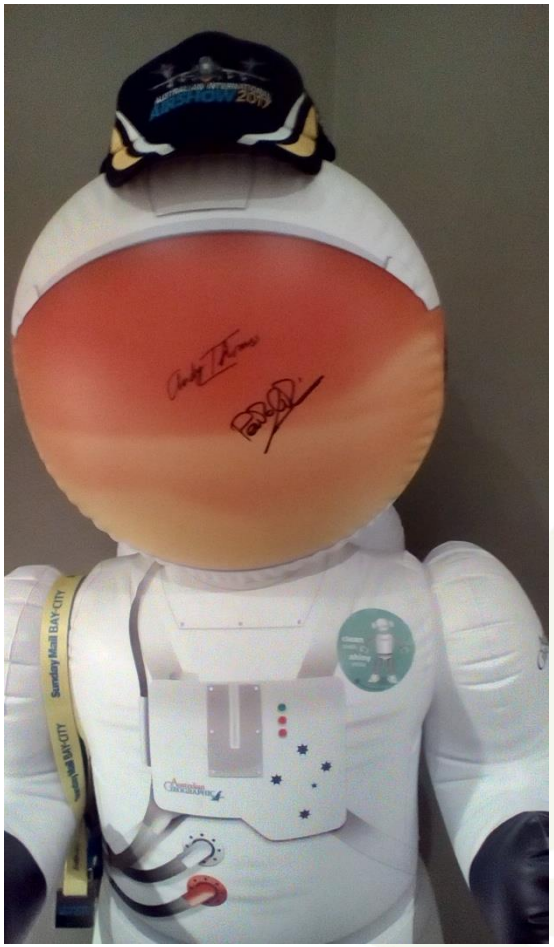
I am sorry for *Droning* On, But Don't Forget The Human Factor

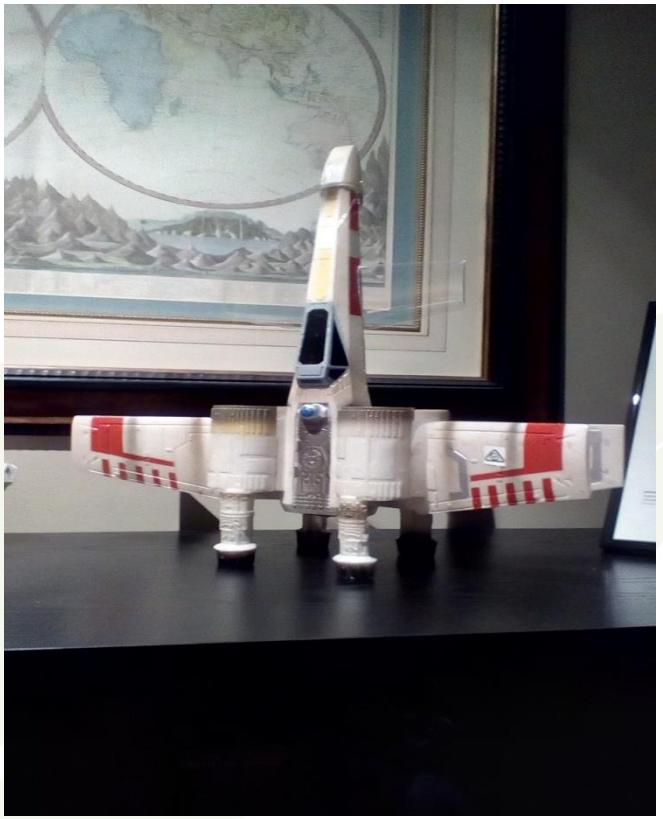
Jo Hamilton (SQNLDR SR)

