INFORMATION SYSTEMS TODAY
Managing in the Digital World

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Our objective for this chapter

1 **understand the role of information systems**

as we continue to move further into the digital world

2 **contemporary societal issues of the digital world**

in current issues faced by societies in the digital world

3 **how increasing digital density is shaping the digital future**

in influencing the digital future

The Emergence of the Digital World

changes in technology lead to social changes and social changes shape technological changes.

the advent of powerful, relatively inexpensive, easy-to-use computers

Increasing global competitiveness has forced companies to find ways to be better and to do things less expensively

advances in cloud computing (Gmail, Office 365, or Dropbox)

allow for accessing emails, files, notes, and the like from different devices, further enhancing portability and mobility.

we are now living in the post-PC era

in the past, people were bound to a stationary PC to do essential tasks, they are not bound to any particular location any more.

the increasing fixation on being permanently "on call"

the boundaries between work and leisure time are blurring,

Information Systems Today

Today, information systems (IS) are ubiquitous: Be it traditional desktop computers, laptop computers, smartphones, tablets, you name it, information systems are all around us, whether you see them or not.


Companies such as _FedEx and UPS_ use information systems **to route trucks and track packages**. Retailers such as _Walgreens and Walmart_ use information systems for everything from **optimizing supply chains to recording purchases and analyzing customer tastes and preferences**. _Cities_ use information systems for **adaptive traffic control systems or variable speed limits**. _Cars_ use information systems for everything from **ignition control to airbags to distance control and park assist systems**

Views of innovation are shifting away from traditional stereotypes

Open innovation is a new approach. Instead of relying on tightly controlled internal research projects, companies are opening up their research and development efforts to a broad audience.
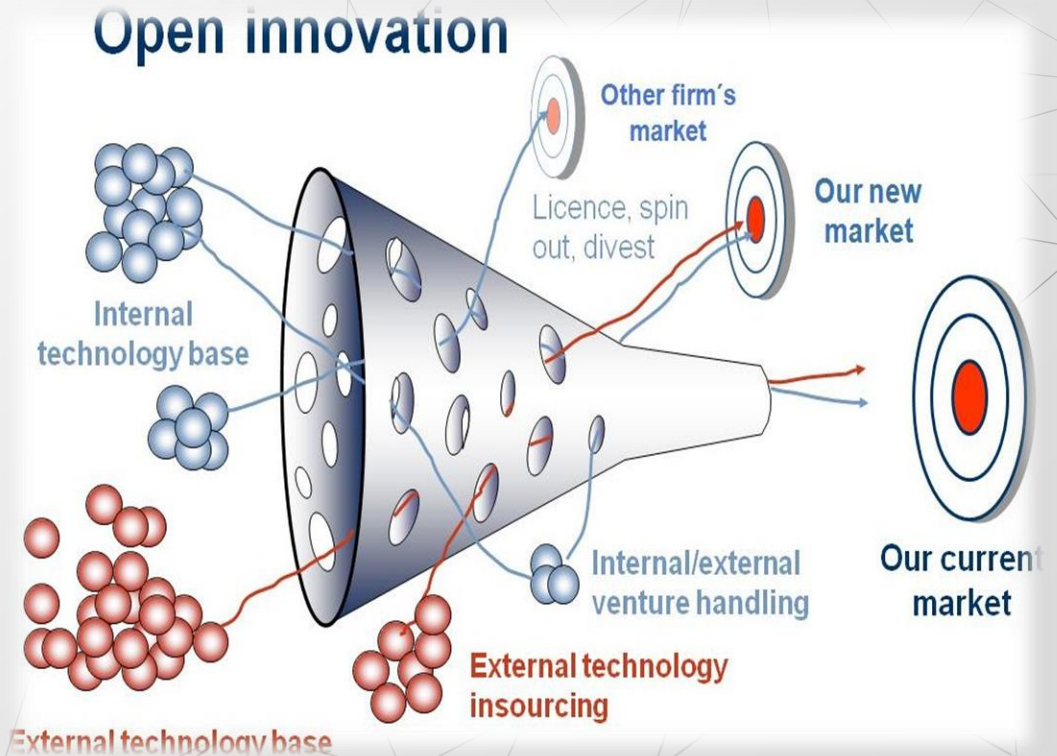
KNOWLEDGE WORKERS AND THE KNOWLEDGE SOCIETY

Peter Drucker 60 years ago, coined the term knowledge worker

Knowledge workers

professionals who are relatively well educated and who *create*, *modify*, and/or *synthesize* knowledge as a fundamental part of their jobs.

Knowledge society

with the *growth in the number of knowledge workers* and with their rise in importance and leadership, *a knowledge society would emerge*

education would become the *cornerstone of the knowledge society.* Possessing knowledge, he argued, would be as important as possessing land, labor, or capital (if not more so)

Drucker's term knowledge worker, there are many alternatives to the term knowledge society

01

The new economy

02

The digital society

03

The network era

**04**

The internet era

05

The digital world

THE DIGITAL DIVIDE

in the informational society, the fuel, the power, is knowledge,"

the strong linkage between computer literacy and a person's ability to compete in the digital world.

