

Digital Media Infrastructures

Prepared by Dr. Shereen Kedwany

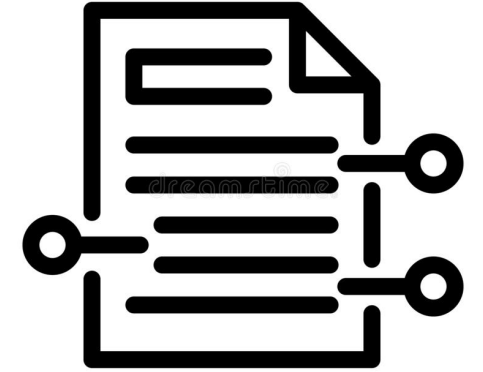
Lecture 2

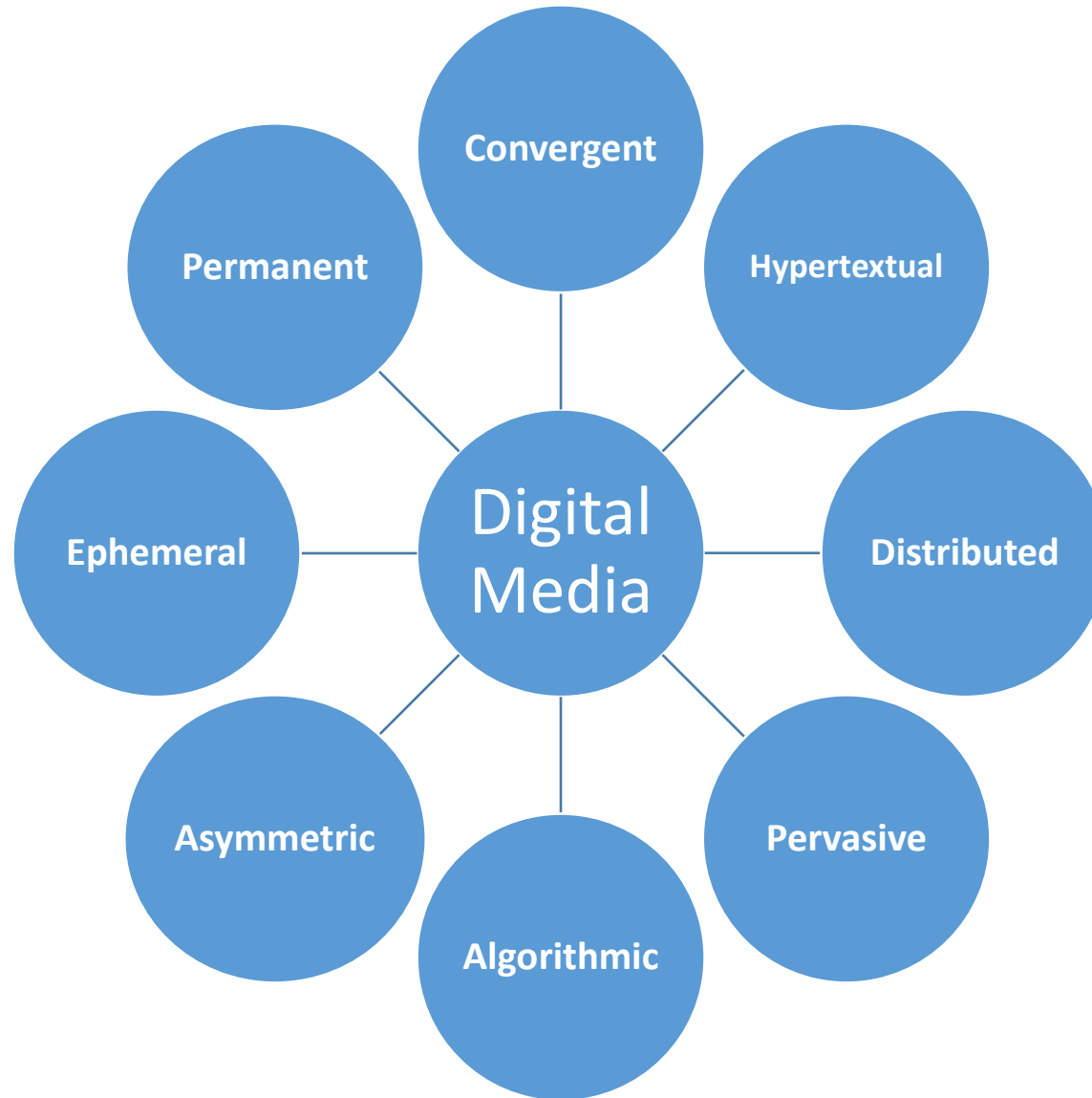
DGM 711
Introduction to Digital Media



- **Mediatization** is the increasing presence of media in all aspects of life .
- **Computer networks** have become “the key **infrastructure** for all aspects of life in the digital environment.
- “**Digital Media**” are “the means that they carry information represented by a numeric code and then transform it into human language”.
- **Digital media** is sometime called **multimedia**.
- Digital media can carry information very **efficiently** than old media.
- The introduction of **new media** has not caused the disappearance of the **old media**.
- A practice, content, or format can be **re-mediated** by a new technology .

