Topic 4
IT Applications, Societal and Ethical Considerations
Lec 7

Outline

- IT Application Domains:
  - Education and E-learning
  - Medical and healthcare
  - Agriculture
  - E-Business and E-Commerce
  - Manufacturing
  - Law enforcement
  - E-government
  - Entertainment
- Impact on environment & other ecological considerations
- Information and Knowledge economy.
- Information Technology ethics

Manufacturing

ICT in Manufacturing

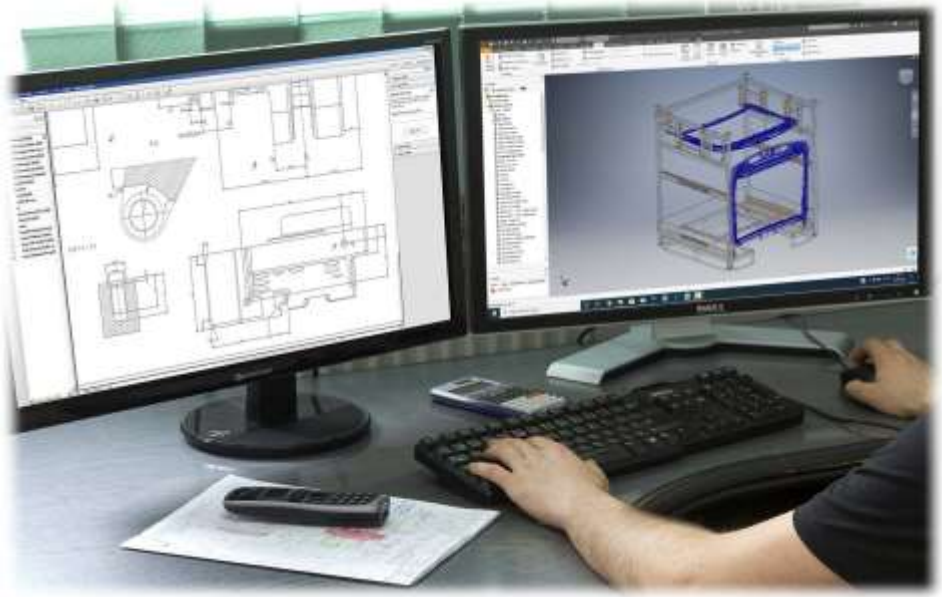
- In modern design and **manufacturing**, **ICT** is a useful support tool because it can **make design and manufacturing more robust, effective and efficient by using computer-based system, such as virtual system and computer simulation**.
- **ICT** can also reduce costs, increase productivity and improve the base for strategic decision-making and risk management.

Computer Aided Manufacturing (CAM)

- **Computer-aided manufacturing (CAM) : is a computer-based technique that is used to plan, manage, and control the manufacturing process such as fabrication and assembly. التصنيع والتجميع**
- Industries use CAM to reduce product development costs, shorten a product's time to market, and stay ahead of the competition.
- CAM is used by a variety of industries, **including oil drilling, power generation, food production, and automobile manufacturing**.
- Often, **robots carry out processes in a CAM environment**.
- Automobile plants have an entire line of industrial robots that assemble a car.

Computer Aided Design (CAD)

