
20 Years

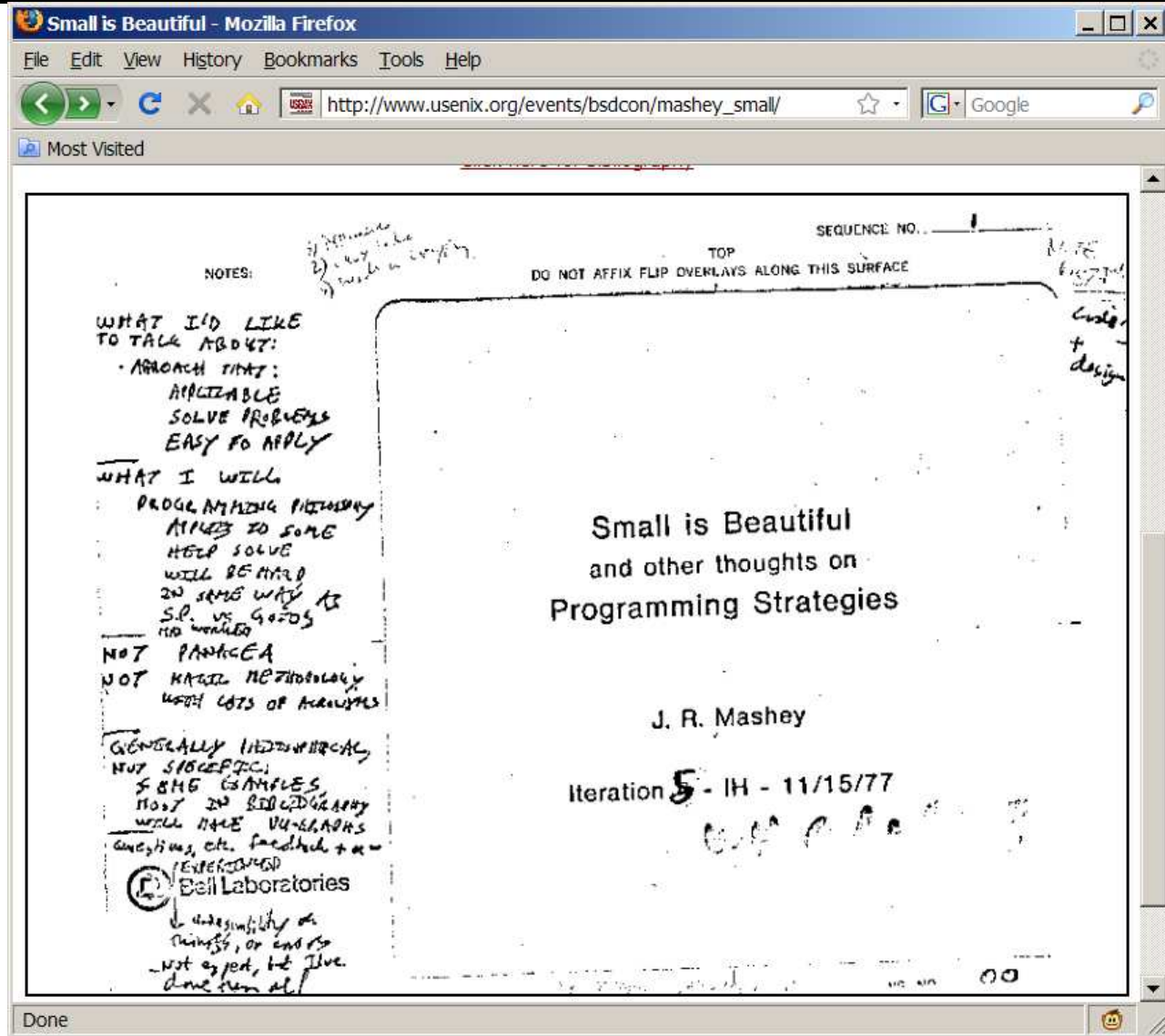
Well, actually, further back than that!
And 5000 years forward

