

OCTOBER 24, 2023

Cognizant: Keeping up with the super-human speed of digital transformation

Keeping up with the Superhuman Speed of Digital Transformation

Damien O'Connor

Sharath Prasad

AVEVA



How Cognizant works with its clients



Helping you transition to your new PI system



Getting more out of your existing PI landscape



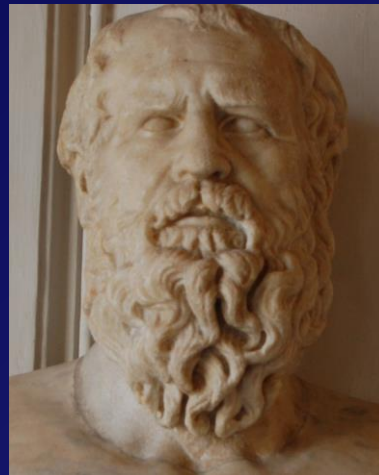
Managed Services to reduce your OpEx



Partnering with you in your journey to the cloud

“The only constant in Life is Change.”

Heracleitus – 540 BCE - 480



THE FIRST INDUSTRIAL REVOLUTION

The Industrial Revolution

1760-1840

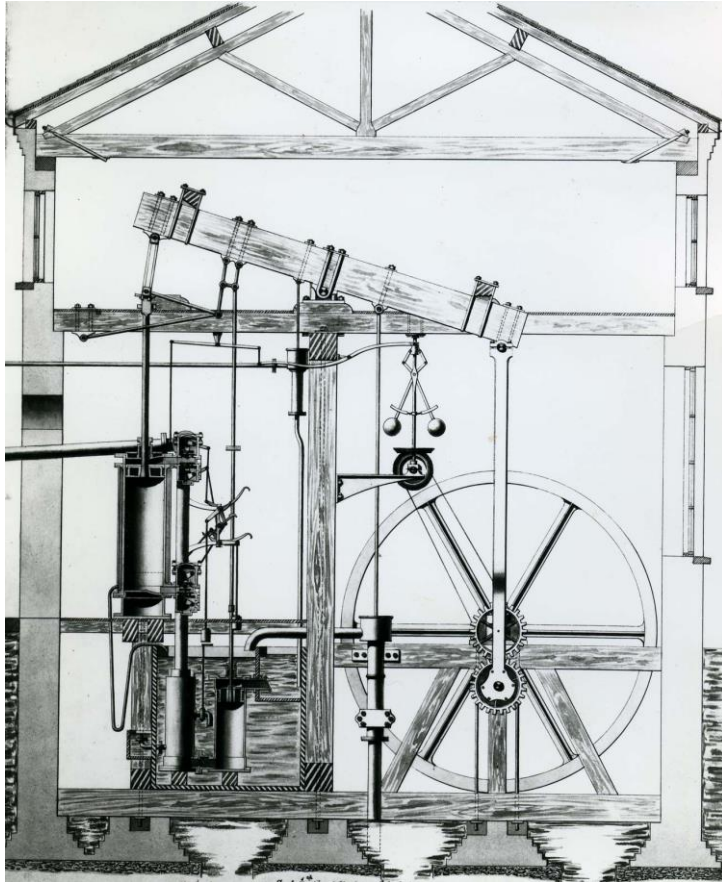
From Horses to Horsepower



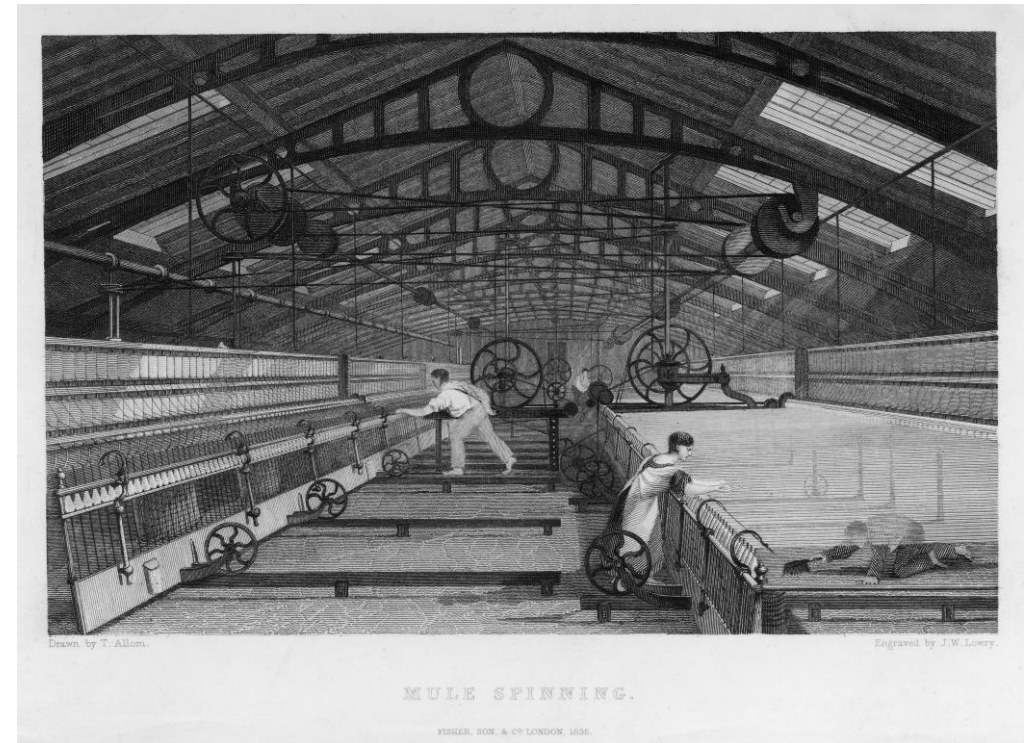
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The First Industrial Revolution

1760-1840: The original Steam Punk's



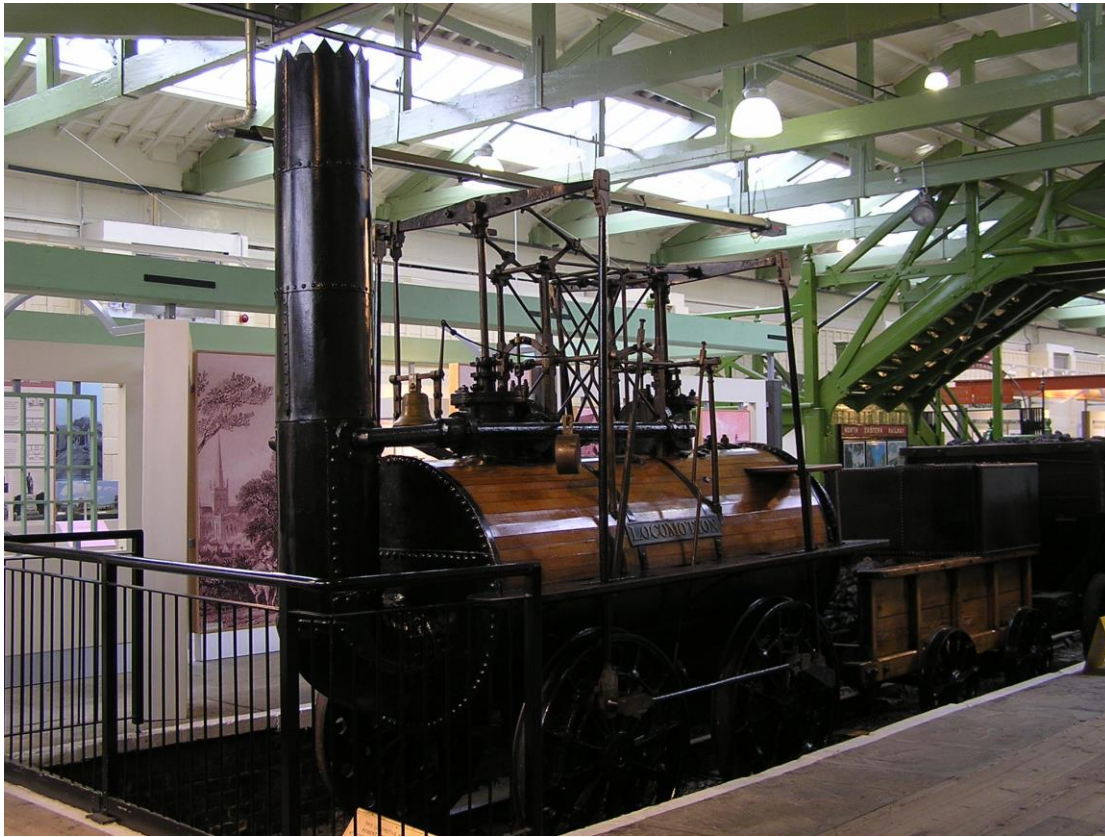
James Watt 1788 Double Action Sun And Planet Engine