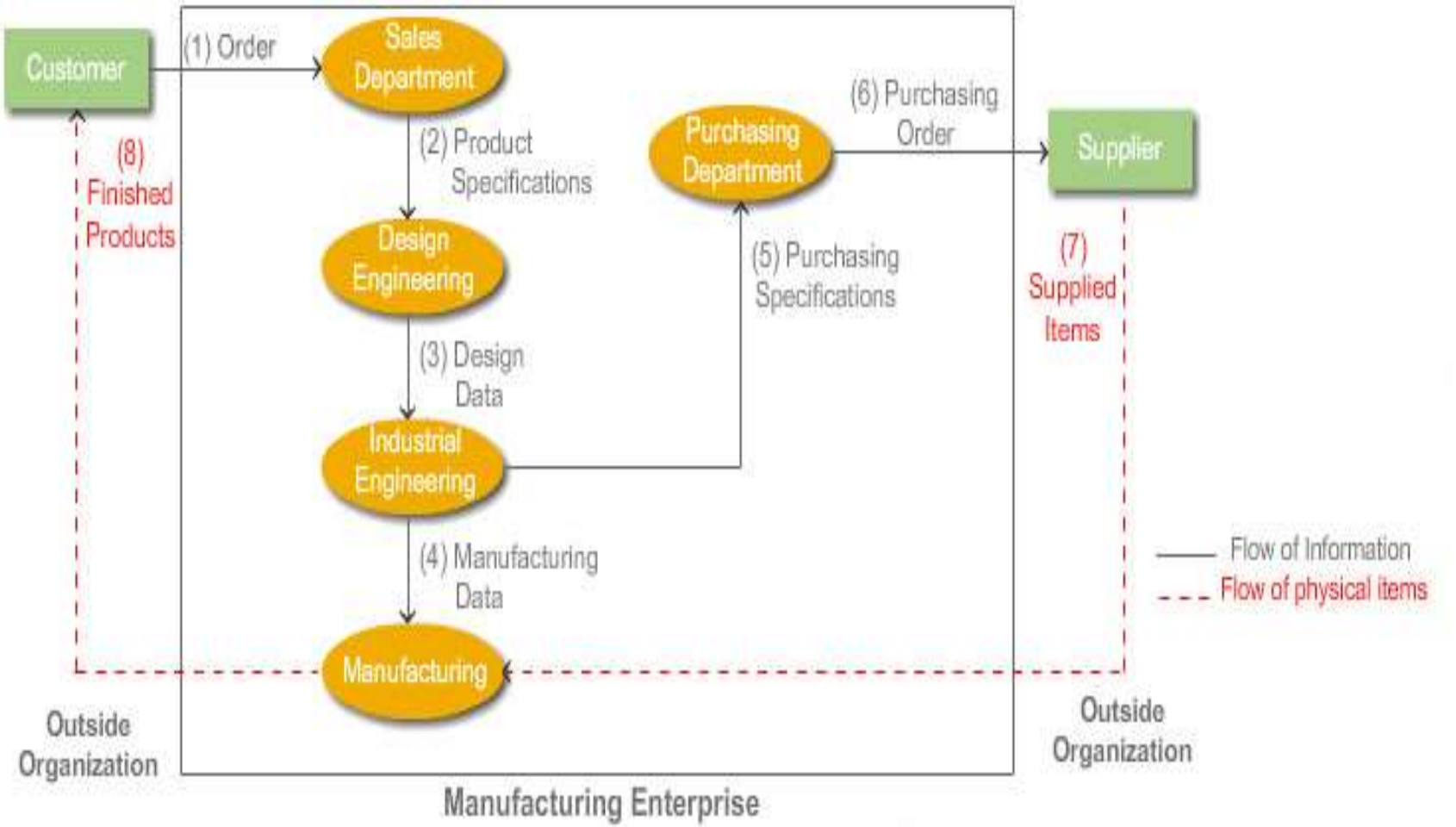
- **CAD** is defined as : **the use of Computer software to help (Aid) the designer in the Design process (creation, modification, analysis, or optimization)**
- CAD uses **different algorithms together with computer graphics and visualization techniques in the design** process for automotive, aerospace, electronic, textile, food, and all other industries.
- 3D graphics packages are important tools that **help designers to form a more realistic idea about the designed products**.



Computer Integrated Manufacturing (CIM)

- **Computer-integrated manufacturing (CIM)** : **is a system that relies on IT to automate and manage the entire manufacturing process directly**.
- This is a procedure in which all phases of production are controlled in an integrated manner by computers, it reduces design time, increase machine utilization, shorten the manufacturing cycle, cut inventories, and increase product quality.
- This integration **allows individual processes to exchange information with each part**. It integrates not only local units in the manufacturing enterprise, but also other units outside it like customers and suppliers.

