

DEC: The mistakes that led to its downfall

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In 1987 Digital Equipment Corporation (DEC) was the number two computer manufacturer in the world with its founder being named the “most successful entrepreneur in the history of American business” by Fortune magazine. This paper looks at the later history of Digital Equipment Corporation and asks how an organisation that was so successful in 1988 could sink to become a takeover target for a PC hardware company ten years later. The management styles and company culture have been extensively described in Edgar Schein’s book “DEC is dead, long live DEC” but there is much more to the story. The technology that the company developed and the business decisions made in the development and the direction of that technology had a major bearing on the fate of the company. Many mistakes were made over the last fifteen years of the company’s existence and this paper offers a suggestion as to what those mistakes were.

In this paper, extensive use is made of interviews with people involved at the time as well as material from the Ken Olsen Archives at Gordon College which contain many of the memos that Ken Olsen sent in his long career at DEC. It considers DEC as a case study set in the context of literature on business change and the impact of downsizing. It looks at DEC’s initial attempt to break into the business market for personal computers in 1983, the personalities involved and the competing products that the company developed. There is also an investigation of the Workstation market, DEC’s surrender of leadership and the various architectures that were considered and chosen over the years, in particular the decision to kill various programmes only to resurrect them a few years later. Discussion of the VAX9000 is included and the drain that the product had on the company resources as well as the semiconductor business which also drained the company resources at a time when product profitability margins were being eroded by the technology change that was happening in the late 1980’s. The VAX9000 is compared with it’s follow on system built using a different technology at a fraction of the price and offering comparable speeds.

OpenVMS, UNIX and Windows NT opportunities were also missed due to internal struggles and some management naivety which will be considered in terms of company profits and sales. Also analysis of why the Alpha processor failed when it was years ahead in terms of performance is made, including the potential of Apple using the chip in its new system. The final mistake involved the internet business which is analysed to understand why DEC did not succeed when it was ahead of most other businesses in this sector. AltaVista was the preferred internet search engine of choice in the late 1990’s and many other internet technologies were being introduced by DEC when they lost management focus, not understanding what they had to offer and its potential for the future.

Digital Equipment – What went wrong?

Brief History of DEC

Digital Equipment Corporation (DEC) was founded in 1957 by Ken Olsen and Harlan Andersen with a loan of \$70,000 from American Research and Development led by General Georges Doriot [Ante, 2008]. It built on experience gained from TX-2 work that Olsen led at Lincoln Labs, MIT. The company began by building DEC LAB Modules which were based on the TX-2 concepts.

Olsen himself was born in Stratford, Connecticut in 1926 and held Christian fundamentalist beliefs which were a major influence on the DEC values that Olsen held dear. In 1986 Olsen was named “Americas most successful entrepreneur” by Fortune Magazine [Petre, 1986] marking the pinnacle in his long career at DEC. The Corporation enjoyed strong growth year on year peaking in 1988 when it had its best ever year, but its growth was not without issues. There were a number of testing times as they switched product sets in the 70’s and they were unprepared for the worldwide recession in the late 80’s. There was also a slow recognition of the shift in the computer industry as DEC focussed on IBM’s business in the high end. This was spurred on by the public statement from Jack Shields that

DEC would overtake IBM by 2007. This chasing of IBM resulted in the hiring of a large number of personnel in the mid 80's which in turn resulted in the earnings per employee being 30% less than HP, a company of similar size and customer base to DEC.¹ This coupled with management difficulties and missing some key technological opportunities left the company in difficulties from 1988 onwards.