John R. Mashey, mash at heymash dot com

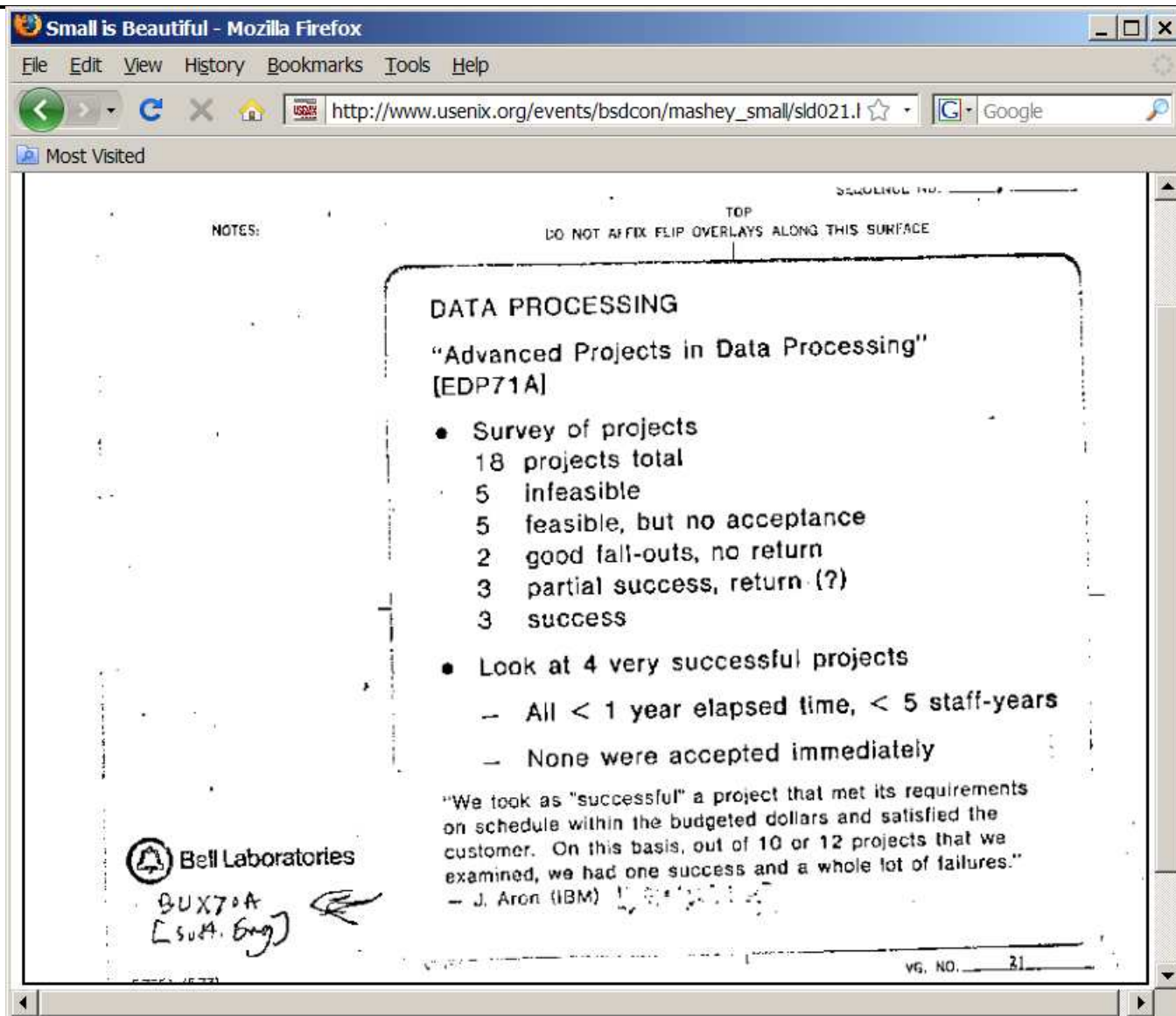
Overview

- Introduction
 - *Many failures, but no surprise*
- “Small is Beautiful and Other Thoughts on Programming Strategies”
 - 1977-1983,
 - dug out again in 2002, <http://www.usenix.org/events/bsdcon/tech.html>
- Why things fail
- Hot Chips 1989
- Baggage and Surprises

