

GENNXT WAVE: PEOPLE, TECHNOLOGIES & INNOVATION FOR INDIAN LIVESTOCK SECTOR

# Confluence of TECH INNOVATIONS and People for Indian Livestock Sector

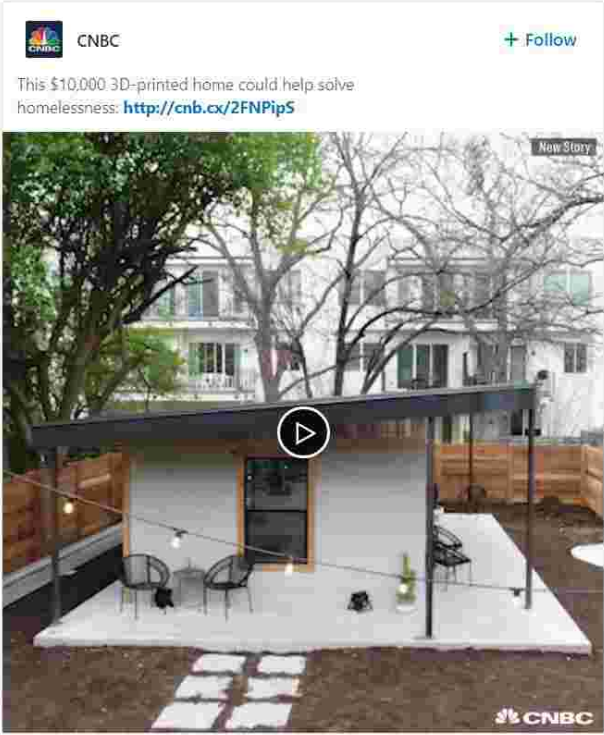
by

Yiannis Christodoulou

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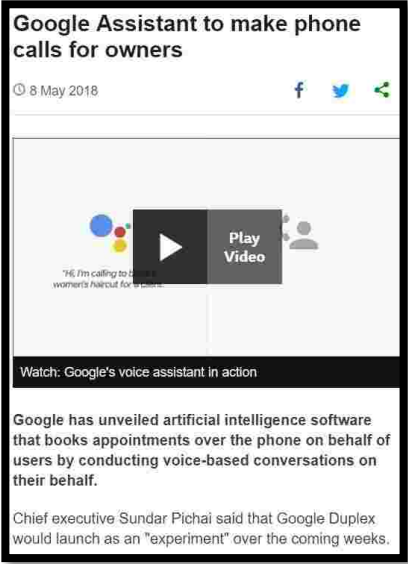
CLFMA 60<sup>th</sup> Annual Symposium  
8<sup>th</sup> Sep 2018

# Trending technology news and stories

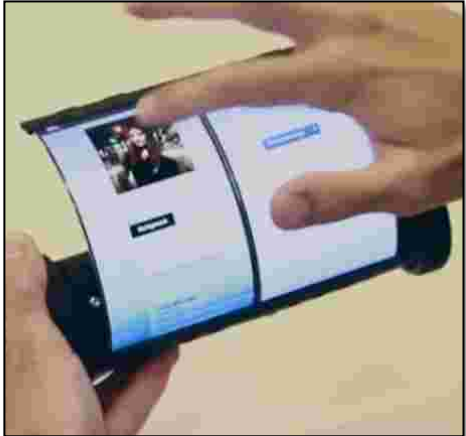


What if you could design, build, and move in to a house in under 24 hours? That's now becoming a reality, thanks to 3D-printed houses produced by startup Icon  
Source: <https://www.livescience.com>

Sensing City, Quayside high-tech project, Toronto.  
Source: <https://www.theglobeandmail.com>



Source: [www.bbc.com/news/technology](http://www.bbc.com/news/technology)



Source: [www.bbc.com/news/technology](http://www.bbc.com/news/technology)

# Tech trends that will be dominating the news

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- **Artificial Intelligence**

- Smarter software

- **Sensor Technology**

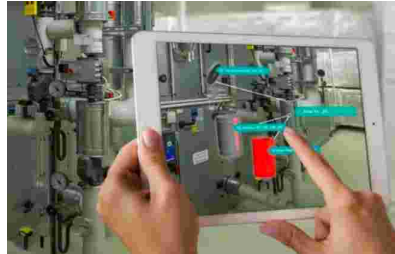
- More sensors collecting real-time information
- More data processing technology

- **Vision and Positioning System**

- Workflow Analysis and Digitization
- Processes, from enterprise to manufacturing will be analyzed to check for redundancy and overlaps -> Optimization

- **More CPU power at the 'edge'**

- Cameras that can not only see, they can understand the image
- Microphones which can listen
- Only useful data & non private data is passed back to the cloud



- **Industrial Robotics**

- Speed / Capability / Size
- Multi purpose robot

- **Augmented reality (AR)**

- Help humans in skilled and manual tasks.
- Access to information for specific things at the right point in time. smart documentation

