The Nature of Digital Economy

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Outline

國內外有識者(120名)對社會變化的預測

分類	關鍵詞	
社會樣貌	數位資本主義／進步資本主義／利益相關者資本主義／頭腦資本主義／非接觸經濟社會	
趨勢	數位轉型	·疫情帶來的趨勢將**不可逆、加速進行**
	全球化	·**部分看法認為全球化正在倒退、**、部分看法則認為企業將會為了避險而**更為分散**
	政府扮演的角色	·在危機之中，**國家的角色擴大，且疫情收束後仍將維持**(亦有可能導入基本收入制度)
	政治體制	·民主制或IT極權主義
	國際秩序	·現狀朝無極化發展，但**美國**與逐漸嶄露超級大國態勢的**中國之間的對立可能更為嚴重**
	國際情勢	·與經濟大恐慌後**第二次世界大戰前的1930年代相似**
社會構造／產業結構	遠距化網路化	·所有**溝通場面皆網路化**(遠距工作、線上授課、遠距診療、商談、娛樂等)。與人面對面僅限於真正有必要時 ·直接見面時的**「臨場感」價值提高**
	分散化	·**住家與職場地理位置更為分散**。在地方擁有寬廣住居、一定期間在地方工作等生活型態
	產業結構	·**餐飲業及旅遊業**的產業規模將**大幅縮小** ·網路化**將陸續催生新型商業模式** ·遠距化、分散化等**新生活方式將帶來新的需求** ·避免人群聚集的政策可能帶來新的市場區隔
	技術開發	·人類的行動變化引領技術革新(**以人為中心**)。**倫理觀念**將更為重要
	企業行動	·不只追求利潤，亦更加**重視如何與自然共存**。經營觀點更為長遠
	就業	·AI運用加速使剩餘勞動力增加。從另一角度來看，將轉型為**從勞動中解放的社會**
	個人之間的關係	·將發展成更具**互助、利他性、互惠性**的社會
	監控社會	·IT技術持續發展，**連人類情緒都可即時監控**(生物監控社會)

（注）由2020年三月28日至五月11日發行的主要媒體刊物（朝日新聞、產經新聞、日本經濟新聞、每日新聞、讀賣新聞、週刊Economist、週刊Diamond、週刊東洋經濟、日經Business、文藝春秋）中擷取有識者之見解（採訪、投稿等），並整理其中關鍵詞製表而成。
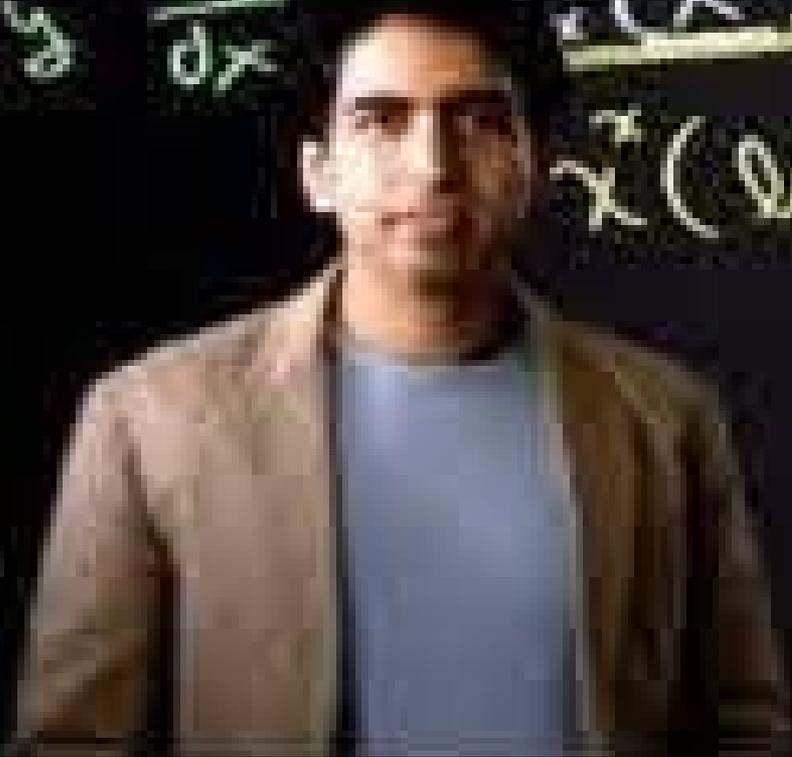
I. Data driven Economy

