Academic Year 2023/2024

Social Media Analytics (SMA)
Presentation of the Course

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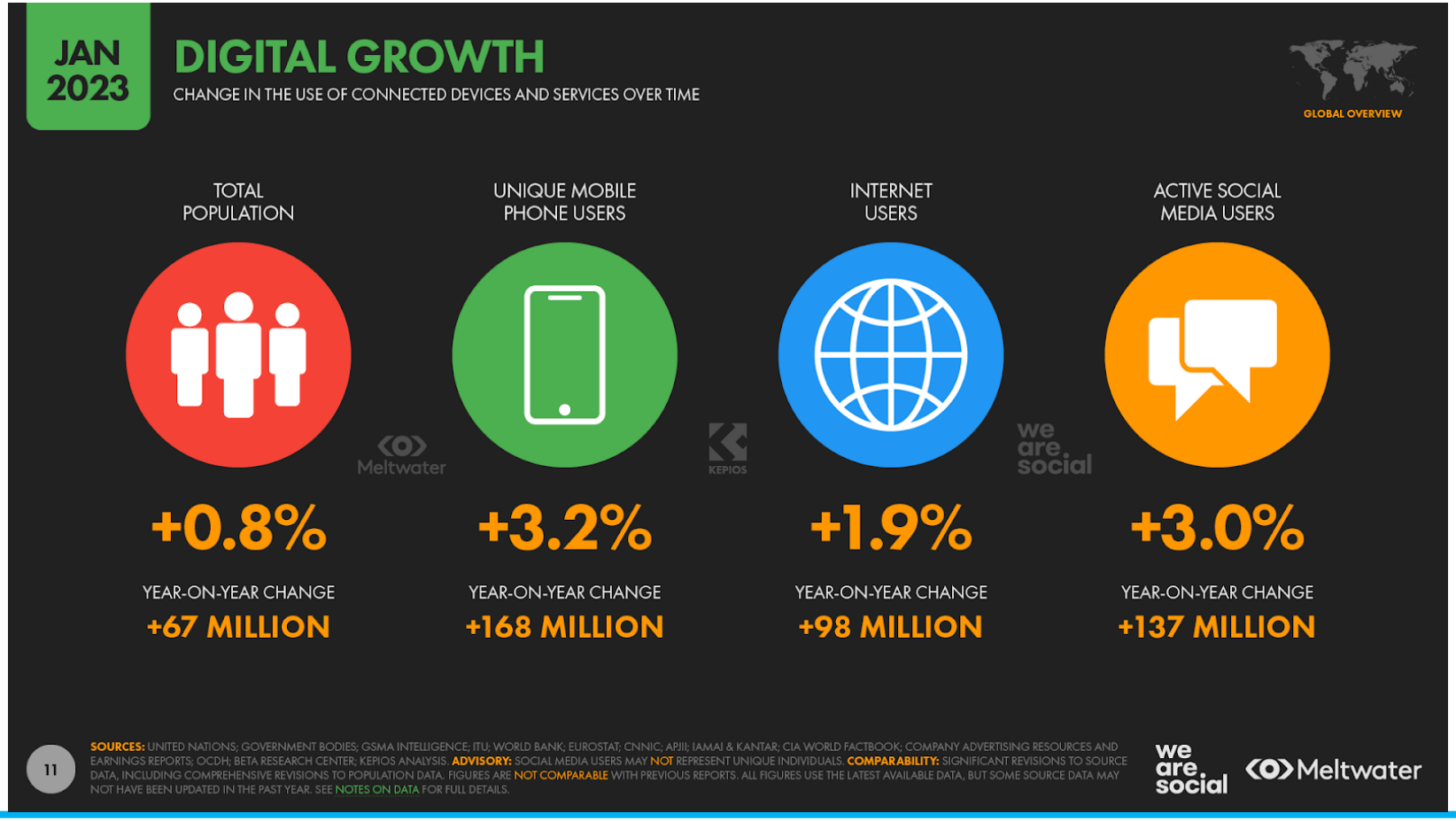
Scenario

- **Huge amounts of data** are exchanged nowadays on **social media** through the use of various **devices**

- **Ubiquitous Computing**: information processing is fully integrated within everyday objects and activities

