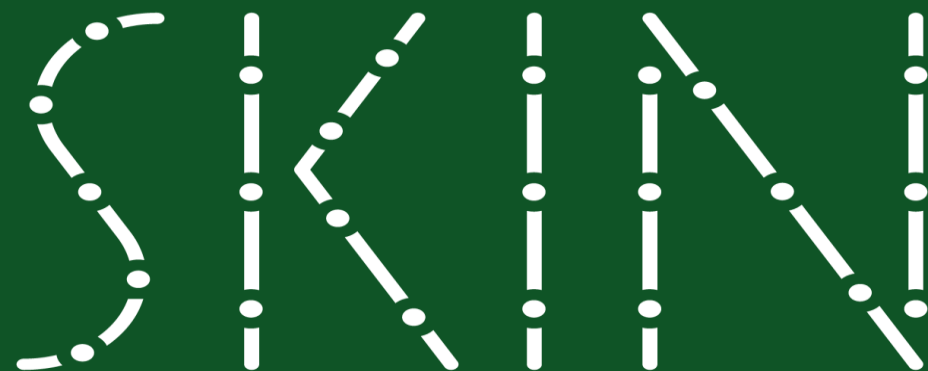




Horticulture 4.0 Conference

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SHORT SUPPLY CHAIN KNOWLEDGE
AND INNOVATION NETWORK

Horticulture 4.0 Conference WSGA - Why we need to Embrace Industry 4.0

Martin Collison, Collison & Associates Limited

26th October 2018



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°728055.

Martin Collison

- Ag/hort (since 1980s) – glasshouses, arable, sheep
- Part time academic since 1987 – now @ National Centre for Food Manufacturing (NCFM) & LIAT

Consultant since 2000 on agrifood development inc.:

- EU SKIN Short Food Chain Network, Internet of Food Things network in UK, Industrial Digital Review in the UK (2017), AgriTech Strategy (2013)
- Lead on AgriFood for Greater Lincolnshire LEP
- Food & Drink Sector Council & DEFRA/LEP Food Group support

Short Food (produce) Chains?

Stansted airport, UK summer 2017 - power of 'local food':



What are Short Food Chains (SFCs)

Very contentious issue!

- Some argue distance (local) is most important factor
- Others on getting more of the retail value to farmers & food producers through fewer steps in the chain

The EU & SKIN adopted the 2nd definition – SFCs are:

- Where the consumer & farmer are in closer contact
- & the supply chain has fewer steps so more value is returned to the farmer (*horticulture better than most*)

Digital will accelerate the move to Short Food Chains

Context for Technology

‘We are stuck with technology when what we really want is stuff that works’

*In *The Salmon of Doubt* by Douglas Adams (also author of the Hitchhikers Guide to the Galaxy and the Answer to Life, the Universe and Everything)*

So how do we make sure the 4th Industrial Revolution & technology works for horticulture?

UK Manufacturing Sector

The Engineering Employers Federation reported that:

- **80%** of manufacturers thought the **4th Industrial Revolution would be a reality before 2025**
- but only **11%** thought the **UK manufacturing sector was ready**

Engineering Employers Federation (EEF), 'The 4th Industrial Revolution: a primer for manufacturers'

UK Trade Unions & Fabian Society

In August 2018 the Fabian Society & Trade Unions launched a 2 year commission: **Workers & Technology**

Initial evidence shows (online >1,000 workers):

- **73%** are confident they will be able to change & update their skills if new technology affects their job
- **53%** were optimistic: future work & job prospects

However:

- **37%** are worried their job will change for the worse
- & **23%** worried their job may no longer be needed

UK Trade Unions & Fabian Society

Few workers think government, employers or unions are taking action to help workers as technologies change:

- **9%** think **government** is taking steps to prepare them
- **16%** think **their union** is working to ensure new technology improves their working life
- **27%** think **their employer** is taking action to prepare them for changes

Fabian Society (2018), Workers & Technology <https://fabians.org.uk/workers-and-technology/>

So How will Industry 4.0 Affect Horticulture?

