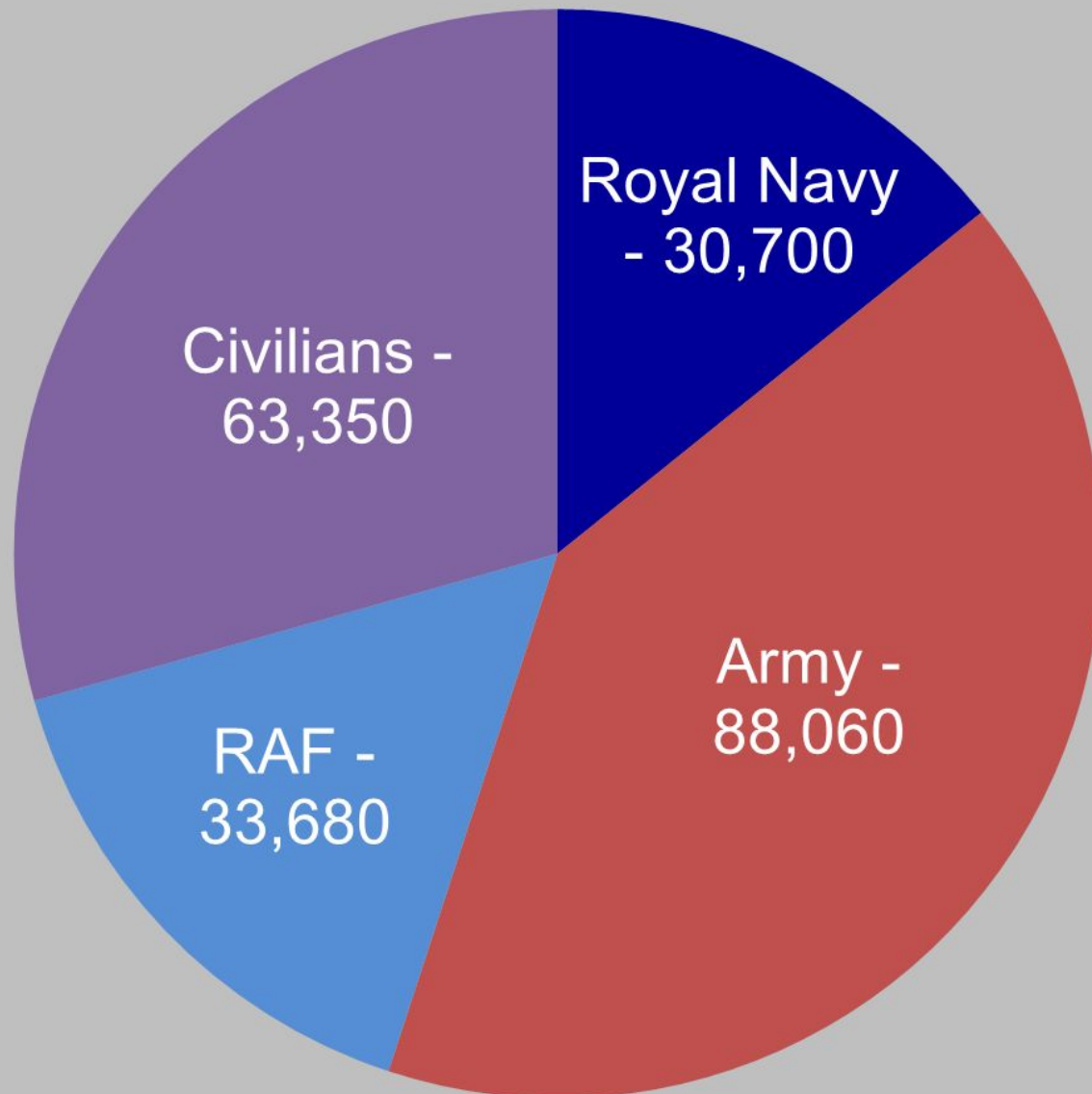


UK Armed Services (2013/14)

- £33bn pa (4th in World)
- 152,440 UK Regular Forces personnel
- 90% Male and 10% Female
- 7% Black and Minority Ethnic
- 83% age 39 years old and younger



Military/Civilian Personnel 2014 (215,790)



Nature of Defence Training and Education

- Scale - 215,790 Military/Civilian (2013/14)
- Depth – eg. Fighter Pilot, Nuclear Reactor Operator
- Breadth – eg. Apache Pilot through to Cook
- Flexibility – Current and Contingency Operations
- High Turnover



Commander's Intent

Military Training

- 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

Cost of Training and Education in Defence

- Manpower
 - Platforms and Equipment
 - Fuel and Maintenance
 - Training Estate and Establishments
 - Training Systems and Simulators
-
- Approximately 20% of Defence Budget (£7-8bn)

Simulation and Training

What is Simulation?

Typically a military training simulation is interactive, with a “human in the loop”