- **Virtual reality (VR)**

- Design optimization
- Line and/or process optimization

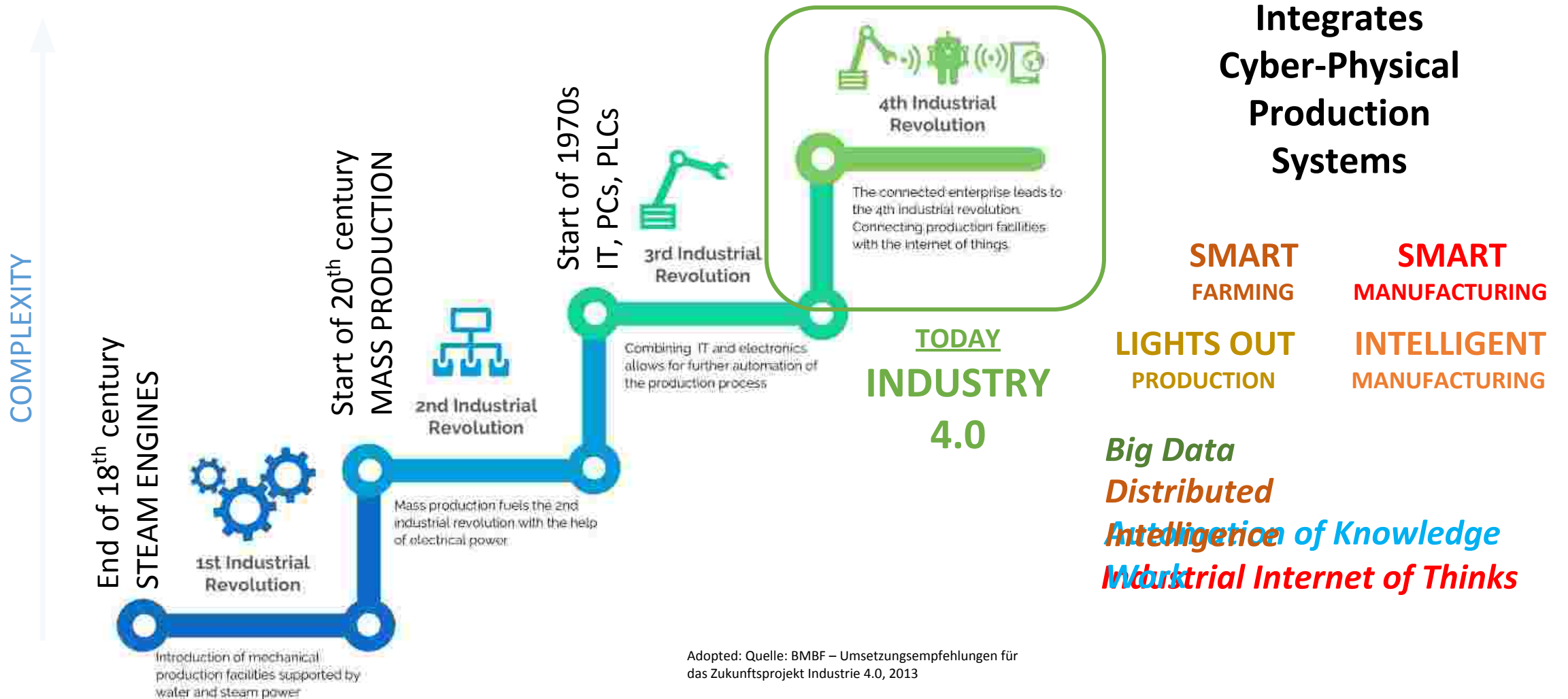
- **Autonomous Vehicles**

- Material Receiving, Warehouse management, Finished Goods Loading, Line Loading

- **Machine Interconnectivity**

- More and more devices will become connected and capable of speaking to each other

# 4<sup>th</sup> Industrial Revolution – Industry 4.0



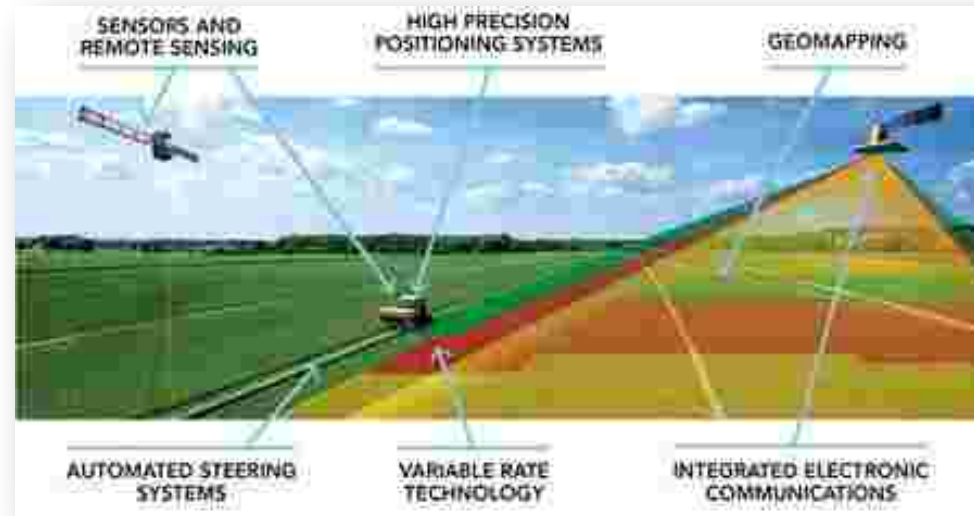


# One cyber-physical system based on IIoT

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Source: [www.tracks360.com](http://www.tracks360.com)



