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## Computer Systems Development: History, Organization and Implementation

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**Andrew L. Friedman, Computer Systems Development: History, Organization and Implementation. John Wiley, New York, 1989.**

As information managers we use computer systems in our day-to-day work. This book provides background for our dynamic digital data environment and tools. Unlike many classic computer systems texts, the author highlights non-linear aspects of computer systems development, taking a historical rather than prescriptive perspective. The historical perspective provides insights that inform today's work. The history starts with business applications created in the 1950's, develops under the influence of legacy systems, and evolves together with technological and social factors. Friedman states: "If we are interested in understanding how things are likely to change, it is important to understand how things came to be as they are." In the information world, this background material is pertinent to the work of many: computer programmers and information managers, computer center directors and network engineers, technologists and data analysts, researchers and policy makers.

The book is organized into four sections: 1) Background and theory; 2) Phase one and phase two: hardware and software constraints dominate; 3) Phase three: user needs dominate; 4) Prospects and implications. The concept of phases introduces the notion of change and planning over time. In the first part, a rationale for a historical and non-prescriptive approach to computer systems development is given along with a guide to readers. This is followed by an overview of previous approaches to the history of computer systems and the book's own phase model of computerization growth. The second section after discussing hardware and software constraints, introduces strategies for dealing with the software bottleneck. The third section summarizes successful systems development, life cycles, and a phase where user needs dominate. It asks the non-trivial question: Who are the users? The literature on user relations is reviewed and strategies for dealing with user relations are discussed. Throughout the book the concept of 'Agents of Change' is explored. It is noted that each of the approaches to the history of computer systems development has a different fundamental change agent, "a different factor which may be thought of as driving the history, of stimulating long-run changes".

The book concludes with discussion and evaluation of some models of computer systems development. In addition, a set of generalizations from the Phase Model perspective are given: 1) no 'best way'; 2) auto generation of new technology; 3) perception of problems; 4) technology regimes and computer systems technology regime; and finally 5) directions of causality. In the final generalization, both technological and social factors are considered.

For information system designers, technology enablers and end-users, this book provides context – both historical and synthetic. Today we face the difficulty of hearing about techniques implemented that are not widespread but rather exist at a few state-of-the-art sites. Techniques may be understood as

widespread, when the techniques may be described more accurately as potentially widespread or as hoped-for ubiquitous applications. Indeed, it is interesting to note over a two-decade uptake timeframe, the concept of "Agents of Change" traveled from the community - as mentioned by Friedman in this 1983 book - to become in 2004-2007 an NSF Human Social Dynamics funding call proposal category of 'Agents of Change'. Early histories point to hardware, applications, and the labor process as fundamental change agents. Friedman underscores a variety of types of change factors as well as the need to modify recognized drivers.

Friedman outlines in the foreword what he sees as dimensions of computer systems' work for years to come: "The expanded use of information systems also raises major challenges to the traditional forms of administration and authority, the right to privacy, the nature and form of work, and the limits of calculative rationality in modern organizations and society."