

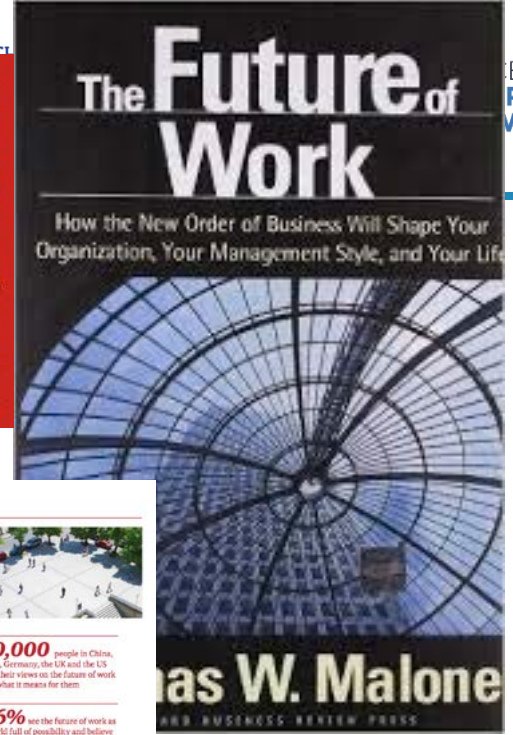
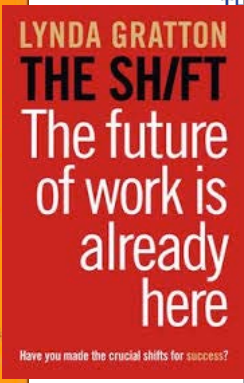
Future Work: Implications for Job Quality and Employee Skill

Sharon K. Parker

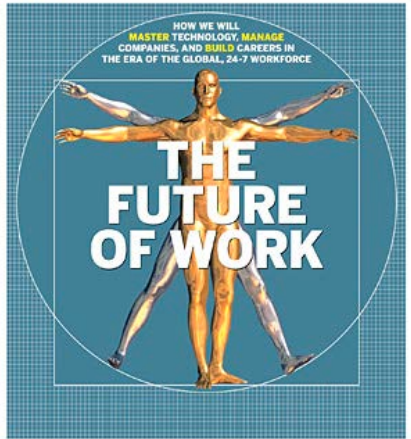
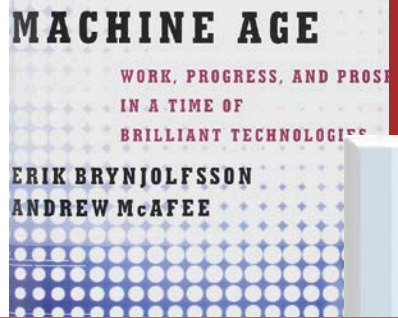
Australian Research Council Laureate Fellow

UWA → Curtin University

parkersharonk@gmail.com



ENTRE FOR
TRANSFORMATIVE
WORK DESIGN



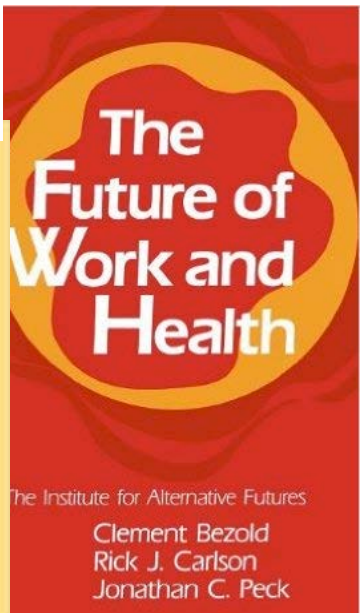
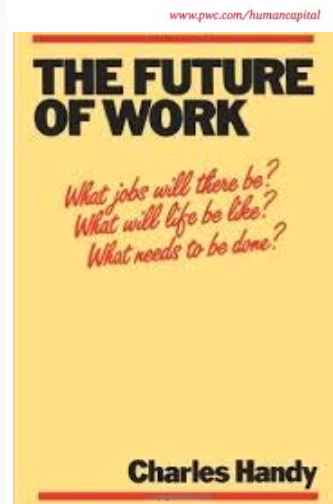
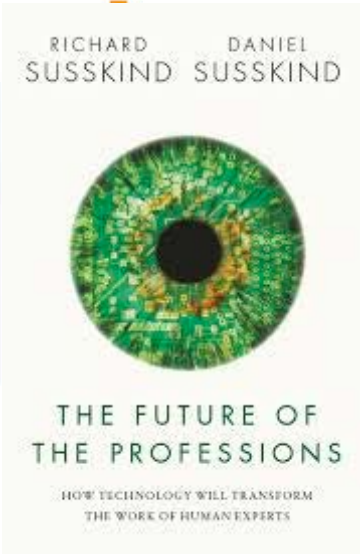
The future of work
A journey to 2022



