

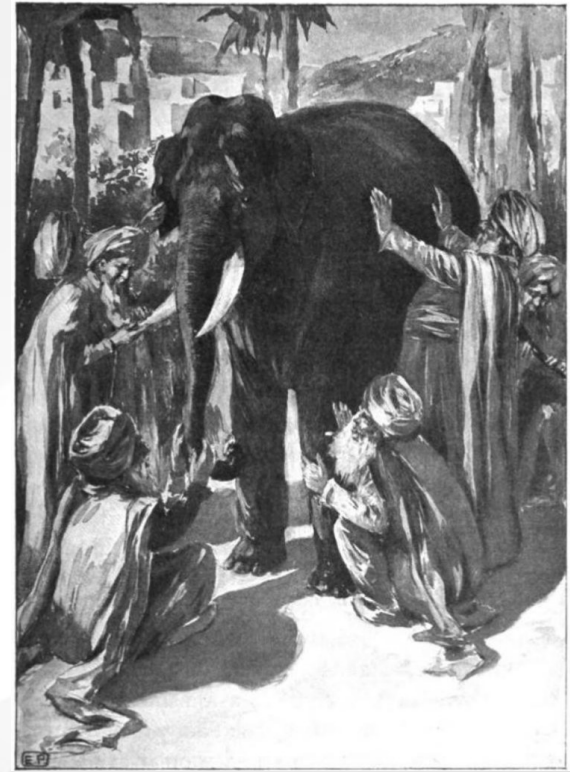
# A Story of Cyberspace

## From PLATO to Facebook

Kaido Kikkas

# Touching the elephant, or - everyone's got an opinion

- “A quite recently invented nice place to read news, write to friends and chat”
- “A toy for computer nerds”
- “Unlimited advertising!”
- “Playground of perverts and other weirdos”
- “The mystical cyberspace”



Illustrations come from Wikimedia Commons, if not noted otherwise

# You get what you seek

- Plenty of useful information  $\Leftrightarrow$  loads of bullshit
- Many nice people  $\Leftrightarrow$  a host of dorks and idiots
- An interaction aid  $\Leftrightarrow$  a source of 'Ooops..!'
- A place to get help  $\Leftrightarrow$  a source of despair
- A media channel  $\Leftrightarrow$  yellow news and hate speech
- Literature and art  $\Leftrightarrow$  a toilet wall  
( 'F... you, too!' )
- Faeryland  $\Leftrightarrow$  cyberjungle



# Two parables

- Internet is a knife – a surgeon can save lives, a bandit can kill someone
- Internet is an amplifier – for human relations, mass media, wisdom, stupidity...

# Main services

- The Web (WWW)
- E-mail
- File transfer (FTP, various P2P solutions)
- Virtual terminal / remote access (Telnet, SSH)
- Real-time interaction (IRC, talkers, MUD, IM, VoIP apps)
- Derivatives and combinations of the above

# Where did it all start?

- Again, opinions differ. Some possible starting points include
  - The Atlantic Cable 1858/1866 (the first connection)
  - Nevil Maskelyne vs Guglielmo Marconi: the 1903 radio hack
  - Hackers: the U.S. radio amateurs of early 20th century; Radio Act 1927
  - *The War of the Worlds* media panic 1938
  - *As We May Think* by Vannevar Bush 1945 (Memex and microfilms)
  - *Cybernetics* by Norbert Wiener 1948 (tech + management)
  - The AI Conference at Dartmouth 1956 (McCarthy and Minsky; the first suggestion of exponential growth of tech)
  - Sputnik 1...

# Competing narratives

- Was the Internet born
  - ...of the need to protect the U.S. against the imminent Soviet nuclear attack? (still the prevailing opinion)
  - ...as a manifestation of the hippie-influenced technoculture (classic hackerdom in MIT and Stanford? (Steve Levy *Hackers*, and several others)
  - ...as a surveillance tool from day one (another question is how much of this was actually necessary; e.g. see Yasha Levine, *Surveillance Valley: The Secret Military History of the Internet*, 2018)

# “OMG! The Russians are in space!”

- Someone said: “The Russians put up Sputnik yesterday, and it goes around the world saying *beep-beep-beep*. Then, when it gets to the U.S., it says *ha-ha-ha*.”
- NY Times on Oct 4, 1957: “A shocker like Pearl Harbor, waking America up and making it buckle down.”
- The National Defence Education Act 1958 – 5 bln \$ => 13 bln
- The Advanced Research Projects Agency (ARPA) and their 'nuclear shield' programme – one of the goals was to create a control network capable to keep working 'half dead' (the assumption was that the Russians will hit first)