8th August 2017

HumanFactors [SA]
AUSTRALIA

Geek Credentials





Overview

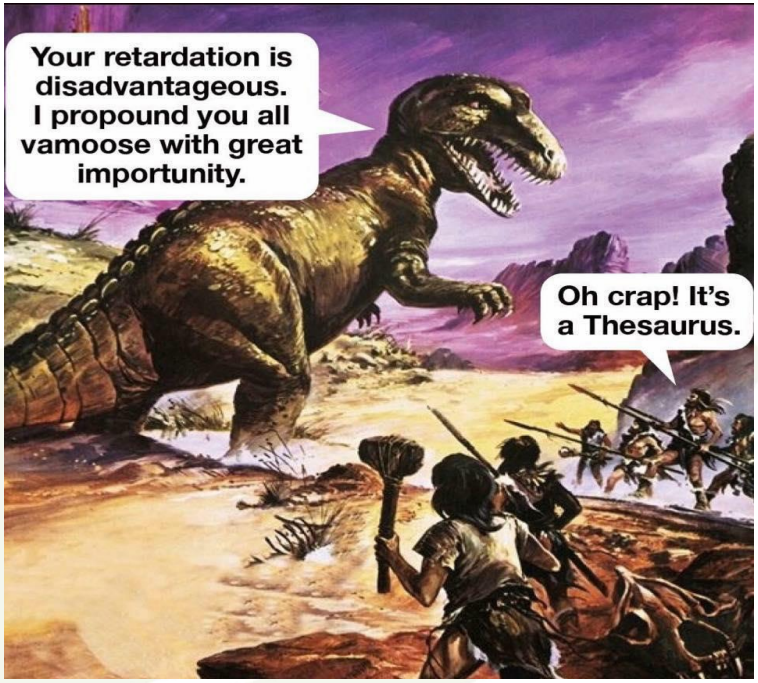
- The focus is on the *Human* Factor
- Drones 101
- Unintended consequences
- Possibilities
- The “real” human factor

The Focus is on the Human

How *humans* behave physically and psychologically in relation to particular environments, products, or services.

What is a Drone?

- Unmanned Aircraft (UA)
- Remotely Operated Aircraft (ROA)
- Remotely Piloted Vehicle (RPV)
- Unmanned Aerial Vehicle (UAV),
- Remotely Piloted Aircraft (RPA)



What Are They Used For?

- Load-Delivery
- Passenger Transport
- Hobby and Entertainment Uses
- Journalism
- Voyeurnalism
- Law Enforcement
- Community Policing
- Voyeurism
- Hostile Load-Delivery

Predicting the Future from the Past and Present

Rule of Accuracy:
When working toward the solution of a problem, it always helps if you know the answer.

Corollary:
Provided, of course, that you know there is a problem.

Corollary Corollary:
Every solution breeds new problems.

Human Behaviour is Unpredictable

"Next Christmas the iPod will be dead, finished, gone, kaput."

(Alan Sugar, 2000)

"Using Twitter for literate communication is about as likely as firing up a CB radio and hearing some guy recite The Illiad."

(Bruce Sterling in The New York Times, 2007)

"There is no chance that the iPhone is going to get any significant market share. No chance."

(Microsoft CEO Steve Ballmer, 2007)

"I think there is a world market for maybe five computers."

(**Thomas Watson, chairman of IBM, 1943)**

Human Behaviour is Unpredictable

"I predict the internet will soon go spectacularly supernova and in 1996 catastrophically collapse."
(Robert Metcalfe, inventor of Ethernet, 1996)

"Atomic energy might be as good as our present-day explosives, but it is very unlikely to produce anything more dangerous."
(Winston Churchill, 1939)

The Humans Factor

It Probably Won't Be the Obvious Concern

- About half of the 180 occurrences from 2012 to 2016 involved near encounters with manned aircraft.
- To date, there have been no reported collisions between RPAS and manned aircraft in Australia.
- Collisions with terrain, accounting for 52 occurrences between 2012 and 2016
- Terrain collisions were most commonly associated with a loss of control (about 40 per cent), a bird striking the RPAS (about 10 per cent), or engine failure or malfunction (10 per cent).
- World-wide, there have been five known collisions. (*ATSB, 2016*)

It Probably Won't Be the Obvious Concern

- Crash into White House gardens
- Dead cat made in drone named Orville
- Pokemon drone used to cheat
- Drone crash into hot springs –ecological damage
- Flame thrower drone
- Drug delivery into prisons
- Drone used to walk son to school
- Drone steals dog
- Drone operator fined for starting a bushfire in West Australian farmland

Why Worry?