Computer Integrated Manufacturing (CIM)



A simple illustration of Computer Integrated Manufacturing System

Law-enforcement

Introduction

- ICTs can **play a pivotal role in transforming the police** force from being an oppressive agency of the government to an agency which first and foremost exists to protect the lives and liberty of the common citizens.
- ICT play a huge role in **crime detection and the information it** provides must be accurate and easily available.
- **Video and CCTV camera** are an **essential component and tool in ICT usage to combat and prevent crime**.

Applications of ICT in Law enforcement

- **In law enforcement**, police officers need to know how to use computers while on patrol or at their desks to check out stolen cars, criminal records, outstanding arrest warrants, and the like.
- However, investigators with specialized computer backgrounds are also required to help solve fraud, computer break-ins, accounting illegalities, and other high-tech crimes.

E-government

E-Governance and E-Government

- **E-Governance : refers to the development and enforcement of the policies, laws and regulations necessary to support the functioning of governmental units**

- **E-Government : refers to the use of information technologies by government agencies .**

Introduction

- Governments apply ICT to provide better service for the citizens and businesses to complete the e-government strategies, eliminate existing bureaucracy and therefore achieve significant economic and operational efficiencies.
- The internet is a convenient and cost-saving channel for governments delivering information and providing online transactions.

Functions of E-Government

The e-government definition incorporates **four key dimensions**, which reflect the functions of government itself:

- **E-services: the electronic delivery of government information, programs, and services over the Internet**
- **E-democracy / E-participation: the use of electronic communications to increase citizen participation in the public decision-making process**
- **E-commerce: such as citizens paying taxes and utility bills, renewing vehicle registrations, or government buying supplies and auctioning surplus equipment**
- **E-management / E-administration: the use of information technology to improve the management of government, from streamlining business processes to maintaining electronic records.**

E-Governance Applications

- E-governance is the application of information and communication technology (ICT) for :
  - **Delivering government services,**
  - **Exchange of information,**
  - **Communication transactions,**
  - Integration of various stand-alone systems and services between:
    - **Government-to-citizen (G2C),**
    - **Government-to-business (G2B),**
    - **Government-to-government (G2G),**
    - **Government-to-employees (G2E)**
  - As well as back office processes and interactions within the entire government framework.

Government–to–citizen (G2C)

- The goal of government-to-citizen (G2C) e-governance is **to offer a variety of ICT services to citizens in an efficient and economical manner, and to strengthen the relationship between government and citizens using technology**.

Government–to–citizen (G2C)

- There are several methods of government-to-customer e-governance.
  - Two-way communication allows citizens to instant message directly with public administrators, and cast remote electronic votes (electronic voting) and instant opinion voting.
  - **Transactions** such as **payment of services**, such as utilities, can be completed **online or over the phone**.
  - **Mundane services** such as name or address changes, applying for services or grants, or transferring existing services are more convenient and no longer have to be completed face to face.

Government–to–employees (G2E)

- **Government-to-employees (G2E)** : **is the online interactions through instantaneous communication tools between government units and their employees**.
- E-governance makes it possible for employees to become paperless and to send important documents electronically back and forth to their colleagues.

Benefits of Government–to–employees (G2E)

- **E-payroll** : **online sources to view paychecks and keep records for tax information**.
- **E-benefits** : **be able to look up what benefits an employee is receiving and others they have a right to**.
- **E-training** : **allows for new and current employees to regularly maintain the training they have through the development of new technology**.
- **E-learning** : **It is usually a computer-based learning tool to keep employees informed on the important materials they need to know through the use of visuals, animation, videos, etc**.
- Maintaining records of personal information in one easy location to be easily updated. Examples social security numbers, tax information, current address, and other information.

Government-to-Government (G2G)

- **Government-to-Government G2G)** : **is the online non-commercial interaction between Government organizations, departments, and authorities and other Government organizations, departments, and authorities**.