eg. a flight simulator or driving simulator



Benefits of Simulation



Improve Training



Reduce Time to Train



Reduce Costs



Reduce Environmental Impact



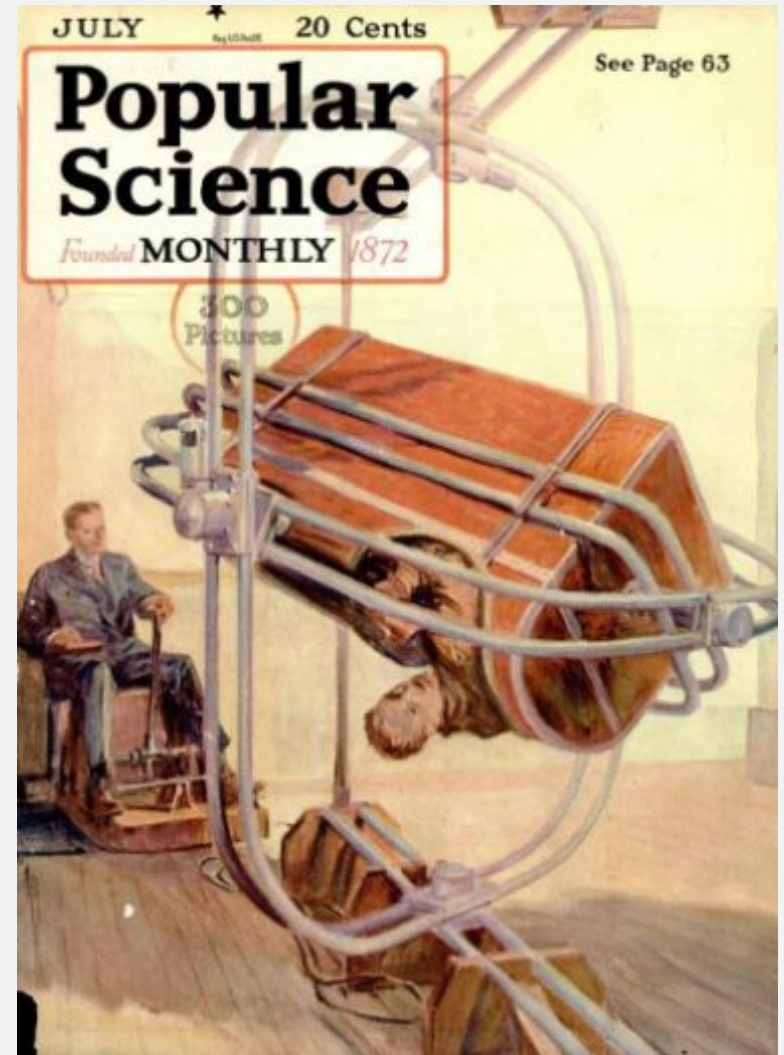
Improve Safety

Military Training

all but war is simulation

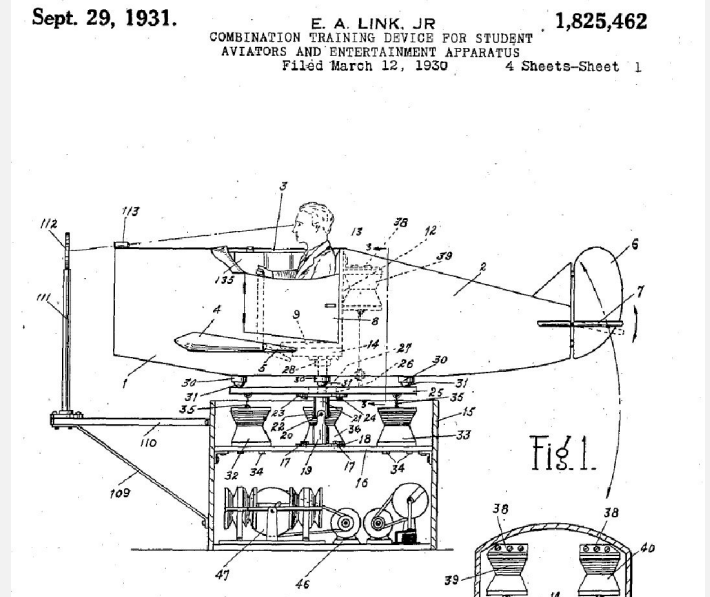


Early Training Technology



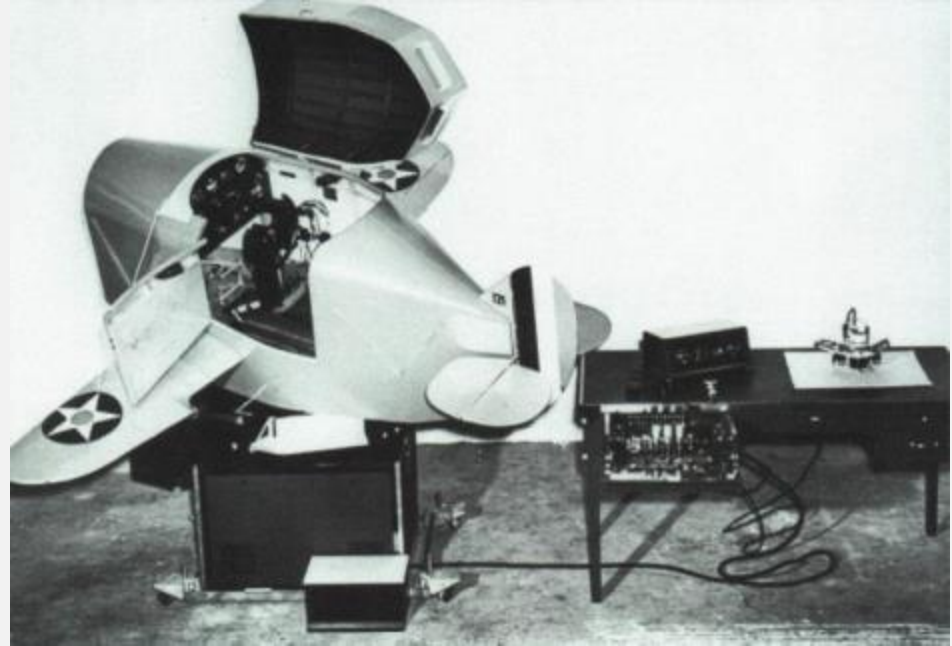
1920s – Edwin A Link (born 1904)

- 1920 - First Flying Lesson
- 1926 - First Solo Flight
- 1929 - First Link Pilot Trainer



1940s

- The Link Trainer came into widespread use during WWII
- 10,000 trainers used to improve safety and shorten training time for over 500,000 pilots





1960s/70s



THINKE





NH90 Helicopter (CAE)

THINKE

Games!



Back to 2002

BBC CATEGORIES TV RADIO COMMUNICATE WHERE I LIVE INDEX **SEARCH** **Go**

BBC NEWS

You are in: [Science/Nature](#)
Thursday, 20 June, 2002, 13:58 GMT 14:58 UK

[News Front Page](#)
[World](#)
[UK](#)
[England](#)
[N Ireland](#)
[Scotland](#)
[Wales](#)
[Politics](#)
[Business](#)
[Entertainment](#)
[Science/Nature](#)
[Technology](#)
[Health](#)
[Education](#)

Talking Point
Country Profiles
In Depth
Programmes
BBC SPORT
BBC WEATHER
CBBC news
SERVICES
Daily E-mail
News Ticker
Mobile/PDAs
Text Only
Feedback
Help
EDITIONS
Change to World

Troops in virtual combat



Up to eight soldiers can play together

The British Army is using a specially developed version of the celebrated computer game Half-Life to train its troops.

With the first-person shoot-em-up soldiers can try out new weapons and new tactics without encountering real bullets and bombs.

The Ministry of Defence hopes the system may help reinforce some of the lessons learned on more traditional training exercises.

Like the popular modification, or mod, of Half-Life known as Counterstrike, the army version allows up to eight soldiers to go into virtual combat at any one time.

See also:

- ▶ 24 Jan 02 | England War simulator unveiled
- ▶ 23 May 02 | New Media US military reveals computer game
- ▶ 21 Dec 01 | Reviews Half-Life revives for new generation

Internet links:

- ▶ QinetiQ

The BBC is not responsible for the content of external internet sites

Top Science/Nature stories now:

- ▶ Date for first Australians
- ▶ Fifth closest star discovered
- ▶ Mona Lisa smile secrets revealed
- ▶ The gene that maketh man?
- ▶ Gravity wave detector all set
- ▶ Robots get cheeky
- ▶ The big and the bizarre
- ▶ Botox 'may cause new wrinkles'

Links to more Science/Nature stories are at the foot of the page.

“
Obviously, being killed in the virtual world isn't quite so serious
”
Major Bruce Pennell

Dismounted Infantry Virtual Environment (DIVE)



- MoD Research Project
- Modified Half Life Counter-Strike (1999)
- Up to 12 Networked Soldiers
- Copehill Down Scenario



Operation Flashpoint: Cold War Crisis & VBS (2001)

- Op Flashpoint - modern military simulation multi-player game
- VBS – based on Op Flashpoint with user-definable mission scenarios, and customized vehicles and equipment.



