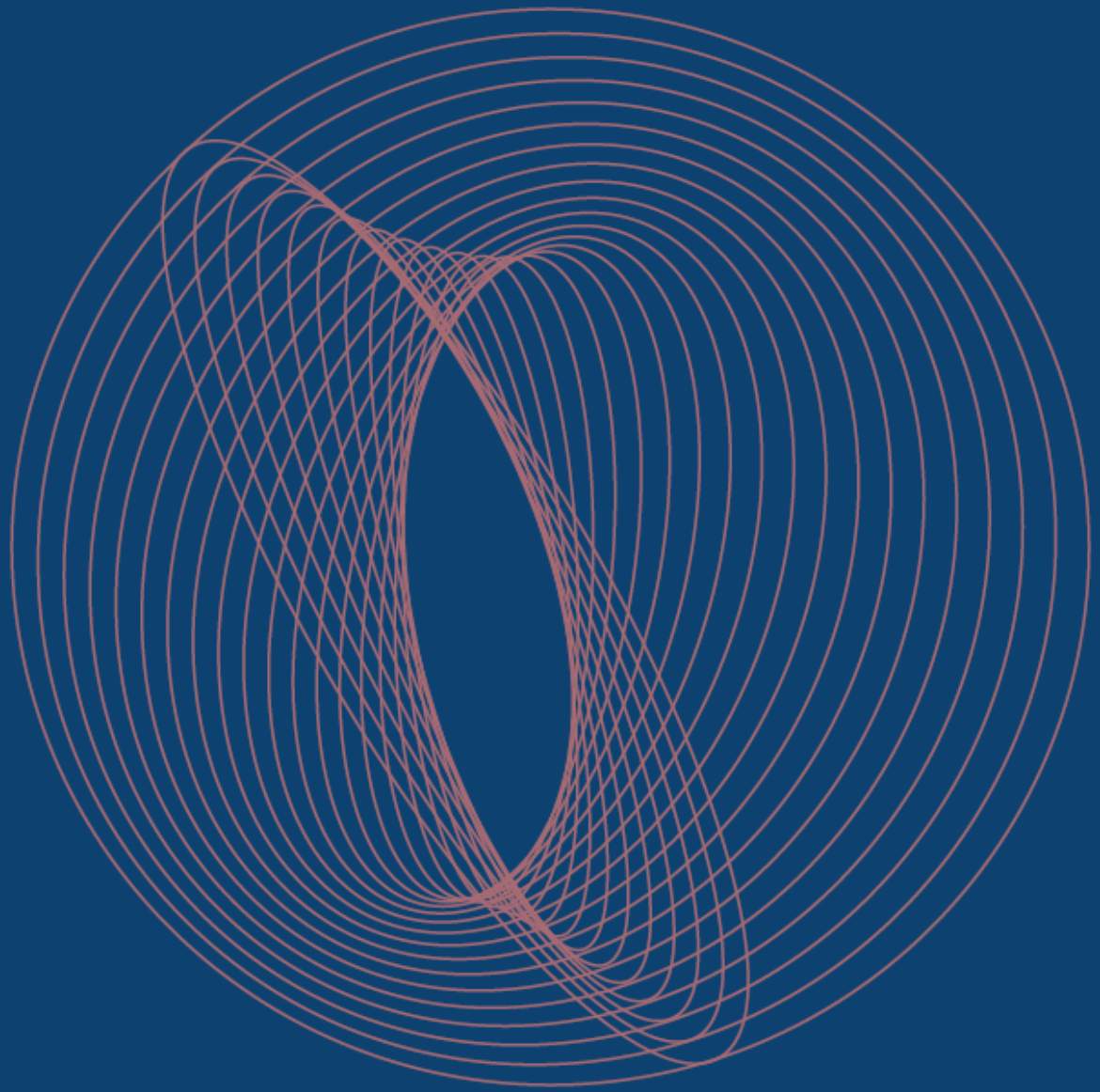
Technology and Society

From techne to artificial intelligence



Technology

- Episteme (knowledge) and techne (craft/art)
- Theory and practice
- Scientific method (logical rules) vs rules of thumb (insight)
- Knowing that (propositional knowledge) and knowing how (non-articulated knowledge/tacit knowledge)
  - Gilbert Ryle (1949): knowing that vs knowing how
  - Michael Polanyi (1966): “we can know more than we can tell”
- AI as a test case (Polanyi’s paradox)
  - Expert systems tried to write tacit knowledge down as rules
  - Machine learning picks up skills from examples instead

