



Digital Equipment Corporation (DEC): a Case Study of Indecision, Innovation  
and Company Failure

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# 1 Summary in English

The minicomputer began a revolution in the computer industry and was influential in the industry for over twenty years until superseded by client server computing and the personal computer. The subject of the thesis is a case study of how DEC, which was number two in the world in 1988, became a takeover candidate for a PC manufacturer in just ten years. It is a business history that considers the decline from the viewpoint of the decision makers and their strategic choices. We examine whether management indecision or technological leadership played a part in DEC's problems. This thesis considers the part that Schumpeter's Creative Destruction and Christensen's theories on Innovation played in the downfall of Digital Equipment Corporation (DEC) in particular his assertion that it was the rise of the PC that was instrumental in the failure. It also considers Schein's theory of the money gene as the cause of the failure and Saxenien's view that the east coast versus west coast was at the heart of DEC's demise. The study uses a variety of sources including interviews with senior technical and managerial employees, archival material and reports to examine the company history, the ways in which it achieved its success, and the reasons for its downfall. It compares similar computer companies of the time, looking at how they either avoided the mistakes that DEC made or how they fell into similar traps.

This thesis argues that DEC made a number of strategic errors in the 1980s. In particular it considers the failure of its high end machine, the VAX 9000, and subsequent downsizing, DEC missing the rise of the RISC workstation and being late to join the PC revolution as major contributors to its downfall. It examines the technologies that emerged during the period and investigates the hesitation in adopting these newer technologies. We look at whether the problems were caused by indecision, a lack of technological leadership or both. The board removed the CEO in 1992 after which the company went through a number of years of downsizing and stagnation, trying to regain control and direction. The downsizing process undertaken by the company is examined to identify its effect on the company's performance.

In Chapter 2 we investigate the relevant literature on Creative Destruction and innovation in relation to the high tech industry, the rise of Silicon Valley and also the downsizing process at DEC. We also formulate the theoretical framework on which the thesis is grounded. Chapter 3 details the methodologies used in the research of the topic. As this is a case study, multiple methodologies are used. This chapter describes the major tools employed to analyse the company financially and those used to analyse its products and technologies. It also identifies the data sources referenced. Chapter 4 analyses comparable companies that experienced the same issues at the time and investigates why and how some managed to survive when DEC did not. During the 1990s, five main companies dominated DEC's computer marketplace. IBM, HP, SUN, Data General and DEC all faced issues involving the change in the marketplace, reinventing themselves and defining new strategies for growth. Of these, only DEC and Data General failed, although SUN followed some ten years later. Chapter 5 looks at the rise of the company and its innovational products that defined the industry. It briefly details the history of the company from the initial investment by American Research and Development (ARD), examining how DEC introduced its own disruptive technology and then successfully rode the technology waves through the 1960s, 1970s and into the 1980s.

The next two chapters propose the two primary reasons for the failure of the company. Chapter 6 examines the main technical reasons behind the failure, including those products that were costly to the company both financially, and in terms of reputation and personnel. The main innovative technologies that were relevant to the company's success and the impact of Creative Destruction are considered. In this chapter it is argued that DEC missed the technology wave at the same time as the industry was changing and recession was biting. It invested in a product intended to cause serious damage to IBM, when the market was disappearing and DEC was late with its development. It will be argued that DEC missed the Reduced Instruction Set Computing (RISC) market, the PC market and the UNIX market, and focussed on its proprietary VAX system for too long without

developing a follow-on architecture.<sup>1</sup> Chapter 7 is devoted to the downsizing in DEC in the 1990s and the subsequent effect on employee morale and capabilities as well as the impact on the finances of the company. It verifies a number of theories with a survey of ex-DEC staff. We believe that this had a major impact on the company at a time when it should have been rebuilding. It is argued that the manner in which the downsizing was implemented went against all of the popular theories of how to reduce staff without negatively affecting the company, and the result was of major significance to DEC. Chapter 8 is a brief analysis of the financial aspects of the company which, even though it posted a number of negative annual statements, still had a healthy balance when it merged with Compaq. Much of the later financial data is complicated by wholesale sell-offs and plant closures, which make analysis difficult. It is not usual for a business history to cover the financial performance of a company but it is important for this thesis so it can consider Schein's theory of the 'money gene'. In this chapter, the argument is that DEC was always financially prudent, but that Palmer focussed solely on maintaining cash reserves instead of investing for the future. It will be shown that the financial problems the company faced were due to imprudent hiring in the late 1980s and to falling margins. Chapter 9 is the concluding chapter and summarises the findings of the research, suggesting some lessons that could be learned by any company that finds itself in a similar position to DEC.

Appendix A1 has a biographical summary of the main people involved in the rise and fall of the company. Appendix A2 has a list of people interviewed by Strout and myself as well as transcripts of interviews with the board members.

Appendix A3 contains data from the survey carried out to gain feedback from ex-DEC personnel.

Appendix A4 contains data from the SEC filings.

Appendix A5 summarises the papers that were authored and were delivered at the Society for the History of Technology conference in Pittsburgh in 2009 and the World Computer Congress in Brisbane 2010, together with the ABH paper which was published in the journal of business history *Zeitschrift für Unternehmensgeschichte* in 2010.<sup>2</sup>

Appendix A6 contains the timeline of the important events that occurred in the company history and the people who were influential in its growth and decline, as well as a short biography of the key people identified.

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<sup>1</sup> RISC technology will be explained in detail later in this thesis but the following is a short explanation of the significance of Reduced Instruction Set Computers (RISC) in the 1990s. Prior to RISC most computers were driven by a complex instruction set (CISC) where many instructions were carried out in microcode. RISC computers introduced the concept of a reduced instruction set in microcode leaving complex instructions to be constructed by the compilers. This made the computer much simpler to design and test, any changes or additional instructions could then be implemented in the compiler, meaning there would be no need for changes to the hardware in the case of errors or enhancements.

<sup>2</sup> D. T. Goodwin and R. G. Johnson, "DEC, the Mistakes That Led to Its Downfall," [http://www.sigcis.org/files/Goodwin\\_paper.pdf](http://www.sigcis.org/files/Goodwin_paper.pdf); D. T. Goodwin and R. G. Johnson, "Recession, S-Curves and Digital Equipment Corporation," *World Computer Congress conference, History of Computing* (2010); D. T. Goodwin and R. G. Johnson, "The Demise of Digital Equipment Corporation: Downsizing - Cause or Cure," *Zeitschrift für Unternehmensgeschichte* 1(2010).

