

# Old mistakes repeated.

(but you do get the source now)

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Old Fart

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# Repeating mistakes

- Experience: The ability to recognize that you made the same mistake.
- ... again.



- [www.non-sequitur.com](http://www.non-sequitur.com)

# Complexity in computing.

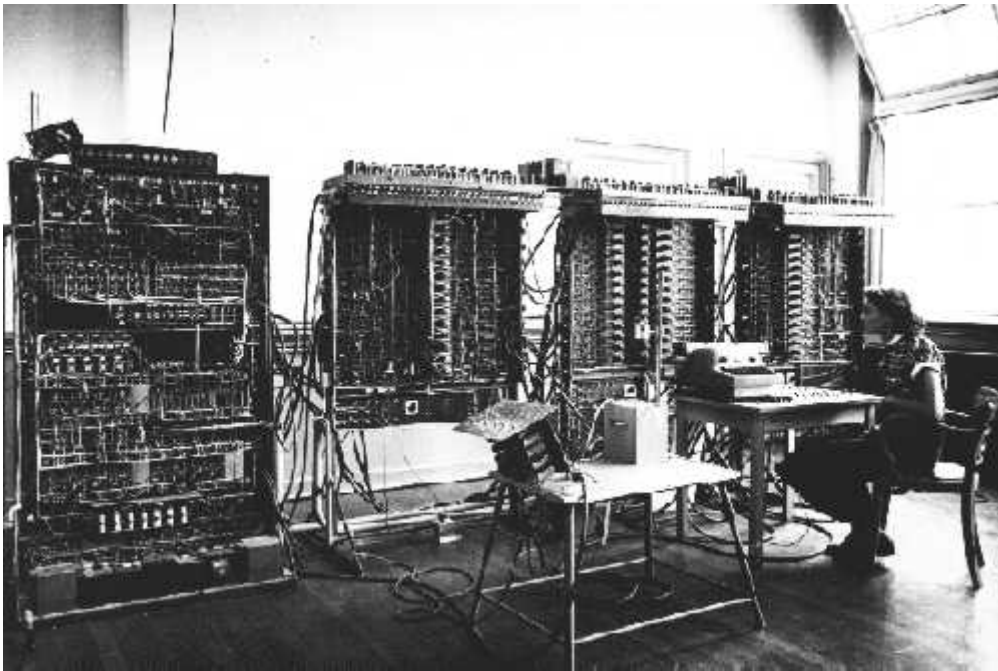
- "[...] I am perfectly aware [...] that I have only a very small head and must live with it."

-- Dijkstra

- 1965, "Programming Considered as a Human Activity", 1965 IFIP congress.

# And the computers?

- Looked like this (ARRA I and ARMAC)



# Older and wiser.

- "[...] when we had weak computers, programming became a mild problem, and now that we have gigantic computers, programming has become an equally gigantic problem."  
-- Dijkstra

# Older and wiser.

- "[...] when we had weak computers, programming became a mild problem, and now that we have gigantic computers, programming has become an equally gigantic problem."  
-- Dijkstra
- 1972 ACM Turing Award speech.

# Complexity in real life.

- IKEA bookshelf
  - 30 parts, many alike
- DIY sports plane kit
  - 75 parts, many in pairs.
- Scale model of Amalienborg in LEGO bricks
  - Thousands of bricks, most alike.
- Air-craft carrier Ronald Reagan
  - 1 million parts, many identical.

# Complexity in software

- C-compiler
  - A million individual lines
- Operating system
  - 10-20 million individual lines.
  - Longhorn rumoured to be 50 million lines.
- "Don't make life difficult for yourself"
  - my dad.

# UNIX is getting old

- UNIX is getting into the thirties now.
- Third generation of UNIX hackers.
- Enormous software library available.
  
- But is UNIX getting wiser ?

# UNIX world domination

- Or rather: the lack off...
- UNIX have blown more chances at world domination than anything else in the world.
- Why is that ?
- Can we do something about it ?
- Should we do something about it ?