Source: [www.cema-agri.org](http://www.cema-agri.org)



*Image is not meant to be endorsing, supporting, advertising or be exhaustive of companies in the space*

# How we make feeds is also changing

Source: Progressus AgriSchools (2018). [www.progressus.asia](http://www.progressus.asia)



1970s - 1990s



MANUAL OPERATIONS



1990s - today



SEMI AUTOMATION



Today onwards



Mobile Internet



Cloud technology



The Internet



Advanced robotics

SMART FEED MILLS



Image courtesy of Agentis Innovations. Mill+



Image courtesy of Agentis Innovations. Mill+



Source: Agentis Innovations. Smart Layout.



Image courtesy of Agentis Innovations. Smart Bagging.



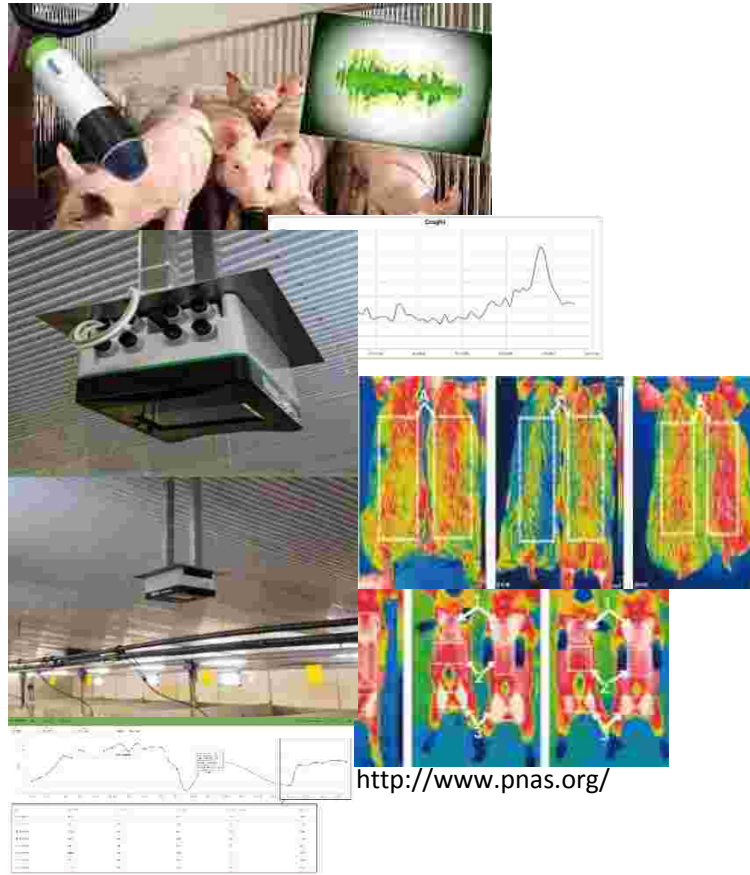
Source: [www.ssi-schaefer.com](http://www.ssi-schaefer.com). Warehouse Automation.



# How we farm animals is also changing



Source: <http://www.rotem.com>



<http://www.pnas.org/>

Source: Fancom



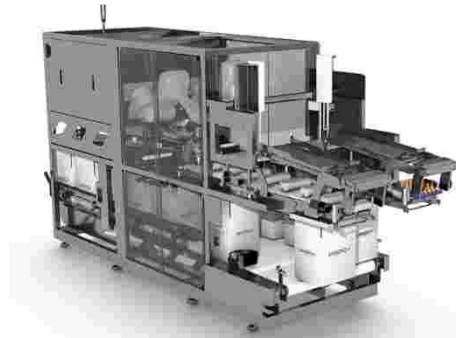
<https://www.afimilk.com>



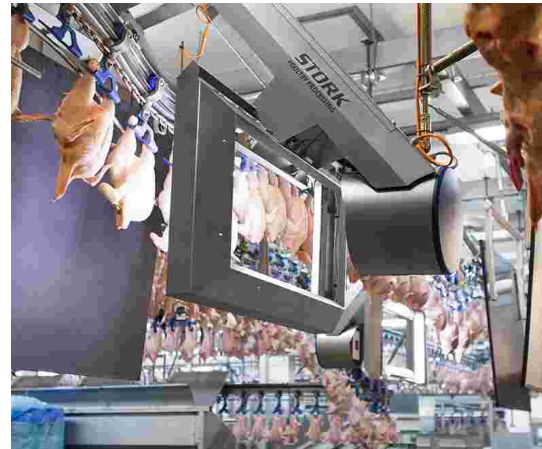
# How we process the end product is also changing

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From washing, inspecting, grading and packing. Already products can make it from the farm to the carton without being touched by a human.



