

# Technology and World Change

Session 1

Lee Kong Chian School of Business

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# Working Agreements

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- Using ChatGPT and Midjourney is highly encouraged
- Laptops are required for all sessions
- Place mobile on silent mode while during session
- Sit according to your groups
- All grading is during class, except final exam
- Technical support is not provided for installations and errors

# Course Structure and Coverage

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1. How **Technology** changed?
2. How was **society** impacted?
3. How was **industry** impacted?
4. How was **civilization** impacted?

Past

1. What technology **trends** are shaping change?
2. How is **industry** getting impacted?
3. How is **society** getting impacted?
4. How are **countries** creating change?

Present

1. How will **you** create a change?
2. What should you be **concerned** about?

Future

# Course Assignments and Assessment

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1. How **Technology** changed?
2. How was **society** impacted?
3. How was **industry** impacted?
4. How was **civilization** impacted?

**Past**

Industry  
Presentation  
– Group  
Work

1. What technology **trends** are shaping change?
2. How is **industry** getting impacted?
3. How is **society** getting impacted?
4. How are **countries** creating change?

**Present**

Case Study,  
Mid Term &  
Final Quiz

1. How will **you** create a change?
2. What should you be **concerned** about?

**Future**

Start-up  
Pitching –  
Group Work

# How grading works? How to score higher?

Assessment	Grade	Grading
Class Participation	20%	Asking questions does not improve class participation score. Keeping quiet does not either. After every session, TA will add 1 point for every good question, insight, debate, and activity. CP will be cumulative of all sessions.
Mid-Term Quiz - MCQs	10%	MCQs are deductive and easy to score but a key differentiator in overall grades.
Industry Presentation	20%	Engagement is key as 50% weightage is how the class grades your presentation.
Start-up Pitching	20%	Each team member receives same grade. Customer Validation, Prototype, Idea refinement are graded higher
Final Examination:	30%	MCQs give you 15 marks and case-based questions give you 15 marks. The case-based questions need to be articulated with proper structure and clarity of thought.

In a class of 45, approx. 13 students achieve A- or above. Rest all get a B+ or below

Every team puts a lot of effort but there is no grade allotted for effort. It is only based on the outcome.

Speak to me if you wish to include peer review in your project grading.

# Assessments & Grade Distribution

Assessment	Grade	G4	G5	G7
Class Participation	20%	Ongoing	Ongoing	Ongoing
Mid-Term Quiz - MCQs	10%	25th Sep 2023 8:15AM	26th Sep 2023 8:15AM	28th Sep 2023 8:15AM
Technology & Industry (Group Project)	20%	9th Oct 2023 8:15AM	10th Oct 2023 8:15AM	12th Oct 2023 8:15AM
Technology & Entrepreneurship (Pitching)	20%	23rd Oct 2023 8:15AM	24th Oct 2023 8:15AM	26th Oct 2023 8:15AM
Final Examination:	30%	24 <sup>th</sup> Nov 2023 2:30PM	24 <sup>th</sup> Nov 2023 2:30PM	24 <sup>th</sup> Nov 2023 2:30PM

Week 1	Week 2	Week 3	Week 4	Week 5
Technological Revolutions & Societal Impact	Tech Product Ideas and Business Model Canvas	Lean LaunchPad for Commercialization of Technological Innovations	Customer Experience Design leveraging new technologies	Product Idea Pitching
Week 6	Week 7	Week 8	Week 9	Week 10
Industry Development Life Cycle, Dominant Design & Network Effects	Radical, Architectural and Disruptive Innovations <i>Online Test</i>	Break	<i>Group Presentation - Industry</i>	Future Technologies and World Change
Week 11	Week 12	Week 13	Exam	
<i>Group Presentation – Start-up Pitch</i>	National System of Innovations & National Competitiveness	Revision and Exam preparedness	Online Exam	

# Technology & Industry – Group Project

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- Team will deliver 20 mins presentation on an industry.
- Choose an industry during the first week and inform the TA. Presentation covers innovation, society impact, business impact.
- Analyze past (5 slides), present (5 slides) and future trends (5 slides) within that industry. Approximate 15 slides
- This is a flipped classroom. The team will create engagement with the class and the class will grade them (50% weightage). The criteria for grading will be engagement and content.

**Why graded by class?**

*Your chance to experience  
feedback from customer.  
Is it what you expected? Is  
it rational? Is it fair?  
Could you connect?*



# Technology & Entrepreneurship - Pitching

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- Teams will develop an idea into a product and show a 5min video pitch to the class.
- Q&A for 5mins after the video pitch
- Hone your VC pitching skills
- Submit a pitch deck.
- Reference pitch: <https://www.youtube.com/watch?v=EayeBffSldw>



## Why video pitch?

*Learn making video pitch  
for global pitching  
sessions. Build product  
prototypes using Canva  
and Figma.*

# Technology & Society – Midterm Test

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- This is an online test covers entire syllabus from Session 1 to Session 6. However, it will be based mainly on contemporary issues in society and how science and technology is being deployed to solve societal issues such as poverty, climate change, national competitiveness and technology commercialization and intellectual properties.
- Format of Test: 20 MCQ
- Duration of Test: 30 mins
- No lockdown browser
- Weightage of Test: 10%
- Date: G4-25<sup>th</sup> September/ G5-26<sup>th</sup> September/ G7-28<sup>th</sup> September

# Final Examination (30%)

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- The final examination is an online, 2-hour, open-book. No paper submission allowed.
- Exam will have equal weightage of MCQ and case study questions.
- There will be 15 MCQs each carrying 1 mark and 3 case based questions each carrying 5 marks.
- The instructor will go through the case with the students in the last lecture.

# Session 1

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- Medieval and Industrial Age
- Kondratiev Cycles
- Schumpeter's Creative Destruction and the Entrepreneur
- Henry Ford - The Entrepreneur
- Last 100 years and current trend
- Technology driven Entrepreneurship

# Let's travel through time

15 mins



- Choose one of the profession or role in the medieval period.
- Interact with class fellows and sell your produce or buy your requirements.
- Understand what drives the economy and what the community focusses on.
- Identify a technology your role can make to improve the livelihood of your self or the community.

