What's New?

September, 2022

Phones & Tablets

Apple iPhone

- Earlier today, Apple announced the latest version of its iPhone series, the *iPhone 15*.
  - Less square in shape, more rounded on the edges.
  - *Periscope lens* on the camera, providing 6X zoom rather than the current 3X zoom.
  - *USB-C charging and data port* instead of the Apple Lightning port. However, only the more expensive pro model supports *USB 3.2 speeds* (20GB/sec); other models are limited to *USB 2.0 speeds* (0.48GB/sec).
  - Faster, more capable processor chip: A17 Bionic.

Apple iOS

- *iOS 17* is the latest iPhone OS and contains several new features, including:
  - *Contact posters* – Allows you to customize how your profile appears on other people's iPhones.
  - *Collaborative music playlists* – multiple people can create, edit, and use a music playlist.
  - *Improvements to autocorrect* – using artificial intelligence (AI) and machine learning (ML).
  - *Live voicemail* – Provides a real-time transcription as someone leaves a voicemail for you, and lets you pick up the call at any time.
    - Calls identified as spam by your carrier will not appear as live voicemail.
  - *Dynamic Island* – The latest attempt by Apple to make the (selfie camera) notch on the iPhone display a little less intrusive. The notch area now doubles as an area to provide information.

Android Phones

- Since there are many manufacturers of Android phones, your best bet is to visit the manufacturer's website to learn about new features being added.

Android OS

- Fall 2023 will see the release of *Android 14*.
  - The ability to upgrade your phone to a new version of Android is *controlled by your phone's manufacturer*: some permit it earlier, while others defer it until later.
  - Android phone manufacturers also *may customize the version of Android on your phone* to exploit hardware features of those phones.
- New features of Android 14 include:
  - *Notification flashes* – camera flashes or screen flashes to quietly alert you to new notifications.
  - *App cloning* – If you and others share a single device to access certain apps (e.g., Facebook), you now can have multiple copies of the app, one connected to each of your accounts.
  - *Predictive back gestures* – These afford you a glimpse of the screen to which the back button will take you.