Source: <https://www.sanovogroup.com>



Source: [www.marel.com/poultry-processing](http://www.marel.com/poultry-processing)



Source: [www.bbc.com](http://www.bbc.com)

# How the industry interacts with the consumer is also changing

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## HAPIfork

Monitors How Fast People Eat and Helps Them Slow Down



Source: HAPILabs

## Smart fork

(Georgia Tech, Dr. John Pierson)  
fork that includes sensors to detect food temperatures

## Biosensors

Detect pathogen counts

- On-farm sensors
- At the washing – grading
- At further processing
- During transportation

## Quirky Egg Minder

push notifications when you're on the verge of being eggless & which eggs nearing their expiration date



Source: [www.businessinsider.com](http://www.businessinsider.com)

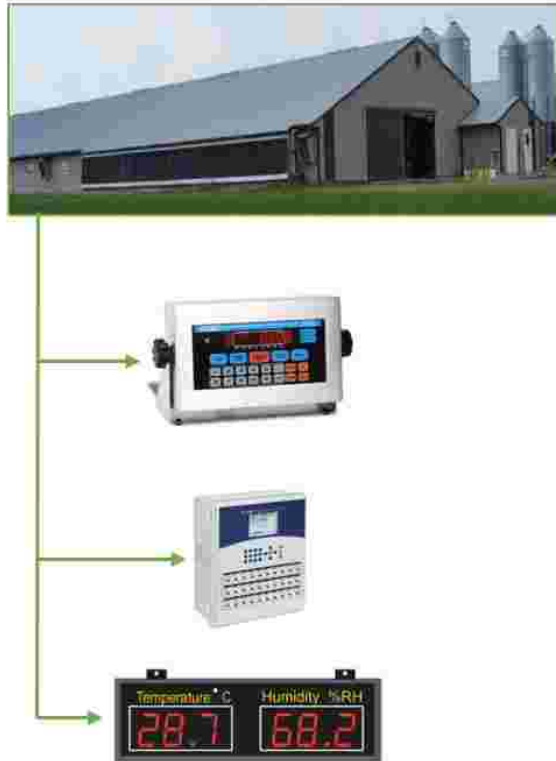
# Key to Competitiveness and Differentiation



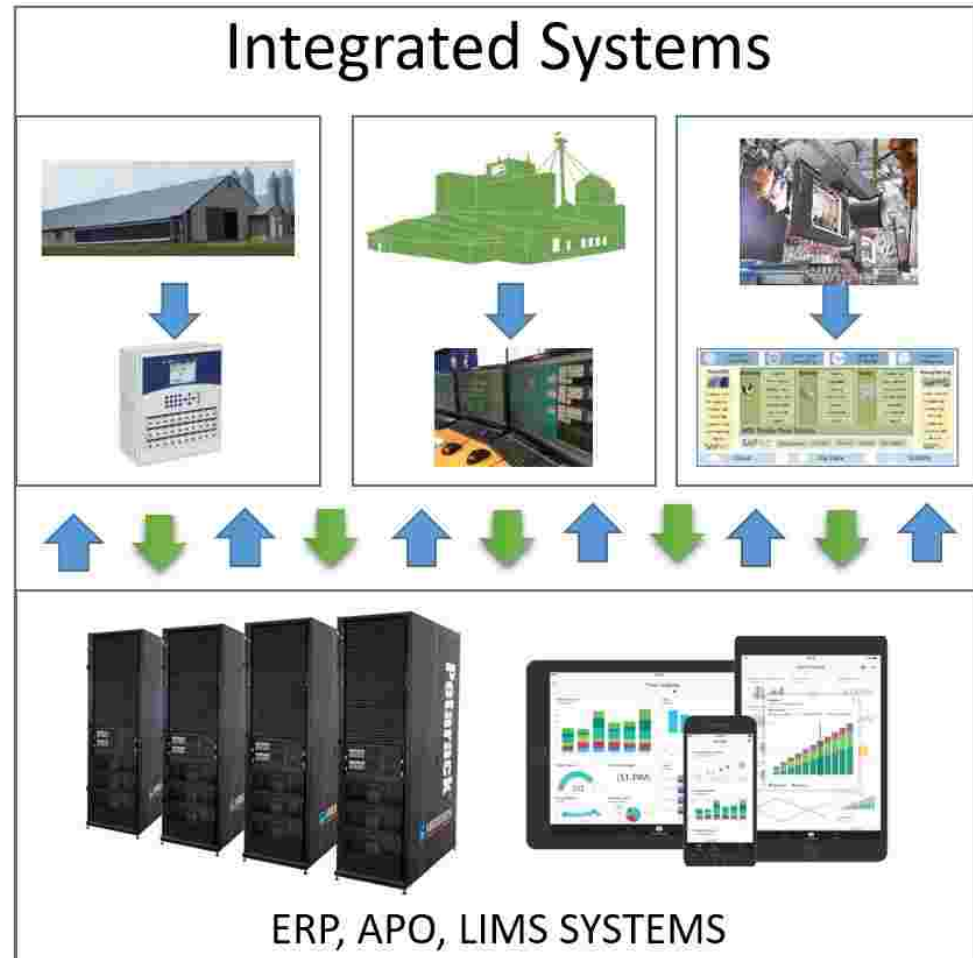
Source: Progressus AgriSchools (2018). [www.progressus.asia](http://www.progressus.asia)