10,000 people in China, India, Germany, the UK and the US give their views on the future of work and what it means for them

66% see the future of work as a world full of possibility and believe they will be successful

53% think technological breakthroughs will transform the way people work over the next 5 - 10 years





What &
how

- Technology
- Laws & regulations
- Short-term contracts
- Insecure contracts

What risks and
opportunities does
technology present?
How should we respond?

Changes in Work

Where
& when

- Globalisation
- Strategic alliances
- Virtual working
- Crowdsourcing

Who

- Diversity (racial, ethnic, gender)
- Ageing
- outsourcing

If you were able to fold a piece of paper 42 times, how high would it be:

1. As high as a desk
2. As high as the average Australian ceiling
3. As high as Big Ben in London
4. As high as the moon

Features of the new technologies

- From physical to cognitive
- Processing power (Moore's law) + Big data + knowledge engineering (algorithms)

Examples

- Winning at Chess (1997) & Go (2016)
- Financial reports
- Making investment decisions/
diagnosing disease
- Classical music



Plan



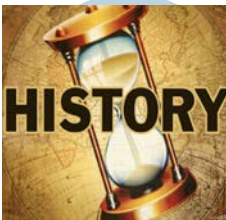
Opportunities & risks of new technologies



Importance of good work design



Work design & new technologies



How do we move forward?

Risks (Dystopian)

- Eradicating jobs including white collar
 - Frey & Osborne (2013) 47%
- Divide between rich/ educated and poor/uneducated
- Threats to privacy
- Algorithmic discrimination
- Killer robots



Facebook Co-Founder Wants Basic Income Before Robot Takeover

“The development of full artificial intelligence could spell the end of the human race”. (Stephen Hawking)

Opportunities (Utopian)