Downsizing

DEC was forced into downsizing by the reckless recruiting and being caught by the recession and change in direction of the industry. The downsizing at DEC started in a compassionate manner with regard to the employees, driven by Olsen's personal values. Many have commented in feedback to a survey on downsizing conducted in 2008 that the package was very generous, some going as far as saying it was too generous given the problems with the company finances. Even board members when interviewed said that the compensation packages were unsustainable². Analysing the company reports adds weight to this theory, the reduction in staff and facilities resulted in a cost to the company of \$550 million in 1990, \$1.1 billion in 1991, \$1.5 billion in 1992, \$1.2 billion in 1994 and \$420 million in 1996. A total of almost \$4.8 billion in six years covering a reduction of staff of 50%. A simple calculation puts this at a cost of around \$80,000 per employee. Part of the DEC downsizing included the closing of manufacturing facilities and consolidation of these facilities. Although this might have appeared a sensible and prudent move on behalf of the company it resulted in facilities that had just geared up to produce product and achieving best in class, suddenly being relocated to another manufacturing facility. This resulted in a gap in production as well as the loss of experienced production workers. This was one of a series of errors that DEC made during its downsizing.

The first rounds offered voluntary redundancy and early retirement which cost DEC greatly, not only financially but also their reputation for company stability. Howard [1988] looked at the motivation of those who considered early retirement and whether there is in fact a detrimental impact on the company. A number of ex-employees have recalled their joy at being able to volunteer in 1992-94. This led to a loss of valuable skills as the company did little to categorise those who were able to volunteer. Cascio [2002] covered ten mistakes to avoid when restructuring, all of which DEC managed to implement at some stage. Later rounds were across the board cuts with no regard to business requirements for growth, whole departments were sold off to erstwhile competitors together with the staff.

This left a gap in the support of customers products as the escalation path was often no longer available for the service arm of the company. This in turn led to a loss of confidence in the company's ability and future and hit sales. This type of downsizing is not efficient as skills needed for the future are often lost, requiring a round of hiring in extra people and causing a further round of redundancies. Sales organisations stagnated whilst they waited for reorganisation as a result of downsizing. At the same time they went from non-commission to commission based sales. Unfortunately the commission basics were not in place which again led to demoralisation of the workforce. Fifteen years later H.P. is still having problems with the commission tracking software, Omega, used by DEC.³ The manner and increasing rounds of downsizing had a major impact on the company in terms of morale and attitude to management and impaired recovery to a great extent. These issues were investigated by Goodwin [2008] in a paper delivered to the Association of Business Historians conference.

What went wrong?

There were many mistakes in the years prior to 1988 that contributed to the downfall of DEC, some minor, some major but it is the contention of this paper that none of them were serious enough that the situation could not have been recovered by the end of the 1990's with the correct strategy and management. DEC along with many other companies had been on a roller coaster ride through the economic cycles of the previous two decades. Every time DEC had managed to weather the storm without downsizing, Olsen moved his workforce around to compensate and so maintained the company's no layoff policy. The final problems at DEC started in the early 80's but were not

¹ SEC filings of the period

² Interview with Tom Phillips (board member) by Ben Strout, Televerse productions.

³ Article in The Register "HP sued by own sales reps", 10th August 2009 available at http://www.theregister.co.uk/2009/08/10/sales_reps_sue_hp/ last accessed 10/8/09

immediately recognised. This was due to the success of the VAX range which had resulted in increased sales, market penetration and high profit margins. However DEC did not see that the market was changing and they were caught out by the rate of change and the fact that they were successful with the VAX. DEC didn't see their customers moving downward to server based PC computing and were late in the realisation to such an extent that their position was not as a leader in this growth area. They had invested in large mainframe type systems when technology was moving in the other direction. Other startup companies such as SUN grew to take DEC's traditional market and were much more able to develop rapidly without the overheads. The majority of these startups were in Silicon Valley where there was much more mobility of the workforce rather than the more traditional Massachusetts attitude of a single company for life. DEC had hired for their assault on IBM whilst IBM were moving into DEC's services space. This led to DEC having far too many employees doing nothing when there was a downturn. This was a great drain on DEC's finances at a time when margins were decreasing. DEC had approximately 30,000 extra employees than it needed, which at an average salary of \$25,000⁴ was costing DEC \$750,000,000 per year in salary alone, not including the company's contribution to pensions and other employee benefits. Olsen's puritanical ideals led to his wanting to redeploy the extra personnel rather than lay them off, utilising them in other roles although he did agree to substantial layoffs. Olsen had done this successfully before in downturns, however this time DEC had hired the excess personnel recently rather than previously productive workers being redeployed. The board had different ideas to Olsen and wanted even deeper cuts. This led to conflict and eventually the removal of Olsen as the company leader. Olsen was amenable to losing 15,000 but the board wanted more.⁵ According to Tom Phillips, a board member at the time, the board were unanimous in their request for Olsen to step down.⁶