Edmund Cartwright 1785 Power Loom

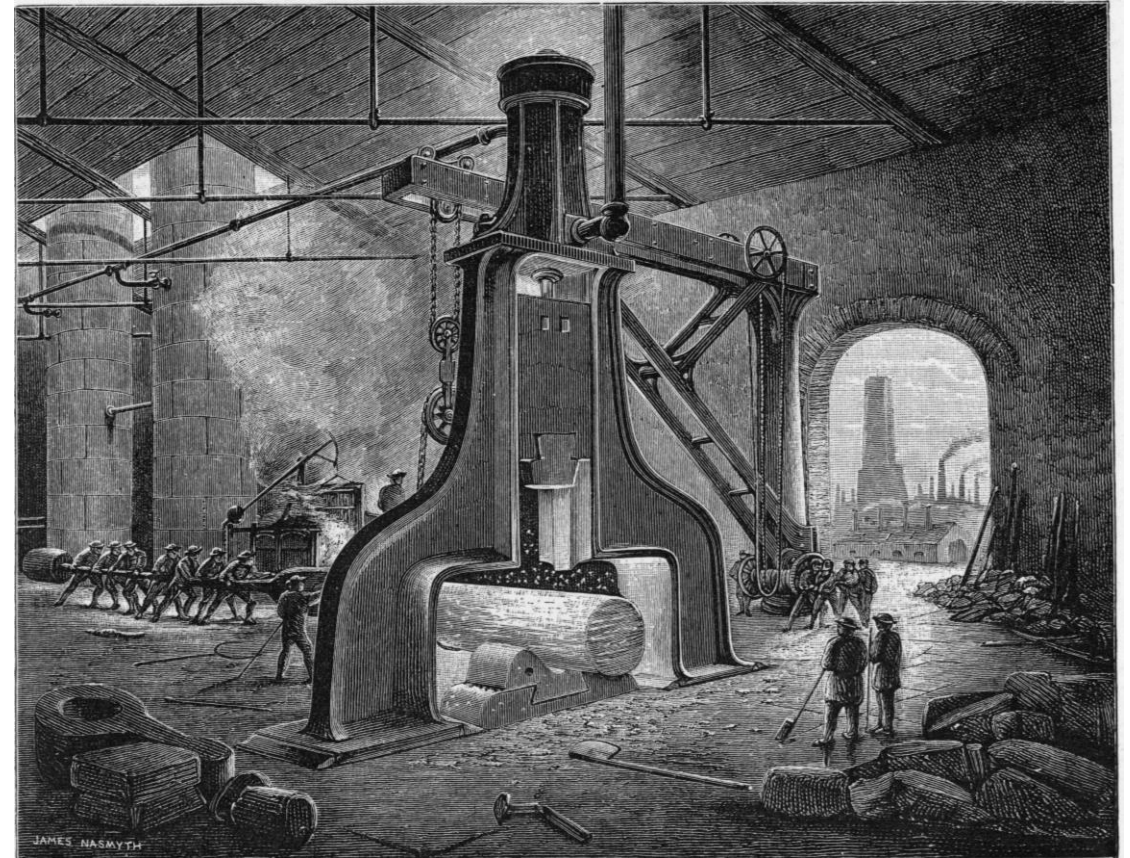
The First Industrial Revolution

1760-1840: The original Steam Punk's



Locomotive NO.1 George Stephenson 1825

Author



Steam Hammer James Nasmyth 1839-1842

** Francois Bourdon also invented the Steam Hammer*

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The First Industrial Revolution

1760-1840: The original Steam Punk's

1796

Dr Edward Jenner created the world's first successful vaccine. He found out that people infected with cowpox were immune to smallpox.



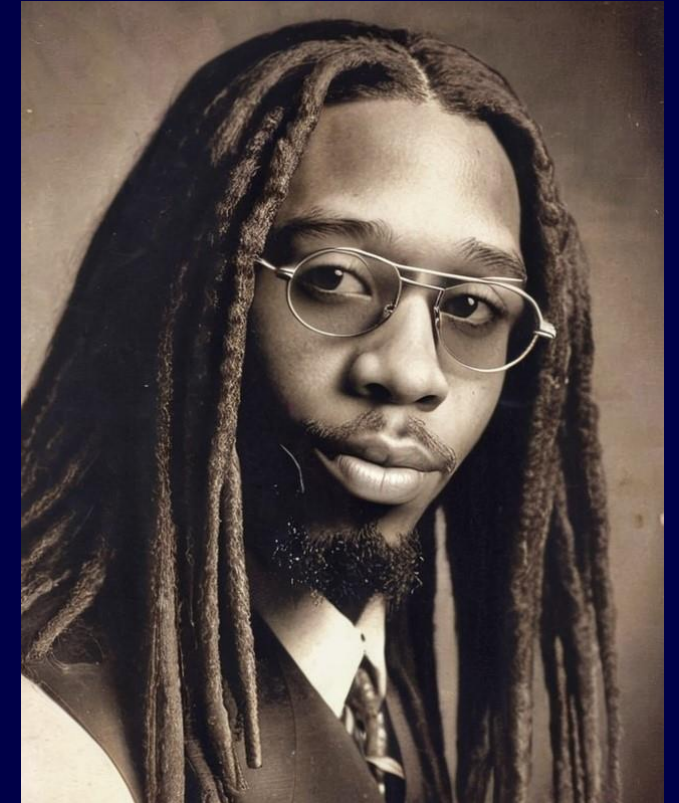
Author

THE SECOND INDUSTRIAL REVOLUTION

The Technological Revolution

1870 - 1914

Turn down for Watt !?!

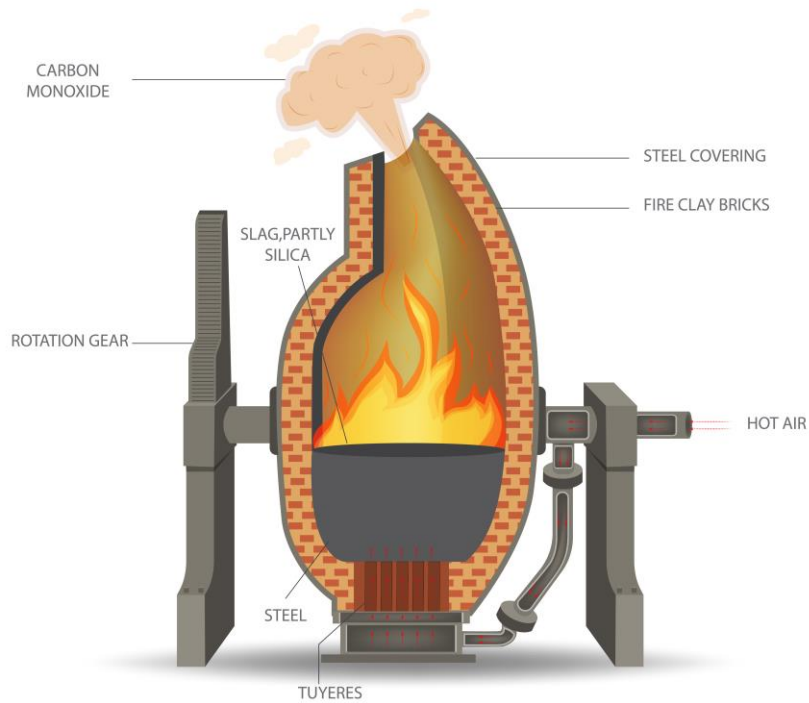


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The Second Industrial Revolution