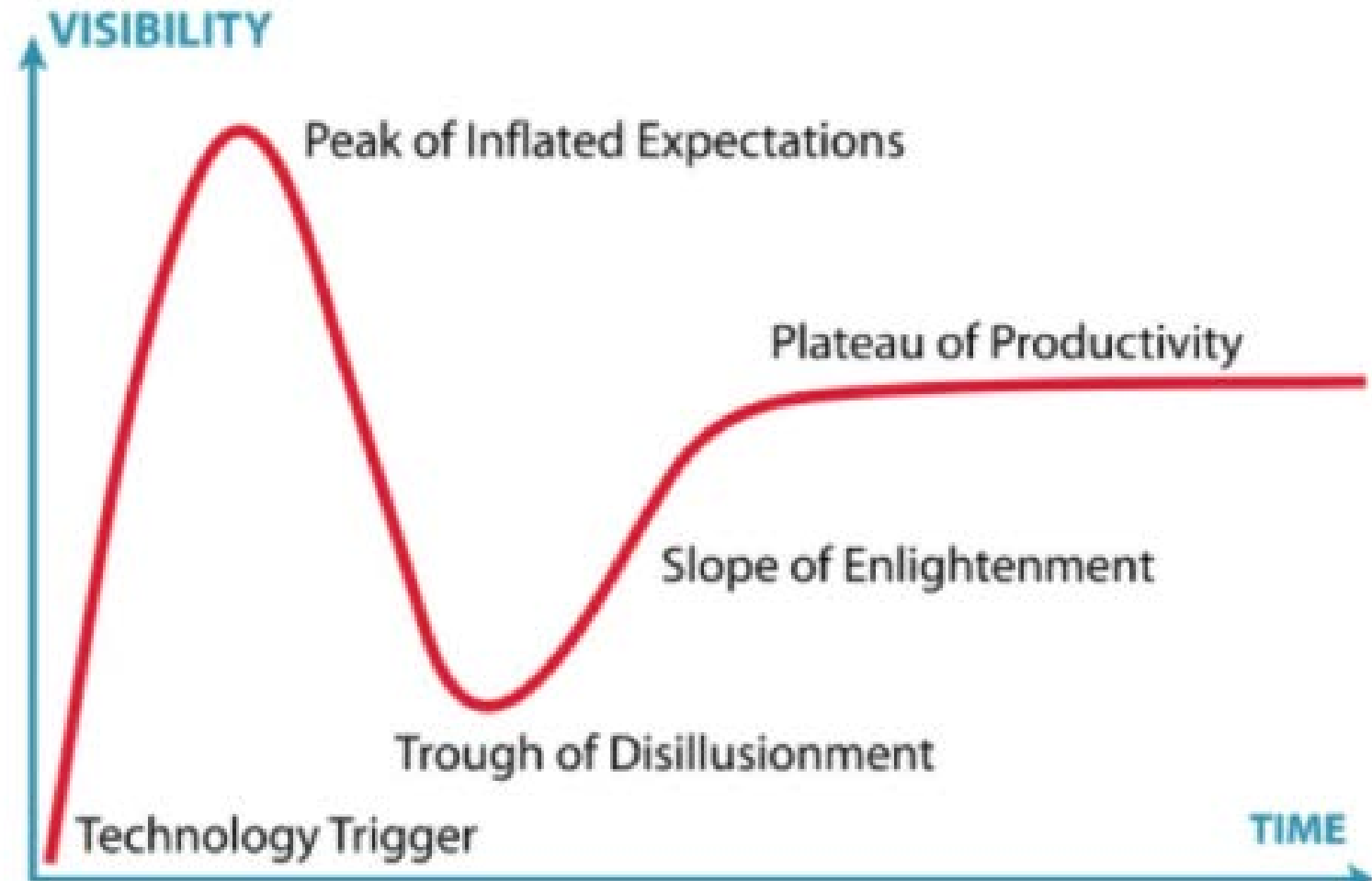
- Only 5% of jobs will be eradicated
- “Dirty, dangerous, dull” jobs will be replaced
- New jobs will grow
- Amazing achievements
 - Productivity
 - Eradicate disease
 - Forecasting the weather
 - etc

“Right now a Masai warrior with a cell phone has better mobile phone capabilities than the president of the USA did 25 years ago. And if he’s on a smart phone with access to Google, then he has better access to information than the president did just 15 years ago” (Diamandis & Kotler, 2012)

Where does the truth lie?

Gartner Hype Cycle

Answer
Somewhere
in between –
we've been
here before



Where does the truth lie?

Answer

Both are true: **It depends on the choices we make**

How do we maximise the opportunities and minimize the risks?

How do we maximize the
opportunities and
minimize the risks?

Adapt humans to the new work/technology

Get Right Skills & Values

- Creativity
- Emotional intelligence
 - Ethics
- Computational thinking
- Lifelong learning

Larger Life Changes

Basic income, tax changes,
shorter working hours, etc

W O R K

Adapt the work/technology to humans

*This perspective is
relatively neglected*

But important!

*60% of occupations - 30%
of their tasks potentially
automatable*

Plan



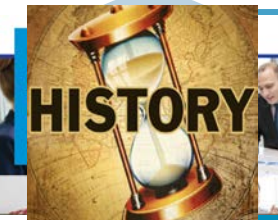
Opportunities & risks of new technologies



Importance of good work design



Work design & new technologies



How do we move forward?