- I. The Digital Media Characteristics.
- II. Infrastructures and Platforms.
- III. The Web Generations .
- IV. Conclusion.

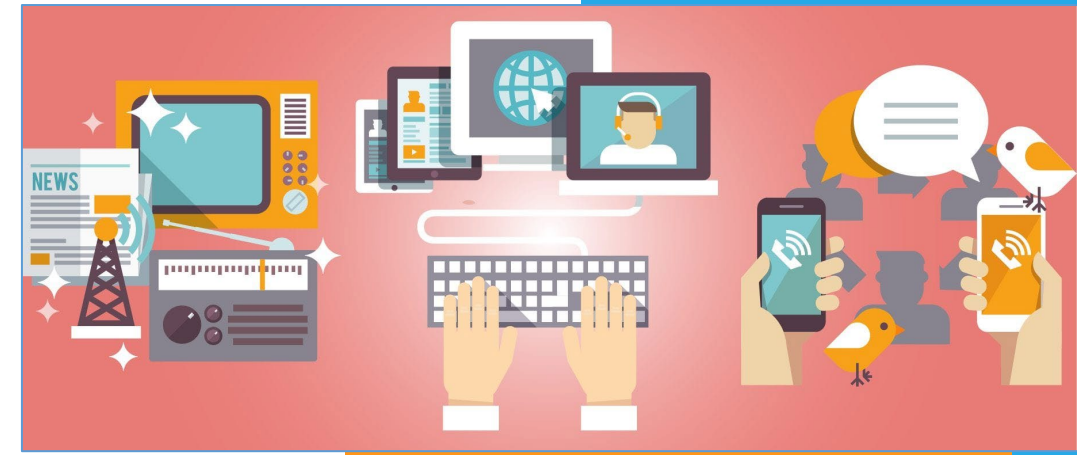




Chapter 02

1. Convergent

- On digital media, different types of content (**written**, **audio**, **visual**, etc.) converge onto a single technical platform.
- **The personal computer**, for example, is at the same time a **television** set, a **typewriter**, a **radio**, a **telephone**, and countless other machines.
- Thanks to the digitization of information, computers are “**universal machines**” that can mimic other machines.



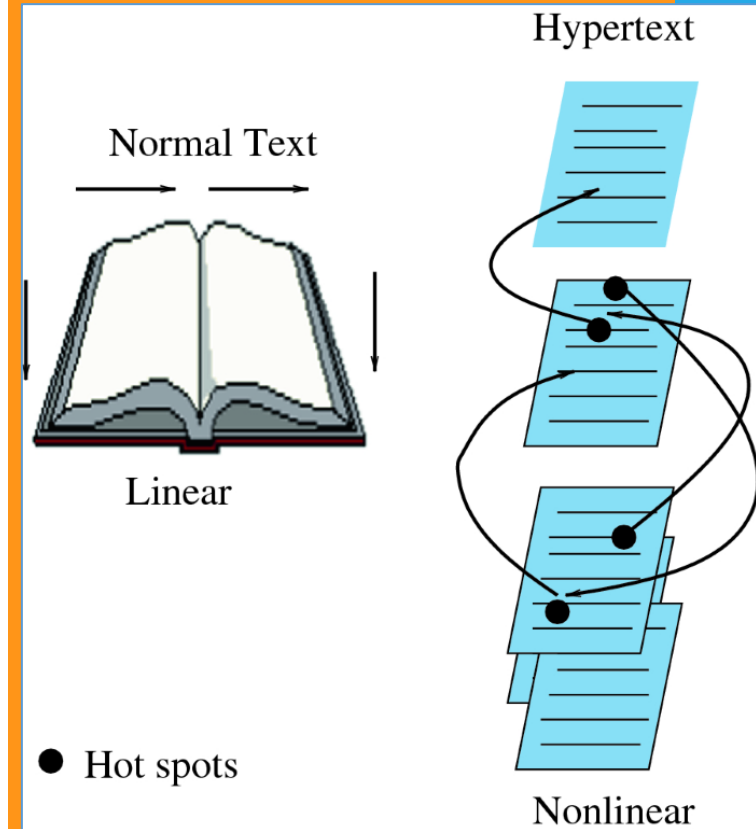
- This means that the production and consumption of different kinds of media **content** (film, text, music, etc.) no longer presupposes different kinds of **hardware** (projectors, books, stereos) that use different **codes** and technological supports (celluloid, paper, vinyl), but can happen on a set of **machines**, such as **computers or smartphones**, where all these different kinds of content are represented by means of the same **binary code**.
- This goes beyond the **technical** level and implies a **cultural convergence** between **producers** and **consumers** of media content.