# Medieval Age – Economic Cycle (players)

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King

Farmer 1

Teacher1

Teacher2

Monk1

Horsema  
n1

Hunter1

Mason1

Chief  
Minister

Farmer 2

Goldsmith  
h2

Worker1

Monk2

Horsema  
n2

Hunter 2

Mason2

Goldsmith  
h1

Farmer 3

Money  
lender2

Worker2

Physician  
1

Gatherer  
1

Soldier 1

Boatman  
1

Money  
lender1

Blacksmi  
th1

Blacksmi  
th 2

Worker3

Physician  
2

Gatherer  
2

Soldier 2

Boatman  
2

# Let's answer a few questions

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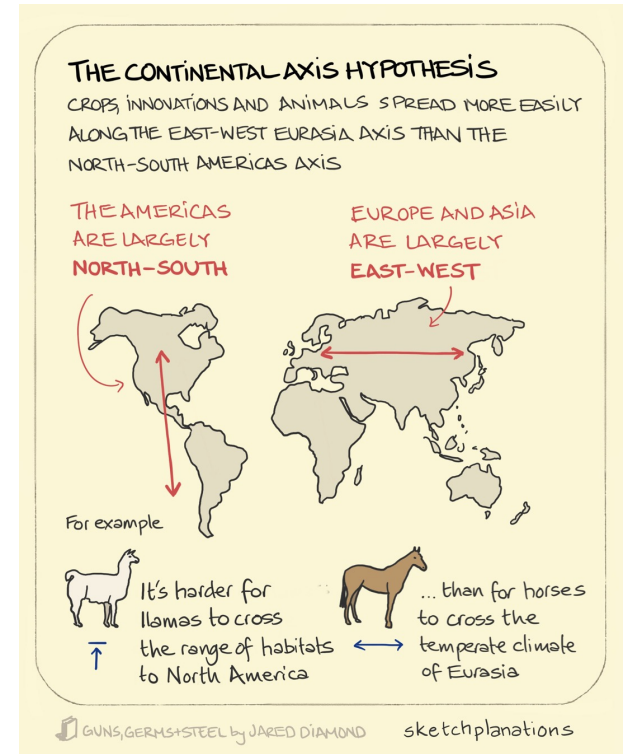
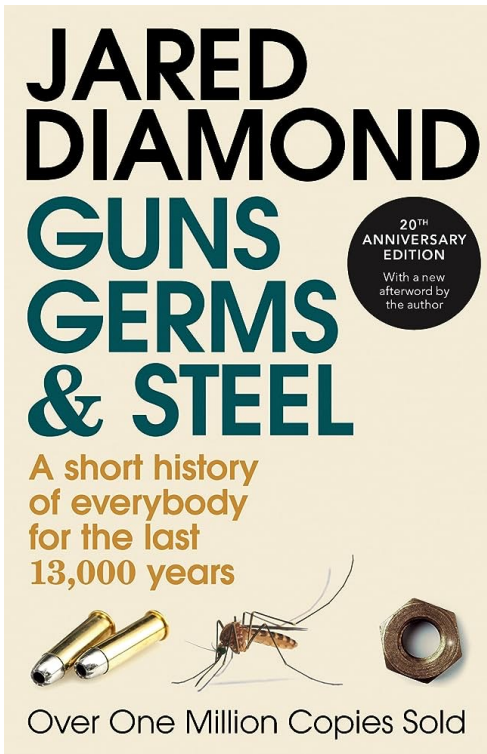
- What does prosperity mean in this age?
- What is the focus of this community?
- How is wealth accumulated and held?
- Does the economy have inequality of wealth?
- What is the governing order within the community?
- How will you create economic prosperity?
- Is there any regulation or legal order?
- Does the economy have bubbles or inflation?
- How does this community get impacted by introduction of 1) paper as a currency, 2) Communism, 3) Capitalism, 4) Socialism?

Agricultural  
economy with no  
focus on trading,  
manufacturing,  
banking



# Guns Germs & Steel – Jared Diamond

- How many animals have been tamed by humans?
- Why has the African elephant never been tamed?
- Why does the white man carry so much cargo?
- Why did people chew beetle nut? How did they invent narcotics?





# Ancient River Valley Civilizations



1. Tigris and Euphrates  
2. Nile

3. Indus  
4. Yellow and Yangtze



# Lost Art: Traditional Culture of Living

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- 95% of us will die with preventable diseases
- Climate crisis: We are overconsuming!
- We may relapse to traditional society. Can we survive?
- New Guineans face natural risk, no lifestyle disease, heart, diabetes
- Elderly – abandon, suicide, kill
- First world scared of plane crash, terrorists, cancer
- Justice – self or by government? Inheritance/Divorce – emotional closure to live together
- Survival – Make stone tools?



# How resilient are you?

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- Who is the best teacher?
  1. Prof Shirish
  2. Formal Education
  3. Experience
  4. Social Media
- Do you get complete freedom to take your own decisions in everything you do?
- Do you think freedom makes you self confident, better negotiator, decisive?

