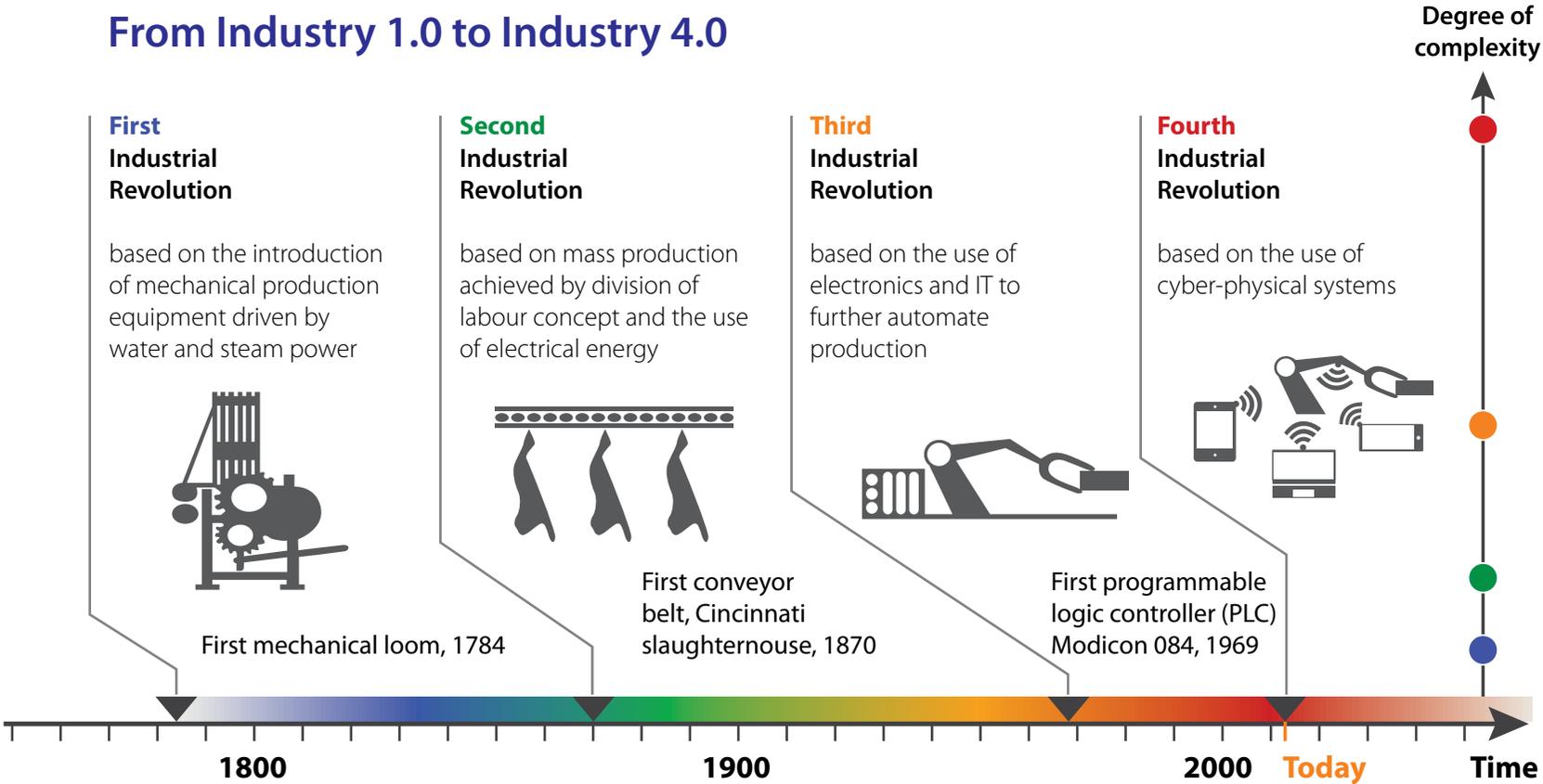


# Seismic change ahead: preparing for the Fourth Industrial Revolution



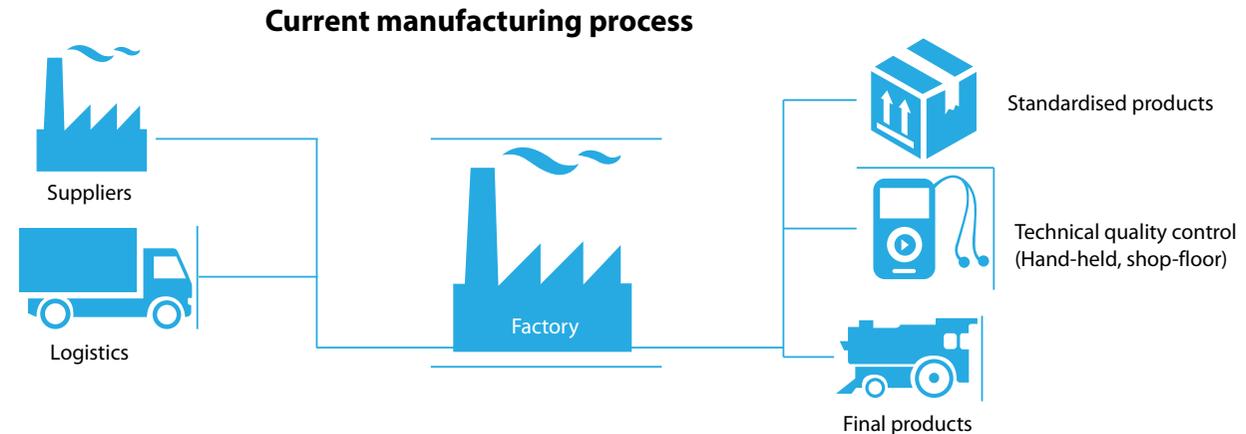
# A qualitative leap into an unpredictable future

## From Industry 1.0 to Industry 4.0

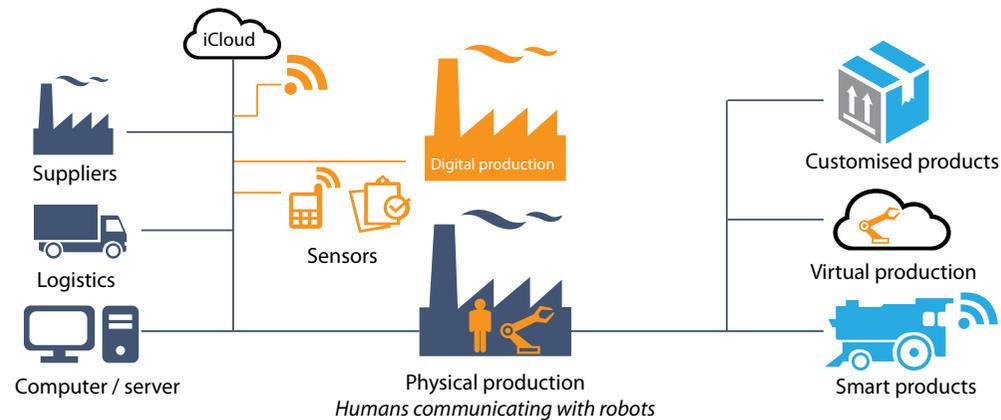


# Process re-shaping under Industry 4.0

- The current manufacturing process comprises isolated and automated cells. Each single cell seeks optimisation of its operations, and manufacturing is a step-by-step process where each participant plays its own role.
- Communication between participants is rather limited (especially with those further along the supply chain), as the supply chain remains particularly long.
- Manufacturing of final products is based on mass production and economies of scale in order to achieve maximum efficiency.



## Process transformation under Industry 4.0



- Industry 4.0 will transform the manufacturing process by making it more interconnected. Sensors and digital systems will allow production to speed up, and make supply chains more efficient and flexible.
- Digital production will enable companies to monetise data generated, as more flexible supply chains will enable production of custom-made and smart products.
- The Industry 4.0 concept is based on nine key technological pillars (SEE NEXT PAGE), which will reshape product design and production and create new business models and revenue streams.