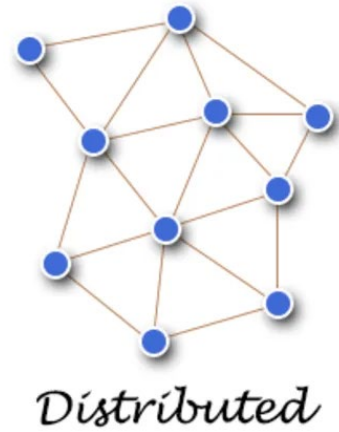
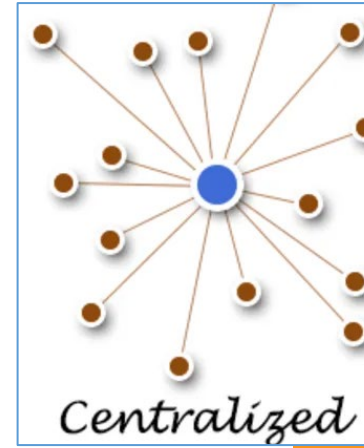
Chapter 02

2. Hypertextual

- A **hypertext** is a text that embodies **references** to other texts or other forms of content.
- On the World Wide Web, **hypertexts** are a fundamental feature that **link one webpage to another**.
- This way, **digital media** allow users to enjoy content in a **non-linear** fashion.
- On a **webpage** you do not have to read contents in a **linear** way, as you would with a **book**.
- Instead, you can **customize** your reading experience, jumping from one text to another, to a video, to a Wikipedia entry, and then back to another webpage or app .



- **Traditional mass media** are **centralized** and **unidirectional**: information is transmitted from a central facility, such as a **newsroom**, to a large **audience** of readers.
- **Digital media** are instead characterized by a **distributed model**.
- Indeed, the **internet** is composed by thousands of interconnected **nodes** rather than a few core hubs .



- Furthermore, the spread of cheap computers, tablets, and smartphones, along with widespread internet connectivity and software that foster the production of **User-Generated Content (UGC)**, has allowed users to take a greater role in the creation of content.
- The **resources** for information production and distribution are at least partially in the hands of **individuals** who communicate **horizontally** via media platforms .



- Mobile technologies, such as **mobile phones**, **smartphones**, and **tablets**, give a **pervasive** or even ubiquitous scope to digital media.
- In fact, they allow people to **access** and **post information** at any **time** and from any **location**, and **companies** to track and surveil user behavior at an unprecedented scale.



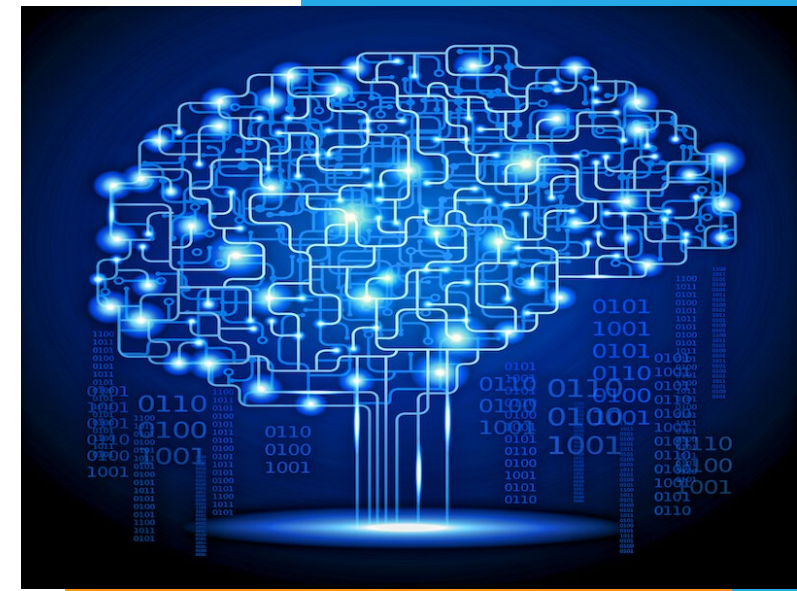
- This makes it possible to produce and exchange information specifically related to the **place** and **time** of use: to upload information on a shared map, for example **Google Maps**, or to communicate and interact with those who are attending an **event** in a particular **location**, for example textually via **Twitter** or with a video via **Periscope**.



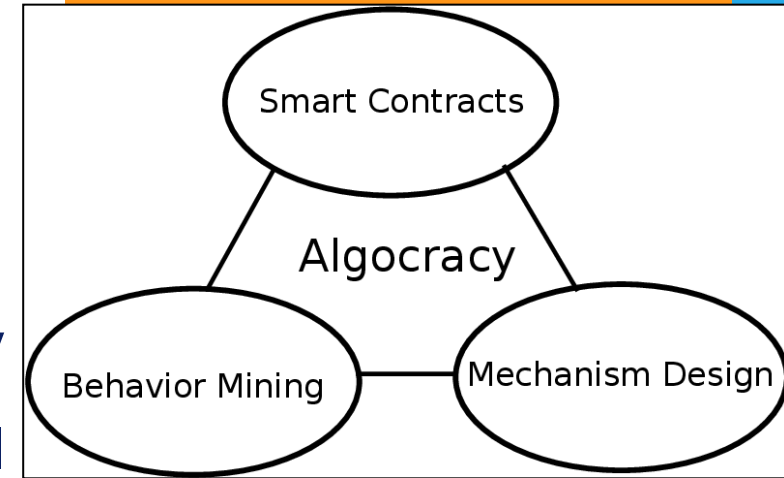
- Mobile technologies have the ability to modify and extend our **social networks**.
- In this sense, they are not only a means for creating abstract communities, but also a tool to **strengthen social ties** connected to specific physical locations or territories.