# From 'isolated automation' to Integrated Cyber-Physical Production Systems

Stand Alone Units



Integrated Systems



# Considerations & Challenges

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TECHNOLOGY

PEOPLE

ENVIRONMENT

emics  
nsibility

# Considerations & Challenges related to technology

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TECHNOLOGY

- Technology availability and adaptability
- Available infrastructure
- Predictions of future course of technology's
- Technology maturity
- The pace of technology change
- **Technology compatibility and collaboration**
- **System design**
- **System integration**
- **Manufacture and supplier quality and longevity**
- Technology certification
- Information security

# Considerations & Challenges related to People

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PEOPLE

## SOCIAL

- It transforms the way we work and LIVE
- It raises important societal challenges and creates new opportunities

## LEADERSHIP

- **Awareness/Knowledge by the Top Management**
  - Vision and Leadership
  - Requires a proactive business strategy
- Willingness for change and adaptation
- **Requires change! Define a new way for doing things**

## WORKFORCE

- **Qualification and Skill Set**
- Job security and Job Displacement
- **Redeployment of the displaced workers**



# Displacement of jobs by technology is an old fear

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- Many people around the globe approach technological change with caution rather than excitement. No doubt, over the past two centuries waves of technological change have eliminated jobs and rendered some occupations obsolete. *i.e. Early in the 19th century, English textile workers who destroyed new weaving machines*
- The transition will be very challenging. We are on the tip of a technology revolution, especially when it comes to the boundaries between 'artificial intelligence' and 'biology' which are blurring

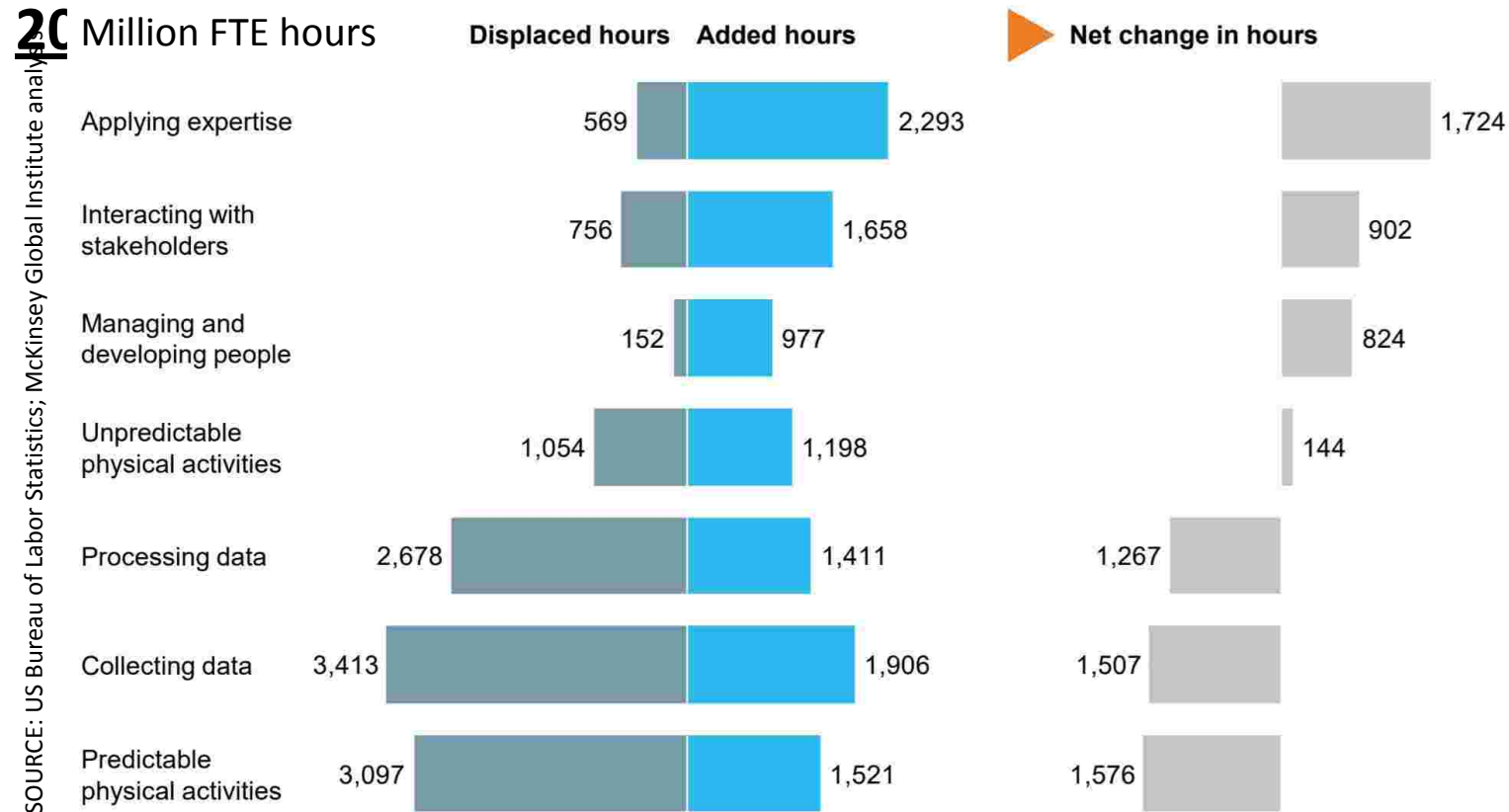
# Not to be forgotten—technology also will create new jobs and income possibilities