A high reliability organisation is chronically uneasy. It knows things will go wrong, and a safe culture is one that's constantly reminding you to be afraid, to be wary.

(Professionals) are the ones who recognise error-prone situations, detect their errors, have considered the possibility of going wrong in these circumstances, have contingencies in place, and can compensate for it.

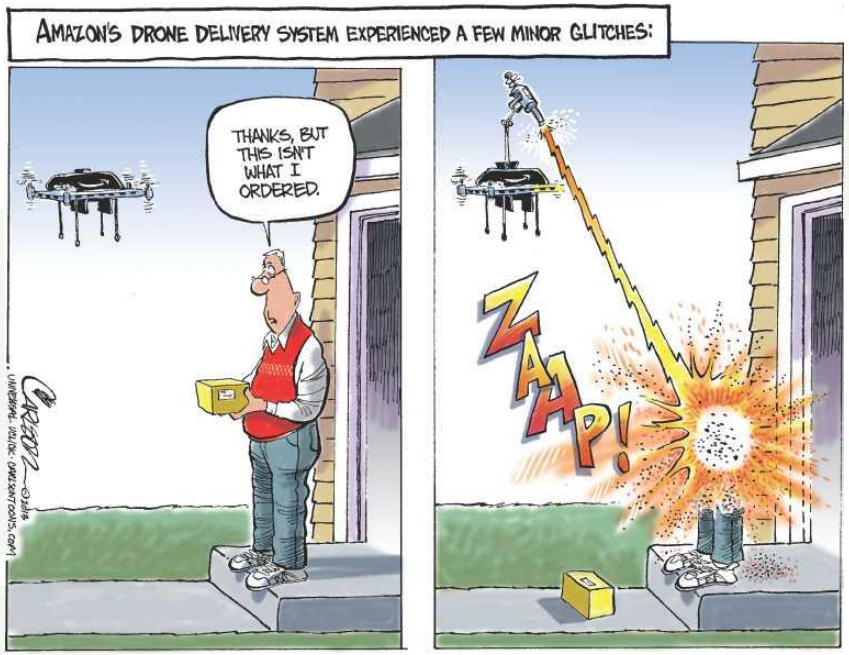
James Reason

Some Relevant Lessons from Automation?

- Decision making – whose decisions – designer, the drone, the operator?
- Monitoring and display
- Overreliance / Complacency
- Adequacy of training
- Situational awareness / vigilance
- Inappropriate use of systems
- Loss of manual proficiency
- Design faults / automation surprises

Some Relevant Lessons from Automation?

- How do you control for ethics? Whose ethics?



Ethical Issues

- Voyeurnalism
- Law enforcement - unconstrained surveillance
- Permanent drone enabled “neighbourhood watch”
- “Community protection” used to indulge in voyeurism
- Hostile load-delivery
- Drones malperformance arising from information overload on analysts

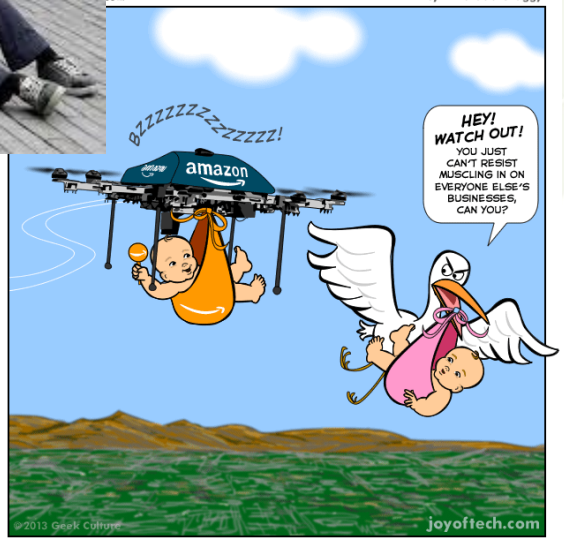
Some Relevant Lessons from Automation?