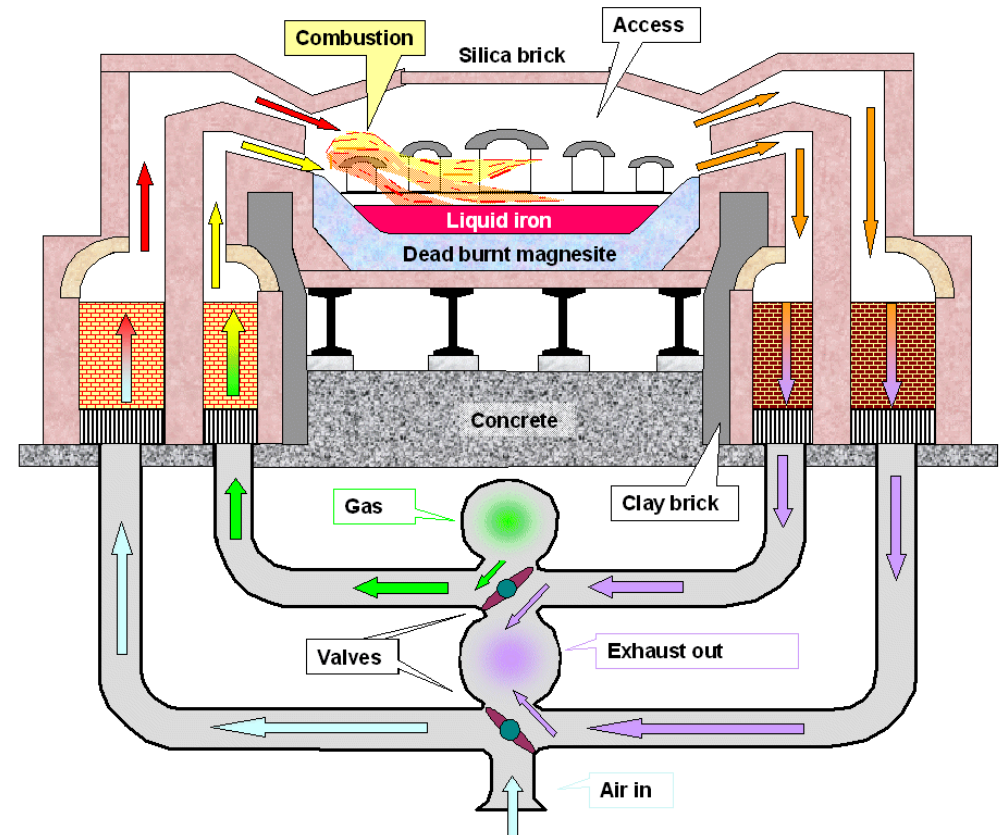
1870-1914: The Technological Revolution

BESSEMER CONVERTER



Bessemer-Thomas Steel Production Process
~1877

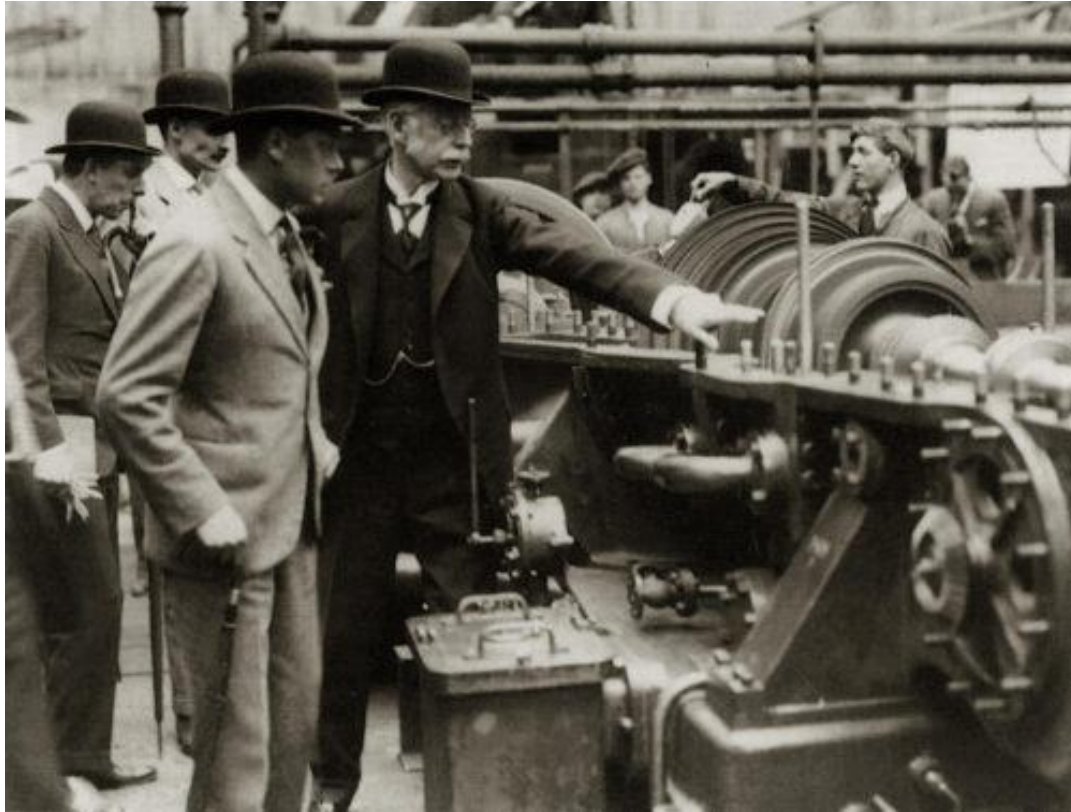
**William Kelly mention*



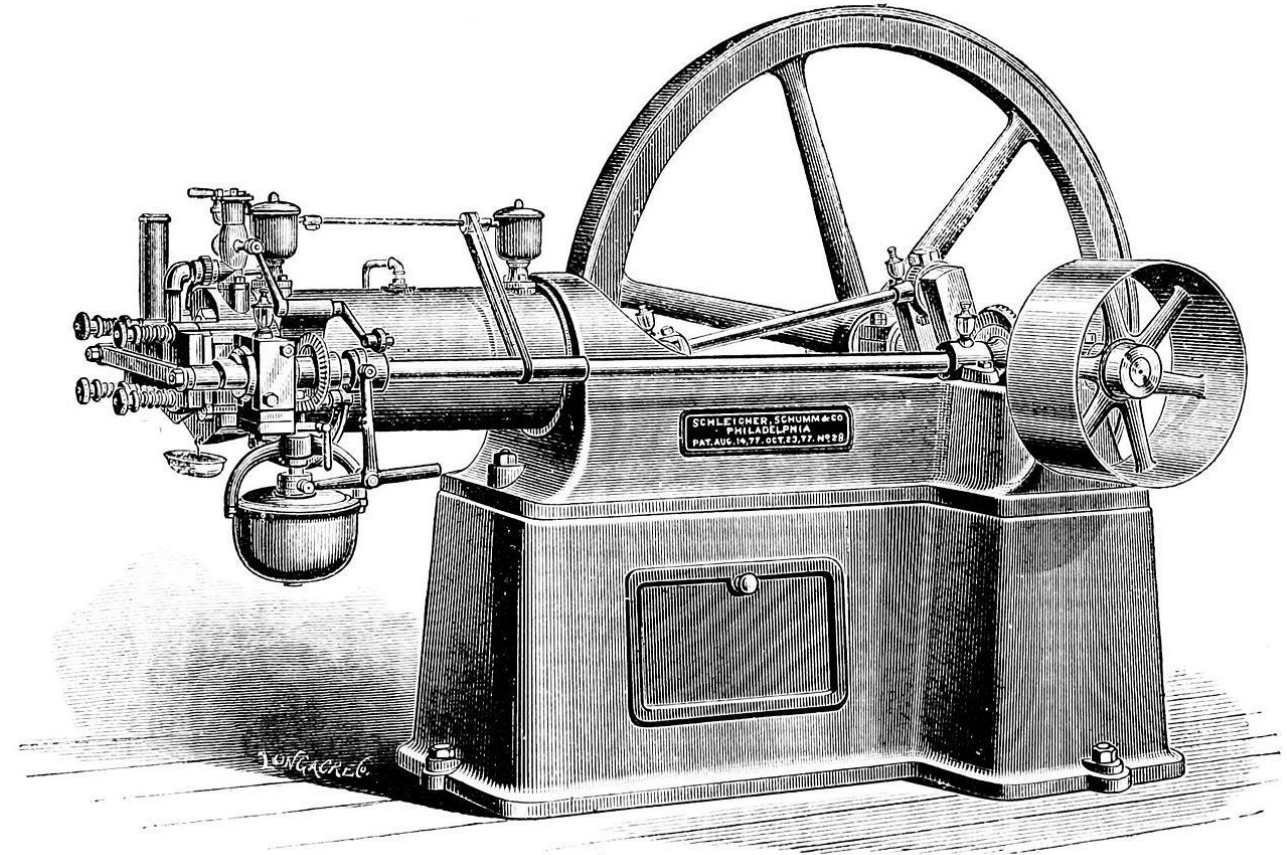
Siemens-Martin regenerative furnace
~1865