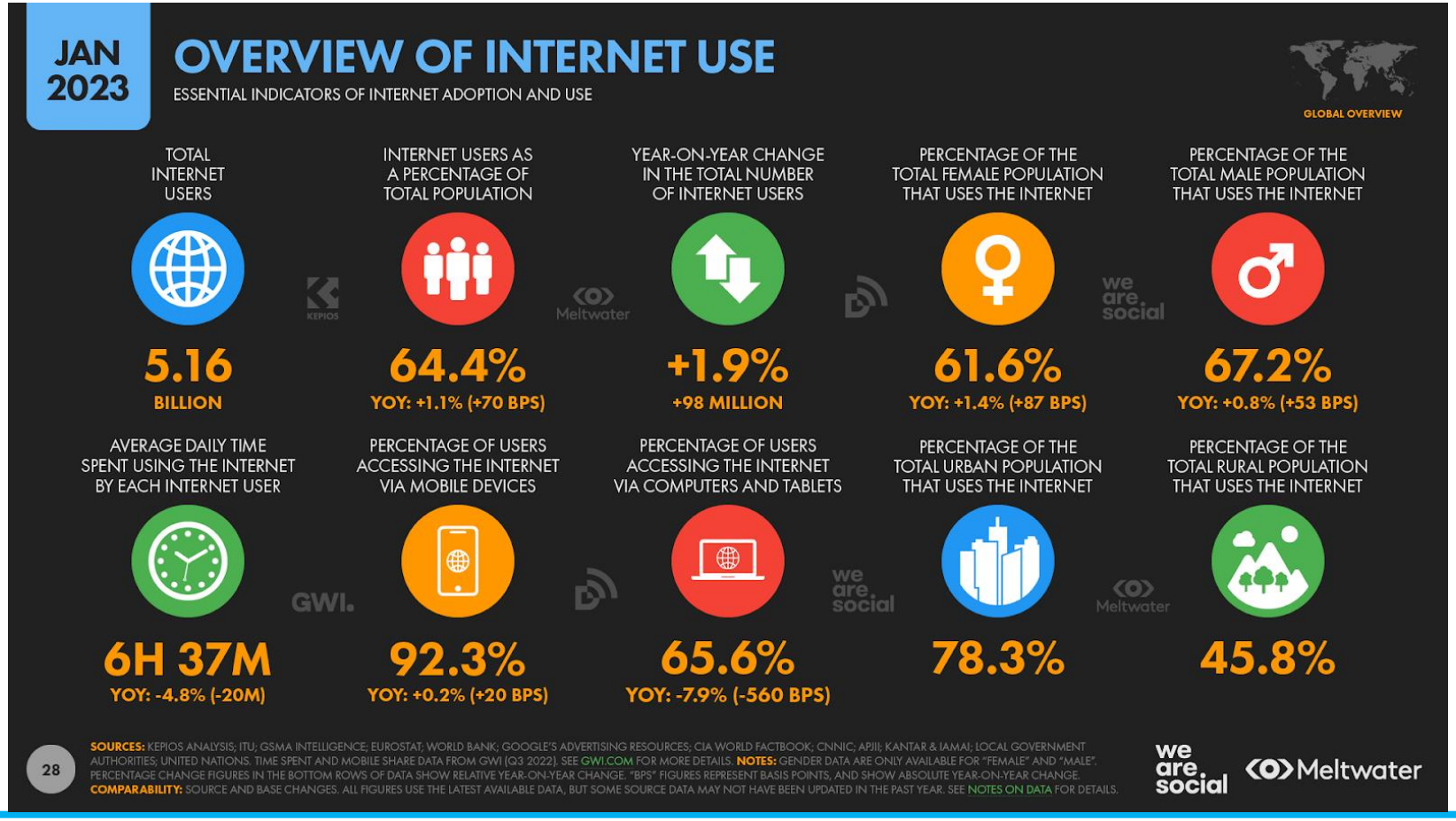
Some Statistics… (1/5)

