

Tutorial 2: Emergence and Convergence of Technologies

Part 1

1. The Internet has been in existence for over 30 years. Identify and discuss the positive and negative consequences brought by Internet technology advancement. (PIC: Jun Rong)

Positive consequences

- **Better information accessibility** ---Internet search engines are the best information retrieval system available. It brings all kinds of information to the Internet users. For instance, the search engine now such as Google has the ability to gather a lot more useful information from various sources based on the keyword input by the users. It will also suggest a corrected version of the keyword if the input data is found to be incorrect.
- **Better and effective communication**--- The Internet provides the most **effective means of communication** between people, including online email sending and instant messaging. For instance, people no longer need to send a letter to another person through the post office in order to communicate with someone. Instead, with the Internet connection, they can simply interact with each other through any means such as Facebook Messenger, Whatsapp, WeChat and others. As a result, it makes the communication process much easier and efficient
- **Expand the business easily (ecommerce)** - having the business by using the online platforms such as Shopee, Lazada and Taobao. For example, the customer does not need to go to the physical shop to purchase items.
- **Improve work productivity** - automates machinery processes which results in less human error // From the education point of view, the Internet allows students at different geographical areas to work on the same assignment through some online collaborative tools such as Google Docs, Google Sheets and Google Slides.

- **Ease your daily life /simplify the procedure/transaction e.g.** online banking (no need go to bank to transfer money, can transfer through online) / E-wallet (by using phone can make payment)

Negative consequences

- **Content Control /monitoring---** Illegal or inappropriate materials can be found on the internet. Ever since the rise of Internet technology, more and more information is available online as people may simply upload it without much issues. For example, some pornographic materials or videos have been uploaded to the Google engine by a certain party. Despite these materials being only restricted to adults, the teenagers have their ways to access them. As a result, the teenagers will be badly affected and some may even get addicted to it which can kill their future.
- **Security concern/ privacy concern** Some criminals use the internet for spreading computer viruses or even steal personal information that could be used for identity theft. The most common method is through email or SMS sending. Most unethical users or hackers would send an email that consists of an unsafe link to the user. The email content would look exactly like a legit email and may be indistinguishable. Once the user accesses the link, their personal information such as IC No, account balance, and others may be stolen by the criminal for immoral purposes.
- **Health Issues --** Frequent use of the Internet via electronic gadgets, especially mobile phones, may lead to health issues such as eye disease, back pain or even mental health issues like anxiety. Lack of sleep quality.

Reduced physical activity / lesser social interaction → There was a decline in skills such as language proficiency, communication skills

Reduced manual labour job opportunities / Loss of work opportunity /work retrenchment issue..... → with the Internet technology advancement, machines now are able to replace manual labour job with the capability of automating manual works which greatly reduced the number of manual workers needed for a company (manufacturing)



2. Define and discuss the differences between print media versus broadcast media. (PIC: Ming Jun)

Print Media	Aspects	Broadcast Media
A print media is a news organization such as newspapers and magazines that produce news and stories that are meant to be read.	Meaning	A broadcast media is a news organization that supplies people with news in a format that can be heard or viewed. Examples of broadcast media are the radio and television as well as Internet like social media sites.
One should be literate to read the information provided.	Literacy (Ability to read and write)	Literacy is not the primary requirement as anyone can watch and hear information provided.
Deadlines exist in relation to the collection or compilation of news/information to catch up the info/news publish datetime	Deadline	Flexible where there are not so rigid deadlines that need to be strictly adhered to. No such fixed deadline as information/news can be updated/published anytime.
Not possible	Live discussion	Possible
Periodical	Updation	Frequent /flexible
Comparatively less wider - This is because most	Wider/broader target reader/audience Coverage	Wider audience - This is because the

printed news is aimed to feed the local people for most of the time. For instance, Sin Chew daily news.		news can be shared to other regions or countries easily if the news is published online on the Internet. For instance, Facebook.
Detailed/In-depth information /elaborated point /explanation onto the topic covered.	Length of information/scope of topic coverage	More on those summarized, brief, concise information coverage of the topics
Visual --2 dimensional work -less eye-catching & less impressive	Mode of presentation	audio visual + video /animation --3 dimensional work----more eye-catching & more impressive
Take up space to store the printed media.	Data storage	- Data can be stored in electronic/digital/cloud storage
Difficult to sort/search information	To organize/search/sort data	Easier to sort/search information

