UTM
UNIVERSITI TEKNOLOGI MALAYSIA

School of Computing
Faculty of Engineering

TECHNOLOGY AND INFORMATION SYSTEM

SECP1513 – SECTION 8

COMPUTER NETWROK & SECURITY (SECR)

INDUSTRIAL VISIT

CICT GALLERIUM

PERPUSTAKAAN SULTANAH ZANARIAH (PSZ) UTM

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1. INTRODUCTION

The Technology and Information System class has visited the Gallerium of UTM. Gallerium of UTM is a place that stores UTM's valuable history. We can find antique technology that was used by UTM in the early days. From the IBM Personal Computer 300GL that was used for about 10 years. We also discover history of the UTM Library. UTM Library in its early days still use cabinets that was filled with catalogues to find a certain books, material, or reference. There is also early convocation robe that is displayed in the UTM Gallerium. To sum up, UTM Gallerium is a place where the memories of the early days of the UTM and UTM Gallerium are stored.

We began the visit by short explanation of the basic Information Technology devices, from a personal computer to a mainframe. After that, the guide introduced us to some of the old devices, for example the Mainframe tape subsystem (Model: IBM 9309) that was used as a "back-up" for mainframe system and information database of staff and students as well as other University's information system during the year 1987 until 1995. And there is also a movie camera – Panasonic M 9000, which was used for library media service to record the Library's Programmes or Activities during the early 1990s until early 2000s. After a brief explanation of the old devices, the guide continued to explain about the early days of the UTM Library. The Library in its early days use cabinets to store information about books and reference materials. They also store many geographical maps and graphics reference that students can use a reference material. After that we were given the freedom to explore the Gallerium by ourselves. We discover a lot of devices that was used by the UTM in the early days. And there is also first convocation heritage. Like the first convocation book and the chair that was used by the higher counsellor.

Picture 1 : Briefing by Encik Zahari

2. COMPONENTS

COMPUTER

A computer is an electronic device that manipulate the information or data. Modern computers have the ability to follow generalized sets of operations, called programs. These programs enable computers to perform an extremely wide range of tasks. There are different types of computers such as mainframe computer, supercomputer and so on. From the visit, we had the chances to see a lot of "old-fashioned" computer models. The computers that on display was used in UTM in early 80s to 90s. And these computers also have different characteristics to carry out some specific functions. For example, the IBM Personal Computer 300GL being an all-inclusive and affordable computer, helped increased the productivity and reduced the cost of ownership of UTM Library. The transformation of system is taking place constantly in the Library. Apparently, technological revolution of computer usage coincides with system change and this was evident with the application of Dynix system for 10 years.

Picture 1 : Model of computer

Picture 1.1 : IBM Personal Computer 300GL

MAINFRAME

Mainframes first appeared in the early 1940s. The most popular vendors included IBM, Hitachi and Amdahl. Some recently considered mainframes as an obsolete technology with no real remaining use. Yet today, as in every decade since its inception, mainframe computers and the mainframe style of computing dominate the landscape of large-scale business computing. Mainframe computers now play a central role in the daily operations of many of the world's largest Fortune 1000 companies. Though other forms of computing are used extensively in various business capacities, the mainframe occupies a coveted place in today's e-business environment. In banking, finance, health care, insurance, public utilities, government, and a host of other public and private enterprises, the mainframe computer continues to form the foundation of modern business.

The main difference between mainframes and supercomputers is their typical application domain – mainframes excel in reliable volume computing in domains requiring integer operations (e.g, financial, indexing, comparisons, etc). Supercomputers are design to excel in their ability to perform floating point operations – addition, subtraction, and multiplication with enough digits of precision to model continuous phenomena such as weather. Despite the continual change in IT, mainframe computers considered by many to be the most stable, secure, and compatible of all computing platforms. The latest models can handle the most advanced and demanding customer workloads, yet continue to run applications that were written in earlier decades. For those who think there is no use for the 'big iron' now, they would really be surprised. The truth is that we are all mainframe users in one way or another.

For example, the Mainframe Tape Subsystem was used as a 'back up' for mainframe system and information database of staff and students as well as other University's information system during the year 1987 until 1995. This model used a square shape tape after the round shape tape was no longer in use.