https://wearesocial.com/uk/blog/2023/01/the-changing-world-of-digital-in-2023/



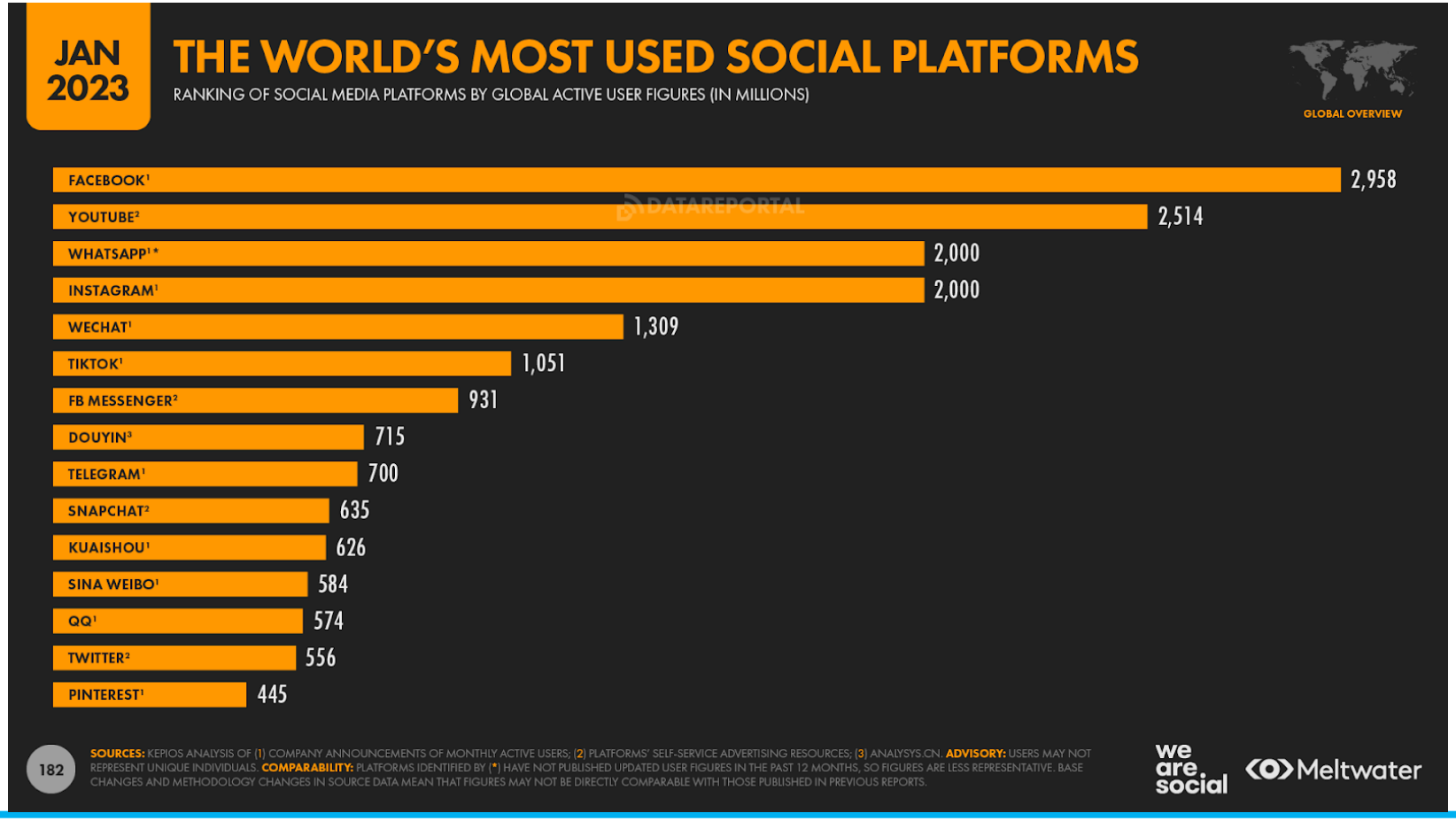
Some Statistics… (2/5)