<https://brainly.in/question/13522476>

<https://hosbeg.com/print-media-and-broadcast-media/>



3. **Viewing video content using Internet streaming** is quickly replacing **air television broadcasts and cable television broadcasts**. Discuss the impacts of **internet streaming** using **Lessig's Four Modalities Analysis**. (PIC: Yih Feng)

Laws - It is illegal for consumers to download and view copyrighted video content, different countries or states will have different sets of legal laws to constraints. Eg Copy Right 1987 for Malaysia context.

Rules /regulation need to be set up /review /enforce to cover up the following:

Age restriction - sometimes videos are not accessible due to its sensitive content (violence, sexual)

Region restriction - Different regions have different accessibility of the videos due to the compliance with local laws and the choices made by the video owners. For example, China banned Ultraman (e.g. Ultraman Tiga) and Peppa Pig cartoon shows in their country.

Social norms - It is unwritten rules about how to behave. They provide us with an expected idea of how to behave in a particular social group or culture. For example, we expect humans to understand that viewing a video using the internet without copyright is illegal then will constraint their behavior on viewing video.

Before: Rush back to home just to catch up a drama series

After: watch it anytime anywhere as long as has Internet connection & stable & good internet bandwidth

Before: only can watch one time

After: can repeated watch again

Before: cannot skip some part of the videos and cannot pause the video while watching

After: can skip some part of the videos and can pause the video while watching

Before: cant backward and forward the video

After: can backward and forward the video

Markets

- With the popularity of the Internet and more peer-to-peer (P2P) file sharing sites set up nowadays, more people are now using all those digital gadgets like Ipad, PC, desktop, notebook or even their hand-held smartphone to watch the video through Internet streaming form. Video content producers offer some shows only in the web streaming format which may or may not charge viewers for some amount of fees in between. More companies can develop internet shows thereby allowing for more diverse selections for viewers. Eg Astro, Viu TV.
- Drop in the movie company's sales as the people can simply access the videos or movies online instead of buying tickets in the cinema.
- Internet streaming (Eg. Youtube and Netflix) is an opportunity because they can earn money by selling advertisement plans to those who want to advertise their products. Therefore, they can earn money in a legal way.

Architecture

- Since computer-based technology is getting more popular, the price of the computer has become more affordable compared to earlier generations to their own computer and common use of the Internet, P2P sites and technology. Eg PC, smartphone
- Subscription of better/higher bandwidth from the Internet Service Provider provides the users a good and smooth watching experience
- Special features such as personalised playlist for future references
- Create personal playlist where the user can customizes its playlist to include his/her favorite movies or videos



4. Digitization means converting analogue information into digital format. The first, second, and third generation of mobile phones are analogue, digital, and high-speed data transmission. Identify the **advantages** and **disadvantages** of **mobile phones digitization**. (PIC: Sam)

Advantages:**Communication Speeds**

- Mobile phones can access to the Internet, and the internet speeds have increased and faster broadband enables the transfer of large amounts of information across the web almost instantaneously, making it possible to stream video and audio in real time, send large data files, and access data from virtually anywhere in the world.

Information Storage

- Digitization enables the storage of massive amounts of phones. As well as physical locations, data can also be stored online, enabling it to be accessed from any device which has internet access. For example, people can access the data stored in Google Drive at any time and anywhere as long as their phone has an internet connection.

Smaller sized devices

-The devices can be made much smaller.

Encryption of digital signals

-Digital signals are easy to encrypt using public key encryption protocol such as avoiding eavesdropping.

Disadvantages:**Data Security**

- It would be very difficult to keep this data safe because just a single tap can mean vast amounts of private information going into the hands of criminals, terrorists, business rivals, foreign adversaries. For example, some of the criminals might spread computer viruses and hack to steal the data.

Social Disconnect

- People prefer to socialize and communicate via mobile phones rather than through real life contact. This can easily lead to a sense of disconnect to real life social.