Short answer – **no one is sure what the impact will be**

Evidence from industry suggests 4 big changes:

- Communications automated, consumers become more aware & engaged & traceability increased
- New supply chain models grow – **shorter food chains**
- old supply chain models may fail
- Automation of processes at every stage of the chain
→ increased labour productivity
- New jobs roles displace older manual tasks: most new jobs need higher inter-disciplinary skills

The Food Chain Opportunity – a UK view

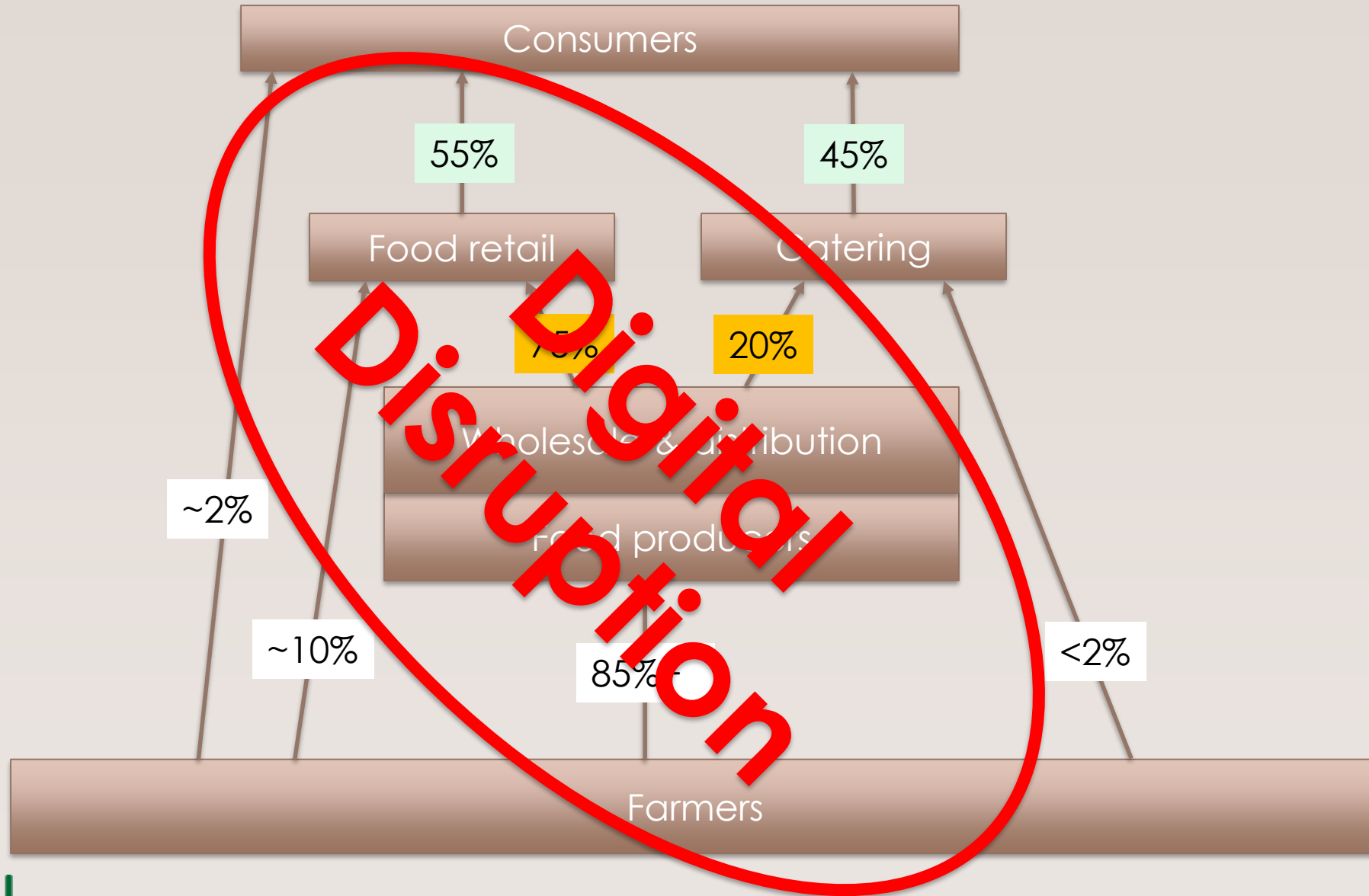
UK consumer food spending now over £220bn & rising 2-3% per annum & UK's largest manufacturing sector

