Lecture 1:
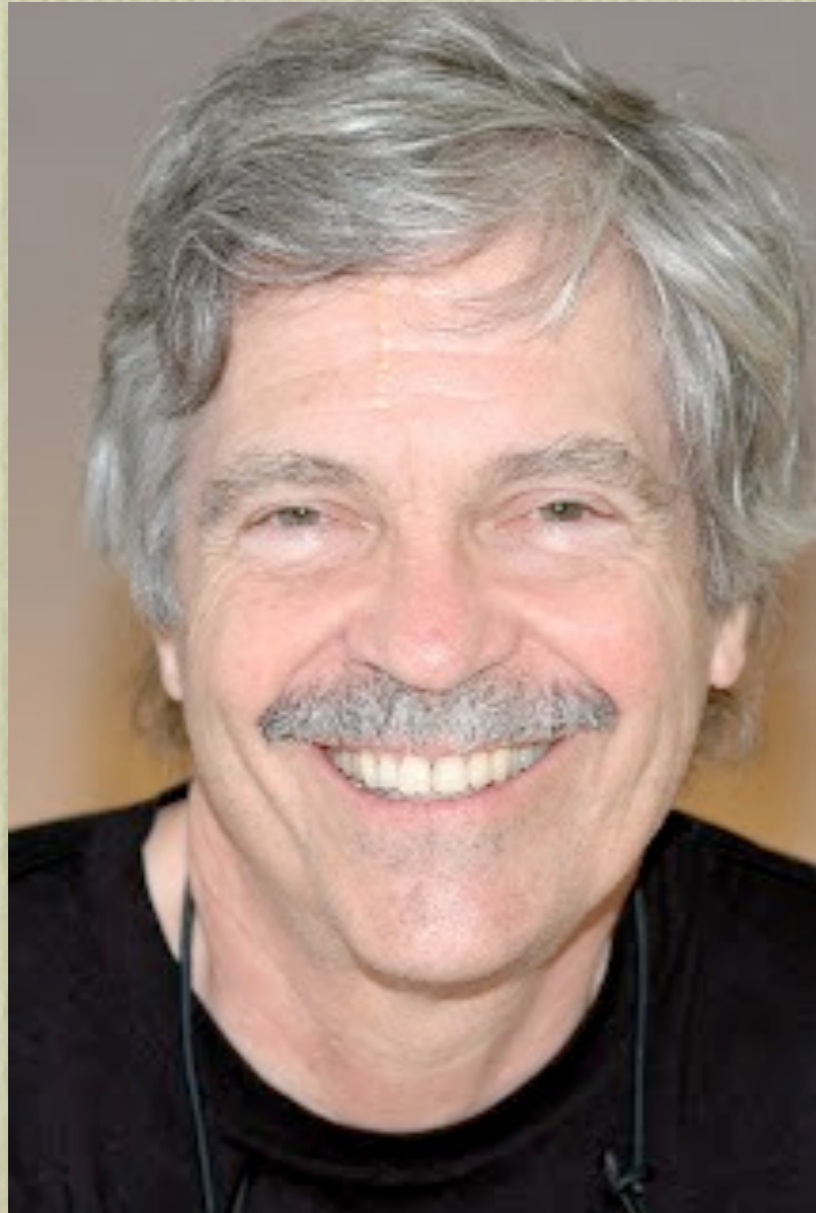# Historical Introduction

Dino Karabeg

This seminar begins with a riddle...