1. The core of digital economy is data, not digital technology. When data become a new input to production, the paradigm shifts. Digital economy is a data-driven economy.

2. Digital technology is evolutionary, and has been used in production since the computer was invented. Data has been used by computer ever since, but only historical data. Today, real-time data is used.

3. Digital revolution occurs when data become a new input to production, just like what happens to industrial revolution when machine becomes a new input to production. Industrial technology did not cause industrial revolution, e.g., industrial technology for making steel already existed in the agriculture era.
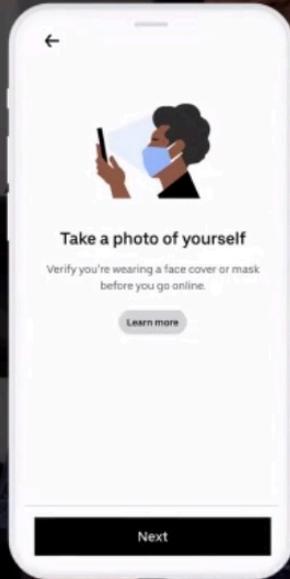
I. Data Driven Economy

4. Using historical data to aid production is an old economy; in the new economy (digital economy), real-time data is used in production. Historical data can be used to drive automation, real-time data is used for smart production. Automation is an automated machine, which is predictable; smart production is pseudo-human (intelligent machine).

5. Industrial revolution allows machines to supplant animal forces; digital revolution allows smart machines to supplant human brains.

6. Smart machines react to real-time data fetched from the environment, including natures, humans, and other machines. In the old economy, machines do not react to the environment.

I. Data Driven Economy

7. Unlike labor, land, and capital, data is non-rivalry. Data can be used by multiple firms, in multiple industries, multiple locations. In the digital age, it will be common for firms to operate across different industries and regions. Boundary of industry is blurred.

8. Data may not be subject to the law of diminishing returns. It is possible for a firm to operate with world-wide data, becoming a global natural monopoly.
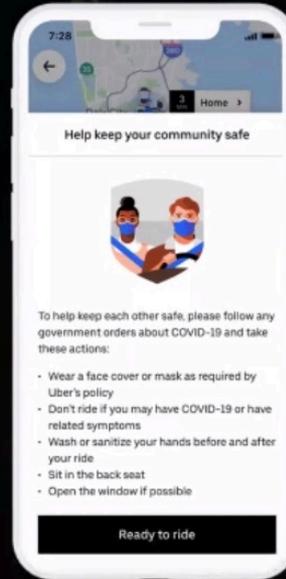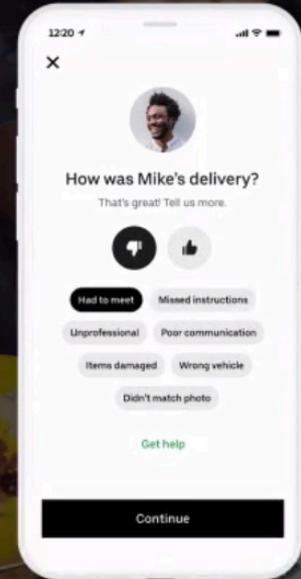
Driver

Take a photo of yourself

Verify you're wearing a face cover or mask before you go online.

