what is software innovation?
what does innovation in software look like?
what makes a software product successful?
story #1: TBL’s Web (1989)
What was novel about the web?

World Wide Web

The WorldWideWeb (W3) is a wide-area hypermedia information retrieval initiative aiming to give universal access to a large universe of documents.

Everything there is online about W3 is linked directly or indirectly to this document, including an executive summary of the project, Mailing lists, Policy, November's W3 news, Frequently Asked Questions.

What's out there?
- Pointers to the world's online information, subjects, W3 servers, etc.

Help
- on the browser you are using

Software Products
- A list of W3 project components and their current state. (e.g. Line Mode, X11, Viola, NeXTStep, Servers, Tools, Mail robot, Library)

Technical
- Details of protocols, formats, program internals etc

Bibliography
- Paper documentation on W3 and references.

People
- A list of some people involved in the project.

History
- A summary of the history of the project.

How can I help?
- If you would like to support the web.

Getting code
- Getting the code by anonymous FTP, etc.

http://info.cern.ch/hypertext/WWW/TheProject.html
the technology?

NeXT computer
660MB hard disk
Motorola 68030, 25MHz
17” monitor with Display Postscript
built in ethernet connectivity
Hypertext Editing System
(Nelson & van Dam, 1967)

Memex
(Vannevar Bush, 1945)

Apple HyperCard
(Bill Atkinson, 1987)

File Transfer Protocol
(Abhay Bhushan, 1971)

SGML
(Charles Goldfarb, 1986)
the novelty was... the URL!

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key concept: the URL

old scenario with annoying constraints

get S/F1 get S/F2

concept allows new scenario with constraints removed
story #2: iPod (2001)
what was novel about the iPod?

Apple iPod
(2001)
a new industrial design?

Apple iPod  
(Jony Ive, 2001)

Braun Pocket Radio T3  
(Dieter Rams, 1958)
a technology breakthrough?

- iPod 5GB drive (Toshiba, 2001)
- FireWire serial bus (Apple, 1995)
- Personal Jukebox 5GB drive (DEC, 1999)
key concept: the song

- Download pirated track
- Upload track
- Play track

- Rip your CD collection

- Buy song
- Play song
- Sync
- Play song
supporting cast: iTunes

iTunes Media Player (2001); iTunes Music Store (2003)
explosion in sales came after iTunes took off
story #3
WhatsApp
(2009)
what was novel about WhatsApp?

WhatsApp (2009)
was it free texting?

first free-texting app
TextFree/Pinger (2006)

WhatsApp (2009)
whatsapp’s big moment

WhatsApp 📞
@WhatsApp

Group chat is now live for iPhone and BlackBerry in versions 2.6 (our Android client update with group chat is coming in 12 hours)

1:08 AM · Feb 10, 2011
growing with groups

monthly active users (million)

growth rate

groups

e2e
what was happening in 2011

Start-Ups Are in a Rush to Bring the Chat Room to the Smartphone

By Jenna Wortham
March 10, 2011
key concept: group

- add recipient
- send
- add recipient
- send
- invite
- join
- send
- join
- send
story #4
Zoom (2013)
Number of estimated Skype users registered worldwide from 2009 to 2024 (in billions)

from Statistica: 2018-2024 estimated
There's only one winner in the work-from-home meeting app wars

Source: Apptopia
what was novel about Zoom?

March 31, 2020
were video calls new?

Picturephone (1964)

Skype (2009)

QuickCam (1994)
first commercial webcam

key concept: meeting

1. signup to app
2. signup to app
3. place call
4. add to call
5. talk
6. hangup

1. signup to app
2. create meeting
3. send link
4. start meeting
5. join meeting
6. talk
tracing zoom’s meeting concept

- Skype: initially P2P (2003), Microsoft (2013)
- FaceTime: Apple (2010)
- Zoom: Eric Yuan (2013)
- Google Meet: launched (2017), absorbs Duo (2022)
- Microsoft Teams: launched (2017)
- Join.me: LogMeIn (2010)

Meeting concept added to Teams June 2022?
each innovation has a key concept at its core
Talkomatic (1973): first Group concept
concepts undo constraints

add recipient  send  add recipient  send

invite  join  send  join  send

"not nots": it’s not OK to not have group functionality
key concepts are **necessary** but not **sufficient**

**recipe for success** =

- **authentic demand**

- + **concept**

- + **usable design**

- + **available technology**

a “not not” constraint

removes the constraint

easy to use, robust, aesthetic
THE ESSENCE OF SOFTWARE

WHY CONCEPTS MATTER FOR GREAT DESIGN

DANIEL JACKSON

https://essenceofsoftware.com

why Zoom is broken after all

dark concepts: going rogue

what conceptual models missed