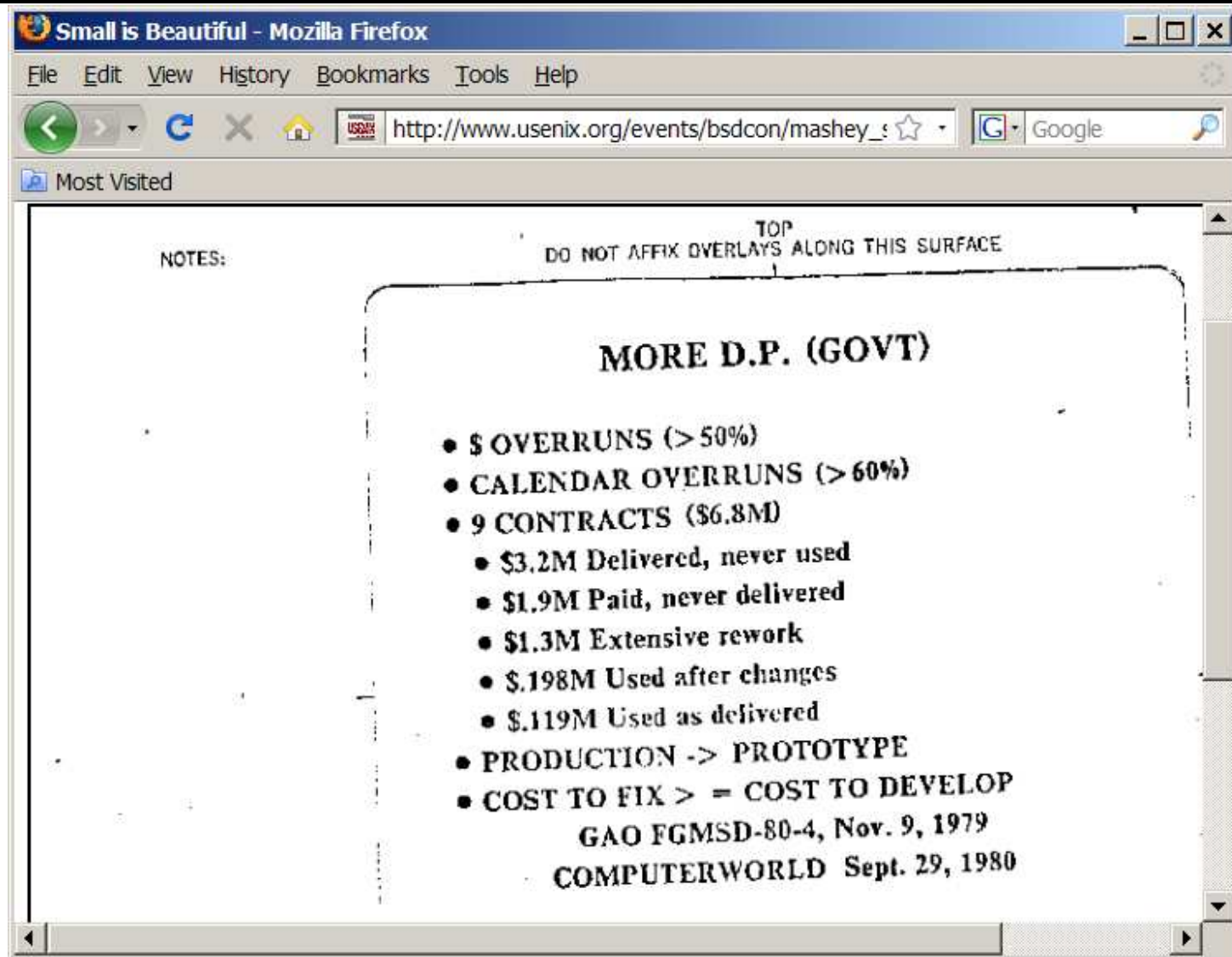
The 1977 talk



The 1977 talk – software failure



The 1977 talk – software failure



The 1977 talk – other failures

Small is Beautiful - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.usenix.org/events/bsdcon/mashey_s

Most Visited

*WILLIAM JOYCE
BTL 20*

OTHER AREAS OF R&D

"Organization of Unsuccessful R&D Projects" [JOY71A]

"In this sense [successful products] nearly every proposal considered is an eventual failure."