https://wearesocial.com/uk/blog/2023/01/the-changing-world-of-digital-in-2023/



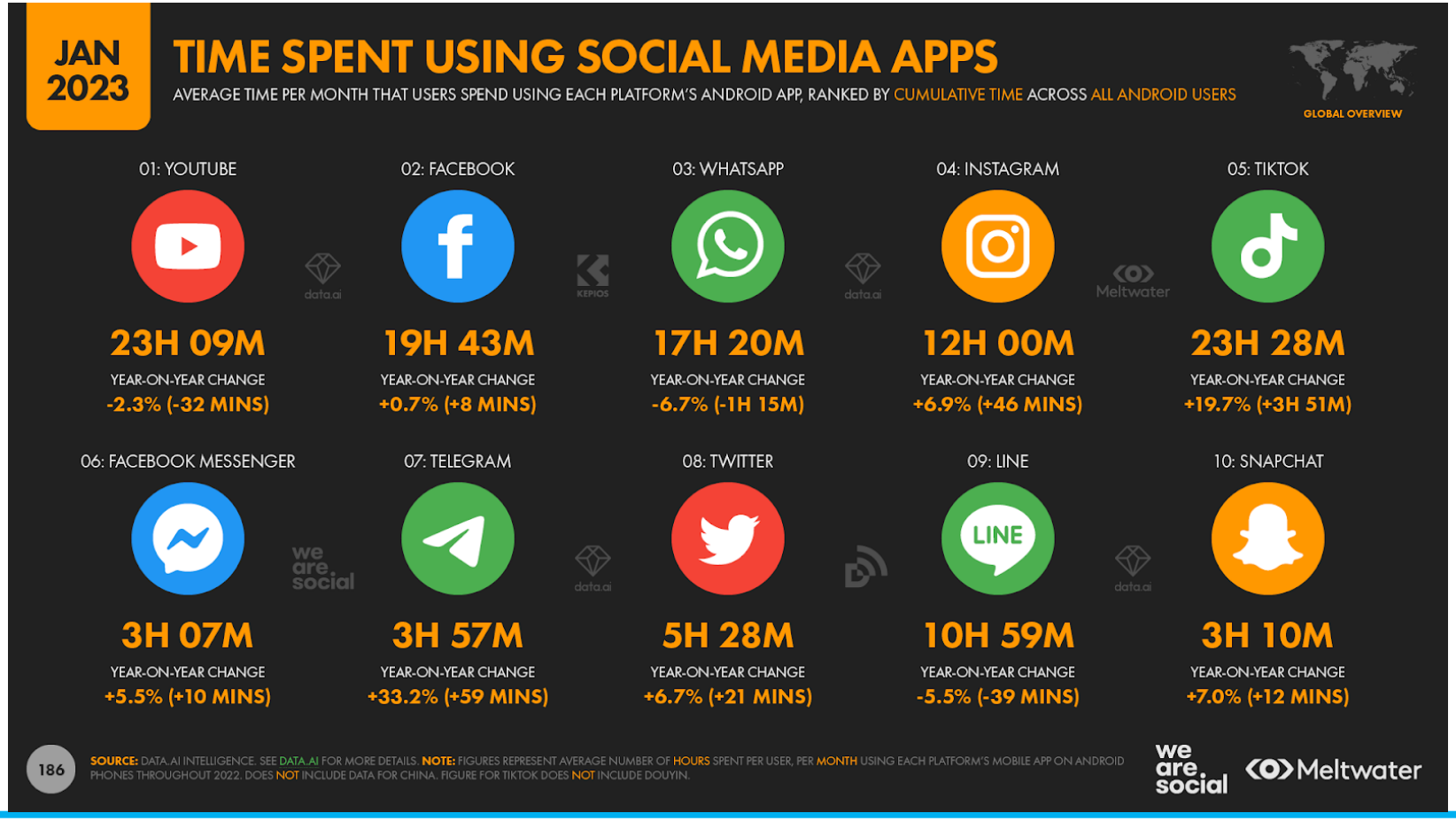
Some Statistics… (3/5)