# A reconfigured industrial landscape: 1

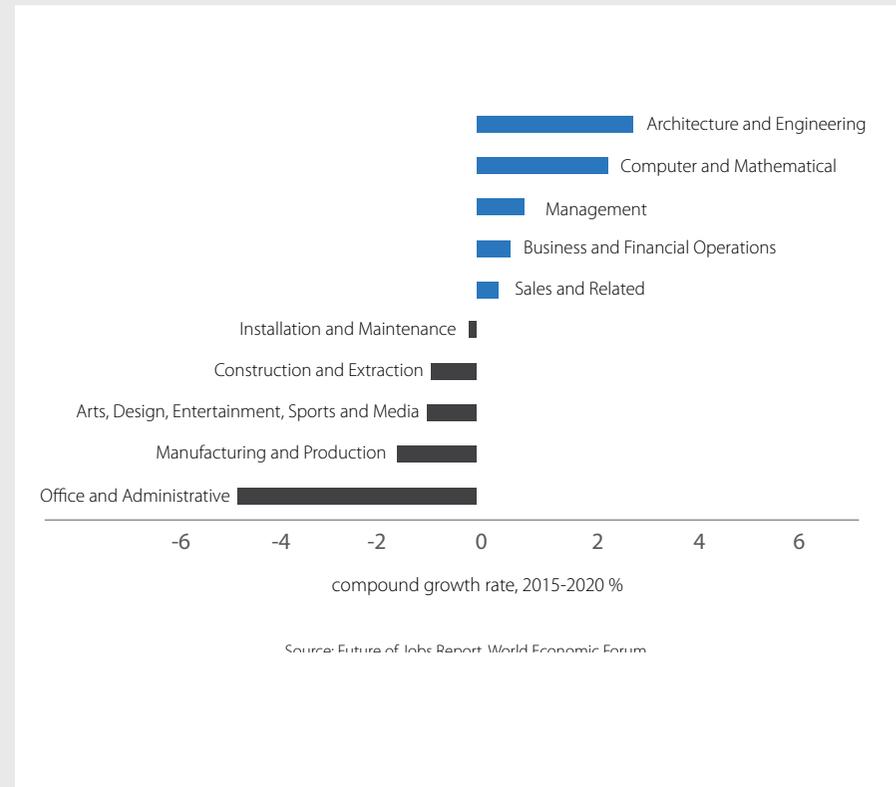
## Enabling technologies



Online source:  
[https://www.bcgperspectives.com/content/articles/engineered\\_products\\_project\\_business\\_industry\\_40\\_future\\_productivity\\_growth\\_manufacturing\\_industries/](https://www.bcgperspectives.com/content/articles/engineered_products_project_business_industry_40_future_productivity_growth_manufacturing_industries/)

# A reconfigured industrial landscape: 2

## Job families in decline and on the rise



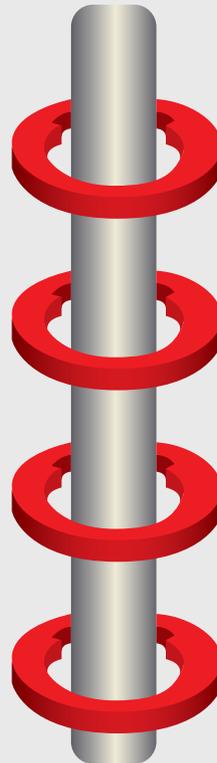
## Jobs and skills: migration, change and response

Prospect of almost unlimited new opportunities; but knowledge and ICT skills critical to unlocking them

Many jobs are threatened by redundancy  
Others job types grow rapidly but unpredictably

By importing Industry 4.0 technologies and combining them with low costs of production factors, emerging countries can leapfrog in the value chain and solve societal issues, including creating decent jobs

Strong collaboration and consensus required between government, academia, science councils, business and labour



Accelerating change in forms of employment: from 'job' to short-term contract to 'livelihood'

Existing jobs also go through step-changes in the skill sets required to perform them

Industries with wide product ranges (such as food and beverages), commodity producers (metals, agriculture) and precision-driven (pharmaceuticals and electronic components) are most likely to invest in Industry 4.0 (This could be crucial for the SA economy)

Upskilling is essential to ensure economic survival and social consent; a critical responsibility falls on the state and business for continuous, targeted training and re-training initiatives

## Early South African areas of response

Aggressive technology acquisition, transfer and diffusion;  
 Securing inward investment from global OEMs in key strategic value chains to build global competitive capabilities  
 [e.g. Mining and mining capital equipment; fuel cells; aerospace and defence]



A much stronger institutional architecture to support technology transfer - building on excellent examples like the Technology Localisation Implementation Unit at the CSIR

Stepped up research and development and commercialisation efforts, led by the DST and its institutions, in close collaboration with **the dti**

Strong institutional arrangements and programmes to support innovation: tax incentives to encourage acquisition and innovation in production capabilities, new systems, processes, products and exports.