Technology and nature

- Technology imitates nature
- Technology can produce things nature cannot. Aristotle “generally *technè* in some cases completes what nature cannot bring to a finish, and in others imitates nature” (*Physics* II.8)
- Natural and artificial - „Natural products (animals and their parts, plants, and the four elements) move, grow, change, and reproduce themselves by inner final causes; they are driven by purposes of nature. Artifacts, on the other hand, cannot reproduce themselves.“
  - Counterexamples: von Neumann’s self-reproducing automata, computer viruses, genetic algorithms

Instrumentality and productivity

- **Instrumentality**: technology as a means to an end, used to control life and the environment
  - Heidegger's "instrumental and anthropological" definition: technology is a means to an end and a human activity (*The Question Concerning Technology*, 1954)
  - From the plough and irrigation to freezer trawlers. Tools extend human control over nature
- **Productivity**: technology invents and brings forth things that did not exist before
  - Greek *poiēsis*: making as bringing something into being; Heidegger calls technology a way of revealing
  - Software is the extreme case - artifacts built from symbols alone
- **Is the tool neutral?** The instrumental view says yes; Langdon Winner argues artifacts embody values and power ("Do Artifacts Have Politics?", 1980)





Standing-reserve: nature and people as stock to be used

The river

Dammed and stored, the river becomes power on demand

The user

Logged and stored, behaviour becomes data to be mined, predicted and optimised

Technology

- Relationship between Science and Technology
  - Is technology applied science?
    - Counterexample: the steam engine came before thermodynamics (Carnot, 1824)
  - What about the impact of technology on science?
    - Telescope, microscope, computer simulation
- Ontology
  - Science: How things are? (Actuality)
  - Technology: How things ought to be? (Possibility)
    - Herbert Simon, *The Sciences of the Artificial* (1969): computer science as a science of the artificial
- Is computer science a science or engineering?
  - Attributed to Dijkstra: “no more about computers than astronomy is about telescopes”

Technological progress

- Bacon in the Novum Organum: „Again, it is well to observe the force and virtue and consequences of discoveries, and these are to be seen nowhere more conspicuously than in those three which were unknown to the ancients, and of which the origin, though recent, is obscure and inglorious; namely, printing, gunpowder, and the magnet. For these three have changed the whole face and state of things throughout the world; the first in literature, the second in warfare, the third in navigation; whence have followed innumerable changes, insomuch that no empire, no sect, no star seems to have exerted greater power and influence in human affairs than these mechanical discoveries.“

Source: Francis Bacon, Novum Organum (1620), Book I, Aphorism 129

What would Bacon say today?









Industrial revolutions

- First (steam power) 1760-1870
- Second (electricity) 1870-1970
- Third (information technology) 1970-2010
- Fourth (artificial intelligence) 2010-