Good work design

The **autonomy** to make decisions
Varied tasks that are meaningful
Support from colleagues and supervisor
The chance to use one's **skills**
Development & **growth opportunities**
Doing a “**whole**” job
Feedback from the job itself
Connection with the end user

A **manageable** work load
A lack of role conflict & ambiguity
Well-managed change
Moderate emotional demands

**High Job
Resources
(Psychological)**

**Reasonable Job
Demands**



**Mental health &
well-being**

**Performance &
productivity**

Innovation

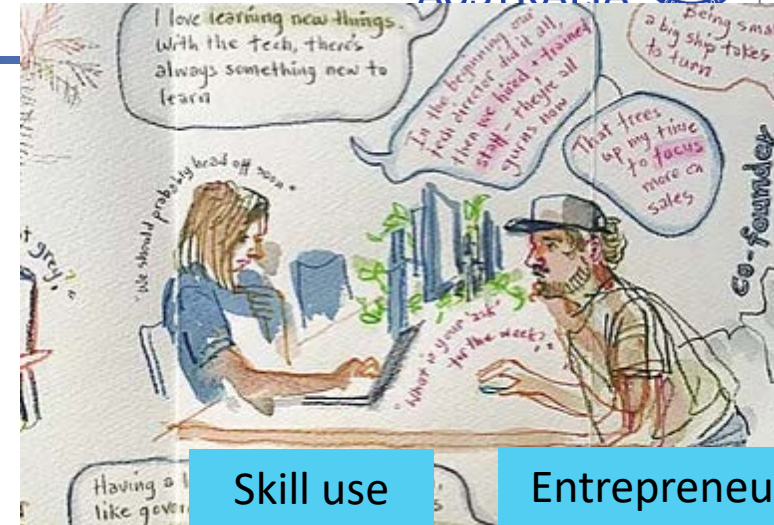
Safety

High Job Resources



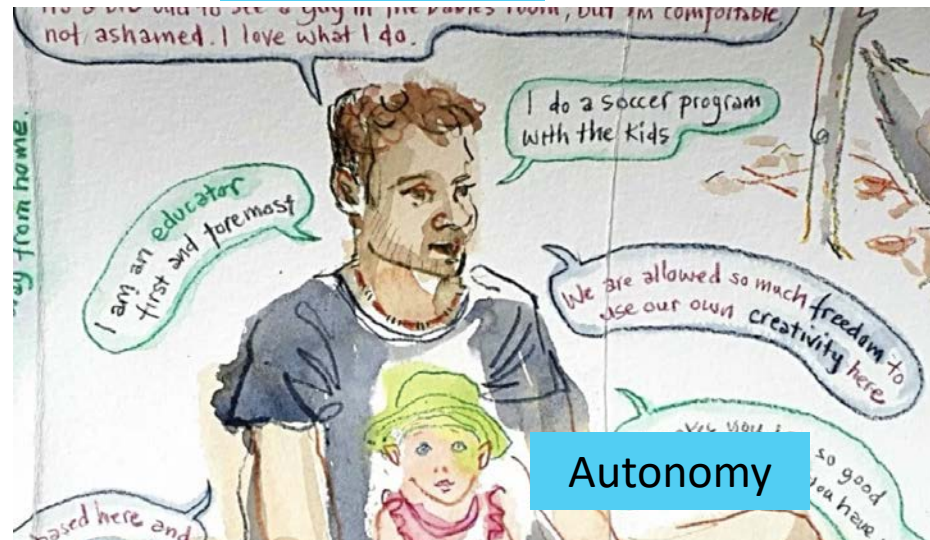
Support

Childcare
workers



Skill use

Entrepreneur



Autonomy



Lack job resources
(low autonomy)