Some Key Milestones

- MoD led a NATO commercial games workshop in the Hague 2004
- Pan-Govt Games Group 2004
- MoD/DTI hosted an “Exploiting Commercial Games For Defence” seminar in June 2005 (170 in attendance)
- MoD sets up “Commercial-off-the-Shelf Exploitation” Unit in 2005 (QinetiQ)
- Convoy Tactics Trainer deployed 2006 (VBS1)

America's Army Medic Field Training - 2006



**If Call of Duty players were actually in the
Army...**



Operational Joint Combat Operations Virtual Environment (Op JCOVE)

- Procured as a Service
- Mobile and deployable capability
- Mission Specific Training
- Game-Based Simulation
- Scenarios including:
 - CIED drills
 - Convoy Training



BBC Points West - 2010



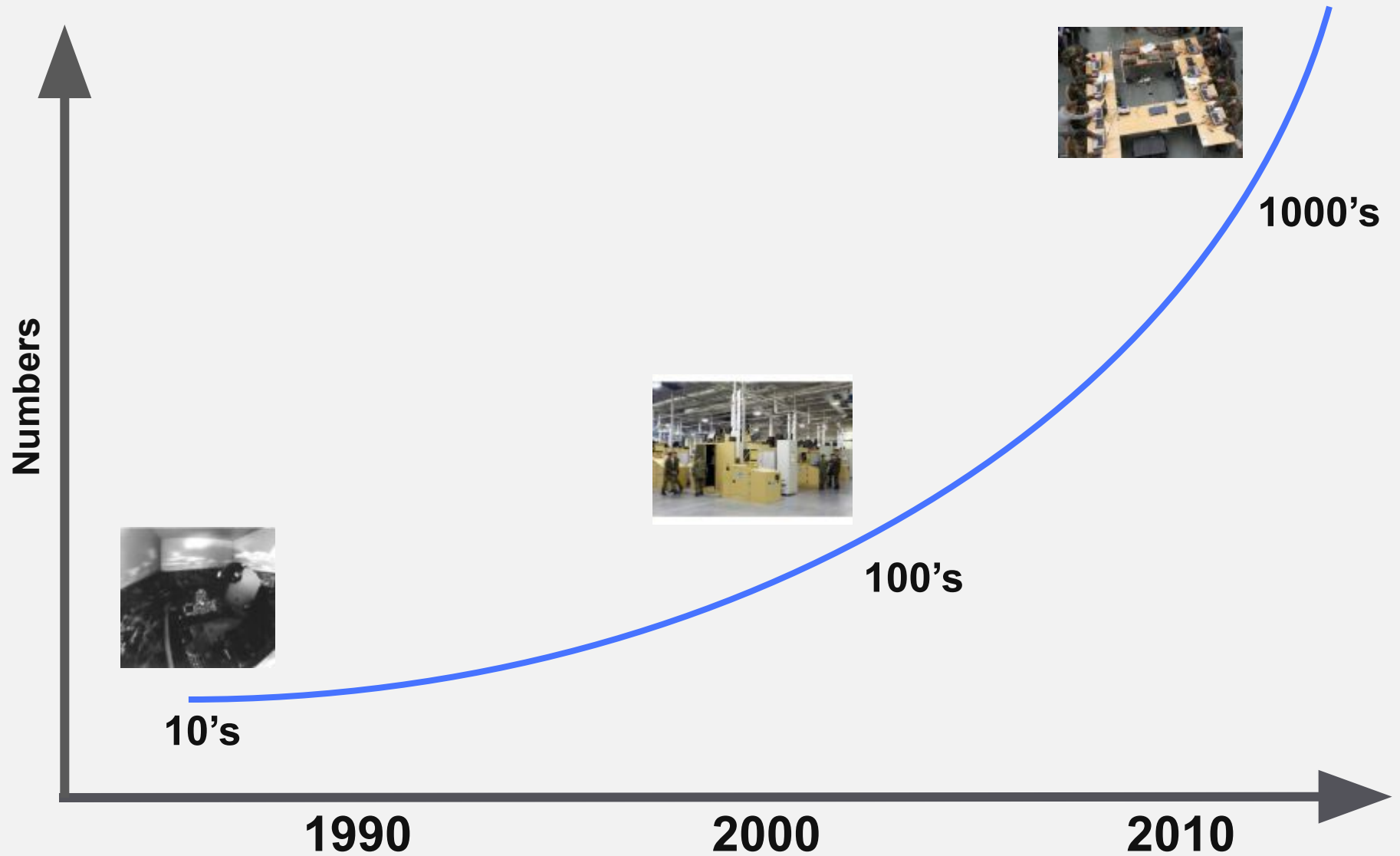
Modern Simulation



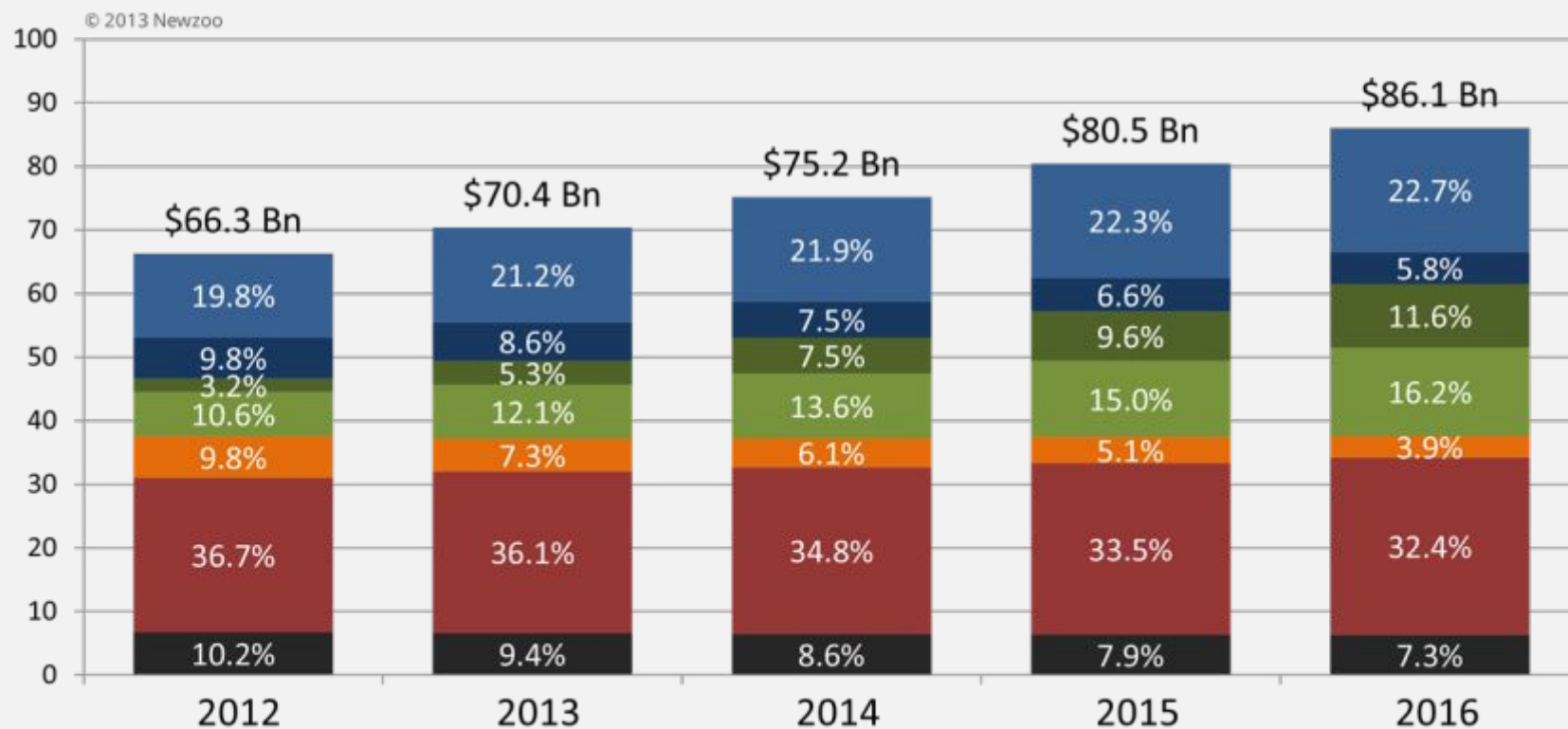
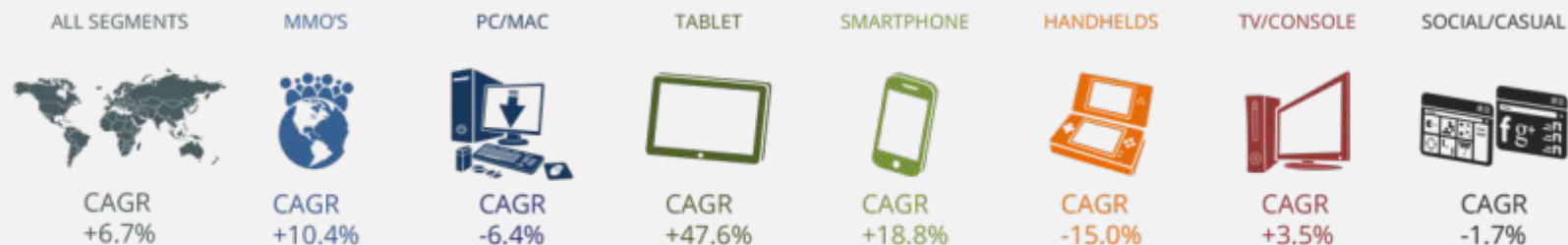


Source - Wisconsin National Guard Public Affairs photo by Vaughn R. Larson

Access to Simulation

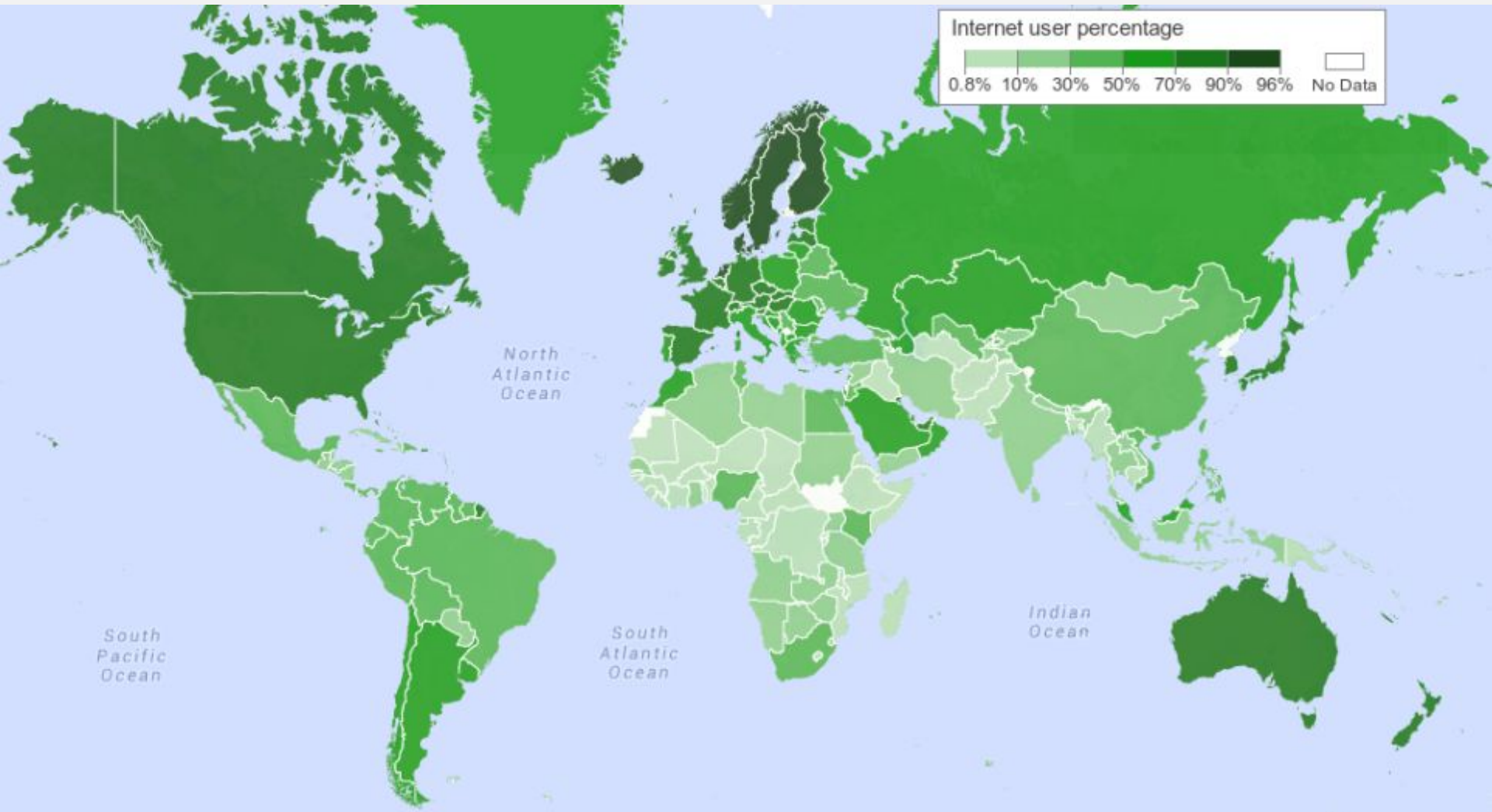


Global Games Market 2012 - 2016



Source: Newzoo, 2013 Global Games Market Report

Internet Users (% of the population) 2014



Military & Civilian Technology Convergence?







