Mike Burrows Access Summary

Michael Burrows, born in 1963, discussed his journey from a grammar school student in London to a prominent researcher at Digital Equipment Corporation (DEC). He detailed his early interest in electronics, his academic achievements, and his pivotal experiences at UCL and Cambridge. Burrows highlighted his work on AltaVista, a web search engine launched in 1995, which initially indexed 10 million web pages and grew to 16 times larger than its competitors. He also shared his medical challenges with CIDP and his subsequent career moves to Microsoft and Google, where he applied his expertise in distributed systems and consensus algorithms. Speaker 2 contrasts the hiring strategies at DEC and Google, noting DEC's meticulous two-day interviews and reliance on letters of reference, which fostered a conflict-free work environment but favored those with certain educational backgrounds. Google's process is described as more fair, with anonymous committees evaluating responses. Speaker 2 also reflects on DEC's legacy, particularly the Alpha Architecture and the Paxos algorithm, which continue to influence modern technology. Despite the financial struggles leading to DEC's acquisition by HP, Speaker 2 expresses sadness over the loss of DEC's research culture and personal satisfaction from their work there, despite later financial success at Google.

Accomplishments

- Worked on Alta Vista search engine, which became the most popular search engine in the 1990s
- Developed indexing library for Alta Vista, increasing performance by a factor of two
- Created a web server 30-100 times faster than the previous one for Alta Vista
- Developed software for Giga Switch ATM and associated network adapters at DEC
- Created a distributed lock server at Google, still in use today

Challenges

- Optimized Alta Vista's performance weekly to handle 10% increase in traffic
- Managed Alta Vista's operations alone for months, working 14-hour days
- Developed privacy measures for Alta Vista logs before launch to protect user data
- Diagnosed and treated a rare autoimmune disease (CIDP) while working on Alta Vista
- Adapted to different research cultures at DEC, Microsoft, and Google

Outline

Michael Burrows' Early Life and Education

- Gavin Clark introduces the interview with Michael Burrows, a former employee of Digital Equipment Corporation (DEC), as part of the 60th anniversary of DEC's first UK office.
- Michael Burrows shares his background: born in Palmer's Green, Enfield, London, in 1963, with a father who was an electrical engineer and a mother who was a secretary.
- Michael describes his family as fairly normal, noting that he was introverted and preferred reading over outdoor activities.

- He excelled in school, particularly in mathematics and physics, and avoided subjects that required essay writing by choosing technical subjects like French, German, Latin, and technical drawing.

Interest in Electronics and Academic Journey

- Michael expresses an interest in electronics but admits he was not a natural maker due to fears of breaking things and injuring himself.
- He gravitated towards calculators and slide rules, which were less risky, and eventually computers.
- Michael attended the Latimer School in Edmonton, a grammar school where he excelled in sciences.
- He initially considered applying to Cambridge for electronic engineering but decided to attend University College London (UCL) instead, where he studied electrical engineering.

First Exposure to DEC Computers

- Michael discovered his interest in computer science at UCL, where he took courses and worked on PDP-11 computers.
- He describes his first programming exercise on a PDP-11, which involved computing primes using the silver Eratosthenes algorithm.
- Michael found the experience slow and challenging due to the need to set instructions manually on the front panel switches.
- He later used PDP-11 assembly language on punched cards, which allowed for easier programming and larger programs.

Transition to Cambridge and PhD Journey

- Michael was offered a PhD position at Cambridge, where he worked with David Wheeler, the first student to do a PhD in computing.
- David Wheeler had invented many fundamental programming concepts, including the Wheeler jump for procedure calls.
- Michael's PhD focused on distributed file systems, and he spent much of his time learning from Roger Needham, who viewed PhDs as apprenticeships.
- Michael also had a summer internship at DEC Systems Research Centre in Palo Alto, which was a significant turning point in his career.

Experience at DEC Systems Research Centre

- Michael describes the DEC Systems Research Centre as a competitive and innovative environment, with notable figures like Chuck Thacker and Butler Lamson.
- He worked on various projects, including Autonet and A and B networks, and the Alpha Development Unit.