In developing countries the gap gets even wider and the obstacles get much more difficult to overcome, particularly in the developing countries where infrastructure and financial resources are lacking.
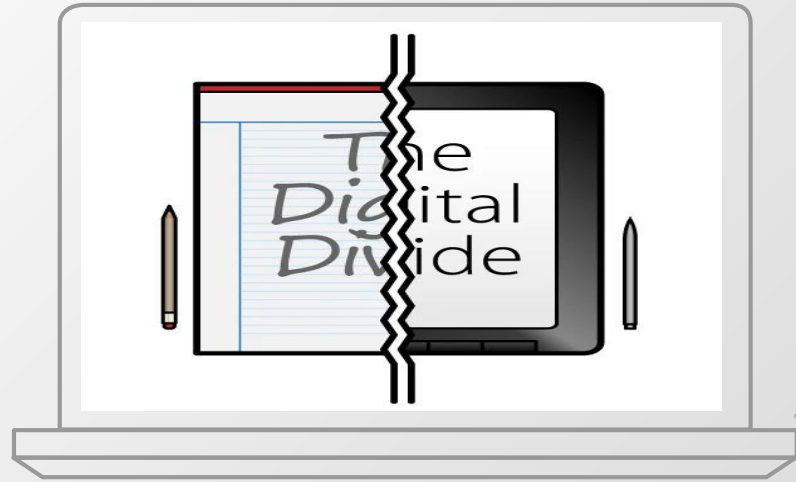
Globalization and Societal Issues in the Digital World

the integration of economies throughout the world, enabled by innovation and technological progress

the greater international movement	of commodities, money, information and labor
to facilitate this movement.	the development of technologies, standards, and processes
opened up many opportunities	globalization has moved cultures closer together
Development	a shared understanding about norms of behavior, desirable goods or services
cost reduction	decrease in communication costs has increased the use of _outsourcing_
face governmental challenges	related to differences in political systems, regulatory environments, laws, standards, or individual freedoms, Likewise, geo-economic challenges include differences in infrastructure, demographics, welfare, or workers' expertise. Lastly, organizations face cultural challenges

SOCIETAL ISSUES IN THE DIGITAL WORLD

Demographic changes

factors such as age, birth rates, and migration

Urbanization

the movement of rural populations to urban areas

The global shifts in economic power
changes in countries' purchasing power and control over natural resources

Digital Density and the Digital Future

The amount of connected data per unit of activity

Radical innovations marginalizing or displacing existing products or industries. Increasing digital density enables new value-added interactions and business models

THE DRIVERS OF DIGITAL DENSITY

connections and data, the essential drivers of digital density

Mobile devices — 01

mobile devices are frequently
seen leapfrogging traditional PCs

02 — **Mobile apps**

software programs designed to perform
a particular, well-defined function

**The Internet of Things
(IOT)** — 03

A key factor in increasing digital
density

IOT
The Internet of Things

a network of *a broad range of physical objects* that can *automatically share data over the internet*—is a key factor in increasing digital density
Such objects (or "things") can *range from an automobile tire* equipped with a pressure sensor to a smart meter enabling remote monitoring of energy consumption to *a cow with an injectable ID chip*.
Fueled by advances in chips and *wireless radios* and decreasing costs of sensors (*devices that can detect, record, and report changes in the physical environment*), in the not-too-distant future everything that can generate useful information will be equipped with sensors and wireless radios to connect to other devices or the cloud.

Example of IOT

1. Smart home technologies
sometimes called home automation

technologies enabling the _remote monitoring_ and controlling of lighting, heating, or home appliances. is expected to reach almost US$140 billion by 2023

2. Wearable technologies

clothing or accessories that incorporate electronic technologies, such as the Apple Watch_, sensors record physiological data_ such as body movements or heart rate but also environmental data such as ambient light, orientation, or altitude.

3. Industrial Internet of Things (IIOT)

_improvements in efficienc_y, _product quality_, _agility_, and _flexibility_, allowing companies to mass produce _customized products_, _better monitor supply chains_, and so on. In sum, the applications of sensor technology for home automation, smart cities, smart metering, _smart farming_, e-health, manufacturing, and other areas are almost limitless. As the number of sensors and devices connected to the internet grows, the Internet of Things will evolve to become _the Internet of Everything (IOE)_.

Big Data

The ability to connect elements of the physical to the digital world has generated tremendous amounts of Big Data
Big Data is typically described as _extremely large_ and _complex_ datasets, which are characterized as being of _high volume_, _variety_ (i.e., many different types of data), and _velocity_ (i.e., the data are being collected and analyzed at ever-increasing rates). _Following the old adage that information is power_
cloud computing can enable _advanced analytics of massive amounts of Big Data_ generated by mobile devices, sensors, or users of social networks. Continuous input from various sensors, paired with _artificial intelligence_ to make sense of such Big Data streams, enables _advances in robotics_ (i.e., the use of robots to perform manual tasks).