The Second Industrial Revolution

1870-1914: The Technological Revolution



Steam Turbine, Charles Parsons.
1884

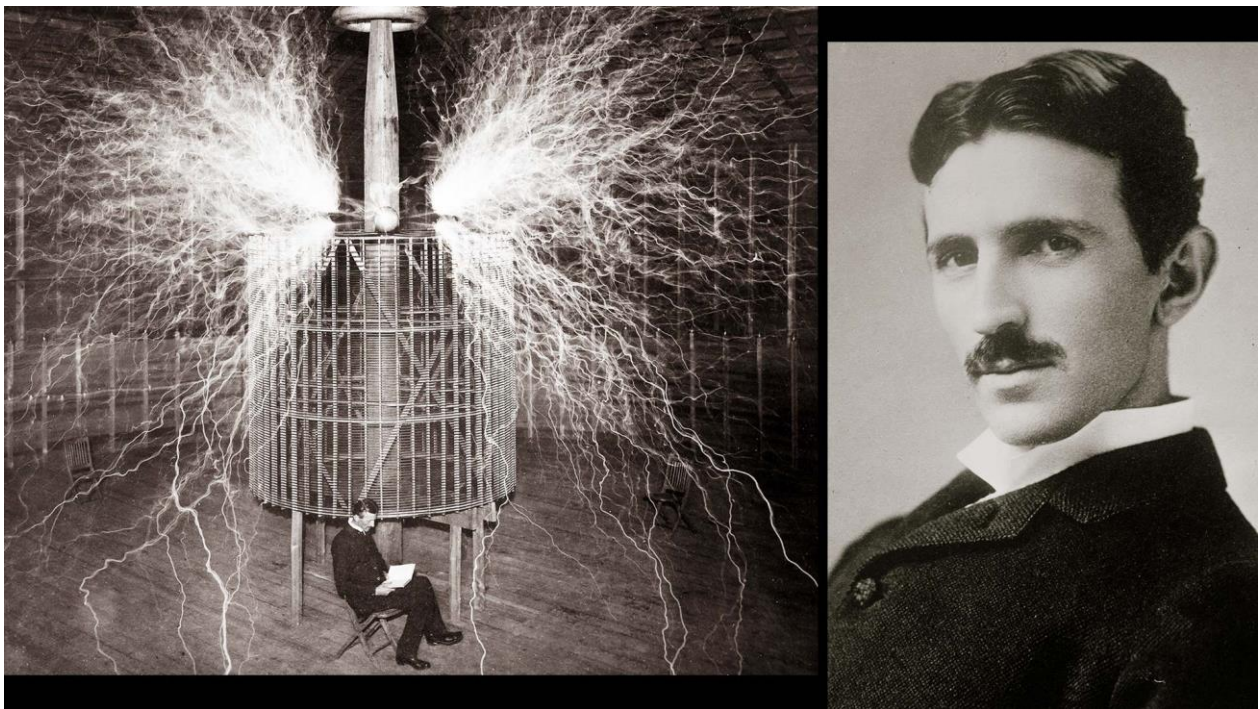


The "Otto cycle" engine. Nicolaus August Otto/
1876
More commonly known as "Internal Combustion engine".

Author

The Second Industrial Revolution

1870-1914: The Technological Revolution



1888 Nikola Tesla demonstrated the first polyphase alternating current (AC) electrical system.
George Westinghouse buys the patent rights.



1879 Thomas Edison invents first incandescent light bulb, which lasts 40hrs.
By 1880, bulbs would last 1200hrs.

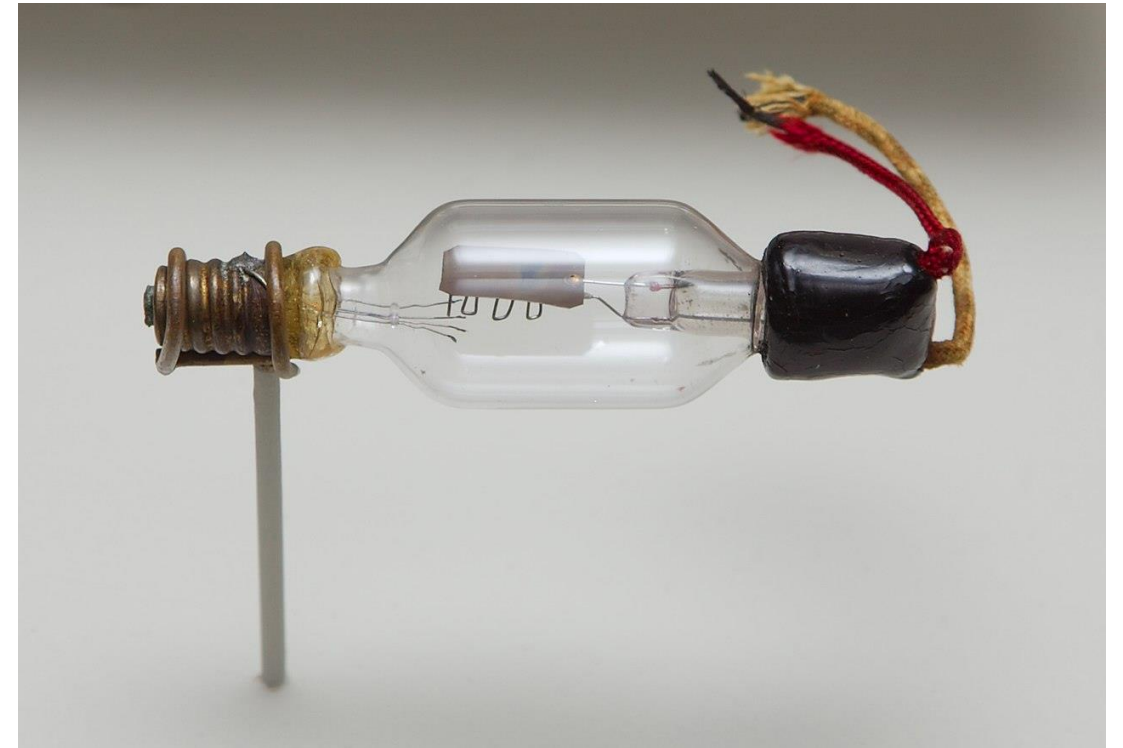
The Second Industrial Revolution

1870-1914: The Technological Revolution



Radio-based wireless telegraphy.
1901. Guglielmo Marconi.