Loss of Doriot and the consequences

The death of General Doriot had a big impact on Olsen and his relationship with the board. Olsen had relied on General Doriot as his management mentor, friend and counsellor. Doriot was also a calming influence on the board and advisor to Olsen. The board itself was very weak and driven by Olsen and Doriot as witnessed by many senior managers spoken to. Many of the board members didn't understand the technology or the business. After Doriot's death Olsen's relationship with the board worsened, he was cut off from many of the activities of the company by his senior management who kept certain things from him. He was working with a board who did not fully understand the DEC culture or market. The board membership also changed bringing in a number of younger members who were not steeped in the old DEC way of working. When the stock price worsened their main driver was to prop up the price quarter by quarter rather than look long term at growth. Eventually in 1992 they appointed Robert Palmer to replace Olsen. The board looked inside the company running a number of secretive interviews with senior managers. One thing they were asked was for a presentation on what they would do to turn the company around. Palmer was a slick presenter, which helped his selection, but had little understanding of the DEC culture. He had been in semiconductor manufacturing for most of his career so it was an odd choice, especially as he didn't have the broad experience of the market DEC sold into. This proved a costly error by the board as, even though Palmer tried, his comprehension of what was required to turn DEC around was lacking. He tried to run the company from the top down paying little respect to the feedback from the field or the existing DEC culture. Downsizing was carried out with little concern for skills and requirements, rather making numbers was the priority. This led to a stagnation of innovation and sales were impacted. Palmer even changed the colour of the company logo to try to signify the new DEC but all this did was annoy the employees and confuse the customers.

DEC had also lost many key employees at critical times that impacted its operations, the main ones being Gordon Bell in 1982 and Dave Cutler in 1988 but there were many others in technical and managerial positions that had an impact. Also a few, such as Edson de Castro of Data General, left to create companies that were to challenge DEC in its traditional market place. Many senior managers left around 1988 to 1992 creating a problem at the executive level in the company. Palmer hired many ex-IBM staff into these senior management positions. This created a clash of ideals as Palmer tried to

⁴ US Bureau of the Census, Current Population Reports, Series P-60, No. 166, *Money, Income and Poverty Status in the United States: 1988 (Advance Data from the March 1989 Current Population Survey)* U.S. Government Printing Office, Washington, D.C., 1989

⁵ Memo in Ken Olsen Archives at Gordon College

⁶ Tom Phillips interview with Ben Strout, Televerse productions 8/27/08.

force a top down management regime on DEC who were used to a more liberal management style. Many of these managers left within a year with large severance packages.

Paul Ross [Ross 2004] suggested that DEC was flying without looking at the readings on the instrument panel. He suggests that Schein [Schein 2003] was only partially correct in his hypothesis that it was a lack of the money gene that brought about DEC's downfall and that it was really a lack of reliable management information that was at the heart of it. He suggested that DEC seemed to lack insight into and an interest in using management metrics of all kinds. Many contacted agree with Ross that there was a lack of management information and this contributed to the problems, especially in the early years of its problems. Olsen recognised there was a lack of accurate budgeting within the company and tried desperately over a number of years to get his senior management to give him realistic budgets for the forthcoming years. His frustration comes out in many of his memos located in the Ken Olsen Archives at Gordon College in Massachusetts.