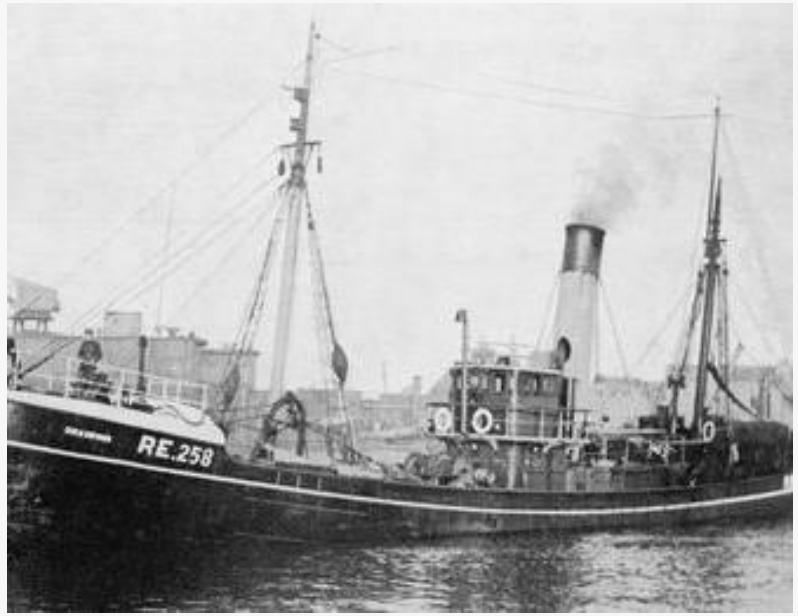








Technological advancement



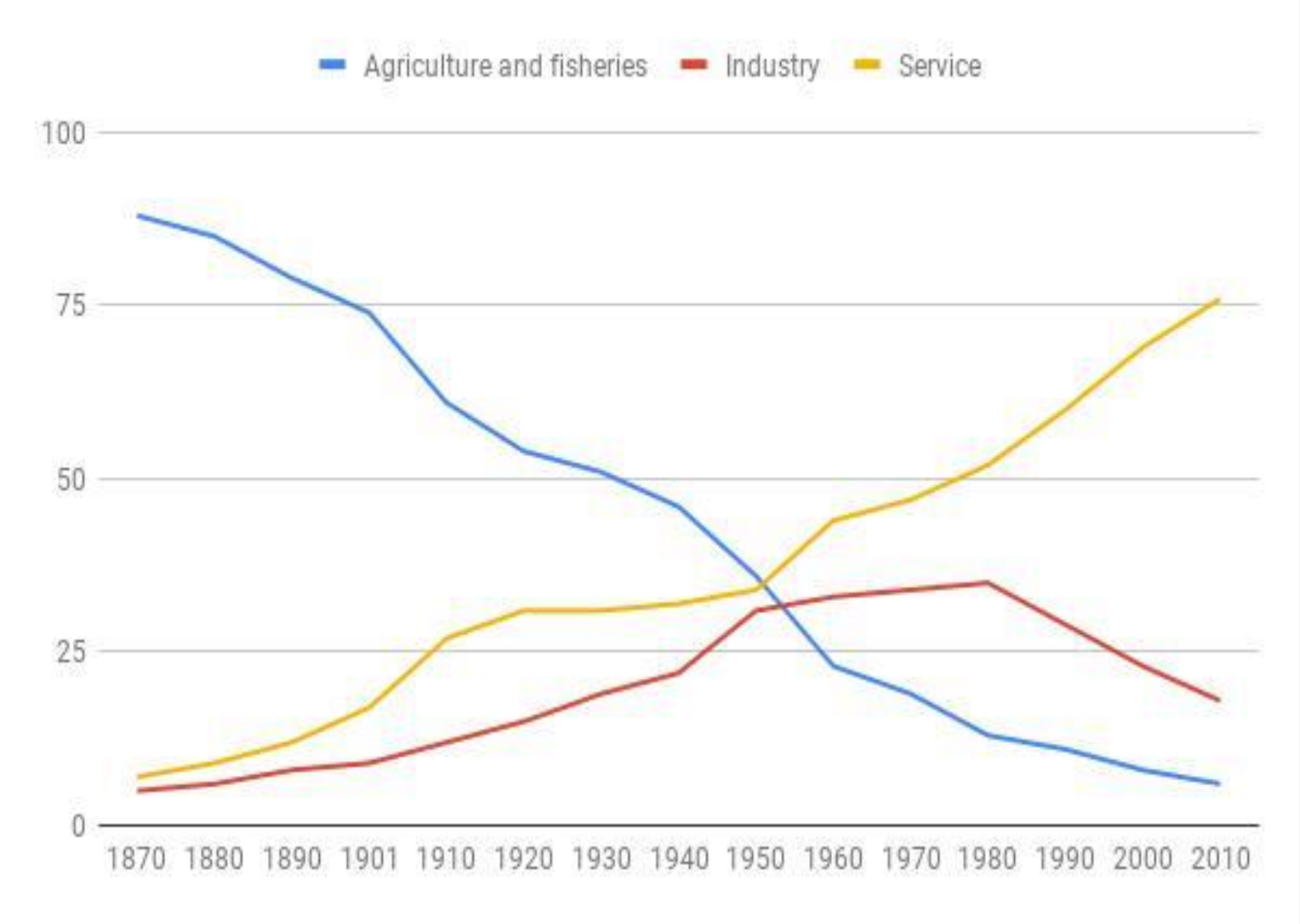