Replacing a working cell phone can result in discarded electronics

-As people are upgrading their phones and changing their phones even though their old mobile phones are still functioning. Consequently, there might have a lot of unused mobile phones which will result in discarded electronics.



Additional info: Refer to chapter 2 slide 67, 68

Advantages of mobile phone digitization

- The power of broadcasting and receiving signals will be reduced.
- Smaller size, longer standby and connection time, wider area coverage, increased density of the maximum number of connections in the same area.
- Digital signals can contain error correction elements.
- It can bring a smaller antenna.
- Digital signals are easy to encrypt using public key encryption protocol. Like avoiding eavesdropping.

Disadvantages of mobile phone digitization

- Mobile phone infrastructure is also very expensive to install called transceiver stations. Existing companies must maintain both analog and digital services. And new entrants need to make huge investments in infrastructure.
- Consumers face the cost of upgrading their phones.

Solution: Operating companies offer digital phones at subsidized prices or for free

- Replacing a working cell phone can result in discarded electronics

Solution: Recycle mobile phones to developing countries

5. Microsoft Windows is one of the popular operating system types and is preloaded on most new personal computer (PC) hardware. More than 90% of PCs run a version of the Microsoft Windows operating system. (PIC: Kai Yuan)

i) In what ways is this situation beneficial to computer users?

Ease of use

Users who are familiar with earlier versions of Windows will likely find the most recent versions to be simple to use as well. This can be attributed to everything from the consistent look and feel of practically all Windows apps to the way the file system has been presented throughout time.

Plug and play feature

In terms of Plug & Play compatibility for PC hardware, Windows still has an advantage over the competitors as an operating system for the typical home user. It does not need to install the hardware manually but ready to use when attached.

Available software

Windows supports a huge amount of available software because of Microsoft's dominance of the world market in terms of computer operating system and office software. Most of the applications would be available in Windows version which could suit the business need.

Support for new hardware

Due to the Microsoft's dominance in the market, most hardware manufacturers will offer support for the Windows in their hardware products to ensure that the products can support any version of Windows

Upgrade the feature and function available inside the windows OS from time to time



ii) In what ways does this situation harm computer users?

Vulnerable to malicious software (e.g. Virus, ransomware, spyware, etc) attack

Hacker attacks on Windows may be prevalent. Hackers can easily breach the security of Windows. As a result, most Windows users rely on anti-virus software and must pay firms monthly fees to secure their data. Additionally, Windows users must upgrade their operating system to stay current with security patches.

High computer resources /not much of custom made/tailor build feature/suite to suit individual user need

Microsoft expects its consumers to put the most money into their computers. Microsoft has always claimed that this is due to the additional functionality that they have developed in response to consumer requests. Despite the fact that few individuals use many of those functions, everyone is obliged to deal with the added burden.

user not at bargain end due market monopolization

Eg.

Since the company is the sole seller, buyers have no choice but to follow whatever policies set by the seller such as rise in the price

Windows is paid /closed source software

-pay as you use/go → subject to pay for software subscription fee, software licence renewal fee....

-Only Microsoft owns full access to its software's source code, and no log files are generated. This has caused the troubleshooting process to be time consuming because the users can only deduce the problems by trial and error.



Part 2

6. Discuss two significant **challenges** ahead in the **emergence and convergence of technologies**. Give examples for each challenge. (PIC: Jun Wai)

- Digital Privacy Issues (security breach concern /privacy infringement concern)
 - Internet users are starting to be concerned about their privacy being exposed to the community and technology due to the emergence and convergence of technologies are able to keep and store their personal information where a person can be located and stalked without the knowledge of the person.