The inventor who marked the computer age

Alan Kay

who was awarded with highest honors

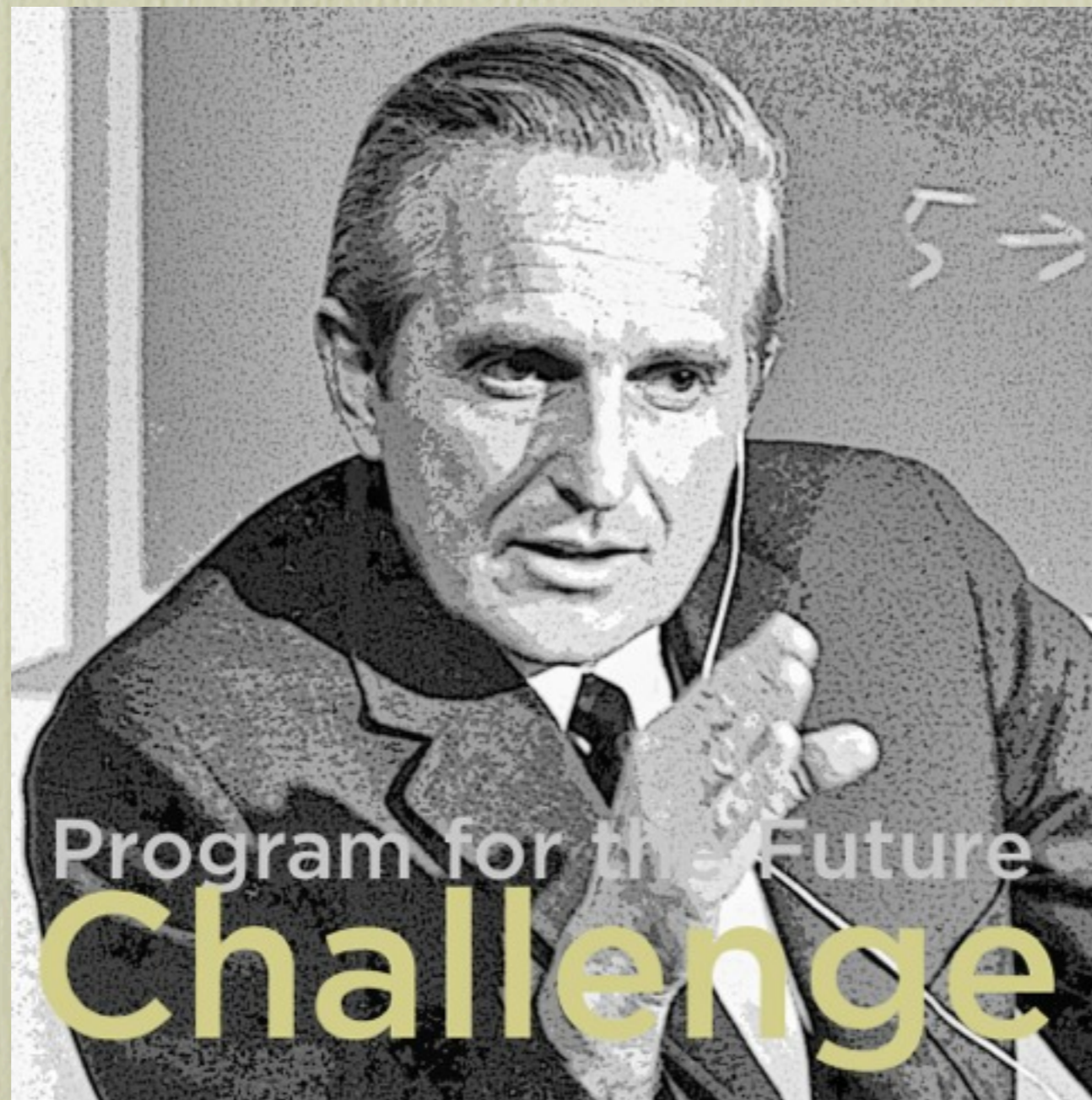ended his life feeling neither successful nor understood

What's the remaining

96.4%

Program for the Future Challenge
Launched Dec. 9, 2013 at Googleplex

The PFTF Challenge extends three challenges called A, B and C

This seminar will explore

- Doug's core ideas and

- their contemporary extensions in order to

- create a perspective on the future of informatics

- and its potential for social impact

From Adams & Lowood interviews

I'd interview a fresh Ph.D. and start asking questions like, "What do you think the strategically most important research factor in your discipline is?" And their jaw would drop, as if they'd never even heard the words, or something. So you began to wonder, what kind of job are their professors doing? Then you realize their professors went through without anybody ever challenging them or getting them to think about it. So unfortunately, a great part of the research community just doesn't make a practice of thinking about the strategic investment in their career.