https://wearesocial.com/uk/blog/2023/01/the-changing-world-of-digital-in-2023/



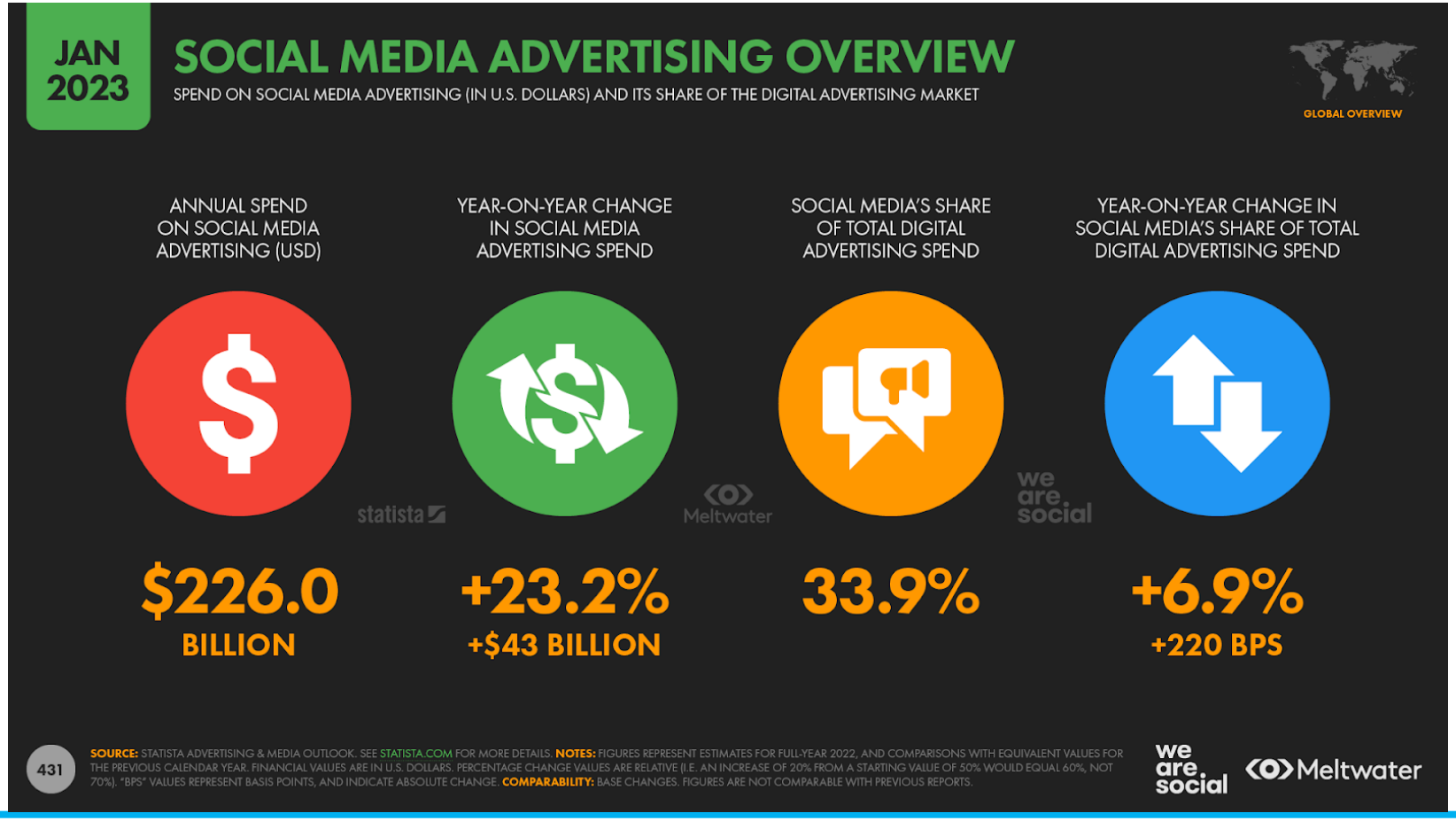
Some Statistics… (4/5)