From steam trawler to freezer trawler

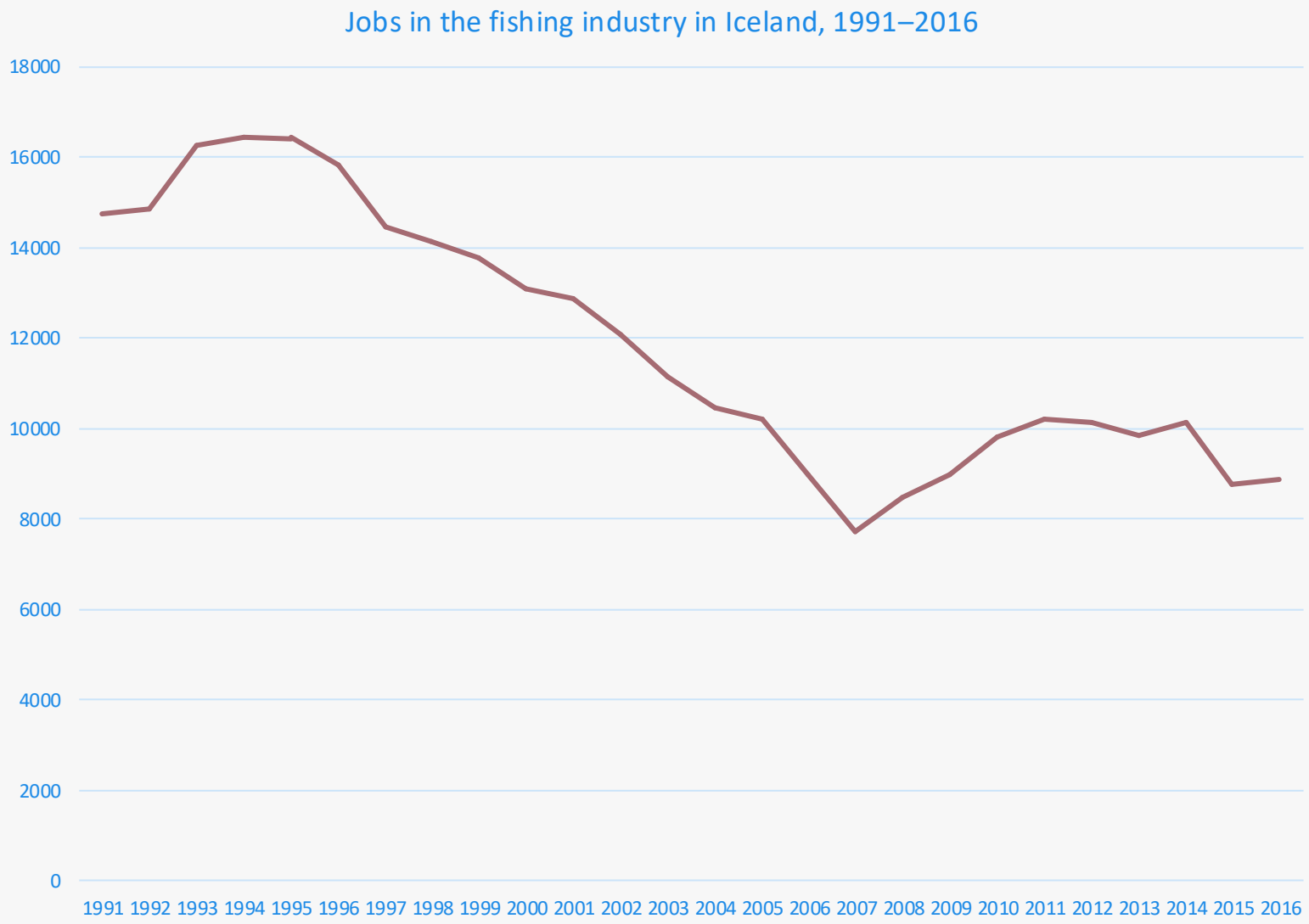
Changes in the labour market in Iceland are well known.