# Industrial Age – Economic Cycle (Players)

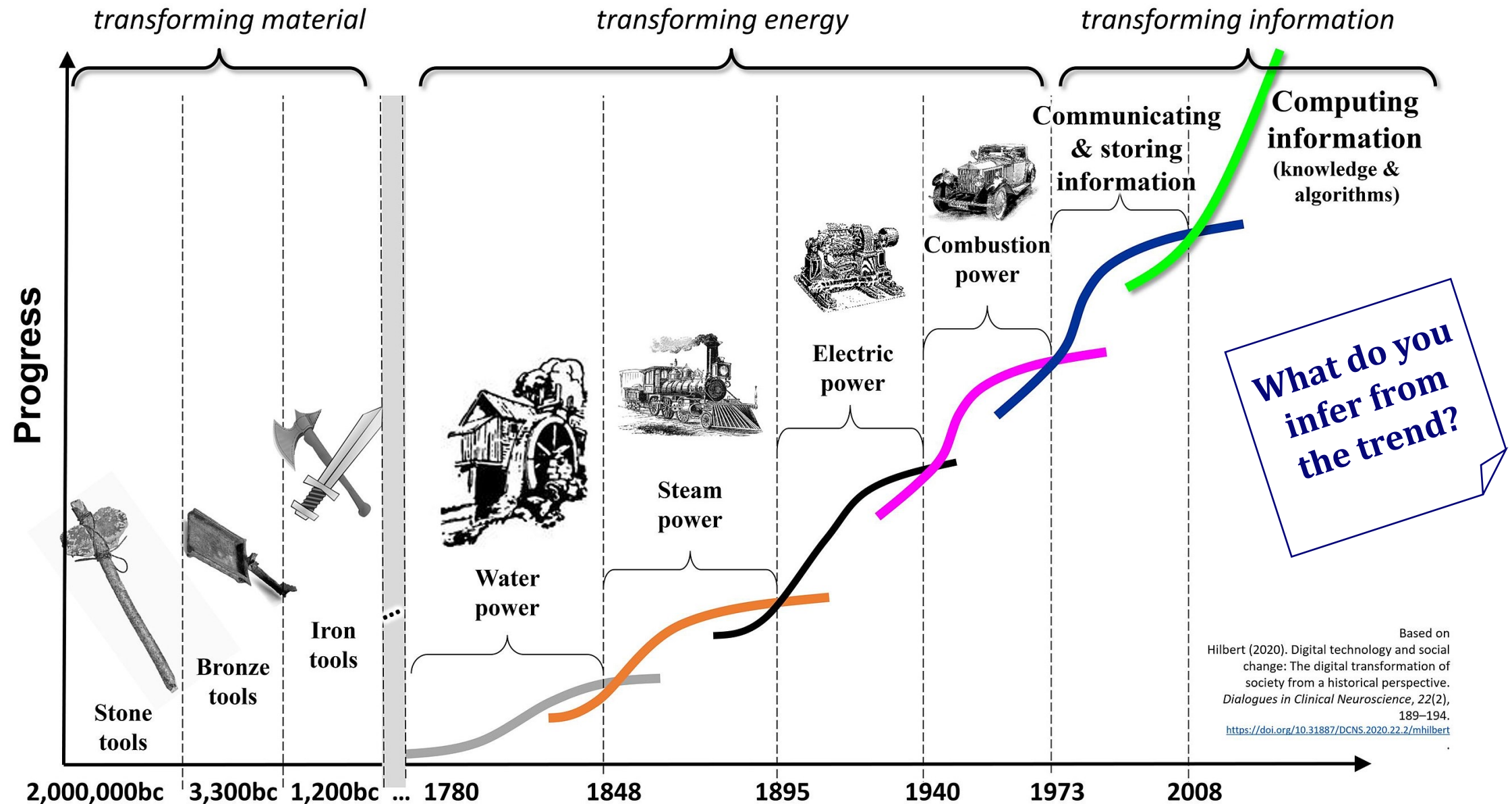
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Bank 1	Farmer 1	Manufacturer 2	Trader 3	Doctor 1	Teacher 1	Architect 1	Soldier 1
Bank 2	Farmer 2	Manufacturer 3	Labour 1	Doctor 1	Teacher 2	Architect 2	Soldier 2
Central Bank	Farmer 3	Trader 1	Labour 2	Engineer 1	Sailor 1	Accountant 1	Technician 1
Government	Manufacturer 1	Trader 2	Labour 3	Engineer 2	Sailor 2	Accountant 2	Technician 2

# What changes in Industrial Age?

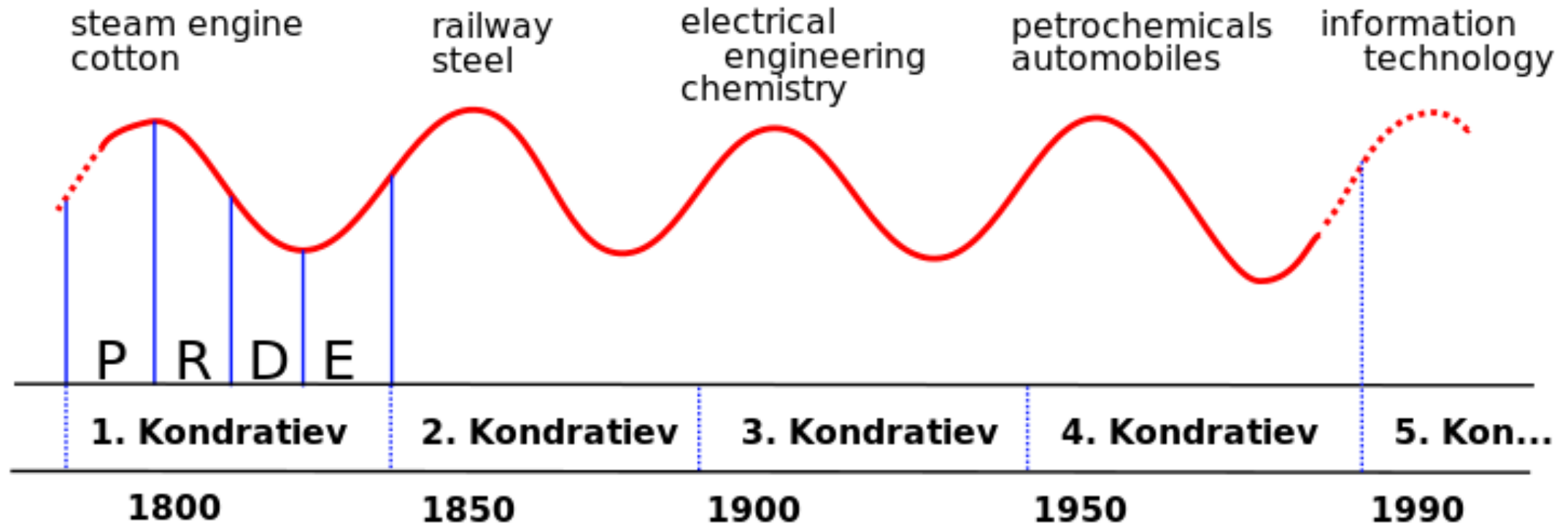
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# Technology Transformation of Humans





# Kondratiev Waves



P: prosperity  
R: recession  
D: depression  
E: improvement

A Kondratieff Wave is a **long-term economic cycle believed to be born out of technological innovation**, which results in a long period of prosperity.