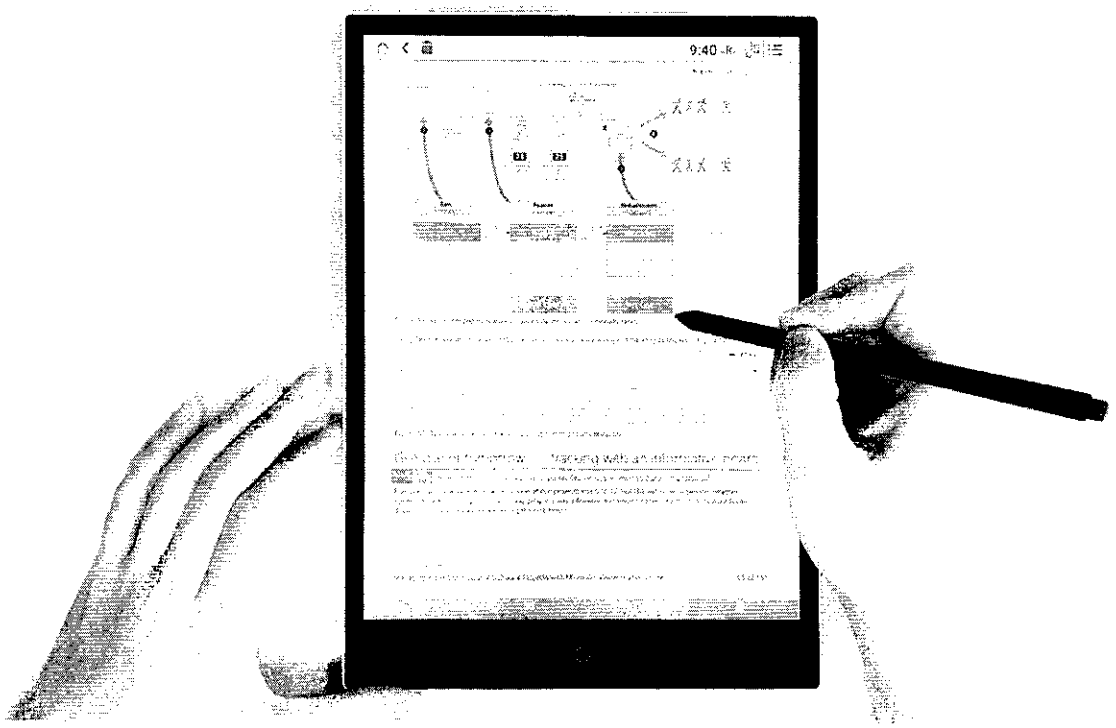
Tablets

- So, what's new in *tablet devices* this year?
- For the most part, look at the changes in smartphones and you will see the same changes in tablets.
  - A tablet is (for the most part) a smartphone with a *bigger display* and *without the ability to make cell phone calls.*

eReaders

- An *eReader* is a tablet-type device traditionally dedicated to letting you read eBooks.
  - An example is the *Amazon Kindle.*
- eReaders usually have an *eInk display* that appears similar to actual paper (e.g., no glare, such as one gets on an *Apple iPad*).
- An advantage to an eInk display over an LCD or OLED display is that the eInk display uses power *only when the image on the display changes*, but not when the image remains static (i.e., unchanging).
- A disadvantage of the display is its *slow refresh rate* (i.e., the time to change the image on the display). This can range from *0.35 seconds to 1.5 seconds.* This makes eInk displays impractical for displaying video.

- eReader manufacturers have been experimenting with two features, and these are becoming popular and more widely available:
  - The ability to *take notes and mark up documents* on the device using a *stylus*.
  - *Color eInk displays* rather than grayscale eInk displays.
- Incorporating one or both features adds significantly to the price of the eReader.
- Here is an example of an eReader that incorporates both a stylus and a color eInk display:



https://blog.the-ebook-reader.com/2019/12/18/e-ink-releasing-new-color-screens-print-color-e-ink

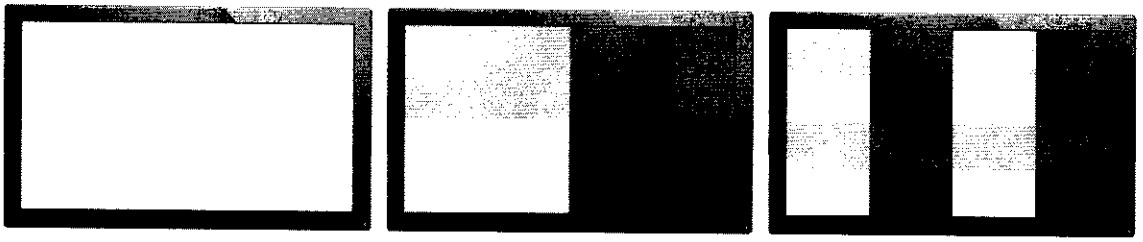
TV & Streaming

TV Picture Quality

- *OLED (Organic Light-Emitting Diode) TVs* still are the "gold standard", with bright colors and true blacks.
- However, manufacturers continue to create new and improve existing technologies to approach the benefits of OLED.
  - Competitors include *QD-OLED* and *micro-LED*.

TV Resolution

- With the advent of *4K TV*, manufacturers immediately began working on *8K TV*.



HD 4K 8K

- You now can choose from among several brands and models of 8K TVs that are available.
  - Unless your TV is the size of the wall (*100+ inches*), you probably will be *unable to distinguish* between 4K and 8K TVs.
  - You also will *pay a premium* for 8K TVs.
  - Currently, there is very little *8K content* available.