The PC revolution

Many contend that DEC's problems began when Olsen said that no-one should need a computer in their home. This was a misrepresentation of what Olsen said. He was referring to the computers at the time, these ran large businesses rather than the personal computers we know today. It is the author's contention, and also that of many senior managers interviewed, that the PC business at the time was not right for DEC as the company was not a high volume low profit margin company and there were many others capable of filling that market. IBM found this out to their cost as did many other companies. In its time, DEC had a few opportunities to kill the IBM PC but did not take them. At one time there was a plan to sell a PDP11 based desktop which would have had thousands of applications ready made. Their initial entry into the market failed as they developed systems that were all over-engineered, Rolls Royce systems in a market that was cost driven. When they re-entered the market it took some time to gain momentum but eventually their server products gained market share because of their technical excellence in a sector where reliability was important.

When interviewed, Avram Miller, the project manager in charge of the developing the DEC Professional series, said that when DEC first went into the PC market, they did their usual engineering thing of starting three competing products in different places. This created an air of secrecy where competing groups didn't communicate and so developed to different standards instead of co-operating and using standard components. This in turn brought about the ridiculous situation that the floppy drive was a non standard format and there was no format program available for end users. The company also tried to make everything perfect, driven by Olsens attention to detail in the packaging and presentation area, so they spent days refining the smallest piece, the monitor taking 12 months to complete. This resulted in a machine that was late, expensive and non standard. The system Miller created was the PRO series which ran a custom version of RSX which again would have had many applications at release but the custom version was not fully compatible with RSX11 and also slow. The PRO was eventually used as the front end to the 8800 series of large systems. DEC also attempted to sell via outlet stores, but again this was not a core competency for the company and so failed.

Giving up the OEM and workstation market

DEC in the 1960's and 1970's was full of engineers and managers in their twenties and thirties, dynamic and enthusiastic. In the 1980's these engineers and managers had all aged and DEC's business had moved from the environment where the customer was technically astute to one where they were selling into business areas where the customer was not as computer literate as in the early days. At the same time in the West Coast around Palo Alto, many companies were starting up with dynamic products, young employees and fast development times. DEC didn't realise the danger of ignoring these startups and consequently lost their advantage in the upcoming workstation market. This forced DEC to start a workstation engineering group in Palo Alto to try to regain their market share.

Don Gaubatz⁷ has been an extremely good source of information regarding DEC workstations and the way the market was lost, recaptured and then lost again. One of the major mistakes that the company made was reducing the OEM (Original Equipment Manufacturer) discount and thus driving away many of their loyal VARs (Value Added Resellers) and losing contact with the workstation market by going after IBM. DEC had built its business with the help of OEM's who used DEC computers and added their own peripherals to build systems for end users. In return, DEC gave good discounts to the OEM's. James Utterback [1996] observed that DEC 'dragged it's heels in making an investment in RISC and then did so in a half hearted way' and that 'its large established base of customers and installed equipment presented an obstacle to DEC's making the transition to the RISC architecture'.

Whilst this may be partially true DEC had been at the leading edge of RISC development. There were several projects inside DEC between 1982 and 1985, which researched the RISC area. One was the Titan project was begun as the initial project of the Western Research Laboratory (DECwest) in Palo Alto (California), supervised by Forest Baskett in April of 1982. By December 1985 they had a complete system running UNIX. A second was SAFE (Streamline Architecture For Fast Execution), supervised by Alan Kotok and David Orbits, HR-32 (Hudson RISC 32-bit), located at DEC's factory in Hudson (Massachusetts), supervised by Richard Witek and Daniel Dobberpuhl. Finally there was the CASCADE project at DECwest in Bellevue run by Dave Cutler. Eventually DEC decided to unite on a single architecture and the PRISM project was born in 1985. This was to be DEC's RISC system that would run both UNIX and VMS with Cutler working on the operating system codenamed Mica. The team tasked with developing it were:- Dave Cutler, Dave Orbits, Rich Witek, Dileep Bhandarkar, and Wayne Cardoza.