Government-to-Government (G2G)

Objective

- Its strategic objective is to support and simplify governance for government, citizens and businesses. The use of ICT can connect all parties and support processes and activities.
- Other objectives are to make government administration more transparent, speedy and accountable, while addressing the society's needs and expectations through efficient public services and effective interaction between the people, businesses and government.

Government-to-Business (G2B)

- **Government-to-Business (G2B)** : **is the online non-commercial interaction between local and central government and the commercial business sector with the purpose of providing businesses information and advice on e-business 'best practices'.**

Government-to-Business (G2B)

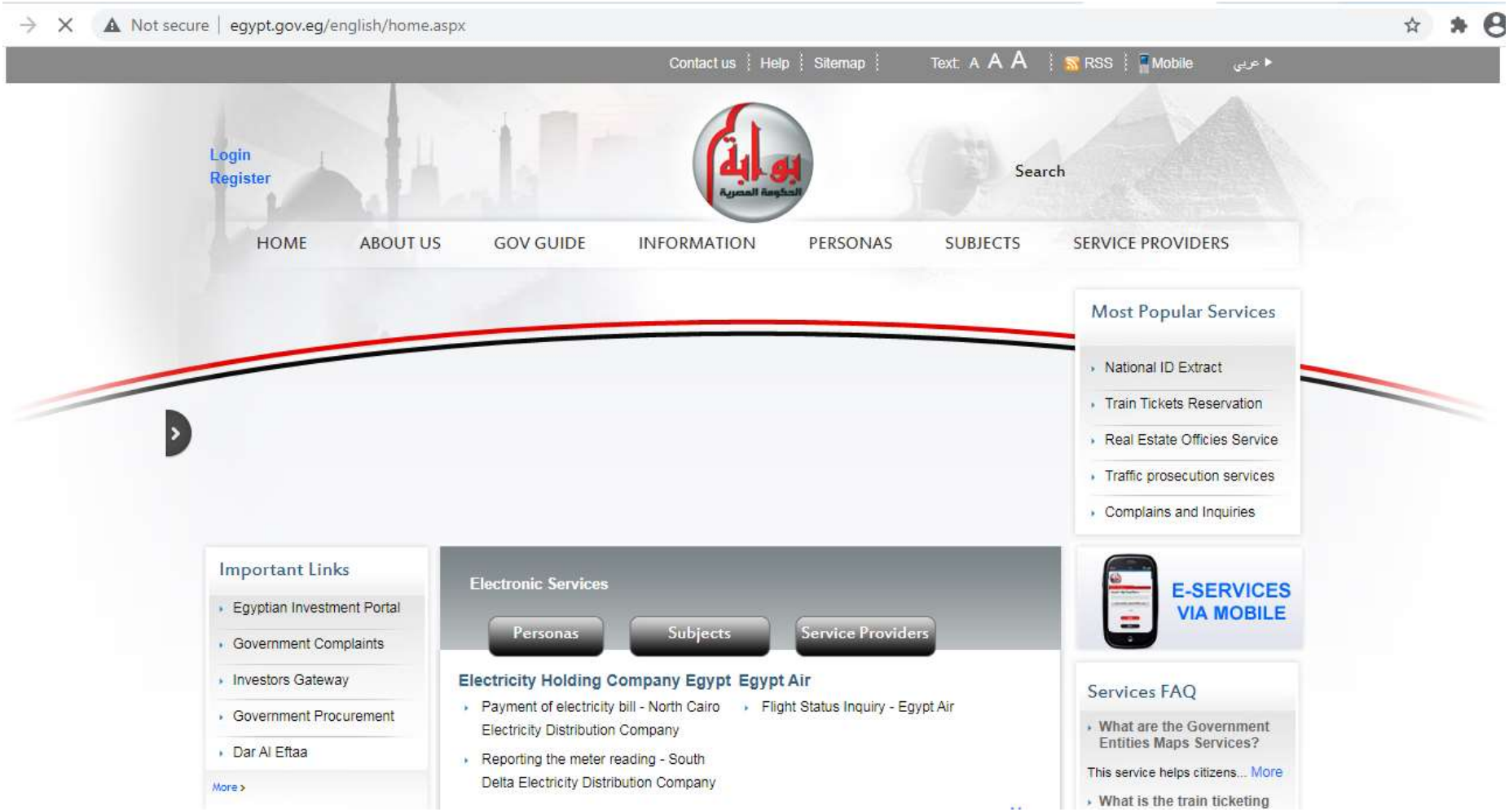
- **G2B**: **Refers to the conduction through the Internet between government agencies and trading companies**.
  - The objective of G2B is to reduce difficulties for business, provide immediate information and enable digital communication by e-business.
  - Government services are concentrated to the following groups: human services; community services; judicial services; transport services; land resources; business services; financial services and other.
- **B2G**: **Professional transactions between the company and governmental regulatory agencies**.
  - **B2G usually include recommendations to complete the measurement and evaluation of books and contracts.**