https://wearesocial.com/uk/blog/2023/01/the-changing-world-of-digital-in-2023/



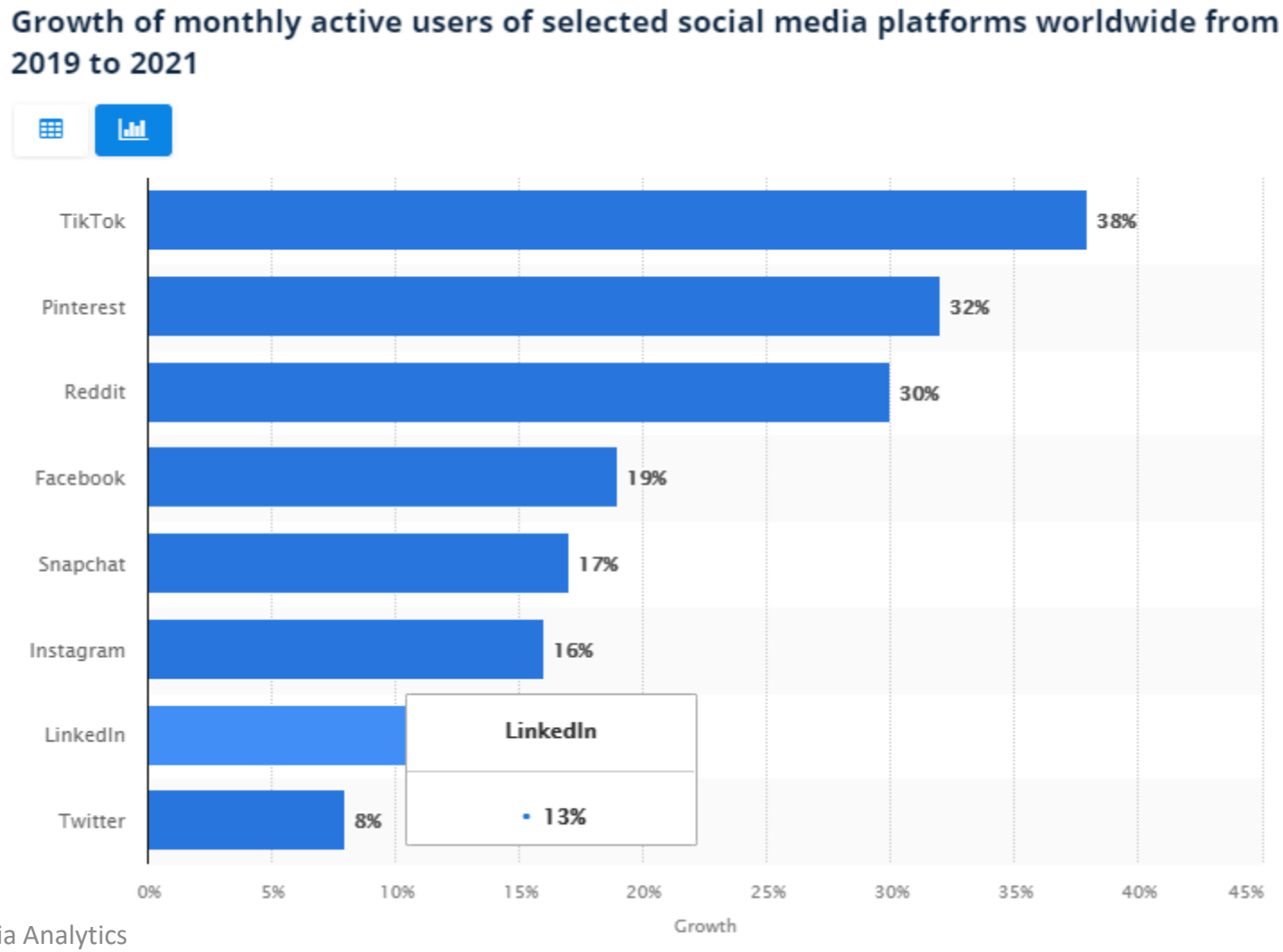
Some Statistics… (5/5)