DEC was being severely damaged in the workstation space by companies such as SUN who already had a RISC system. According to Dr Dileep Bhandarkar⁸ the sales team started to complain about losses to SUN and, along with Carol Peters and Tom Furlong, negotiated a deal with MIPS⁹ for a quick fix. A small team in Palo Alto quickly put together a prototype workstation based on the MIPS chipset in a VAXstation box and demonstrated it to Bob Supnik¹⁰. This ran DEC's version of UNIX, Ultrix and was shown to be very competitive. A recommendation went forward that DEC should build their workstation based around the MIPS chip, which at the time had an aggressive roadmap including a 64bit version. This product was well received and sold well, however it was not capable of running VMS and the roadmap proved to be very optimistic. According to Bhandarkar DEC had the rights to develop their own chips and extend the MIPS architecture. This would have enabled DEC to port VMS to it, however internal politics prevented this. Meanwhile the decision was taken to close the PRISM project in July 1988 even though they had developed it as far as the silicon stage. This decision was taken primarily due to DEC's financial situation. It was a decision that led to Dave Cutler resigning and immediately joining Microsoft with a number of his team and developing Windows NT which closely resembled VMS and Mica. Much of the technology they had been involved with in DEC was transferred into the architecture and code of Windows NT. Ironically, a few months later, Olsen started the project that led to the Alpha at the same time, using the accumulated knowledge and many of the people from the PRISM project. Had he taken this decision earlier, Cutler would have stayed and NT would not be the same.

DEC released the MIPS based workstation in early 1989 and it immediately made a difference to DEC's workstation penetration. DEC delivered a number of variants and they sold well giving DEC

⁷ **Dr Don Gaubatz** – VP of Workstations at DEC, developed Ethernet and disk controllers for the Microvax and ran the workstation team developing products based on MIPS, VAX and Alpha and also the first 3D graphics board for DEC. He is a founding member of the Computer History Museum and on the editorial board of the Microprocessor Report. He also holds a PhD in Computer Science from Cambridge University in England.

⁸ **Dr Dileep Bhandarkar**, joined DEC in 1978 and worked on the VAX architecture, the PRISM architecture, the MIPS architecture and finally the Alpha architecture.

⁹ **MIPS Computer Systems Inc.** was founded in 1984 by a group of researchers from Stanford University

¹⁰ **Bob Supnik VP**, Senior Corporate Consulting Engineer Digital Equipment Corporation June 1977 — June 1999 (22 years 1 month) Multiple positions including: VP of Corporate Research; Engineering Program Manager for Alpha (chips, systems, software); Group Manager of Microprocessor Development. Deliverables include VAX microprocessors starting with MicroVAX II; Alpha, all aspects; and new business/technology opportunities, such as the Palo Alto Internet Exchange and the Personal JukeBox (pre-iPod MP3 player).

market share at last. DEC however did not have sufficient faith in MIPS delivering on their product roadmap and at a high level meeting DEC executives were informed that their fears were correct and the 64bit MIPS chip was very late. This resulted in a change in direction for the workstation developers and a rethink of where the workstation development should be based. The choice was between Palo Alto and Maynard and eventually Maynard won. The move from Palo Alto to Maynard was not popular with the engineers in Palo Alto who were in the West Coast lifestyle and technology scene so most of them took redundancy and moved to competitors. Olsen saw to it that their redundancy package was a good one and many of them now occupy high level roles in West Coast corporations. Initially DEC promised to port MIPS Ultrix to OSF Alpha but later decided that to save costs it wouldn't. This led to the consequent loss of customer confidence in the investment in MIPS based workstations which DEC had built into the number two in worldwide shipments. This decision had even bigger impacts for the company as Microsoft was developing Windows NT on the MIPS workstation from DEC as well as Intel. The first time NT booted was on a DECstation3100 with a customised boot rom. The compile statements for DEC MIPS were still in the NT build as far out as version 4 even though support was dropped almost immediately. Had DEC's commitment to MIPS remained, Microsoft would have delivered NT for the platform creating a new market for DEC and MIPS.