- Most digital media services and technologies are underpinned by **algorithms**.
- These are **programs** that follow procedural logics in order to generate specific outputs.
- The role of **algorithms** is made possible by the fact that digital technologies “**datafy**” behaviors and **interactions**, or transform them into **data** that can be analyzed and then used to make choices.



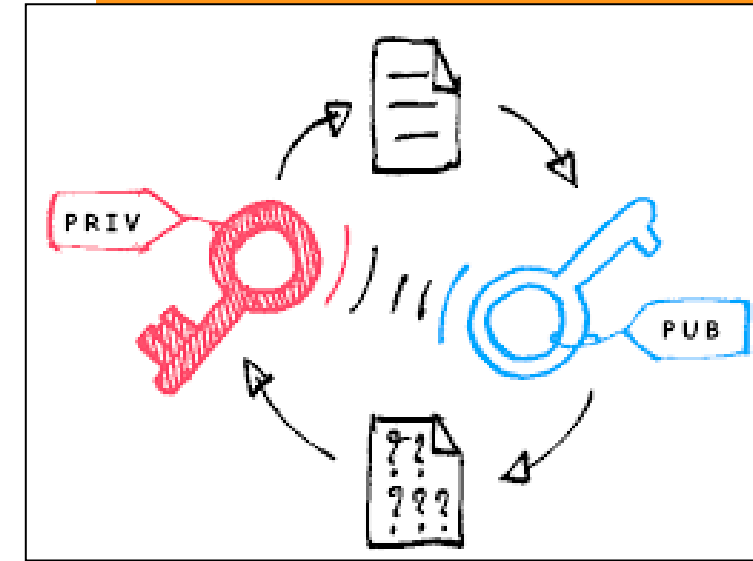
- **Algorithms** bring with them a **promise** of **objectivity**, as they are supposed to be **accurate** and free from bias or external influence .
- And yet the study of their logics and effects has found that, like any human technology, they are **not neutral** .
- The term “**Algocracy**” describes situations in which **power** is exercised by algorithms that affect action by making some kinds of interaction or organization **possible** and **blocking** others .



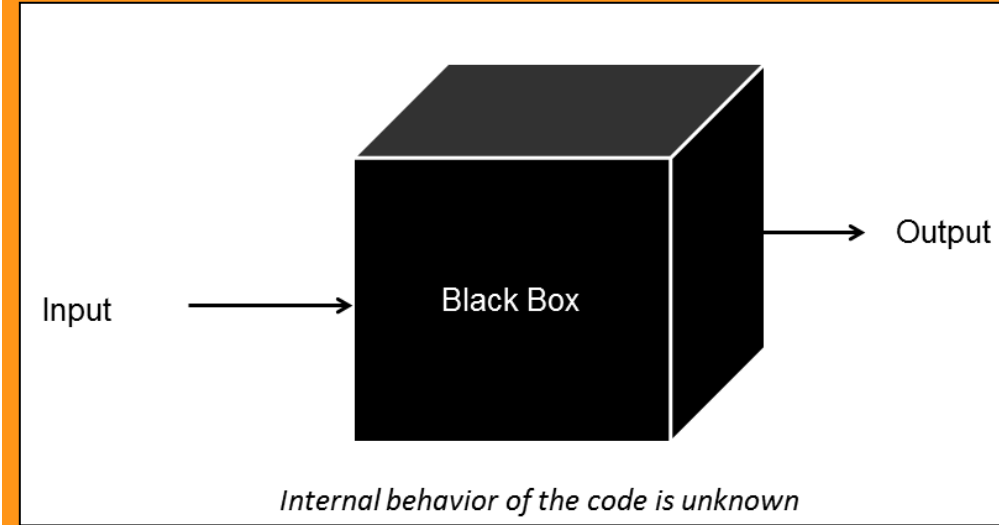
- For example, **Facebook's algorithms** analyze the activities of users and estimate which content is more likely to generate interactions if shown on their timeline.
- **Software**, in sum, structures all activities mediated by digital technologies.
- Many algorithms are based on **machine learning technologies**.
- This means that while using a certain service, **individuals** contribute to training algorithms.



- Digital media are highly **commodified**, as the biggest services are owned by a handful of gigantic **corporations**.
- In this landscape, **power** is unevenly distributed, as individual **users** do not have access to the information these corporations collect about their interactions and behaviors, although such information shapes the way users interact with a certain platform or service .



- **Users** do not know the **algorithms** that underpin the functioning of Tinder, and need to guess how to influence the way the platform decides to which other users one's profile will be suggested as a possible match.
- Indeed, digital media tend to be perceived as **black boxes** that obscure the underlying operations that structure **user experience**.



- Different media have different **duration** and **persistence**.
- The **paper book** can be stored for **centuries**;
- **Inscriptions on stone** last for **millennia**.
- In the case of the information produced and transmitted by **digital media**, its duration in time **depends on several factors**.