https://wearesocial.com/uk/blog/2023/01/the-changing-world-of-digital-in-2023/



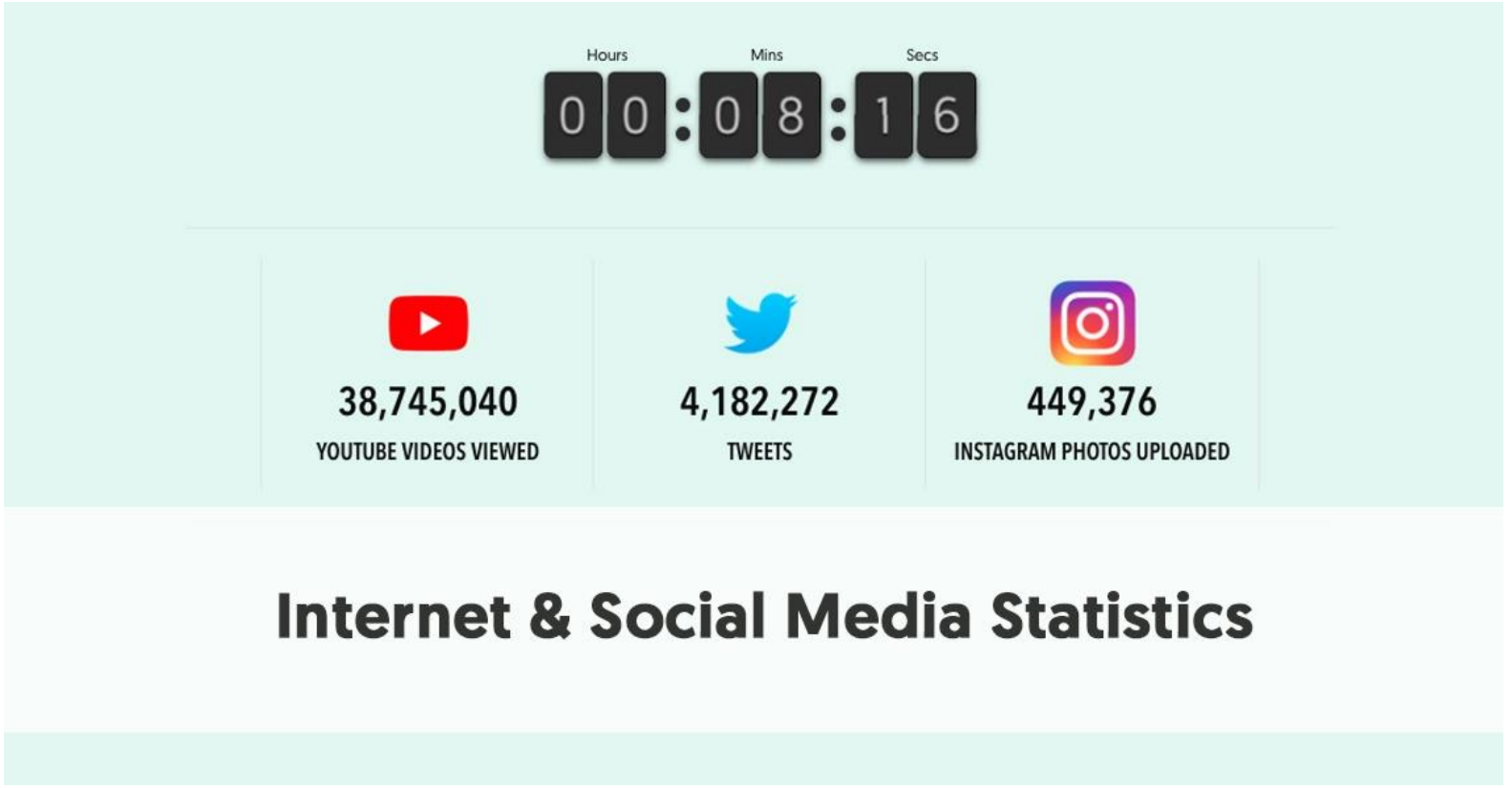
https://www.statista.com/topics/7863/social-media-use-during-coronavirus-covid-19-worldwide/

Social Media and the Pandemic



Other Statistics

https://influencermarketinghub.com/social-media-statistics/



The Importance of Social Media

- (Potential and pervasive) information is provided in **real time** on the various social platforms:
  - **Entities** (relevant/popular) → Books, records, television series, characters, restaurants, ...
  - **Events** (cinema/music/…) → Launch of a new product, exhibition, concert, ...
  - **News** (entertainment/politics/catastrophic events) → Earthquake in ...
  - **Relationships** (between entities, events, news) → @RealDonaldTrump vs. @POTUS

From Information to Knowledge

- **Information** is organized or classified data, which has some meaningful values for the receiver
- By **knowledge** we mean: Awareness and understanding of a set of information and ways in which information can be made useful
- Knowledge is derived and/or inferred from "raw" information to enable **informed decisions** to be made

Social Media Analytics

- Complex process of identifying information:
  - relevant
  - valid
  - new
  - *potentially* useful

  on social media, which can be transformed into knowledge that can be used by **different actors** and for **different purposes**

Social Media Analytics (Applications)

LIFE QUALITY

BRAND REPUTATION

FORECASTING THE PERFORMANCE OF FINANCIAL MARKETS

Social Media Analytics and Decision Making

- Opinions expressed by others impact our choices

Social Media Analytics and Decision Making

- Social platforms are a source of **huge volumes of data**

- In the presence of such a large amount of data, how to transform them into information and knowledge useful for the **decision-making process**?