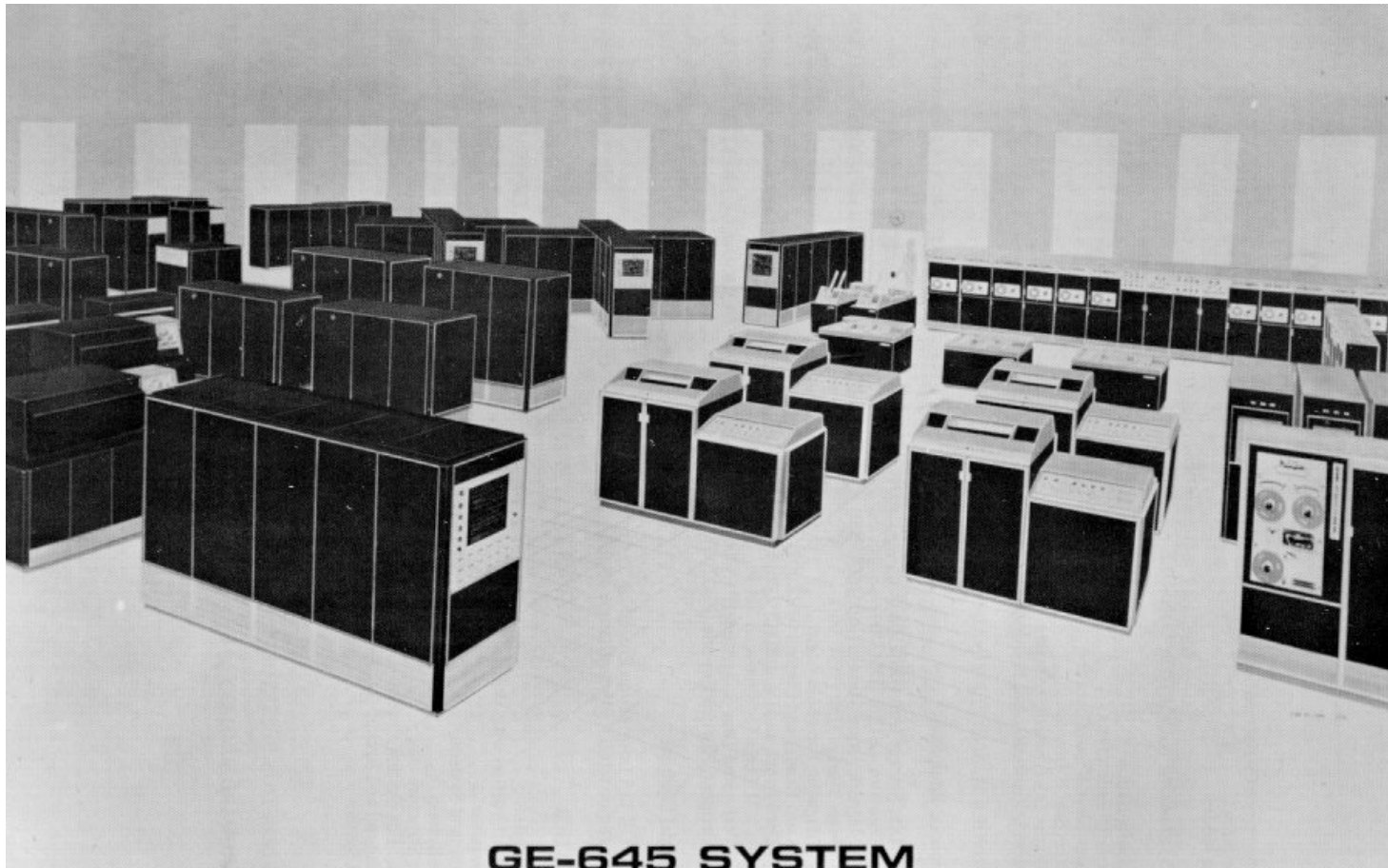
# Innovation vs. Development

- Innovation is a current buzz-word, much abused in marketing.
- What is the difference between Innovation and Development ?

[sound of time-machine launching]

# MULTICS

- The mother of ~~all~~ many operating systems



# MULTICS

- Ground breaking Operating System.
- "Computing power as utility service"
- Backed by really big players:
  - MIT
  - Project MAC
  - Bell Telephone Laboratories
  - General Electric's Large Computer Division
  - (later Honeywell).

# MULTICS

- Required large computer resources.
- Big project problems:
  - Supertanker decision making.
  - Mistakes, once committed to, not fixable.
- Ground-breaking, but not innovative.
- But lots of development.

# UNIX

- The one and true way to write an OS.



# The genesis of UNIX

- Bell Labs withdrew from MULTICS.
- Dennis & Ken suffered withdrawal:
  - They had tasted the sweet luxury of an OS.
  - But their PDP was waaaay too small for it.
- THINK!

# Send the wife away...

- And innovate:
  - Spend a week on the editor
  - Spend a week on the assembler
  - Spend a week on the rest of the OS
  - (The rest is history)

# Innovation vs. Development

- Innovation:
  - Show impossible things to be possible.
  - Think outside the box.
- Development:
  - Improve things we already know how to do.
  - Think up a better box.

# OSS today ?

- The OSS is largely development.
  - More boxes.
  - Different boxes.
  - Boxes with funnier names.
  - L33t boxes.
- Innovation does happen
  - And OSS is a vehicle for it.