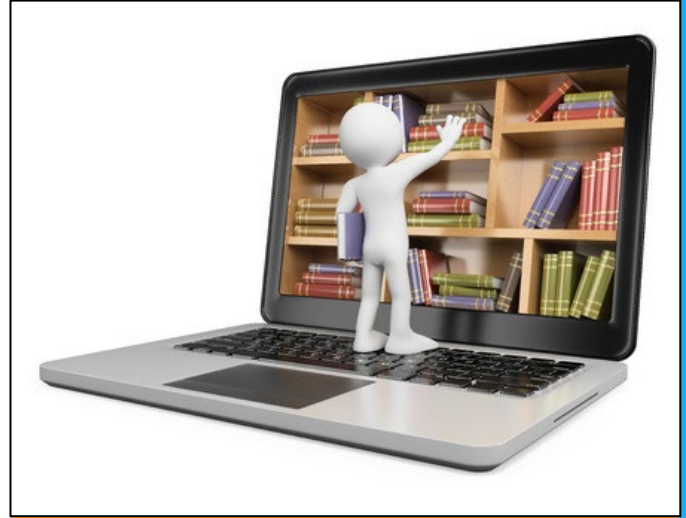
- The **hard disks** used to store data in digital form tend **not to last** more than one or two decades.
- The **softwares** that transform human language into binary code are quickly **replaced** by new programs.



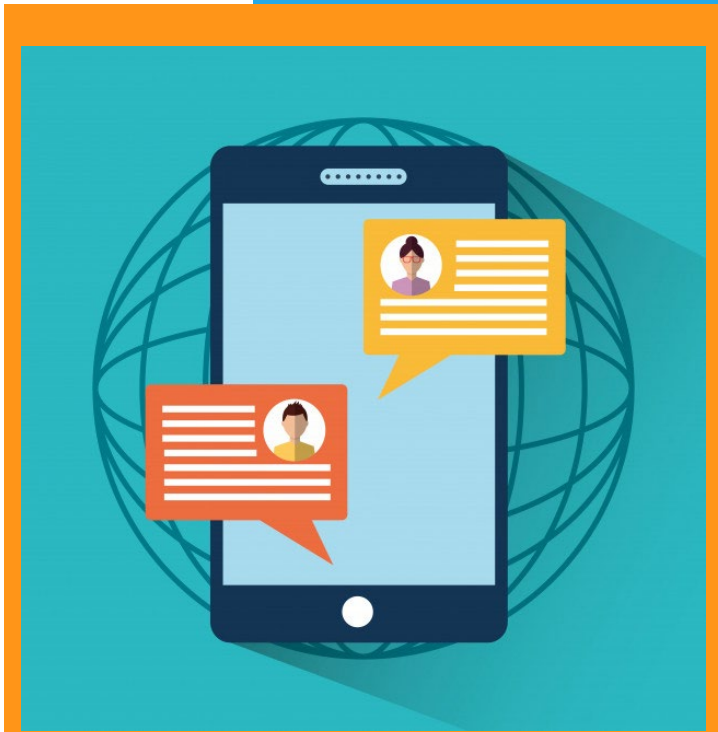
TYPES OF SOFTWARE



- At a stage of human history in which **knowledge** is archived and stored on **digital media**, these problems assume a central importance for **institutions** like **libraries or archives**, whose mandate includes the preservation of documents for future generations.



- At a different level, **digital communications** like **messages, chats, or pictures** are perceived as being highly **ephemeral** .
- However, **copies** and traces of these communications can be **uplicated** and **stored** for **years** without the author's knowledge, by the **companies** that manage digital communication services, by government agencies, or by other individuals.



- The technical characteristics that underpin **digital media** reach global significance through the **infrastructures** that compose **digital networks**.
- Understanding the **architecture** and **design** of the “plumbing” of **digital media** is crucial for the study of the **actors** and **communities** that populate them.



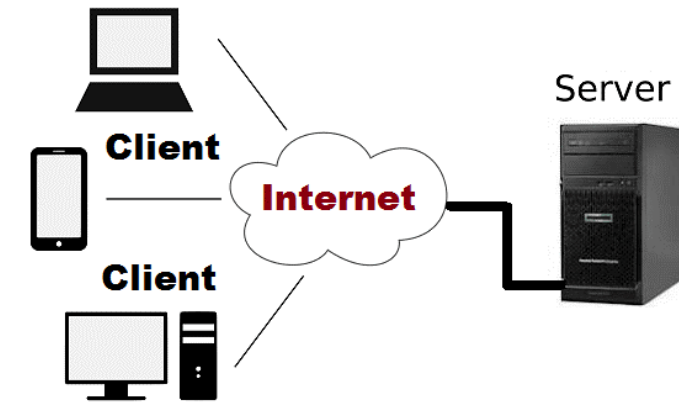
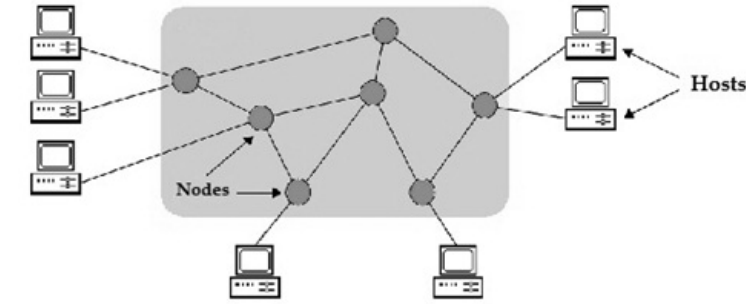
- According to the American law scholar Lawrence **Lessig** (2002), “**code is law.**”
- With this formula, **Lessig** suggested that the **architecture** of the different layers of **digital networks** is **not neutral**, but rather has the **power** to shape the behaviors of their users.