Social Media Analytics and Decision Making

- Is it a simple process?
- **NO!**
- "Too much" information often equates to not having information

Aim of the Course

- Provide the skills to start a **social media specialist** path to learn how to **extract significant insights** from the huge volume of mostly unstructured data using **social media analytics** methods and tools

- **Main concepts** behind social media data management:
  - Access and collection
  - Pre-processing
  - Representation
  - Analyses

Organization of the Course

- **Frontal lessons + laboratory exercises**
- **28 hours** of frontal lessons
- **18 hours** of laboratory exercises

Course Program

1. Introduction
- Introduction to the Web, Social Web, and the terminology used.
- The "information objects" on the Social Web.
- Social Media Analytics: definition and objectives.

2. Data in social media
- Main social platforms, Advanced Programming Interfaces (API)s, the “crawling” process;
- Pre-processing and storing of social data;
- Hints of data collection issues, both legally (the GDPR) and technologically.

3. Social data representation
- Elementary and complex data structures;
- Representing social structures via a graph-based representation (graph theory, network topologies).

4./5. Social Network Analysis
- Link analysis, Web link analysis, and related metrics;
- Network clustering: community-detection algorithms;
- Influence and contagion in social media.

6./7. Social Content Analysis
- Introduction to concepts of Natural Language Processing in the context of social networks;
- Objectivity/subjectivity, polarity, emotion and irony in social networks;
- Lexical and Semantic Approaches;
- Named-entity Recognition and Linking.

8. Visualization of social media data: open issues and techniques

Teachers

Frontal Lessons	Labs
Marco Viviani  Associate Professor (IKR3 Lab) Reception: *by appointment* Room 2006, Building U14 marco.viviani@unimib.it	**Davide Mancino**  PhD Student (LTA Lab) Reception: *by appointment* Room T033, Building U14 davide.mancino@unimib.it

Calendar

- Any changes will be communicated via notices on the **e-learning platform**
- ALWAYS check the university mail

Frontal Lessons	Labs
• September 27th • September 29th • October 4th • October 6th • October 11th • October 13th • …	• October 13th • October 20th • October 27th • November 17th • November 24th • Last data still to be defined

Access to the e-Learning Page of the Course

- Access to the page is based on spontaneous registration:

https://elearning.unimib.it/course/view.php?id=51050

- You will find notices, links to lessons, exercises, and any other material for further study

Study Material (Frontal Lessons)

- **Slides**
- Suggested **further readings** (e.g., scientific articles and online resources)
- **Books**:
  - Rahman, Md Saidur. Basic graph theory. Springer, 2017.
  - Reinhard Diestel. Graph Theory. Springer, 2017.
  - Suliman Hawamdeh, Hsia-Ching Chang. Analytics and Knowledge Management. CRC Press. 2018.
  - John Scott. Social Network Analysis. Sage, 2012.
  - Bing Liu. Sentiment Analysis and Opinion Mining. Morgan & Claypool. 2016.

Study Material (Labs)

- **Slides**
- **Online resources** (websites, examples, notebooks, etc.)
- **Books**:
  - PM, K. R., Mohan, A., & Srinivasa, K. G. (2018). Practical social network analysis with python. New York: Springer International Publishing.
  - Cambria, E., Das, D., Bandyopadhyay, S., & Feraco, A. (Eds.). (2017). A practical guide to sentiment analysis (Vol. 5). Cham: Springer International Publishing.

Method of Evaluation

- **Written exam** (theoretical aspects + exercises seen in class)
  - Max 24 points (6 open questions and exercises)
- **Group project**
  - Max 8 points to be added to the score obtained in the written exam
- **The maximum mark obtainable is 32**
  - Honors (Lode) are awarded from 31,5

Questions?