VAX9000

In 1988 DEC had its best ever year with record sales, however this was the year after the stock market crash and recession in the US and Europe. DEC had two parallel development teams working on high end systems, the Midrange group and the High End group. Both these developments were expensive and divisive in terms of engineering rivalry within the company as well as management rivalry. The High End group did something DEC had never done before in that they used three new technologies in their product. This was at odds with DEC's normal conservative product development process and proved costly as delays occurred in development. These technologies were the multi-chip substrate technology inherited from Trilogy, a company they invested in heavily and lost a great deal of money, high-density ECL macrocells and a heavily micropipelined architecture.

The VAX 9000 was DEC's last system not based on microprocessor technology. DEC had invested billions in the creation of the VAX 9000, the 'IBM killer' which was two years late, a dying technology and was released when the world economy was in decline. According to Supnik¹¹, the use of multi-chip substrate technology alone cost the company a billion dollars to build a facility to manufacture them. Ho [1991] presents the design issues that DEC had when working on the multi-chip packaging and suggested that the design could be extended for several generations, illustrating the design team's belief that their product had a future even then. By 1987, according to Bob Supnik¹², it was clear to senior technical people in DEC that the VAX9000 would be overtaken by CMOS technology within a year. Sales of the VAX 9000 were disappointing partly due to the lack of a version of UNIX that was man enough for the system.

Bob Glorioso says, in a paper he wrote later and sent to the author, that he commissioned the UNIX team to build a system for the VAX9000 but they spent the money elsewhere and only came up with a version that supported 256Mb memory. This led to a loss of sales to AT&T of some 100 machines. Sales were also hampered by the recession which meant that companies were not investing in hardware. The engineering committee had advised on a number of occasions that the VAX 9000 should not be built as there was, in their opinion, no way of selling enough systems to recover the investment. By 1991 they had sold a maximum of 350 systems at an average price of \$1.5million recouping less than 25% of the startup costs without even taking into account manufacturing costs. Olsen was advised badly by his senior management team and constantly overruled the proposal to scrap the system. Bob Supnik in the same email recalls that he spoke to Olsen and De Vitry about the power of the NVAX and neither man could understand how a small chip could be faster than the big iron. Olsen was later heard to say 'Do you mean we have spent billions on the VAX 9000 and the NVAX is just as fast?'. In the end the 9000 cost DEC three billion dollars of much needed money at a time when they should have been investing it elsewhere. Uhler [1992] writes that the NVAX and NVAX+ used techniques traditionally associated with RISC microprocessor designs to dramatically improve VAX performance giving DEC a fast RISC type system with an upgrade path to Alpha.

¹¹ Email to D Goodwin 11-March-2009

¹² Email to D Goodwin 11-March-2009

ALPHA

DEC invested heavily in Semiconductor Fabrication Plants (FAB's), \$500Million in the early 90's, Palmer having convinced the board that Alpha volumes would make it profitable. Failure to utilise the FAB's fully meant that they were much more expensive than competitors' facilities to run. This was a result of DEC's proprietary stance and mistaken belief that they were invincible. Had the FAB's been utilised 24hrs a day by alliances with other parties then much of the losses could have been avoided. DEC also failed to secure a second source for the Alpha until very late in it's development.

DEC missed an opportunity with the Alpha to gain market share and visibility in the industry when negotiations with Apple, who were looking for a new chip at the time, failed. Apple engineers were keen to go with the Alpha as were DEC engineers. John Sculley the Apple CEO met with Olsen in June 1991 over dinner to discuss the proposition that the new Apple be based on the Alpha chipset. However Olsen was not convinced of the Alpha technology and still believed that the VAX would be DEC's future. He was not prepared to commit to the deal especially as there were conditions on the technology¹³. Apple went with the power PC and the rest is history. Sculley later said that DEC's board were distressed that nothing came of these discussions and that DEC lost a great opportunity.¹⁴ DEC in fact developed an Alpha laptop which was licensed to Tadpole as DEC's PC manager decided that it was too much of a threat to it's Intel laptop line¹⁵.