Learn more

Next

Go Online Checklist

Mask Verification

Rider

7:28

Home

Help keep your community safe

To help keep each other safe, please follow any government orders about COVID-19 and take these actions:

· Wear a face cover or mask as required by Uber's policy
· Don't ride if you may have COVID-19 or have related symptoms
· Wash or sanitize your hands before and after your ride
· Sit in the back seat
· Open the window if possible

Ready to ride

Safety Checklist

No Mask Feedback

Eats

12:20

How was Mike's delivery?

That's great! Tell us more.

Had to meet   Missed instructions

Unprofessional   Poor communication

Items damaged   Wrong vehicle

Didn't match photo

Get help

Continue

Leave at Door

Feedback Loops

I. Data drive economy

9. Data need to be collected, processed, understood before it can be used in production. The capability to understand data and apply it in production is firm-specific. This specific capability is the foundation of firm, and this capability is reinforced by the accumulation of data. It is hard for other firms to duplicate or emulate, firms in the digital age is heterogeneous.

10. Firm-specific capability is underscored by domain know-how, which combines with data to create knowledge to be used in production.

I. Data driven economy

11. In a digital economy, firm is a repository and creator of knowledge for the purpose of production. Digital economy is a knowledge-based economy. Workers who work with data to create knowledge are knowledge workers. They are distinct from workers who work with machines (machine workers) to produce goods and services.

12. Real-time data is incorporated into the production process through a software that contains algorithms or routines. Software is analogous to machines in the industrial age. Data is analogous to oil that drives machines. Software is mostly firm specific and manifests the firm-specific capability.

Ⅱ.. **Data Capitalism**

1. Capitalism is a system where capitalists dominate the mode of production to produce for profits, which in turn, are converted into new capital. Capital accumulation is possible only when machines become an essential input to production.

2. A data driven economy creates a new type of capitalism, which may be called data capitalism.

3. When capital accumulation is possible, a small country in terms of land size may become a strong industrial state. But its industrial power is eventually limited by population (Robert Solow, 1956).

II. Data Capitalism

4. Data can also be accumulated. Moreover it may not be subject to diminishing returns, therefore the Solow ceiling does not apply. Data accumulation becomes a new way of growth if it is transformed into knowledge accumulation.

5. When capitalists dominate the mode of production, wage-workers are exploited. If data-owners dominate the mode of production, both capitalists and wage-workers may be exploited. Only knowledge workers who put data to work will be cherished.

6. It is already clear that leading companies in the digital economy employ fewer workers than their counterparts in the industrial age. Those work under the digital systems of Uber, Amazon, e.g., are low-paid.

Employment of High-tech Companies

Company	Employment
Microsoft	144,000
Apple	137,000
Amazon	840,000
Google	114,000
Facebook	44,942
TSMC	48,752
AT&T	247,800

Note：Data are of year end 2019, except TSMC, which is year end 2018.

II. Data Capitalism

7. Income distribution in the digital age critically depends on the ownership of data, just like ownership of capital in the industrial age.

8. Capitalists of big-data companies have attempted to steal the ownership of data. Zuboff (2020) called this an "exploitation of the surplus value of data," parallel to Marx's doctrine. If her argument is correct, then what China is doing today is an authentic Communist approach to the digital age as data is owned by the public (state) in China.

THE AGE OF SURVEILLANCE CAPITALISM

THE FIGHT FOR A HUMAN FUTURE AT THE NEW FRONTIER OF POWER

SHOSHANA ZUBOFF

II. Data Capitalism

9. However, data has no value until it is collected, processed and converted into knowledge. Converting data into knowledge is like extracting oil from underground. The concept of surplus value does not seem to apply.

10. In fact, individual data has little value. Data is valuable only when combined with other data in large numbers. Therefore the value of data should be considered as a common good, which is not equivalent to public ownership or state ownership.