We will

- study Doug's not yet implemented ideas

- join an international project to complete them

- begin to develop projects of our own

We begin with

- historical introduction

- the 1968 demo

- Doug's main insight

- Doug's core technical ideas

and continue with

- contemporary developments

- project work

Doug's biography

Sources

- Judy Adams and Henry Lowood: Stanford and the Silicon Valley Oral History Interviews

- John Markoff: What the Dormouse Said

- Thierry Bardini: Bootstrapping. Douglas Engelbart, Coevolution and the Origins of Personal Computing

- Doug Engelbart Institute: About Doug Engelbart

Beginnings

- Born in Portland, Oregon on January 30, 1925

- Johnson Creek since the age of 5

- Study of Electrical Engineering at Oregon State College, Corvallis

- Drafted near the end of World War II

- Radar technician in the Philippines

Reading Vannevar Bush's "As We May Think"

As Director of the Office of Scientific Research and Development, Dr. Vannevar Bush has coordinated the activities of some six thousand leading American scientists in the application of science to warfare. In this significant article he holds up an incentive for scientists when the fighting has ceased. He urges that men of science should then turn to the massive task of making more accessible our bewildering store of knowledge. For years inventions have extended man's physical powers rather than the powers of his mind. Trip hammers that multiply the fists, microscopes that sharpen the eye, and engines of destruction and detection are new results, but not the end results, of modern science. Now, says Dr. Bush, instruments are at hand which, if properly developed, will give man access to and command over the inherited knowledge of the ages. The perfection of these pacific instruments should be the first objective of our scientists as they emerge from their war work. Like Emerson's famous address of 1837 on "The American Scholar," this paper by Dr. Bush calls for a new relationship between thinking man and the sum of our knowledge.

From "As We May Think"

There is a growing mountain of research. But there is increased evidence that we are being bogged down today as specialization extends. The investigator is staggered by the findings and conclusions of thousands of other workers—conclusions which he cannot find time to grasp, much less to remember, as they appear. Yet specialization becomes increasingly necessary for progress, and the effort to bridge between disciplines is correspondingly superficial. (...)

The difficulty seems to be, not so much that we publish unduly in view of the extent and variety of present day interests, but rather that publication has been extended far beyond our present ability to make real use of the record. The summation of human experience is being expanded at a prodigious rate, and the means we use for threading through the consequent maze to the momentarily important item is the same as was used in the days of square-rigged ships.

December 1950

- Graduated

- Employed by Ames Research Center

- Engaged with Ballard Fish

- Thinking about the purpose of his life and career

The 1951 epiphany

From <u>Adams & Lowood</u> interviews

I remembered reading about the people that would go in and lick malaria in an area, and then the population would grow so fast and the people didn't take care of the ecology, and so pretty soon they were starving again, because they not only couldn't feed themselves, but the soil was eroding so fast that the productivity of the land was going to go down. So it's a case that the side effects didn't produce what you thought the direct benefits would. I began to realize it's a very complex world. (...) I began to realize the probability of your achieving your goal isn't terribly high, and the probability if you do achieve it that it's a success is low. So, you'd better start learning about that. Someplace along there, I just had this flash that, hey, what that really says is that the complexity of a lot of the problems and the means for solving them are just getting to be too much. The time available for solving a lot of the problems is getting shorter and shorter. So the urgency goes up. So then I put it together that the product of these two factors, complexity and urgency, are the measure for human organizations or institutions. The complexity/urgency factor had transcended what humans can cope with. It suddenly flashed that if you could do something to improve human capability to deal with that, then you'd really contribute something basic. That just resonated. Then it unfolded rapidly. I think it was just within an hour that I had the image of sitting at a big CRT screen with all kinds of symbols, new and different symbols, not restricted to our old ones. The computer could be manipulating, and you could be operating all kinds of things to drive the computer. The engineering was easy to do; you could harness any kind of a lever or knob, or buttons, or switches, you wanted to, and the computer could sense them, and do something with it.

From "Engelbart Hypothesis"

Many years ago, I dreamed that people were talking seriously about the potential of harnessing a technological and social nervous system to improve the collective IQ of our various organizations. What if, suddenly, in an evolutionary sense, we evolved a super new nervous system to upgrade our collective social organisms? Then I dreamed that we got strategic and began to form cooperative alliances of organizations, employing advanced networked computer tools and methods to develop and apply new collective knowledge. I called these alliances Networked Improvement Communities (NICs).