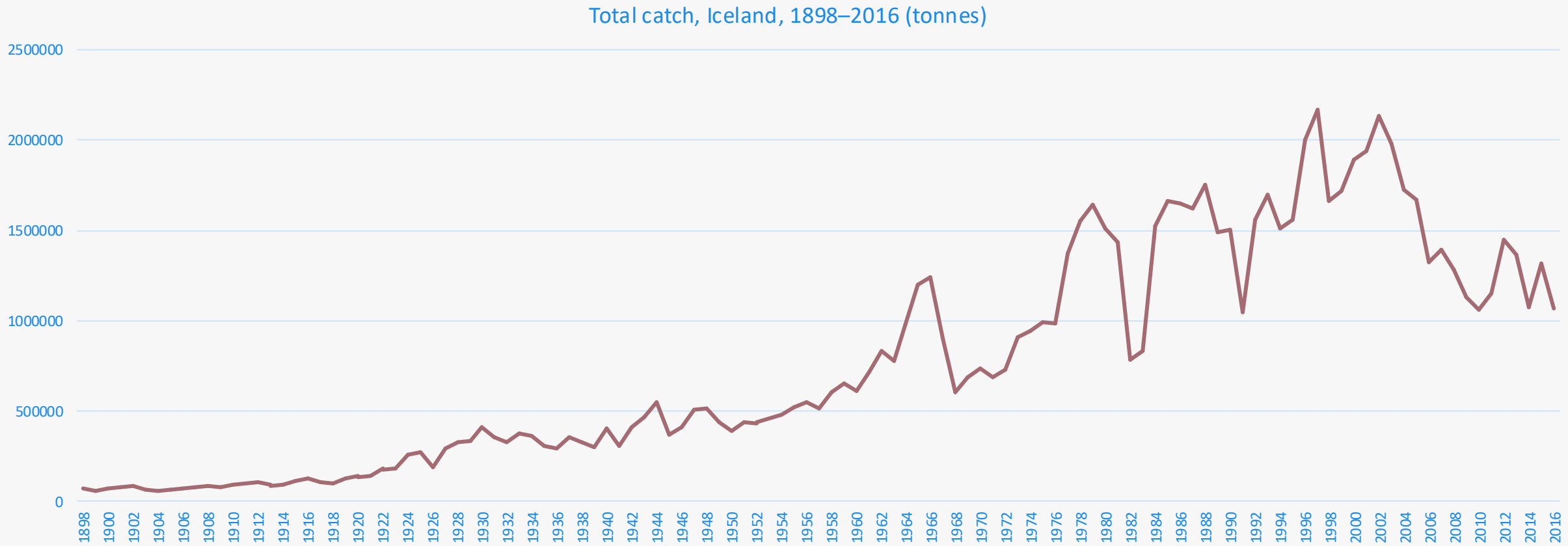
- Jobs in fisheries and agriculture have dropped from over 80% of the labour market down to under 15% in the last 100 years.
- Jobs in services have taken over.
- Seafood sector still of great importance in terms of export.
- AI may be the next shift: 48% of Icelandic companies already use AI software, but only 14% have a strategy for it (Statistics Iceland, March 2026).



