**TED Talk Assignment Brainstorm**

*6. XX has made the greatest contribution to development of computing. (XX to be agreed with the course lecturer).*

**Presenting:**

-Brandon Dooley

-Owen Duffy

**Q&A:**

-Eoin Dowling

-Paul Devaney

-Cian Donohue

**Options:**

-Microchips

-GUI

-Binary

-Alan Turing

-George Boole

-Space Race

-Cold War

-Internet

-Tim Berners-Lee

-War (Turing, GPS, Missiles)

-John Von Neumann

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**War:**

-Alan Turing (Enigma Machine)

-War Funding

-GPS (Ronald Regan, STAR wars)

-Drones

-Cybernetics

-Bio-limbs

-Satellite TV (Telstar)

-Missile Launching

-Space Race

-Internet and The Department of Defense (DARPA & ARPAnet)

-ENIAC / IBM 701

-IBM 709 (Korean War), commercialized

-Modern advancements hidden through secrecy (Area 51)

-SAGE

-Radar, aviation

**Arguments:**

-Lack of funding outside of war

-Opportunities would never have been granted outside of war

-IBM vs DARPA funding

**American Civil War**

*Telegraph*

The telegraph was invented by Samuel Morse in 1844, and telegraph wires soon sprang up all along the East Coast. During the war, 15,000 miles of telegraph cable was laid purely for military purposes. Mobile telegraph wagons reported and received communications from just behind the frontline. President Lincoln would regularly visit the Telegraph Office to get the latest news. The telegraph also enabled news sources to report on the war in a timely fashion, leading to an entirely new headache for the government: how to handle the media.

**World War I**

*Mass Radio*

During the war radio became smaller and lighter and better at filtering out static for clear reception. In particular, companies like AT&T—in collaboration with the Signal Corps—made great advances in manufacturing vacuum tubes, or valves, and U.S. industry was producing a million a year by 1918. Better valves meant smaller receivers and more powerful transmitters, opening the way for a new age of popular radio after the war.

**World War II**

*Microwave Oven & Radar*

While scientists around the world worked on using radio antennae to detect distant objects during the early part of the 20th century leading to first practical radar set in 1935.

The cavity magnetron was developed for radar use in 1940, but now forms the power source of the domestic microwave oven. Later Percy L. Spencer invented Microwave open using the basic concept of mangetron.

**Internet:**

*Is the internet a war baby?*

In a way, the Internet itself began as a military project. Beginning in the 1960s, the U.S. Department of Defense funded a project called ARPANET. The purpose of the project was to develop the technologies and protocols necessary to allow multiple computers to connect directly to one another. This would allow people to share information with each other at unprecedented speeds.

A computer network could also have another benefit: national security. By creating a robust and flexible network, the United States could ensure that in the event of catastrophe, access to the nation's supercomputers could remain intact. ARPANET's protocols allowed information to travel across different routes. If something happened to a computer node along one route, the information could take another path to get to the right destination.

**The "original" computer**

Two coding and decoding machines stand at the foundation of the modern day computer, namely the Enigma and the Lorentz machines. The role of these gadgets was to encode and respectively decode the traffic, which comprised mainly of communications between the German high command and the air, ground and naval forces dispatched.

**Alan Turing and Enigma (1940’s)**

He was highly influential in the development of theoretical computer science, providing a formalization of the concepts of algorithm and computation with the Turing machine, which can be considered a model of a general purpose computer. Turing is widely considered to be the father of theoretical computer science and artificial intelligence.

During the Second World War, Turing was a leading participant in the breaking of German ciphers at Bletchley Park.

With the Germans encrypting practically every message, Bletchley Park was put into operation to decode them and give the Allies a massive advantage. In the process, the incredible team that worked there, created the world's first computer.

**Collosus Computer (1943)**

Colossus used thermionic valves (vacuum tubes) and to perform Boolean and counting operations.

Colossus is thus regarded as the world's first programmable, electronic, digital computer, although it was programmed by switches and plugs and not by a stored program.

An improved Colossus Mark 2 that used shift registers to quintuple the processing speed, first worked on 1 June 1944, just in time for the Normandy Landings on D-Day.

Bletchley Park's use of these machines allowed the Allies to obtain a vast amount of high-level military intelligence from intercepted radiotelegraphy messages between the German High Command (OKW) and their army commands throughout occupied Europe.

“It is my opinion that the COLOSSUS project was an important source of this vitality, one that has been largely unappreciated, as has the significance of its places in the chronology of the invention of the digital computer.” *–Brian Randell, Prof. Computer Science, Newcastle University*

**ARPAnet (1970-1980)**

ARPANET was initially funded by the Advanced Research Projects Agency (ARPA) of the United States Department of Defense.

Designed to allow government defense’s to communicate in the event of a nuclear attack.

“The goal was to exploit new computer technologies to meet the needs of military command and control against nuclear threats, achieve survivable control of US nuclear forces, and improve military tactical and management decision making.” -  Lukasik, Stephen J. (2011). "Why the Arpanet Was Built".IEEE Annals of the History of Computing.**33**(3): 4–20.

As the project progressed, protocols for internetworking were developed by which multiple separate networks could be joined into a network of networks.

At the height of the Cold War, military commanders were seeking a computer communications system without a central core, with no headquarters or base of operations that could be attacked and destroyed by enemies thus blacking out the entire network in one fell swoop.

The term “Internet” was adopted in 1983, at about the same time that TCP/IP came into wide use. In 1983, ARPANET was divided into two parts, MILNET, to be used by military and defense agencies, and a civilian version of ARPANET.