



VIRTUAL AND SYNTHETIC TRAINING

TOMORROW'S NEW SIMULATION FOR A MORE EFFICIENT AEROSPACE INDUSTRY

Marc St-Hilaire, Vice President, Technology and Innovation

April 26, 2016



WHO WE ARE

CIVIL



DEFENCE & SECURITY



HEALTHCARE



A world leader in the delivery of training and in designing the industry's most comprehensive training solutions

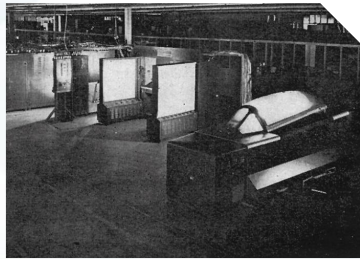


A BIT OF HISTORY



Founded

1947



**First
simulator**

1952



**50%
market share
in FFS Sales**

1979



**70+%
market share
in FFS Sales**

1990s



**Our roots:
Simulation
Products**

TODAY: GLOBAL FOOTPRINT

8,000
Employees

30
Countries

160
Sites

Customers in
190 countries



IN SUMMARY

- ▶ Nearly 70 years of breakthrough innovation
 - ◆ C\$1.2 B invested in R-D over the past 10 years
- ▶ Annual revenue > C\$2B
- ▶ Approximately 8,000 employees with 5,000 outside of Canada
 - ◆ Emerging markets leader
- ▶ Expertise and credibility in aviation training
 - ◆ 120,000+ pilots and crewmembers trained by CAE annually
 - ◆ Comprehensive solutions provider
 - ◆ Largest installed base of flight simulators globally

Exciting company with good growth potential



FORUM **AEROSPACE** INNOVATION

➤ APRIL 25 AND 26, 2016

**COLLABORATE
GLOBALLY
TO DEVELOP
AEROSPACE
INNOVATION**



IN COLLABORATION WITH:



ORGANIZED BY:

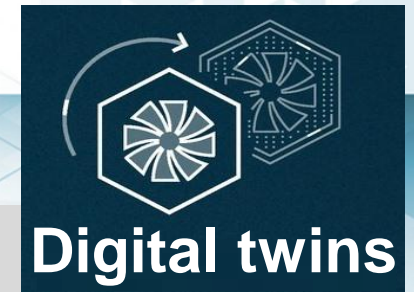


Québec's Aerospace Cluster

COMPETITIVE FUNDAMENTALS



COMPETITIVE FUNDAMENTALS



For each of those moving aircraft, there are dozens of

Digital twins

From the day they were designed and manufactured...



...we are now talking about the **Smart Factory**

...To their operation life optimization and maintenance...



...we are now talking about **Connected Smart Objects**

...With all their related operational sectors, like crew, passengers, baggage, air traffic...



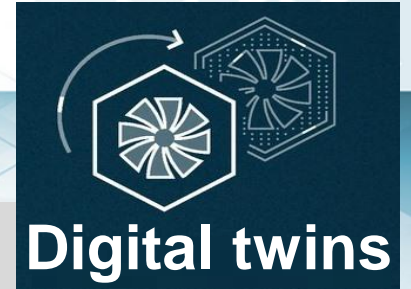
...we are now talking about **Big Data and Internal Search Motors** to break down the silos of traditional IT systems

...All of that for the ultimate goal: the best customer experience (from their early idea of a trip to delivering the service)...



...we are now talking about **Predictive Customer Behavior** technologies

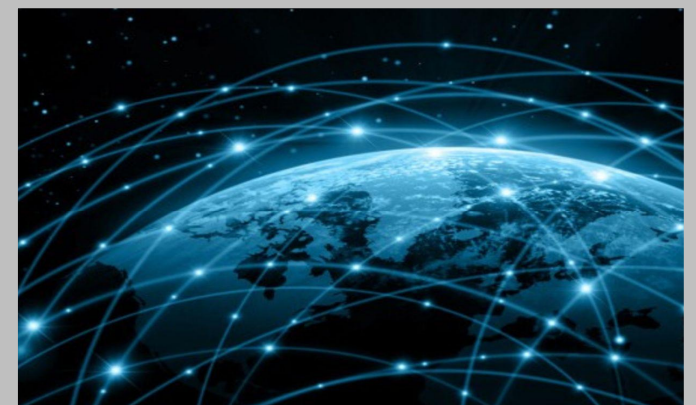
COMPETITIVE FUNDAMENTALS



For each of those moving aircraft, there are dozens of

Digital twins

Value creation from the digital synthetic world is overtaking the traditional industry sectors