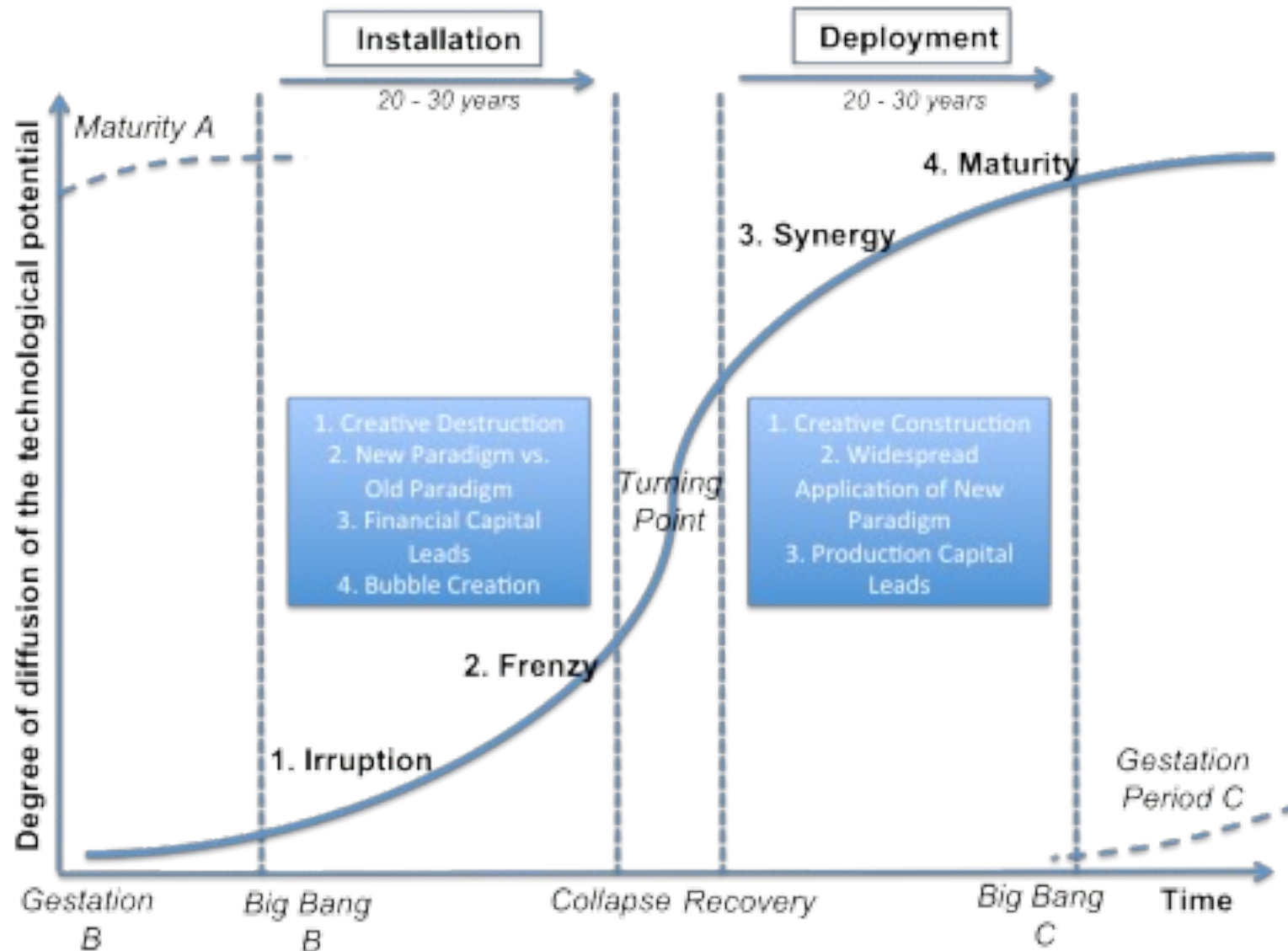
# Kondratiev wave (technological basis)

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- In 1925, Soviet economist Nikolai Kondratiev identified cycles consisting of alternating intervals of high sectoral growth and intervals of relatively slow growth.
- Kondratiev identified three phases in the cycle, namely **expansion**, **stagnation** and **recession**. More common today is the division into four periods with a **turning point** (collapse) between expansion and stagnation.
- In 1939, Joseph Schumpeter suggested naming the cycles "Kondratieff waves" in his honor.