Fewer jobs

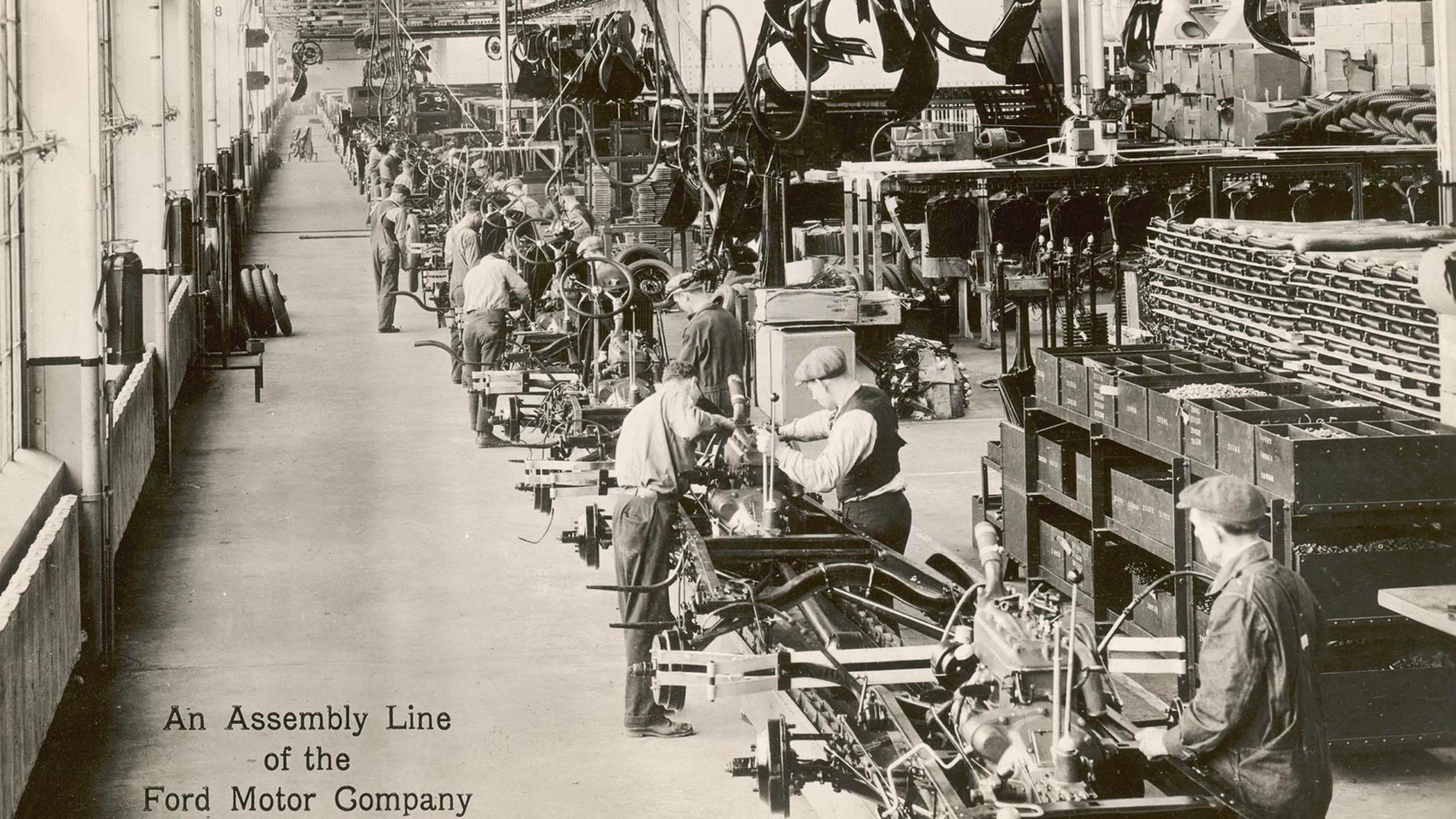
- In the traditional fishing sector there are fewer jobs.
- In high-tech fishing sector we have an increase in job.
- Big difference between the sectors in terms of skills required.
- The national AI plan projects the same pattern economy-wide: 55% of jobs are expected to change, not disappear. Its GDP estimate (0.8-6% a year to 2029) is wide because outcomes depend on how the transition is managed.