Aerospace industry is going through a transformation
from **Carbon** to **Silicon**

THE EVOLUTION OF TRAINING

From **live** training... ...to **virtual** training



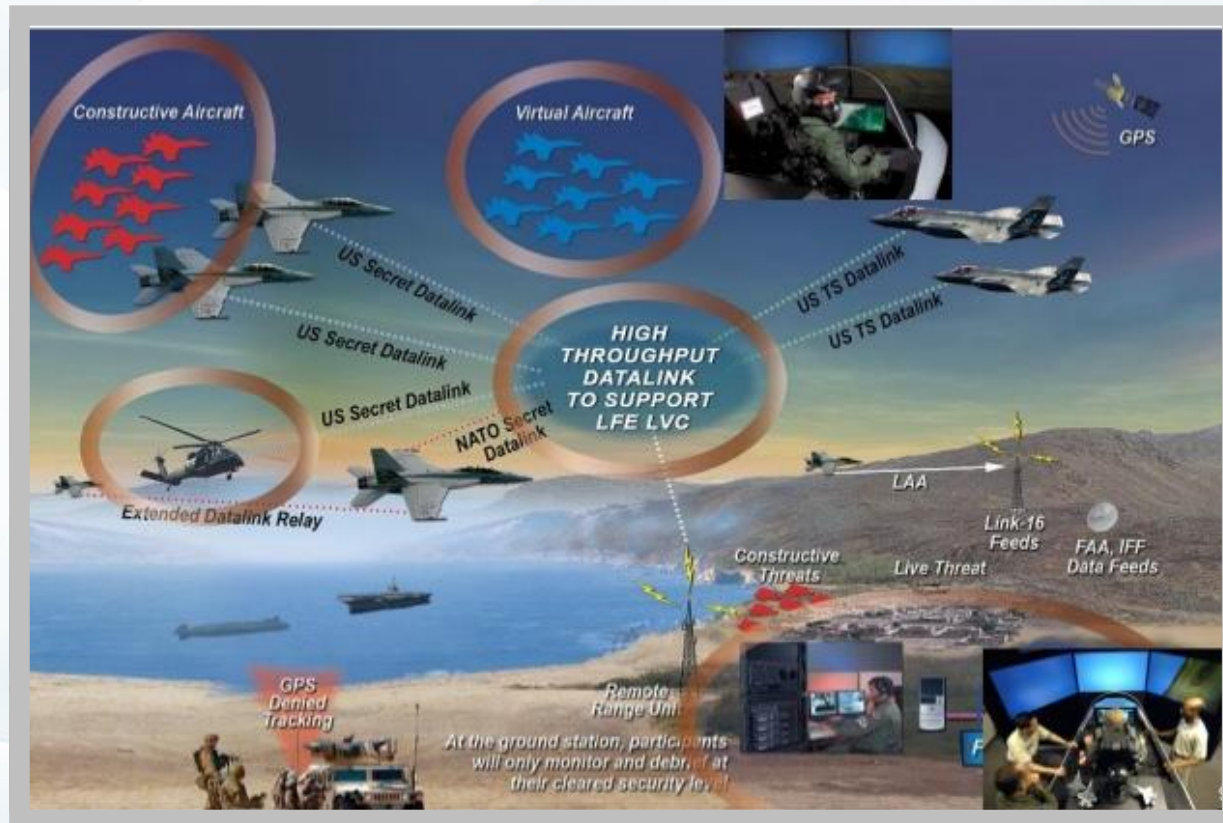
THE EVOLUTION OF TRAINING