Academic

Moderate Job Demands



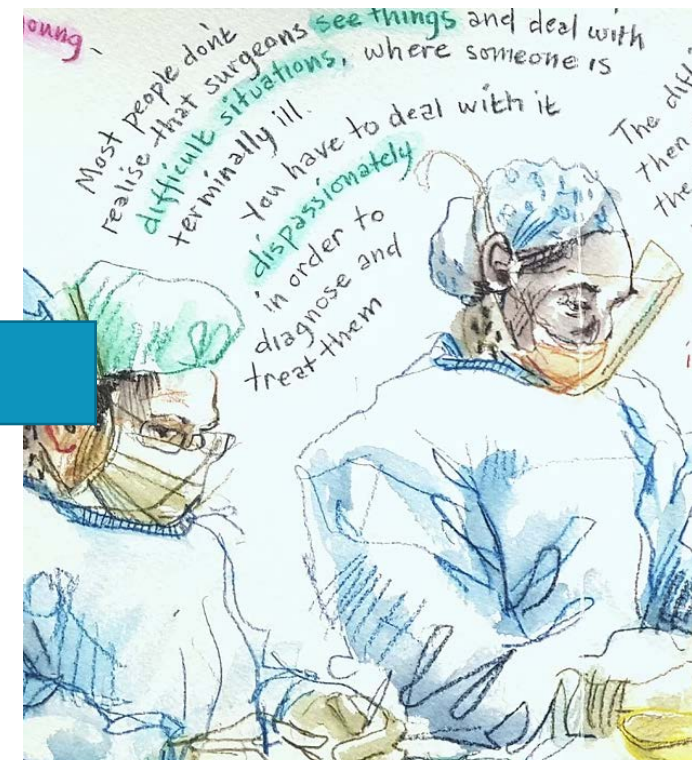
Time pressure

Geneticist



Emotional demands

Call centre debt collector



Hand surgeon

Plan



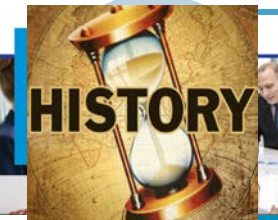
Opportunities & risks of new technologies



Importance of good work design



Work design & new technologies



How do we move forward?

Technology and skill use

Example: Aviation



U.S. Department
of Transportation
**Federal Aviation
Administration**

<http://www.faa.gov/otl>
A SAFO contains importa
valuable to air carriers in
interest. Besides the speci
issue named in the SAFO.

Subject: Manual Flig

Purpose: This SAFO

Background: A recent analysis of flight operations data (including normal flight operations, incidents, and accidents) identified an increase in manual handling errors. The Federal Aviation Administration (FAA) believes maintaining and improving the knowledge and skills for manual flight operations is necessary for safe flight operations.



**U.S. Department
of Transportation
Federal Aviation
Administration**

SAFO
Safety Alert for Operators

SAFO 13002
DATE: 1/4/13

Flight Standards Service
Washington, DC

should be especially
gree of safety in the public
re in addressing the safety

on appropriate.

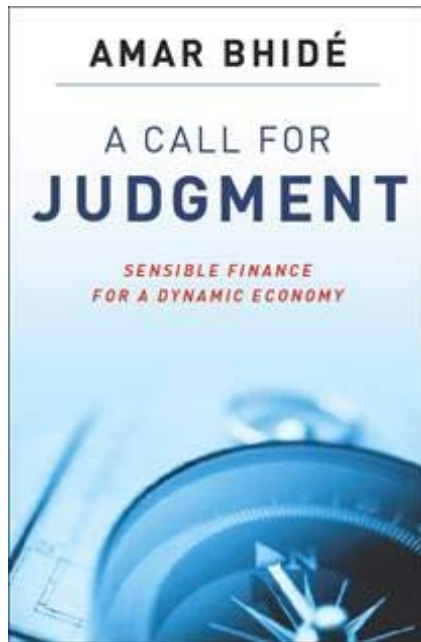
“We’re forgetting
how to fly”



Overuse of automation:
*“leads to a degradation of the
pilot’s ability to quickly
recover the aircraft from an
undesired state”*

Air France Flight 447 “*total loss of cognitive control of the situation*”

Technology and control



**“robotization of
finance”**

“There is no single algorithm that can combine multiple volatile variables with a multidimensional economic forecasting model that works for all investors. **Expecting that could prove a potentially fatal error for financial markets**” (Alam & Kendall, 2018)