Government–to–Business (G2B)

Benefits for Business

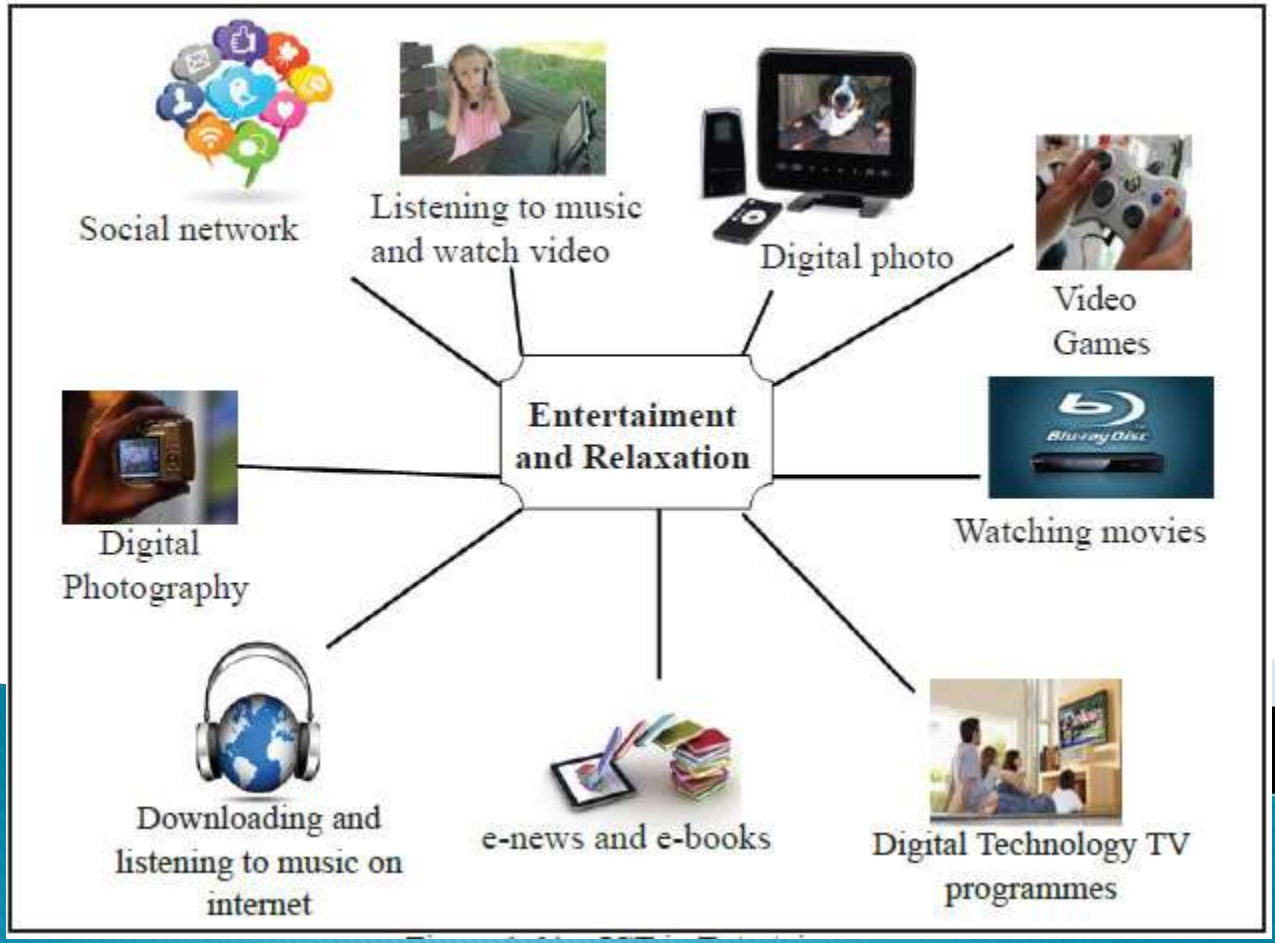
- E-government reduces costs and lowers the barrier of allowing companies to interact with the government, this reduces the time required for businesses to conduct a transaction.
- E-Government provides a greater amount of instant and clear information needed by businesses.
- The government collected a lot of economic, demographic and other trends in the data. This makes the data more accessible to companies which may increase the chance of economic prosperity, through better planning and forecasting.
- E-Government provide an intuitive site organization with a wealth of useful applications for government regulations.