The final humiliation on Alpha was the lawsuit with Intel where the settlement sold the FABs and technology rights to Intel for much needed cash even though DEC kept the patents. Alpha was getting rave reviews although its impact in the market was slow due to mismanagement of getting applications ported. Tru64 UNIX on Alpha was beginning to build market share and the majority of internet businesses were based on Alpha technology when the company was sold to Compaq because of its speed and memory addressing capability. With the settlement, Intel also gained access to the ARM technology but were unable to capitalise fully on it as all of the design team refused to join Intel. The ARM chip is now used in the majority of the world's mobile devices.

ALTAVISTA

Near the end, DEC was focussed on the Internet Business, forming an internet business unit and creating some excellent products. Russ Jones [Cronin, 1996] looked at DEC's internet business and its leadership position in late 1994. DEC was the first fortune 500 company to have its own web site when it opened the first commercial home page on the internet in October 1993. They had the majority of the business server market in the internet arena with Amazon as a major customer. When they released AltaVista it was an instant hit and the name went from nothing to worldwide fame in six months being better known than DEC itself. DEC produced the first internet firewall product, the first tunnelling software in 1991 and was well ahead of the competition. When the founders of Google came to DEC with an offer of joining with AltaVista, DEC's response was negative due to a 'not invented here' attitude and senior management preparing for the sale of the company. This was certainly another opportunity missed for DEC. Palmer didn't understand what he had in AltaVista. He didn't understand the potential of the internet, valuing AltaVista at \$0 when the sale to Compaq went through. In 1999 Compaq sold AltaVista to CMGI for \$2.3 billion¹⁶. Bell in his appendix to Schein [Schein, 2003] stated that Internet business products were perfect for DEC, they had all the pieces including servers, software and networking, however they didn't understand how to organise to engage in a new market. In the November 2000 update to the Gartner Firewall Market Magic Quadrant there is a specific reference to AltaVista selling its firewall operation to Axent who appear in the leadership role quadrant. By 2003 AltaVista had fallen into the Niche Player quadrant due to lack of investment. A Gartner report in 1997 talks about the built-in redundancy and features in the implementation of AltaVista that enables it to be a model for E-Merchant and E-Marketplace design. It was a leader in 1997 and an example to others when the internet boom was about to take off, processing over 20 million queries per day. DEC had the lead in this growth area but were sidetracked by a management that did not realise the potential and a

¹³ Email from John Sculley 16/6/2008 to author.

¹⁴ Business Week April 28th 1997 page 94

¹⁵ Roger Hannemann interview with Ben Strout, Televerse productions 8/26/08

¹⁶ Sam Fuller interview with Ben Strout, Televerse productions 8/28/08

desire to sell the company. Sheridan Forbes, director of Marketing for the Internet Business Group, recollected that DEC had the first online store, the first web based election results, the first online city (Palo Alto)¹⁷. Unfortunately DEC, after Olsen had left, had an executive management who didn't understand how many computers would be sold as a result of the web. Forbes believed sincerely that if Olsen had still been in charge DEC would have owned the internet because he understood the relevance whereas Palmer did not.

OpenVMS and UNIX

OpenVMS had, for many years, been a significant generator of profit for DEC. Many wrote at the time that it was outdated and past its time, but it had many features that customers wanted and there were many loyal customers. It had a reputation for its stability and security, VAXclusters were unsurpassed in their technology and they still offer features that many other manufacturers look at with envy. Even though Compaq did not promote OpenVMS and nor did H.P., sales carried on increasing and profit continued to be made. In 2004 OpenVMS sales were growing at 14% without any real marketing. Open VMS is still used today when a stable/reliable/secure system is required. It is one of the few operating systems that have been classed as unhackable by Defcon. Even today there are millions of OpenVMS users in the most demanding environments. Over 90% of text messages pass through OpenVMS systems, many transaction on the worlds stock exchanges pass through OpenVMS still.