Author

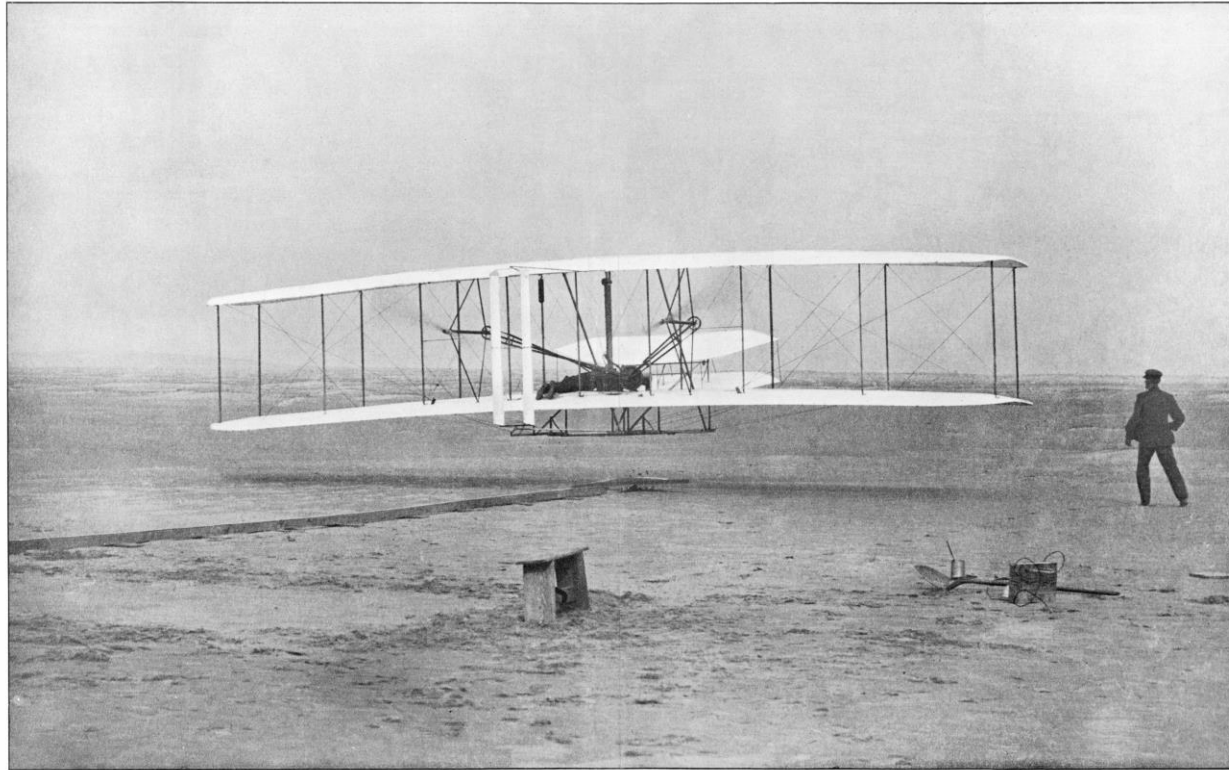


The First Triode, De Forest Audion Tube.
1908. Lee De Forest

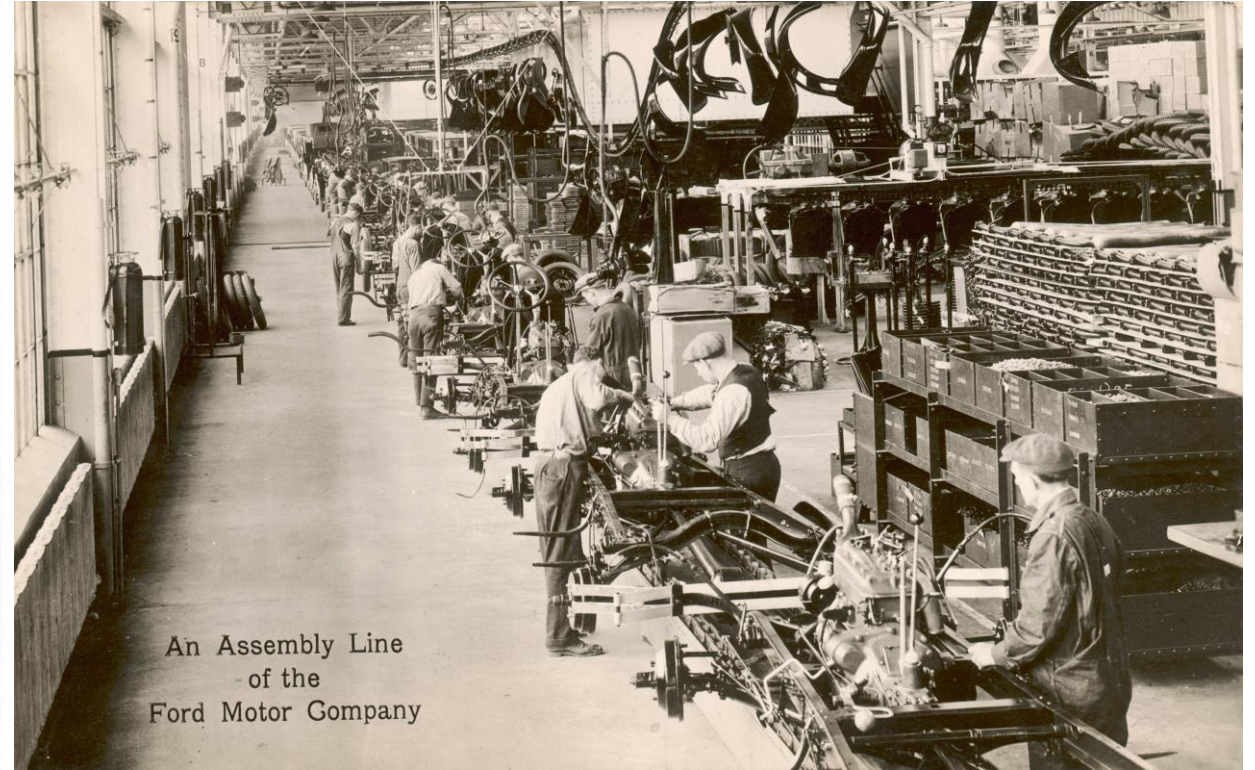
Author

The Second Industrial Revolution

1870-1914: The Technological Revolution



The Wright Flyer. 1903



An Assembly Line
of the
Ford Motor Company

Ford Assembly Line, ~1913.
250,000 Model T's sold in 1914

THE THIRD INDUSTRIAL REVOLUTION

The Digital Revolution

1947 -> 21st Century

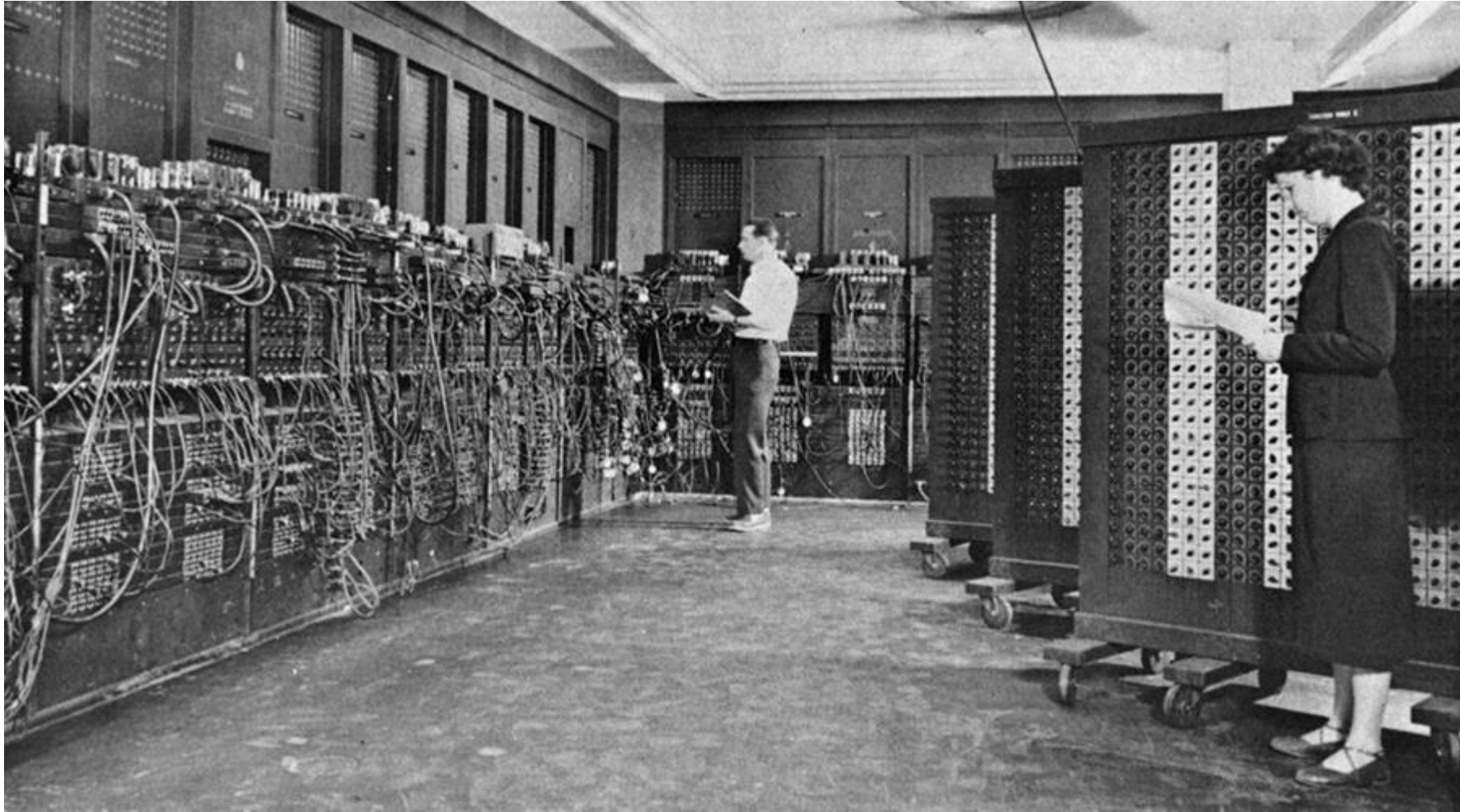
Holy Silicon Batman!



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The Third Industrial Revolution

1947 -> late 20th Century: The Digital Revolution



ENIAC. General Purpose digital computer
1945

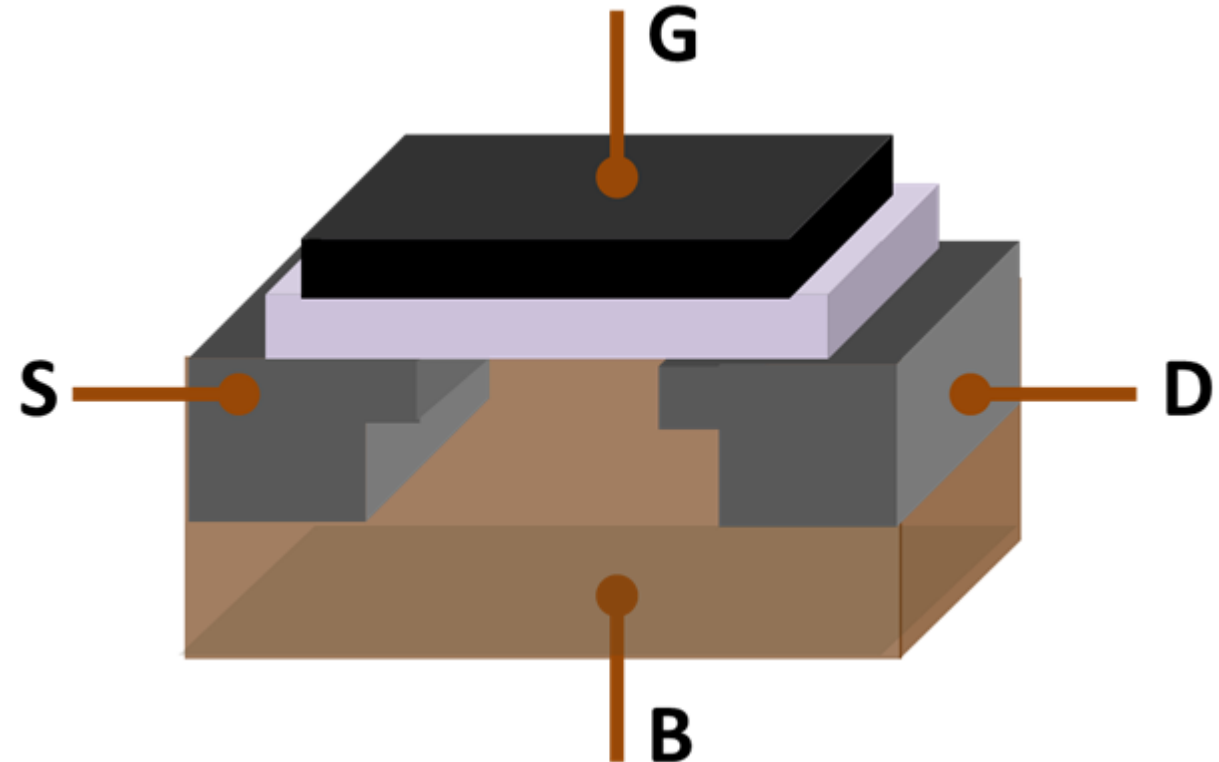
The Third Industrial Revolution

1947 -> late 20th Century: The Digital Revolution



Germanium-based point-contact transistor.
1947 John Bardeen, Walter Houser Brattain, William Shockley. BELL LABS