THINKE

[HOME](#) » [NEWS](#) » [NEWS TOPICS](#) » [HOW ABOUT THAT?](#)

Royal Navy use PlayStations to train sailors

The Royal Navy has begun a programme to issue hand-held PlayStation computer consoles to sailors so they can study for tests in confined quarters.



Marine warfare engineering technicians were the first to receive the devices, and if proved useful they will be distributed around other personnel. Photo: GETTY

7:16AM GMT 27 Nov 2009

Print this article

Share 7

Facebook 6

Twitter 1

Email

LinkedIn 0

+1 0

How about that?

[News](#) » [UK News](#) »
[Defence](#) »
[Technology News](#) »

[In Politics](#)

Mobile Training

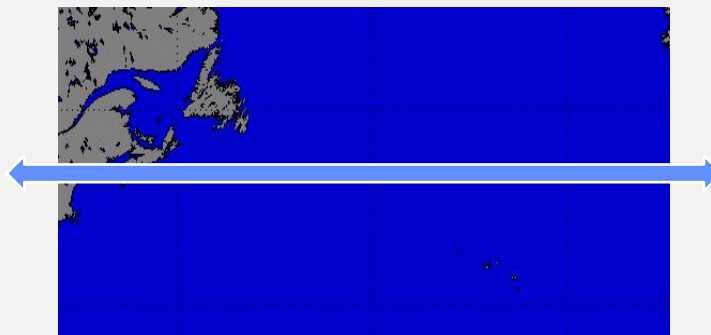
The Rise of the Mobile in Training



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

THINKE

Augmented Reality – 2008



- US Pilot in US Flight Simulator
- UK Soldier on Salisbury Plain with AR Sight
- Virtual Bombs landing on Real Terrain





VOGUE

THINKE



defence Learning Portal



[Home](#) [Help](#)

You are here : Home

[Login](#)

Login

UserName:

Password:

[Login](#)

[Reset Password](#)

IMPORTANT INFORMATION

Cookies

By logging on to the Defence Learning Portal, you are authorising the implementation of cookies by all DLP services for use as outlined [HERE](#)

Privacy

It is important that Users accessing the DLP over the Internet from a shared device manually delete their Browsing Cache (i.e. Browsing History, Cookies and Temporary Internet Files) after logging out of a DLP Session.

The method for doing this will be dependant on both the Web Browser and version that is used.

Please use the hyperlinks below to navigate to the Support pages of the 4 most popular Web Browsers where you will find instructions on how to delete the Web Browsing Cache.

If you are not using one of the Browsers detailed below then it is recommended you search for the related Browser web page and navigate to the Support section.

[Internet Explorer](#) [Google Chrome](#) [Mozilla Firefox](#) [Opera](#)

Additional Security Note: - Users are advised NOT to choose the 'Remember Password' option should it exist on the Web Browser.



twitter

Follow us at DLPortal

DLP System Downtime

UsersOnline



People Online:

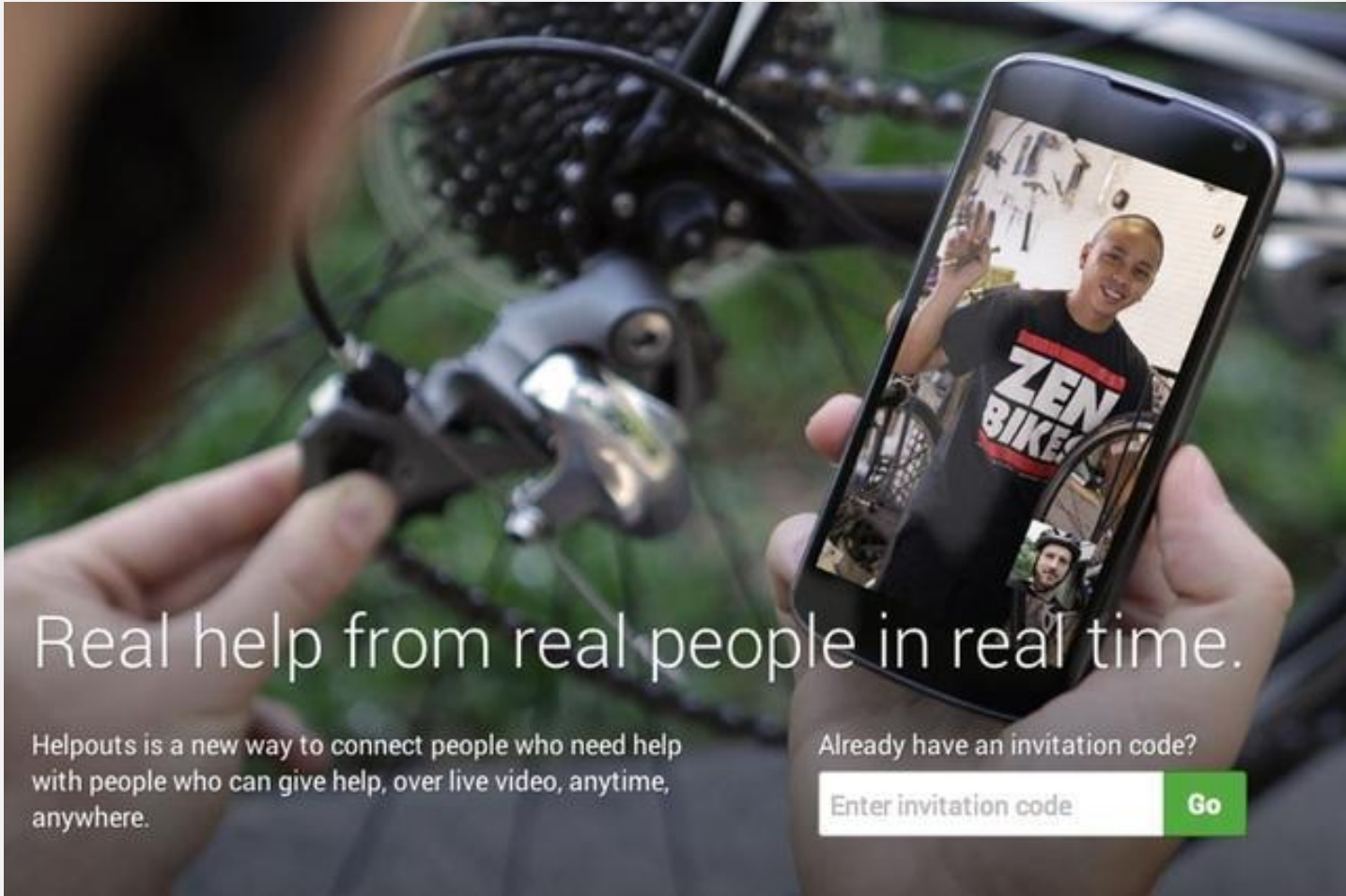
Visitors: 105

Members: 68

Total: 173



THINKE



Real help from real people in real time.

Helpouts is a new way to connect people who need help with people who can give help, over live video, anytime, anywhere.

Already have an invitation code?