- Of 400-500 ideas, 1-2 work out
- 4/5 R&D hours spent on projects that do not reach commercial success

AND OUTSIDE R&D...

Museum of Modern Art and designs of "lasting value"

| | | |
|------|-----|---------------------------|
| 1934 | 397 | 1 survived |
| 1939 | 70 | 1 saw further development |
| 1950 | 46 | 1 survived |

"...a score of 3 successes and 510 misses is far from reassuring."

- V. Papanek, in [PAP73A]

FAILURE IS THE NORM

Bell Laboratories

1977 – failure modes ... and hardware?

The screenshot shows a Mozilla Firefox browser window displaying a slide from a presentation. The slide is titled "WAYS IN WHICH PROJECTS FAIL" and lists several failure modes. On the left side of the slide, there are handwritten notes in black ink, including "NICHES", "MAGE WIDE-ONE DEVICES", "BMS for future things", "HARDWARE", "Real-time multipl. processor partition", "FAULT REED KIDLY", "TESTRAN", "HARDWARE DESIGN", "LITTLE BIT TO R. AND S. LISTS", "HARDWARE CHANGES", "BSSD CORE LOGIC", "LOW-LEVEL ANALOGUES", "VLSI", "KIDS MILITARY", "OIL CO CREDIT", and "COSTS". The slide also includes a quote: "Don't look back. Something may be gaining on you." attributed to Satchel Paige. The browser window shows the URL "http://www.usenix.org/events/bsdcon/mashey_s" and the page title "Small is Beautiful - Mozilla Firefox".

Small is Beautiful - Mozilla Firefox

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http://www.usenix.org/events/bsdcon/mashey_s

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WAYS IN WHICH PROJECTS FAIL

- Wrong problem
- Wrong approach
- Infeasible performance
- Cannot be finished at all
- Becomes irrelevant or inappropriate when done
- Lack of user acceptance
- Leapfrogged by somebody moving faster

"Don't look back. Something may be gaining on you."
- Satchel Paige

Bell Laboratories

- More \$\$
- (Usually)
- But (lack of) software can cause failure

Hot Chips 1989

- ECL SPARC Chip Set
- Architecture of the P1 – A 250 MHz SPARC in GaAs
Mike O'Dell: Putting UNIX on Very Fast Computers or What the Speed of light Means to Your Favorite System Call, USENIX, Summer, 1990
- Intel i860 Million Transistor 64-bit Processor
- Panel Session : Compiler Issues with Hot Chips
- Building on-the-edge hardware is hard
- Building it without having software issues in good shape ... deadly

Hot Chips 20 - 2008

- Biggest surprise - How long it took to get 64-bit CPUs
- Next biggest - C has evolved from 1973, but ... 35 years
 - And of course, FORTRAN is still around, 50+ years
- And the future, 5000 years off, from Vernor Vinge, “A Deepness in the Sky”, quoted in ACM Queue - **Languages, Levels, Libraries, and Longevity**

•
“The programs were crap...Programming went back to the beginning of time...There were programs here that had been written five thousand years ago, before Humankind ever left Earth. The wonder of it—the horror of it...these programs still worked...down at the very bottom of it was a little program that ran a counter. Second by second, the Qeng Ho counted from the instant that a human had first set foot on Old Earth’s moon. But if you looked at it still more closely... the starting instant was actually about fifteen million seconds later, the 0-second of one of Humankind’s first computer operating systems...

“We should rewrite it all,” said Pham.

“It’s been done,” said Sura.

“It’s been tried,” corrected Bret...“You and a thousand friends would have to work for a century or so to reproduce it... And guess what—even if you did, by the time you finished, you’d have your own set of inconsistencies. And you still wouldn’t be consistent with all the applications that might be needed now and then...”

“The word for all this is ‘mature programming environment.’”

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