

# **INFS 401**

# **AUTOMATION OF INFORMATION SYSTEMS**

**ELECTRONIC PAPER AND INTERNET SECURITY**

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## **UNIVERSITY OF GHANA**

**College of Education**

**School of Continuing and Distance Education**

2018

# ELECTRONIC PAPER AND INTERNET SECURITY



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# Session Outline

Topics to be treated in this session are;

- Electronic Paper and its attributes
- Application of Electronic paper
- IPAD

By the end of this Unit, you should be able to

- Appreciate new technology that is associated with most modern smartphones and electronic boards
- Protect your PCs and smartphones from viruses, and other disasters.

Topic One

# **ELECTRONIC PAPER AND ITS ATTRIBUTES**



# OBJECTIVES

By the end of this section you should be able to

- Appreciate and have an understanding of the technologies used in modern smartphones, and other appliances derived from electronic paper.
- Be encouraged to use e-paper appliances by appreciating the advantages and disadvantages of e-paper technologies.

# E-PAPER AND ITS ATTRIBUTES

- Electronic Paper (e-paper) and electronic ink are display technologies which are designed to mimic the appearance of ordinary ink on paper.
- Unlike conventional backlit flat panel displays which emit light electronic paper displays reflect light like ordinary paper, thematically making it more comfortable to read, giving the surface a wider viewing angle. An ideal e-paper display can be read in direct sunlight without the image appearing to fade. Many e-paper technologies can hold static text and images indefinitely without using electricity.



# BASIC ATTRIBUTES OF E-PAPER

The following are the attributes of E-paper:

- Has high resolution
- High contrast equal to that of print on paper about 10:1 better
- Readable at any viewing angle
- Bootable, once a display is written, it will stay displayed even if power is switch off.
- Robust can withstand being dropped or lit
- Readable in any ambient light conditions
- Light weight, at most comparable to an equal sized sheet of cord.

# E-PAPER TECHNOLOGIES

Electronic paper was first developed in the 1970s by Nick Sherdon at Xerox Palo Alto center. Four different technologies can be looked at (1) Gyricon (2) electrophoretic (3) Electro- wetting (4) Electrofluidic



# E-PAPER TECHNOLOGIES CONT'D

## Gyricon

It was the first electronic paper. This consisted of polyethylene spheres between 75 and 100 micrometres across. Each sphere is a janus particle of negatively charged black plastic on one side and positively charged white plastic on the other. The spheres are embedded in a transparent silicone sheet, which each sphere suspended in a bubble of oil so that they can rotate freely.

# E-PAPER TECHNOLOGIES CONT'D

## **Electrophoretic display**

This is the main technology considered as a prime example of the electronic paper category because it looks like paper and has low power consumption. It is constructed from an electrophoretic imaging film. Its high resolution active matrix display is used in Amazon kindle, Barnes and Noble Nook, Sony librie, Sony reader, Kobo eReader etc.

# E-PAPER TECHNOLOGIES CONT'D

**Electro-wetting display (EWD)** – This display is based on controlling the shape of combined water and oil interface by applied voltage. It has the feature of switching between white and coloured reflection very fast and as such suitable to videos.

Another feature is its brightness; its displays are 4x brighter than reflective LCDs. Examples are Liquavista, ITRI, PVI and ADT.

# E-PAPER TECHNOLOGIES CONT'D

**Electro-fluidic display** – This is a variation of electro-wetting technology. Its unique feature reflection is very white. The core technology was invented at the Novel Devices laboratory at the University of Cincinnati. The technology is being commercialized by Gamma Dynamics.

Topic Two

# APPLICATION OF E-PAPER



# APPLICATION OF E-PAPER

There are several applications of electronic paper and ink. Some of the applications depend on technology used. Some use electronic ink applied to flexible or rigid materials. Others modify liquid crystal displays. Some of the applications are wrist watches, eBooks, smart cards, status displays, mobile phones, electronic shelf labels, newspapers etc.

- **Wrist Watches** – some use e-ink. First electronic inks based watch was called Spectrum SVR D001 released by Seiko in 2005. In 2010 Seiko released again a second generation of e-ink watch using matrix display.