Wireless TV

- Look for the proliferation of *wireless TV* soon.
- These are TVs in which the *display and tuner* components are separated from one another and communicate via *Wi-Fi or Bluetooth*.
  - The thin display can hang on the wall like a framed picture while the tuner sits on a nearby shelf or behind a couch.
- Another extension of this concept is to *power the wireless display using batteries* (probably rechargeable) so that the display has no wires running to it when in use.

Computers

Speed vs Efficiency

- Computer manufacturers are always on the lookout for ways to make computers run faster.
- However, there can be a tradeoff between speed and energy efficiency.
  - One can push a CPU to run faster, but it takes more energy to do so.
  - One can use less energy to run the CPU, and it will run slower.

- Another way to make computers faster is to *make the components smaller.*
  - For example, the up-and-coming chip technology uses data paths that are *3nm (nanometers)* wide.
- But we are approaching a *physics-enforced wall* regarding how small we can make components.
- Still another way to avoid this tradeoff is to put *multiple cores* (i.e., multiple processing units) within a single CPU chip.
- Some of the consumer-grade CPUs have as many as *32 cores.*
- Then, computer programs can be written to *divide larger tasks into a group of simpler subtasks,* assign each subtask to one or more of the cores, and then *combine the results* after the cores have completed their jobs.

Light vs Electrons

- Most new CPU chips today follow the multiple-core approach.
- However, some exciting progress has been made recently in using *light paths* to transfer data within the CPUs rather than using *electron paths.*
  - Expect light-powered CPUs to become available in consumer-level computers within the next year or two.

Solid-State Memory

- We have discussed *solid-state memory* in earlier sessions.
- *SSDs (Solid-State Drives)* have speed advantages over *HDDs (spinning Hard Disc Drives),* but SSD storage costs more than HDD storage.
- If you have been looking to upgrade your computer drives to SSD or acquire an external SSD that plugs into a USB 3.x port, now may be the time: *prices have been falling significantly.*
- Prices for solid state memory has reduced by *1/3 or more* recently.

Artificial Intelligence

AI & ML

- Artificial Intelligence (AI) & Machine Learning (ML) have been the topic of much discussion and debate over the past year or so.
- *ChatGPT* and its cousins simultaneously have caused hope and panic.
- *Neural Processing Units (NPUs)* are appearing more frequently in computers, TVs, phones, etc. to support the use of AI & ML.

- AI & ML provide a lot of benefits, including natural-language translation, autonomous vehicles, improved weather prediction, and the speedier search for new drugs.
- However, you probably have heard of some of the *dangers of AI & ML*, including plagiarism and academic dishonesty, more devious scams, and security issues.

Vehicle Technology

Autonomous Vehicles

- *Autonomous vehicles* (a.k.a. *self-driving vehicles*) continue to improve because of AI & ML.
- California recently passed a law that *autonomous tractor-trailer trucks* could begin operating on designated roads.
  - However, they also passed another law that such trucks *also must have a human driver* behind the wheel for the next five years.
- This second law was backed by the Teamsters Union. ☺

Electric Vehicles

- An advantage to *electric vehicles (EVs)* is that they have the potential to reduce our reliance on fossil fuels – someday.
- However, EVs have not turned out to be the panacea that the government claimed.
- Many of the problems are related to the current battery technology used in the vehicles.

EV Batteries

- Current batteries (lithium-ion) are heavy.
- The chemicals within them are somewhat toxic.
- Damaged batteries are prone to catch fire.
- They are expensive to produce and replace.
- They do not perform well in high temperatures (e.g., Texas summers).
- They do not perform well in low temperatures (e.g., Minnesota winters).

Battery Research

- Because of the potential of electric vehicles, a great deal of effort and expense is being put toward the development of better battery technology.
- Every few days/weeks/months, one hears news reports concerning battery technology breakthroughs that will "change the world".
  - Remember that many corporate and university research labs employ full-time public relations people. ☺
- When (not if) a significant battery breakthrough truly is accomplished, it could change the face of *all our electronics*, not just our automobiles.