Chapter 02

II. Infrastructures and Platforms

- Unlike broadcast media, such as a **television** station or a **newspaper**, the **internet** is a communication system that is not based on a single central **hub**. Instead, it is composed by a series of interconnected **nodes**.
- Indeed, the **internet** is a distributed structure shaped as a **network**, which means that **information** is physically located on thousands of computers called **servers**, to which other computers connect to request the information they want, such as that making up a **website**.



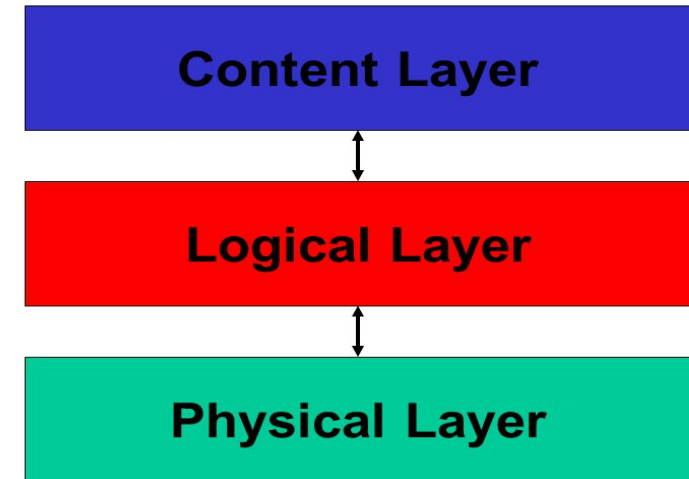
- Furthermore, the **internet** is an **open system** : anyone with access to a telephone or broadband line can access it, either with a personal computer or another device.
- These infrastructural features are based upon a **global governance system**.
- **The World Wide Web Consortium (W3C)** is an international organization that deals with web standards, with the task of keeping them open.



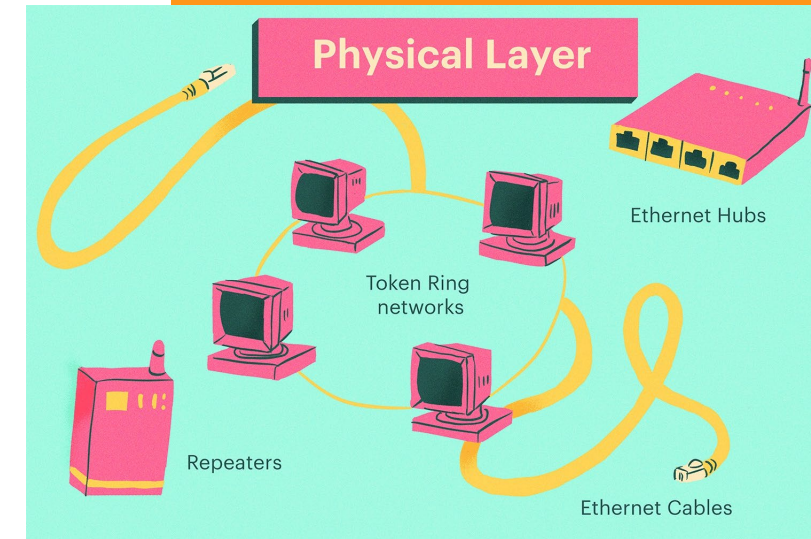
- Each **website** has an “**address**” where it can be reached, that is, an alphanumeric code that identifies the site and allows users to get to the server on which the information that constitutes it is stored.
- These codes are called **domains** and are managed and awarded by an international organization, **the Internet Corporation for Assigned Names and Numbers (Icann)**.
- There are **national domains**, such as **.it**, **.ca**, or **.se**, or others that define the type of **activity** carried out by the site, such as **.com** for commercial activities or **.org** for associations and nonprofit organizations.



- To understand **digital media**, it is important to differentiate the levels that compose them.
- As argued by **Yochai Benkler**, digital media and network technologies are composed of different “**layers**,” that are related to one another but have their own peculiarities, problems, and challenges (2006).



- The **first** is the **physical layer**:
- It is composed of **material** components such as the frequencies that are used for radio broadcasts, and the cables, computers and servers, satellites, and telephone lines that make up the internet.



