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## APSEI 2020-21

### Assignment 2 description

**Subject:** Analysis of an Internet Service or Product

**Context:** Group work to be carried out in the framework of APSEI 2019-20 under the supervision of Prof. Manuel de Oliveira Duarte

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## 1. Framework

Information and communication technologies have undergone considerable changes during the last decades and have acquired major importance in present day forms of life.

The habits of people changed. The way people live, socialize, learn, work, entertain, etc, changed. The way enterprises work and do businesses changed. The way governments govern (or dis-govern) changed. The priorities of international bodies changed (as reflected, for example, in OECD decision to consider “internet for all” an issue of sufficient relevance to be included in its “*Seoul Declaration for the Future of the Internet Economy*”, 2008 [1].

Figure 1 shows symbols associated with some of the currently available Internet services.



<https://www.pinterest.pt/pin/338614465717536598/>

Access: 20180302

**Figure 1: Symbols associated with some Internet services**

There are many others... and it is likely that the many new others will appear in the future.

This is recognized in several instances, as for example in the United Nations [2030 Agenda](#) which contains the new Sustainable Development Goals ([SDGs](#)). Here, the access to information and communication technologies (ICT) is stressed and considered as having a major impact in economic and social development [2].

These changes have brought enormous benefits and opportunities but also major threats and dangers as illustrated by Figure 2, from *The Global Risks Report 2016*, 11th Edition, published by the World Economic Forum [3].