II. Data Capitalism

11. The premise that market economy is superior to plan economy is based on the assumption that individuals know more than the planner (state). In a data-driven economy, the state may actually know more than the individuals, at least in some areas. This implies that state has a bigger role in the digital age than before. The state role needs to be redefined, and data governance is the core institution of a digital economy. COVID-19 has forced the issue.
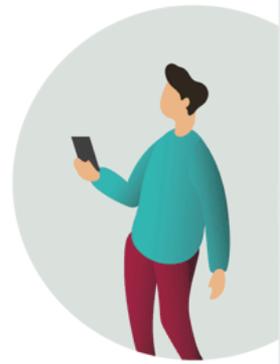
Contact Tracing Follow-up Call

If you are in close contact with a person infected with COVID-19 you will get an exposure notification on your phone.

If you want we will try to call you to provide further assistance after you receive an exposure notification.

You can enter your phone number below or add it in settings at a later stage. Your phone number will only be shared with the HSE if you get an exposure notification.

Your country code

Ireland (+353) >

Your phone number

Your number

Yes, I want to opt-in

No thanks

II. Data Capitalism

11. If data is a common good, data monopoly should be opposed, or regulated in a way to serve the interest of the common. The perils of data monopoly have begun to emerge, e.g., shaping consumer behavior, discrimination against unattractive consumers.

12. When services are delivered by digital technology, the need for commodities to carry services decreases. This may stop the "money-commodity-money" circulation, defusing the power of mass production. Mass production is the major cause of "race to the bottom." 。

II. Data Capitalism

13. Business model innovation becomes the major mode of innovation in the digital age. When a business model succeeds, data will be accumulated fast to constitute an entry barrier. Digital technology is employed to offer a data-driven service, and the technology is embodied in a software that is hard to duplicate. First-mover advantage is strong in the digital age.

表一　美國獨角獸 (2020/8/18)

企業名	佔值(億美元)	產品
SpaceX	460	宇宙、火箭
Stripe	360	電子支付
Plantir Technologies	200	數據分析
Airbnb	180	民宿
Epic Games	173	遊戲
Door Dash	160	餐飲外送
Instacart	138	購物服務
Snowflake Computing	124	雲端數據服務
Samumed	120	生技藥
Robinhood	112	金融交易

資料來源：CB Insights

表二　中國獨角獸 (2020/8/18)

企業名	佔值(億美元)	中文名	產品
ByteDance (TikTok)	1400	抖音	視頻共享
Didi ChuXing	560	滴滴出行	叫車
Kuaishou	180	快手	視頻共享
DJI Innovations	150	大疆	無人機
Shein	150	時尚	服裝平台
Bitman Technologies	120	比特大陸	Bitcoin chips
Chehaoduo	90	車好多	二手車平台
Yuanfudao	78	猿輔導	線上課業輔導
Sense Time	75	商湯	人工智慧
Ziroom	66	中國	租屋網

資料來源：CB Insights

III. Nature of the firm

1. Data carry information. When full information is available to traders, transaction cost is negligible. The rationale for a firm to exist disappears (Ronald Coase 1937). Airbnb offers information to make all ordinary houses a potential place for lodging; hotel is not needed anymore.

2. If firms exist only to reduce transaction cost in the short run, many companies will disappear. People hire themselves, and offer their services on the market. Self-employment will be prevalent.

III. Nature of the firm

3. Coase poses firms against the market: hierarchy vs. market, or command vs. price. Command coordinates economic activities consciously, whereas price coordinates economic activities unconsciously.

"Islands of conscious power in this ocean of unconscious co-operation like lumps of butter coagulating in a pail of buttermilk."(Roland Coase)

III. Nature of the firm

4. However, Coase also reminds us that a firm is an organization. An organization exists because it creates value for its members. A business firm creates value to attract and keep employees, maintain other resources.

5. In the digital age, a firm exists because it gather and produce knowledge to create value for the market. Firm exists because it can put knowledge to work more efficiently than the employees who carry the knowledge individually (knowledge workers). It is more efficient because of coordination, sharing, and synergy.