Constructive content *linked* to Virtual content

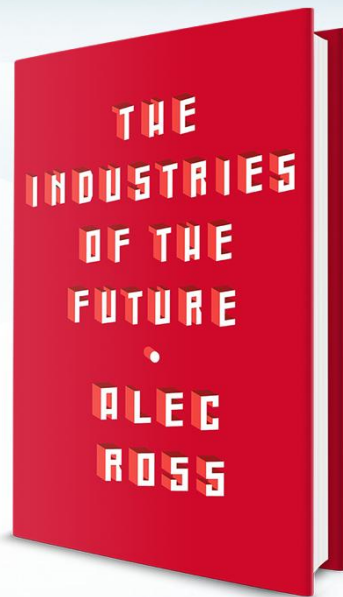


THE EVOLUTION CONTINUES

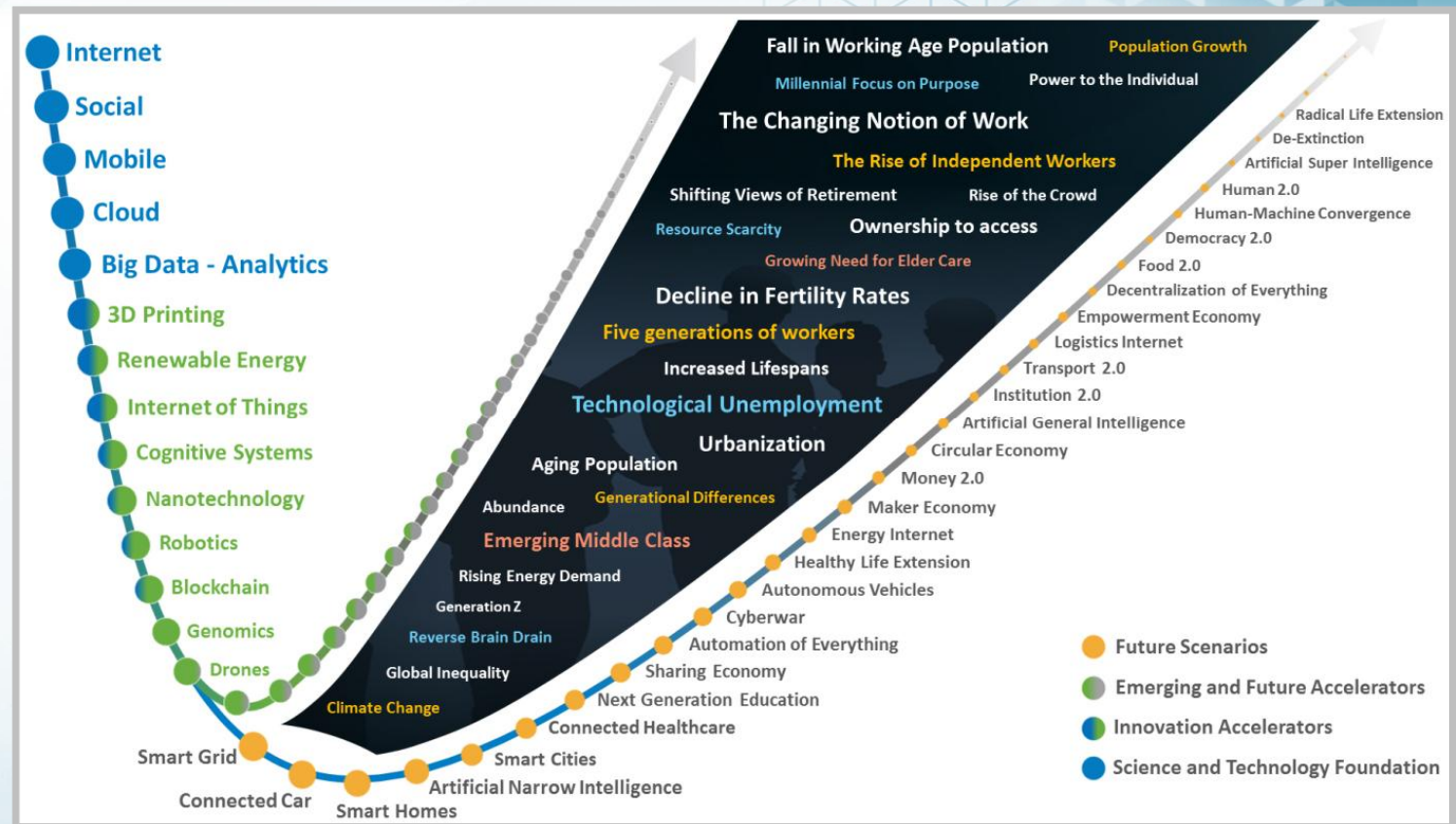
Connecting the real world to **Virtual** and **Constructive** worlds