Only £1 in £6 spent by consumers gets back to farmers

Global food spending is circa \$8trillion (5 times as large as the automotive sector) & growing at 6% per annum

The scale of the sector globally means it is attracting new technology, start ups & a wave of investment which will disrupt the chain

The Food Chain Today (UK estimates – sales value)



Prediction for the Future Food Market After Digitalisation 2025 (AD 2025)

Four strands in future supply chain:

- Delivery services & last 50metres via robot or drones
- Vending or collection from workplace or local 'shop'
- Food on the go & fast food
- (Remaining) food retail, catering & leisure all merge into centres for food indulgence → Food Theatre

These new supply chains will all need new skills

Engineering, data & technology skills all in demand

Delivery – who will win the Race?

Franken Agro, Belgium (April 2018)

- 450ha & contract land
- Vegetables, potatoes, turf
- Process potatoes & vegetables
- Sell direct via 'Fresh from the Farm' with a group of 14 growers – growing very fast

But can they win against:

- Amazon or Alibaba



Collection & Vending: replace local shops

Food vending Austria, January 2018

- Convenient
- Easy to use
- 24 hour access
- Pre-order or browse, pay & collect
- Used to drive footfall to other services e.g. petrol station



Added value online direct sales

Hello Fresh (UK)

Order online

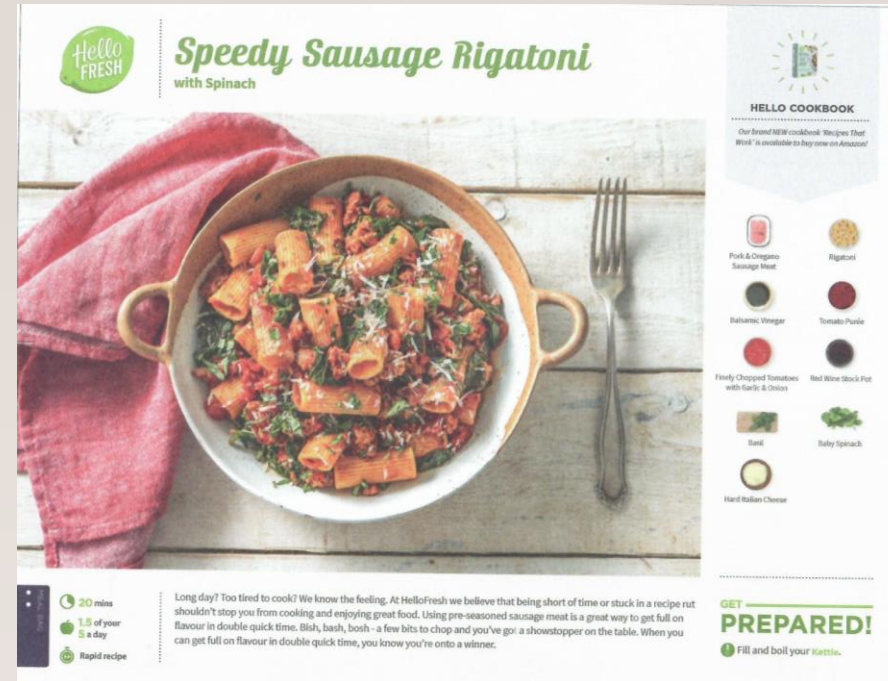
Delivered direct

Ingredients & menus

Convenience

High cost

Focus on fresh & healthy



‘my favourite thing about HelloFresh is not thinking about what to cook for the week ahead. I love the element of a delicious surprise’

(August 2018 direct mailing, testimonial)

Food Theatre – closest to current model – consumers go to the food market, but...

