Overview and Challenges in The Digital Age

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Inquire     Inform     Influence

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Outline of the Presentation

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Introduction

- The Digital Age

The present time, in which many things are done by computer and large amounts of information are available because of computer technology (https://dictionary.cambridge.org/dictionary/english/digital-age).
Nowadays, the “digital age” is known as the “information age”, the time period starting in the 1970s with the introduction of the personal computer with subsequent technology introduced. This laid out the first step towards providing the ability to transfer information freely and quickly (https://timesinternational.net/the-digital-age/).
The ‘digital age’ (or information age) is “a time when large amounts of information are widely available to many people, largely through computer technology”. One definition that seems to capture the realities of the digital age came from TECHOPEDIA, which defines ‘The Digital Revolution’ as “the advancement of technology from analog electronic and mechanical devices to the digital technology available today. The era started during the 1980s and is ongoing. The Digital Revolution also marks the beginning of the Information Era” (Thomas, 2019).
Important Features of The Digital Age

- The Computer Technology
- The People
- An enormous amount of Information
Characteristics of The Digital Age

- **The Digitalization of Data**

  The digital age has changed how users consume data from physical to digital data stored in compact spaces like disks. Data from books and all other primary sources are converted to computer-manipulated forms for sharing and use.

- **Social Connectedness**

  The experience of belonging to a social community or network – a feeling of being supported and connected to others who provide value and meaning in your life. Social connectedness is proven to be a critically important social determinant of health. Our relationships with family, friends, neighbours, and others directly influence our health outcomes and well-being (Introduction to Social Connectedness: What Is It? - Visible Network Labs).
Characteristics of The Digital Age

- **Globalization**

  This age is characterized by making the world a global village. Today anything that happens in any corner of the world can be shared in real-time. This makes the world a small area in terms of information flow.

- **Privacy and data security issues**

  The digital data is more susceptible to misuse and violates user privacy. The age exposes users’ private information which can be spread at a very high speed.
Why The Digital Age?

- The "Digital Age", often known as the "Information Age", refers to a historical era and information technology-based economy originating in the twentieth century. It is marked by a rapid transition from the industrialized economy brought about by the Industrial Revolution to a knowledge-based economy.

- The "Digital Age" intersects with the "Internet Age", which describes the time since the public first had access to the Internet, as well as the fundamental changes it brought about in terms of information availability and worldwide communication.

They are not the same, however, as the "Digital Age" started earlier, before the development of the internet.

Source: Digital Age: Meaning, Society & Privacy | StudySmarter
The “digital divide” is a situation where society is divided into those who know how to use computers and those who do not. The information age has created a big gap between these two groups of people. Some people can afford computers and know how to use them while some cannot afford computers and do not even know how to use them.
Challenges Inherent in the Digital Age

- **Digital Divide**

  - **Digital divide**, describes the uneven distribution of information and communication technologies (ICTs) in society. The digital divide encompasses differences in:
    - both access (first-level digital divide) and usage (second-level digital divide) of computers and the Internet between:
      - industrialized and developing countries (global divide),
      - various socioeconomic groups within single nation-states (social divide),
      - and different kinds of users regarding their political engagement on the Internet (democratic divide).
Challenges Inherent in the Digital Age

- **Darkweb Market Places**
  - Deep web marketplaces are online marketplaces where people buy and sell illicit goods and services under the protection of the anonymity of the dark web. The popular Darkweb markets are:
    - Versus
    - TORREZ (Shut down 17 December 2021)
    - AlphaBay Market
    - Kingdom Market
    - TOR2DOOR
    - Silk Road (an anonymous Internet marketplace for illegal drugs such as heroin and cocaine, and criminal activities such as murder for hire, and arrested its alleged owner) (Flitter, 2013)
    - Genesis.
Challenges Inherent in the Digital Age

- Darkweb Market Places
  - White House Market (Shut down October 2021)
  - Cannazon (Shut down November 2021)
  - Assassination Market

- Russian-speaking Hydra Market: $1B turnover in 2020. It was also the largest narcotic market among the countries of the former USSR. $25M worth of Bitcoin was also seized when the German servers of Hydra Market were taken down in 2023.