E-Government in Egypt



Example : http://www.egypt.gov.eg/english/home.aspx

Entertainment



Introduction

- ICT provides a variety of entertainment and leisure activities that can be accessed easily from the comfort of one's home.
- One can watch movies and listen to music directly from the Internet.
- ICT also supports playing games over the Internet during leisure time.
- Entertainment material can be stored using ICT products like compact discs and memory cards for future use.
- ICT has improved the quality of entertainment and leisure activities by developing better graphics for music and movies.

Application of ICT in Music

Improved production

- Electronic music instruments are increasingly dominating music production and performances. The studio itself has evolved from being analogue to digital based.

Easier Promotion

- The emergence of the internet has made it easy to transform any good musician into a worldwide superstar.

Better distribution

- The internet helped musicians to distribute their music world-wide. E.g. iTunes.

Application of ICT in Movies

- Today, new, lighter cameras have allowed for clearer images, and shots never thought possible.
- With the incorporation of the cloud, editing films has become easier. Teams from across the globe can work on a film together from anywhere.
- And for audiences, on-demand, streaming services, and TV have allowed viewers to watch their favorite movies whenever, and wherever, they want.
- Technology has taken the film industry from silent, black-and-white films to high-definition movies that are capable of making the audience feel as if they are there.

Application of ICT in Movies

Computer-Generated Imagery (CGI)

- Computer-generated imagery : means **computer graphics being applied into movie industry to create special effects**. It was a science fiction that incorporate both robots and humans. It was used in creating films like 'Star Wars'.

Animation

- **Computer animation** : **means creating moving objects by using programs or software designed for computers**.
- Two dimensional (2D) animations, are figures created and edited using **two dimensional bitmap graphics** or two dimensional vector graphics. **'Toy Story' was the first fully computer-generated animated film**.

Application of ICT in Games

- **[1980s]**
  - Home computers appeared with built in games and floppy disks enabled games to be portable.
  - As the internet become more available, dial up bulletin board systems were used for online game playing.
  - Handheld LCD games, especially Nintendo, spurred dozens of other portable games.
  - Board game manufacturers developed their board game creations into video and computer editions.
- **[2000-2011]** Mobile gaming technology booms with the introduction of mobile game apps.
- **[2012-2016]** VR becomes a popular topic and develops rapidly due to advancements in computer, graphics, video and camera technology.

Application of ICT in Games

Facial Recognition التعرف علي الوجه

- **3D scanning and facial recognition technology allows systems to actually create your avatar, or to inventively transfer your own expressions to other digital creations.**

Amazing Graphics

- Now gamers can experience games in fully rendered worlds with photo realistic textures. The ability to increase playability with higher image quality makes it seem like you're right inside the game.

Thank You