III. Nature of the firm

6. A firm owns a portfolio of knowledge, which is put to work with the aid of data. Different portfolio defines different kind of firms. This knowledge is necessarily tacit and firm-specific, in the sense that it cannot be codified and hard to imitate.

7. Knowledge is recognized as a valuable asset in the industrial age, e.g., knowledge-based view of the firm (Robert Grant 1996). It offers a sustainable, competitive advantage to the firm. In the digital age, knowledge is a precondition of firms.

III. Nature of the firm

8. Because of full information, firms that offer mediocre products and untimely services will find no customers, and therefore do not survive. 火車站前的牛肉麵不再存在.

9. Firm-specific knowledge constantly renew itself to meet the changing consumer needs. It invests in knowledge acquisition and learning all the time. Only profitable firms can afford to do so.

10. The application of knowledge incurs a very small marginal cost, therefore a knowledge-based firm always generates rent. Rent reflects the value of internal knowledge of the firm.

III. Nature of the firm

11. A knowledge-based firm also purchase or outsource knowledge-based service from the market, and it pays a full price for external knowledge.

12. Internal knowledge differs from external knowledge in that it is used repetitively in production and essential to the renewal of its knowledge base.

13. Boundary of the firm is defined by the knowledge base of the firm. Considering knowledge base an intangible asset, the boundary is reached when cost of knowledge application exceeds its returns.

IV. International Division of Labor

1. Division of labor across nations is limited by the flow of knowledge. If knowledge does not cross the national border, trade is decided by the comparative advantage of the nation, in which knowledge base is a key component (David Ricardo).

2. Offshore sourcing is made possible by the knowledge carried across borders by technicians who come to the overseas sites to help.

3. Multinational firms arise because knowledge can move within the corporate boundary (between parent and subsidiary) more efficiently and safe (no spillover risk). This increases the scope of offshore sourcing.

IV. International Division of Labor

4. When data moves across borders digitally, some knowledge (those codified) can be transferred to overseas location without human intermediation, the cost of offshore sourcing further decreases, leading to more offshore sourcing (Richard Baldwin, *second unbundling*).

5. Digitalization also allows traditional white-collar work to be divided across borders, e.g, record keeping, customer service, software development, product testing, R&D.

6. It must be noted that only codified knowledge can be transferred digitally, tacit knowledge cannot. Fact-to-face contact remains important.

This may be the first time in years Apple isn't launching a new iPhone in September — here's everything we know about when the iPhone 12 may be released

Lisa Eadicicco   Sep 14, 2020, 11:51 PM

IV. International Division of Labor

7. If all production is coordinated digitally, and data can move across the border freely, then production can be divided across the globe. Division of labor is determined by the availability of knowledge workers who solve problems with the aid of data.

8. If service is driven digitally, then service reaches as far as data go. If there is no barrier to data flow, all service companies are born global. There is even no need for foreign direct investment.

9. Natural endowment (land, capital, labor) is inconsequential to international division of labor. It is the availability of knowledge workers that matters.

IV. International Division of Labor

10. Knowledge-intensive work will be done in locations where knowledge workers are abundant, and non-knowledge-intensive work somewhere else.

11. Knowledge workers cannot adequately trained by education institutions. On-the-job training is essential to the accumulation of tacit knowledge, which can only be done in knowledge-intensive industries. There is a positive accumulation effect of knowledge, and a catch-22 problem, or a development trap for low-knowledge countries.

IV. International Division of Labor

12. Pressure for factor price equalization is even stronger as the law of one price applies to not only goods, but also services. Only knowledge workers enjoy premium wages, and the size of premium tends to increase with the scope of knowledge applications.

V. Issues

1. Data governance, property right of data

2. Data Monopoly

3. Digital tax, cyber space and geography-based taxation

4. Income distribution

5. Employer-employee relations, social security system

6. AI-aided decisions, due process

7. Social media, the right to information, the right to right information