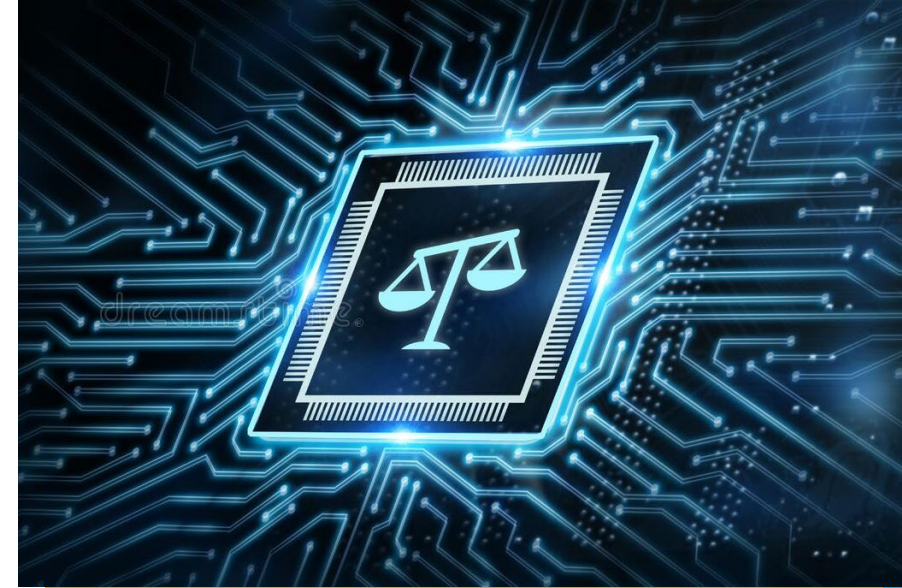
- The second is **the logical layer** :
- composed of the **software, standards, and protocols** that underpin digital networks:
- For example, the TCP/IP protocols that allow for the transfer of information on the internet, or the software that manages an online platform, social network, or database.



- The third is **the content layer**,
- that is, the humanly intelligible **information** that is produced and exchanged within the network:
- for example, the **text** of an article in an online newspaper, the **content** of an email, or a **picture** posted on a social media.



- Finally, there is also **the legal layer**,
- the set of national and international **laws** and **policies** governing the functioning of digital networks and the behavior of their users.
- This level is related to the other three.



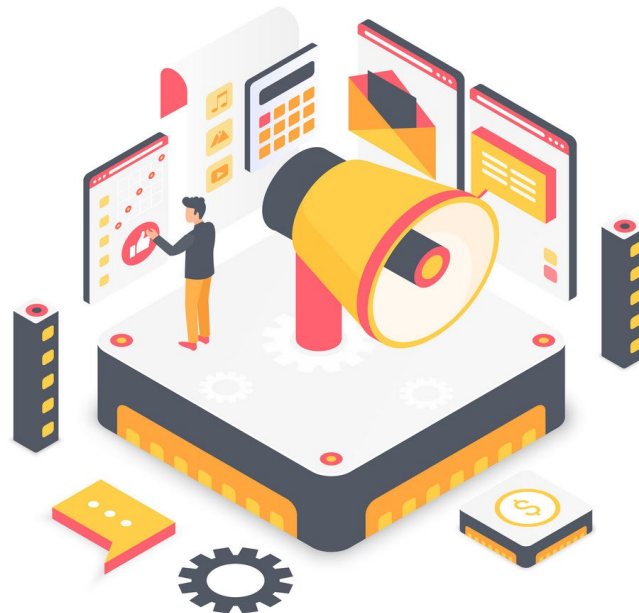
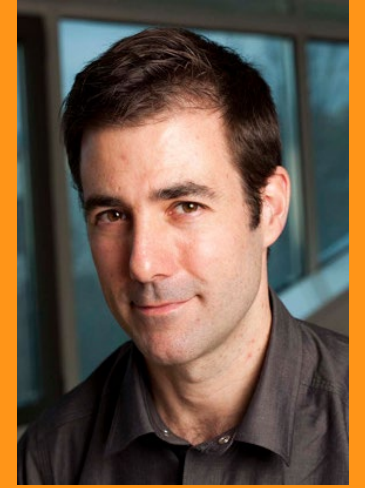
- Another important focus of studies of digital media is represented by one component of digital media infrastructures: **platforms**.
- From a technical viewpoint, a digital platform is nothing else than a **software environment** in which a set of **programs** can be executed.
- In this sense both a **browser** such as **Firefox** or an **operating system** such as **Android** can be seen as **platforms**, as they are environments for other applications – think of a **Netflix** movie watched on Firefox, or an **app** downloaded onto an Android phone.