Go

Digital and Online Classrooms

South Korea 2015



Florida 2015

Stanford University



2012 - 23,000 Graduates

Humans, Machines and Inbetweenies

New Interactions



Today



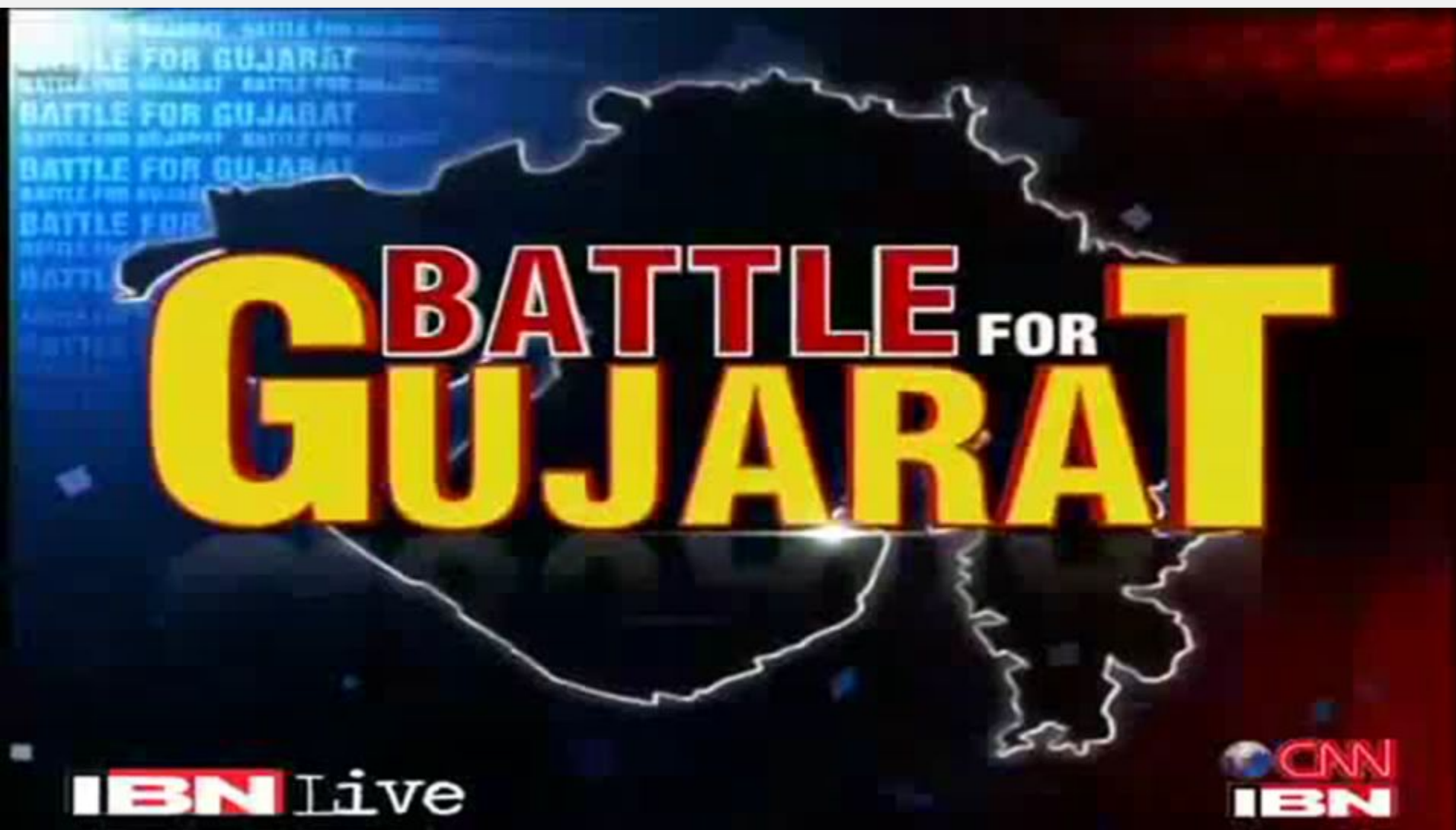
THINKE



THINKE



India Nov 2012 - Narendra Modi uses 3D Telecast to Address Audiences in Four Cities