Author

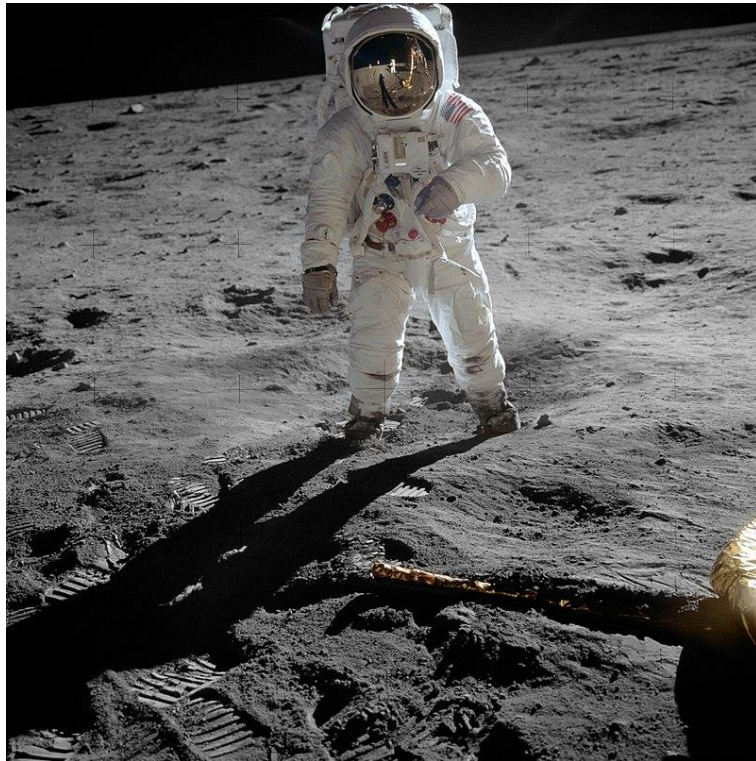


MOSFET transistor.
1959 Mohammad Atalla, Dawon Kahng. BELL LABS

Author

The Third Industrial Revolution

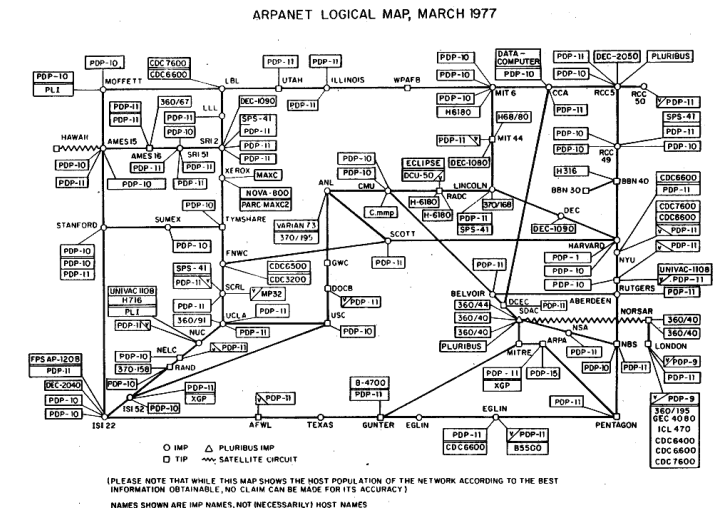
1947 -> late 20th Century: The Digital Revolution



Apollo 11.
1969



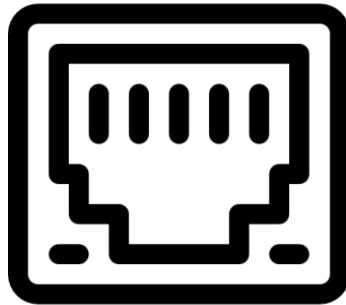
Modicon 084, the first 'Programmable Controller'.
1969 Richard Morley



ARPANET. First computer->computer login.
1969

The Third Industrial Revolution

1947 -> late 20th Century: The Digital Revolution



Ethernet developed.
1973



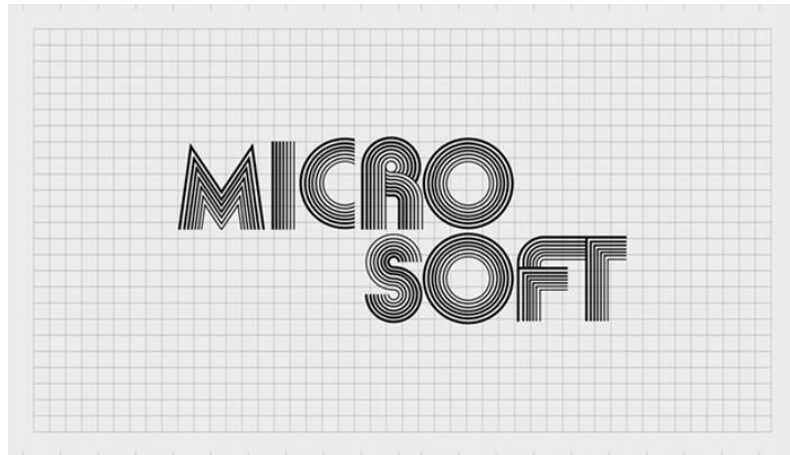
TCP/IP Protocol Suite begins.
Vinton Cerf, Robert Kahn
1973.



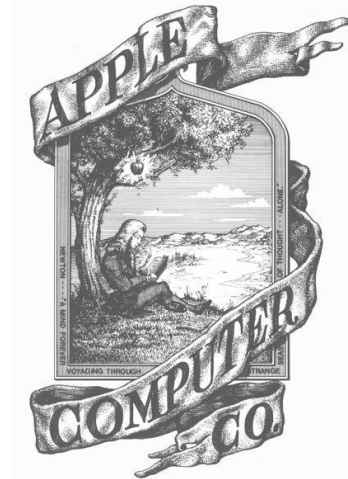
Xerox Alto.
1973

The Third Industrial Revolution

1947 -> late 20th Century: The Digital Revolution



Microsoft Founded.
1975



Apple Founded.
1975

VISICALCTM



VisiCalc. Spreadsheet software. The first "killer app".
1979



OSIsoft Founded.
1980

The Third Industrial Revolution

1947 -> late 20th Century: The Digital Revolution

“Fieldbus Wars”

Modbus.
1979

CANBus.
1986

Fieldbus.
1988

BACnet.
1987

Profibus.
1989

DeviceNet.
Early 90's

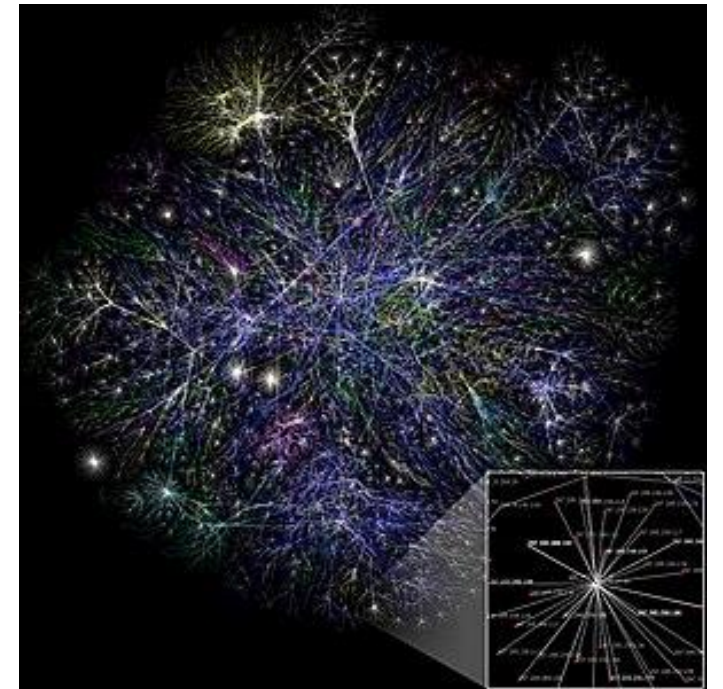
ControlNet.
1997

The First Cell Phone



Motorola DynaTAC 8000X.
1983

The Internet



The World Wide Web
1991. Tim Berners Lee

The Third Industrial Revolution

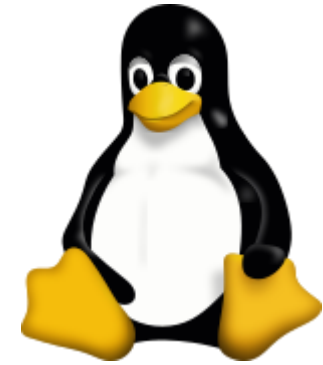
1947 -> late 20th Century: The Digital Revolution