- Azerbaijani Eagles: On a website called “Azerbaijani Eagles”, you can commission a murder for $5,000. The site Slayers Hitmen provides more options, with a beating going for $2,000. Death by torture costs $50,000 (Popper, 2020).
Challenges Inherent in the Digital Age

- Darkweb Market Places

The top seven goods and services on offer in 2021 are:

- Credit card numbers
- Zoom account credentials and meeting IDs
- Bank account and routing numbers
- Voter registration info
- Employee login credentials and other personally identifiable information
- “Fullz” datasets – complete profiles of information used to commit identity theft.

Source: 7 Things for Sale on the Dark Web Right Now (coretech.us)
Challenges Inherent in the Digital Age

- Darkweb Market Places
  - Other goods and services on offer in 2023 are:
    - drugs,
    - fake documents,
    - fraud-related items,
    - and hacking services and tools.

Source: The Top 10 Dark Web Marketplaces in 2022 | Webz.io
Challenges Inherent in the Digital Age

- Genesis Market

Genesis Market sold login details, IP addresses and other data that constituted the “fingerprints” of victims. Often for less than $1, the personal information allowed fraudsters to log into banking and shopping accounts. The Genesis Market had 80 million sets of credentials and fingerprints for sale, and the UK National Crime Agency called it “an enormous fraud facilitation tool”.

- It was a one-stop shop for logins that enabled online fraud. Users could buy login information, including passwords, and other parts of the victim’s “fingerprint,” such as browser history, cookies, data from autofill forms, IP address, and location. This allowed fraudsters to log into bank, email and shopping accounts, redirect deliveries and even change passwords without arousing suspicion.
Challenges Inherent in the Digital Age

Genesis Market

Among the login information for sale were passwords for Facebook, PayPal, Netflix, Amazon, eBay, Uber and Airbnb accounts. Criminals buying the information were even notified by Genesis if passwords changed. Genesis made available to its customers a specially crafted browser that used the stolen data to mimic the victim’s computer so that it appeared that the victim was accessing their account using their usual device at their usual location. Thus, the access did not trigger any security alerts.

Globally, 200 searches were carried out and 120 people were arrested. Law enforcement agencies from 17 countries were involved in the raids that began at dawn on 6 April 2023. The operation was led by the US Federal Bureau of Investigation (FBI) and the Dutch National Police and coordinated from Europol. New Zealand police were involved in the international operation to dismantle one of the biggest online criminal marketplaces (New Zealand police help shut down cybercrime site Genesis Market in international operation | RNZ News).
Challenges Inherent in the Digital Age

- What else is on the dark web? Job listings—lucrative ones, too.

Source: 7 Things for Sale on the Dark Web Right Now (coretech.co)
Challenges Inherent in the Digital Age

- Because of the range of goods and services found for sale and the conversations that occur around these sales, dark web marketplaces can be precious sources of data on criminal activity. As such, they are normally under intense scrutiny from law enforcement and security professionals alike (Top 5 Deep Web Black Markets – BRANDEFENSE).

- Has the law enforcement or security professionals in Papua New Guinea scrutinized the dark web marketplaces at different periods, and examined its implications for PNG national security?
Challenges Inherent in the Digital Age

- Rise in Weapons of Mass Destruction (WMD)

- A new “species” of emerging technologies — additive manufacturing, advanced robotics, artificial intelligence, and synthetic biology — is empowering smaller groups and individuals to acquire technologies that were previously beyond their reach. As a group of researchers with the World Economic Forum suggests, these technologies are contributing to a collapse of barriers between the digital and physical, and between the synthetic and organic (Countering WMD in the Digital Age: Breaking Down Bureaucratic Silos in a Brave New World (warontherocks.com)).
Challenges Inherent in the Digital Age

Self diagnosis and medication

People in different nations of the world are daily searching the web for drugs that can cure different ailments. This approach makes it challenging for doctors to deal with patients self-diagnosing themselves based on unreliable information from the Internet.