LOOKING FORWARD

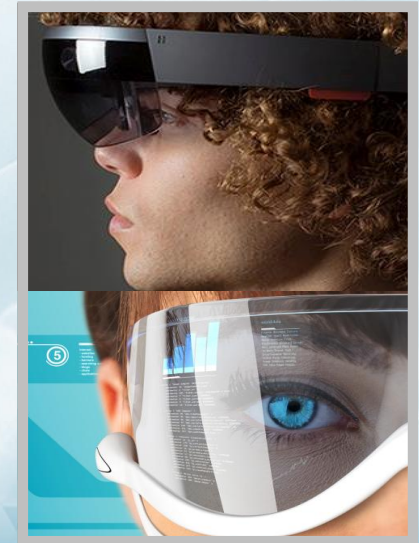
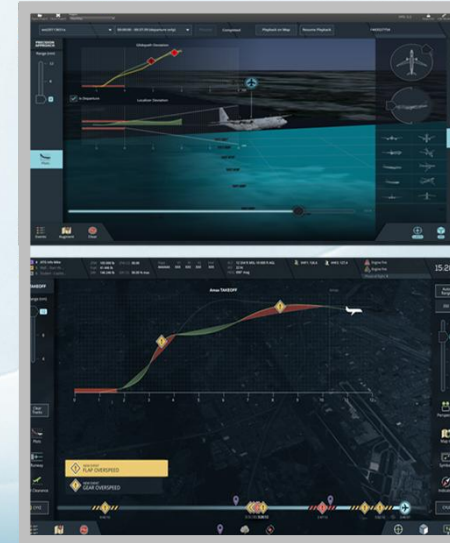
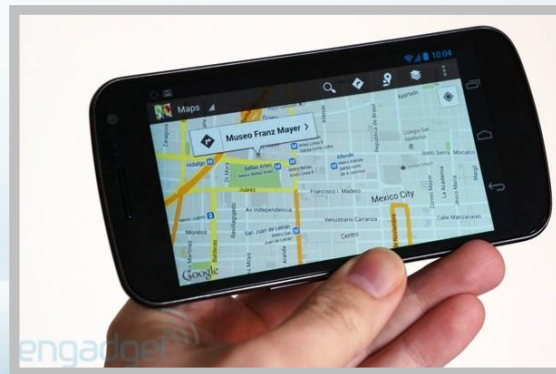


Alec Ross,
Technology Policy Expert who was
Senior Advisor for Innovation to
[Secretary of State Hillary Clinton](#)
for the duration of her term
as Secretary of State.



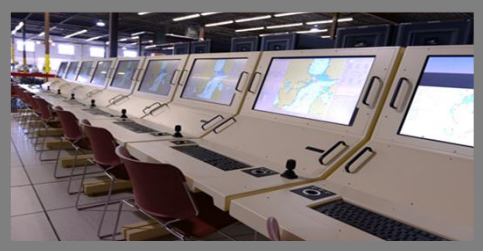
NEW DIGITAL TECHNOLOGIES TAKING AEROSPACE TO A TIPPING POINT

- ▶ Single open architecture synthetic environment
- ▶ Single one-world terrain standard
- ▶ “Point of need” content delivery technology
- ▶ “Internet of Things” sensors
- ▶ Big data analytics
- ▶ Artificial intelligence
- ▶ Automated intelligent tutors
- ▶ Augmented reality



OPPORTUNITY – LARGE SCALE SIMULATION

Mission team training - NAVAL



CONCRETE EXAMPLES OF NEW SIMULATION TOOLS FOR MORE EFFICIENT AEROSPACE APPLICATIONS



~\$20,000 to conduct a three-hour refuel training mission



~\$1,000 in simulators while delivering more and higher quality training

CONCRETE EXAMPLES OF NEW SIMULATION TOOLS FOR MORE EFFICIENT AEROSPACE APPLICATIONS

CAE C-130 Aero Medical Trainer



SO WE WILL TALK ABOUT INTERSECTIONS INSTEAD OF CONVERGENCE

*“When you step into an **intersection** of fields, disciplines, or cultures, you can combine existing concepts into a large number of extraordinary new ideas.”*

“IF YOU CAN’T READ IT AND COME UP WITH AT LEAST A MINOR MONA LISA OR TWO, YOU’RE NOT TRYING.”

—Entrepreneur Magazine

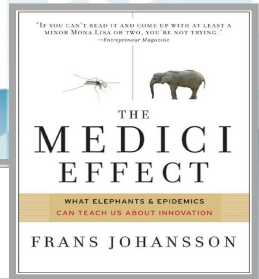


THE
MEDICI
EFFECT

WHAT ELEPHANTS & EPIDEMICS
CAN TEACH US ABOUT INNOVATION

FRANS JOHANSSON

SYNERGIES BETWEEN FIELDS



An exponential increase in concept combinations



ROCK



CLASSICAL MUSIC

Instruments

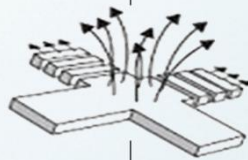
Structures

Voices

Combinations

$$4 \times 12 \times 50 = 2\,400$$

$$30 \times 40 \times 2 = 2\,400$$



~ 6 millions



New innovations in aerospace will come from **collaboration** and **intersection** with other industries



Medical



Digital



Gaming



MOOC





Thank you!