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- Technologies are creating new work in industries that most of us cannot even imagine, a new ways to generate income;
  - 1/3 of new jobs created in the US in the past 25 years were types that did not exist, such as software development, hardware manufacturing, app creation, and IT systems management
- Here in India;
  - Google is rolling out the Internet Saathi (Friends of the Internet) program in which rural women are trained to use the Internet, and then become local agents who provide services in their villages through Internet-enabled devices.
  - UBER – allowed income and the possibility to purchase a vehicle to hundreds

# The TYPE of Jobs will shift

## Total hours by activity type, Germany example,



SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

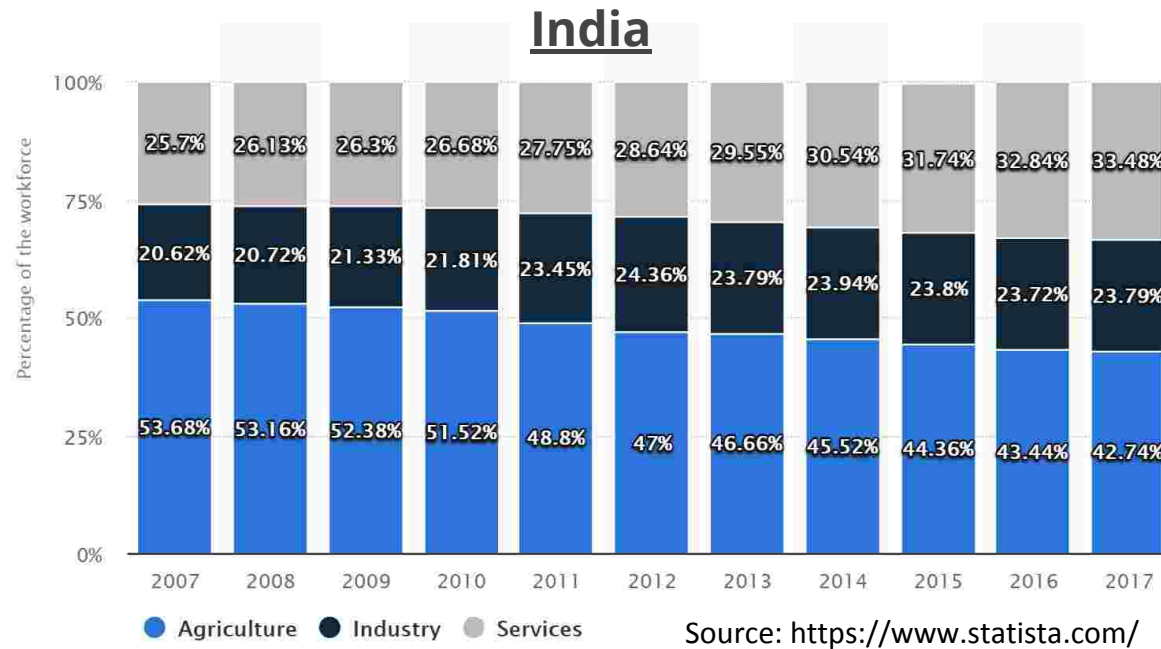
Up to  
**375M**  
 workers globally  
 may need to  
 transition to new  
 occupational  
 categories by 2030