Information Overload

One of the main challenges in the digital age is that there is more information than our brains can process at the same time. Today almost anybody can be a publisher and disseminator of information regardless if it is correct or not. This leaves people with so much information to process. People can suffer from infobesity where there is much information that negatively affects the user (Advantages and disadvantages of the information age – Know Computing).
The Concept of 4IR

What is the fourth industrial revolution? | World Economic Forum (weforum.org)
The Concept of 4IR

**First industrial revolution**
The first industrial revolution, which took place at the end of the 18th century, was marked by mechanization made possible by steam and water power.

**Second industrial revolution**
The second industrial revolution, which occurred at the start of the 20th century, was aided by electricity and marked by mass production, the assembly line and divisions of labor.

**Third industrial revolution**
The third industrial revolution, which started in the 1970s, came through the use of computers to further automate machines and production processes.

**Fourth industrial revolution**
The fourth industrial revolution, currently in its infancy, is expected to result in the smart factory and a fully realized digital and interoperable ecosystem of machines and partners.

Source: What is Fourth Industrial Revolution? | Definition from TechTarget
# The Concept of 4IR

## Navigating the next industrial revolution

<table>
<thead>
<tr>
<th>Revolution</th>
<th>Year</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1784</td>
<td>Steam, water, mechanical production equipment</td>
</tr>
<tr>
<td>2</td>
<td>1870</td>
<td>Division of labour, electricity, mass production</td>
</tr>
<tr>
<td>3</td>
<td>1969</td>
<td>Electronics, IT, automated production</td>
</tr>
<tr>
<td>4</td>
<td>?</td>
<td>Cyber-physical systems</td>
</tr>
</tbody>
</table>

Source: *What is the fourth industrial revolution?* | World Economic Forum (weforum.org)
The Fourth Industrial Revolution 4IR

PricewaterhouseCoopers [PwC] (2022) describes the 4IR, also known as ‘Industry 4.0’ as the unfolding age of digitalization that unveils the transformation from digitally connected products and services humans consume to smart cities and factories advancements and increased common automation of tasks and services in human residences and work places. Ružarovský et al. (2021:2) identifies nine primary technological pillars that would power 4IR, these technologies are:

- Augmented Reality,
- System Integration,
- Cloud Computing,
- Big Data,
- Internet of Things,
- 3D Printing,
- Cyber Security,

3D printing, also known as additive manufacturing, is a method of creating a three dimensional object layer-by-layer using a computer created design (What is 3D Printing? - Technology Definition and Types - TWI (twi-global.com)).
The Fourth Industrial Revolution 4IR

- Autonomous Robots,
- Simulation.

Simply put, cloud computing is the delivery of computing services—including servers, storage, databases, networking, software, analytics, and intelligence—over the Internet ("the cloud") to offer faster innovation, flexible resources, and economies of scale (What Is Cloud Computing? A Beginner’s Guide | Microsoft Azure).

Big data is a term that describes large, hard-to-manage volumes of data—both structured and unstructured—that inundate businesses on a day-to-day basis. But it’s not just the type or amount of data that’s important, it is what organizations do with the data that matters. Big data can be analyzed for insights that improve decisions and give confidence for making strategic business moves (Big Data: What it is and why it matters | SAS).
Most nations automatically figure challenges that are inherent in the “Digital Age” into their calculations when they are planning the national security strategies. However, there are many types of information that can hurt the national economy that are easily obtained on the Dark Webs such as: government secrets; intelligence reports; trade secrets and formulas; research data; and security plans.

You must “digitalize” yourself to function in the “Digital Age”.

Conclusion


References