# APPLICATION OF E-PAPER CONT'D

- **E-books** – Many applications. Sony started by manufacturing the Librie. Amazon in 2007 produced Amazon kindle, later kindle 2 (2009) and then the large kindle Dx. Barnes and Noble in 2009 launched the Nook.
- **Newspapers** – electronic versions of newspapers emerged from 2006. One of the earliest being De Tijd, Les Echos.
- **Smart Cards** – Their applications make it possible to generate passwords for financial payment for card holders

# APPLICATION OF E-PAPER CONT'D

- **Status Displays** – Devices such as USB, flash drives use e-paper to display status information such as available storage space. Once the image on the e-paper has been set, it requires no power to maintain, so the readout can be even when the flash drive is not plugged in.
- **Mobile Phones** – Some mobile phones use electro-phonetic displays. Earliest ones like Motorola and some Samsung phones use E-ink into their keypad.
- **Electronic Shelf Labels** – E-paper based electronic shelf labels are used to digitally display the price at retail stores.



Topic Three:

# IPAD

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# INTRODUCTION

Ipad is an example of a mobile phone which is used to disseminate information and to perform some of the activities of information professionals.



# iPad

- It is written as iPad. It is produced by Apple which introduced the 1st iPad in January 2010. It is a tablet computer that is compact, has a longer battery life than a laptop and has a range of functionality for both work and entertainment. Because of its size it is easily carried in a bag, or even a large pocket and has Wifi and in some versions 4G connectivity to the web.

# iPad Cont'd

- The iPad features no physical keyboard and most applications do not even require a pen like stylus to function. The finger is used to enter text and manipulate objects on screen. With such a simple interface and because the device itself is much lighter than laptops, notebooks and even the ultra- light netbooks, it is a large-screen device that is much more portable for business travelers and general consumers.
- The screen also features a multi touch interface, which is often a unique experience for many electronic device users. Multi-touch means more than one touch at a time are registered by the application running on the screen.

# iPad Cont'd

- It allows users to touch and manipulate objects on the screen with more than one finger at a time. This interface also enables users to shrink object by “pinching” them or expand object by “fanning” out their fingers. Or they can type capital letters on screen by virtually holding down the shift key. Probably the greatest feature of the iPad is APPLICATIONS which have made the iPad very successful. Thousands of applications are available in the Apple App Store free or otherwise with a high percentage of them reviewed by other users.

# iPad FOR BUSINESS

- Using the right applications, the iPad is more than just a content consumption device for videos, music and electronic books. It is a content production device as well, generating documents, spreadsheets. The ability to produce content, given the right applications shifts the iPad into a
- Useful business device. Businesses that depend on fast, accurate business processes can utilize the iPad to quickly supply data, invoice customers, and manage vendors from a reliable, highly mobile platform.

# iPad FOR BUSINESS CONT'D

Some examples of businesses that use iPad are

- **Restaurant owners** – waiters use it to capture orders
- **Travelling Salesman** – can use the iPad to take orders, make presentations and demonstrate aspects of his products via video etc.
- **A moving food vendor** – can use the iPad to announce his current location.
- **Scholars and Librarians** – make use of it to do presentation of seminars.

# FEATURES OF THE IPAD THAT MAKE IT ATTRACTIVE

The following are some attractive features of the iPad

- **Appearance** – Apple is a brand that now has universal appeal. It is a show off gadget, people show them off to peers because it is now sought after.
- **Battery Life** – The iPad has a battery life of up to 10 hours. It therefore ensures that the frustration with recharging is kept to a minimum.
- **Size** – The iPad is compact-enough to be put in a jacket or a school bag and big enough to be used effectively for most computing task.



# FEATURES OF THE IPAD THAT MAKE IT ATTRACTIVE CONT'D

- **APPS (programs)** – The iPad comes with a range of its own apps and there are thousands more that can be downloaded from the App Store. These cover everything from entertainment to education. Some of them are free while others have to be paid for. There are two types of Apps, the first is the iPad that come pre-installed with the iPad accessed from the icons on the iPad home screen then the second is the App Store which is used to access the app Store from where additional apps can then be downloaded.