# The SKILLS needs to perform work activities within all occupations will shift

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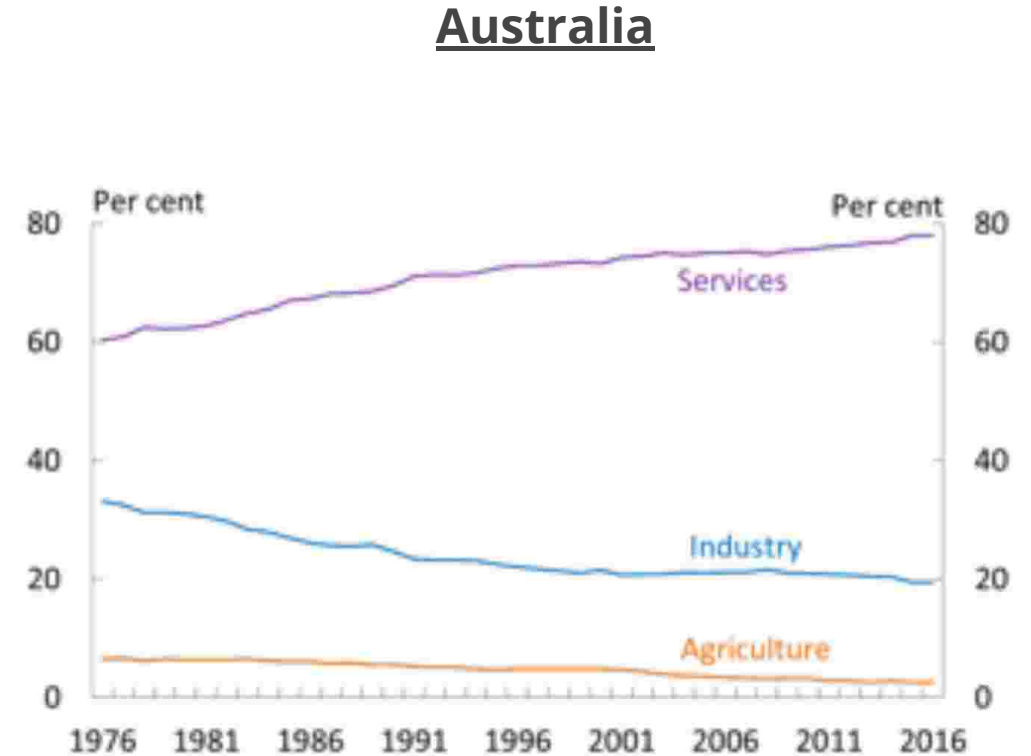
- New work will **lie in non-routine 'thinking' jobs** that involve more application of expertise, interaction, and management “soft skills”
- More work activities will require social and emotional skills and advanced cognitive capabilities, such as high-level logical reasoning—capabilities that are required today for only a relatively limited number of jobs.
- This will be a challenge for education, training, and skill assessment models, which for now do not always emphasize “soft skills” such as social and emotional reasoning and sensing

# Distribution of workforce across economic sectors



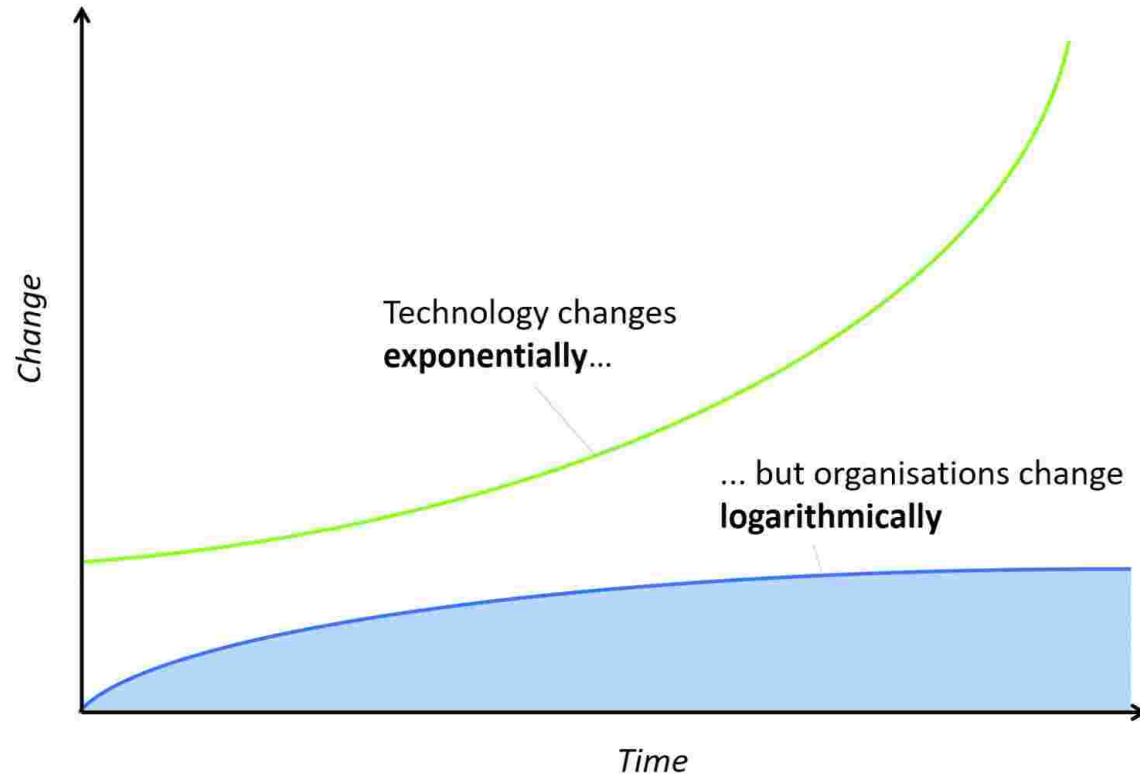
India: from 454 million employees, 235 million are potentially automatable

India: 114M (49%) in Agriculture, forestry, fishing has the potential to be automated



Source: International Labor Organization, ILOSTAT.