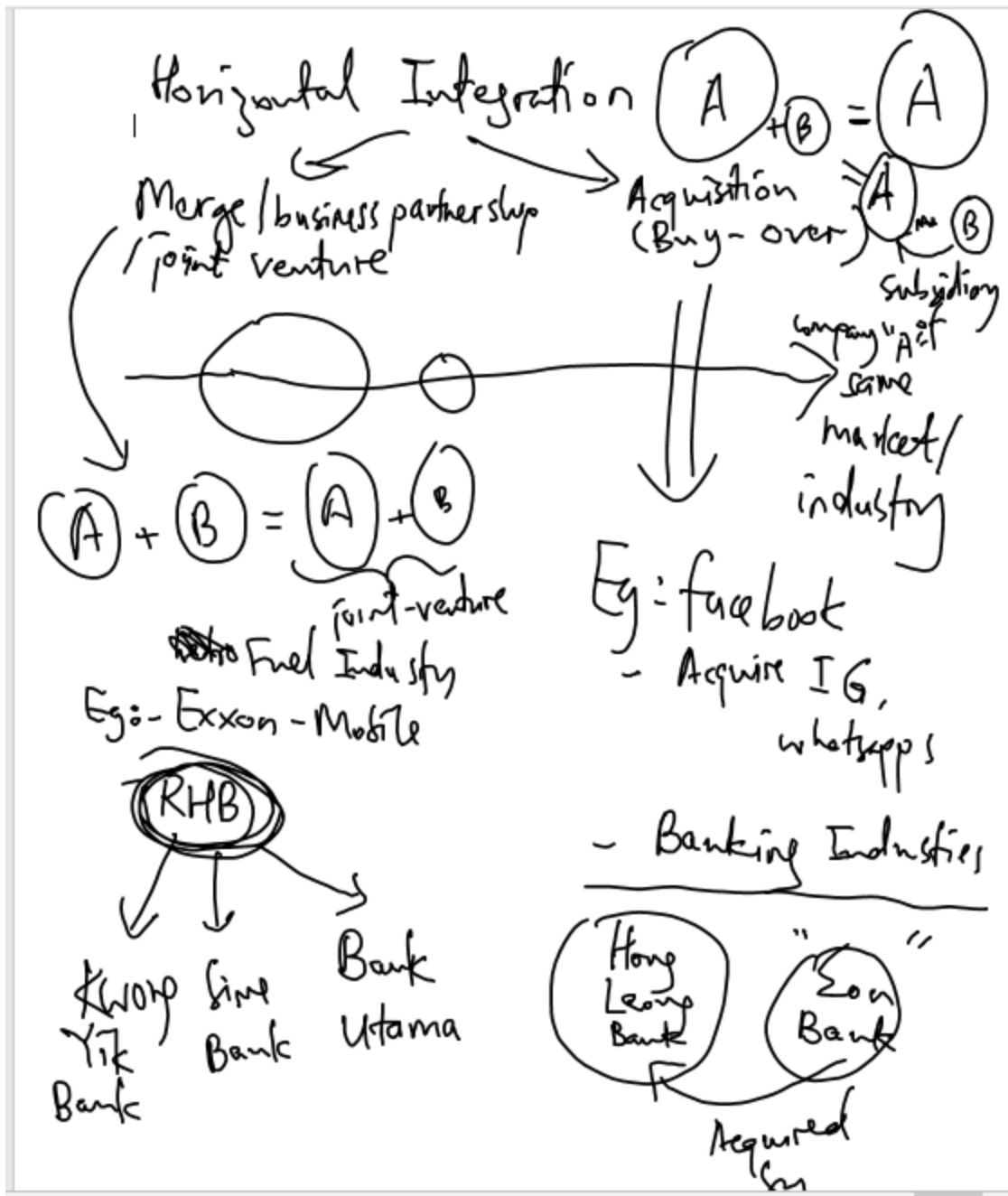
- For example, the information such as home address and mobile phone number we provided to e-commerce platforms like Lazada or Shopee can be exposed to third parties without our knowledge or permission for getting more profits.
- Regulatory Issues
 - Policy makers are having hard time to regularize the technologies due to the emergence and convergence of technologies because there were no specific policies that could be best applied to all and a new sector of technology could be developed where the regulatory entity has not been identified.
 - For example, cable TV and mobile cellular technologies have their own standards and were regulated by specific policies separately in the past. Nowadays there are multiple standards and policies that are required to follow due to the emergence and convergence of technologies.