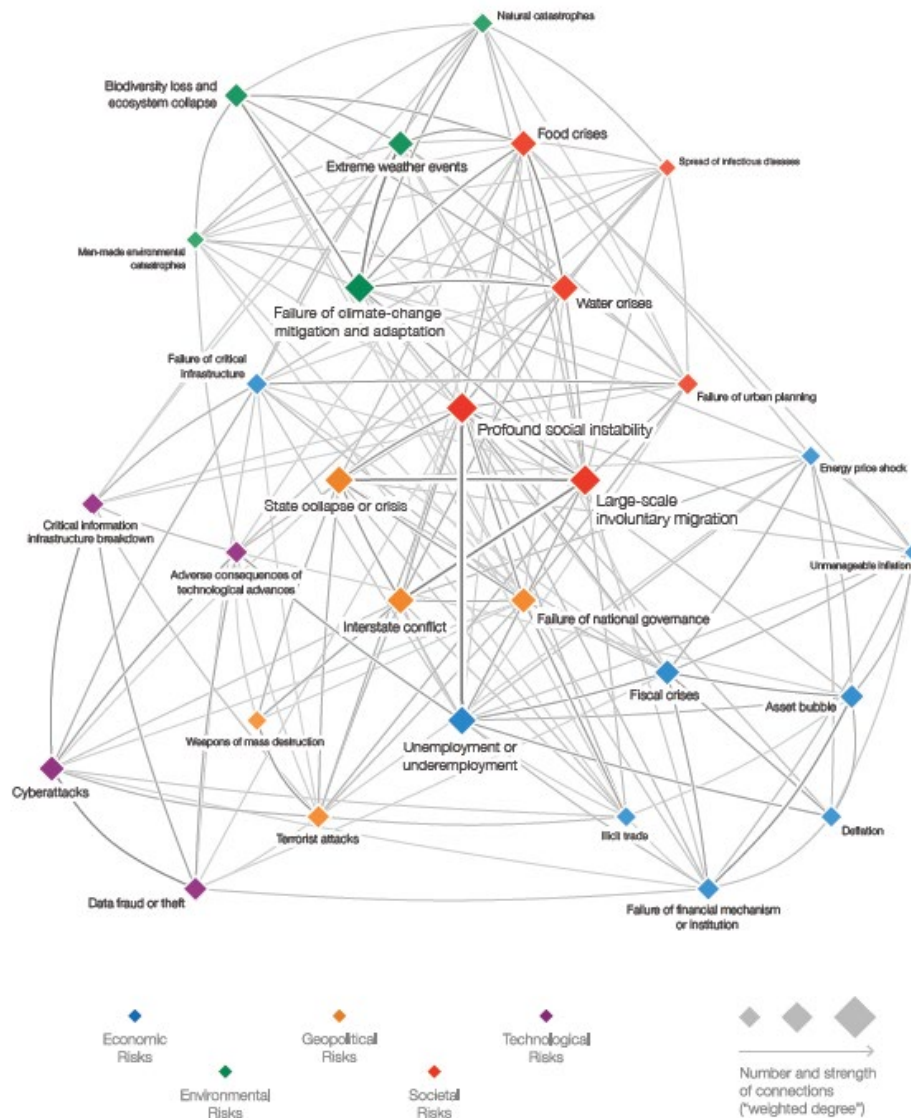


Figure 2: Major threats and dangers faced by current world development processes  
[http://www3.weforum.org/docs/GRR/WEF\\_GRR16.pdf](http://www3.weforum.org/docs/GRR/WEF_GRR16.pdf) (Access: 20180302)

## 2. Purpose

The purpose of this assignment is to stimulate a reflection and a detailed analysis around one **Internet service, product** or relevant **technology** of your choice. A two-fold approach should be used:

- Technical:  
What is it? How does it work? What are the essential mechanisms and processes associated with it?...
- Social, Economic and Ethical:  
To whom is it targeted? What has been its impact on people's way of living?...  
Which economic implications can be associated with the chosen service, product or technology? Can you identify a business model associated with it?  
Are there ethical issues related to the chosen service, product or technology? Is there a fair usage of the involved resources (material, informational, economical, etc)?



### 3. Illustrative Examples

As illustrative examples consider the following:

#### 3.1 Non-fungible token (NFT):

##### **Technical Issues**

- What is an NFT? What does it do? How do you think that it works?
- How does it compare to other similar things?
- Which effects might NFT be producing upon the current electronic commerce and markets?

In order to complement the above points, include also the following aspects:

- Relevant diagrams, pictures or graphs.
- Some numerical / quantified illustrative data. Por example, for the case under consideration (NFT): impact on current players active in the electronic commerce and markets, possible effects on revenues or other indicators that you consider relevant.

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##### **Socio-Economic-Ethical Issues**

- What social impact might have in the notion of money, commerce, etc?

#### 3.2 WhatsApp:

##### **Technical Issues**

- What is WhatsApp? What does it do? How do you think that it works?
- How does it compare to other similar services?
- Which effects might WhatsApp be producing upon the other infrastructures and entities upon which it depends? For example:
  - Can it cause significant bandwidth/throughput consumption on the underlying networks?

- ...

In order to complement the above points, include also the following aspects:

- Relevant diagrams, pictures or graphs.
- Some numerical / quantified illustrative data. Por example, for the case under consideration (WhatsApp): throughput impact on underlying networks, possible effects on revenues or other indicators that you consider relevant.

##### **Socio-Economic-Ethical Issues**

- What social impact might have had / be having WhatsApp? For example:
  - In which ways human language might have been adjusted to online discourse?
  - And socialization?
- Which financial flows do you imagine to happen? Which financial flows do you imagine NOT to happen that would normally happen in the absence of WhatsApp? Can this cause significant effects on the business models of other services?
- Which security, privacy and ethical issues have been raised by WhatsApp in the past? Please comment.
- ...



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### 3.3 Search Engine

#### **Technical Issues**

- What is a search engine? What does it do? How does it work and which are the mathematical foundations for its operation?
- What is search engine optimization? How does it work and which are the mathematical foundations for its operation?
- ...

#### **Socio-Economic-Ethical Issues**

- Are intellectual property rights taken into account by search engines? Are you aware of some recent international disputes about this issue? Give at least one example.
- Do search engines always provide unbiased results?
- If not, which possible mechanism might give rise to such unbiasing?
- Which might be some of the possible consequences of search engine biasing?
- ...