<https://theconversation.com/are-robots-taking-over-the-worlds-finance-jobs-77561>

Robots in Finance Bring New Risks to Stability, Regulators Warn

By **Silla Brush**
1 November 2017, 23:00 GMT+8

Sharon K Parker parkersharonk@gmail.com

Technology and feedback



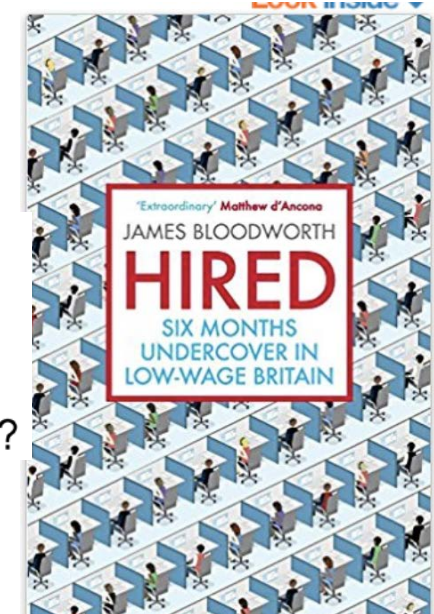
Why the rise of wearable tech to monitor employees is worrying

January 3, 2017 11.06pm AEDT

Technology & demands



Amazon: What's it like where you work?



Peeing in trash cans, constant surveillance, and asthma attacks on the job: Amazon workers tell us their warehouse horror stories

SHONA GHOSH

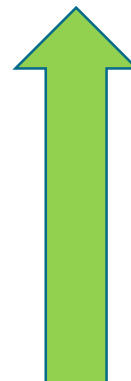
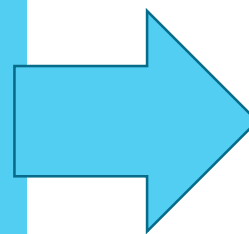
MAY 3, 2018, 8:53 PM

Technology and demands

Electronic monitoring is increasing

Examples

e.g., track key strokes; monitor time on phone; use GPS to track ID cards



Negative for Employees

- Increased stress & burnout
- Lowered perceptions of control, higher demands, & lower support
- Higher blood pressure
- Job dissatisfaction & lower engagement



Mixed Effects on Performance

- Can cause deviant behaviors
- Narrow performance
- Often unintended consequences



These risks can be reduced eg depending on culture, implementation, use, etc.

Technology & team work



“Substitution myth”

Automation needs to be part of a system, designed for co-ordination

“Whether human or machine, a “team player” must be able to observe, understand, and predict the state and actions of others”
(Woods)

- Too little trust = misuse/ neglect
- Too much trust = complacency & automation bias

THE "PATIENT ARCHIVE": A TECHNOLOGY THAT AUGMENTS HUMAN WORK RATHER THAN REPLACES IT



"(Patient Archive is) just one opinion out of many"

Sketchingworkdesign.com

Plan



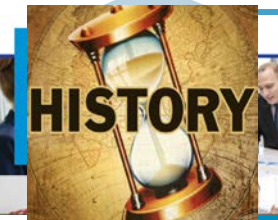
Opportunities & risks of new technologies



Importance of good work design



Work design & new technologies



How do we move forward?

First, learn from history

“Historically..... firms have tended to over-invest in automation without paying enough attention to social issues....” (Grote & Kochan, 2018)