# Research

- 1960 – *Man-Computer Symbiosis* by J.C.R. Licklider
- 1961 – a theoretical foundation for a new type of network laid by Leonard Kleinrock at MIT
- 1962 – *Augmenting Human Intellect: A Conceptual Framework* by Douglas Engelbart
- 1964 – the first practical specification by Paul Baran. The central idea was to divide the whole traffic into packages that find their way over the network independently
- 1965 – Welsh computer scientist Donald Davies proposed the same solution independently of Baran (at the UK National Physical Laboratory)

# The fathers of the Internet (in a way)



Paul Baran (US)  
1926-2011



Donald Davies (UK)  
1924-2000

# Summer of '69 (thanks, Bryan)

- The most popular suggestion for the birth of Internet
- 4 nodes: Santa Barbara, UCLA, Stanford, Utah
- The first login crashed at 'g'...
- The spiritual roots of Internet - academy + counterculture  
(so that's why there are so few normal people online...)

# The tech Babel

- For a time, no common 'language' existed
- 1970 – the first attempt in NCP (Network Control Program), the first layered approach and development of the Open Systems Interconnection (OSI) model
- 1974 – Transmission Control Program
- 1978 – Transmission Control Protocol / Internet Protocol (TCP/IP), developed by Robert Kahn and Vinton (Vint) Cerf

# First e-mails and and online shrink

- 1971 – ARPAnet spanned the whole 23 computers
- A MIT engineer named Ray Tomlinson sent the first text message between computers. His application to ARPAnet for a new protocol was approved and e-mail was born. He also borrowed the @-sign from teletype
- 1972 – first real-time long-distance text chat – a 'patient' in Stanford and a 'psychiatrist' in Massachusetts. To top it off, both were actually what we call bots today (PARRY vs ELIZA)

# Expansion

- 1970 – AlohaNet on Hawaii, a wireless connection
- 1973 – expansion to the UK and Norway, the term 'Internet' adopted. First specification of FTP. Bob Metcalfe invented Ethernet
- UIUC Plato Notes – a pioneer of many things (first online community, e-learning, plasma monitors... but also viruses; see *Friendly Orange Glow* by Brian Dear 2017)
- 1975 – first mailing lists. Queen Elizabeth became the first head of state to send e-mail. First version of the Jargon File



# “Stop the damn world, I wanna get off!”

- The Vietnam War (1965-75) and Nixon's Watergate (1972-74) – many people in the U.S. got a rude awakening
- Among other things, emergence of crackers, phreakers and other similar creatures – *the government does not deserve respect anymore, it deserves a finger*
- Primitive viruses, first 'electronic' bank heist (~1.5 mln), Steve Wozniak trolled the Pope (calling as Henry Kissinger)



# 70s

- 1973-75: Community Memory at UC Berkeley
- 1975 – Minitel (France) and CompuServe (US)
- 1978 – first BBS opened in Chicago
- 1979 – first MUD at the University of Essex, UK
- A controversial idea (the author is disputed, could be Scott Fahlman or Kevin McKenzie) to add characters denoting emotions to texts – after a while, smileys/emoticons started to spread (What is that? >8-[     ] )



# Internet gets ready (for a short while)

- 1982 – TCP/IP adopted as the universal base of Internet
- 1983 – FidoNet
- 1983 – first standard of nameserver (NIC)
- 1984 – first DNS
- 1985-1990 - a period of stability: main services were E-mail, Telnet, FTP and Usenet, IRC was added in 19

# CERN

- 1989 – CERN (European Organization for Nuclear Research) connected to Internet
- 1990-91 – a British independent contractor named Timothy Berners-Lee proposed a novel method for non-linear (hypertext) documents (the ‘Web page No 1’ is still online at <http://info.cern.ch/hypertext/WWW/TheProject.html>) The system was published via CERN FTP site and spread rapidly
- Note: Berners-Lee refused to use any restrictive measures for his invention

# Prerequisites for the Web explosion

- The Protocol: HTTP by Sir Timothy
- The new operating system called Linux, also released in 1991 (and a bit later, also the Apache web server software)
- MS Windows, the first ubiquitous GUI for PC-s
- NCSA Mosaic and later Netscape, the first web browsers

# Right time, right place

- Like at other important points in history, some people made a lot of money:
  - Marc Andreessen – left NCSA, founded Netscape and ruled the web for some years
  - Brian Pinkerton – built Webcrawler, the first web robot, as a part of his thesis at the University of Washington
  - Two Stanford students named David Filo and Jerry Yang piled up their web links and built a large 'Web catalogue', later known as Yahoo