A new beginning

- 1951-55 Doctorate in CS at UC Berkeley

- Acting Assistant Professor at UC Berkeley

- Hewlett & Packard

- Digital Techniques startup

- 1957 SRI International in Menlo Park

- 1962 writes Augmenting Human Intellect: A Conceptual Framework

- 1963 receives funding from ARPA and founds Augmentation Research Center at SRI

From "Augmenting Human Intellect"

By "augmenting human intellect" we mean increasing the capability of a man to approach a complex problem situation, to gain comprehension to suit his particular needs, and to derive solutions to problems. Increased capability in this respect is taken to mean a mixture of the following: more-rapid comprehension, better comprehension, the possibility of gaining a useful degree of comprehension in a situation that previously was too complex, speedier solutions, better solutions, and the possibility of finding solutions to problems that before seemed insoluble. And by "complex situations" we include the professional problems of diplomats, executives, social scientists, life scientists, physical scientists, attorneys, designers--whether the problem situation exists for twenty minutes or twenty years. We do not speak of isolated clever tricks that help in particular situations. We refer to a way of life in an integrated domain where hunches, cut-and-try, intangibles, and the human "feel for a situation" usefully co-exist with powerful concepts, streamlined terminology and notation, sophisticated methods, and high-powered electronic aids.

Man's population and gross product are increasing at a considerable rate, but the complexity of his problems grows still faster, and the urgency with which solutions must be found becomes steadily greater in response to the increased rate of activity and the increasingly global nature of that activity. Augmenting man's intellect, in the sense defined above, would warrant full pursuit by an enlightened society if there could be shown a reasonable approach and some plausible benefits.

The 1968 Demo

1968-1975

- Further development of NLS, time sharing

- Networked version, with University of Utah

- ARPA online library

- Journal, Email

- 1971 Bob Taylor leaves ARPA

- Bill English transfers to XEROX PARC

1976-1986

- 1976 Doug's house burns down

- 1977 Doug is fired from SRI

- 1978 Doug, his lab and the NLS are transfered to Tymshare

- 1984 Tymshare is acquired by McDonnel Douglas; NLS is renamed Augment.

- 1986 Doug retires from McDonnel Douglas

1988-1998

- 1988 Doug and Christina found the Bootstrap Institute (now Doug Engelbart Institute)

- 1992 3-day Bootstrap Seminar at Stanford University

- 1995 Yuri Rubinsky Memorial Award

- 1997 Lamelson-MIT Prize $500 000

1998-2008

- Dec. 9, 1998 <u>Engelbart's Unfinished Revolution</u> Symposium at Stanford University

- Dec. 2000 Bill Clinton awards Doug the National Medal of Technology

- Dec. 9, 2008 40th Anniversary Celebration of Mother of All Demos at Stanford University

- Dec. 8 and 9, 2008 Program for the Future Conference at San Jose Tech Museum and Stanford University

Final years

- 2007 diagnosed with Alzheimer's disease

- January 2008 marries Karen O'Leary Engelbart

- December 2010 second Program for the Future conference

- July 2, 2013 dies of kidney failure at his home in Atherton

My personal recollections

- 2004 first meeting at ECOOP Conference in Oslo

- 2008 First Knowledge Federation workshop

- 2009 second meeting at SRI

- 2009-2010 meetings at Mei Lin's house

- 2011 Knowledge Federation workshop at Stanford University

- 2012 Launching The Game-Changing Game at Future Salon

Reading from "The Revolution in the Valley" to Bill and Roberta English

When Steve Jobs found out about Windows, he went ballistic.

"Get Gates down here immediately," [...] He needs to explain this, and it better be good. I want him in this room by tomorrow afternoon, or else!"

To my surprise, I was invited to a meeting in that conference room the next afternoon. Bill Gates had somehow manifested alone, surrounded by 10 Apple employees. [...] I was just a fascinated observer as Steve started yelling at Bill about violating their agreement.

"You're ripping us off!" Steve shouted. "I trusted you, and now you're stealing from us!"

Bill Gates just stood there coolly, looking Steve directly in the eye, before starting to speak in his squeaky voice.

"Well, Steve, I think there's more than one way of looking at it. I think it's more like we both had this rich neighbor named Xerox and I broke into his house to steal the TV set only to find out that you had already stolen it."