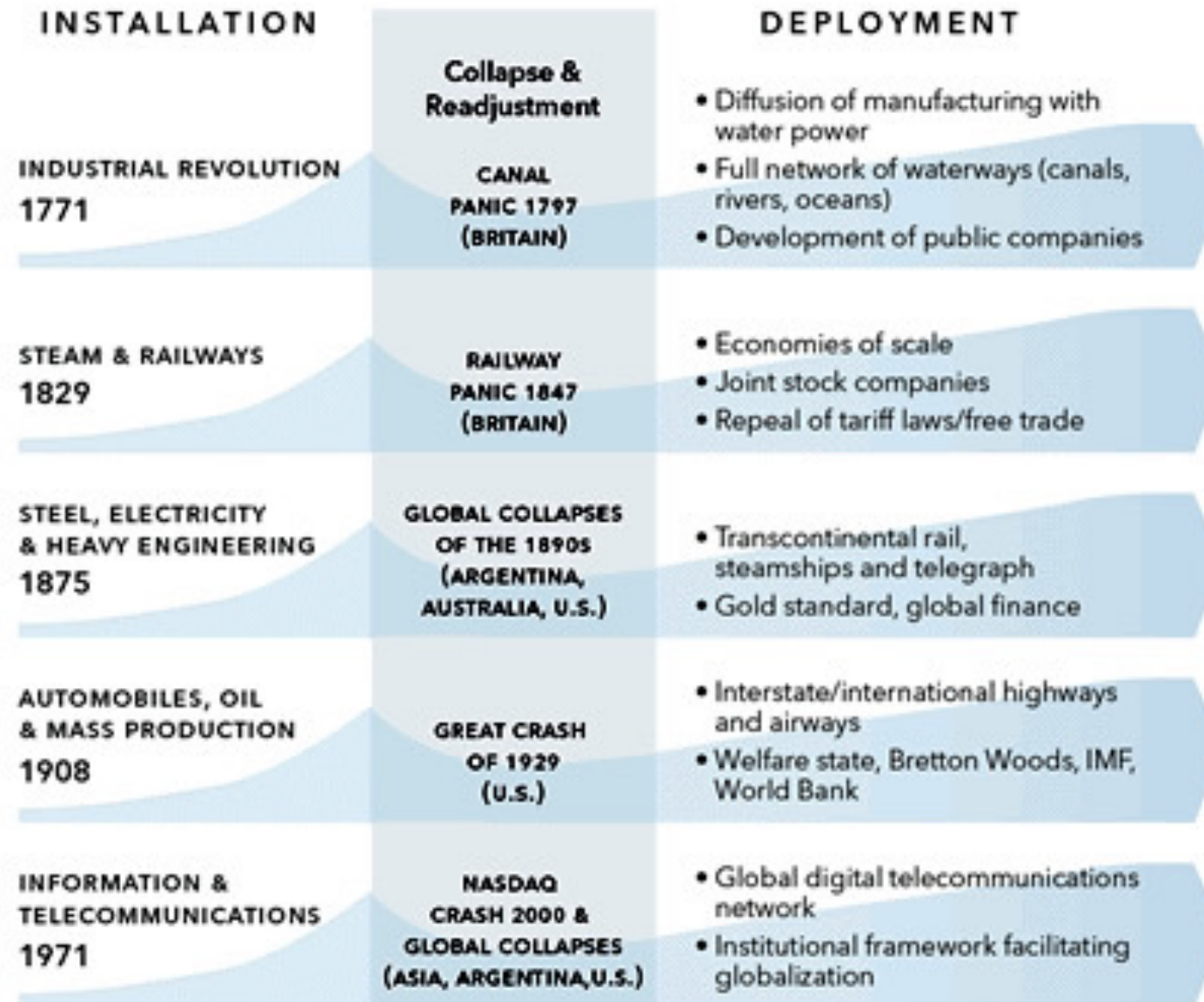


# Carlota Perez Technological Surge Cycle



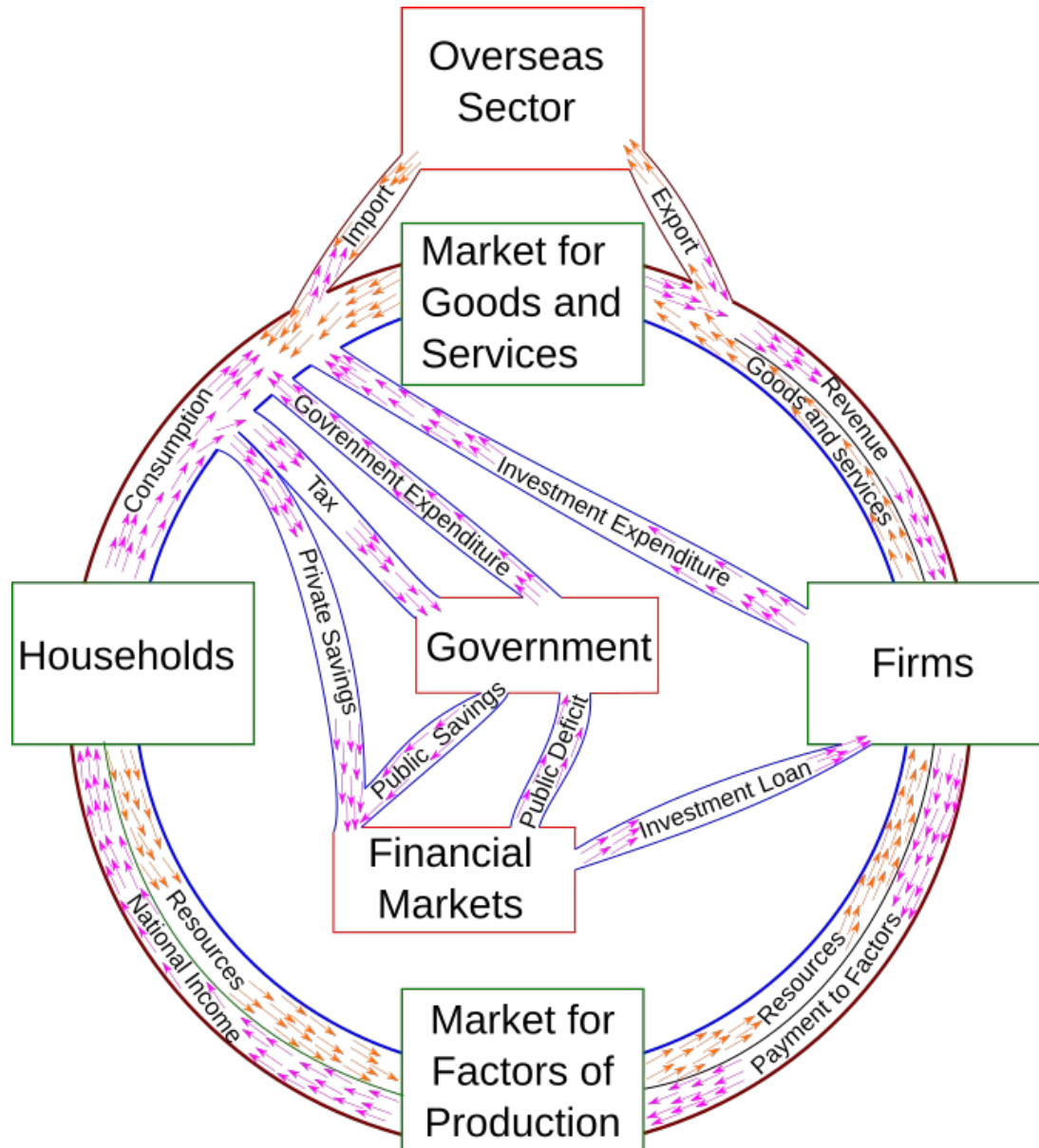
Perez (2002) places the phases on a logistic or S curve, with the following labels: the beginning of a technological era as **irruption**, the ascent as **frenzy**, the rapid build out as **synergy** and the completion as **maturity**

# Where are we on these cycles now?



- Diffusion of technology at rapid scale
- Knowledge based workforce is more important over skilled manual workforce
- Technology has created a hyperconnected world

# Circular flow of income



- The circular flow of income is a model of the economy in which the major exchanges are represented as flows of money, goods and services, etc. between economic agents.
- This graph shows the circular flow of income in a five-sector economy. The flow of money is shown with purple, and the flow of goods and services is shown with orange. Money flows in the opposite direction from goods and services.