# What should keep CEOs awake at night

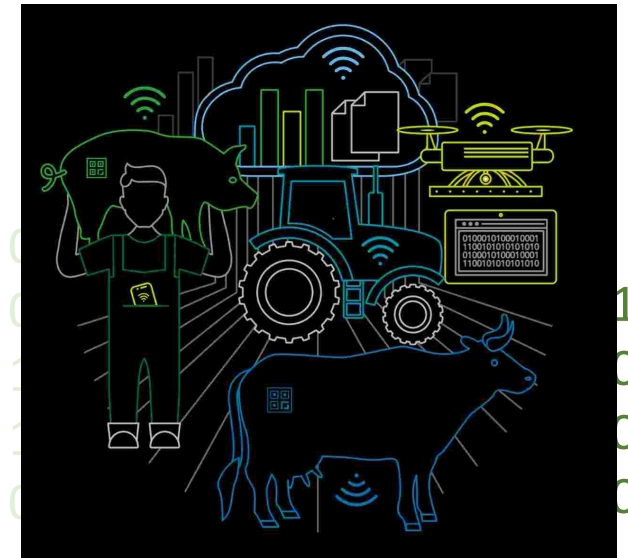


Source: Perkin & Abraham (2017), Building the agile business through digital transformation

- How would we retrain our workforce?
- What are the new skill sets we need?
- Will we be able to produce what is needed to meet demand?
- Are we embracing and adopting technology as we should?
- Are we equipped sufficiently to capitalize on the new trends and remain relevant?
- What new leadership skills do I need?

# In Summary

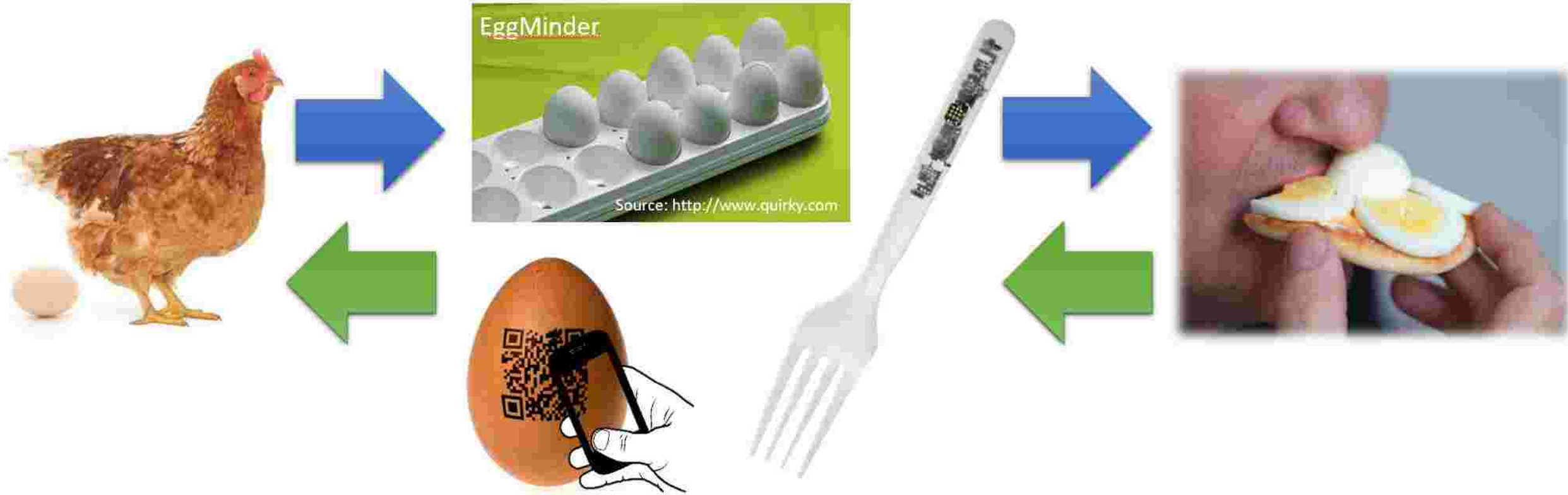
- Very difficult to predict how the future of technology looks like
- The sure thing, the work place and the way we do things today will be fundamentally transformed
- Machines are making decisions and accomplishing things by there own. We will need to learn to truest the machines and work along side them
- Build a system that allows to be responsive to technology changes



Source: Deloitte. Smart Livestock Farming

# Trends and Consideration: Food for thought

*“The consumer will be talking to the hen and the hen to the consumer”*





FEED MILL AUTOMATION AND  
SYSTEMS INTEGRATION



[www.agentisinnovations.com](http://www.agentisinnovations.com)

EDUCATION AND TRAINING FOR  
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