Vs

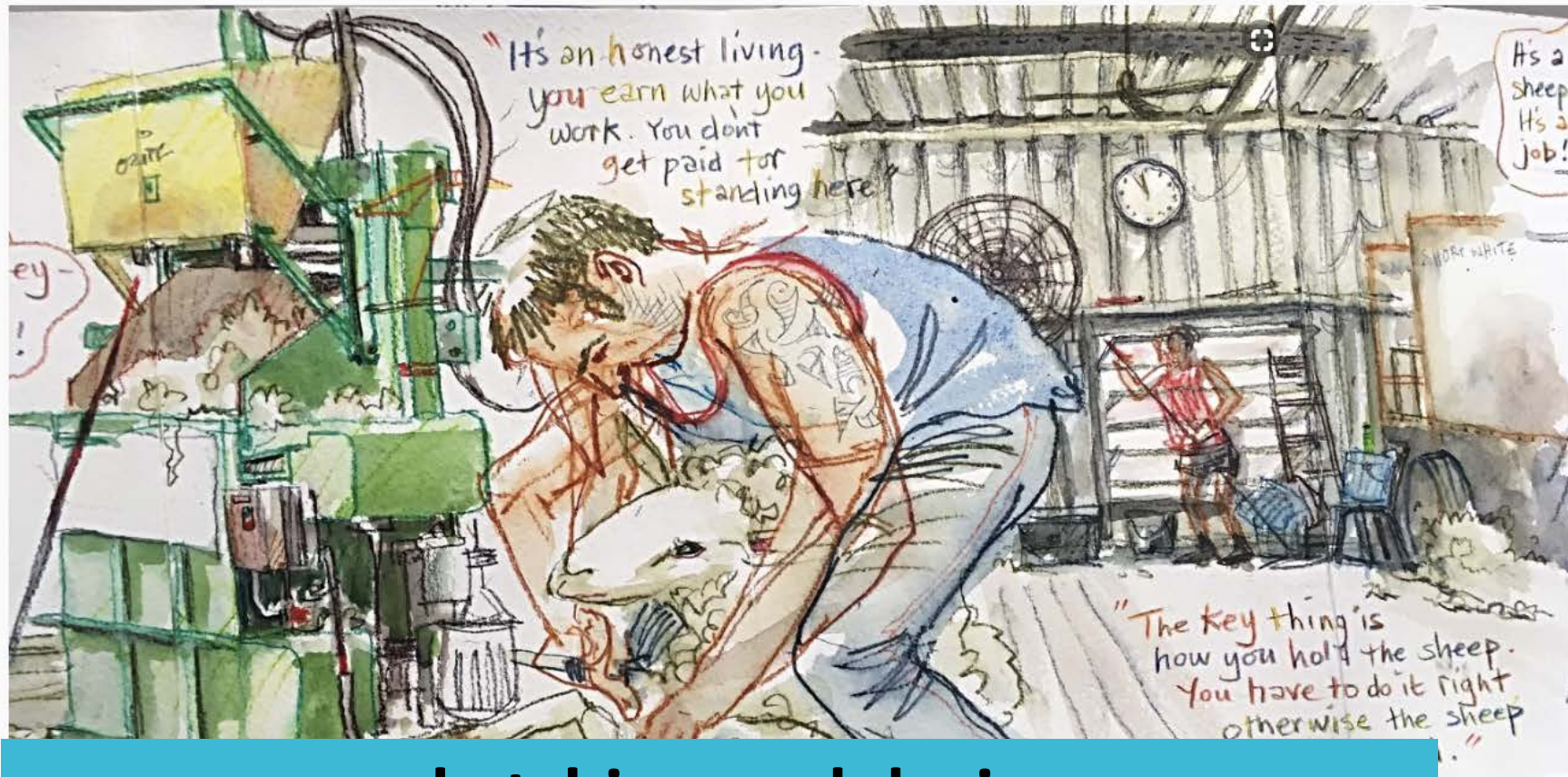


1980s



"NOT IN MY LIFE TIME"

SHEARING JOBS LOOK SAFE FROM ROBOTS FOR SOME TIME TO COME



www.sketchingworkdesign.com

And very recent history



Elon Musk says 'humans are underrated,' calls Tesla's 'excessive automation' a 'mistake'