Another comment attributed to Olsen was that "UNIX was Snake Oil" whereas what he really said was that UNIX was sold like Snake Oil, promising much more than it really delivered. The press jumped on this statement and the idea that DEC didn't do UNIX was born. UNIX itself was originally written in PDP assembler and ran on most DEC systems. In fact the only systems it ran on in 1977 were DEC PDP's. According to Dr. John C. Kelly at the Spring UNITE Conference, 1995 "In the first ten years of UNIX's existence it only ran on Digital Equipment Corporation machines. That has to be one of the greatest missed opportunities of all time. DEC never capitalized on this. In fact, when AT&T got a VAX computer, an upgrade from the PDP system, Thompson and Ritchie refused to port it, or move it up to the VAX system, because Digital wouldn't support and endorse UNIX". DEC had an on off relationship with UNIX over the years but its UNIX software development team was the same size as the VMS team in the 90's. DEC finally got serious about UNIX and developed an enterprise ready version with its TRU64 system for Alpha which started selling well into the internet market where the power of the Alpha was an asset. Meanwhile it had decimated the workstation market with the contradictory statements about migration paths for MIPS Ultrix users to OSF/1.

The final years

In the final years of DEC, Palmer sold off many of the businesses that were deemed to be 'not core'. These included the printing business that DEC had turned around from a -15% profit into a +9% profit business and a leader in laser printers by 1996. In 1997 the networking business that was leading in the GigaBit switch field which was to form a major part of the internet connectivity was sold to Cabletron. The company's relational database system, Rdb, was sold to Oracle and is still making money, Oracle states on its web site that "Rdb is one of the software industry's most successful acquisition stories". DEC's tape technology DLT was sold to Quantum in 1994. Many other products were also sold resulting in a loss of income and a dilution of the company. The final part sold off were the FAB's which went to Intel after DEC filed a suit for patent infringement. Many believe this was a direct aim of the lawsuit in order to offload the FAB's before the sale. Eventually the company was reduced to a size and technology set that was of interest to Compaq and the company itself was finally sold in 1998.

Summary

To summarise, the main factors that led DEC to seek a buyer in 1998 were the three major investments that they made during the late 80's and early 90's. These were the VAX9000 at \$3 billion, the Alpha development \$500 million in plant alone and the cost of downsizing running into almost \$5 billion. These three factors together with too many employees led to losses and created a situation where Wall

¹⁷ Sheridan Forbes interview with Ben Strout, Televerse productions 8/11/08.

Street didn't have confidence in the company, the share price fell and so the rounds of redundancy increased. Had DEC not reported a loss in 1992 things could have been different; Wall Street did not like Olsen but would have had little to complain about had DEC carried on being profitable. The board might have been a little more tolerant of his ideals and given him more time to turn things around. One area that DEC was driven by the press and Wall Street was the notion that the VAX range was running out of steam. Olsen did not believe this and one of the reasons the Alpha did not sell well at first was that no-one needed the power that it gave. However the NVAX had all the power that users needed at the time, it was marketing that let the company down at the time, trying to sell the Alpha over VAX. Had DEC not driven Alpha so hard initially then many of its loyal customers might have remained, especially if DEC had given a VAX future roadmap including clustered systems to provide any required horsepower. DEC had been through this transition with the PDP to VAX migration so should have been aware of the pitfalls. Memos in Olsen's archives indicate that Olsen understood the importance of the VAX and was cautious about a headlong push for Alpha. This caused him to miss the Apple connection. His reluctance to remove excess personnel created a rift with the board resulting in their asking for Olsen's resignation. Removing Olsen without performing a serious search for an external replacement with a track record and replacing him with Palmer who had little experience of running a business the size of DEC let alone turning it around when in trouble was a major failure on the part of the board. Palmer was later heard to say that he had run out of ideas by one senior engineering manager. DEC sold many profitable parts of its business because they were not considered 'core'. However they were making a profit and so selling them resulted in a loss of income at a time when it was needed. Finally the methods used in downsizing caused great problems for the company and caused stagnation at a time when growth was needed.

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