Content control - no perfect mechanism to monitor the content

- Resistance towards change
 - Many elderly prefer sticking to the lifestyle which they have already been used to for years. It takes them some time to adapt to the new changes. Besides, some even resist to step out of their comfort zone. For instance,
- the few technology may work function well separately; but after combine it to work together it may not work as what promised/estimated since some hidden bug/error undetected during testing stage and it will drag/affect the actual business daily operation /transaction when put into use. ✓✓

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7. In the convergence of technologies, there are two forms of integration: horizontal integration and vertical integration. Differentiate between horizontal integration and vertical integration. Identify advantages and disadvantages of horizontal & vertical integration. (PIC: Mun Jun)



Horizontal integration

The acquisition of the business operating at the **same level of value chain in the same industry/similar field**. Horizontal Integration able to **reduce the number of players in a same marketplace or merges the 2 related marketplace** ---leading to M&A (merge and acquisition).

Example:

- Meta Facebook merge Instagram and Whatsapp (Social Media)

- Carrefour Malaysia has been bought over by Aeon Co. Ltd and rebranded as Aeon Big in 2012
- Google acquire Israeli apping service, Waze in 2013

Advantage: **Reduce Competition**

When the company expands, They could reduce the competition in the same industry by merging with other companies. Hence, companies instead of playing a role of competitor but becoming partnership. Moreover, the company itself will own a larger market share percentage compared to the other companies which directly **creates a monopoly** in the market of the particular industry.

- **Bigger base of customer ---> shoot up sales -> increase revenue /profit gaining**

- By combining companies, it will no longer only have one company customer, the new company will have access to a large base of customers from the partner companies.

- **Increased differentiation**

- Since multiple companies that are possibly focusing on different areas are merged together, more products and special service features which vary from the original product could be offered to the public. The company may even earn more profits by offering more products to meet the customers' requirements.

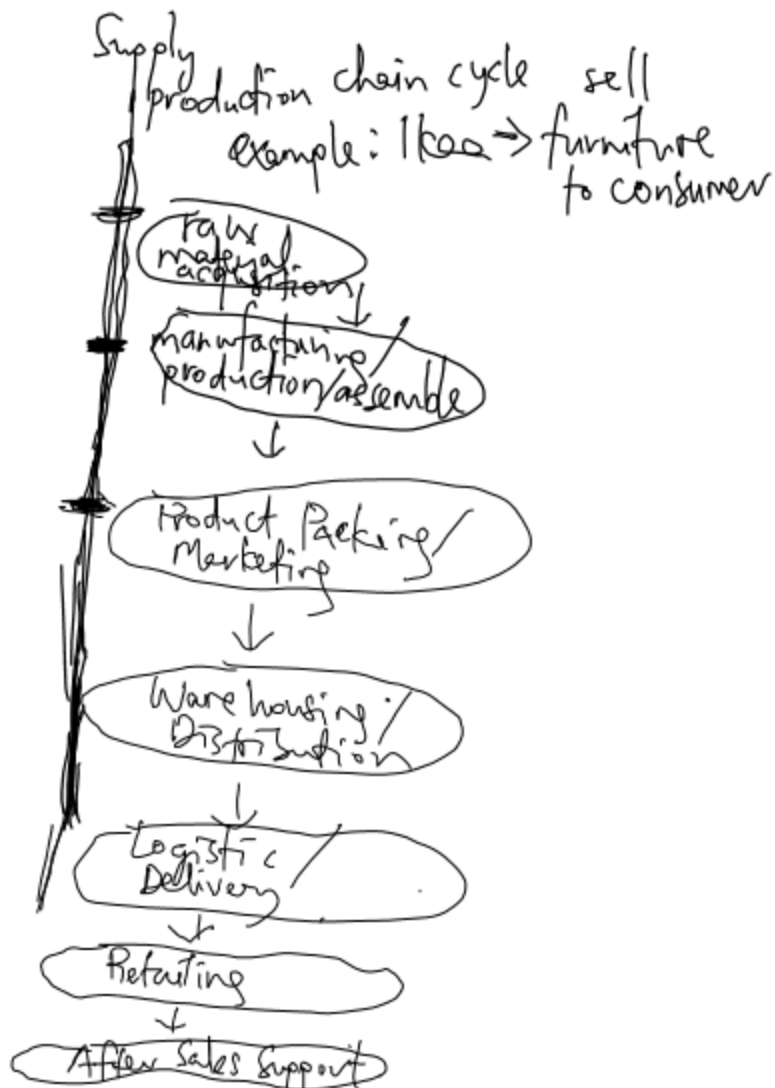
It has the **ability to enter new markets** as the company will have an additional foreign market if the merger is with an organisation abroad.