Netscape Browser.
1994



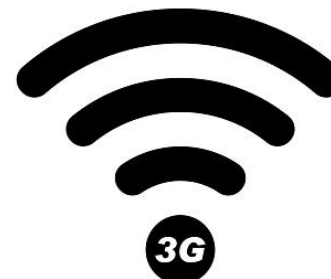
IBM Simon Personal Communicator
1994



Linux Kernel 1.0
1994



Wi-Fi 1 standard released
1997



3G Commercial Implementation
2001

The Third Industrial Revolution

1947 -> late 20th Century: The Digital Revolution



VMWare released first product
1999



Google IPO
2004



AWS S3 Storage and EC2
2006



Facebook opens membership to everyone
2006



iPhone
2007



Bitcoin launched
2009

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THE FOURTH INDUSTRIAL REVOLUTION

Industry 4.0

~2016

Neural Nets to Steel Threats



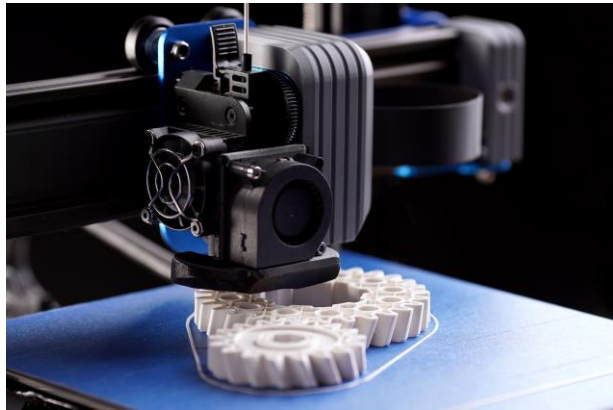
VS



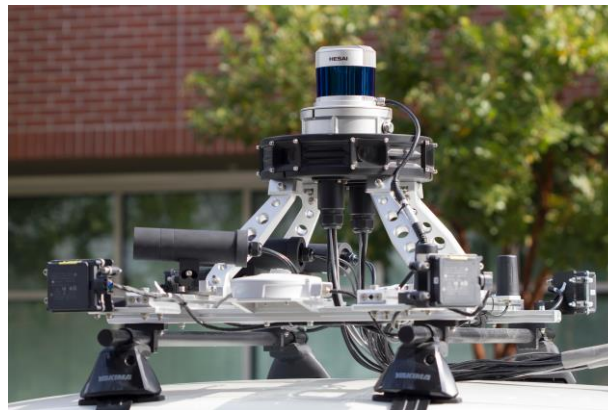
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The Fourth Industrial Revolution

Increasing Rate of Change



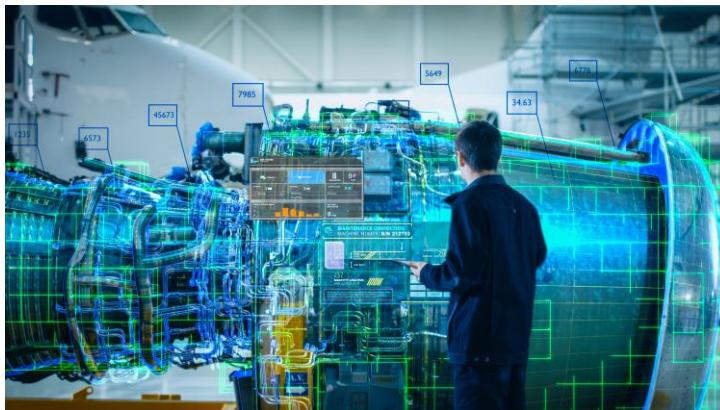
Additive Manufacturing



Smart Sensors



5G
(Commercial Implementation 2018)



Virtual and Augmented Reality



Analytics and Intelligence



Cloud Computing

“The increases in collected data from sensors, compounds to drive more demand for sensors and data.”

Dr. J Patrick Kennedy



The Bedrock for Industry 4.0: PI system

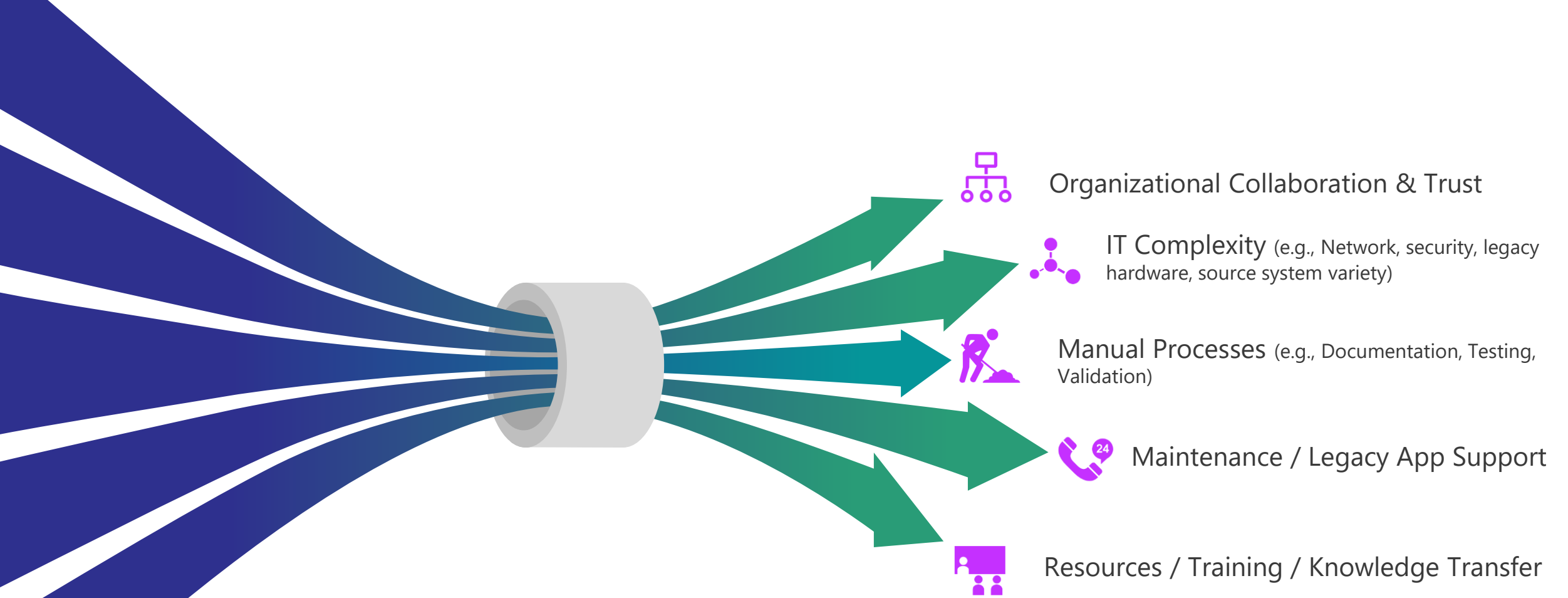
Envision maximizing your ROI and achieving your industry 4.0 goals via advanced analytics through better decision-making, increased productivity & efficiencies

Examples of 4 clients in their journey of digital transformation, leveraging the PI system

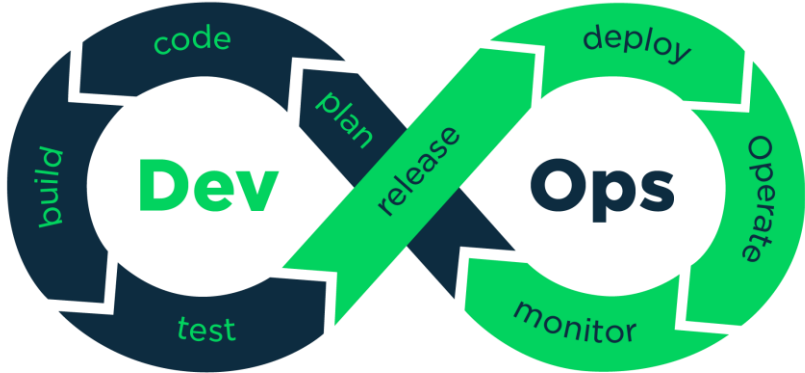
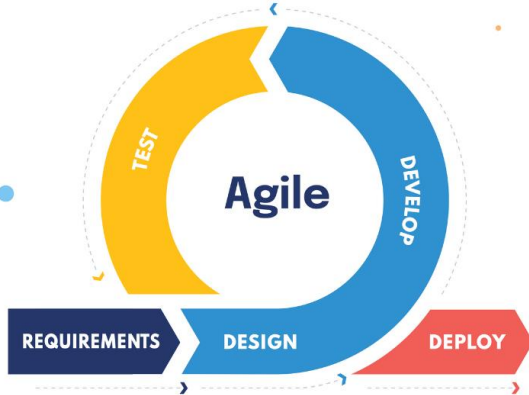
Analytics | Automation | System Engineering