Katie Roof @katie_roof / Apr 14, 2018

 Comment



April 2018

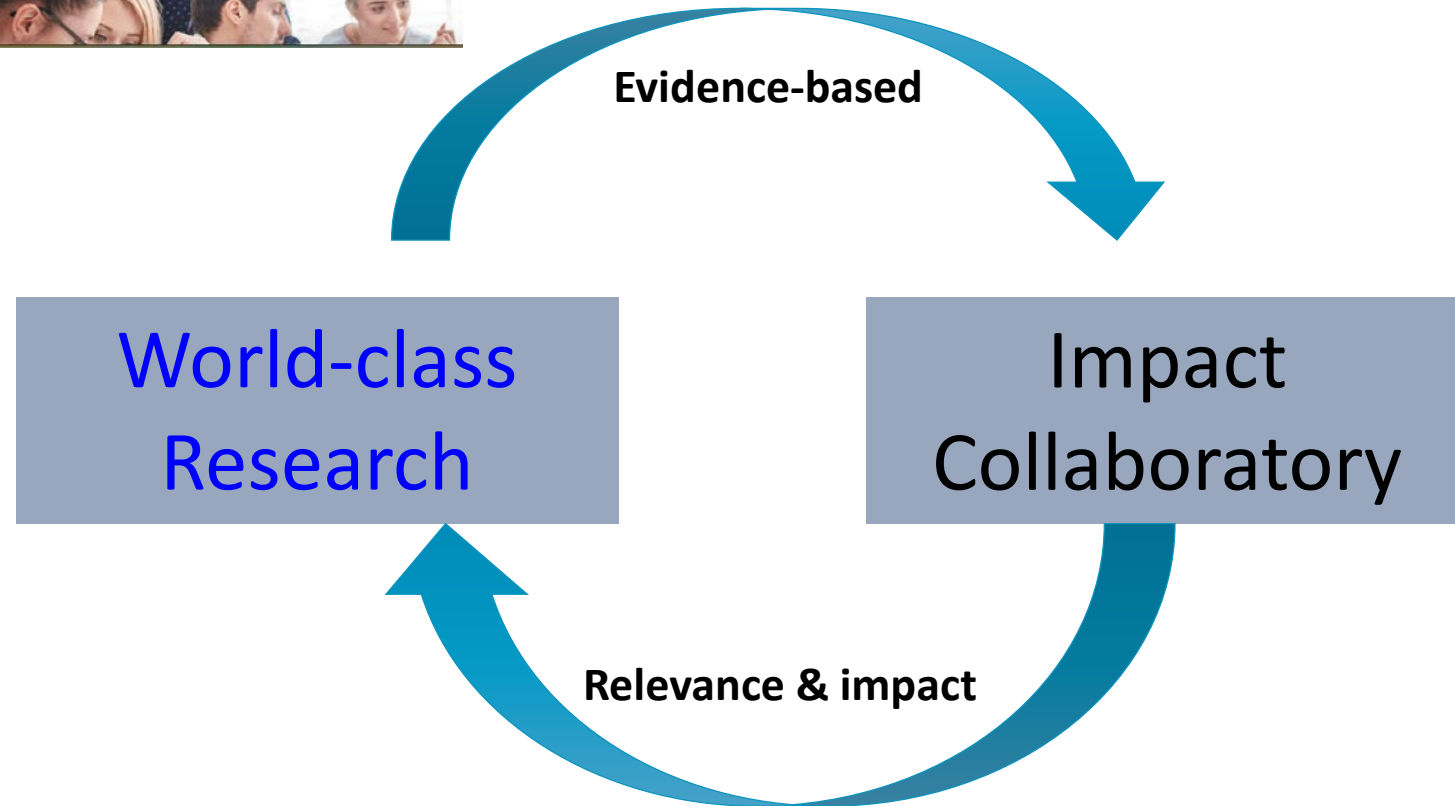
Second use evidence – support research!

E

- How can human skills & learning be maintained?
- What performance & safety risks arise as a result of over-reliance on automation?
- Does electronic monitoring do more harm or more good?
- When should we trust technology? What factors enable trust in technology?
- How should technology be designed so it is an effective team member?
- How do we train people to prevent complacency with automation?



CTWD



Summary



Opportunities & risks of new technologies



Importance of good work design



Work design & new technologies



Moving forward

In conclusion

***The best way to predict the
future is to create it***

www.transformativeworkdesign.com