# The hero of this story is the entrepreneur

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Schumpeter's *The Theory of Economic Development* states that circular flow excluding any innovations and innovative activities, leads to a **stationary state**.



Joseph Schumpeter

The **entrepreneur** disturbs this equilibrium and is the prime cause of economic development, which proceeds in a cyclic fashion along with several time scales.

**Creative destruction** - the process of innovation and technological change that leads to the destruction of existing economic structures, such as industries, firms, and jobs.



# Entrepreneur's DNA

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- Write words that resonate with you when you think of the term “Understanding Customer wants” (5 mins)



Any customer can have a car painted any colour  
that he wants so long as it is black.

(Henry Ford)

- Does the above statement resonate with understanding customer wants and requirements?

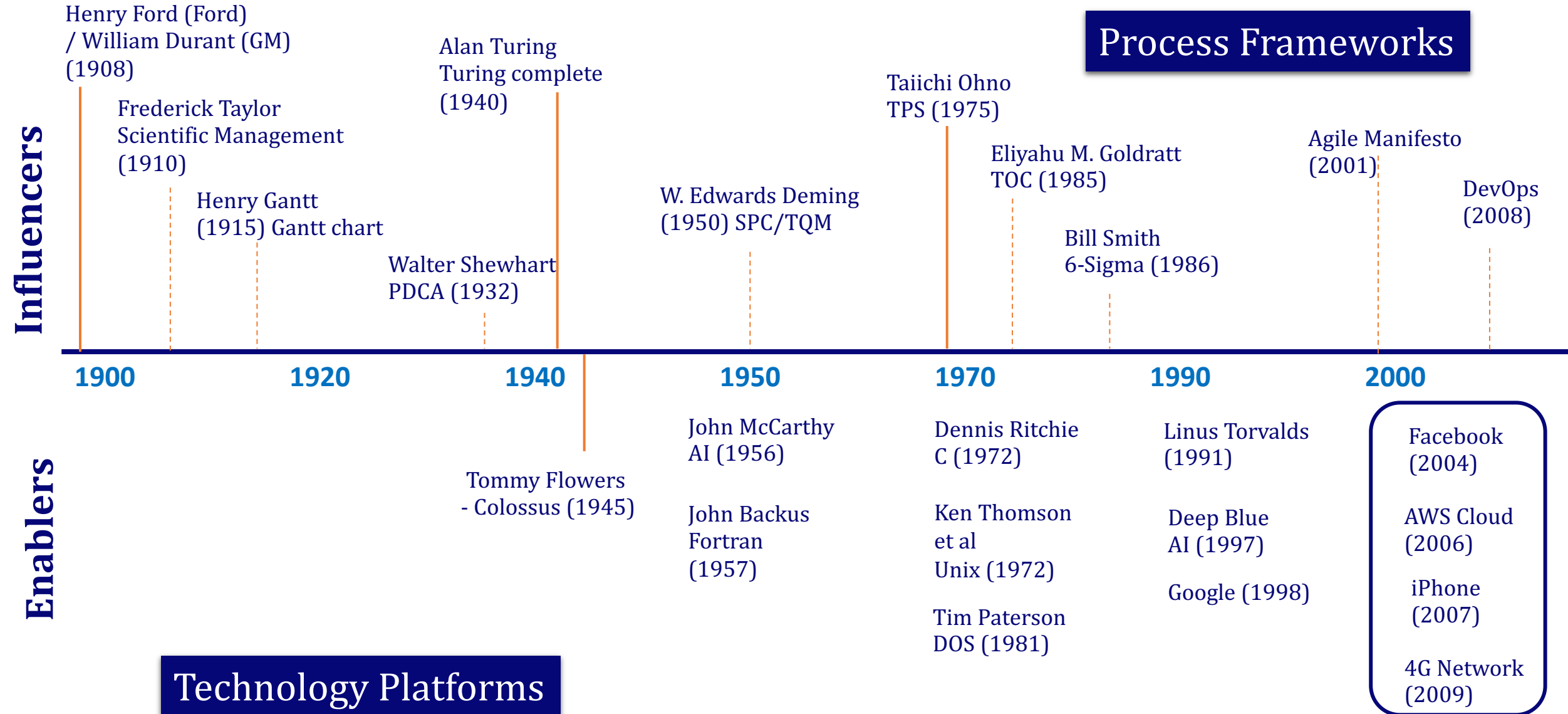
# Ford: Understanding what matters!

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- Watch the video of Model-T manufacturing and identify points that made the product a huge success.
- <https://www.youtube.com/watch?v=S4KrIMZpwCY>
- Did the video change your perception about what customers want?
- Identify the impact to different aspects given in following table