# Does OSS encourage invention ?

- "Not Invented Here" (considered bad).
- "Compatibility must be maintained"
- "But OS/X is not really UNIX"
- "Our mousetrap is 0.0000345% more efficient than your mousetrap."

# Who invents today ?

- Developers:
  - IBM, LINUX, BSD, RedHat, Suse...
  - (It still has all the disadvantages of UNIX).
- Innovators:
  - Plan9 (name spaces)
  - Sun/Java (Portability)
  - Apple (User interface)

# Compete or Cooperate

- Throughout 80ies and 90ies, many UNIX companies competed fiercely.
- "Distinguishing features"
- Legacy product feel-alike adaptations.
- Business strategy is "lock-in"
  - Make it cheap and easy for the customer to start
  - But expensive and cumbersome to stop.

# Software incompatibility

- "Our OS should have everything the competition have and a lot they do not have."
  - Easy to port to our OS
  - Hard to port from our OS
  - QED: customer stays with us.
- (Reality: customers are not that stupid.)

# UNIX – endangered OS.

- The UNIX industry is remarkable for its incompetence in the market.
- Most UNIX vendors are dead.
  - Altos ... Zilog.
- Revenue hard to come by
  - "Sell product" is out
  - "Make computers work" may be a way.

# The mistake ?

- Trying to get a bigger slice of the cake instead of making the cake bigger.
- Instead of fighting IBM mainframes and Microsoft MS-DOS/Windows they fought the other UNIX vendors.
- ...and created massive software portability problems for their users.

# Do we repeat a mistake ?

- Q: Why do I need the autocrap tools to compile a program which consists of one single C or C++ file ?
- A: Because UNIX still is so incompatible that writing portable code is (close to) impossible.

# Current status

- Uncountable Linux distros, none alike.
- A handful of BSD distros, not that alike.
- IBM AIX – IBM the UNIX way.
- Sun Solaris – UNIX, the SUN way.
- HP-UX – UNIX cul de sac.
- Apple OS/X – Closet UNIX.
- SCO – Suicidal (but rich) lawyers.

# Are we aware of it ?

- Sure we are.
- We even have a solution:
  - ”Everybody else should just do like me.”

# WE NEED STANDARDS!!!

- The traditional battle-cry of the users.
- Not at all an unreasonable demand.
- May come at a cost, quite a cost in fact.

# So we need standards...

- AT&T recognizes problem.
- Takes the manual pages and call them "System V Interface Definition".
- Demand that all UNIX licensees must comply to use "UNIX" trademark.

# One (not so) minor detail

- SVID did not contain TCP/IP.
- Everybody had TCP/IP to qualify for .MIL contracts.
  - Some put BSD's netstack in AT&T UNIX
  - Some did it the other way around.

# Strange, that didn't work...

- Move SVID to X/OPEN
  - A group of AT&T licensee companies.
- Reopened the STREAMS vs. Sockets debate.
- Opened the Internationalization wound.
- Opened the GUI wound.

# Lets try ISO

- POSIX standards developed from X/OPEN.
- Massive buy in to the concept of standard.
- Everybody made sure the standard also covered their product.
  - POSIX is so loose that MVS and Windows can be certified as POSIX.
  - Introduced badly designed mechanisms to help determine implementation constraints.

# Linux Standards Base

- Will fail (or at least not work either)
  - Registrative - not innovative.
  - Ignoring that Linux != UNIX.
  - "Cover my product too" tactics.
  - Lip-service buy in
  - No power.

# The one good standard:

- One of the most faithfully implemented API standards is the "POSIX 1E" security extensions.
- ... which was never formally adopted.
- ... so there really is no standard.
- ... so everybody sticks religiously to the final draft.

# Can UNIX be saved ?

- I'm not convinced:
  - No feasible market model.
  - No cooperation to generate a market.
  - Too much politics.
  - Mafia methods
    - Software Patents.
    - Frivolous lawsuits.
    - DMCA.

# Should UNIX be saved ?

- Contra:
  - Architecturally a mess by now.
  - No significant inventions in the last 20 years.
  - Everybody thinking inside their own box.
- Pro:
  - You get the source code.
  - The only alternative is LongHorn.

# What should you do ?

- Start thinking outside your own box.
- Stop bickering about irrelevant details
  - Linux/GPL vs BSD.
  - Gnome vs. KDE.
- Work on the real problems:
  - Fight for Open Data.
  - Fight the Software Patent Mafia.
  - Invent

# And the winner is: Sun

- Develop portable middleware platform.
- Give it away for free.
- Use license which prevents it being in the default install on non-commercial operating systems.

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