## 4. Examples of other possible Internet services or products to be considered

Examples of other possible Internet services to be considered include (but are not limited to) the following <sup>1</sup>:

- Blockchain and crypto currencies.
- Google Ads (including its insertion on web pages of someone, page ranking, business model, etc).
- YouTube (mainly the recommendation algorithms for further visualizations).
- Netflix (mainly the recommendation algorithms for further visualizations).
- Facebook (mainly friendship suggestions).
- OTT<sup>2</sup> services like Meo Go (Altice), Iris (NOS), etc.
- etc

Note:

To get help about some of the above topics see the references at the end of this document. Without discouraging any other indicated references and others that you might consider relevant, it is particularly recommended that you look with detail (and time...) at [4] and [5].

## 5. What do you have to deliver?

- A written report (MS Word or compatible):
  - Use the template provided in Moodle.
  - Use the following naming procedure:  
<Mecanographic\_number(s)of author(s)\_assign2\_report\_APSEI\_1920>
  - No more than 20 pages,... please.
- A presentation (MS PPT or compatible):
  - Use the provided template
  - Use the following naming procedure:  
<Mecanographic\_number(s)of author(s)\_assign2\_presentation\_APSEI\_1920>
- Deadline for submission (report + presentation): 23h59, 14th April 2020.
- Submission Process: Via Moodle
- Presentation: During the class of 16th April 2020.

## 6. References

- [1] OECD, “The Seoul Declaration or the Future of the Internet Economy”, 2008.  
<http://arquivo.pt/wayback/20170822192054/http://www.umic.pt/images/stories/ocde/Seoul%20Declaration.pdf>  
Accessed: 20180302
- [2] United Nations, “Transforming our World: The 2030 Agenda for Sustainable Development”, 2015  
<https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>  
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- [3] World Economic Forum, “The Global Risks Report 2016”, 11th Edition.  
[http://www3.weforum.org/docs/GRR/WEF\\_GRR16.pdf](http://www3.weforum.org/docs/GRR/WEF_GRR16.pdf)  
Accessed: 20180302

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<sup>1</sup> Naturally, the pattern analysis previously used with WhatsApp and Search Engine has to be modified and adapted to each considered service.

<sup>2</sup> OTT are the initials of “Over-the-top”. In references [6], [7], [8] and [9] you can find explanations and examples of OTT services.



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- [4] “Networked Life: 20 Questions and Answers”, Mung Chiang, Princeton University, April 2012 Draft  
<https://elearning.ua.pt/mod/resource/view.php?id=355960>  
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- [5] “Networks: Friends, Money, and Bytes”, Mung Chiang, Princeton University, November 2016, On Line Course.  
<https://www.coursera.org/learn/friends-money-bytes/home/welcome>  
Note: Requires registration  
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- [6] Wikipedia – Over-the-top media services  
[https://en.wikipedia.org/wiki/Over-the-top\\_media\\_services](https://en.wikipedia.org/wiki/Over-the-top_media_services)  
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- [7] ANACOM – Estudo sobre Serviços de Aplicações e Conteúdos “Over the Top” – OTT, 2017.  
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- [8] ANACOM – Conclusions on “Study on content and application services (Over - The - Top - OTT), 2017.  
[https://www.anacom.pt/streaming/conclutionsOTT.pdf?contentId=1382167&field=ATTACHED\\_FILE](https://www.anacom.pt/streaming/conclutionsOTT.pdf?contentId=1382167&field=ATTACHED_FILE)  
Accessed date: 20180301
- [9] ANACOM – OVER-THE-TOP (OTT) SERVICES: Use of Internet-based instant messaging, voice calls and other apps in Portugal and the European Union  
[https://www.anacom.pt/streaming/OTTservices2017en.pdf?contentId=1427794&field=ATTACHED\\_FILE](https://www.anacom.pt/streaming/OTTservices2017en.pdf?contentId=1427794&field=ATTACHED_FILE)