Picture 2 : Mainframe tape subsystem (Model : IBM 9309)

CPU

CPU (pronounced as separate letters) is the abbreviation for central processing unit. Sometimes referred to simply as the central processor, but more commonly called a processor, the CPU is the brains of the computer where most calculations take place. In terms of computing power, the CPU is the most important element of a computer system. On large machines, the CPU requires one or more printed circuit boards. On personal computers and small workstations, it is housed in a single chip called a microprocessor. Since the 1970's the microprocessor class of CPUs has almost completely overtaken all other CPU implementations.The CPU itself is an internal component of the computer. Modern CPUs are small and square and contain multiple metallic connectors or pins on the underside. The CPU is inserted directly into a CPU socket, pin side down, on the motherboard.Each motherboard will support only a specific type (or range) of CPU, so you must check the motherboard manufacturer's specifications before attempting to replace or upgrade a CPU in your computer.

MOVIE CAMERA

The movie camera, film camera or cine-camera is a type of photographic camera which takes a rapid sequence of photographs on an image sensor or on a film. In contrast to a still ccamera, which captures a single snapshot at a time, the movie camera takes a series of images; each image constitutes a "frame". This is accomplished through an intermittent mechanism. The frames are later played back in a movie projector at a specific speed, called the frame rate (number of frames per second). While viewing at a particular frame rate, a person's eyes and brain merge the separate pictures to create the illusion of motion.

Most of the optical and mechanical elements of a movie camera are also present in the movie projector. The requirements for film tensioning, take-up, intermittent motion, loops, and rack positioning are almost identical. The camera will not have an illumination source and will maintain its film stock in a light-tight enclosure. A camera will also have exposure control via an iris aperture located on the lens. The righthand side of the camera is often referred to by camera assitants as "the dumb side" because it usually lacks indicators or readouts and access to the film threading, as well as lens markings on many lens models. Later equipment often had done much to minimize these shortcomings, although access to the film movement block by both sides is precluded by basic motor and electronic design necessities. Advent of digital cameras in reduced the above mechanism to a minimum removing much of the shortcomings. In example, the movie camera - Panasonic M 9000 this movie camera was used for library media service to record Library programmes/activities during the 1990s until early 2000s.

Picture 3 : movie camera - Panasonic M 9000

PRINTER

The history of computer printers began in 1938 when Seattle inventor Chester Carlson (1906–1968) invented a dry printing process called electrophotography—commonly called a Xerox— which was to be the foundation technology for decades of laser printers to come. According to IBM, "the very first IBM 3800 was installed in the central accounting office at F. W. Woolworth's North American data center in Milwaukee, Wisconsin in 1976." The IBM 3800 Printing System was the industry's first high-speed, laser printer. It was a laser printer that operated at speeds of more than 100 impressions-per-minute. It was the first printer to combine laser technology and electrophotography. In 1976, the inkjet printer was invented, but it took until 1988 for the inkjet to become a home consumer item with Hewlett-Packard's release of the DeskJet inkjet printer, priced at a whopping $1000. In 1992, Hewlett-Packard

released the popular LaserJet 4, the first 600 by 600 dots per inch resolution laser printer.

The IBM 4245 is a line printer. The Printer Output Unit for the 4245 Models 012 and 020 attaches to the 370 channel interface (byte multiplexer, block multiplexer, or selector channel) for attachment to 4361, 4381, 308X, 3090, S/38 (5381 and 5382) and 9370 processors. Request an RPQ for channel attachment of the 4341. The 4245 Models D12 and D20 attach to the 3174 and 3274 Models 41 and 61 controllers, the 9370 Workstation Controller, and 4361 processor Workstation Adapter and Display/Printer Adapter. The Models T12 and T20 attach via the Twinax interface to AS/400, S/36, S/38, and S/88. Print speed is 1,200 lines per minute (lpm) for Models 012, D12, and T12 with a standard 48-character set printband. Models 020, D20, and T20 are 2,000 lpm with a standard 48-character set printband.

For example, the impact printer or Dot Matrix Printer is a printing machine used in UTM during the 1990s until 2011. It was used to print the data information of students and staff to meet the University's requirements. This printer was also capable of printing in high volumes and non-stop for 48 hours.

Picture 4 : Impact Printer (Model : IBM (4245))

RADIO

Radio waves were first identified and studied by German physicist Heinrich Hertz in 1886. The first practical radio transmitters and receivers were developed around 1895-6 by Italian Guglielmo Marconi, and radio began to be used commercially around 1900. adio waves are radiated by electric changes undergoing acceleration. They are generated artificially by time varying electric currents, consisting of electrons flowing back and forth in a metal conductor called an antenna. In transmission, a transmitter generates an alternating current of radio frenquency which is applied to an antenna. The antenna radiates the power in the current as radio waves. When the waves strike the antenna of a radio receiver they push the electrons in the metal back and forth, inducing a tiny alternating current. The radio receiver connected to the receiving antenna detects this oscillating current and amplifies it.