Integrated Leisure, Catering &
Retail – Food Theatre

Madeira central market 2016:
food theatre not new...but will:

- *It become the new normal?*
- *Supermarket formats survive the onslaught of eating on the go, home delivery & food theatre?*
- *Or are we on the cusp of a revolution in the way consumers source food & hort products?*



Logistics & Distribution

UK online sales now >18% of retail market & growing at 15% per year (but only 7% of food sold online.....)

Online shopping drives demand for warehousing space, BBC News 27th August 2018:

‘The popularity of online shopping has contributed to a **near doubling in demand for warehouse space over the past 10 years**, according to figures from property research firm CBRE **60% of the space is now used by retailers**’

Digitalisation & Automation Investment

Agrifood tech VC funding globally (CB Insights 2017):

- 26% in Agribusiness online marketplaces - **digital**
- 23% Ag Biotechnology (plants, animals, environment)
- 19% Software, sensors & Internet of Things (IoT)- **digital**
- 17% Novel farming systems – **enabled by digital tech**

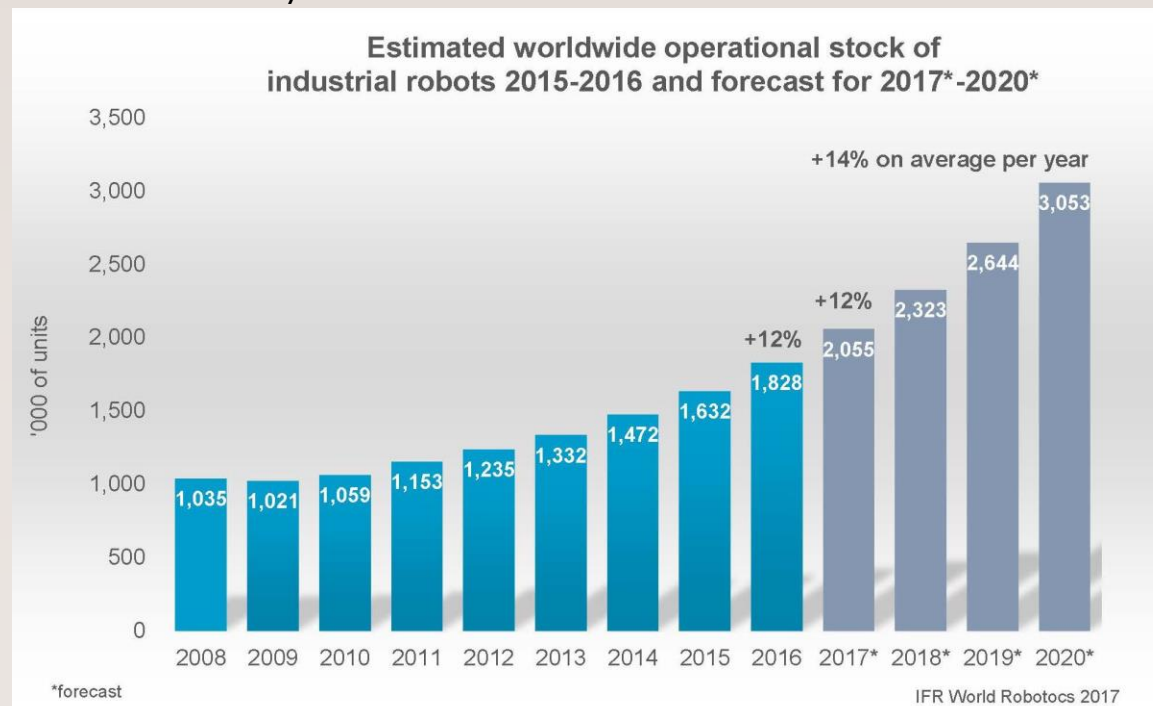
Global market for farm automation worth **\$1billion in 2016**, expected to be **\$16billion by 2020** (Wintergreen 2014)... with growth continuing to **\$74billion by 2024**