- 1 Batch-based application interface to get high frequency data out of PI to AWS S3 bucket for a construction equipment major
- 2 PI reporting using the PI Integrator for Business Analytics, replacing an MES reporting approach for a personal care products giant
- 3 Moving thousands of PI ProcessBook screens (EOL in 2024) to PI Vision using automation, for an electric utility
- 4 Architecting a system use PI Asset Framework effectively and bringing an analytics-ready approach to mining operations

Typical Bottlenecks & Challenges



Enablers for the 4th Industrial Revolution



FDA
CSV -> CSA

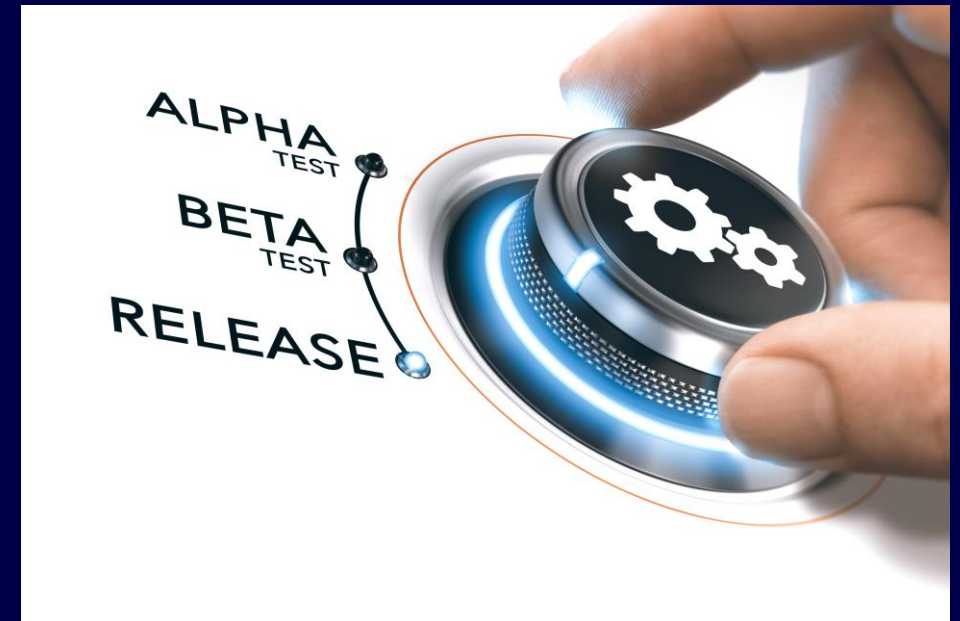


Standard
for DevOps



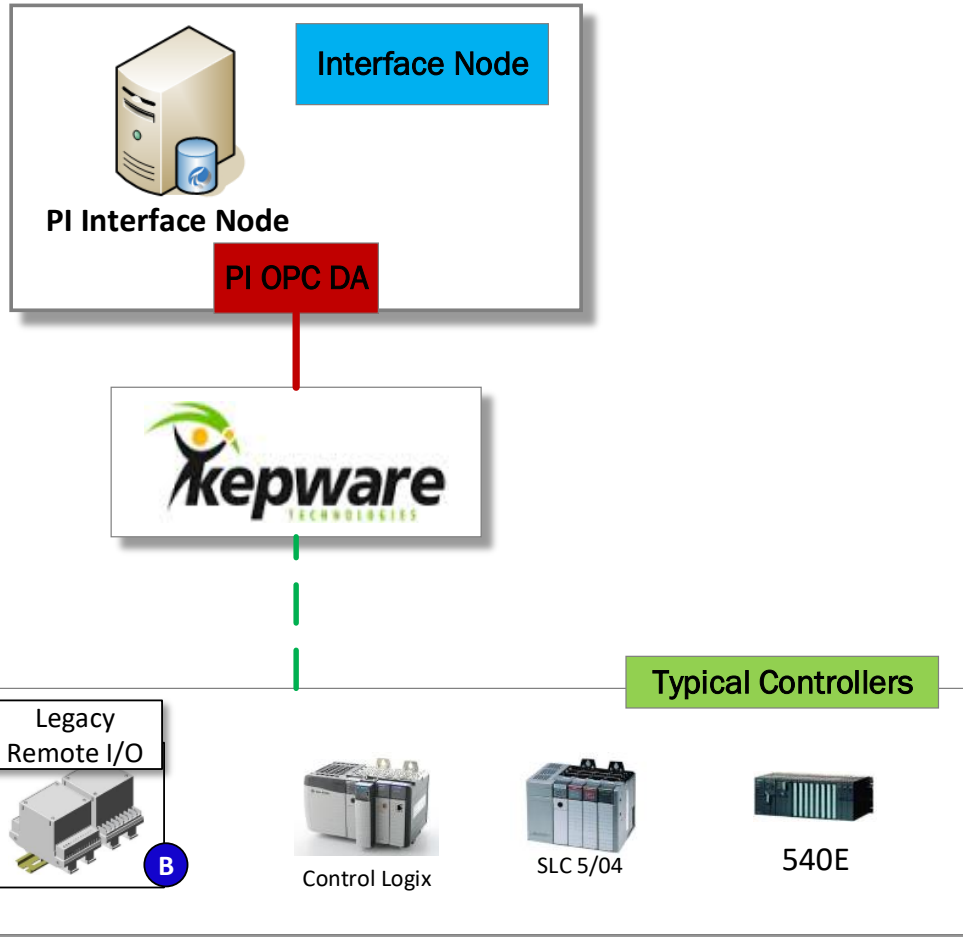
A day in the Life

Getting from Development to Production Environment in about 20mins



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Get a Dev to Production



Goal:

Integrate a device, create all tags, perform testing, deploy to Production

Using a Package Manager

DEMO / VIDEO

Tasks:

- Download/install latest version of the 'standard' PI Interface config from enterprise package manager

Package Interface & Tags, Deploy to next Environment

DEMO / VIDEO

Tasks:

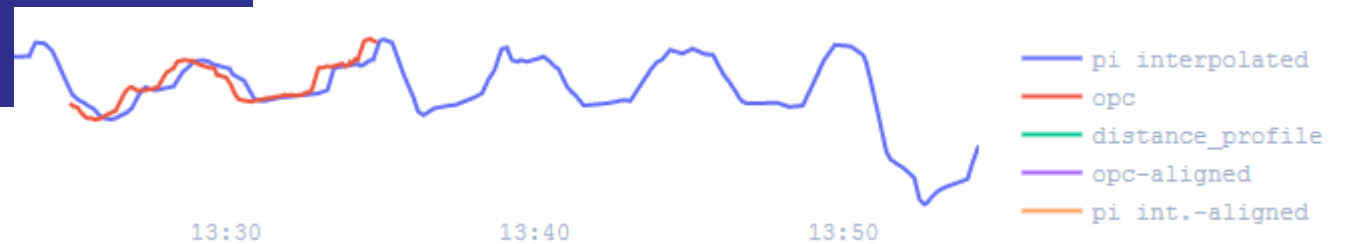
- Capture all relevant config, and package into a deployable zip file (nuget package)
- Deploy to next environment (QA/PROD)
 - Single-line deployment, deploys all interface, dcom, taglist, failover, security, etc.

Data Integrity Testing

DEMO / VIDEO

Tasks:

- Test Data Accuracy between readings from Device & Historian
 - Analyze & Validate data *profiles* (a signal waveform, over a given time range), rather than point-by-point
- Use MASS distance profile to align profiles
- Get Data Integrity result by measuring variance between signals



Using Test tools & Frameworks (Selenium & SpecFlow)

DEMO VIDEO

Tasks:

- Define tests in simple English
- Execute
- Review HTML report
- Publish displays



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Technical Director

Cognizant LSM Group

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Sharath Prasad

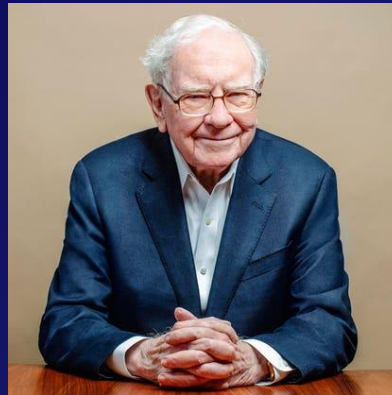
Associate Vice President

Cognizant IOT IO Offerings

<https://www.linkedin.com/in/sharathprasad/>

“Forecasts may tell you a great deal about the forecaster; they tell you nothing about the future.”

Warren Buffet



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ABOUT AVEVA

AVEVA is a world leader in industrial software, providing engineering and operational solutions across multiple industries, including oil and gas, chemical, pharmaceutical, power and utilities, marine, renewables, and food and beverage. Our agnostic and open architecture helps organizations design, build, operate, maintain and optimize the complete lifecycle of complex industrial assets, from production plants and offshore platforms to manufactured consumer goods.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

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