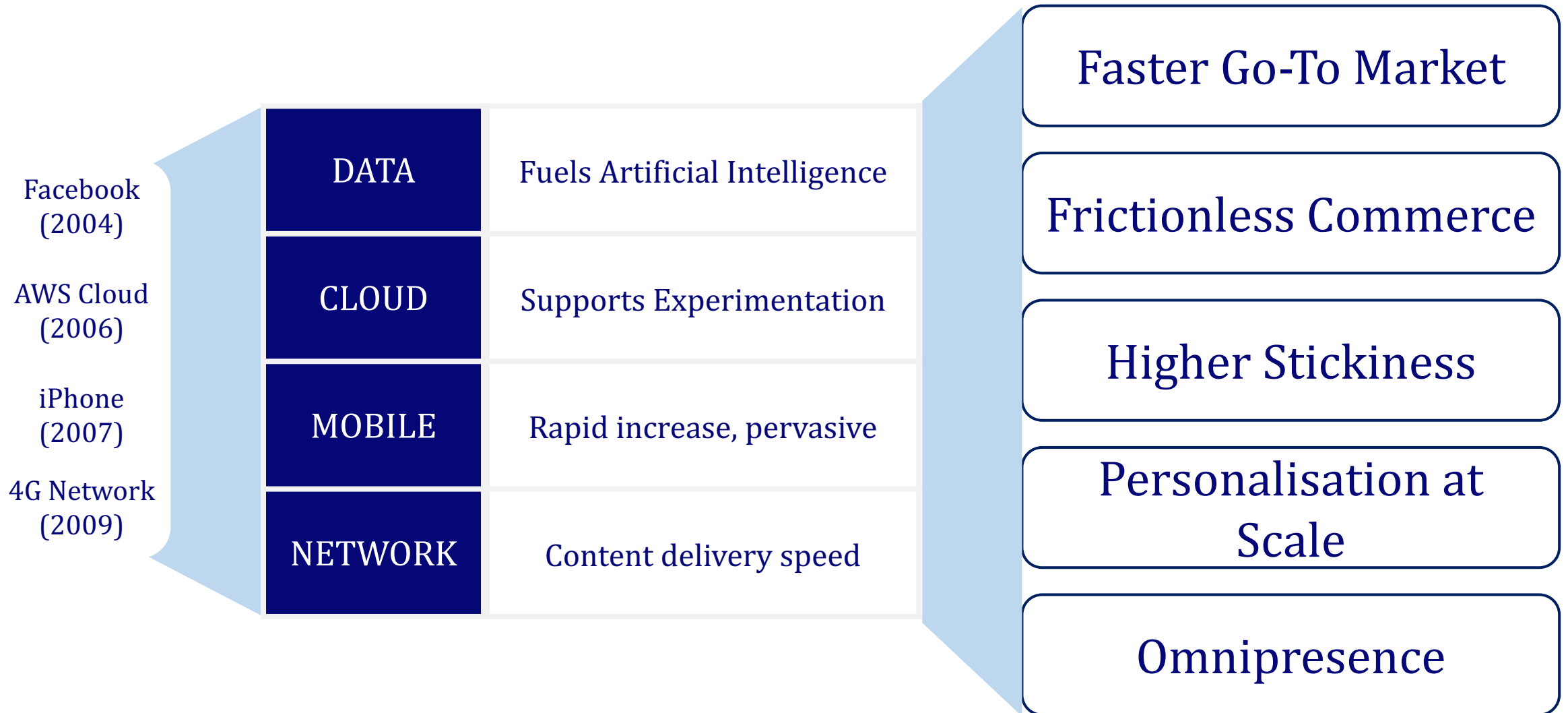
Technology Impact	Societal Impact	Industry Impact

# 100 Years of People, Process, and Technology



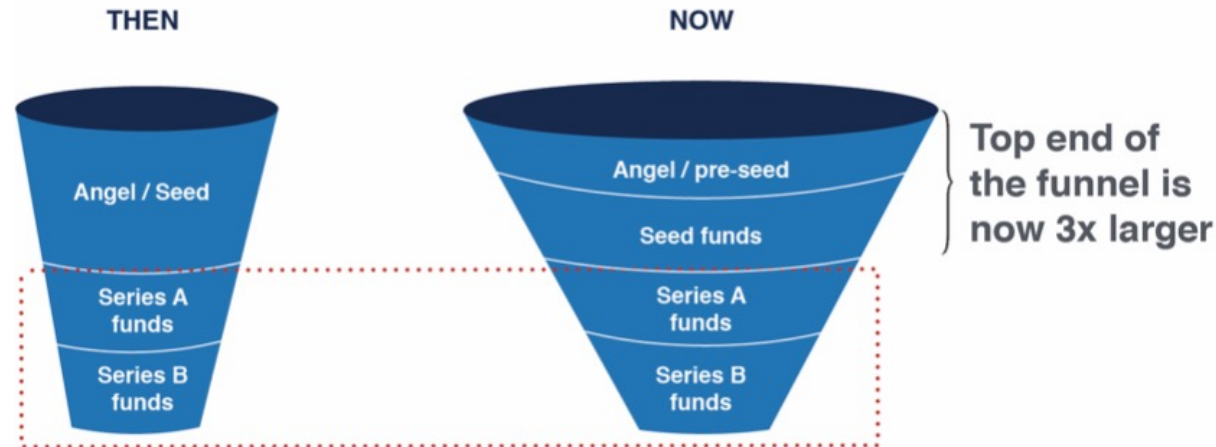
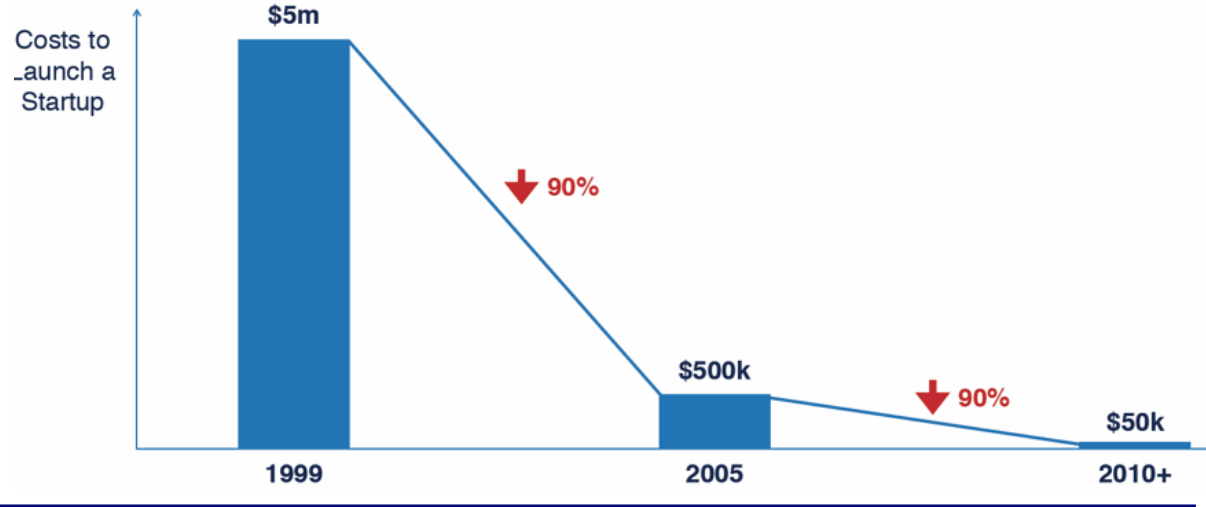
# Business impact of recent trends