As they travel farther from the transmitting antenna, radio waves spread out so their signal strength (intensity in watts per square meter) decreases, so radio transmissions can only be received within a limited range of the transmitter, the distance depending on the transmitter power, antenna radition pattern, receiver sensitivity, noise level, and presence of obstructions between transmitter and receiver. An omnidirectional antenna transmits or receives radio waves in all directions, while a directional antenna or high gain antenna transmits radio waves in a beam in a particular direction, or receives waves from only one direction.

Radio waves travel through a vacuum at the speed of light, and in air at very close to the speed of light, so the wavelength of a radio wave, the distance in meters between adjacent crests of the wave, is inversely proportional to its frequency.

For example, Pye model-Cambridge, England' radio which was produced in the 1950s was used during the 1960s until 1970s in Technical Collage, Kuala Lumpur. It

was used as one the medium of information dissemination and with the purpose of supporting the learning and teaching activities.

Picture 5 : Pye Model-Cambridge, England' Radio

3. REFLECTION

The world has developed and evolved, becoming a place where technology can spread widely. In this modern world, we cannot ignore what we called Technology and Information System. Technology and Information system has helped humanity for years. Educations has developed vastly, countries thriving with resources, and economics has grown in an enormous rate. And everything happens because of the evolution of Technology. Our dream is to get involve in the evolution of the technology so we can make the world a better place. Technology uses varies, it can be good and also bad at the same time. We are thrived to deliver the advancement of technology to become something useful to humanity. Making humanity convenient and live their lives to the fullest with the advantages of the technology.

Nowadays, we often heard about Industry 4.0. What is Industry 4.0 actually? How does this term affect our everyday lives? How much it impacts our work culture?

There's no question that technology is playing a huge part in our everyday lives today, but the increasingly connected culture we live in is also having an impact on the world of industry. Industry 4.0, described as the growing combination of traditional manufacturing and industrial process with technology. Industry 4.0 mainly focuses on the use of large-scale machine-to-machine (M2M) and Internet of Things (IoT) devices implementation to provide automation, improved communication and managing, and also smart machines that can analyze and diagnose problems without the need for human intervention. In Industry 4.0 era, we could see factories become increasingly autonomous and self-monitoring as the machines within are given the ability to analyze and communicate each other. This reduces the task for human, granting companies much smoother and consistent process that leave the employees open for another task.

The most important things in the Industry 4.0 is how data and internet play vital role. Data and internet connected devices is fueling the growth of Industry 4.0. Smartphones, digital cameras, sensors and social media now create more information than ever before. In fact, over the past 18 months we have created more data than in all of prior human history combined. More hours of YouTube videos are now uploaded every three minutes than all Hollywood studios produce in a whole year. This explosion of data is changing how we work and what jobs are going to be available in the future. Data is the raw material that enables automation, smarter ways of working and artificial intelligence. A study out of Oxford University suggests that as much as 35 percent of all the jobs in the U.K. could be at risk of automation inside the next 20 years.

In order to survive in this Industry 4.0 era, we need to consider these aspects to make ourselves stay ahead of the competition and survive the data storm:

1. Knowledge about ICT
    - Basic Information Technology knowledge
    - Ability to use and interact with computers and smart machines like robots, tablets etc.
    - Understanding machine to machine communication, IT security & data protection

2. Ability to work with data
    - Ability to process and analyze data and information obtained from machines
    - Understanding visual data output & making decisions
    - Basic statistical knowledge

3. Technical knowledge
    - General knowledge about technology
    - Specialized knowledge about manufacturing activities and processes in place
    - Technical know-how of machines to carry out maintenance related activities

4. Personal or Soft Skills
    - Adaptability & ability to change
    - Decision making
    - Working in team
    - Communication skills
    - Mindset change for lifelong learning

TASK FOR EACH MEMBER

No.	Members	Task
1.	HUDAN ARYAJUDANTA	Introduction, reflection
2.	MUHAMMAD RAFIQ REDHA BIN RUSHIDI	Explanation on components
3.	AHMAD SAMMAN	Explanation on reflection
4.	AFIQ NAZRIE RABBANI	Reflection, compile