# 90s

- 1993-94 – governing organizations created (InterNIC and W3C)
- 1995 – birth of LAMP and Java
- 1995-2000 – the censorship wars in the U.S. (CDA, COPA, CIPA)
- 1996 – *A Declaration of the Independence of Cyberspace* by John Perry Barlow
- 1998 – ICANN takes over from InterNIC, the current domain system is introduced

# A sleepy, sleepy Microsoft

- 1994-95 – Microsoft ignored Internet and aimed to build their own Microsoft Network
- 1996 – MS woke up and attempted to 'divide the market' with Netscape. Refusal provoked an all-out offensive
- Spyglass => IE
- 1997 – MS won the first war. Netscape open-sourced their newest prototype
- The war goes on till today – Mozilla

# Messengers

- Forefathers: Unix Talk and MUDs/talkers
- 1996 – ICQ (*I Seek You* – meant for finding game partners)
- 1997 – AOL Messenger, later developing into Gaim/Pidgin
- 1999 – Microsoft Messenger (aka MSN Messenger and Windows Live Messenger)
- 2000 – Jabber and multi-protocol clients (e.g. Trillian)
- Later, convergence with VoIP apps (Skype), microblogging and more recently, FB Messenger



# 'Web for common people'

- Back then, proper webmasters had to know HTML – it was considered too esoteric for 'Uncle Bob'
- First sites for 'normal people': GeoCities, Angelfire, Tripod
- On the one hand, the web pages were clumsy, ugly hacks
- On the other hand, it was the first real 'window to the Web' for commoners – and as such a forerunner of social media

# Millennium

- Commercialization and dotcom boom
- Multimedia
- FLOSS emerged as a serious alternative (also on desktop)
- New domain names (.name, .biz, .info)
- Internet as a venue for games and relationships
- Legal nitpicking and cyberdung

# Social software

- Networked services and applications that actively involve the user community
- Wikipedia 2001, Flickr 2004, YouTube 2005...
- Blog boom => web services (Blogger.com, WordPress.com) and standalone software (Movable Type, TextPattern, WordPress)
- Increasing use in education and business
- Microblogging (Twitter, Jaiku, identi.ca)
- Social networks
- Darker side: 4chan (2003)

# (Web-based) social networks

- Main players

- 2002 Friendster (and Rate.ee in Estonia)
- 2003 MySpace and LinkedIn
- 2004 Facebook and Orkut
- 2005 YouTube and Reddit
- 2006 Twitter and VK
- 2009 WhatsApp
- 2010 Instagram, Pinterest, Diaspora

- 2011 Google Plus and Twitch

- 2012 Tinder

- Google Hangouts

- 2015 Discord

- 2017 TikTok

- Notable rise and falls:

- Orkut

- Google Plus

# *Because we can*

- In times of old, nobody could just write an encyclopedia, add new stories to the Lord of the Rings or be a hotshot reporter at an international crisis site
- Today, we have (respectively) Wikipedia, Fanfiction.net/AO3 and Twitter/Flickr/Facebook/Snapchat/...
- Read more on the topic: *The Wealth of Networks* by Yochai Benkler (see [benkler.org](http://benkler.org))

# The dark side emerges

- 2004 – a new type of communication channel tested by a US Navy research laboratory (together with EFF), the aim being to create something that dissidents in the ‘bad countries’ could use
- 2006 – Tor Project
- 2009 – the term ‘Dark Web’ appears
- 2011 – Ross Ulbricht opens the Silk Road

# Ignorance can kill

- A serious problem of the recent years
- Cheap PC + ubiquitous Internet + insecure software + stupid user = LOADS OF CRAP
- Malware, credit card fraud, phishing, social engineering, DDOS...
- No clear-cut solution. Mandatory 'driving license'? Allow remote administration by software vendors (W10 seems to go that way)? Outlaw Windows?

# Future?

- Even more multimedia
- Semantic Web and Big Data
- More fun (but no work?)
- More controlled and commercial? Or back to the roots? Or split the thing in half?
- Death by dung?
- We'll see...



# More on the topic

- Moschovitis C. et al. History of the Internet
- Living Internet, <http://www.livinginternet.com/i/ii.htm>
- Hobbes' Internet Timeline,  
<http://www.zakon.org/robert/internet/timeline/>
- History of the Internet,  
<http://www.nic.funet.fi/index/FUNET/history/internet/en/etusivu-en.html>
- ISOC. History of the Internet,  
<http://www.internetsociety.org//internet/internet-51/history-internet>

**Thanks**