THINKE



THINKE



THINKE

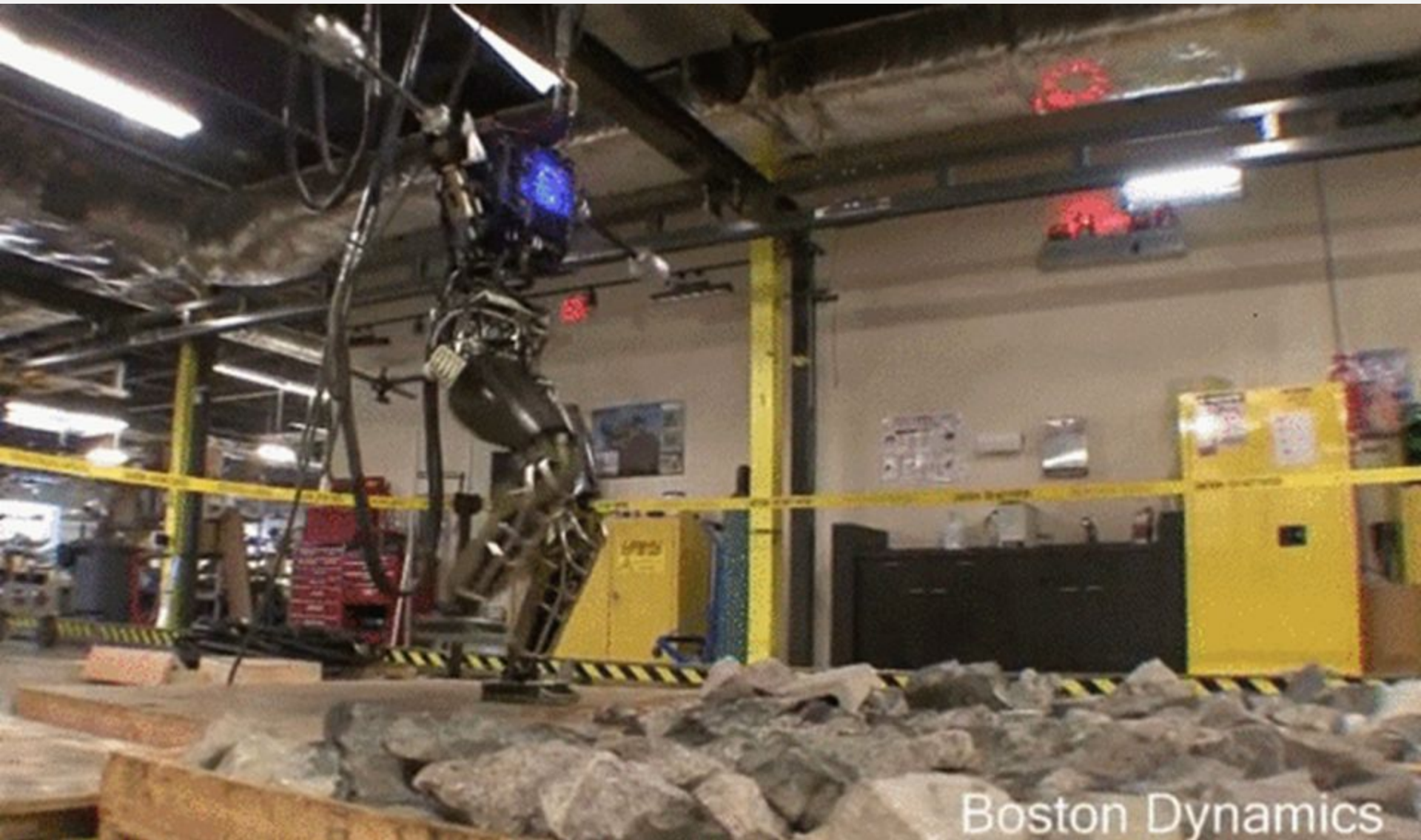
Mind Over Mechanics



Raytheon's Second-Generation Exoskeleton (XOS 2)



Robotics



Boston Dynamics

THINKE

Autonomy ↔ Simulation



Simroid Dental Training Humanoid Robot Communicates with Trainee Dentists - 2011



University of Southern California Institute for Creative Technologies - 2013

USC Institute for
Creative Technologies

University of Southern California

SimSensei: Virtual Human for Healthcare Support & MultiSense: Multimodal Perception and Learning

**Albert (Skip) Rizzo, PI
Louis-Philippe Morency, PI**

**As part of DCAPS program:
Detection & Computational Analysis of Psychological Signals
(3rd Interim Progress Video)**

The work depicted here was sponsored by the U.S. Defense Advanced Research Projects Agency. Statements and opinions expressed do not necessarily reflect the position or the policy of the United States Government, and no official endorsement should be inferred.

arguing with the robot...



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.

In our Lifetime?

- Google Chair Eric Schmidt (6 Mar 14)
 - “Robots will become omnipresent in our lives in a good way.”
 - “The biggest thing will be artificial intelligence,”

Diluting the Human Experience?



So
WHAT?

Technology Change



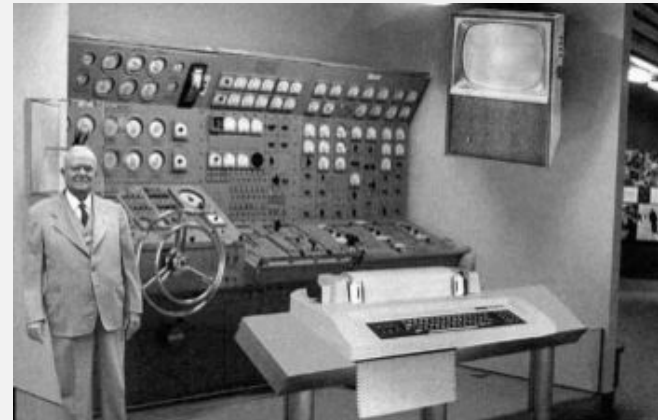
Organisational Realities



Getting it Wrong



Photograph: Alamy



Some Innovation Enablers

London Smart Glass Creative

Home | Members | Photos | Discussions | Maps

Google Glass and Wearables Hackathon

Created Jan 7, 2013

Saturday, November 30, 2013
9:00 AM to 11:00 AM

google campus london
4-5 Strand Street, London EC2A 4BA, United Kingdom, London (map)

The first ever Google Glass and Wearables Hackathon in London bringing together platforms like Google Glass and wearables - Smart Watches, headbands, Wristbands and all kinds of wearables to create interesting possibilities and applications.

One of the best opportunities in London to come, play and hack applications for Google Glass and other wearables!

Agenda

- 9:00 am - Arrive, Team Grouping and Breakfast
- 10:00 am - Demos / Talk on developing for Glass and other wearables
- 11:00 am - Hack Starts
- 1:00 pm - Lunch
- 4:00 pm - Tea/Coffee
- 8:00 pm - Dinner

Will you attend?

☒ Yes ☐ No

10 attending

- Aditya Paul
- Stefan L. Schneider
- Jonathan Schipper
- Peter Seasholtz
- John Webb

People in this meetup are also in:

KICKSTARTER WHAT IS KICKSTARTER? Discover and start a project

STEM System: The Best Way to Interact with Virtual Worlds

by SIVENSE

Home | Updates | Backers | Comments

FUNDING This project successfully raised its funding goal on Oct 12.

Flow-Tracker Demo: STEM System Prototype

2,383 backers
\$604,978 pledged of \$80,000 goal
0 seconds to go

Testing period
Sep 12, 2013 - Oct 10, 2013 (35 days)

Project by SIVENSE, Los Gatos, CA
Contact me

First created 1 backed
Has not connected Facebook
Website: siveness.com
See full list

Wireless, modular motion tracking system for the most natural and intuitive interaction with video games, virtual reality, and more.

LinkedIn Search for people, jobs, companies, and more

Home | Profile | Network | Jobs | Members

Richard Branson
Founder at Virgin Group
Virgin Islands (City) · Aviation & Aerospace

Follow **4,037,560** members

Published by Richard
See more »

- Best Advice: Protect the Doomsday** February 20, 2014
- How to Start a Company at 24 Feet** February 11, 2014
- Productivity Hack: It's All in the Eyes** February 21, 2014

Background

Experience

Founder
Virgin Group
January 1988 - Present (26 years 3 months)
Teaching adventure and thrill seeker, who believes in turning ideas into reality. Otherwise known as Dr.