- How do we consider cultural differences?
- The “Gulfs of Execution and Evaluation”

The Future

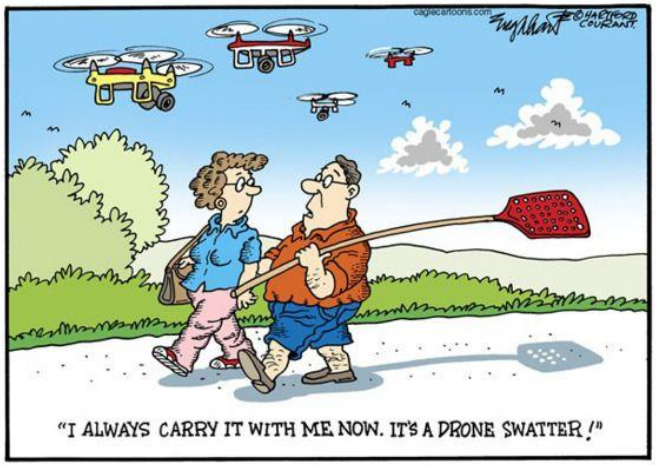

DRONE
TAXI


amazon
Prime Air


BZZZZZZZZZZZZZZZ!
amazon
HEY! WATCH OUT!
YOU JUST CAN'T RESIST MUSCLING IN ON EVERYONE ELSE'S BUSINESSES, CAN YOU?
by Nitrozac & Snaggy
©2013 Geek Culture
joyoftech.com

Backyards of the Future

The Fundamental Orifice Factor



Things we never thought of, take on a life of their own

The Human Factor

Practices do not follow rules rather rules follow evolving practices.

Dekker, 2014

Form follows Function

Louis Sullivan

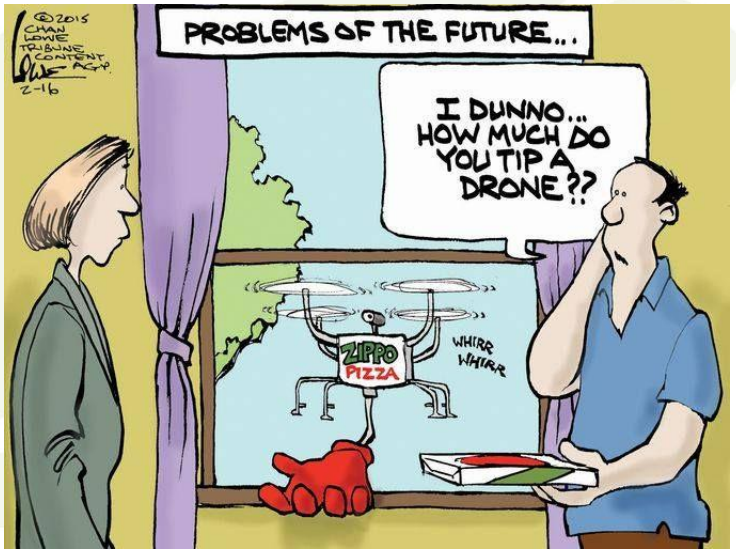
Answers?

\

The problem is that we don't know if there will be a problem.

Will there be:

- Black Swan events
- Drift Into Failure
- Unintended consequences
- WT? moments
- Oh of courses!



References

ATSB (2017) *A safety analysis of remotely piloted aircraft systems 2012-2016* Aviation Research AR-2017-016

Clarke, R (2014)Understanding the Drone Epidemic *Science Direct* *www.Sciencedirect.com*

Dekker, S. (2014) *Safety Differently: Human Factors for a New Era.* Apple Academic Press, CA.

Gladwell, M. (2011) *The Tipping Point. Little Brown an Co, US*

Pappota, M & de Boera, R. (2015). The Integration of Drones in Today's Society. *Procedia Engineering* 128 54 – 63

•Wickens, C. D. & McCarley. J.S. (2005). Human Factors Concerns in UAV Flight. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting.*

Contact

Jo Hamilton:

jmh11@iprimus.com.au

0419849017