- Michael's most productive summer involved optimizing the RPC system for the Firefly workstation, achieving a factor of two improvement in performance.
- He also collaborated with Roger Needham and Martina Bardi on a formalism for describing authentication protocols, which led to another well-regarded paper.

Development of AltaVista

- Michael was involved in the development of AltaVista, a web search engine launched in December 1995, which quickly became the most popular search engine on the web.
- The project was initially proposed to showcase DEC's hardware capabilities, using an Alpha server 8400 as the machine to serve the index.
- Michael and Louis Monnier worked together to build the indexing and query libraries, facing significant challenges due to the large scale of the project.
- The workload increased rapidly, and Michael had to optimize the software weekly to keep up with the growing demand.

Health Challenges and Project Management

- Michael's intense work on AltaVista led to him contracting CIDP, an autoimmune disease, which required medical treatment and significant lifestyle changes.
- Despite his health challenges, Michael continued to manage the project, writing new web servers and optimizing the software to handle the increasing load.
- He emphasizes the importance of privacy and ethical considerations, implementing strict policies to protect user data and prevent misuse of the search logs.
- Michael's dedication and contributions to AltaVista were recognized, and he continued to work on the project until its successful launch.

Transition to Microsoft and Google

- After DEC was acquired by Compaq, Michael stayed until its acquisition by HP but left due to concerns about the culture change.
- He joined Microsoft's new lab in Mountain View, where he worked on various projects, including a web search engine, but found the environment less enjoyable.
- Michael eventually moved to Google, where he continued to apply his expertise in distributed systems and search engines.
- He reflects on the differences between DEC's research culture and that of other companies, emphasizing the importance of hiring talented individuals and giving them the freedom to explore their interests.

Hiring Strategies at DEC and Google

- Mike discusses the meticulous hiring process at DEC, which involved two-day interviews and extensive use of letters of reference to ensure compatibility and a conflict-free work environment.

- The summer intern program at DEC served as a comprehensive interview process, but it was unfair to those who did not attend specific universities, as DEC had established connections there.
- Google's hiring process is described as fairer, with less emphasis on letters of reference and more on structured interviews, where interviewers provide evidence to an anonymous committee for evaluation.
- Speaker 2 notes that while Google's process is fairer, it may not guarantee the same uniformity of quality in hiring compared to DEC's method.

DEC's Legacy and Influence

- Mike reflects on DEC's lasting influence, particularly the Alpha Architecture, which, though no longer developed, is still respected in CPU discussions.
- The Paxos algorithm and the presence of DEC machines among hobbyists are cited as examples of DEC's enduring legacy.
- Mike mentions personal ownership of DEC machines and the role of DEC in enabling important research and discoveries.
- The conversation touches on the continued relevance of DEC's contributions to modern technology and its impact on the industry.

Emotional Impact of DEC's Acquisition

- Gavin inquires about Mike’s feelings regarding DEC's acquisition by HP and the subsequent closure of DEC.
- Mike expresses sadness over the acquisition, noting the competitive history between DEC and HP and the loss of DEC's research culture.
- The reduction in staff at HP Labs and the departure of many researchers are highlighted as additional sources of sadness.
- Despite the financial necessity of the acquisition, Mike acknowledges the emotional toll it took on those involved with DEC.

DEC's Financial Struggles and Final Days

- Mike recounts DEC Compaq's financial struggles leading up to the HP acquisition, including the sale of various divisions to stay afloat.
- The semiconductor staff moving to Intel and the sale of the networking division are mentioned as significant changes during DEC Compaq's final years.
- Speaker 2 describes the company's inability to keep up with financial demands and the impact of the PC and dot-com bubbles on DEC Compaq's viability.
- The conversation underscores the challenges DEC Compaq faced in maintaining its competitive edge and the eventual consequences of its financial difficulties.

Personal Reflections on Career and Impact

- Gavin asks about Mike overall feelings regarding their career journey and the impact of DEC on their life.
- Mike expresses a deep sense of gratitude for their time at DEC, noting the significant personal and professional growth experienced there.
- Despite earning more money at Google, Mike feels that their most impactful and enjoyable work was done at DEC.
- The conversation concludes with Mike reflecting on the reuse of DEC-learned principles in subsequent roles and the lasting influence of DEC on their career.