Technological advancement and fisheries

- Industrial revolutions have had a huge impact on fisheries.
- The first and second revolutions increase the total catch and how far ships can go.
- The third increases the amount of data about the industry.
- The fourth is about quality and better production.
- **What took fisheries 150 years is now the general economic story, compressed into a single decade.**

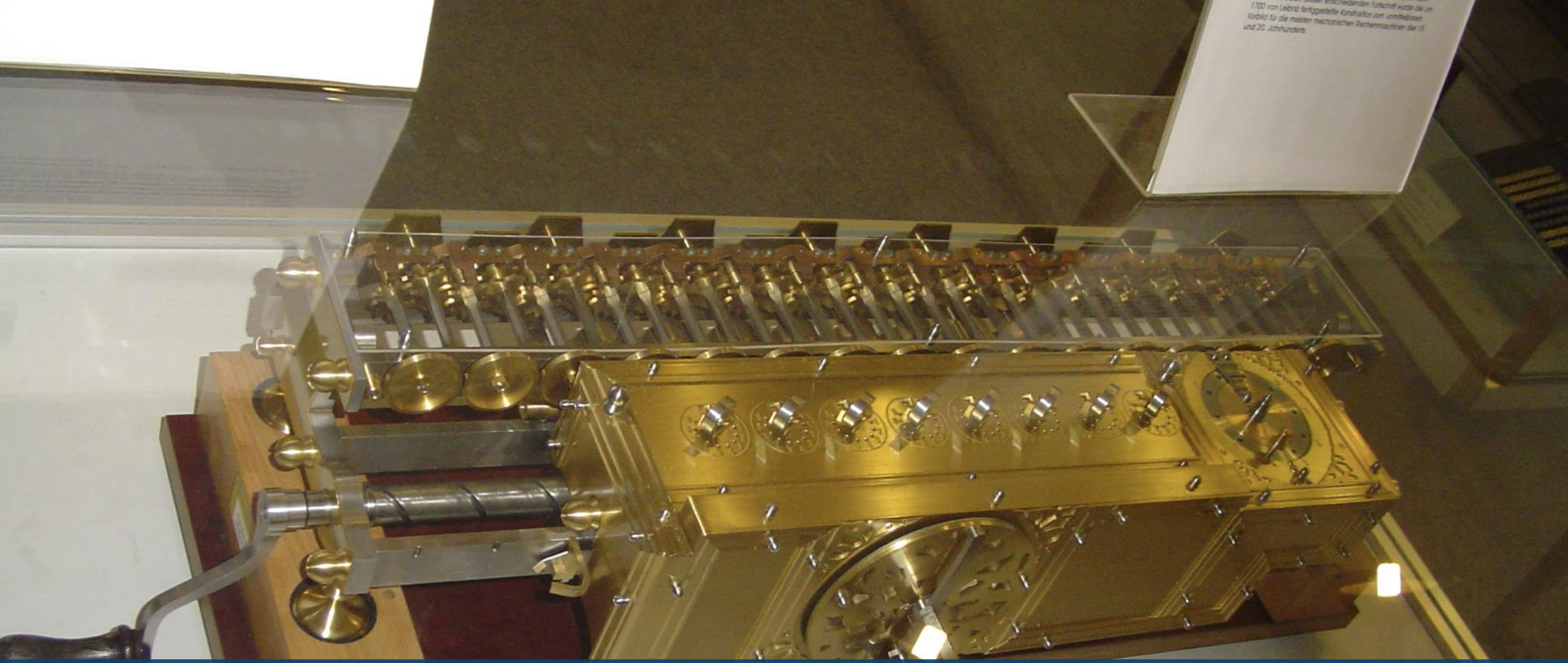


An Assembly Line
of the
Ford Motor Company



“The arithmetical machine produces effects which approach nearer to thought than all the actions of animals. But it does nothing which would enable us to attribute will to it, as to the animals.”

Blaise Pascal, Pensées §340 (1670)



“It is unworthy of excellent men to lose hours like slaves in the labour of calculation which could safely be relegated to anyone else if machines were used.”