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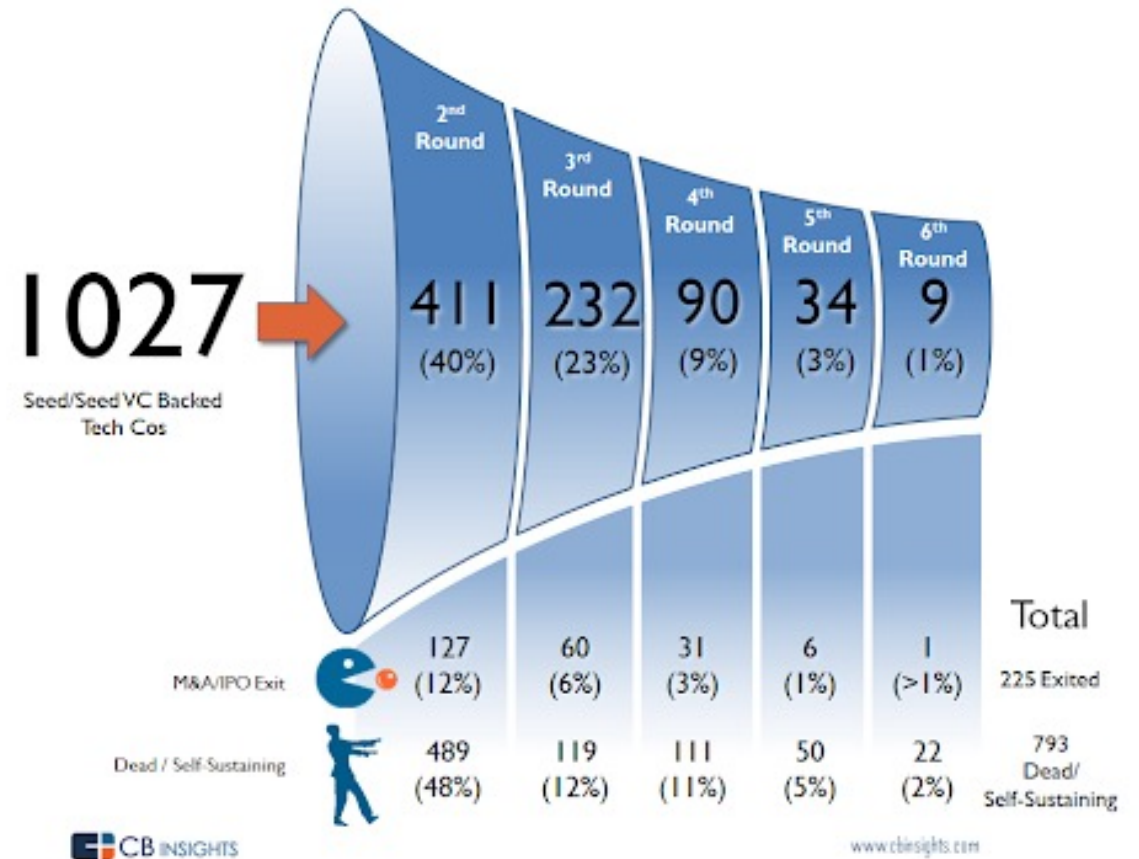


# Start-up Success and Technology impact



Bottom end of the funnel haven't changed much

## THE VENTURE CAPITAL FUNNEL



# Why Technology + Entrepreneurship?

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*"If you want 10,000 new customers you have to build a new warehouse and this and that."*

*"For me, two servers."*



# Who are technology entrepreneurs?

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# The PayPal Mafia

Name	Role	Organizations
Peter Thiel	Founder	PayPal, Palantir, Founders Fund
Elon Musk	Co-founder	PayPal, Zip2, X.com, SpaceX, Tesla, OpenAI, Neuralink
Andrew McCormack	Co-founder	Valar Ventures
Premal Shah	Founder	Kiva.org
Luke Nosek	Co-founder	PayPal
David O. Sacks	Founder	Yammer
Steven Chen	Co-founder	YouTube
Jawed Karim	Co-founder	YouTube
Max Levchin	Co-founder	PayPal
Russel Simmons	Co-founder	Yelp
Jeremy Stoppelman	Co-founder	Yelp
Reid Hoffman	Founder	LinkedIn

# Grandfather of Silicon Valley venture capital

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- In 1972, Don Valentine founded venture capital firm Sequoia Capital
- In 1975, Sequoia's first investment Atari was sold for \$28 million
- In 1978, Sequoia invested \$150,000 in Apple
- Other early investments include LSI Logic, Oracle Corporation, Cisco, Electronic Arts, Google, YouTube



# What is a Start-up?

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Peter Thiel's contrarian question:

**“What revolutionary truth do you know that no one else agrees with?”**

If you know something, especially something important, that nobody else does, then by definition, you have a secret.

# Session 1 - Takeaways

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1. Long-term economic cycle believed to be born out of technological innovation, which result in a long period of prosperity known as Kondratieff waves.
2. Rate of diffusion of innovation has accelerated over time.
3. The entrepreneur is the prime cause of economic development, which proceeds in a cyclic fashion along with several time scales.
4. Creative destruction is the process of innovation and technological change that leads to the destruction of existing economic structures.
5. Innovation impacts technology, society, industry in unprecedented manner that is incomprehensible.
6. Information Technology has hyperconnected our world and provides rapid scaling of innovation and business.
7. Start-ups are new business models that create new paradigm shifts.

# Your deliverables before Session 2

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1. Form your team
2. Identify your business idea for start-up incubation and pitching
3. Identify your industry for group presentation
4. Inform your TA to ensure no two teams are working on the same industry
5. Get familiarized with Canva and Figma. Not compulsory to use these.