Industrial Robot Market

Automation is sweeping the World - 2017 sales of **robots increased +31%**, a **new record of 387,000 units**

- 74% of total sales in: China, S. Korea, Japan, USA, Germany
- **China** is the **biggest robot market in the world** - 30%
- Chinese robot suppliers 31% of market

IFR 2017, Executive Summary World Robotics 2017 Industrial Robots



So what might stop us adopting Ind 4.0?

The **most important area is skills & culture change**:

- Unless companies have the culture & skills to adopt technology uptake will be low
- Skills needed to specify (expert client), purchase, install, manage & optimise technology use
- Have to overcome fear of change
- Have to create the time & finance to drive change

Awareness & Business Case

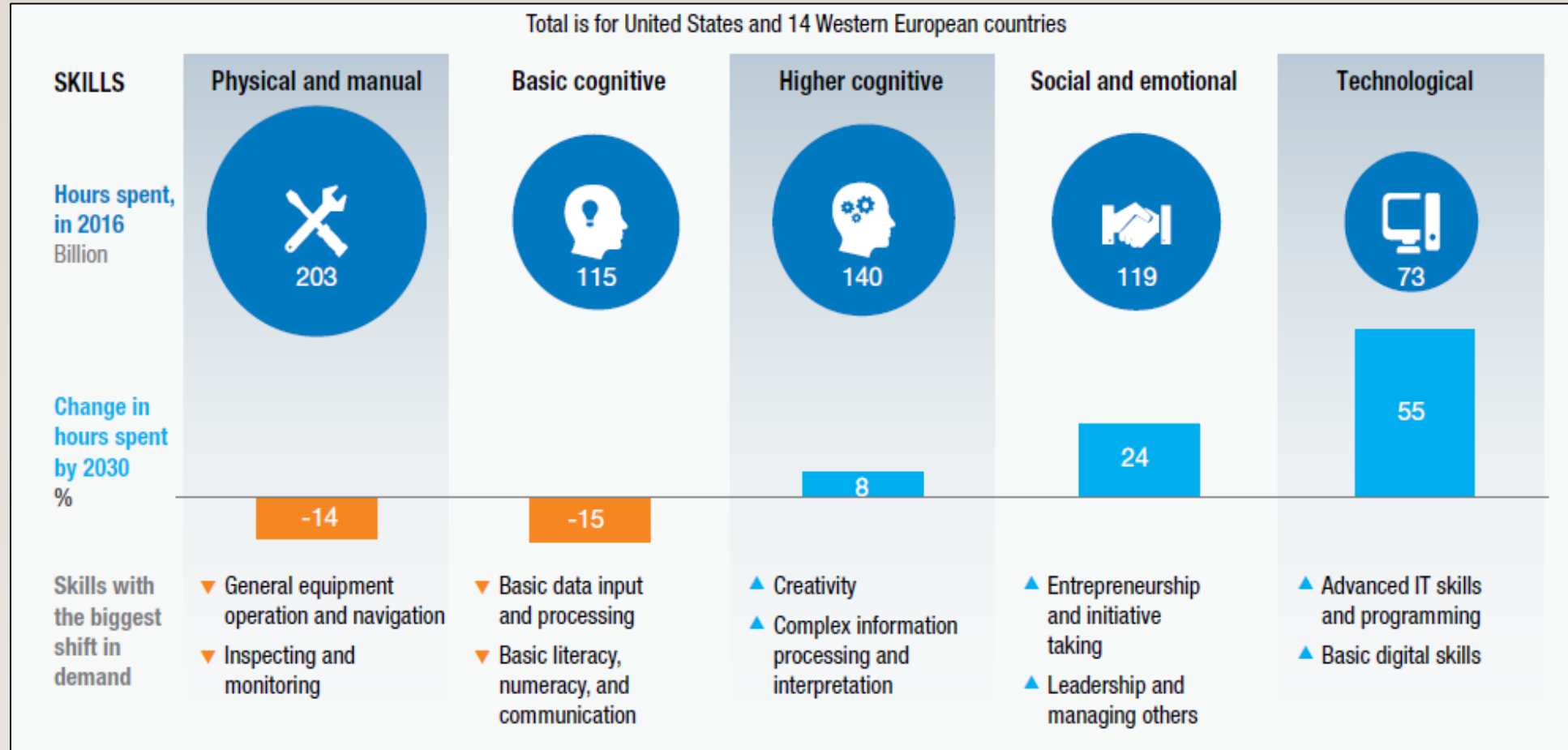
Awareness:

- It is not easy to use something you do not know exists!
- Horticulture needs to 'beg, borrow & steal' ideas from other industries
- **Knowledge transfer needed**

Many companies (& their banks & government) struggle to understand the costs & benefits of new technology

- Return on investment is important but hard to assess for innovative technology – **needs new skills**

Skills



EU Digital Skills & Jobs Coalition

- **44%** of EU citizens **do not have basic digital skills**
- **37%** of workers **lack sufficient digital skills**

A crucial issue is the need to modernise our education & training systems:

- ‘which currently do not prepare young people sufficiently for the digital economy & society
- & to move to a **life-long learning approach** so people can adapt their skills sets throughout their life-times as needed’

Conclusion

The defining issues for the next decade will be:

- **Digitalisation will revolutionise horticulture: production & supply chains**
- Demographics & labour supply mean we need a more productive workforce → higher wages
- But, can we upskill young people & existing workers to compete globally?

Personal view:

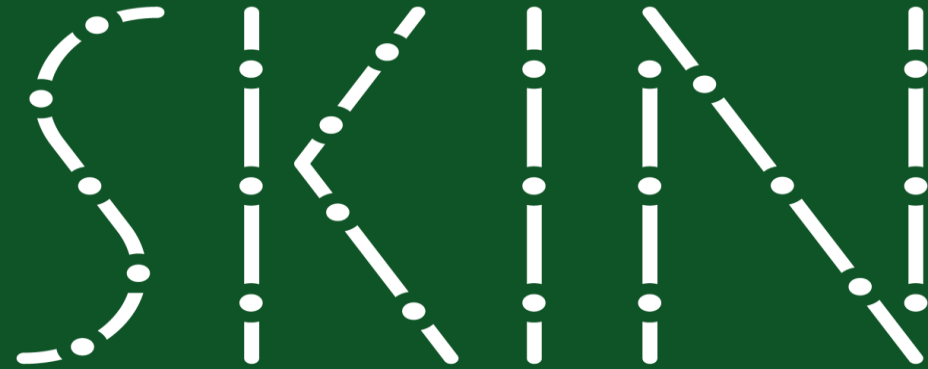
- Optimism – we are talking about the problem
- Pessimism – other parts of the World are acting faster (India new programme for 10million ICT professionals)

Conclusion

We need a step change by businesses, government, unions, Colleges & workers to adopt digital technology

If we do this successfully, we can deliver:

- Higher value, better paid & more interesting jobs
- Jobs which attract young people to horticulture
- Less manual & repetitive tasks leading to better health
- Improved living standards from a competitive sector which leads the World



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THANK YOU !

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