-build up brand → expand brand/ market power-----

Disadvantage: **Challenging in Maintain or Manage the organization -Less flexibility -**

The procedures and practices of the company may become unfriendly to change if the company grows bigger. The size of the company increases proportionally with the number of issues from management and operation, thus, bigger companies are challenging to maintain and manage.

- Monopoly - Based on the view of customer, they will have lesser comparison to make decision of getting services from a certain company. It is because the big company will be monopoly the small company by merging them or buying them which affect lesser different products from different company proposing to the community.
- Conflict of interest/focus/culture/practice - --Two formerly separate organizations still try to maximize their individual unit/branch benefits instead of the whole organization/new firm benefit and certain degree of change/compromise need to achieve, eg.



Vertical integration

The process of expanding control / acquiring business operations within the sa. A company that opts for vertical integration takes complete control over one or more stages in the production or distribution of a product.

Example: Amway control Nutrilite

Advantage: Supply Chain are Controlled

When the company controls their own supply chain, this can prevent supply disruption. Therefore, the company itself is able to resolve the issues better than rely on other external suppliers or distributors.

More competitive advantages - vertical integration allows the business to increase their advantages over their competitor and block them from gaining access to important markets. For example, a retailer combined with the manufacturing company can easily gain resources, patents and some advanced technology that is only available in the company.

- **Better protection of proprietary processes or recipe**

- In some cases, secret recipes are very valuable in a way that they should be maintained and kept within the company instead of being revealed to the third party. For example, Coca-Cola manufactures carbonated drinks and sells to the customers or retailers on their own without having to go through the middleman. This is to prevent other companies from stealing the technology or recipe used by the Coca-Cola company

Disadvantage: **Higher cost**

When the company wants to acquire an existing company or start a new segment, a large amount of money will be needed to buy and take control of a company or start up a new one.

- **Unforeseen labour issues**

- Vertical integration may trigger the labour issues when a union company merges vertically with a non-union company. For example, if a non-union company integrates with a union supplier, there is a possibility where the parent company may shut down the supplier and outsource the service to a third party in order to reduce the costs. One common example is in the airline industry where outsourcing maintenance to lower cost overseas shops has soared.

- **Unprofitable outcome**

- Vertical integration can be more expensive and growing the supply chain does not always lead to greater profits. It may require a large investment to set up and maintain the manufacturing or distribution centers. Therefore the company

may find it difficult to compete with others that outsource to countries with cheap labor.



8. Do online research, present the following: (PIC: Yee Hui)

(i) A case study related to horizontal integration - Discuss in detail the advantages and disadvantages of horizontal integration in the case study.

Facebook acquiring Instagram in 2012

Advantages: The number of companies in the social media industry is reduced which means less competition to deal with and utilizing time to focus on core competencies and enhancing operational or production efficiency.

Therefore, Facebook will be able to offer their users a cost-effective product, innovative & new product & service.

Disadvantages: It will reduce the flexibility of Facebook. Facebook needs to add more personnel and processes in management. Which means that the need for more transparency and more accountability can slow down the rate of innovation of new products to market.

[Mark Zuckerberg bought Instagram as it was a 'threat' to Facebook | Business Standard News \(business-standard.com\)](http://business-standard.com)



(ii) A case study related to vertical integration - Discuss in detail the advantages and disadvantages of vertical integration in the case study.

Apple having its own retail store for selling its products

Advantages: Maintain quality control. Apple has more control over the production process thus it is able to maintain higher quality standards and reduce the risk of a supplier using inferior accessories.

Disadvantages: Loss of competitive advantage when entering a new market/fields/segment.. Vertical integration does limit competition. If raw materials are scarce or a brand's information access to local demographics is limited, then even with vertical integration firmly in place, market entry may not be possible.

- Hardly to manage their products if they handle too much types of products.
- Unprofitable outcome. It is because Apple needs more cost to maintain their manufacturing and business. They will also need to buy more facilities to produce their products.