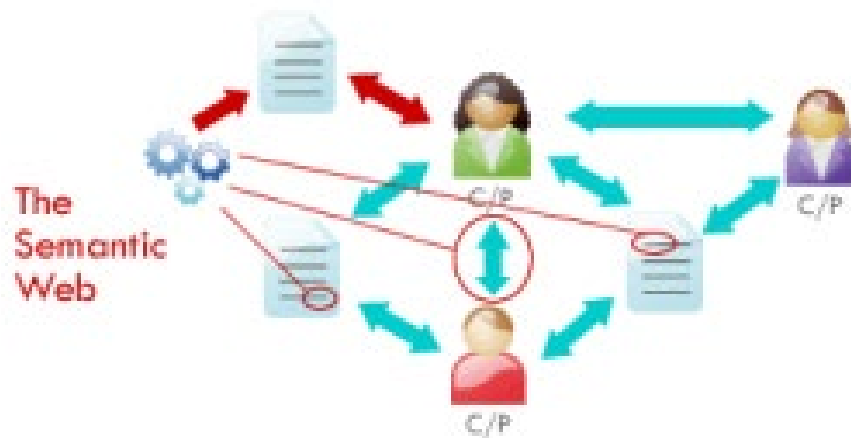
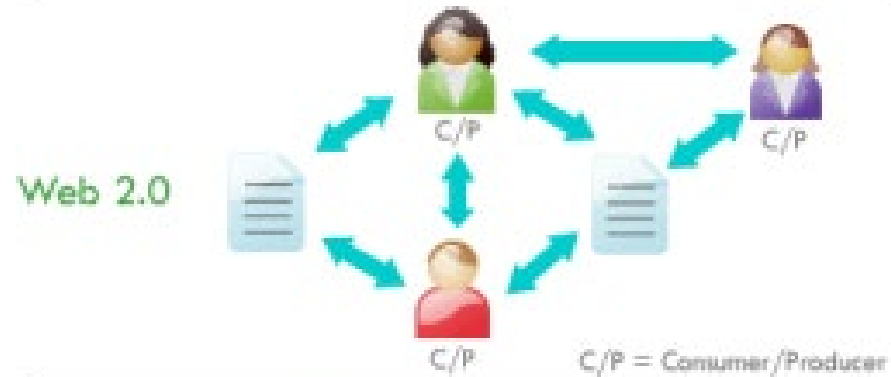
- Media scholars researching **social media platforms** have analyzed the way these services use **algorithms** to organize and mediate the interactions that are carried out through their interfaces.
- For example, **Instagram** uses the same principles to mediate the circulation and exchange of images.



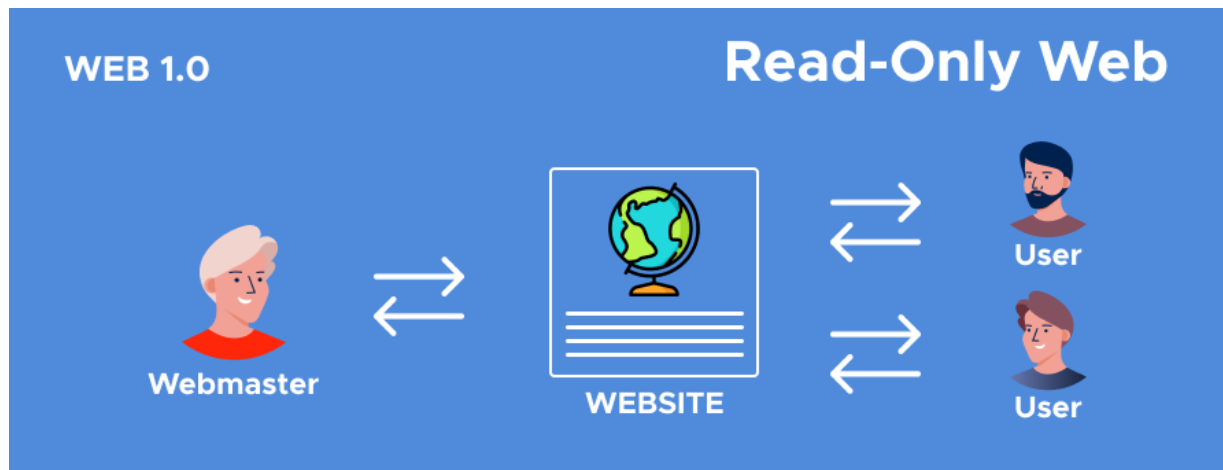
- In this sense, **platforms** are stages that allow users to perform specific activities (**Gillespie** 2010) while shaping how such activities can be carried out.



III. The Web Generations :



- **Web 1.0** is the first generation of the web which could be considered the **read-only web** and also as a system of cognition.
- **Web 1.0** began as an **information** place for businesses to broadcast their information to people.
- The early web provided a **limited user interactions** or **content** contributions and only allowed to **search** the information and **read** it.



- **Web 2.0** was defined as **a read-write web** .
- The technologies of **web 2.0** have more **user-generated content** and **usability** for end-users .
- A **Web 2.0** website allows users to **interact** and collaborate with each other through social media dialogue as creators of **user-generated content** in a virtual community.
- It is also known as **participatory web** and **social web**.



- **Web 3.0** is more focused on the use of technologies like **machine learning** and **AI (Artificial intelligence)** to provide relevant content for each user instead of just the content other end users have provided.



- **Digital media** have common **characteristics** that distinguish them from **Analog old media** (Convergent, Hypertextual, Distributed, Pervasive, Algorithmic, Asymmetric, Ephemeral & Permanent) .
- The **architecture** of the **digital networks** is **not neutral**, but rather has the **power** to shape the behaviors of their users.
- The **internet** is an **open system** , based upon a **global governance system**.
- **Digital media** and network technologies are composed of different “**layers**,” (physical, logical, content & Legal).
- There are **three generations** of the web (**Web 1.0 - Web 2.0 - Web 3.0**).



Thank you for listening

DGM 711
Introduction to Digital Media