THE API ECONOMY
(application programming interfaces)

Together, the use of APIs enables companies to focus on what they do best, while drawing on services and functionalities offered by others.

intermediaries that provide ways for different components of software to interact and exchange data or functionality using common web communication protocols. _Uber_ built almost their entire app around APIs provided by other companies (further, it would have been close to impossible to develop functionality that matches Google's mapping services)

Think of an API just like a power socket in your home or apartment. The power socket is an interface that allows you to receive services (electricity) from a service provider (the electric utility); the power socket has a standardized format in terms of the input (i.e., the plug format) and output (the voltage and frequency). As a service user, you do not need to know how the electricity is produced or how it is delivered to you so that you can charge your smartphone.

Information Systems Defined

An **information system (IS)** is the combination of *people* and *information technology* that create, collect, process, store, and distribute useful data. **Information technology (IT)** includes *hardware*, *software*, and *telecommunications networks.* the difference is shrinking, with many using the terms IS and IT synonymously

various terms to describe the field of information systems, such as *management information systems*, *business information systems*, *computer information systems*, and simply *systems*

DATA —— 01

Data have no meaning in and of themselves and are of little value until processed

02 —— **INFORMATION**

Data can be formatted, organized, or processed to make them useful; they are transformed into information, which can be defined as a representation of reality, and can help to answer questions about who, what, where, and when

KNOWLEDGE —— 03

the ability to understand information, form opinions, and make decisions or predictions based on the information.

Data: The Root and Purpose of Information Systems

CAREERS IN INFORMATION SYSTEMS

01

systems analysts

a person who **uses analysis and design techniques to solve business problems using information technology**

02

installs, customizes, and maintains the operating system, and also installs or upgrades products that run on the system

systems programmers

03

network administrators

responsible for the day-to-day operation of these networks. They organize, install, and support an organization's computer systems

04

Analyze their organization's computer needs and recommend possible upgrades for top executives to consider

systems managers

05

chief information officers

oversees the people, processes and technologies within a company's IT organization to ensure they deliver outcomes that support the goals of the business. 80,000–147,000 Salary Range, in US$

WHAT MAKES (IS) PERSONNEL SO VALUABLE?

good IS personnel possess valuable, integrated knowledge and skills in three areas—_technical_, _business_, and _systems._ Technical Competency The technical competency area includes knowledge and skills in _**hardware**_, _**software**_, _**networking**_, and _**security.**_

Hardware	Hardware platforms, infrastructure, cloud computing, virtualization, peripherals, mobile devices
Software	Operating systems, application software, non-relational databases, AI and machine learning, mobile apps, APIs
Networking	Network administration, wireless networks, 5G, internet security
Business Knowledge and Skills	Business processes, functional areas of businesses and their integration, industry characteristics
Systems Knowledge and Skills	Connectivity, compatibility, integrating subsystems and systems

WHEN THINGS GO WRONG?
Technology Addiction

In 2018, online gaming was designated by health experts as a real, diagnosable addiction. Average adults spent more than 11 hours consuming media each day, 50 percent of 18- to 24-year-olds checked their phone within 5 minutes of waking up, and a third of 25- to 34-year-olds visited social media sites or used mobile apps more than 10 times a day

In fact, recent studies have revealed that the average human attention span has fallen from 12 seconds at the turn of this century to a mere 8 seconds— less than that of a goldfish.

IS Ethics

A broad range of ethical issues has emerged through the use and proliferation of computers.

many people fear negative impacts such as
social decay, _increased consumerism_, or _loss of privacy_.
Computer ethics is used to describe moral issues and
standards of conduct as they pertain to the use of information
systems.

what information an individual should have to reveal to others in
the workplace or through online transactions, ensuring the
authenticity and fidelity of information, who owns information
about individuals and how that information can be sold and
exchanged, and what information a person or organization has
the right to obtain about others and how this information can be
accessed and used.
privacy concerns also issues related _to intellectual property_.

INFORMATION
ETHICS
RECONSIDERATION

A Definition

- Ethics: The discipline
dealing with what is good
or bad and with moral
duty and obligation.

– Merriam-Webster's Collegiate Dictionary, 11ᵗʰ edition

Conclusion

Today, we live in a <u>knowledge society</u>, and <u>information systems</u> have become pervasive throughout our organizational and personal lives. At the same time, we have seen economic, cultural, and technological <u>changes brought about by globalization</u>, and societies face a number of challenges, including demographic changes, rapid urbanization, shifts in global economic power, resource scarcity, and climate change. The possibility <u>to connect physical objects to the digital world</u> has enabled the collection of ever more data; this <u>increasing digital density</u> enables novel interactions and business models, often fueled by the rise of APIs. Being successful in many careers today <u>requires that people be computer literate</u> because the ability to access and effectively operate computing technology is a key part of many careers.

Now this is not the end. It is not even the beginning of the end. But it is, perhaps, the end of the beginning.

(Winston Churchill)

izquotes.com

THANKS . . .