Gottfried Wilhelm Leibniz, on his calculating machine (1685)

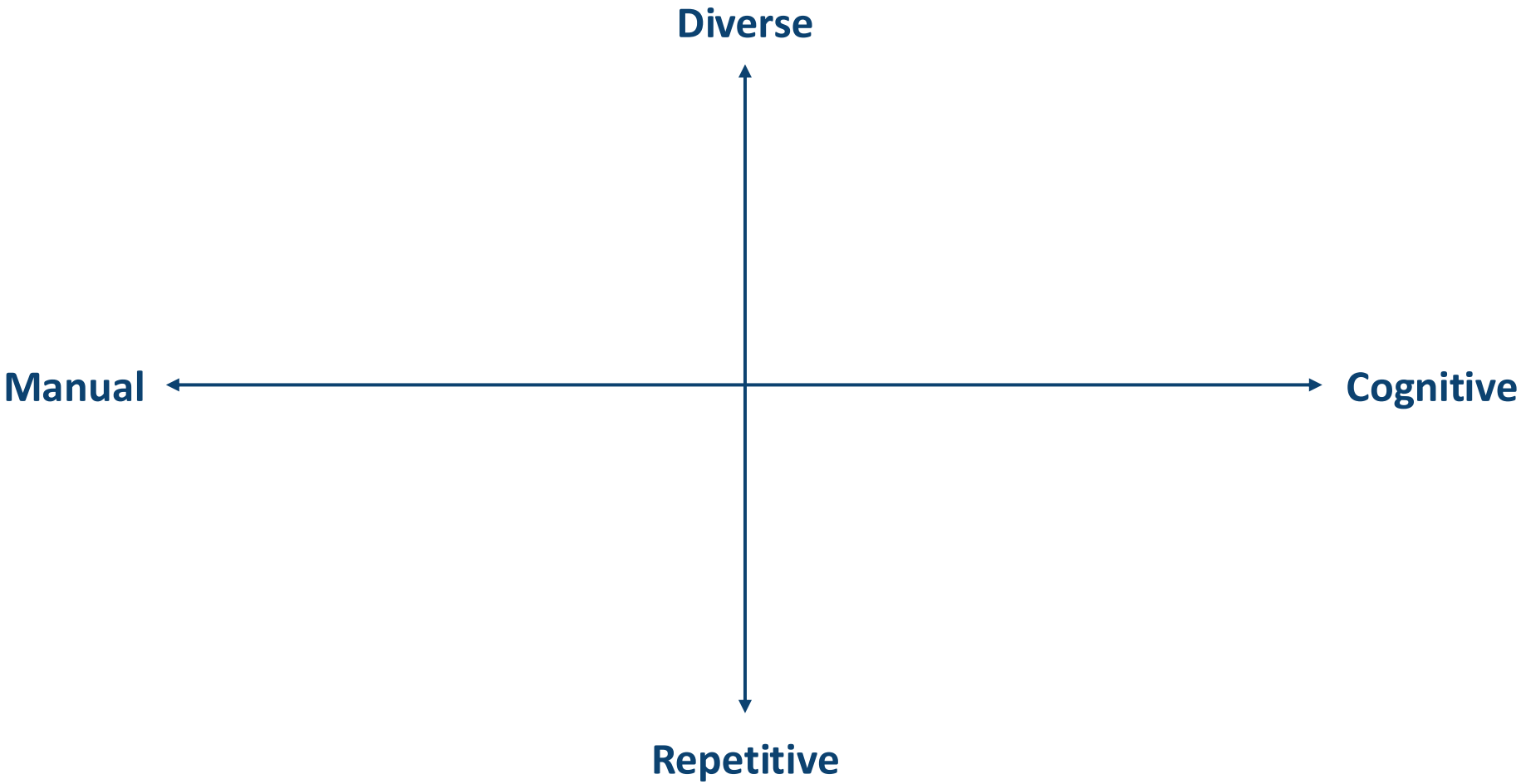


“I wish to God these calculations had been executed by steam.”

Charles Babbage, checking astronomical tables with John Herschel (c. 1821)


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