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Topic One

# **PROTECTING PCs AGAINST DISASTERS**



# DANGERS FACED BY PCs

This section looks at some common computing disaster scenarios besides those caused by malware. The following is an overview of several types of non-malware disaster to PCs.

# DANGERS FACED BY PCs CONT'D

## HARD DISK FAILURE

A dead computer disk cannot be viewed or rescue the data on it. When a hard disk fails one cannot boot into WINDOWS to access his programs. If system is to the internet then it means no emails, no Facebook, no banking, networking can be done. The major cause of a crash is when Electronic give out, typically a component will have blown through overheating. If the hard disk is traditional physical drive, which stores data on revolving platters, the data will still, technically speaking will be encoded in magnetic form.

However, recovering this data is a highly specialist job normally carried out by forensic experts. In other words, the data is lost for good. However the drive must be scanned before disposing of it, so that it is not picked up by say a spy. The easiest way is to drive an electric drill through the platters



# DANGERS FACED BY PCs CONT'D

## OPERATING SYSTEM CRASH

Occasionally an operating system may abruptly stop working for no apparent reason. Could be a result of a hardware problem. Reinstallation of the operating system will solve the problem but then all other applications will have to be re-installed. If it is a result of a hardware then the hardware problem should be fixed otherwise reinstallation will fail.

# DANGERS FACED BY PCs CONT'D

## HARDWARE FAILURE

This may be from power supply, motherboard, memory or processor. Power surges can cause computers internal power supply to blow. If the inside of the computer case gets too hot, the CPU or graphics card might intermittently overheat and shut down. This can also be caused by faulty fan or dust accumulation. A failing memory chip can also make the PC unstable.

# DANGERS FACED BY PCs CONT'D

## FIRE AND THEFT

When a building catches fire computer burns and all files are lost. With theft sensitive data could get into the hands of a cork.



# SOLVING THE PROBLEM

To help solve the catastrophes some of the following measures can be taken.

## **BACKING UP**

To protect yourself against the catastrophes first back up all data. Backups saves data loss associated with malware, hardware failures and domestic disasters such as fires and floods. Update all backups as and when data is changed. Online backups are recommended. It saves data on remote servers ready for you to restore whenever needed. Can also buy the service as a standardize subscription. Alternatively, one can invest in a dedicated backups application such as Acronis True Image Home ([www.acronis.co.uk](http://www.acronis.co.uk))

# SOLVING THE PROBLEM CONT'D

- **Hardware Failure** – To reduce the risk of hardware failure certain practical measures can be taken. Avoid putting PCs in damp or hot areas
- Control Cables, if you built your own PC make sure cables are tacked in properly.
- If it is a laptop do not throw it about as sudden shocks can cause damage to the hard disk.
- Do not frequently connect or disconnect peripherals as those parts are sometimes mounted directly into the motherboard

# SOLVING THE PROBLEM CONT'D

- If there is a black screen or windows crashes repeatedly reset BIOS settings (the motherboards settings) check the manual or search online for how to do this.
- When it is not the hard disk but any other hardware just remove the hard disk and connect it to the PC.



# SOLVING THE PROBLEM CONT'D

## SYSTEM RESTORE

This is a useful tool that can restore a seemingly dead PC to fully working order by rolling back any changes made by software. Though not for broken pieces of hardware. To access it open START menu in Windows type 'SYSTEM RESTORE' a list of recent changes that were made to the System shows click "SHOW MORE RESTORE POINTS" to see ones from more than a few days ago. Choose one then click NEXT and the PC will be reverted to that state.

# SOLVING THE PROBLEM CONT'D

## REINSTALL WINDOWS

Always keep windows installation disk in a safe place. If the operating system stops working for any reason reinstalling can restore it to a working state.

## ENABLE AUTOSAVE

If an application that supports autosave is on the PC it has to be switched on. This reduces the danger of losing important information if the power goes unexpectedly, or the PC crashes. May have to invest in Uninterruptible Power Supply (UPS), a battery backup that gives time to save work in the event of a power out.