People Also Viewed

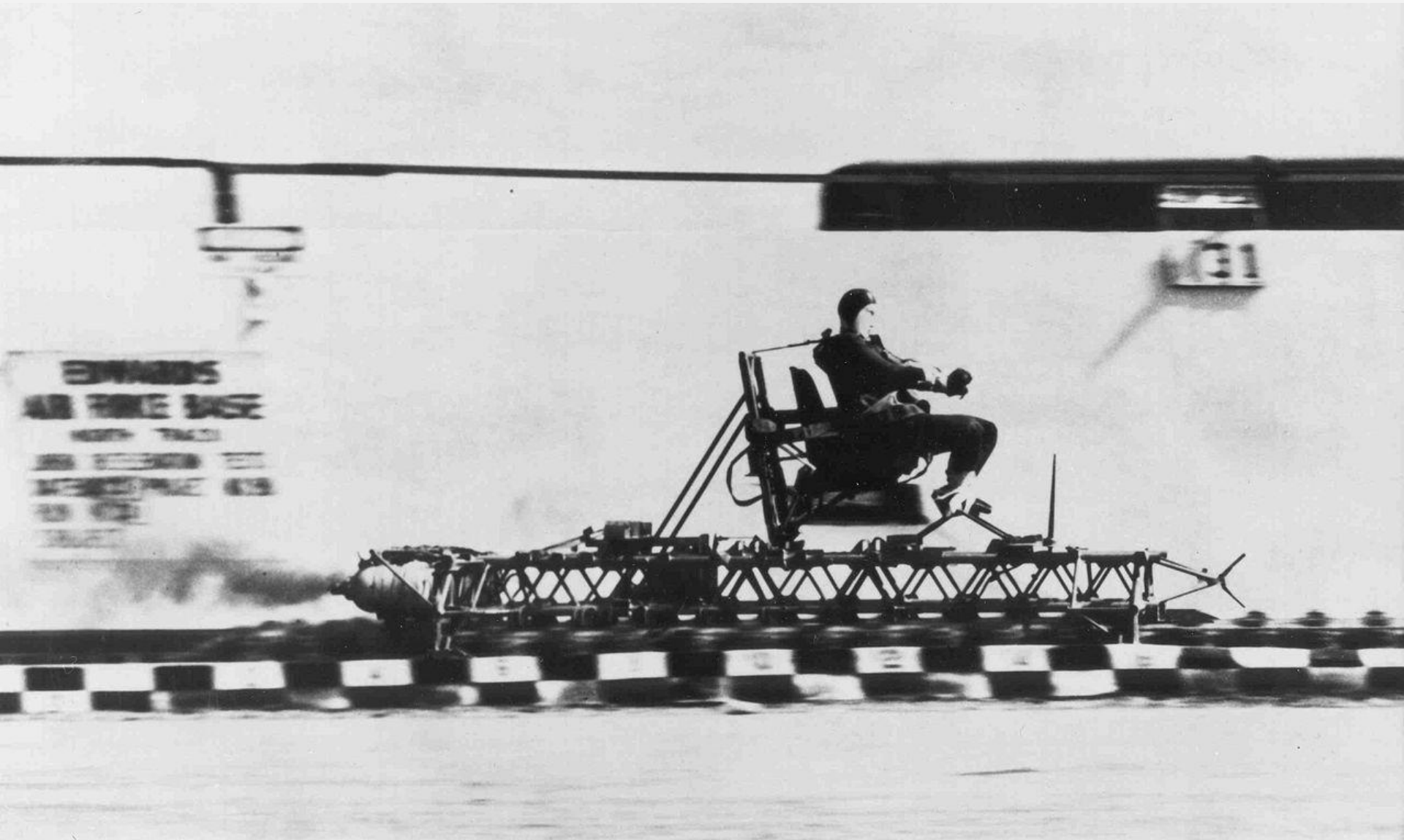
- Bill Imlay
- Barack Obama
- Jeff Weiner
- Markus Mayer
- Alexandra Hollington
- Deepak Chopra MD
- Edouard Savaris
- Jack Welch



Looking to the Arts - Minority Report (2002)



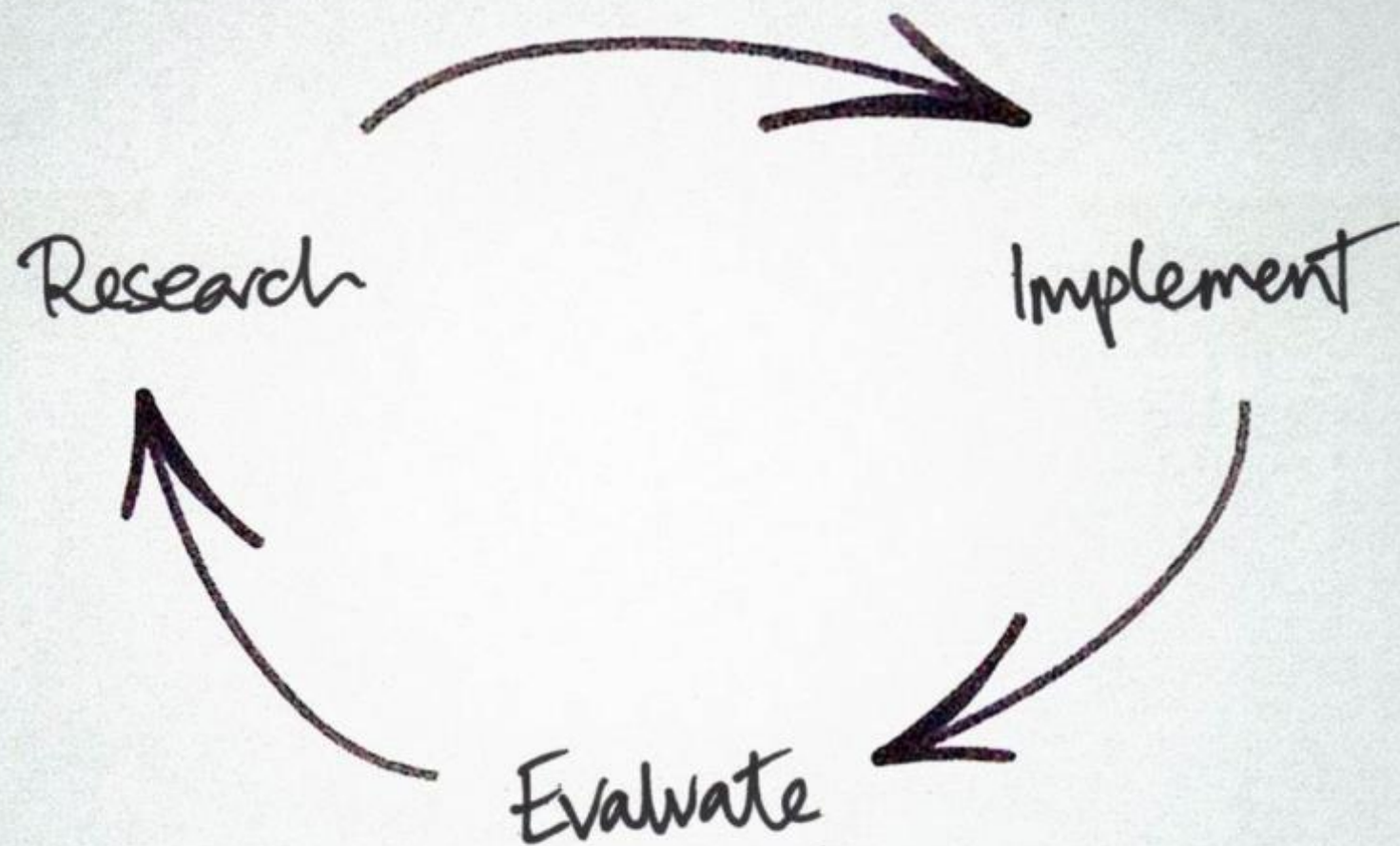
Carry out Trials with the User!



THINKE



THINKE



Some ICT Challenges and Opportunities

- ICT is now much more than Office Applications
 - eg. Training, Education, Communicating
- Balancing User Demands with Enterprise Realities
 - Early Adopters and the “Race to be Second”
- Rate of Technology Change
 - Humans and Machines and Sensors
 - Looking to Other Sectors
- Engaging People
 - Looking to Arts and Entertainment
- Continuous Cycle
 - Research – Implement - Evaluate





?

Questions