Financial benefits of computers

Kleijnen, J.P.C.

Published in:
Management Datametics

Publication date:
1976

In this issue

Financial benefits of computers: a framework
Press release 1. Computer Resources, Inc.
Press release 2. Computing and People '76
Press release 3. GMD publishes reports on ADABAS and IMS

Financial benefits of computers: a framework

Jack P. C. Kleijnen,
Department of Economics and Business,
Katholieke Hogeschool,
Tilburg, The Netherlands

In the following note I should like to provide a framework for the analysis of financial benefits (say, profit) of computers. Applications of computers fall in one of three categories:

(i) *Clerical cost replacement,* e.g. in payroll preparation.

(ii) *Cost reduction* through improved *decisions,* e.g. in inventory management.

(iii) *Gross-benefit generation* through improved *decisions,* e.g. in investment analysis.

Observe that in categories (ii) and (iii) improved decisions may result from better *input data* for these decisions (as a consequence of e.g. data banks with on-line data capture). Better decisions may also result from improved *decision rules* based on scientific models of the process to be controlled (compare operations research, management science).

Computers are used as part of the company's information system (IS). Data on internal (company) events and external (environmental) events are collected, selected (filtered), stored in the computer's memory (data base), and later on retrieved and presented to the user. In categories (ii) and (iii) this data (information) is applied by the user (manager) to make decisions, i.e., to choose among alternatives. These decisions also control the *physical* subsystem which together with the IS, forms the organization. This physical subsystem actually furnishes the products of the company, e.g. steel products and transportation services.

This picture of an IS superimposed upon the physical production subsystem, is well accepted in present literature. What we should like to add is that this IS itself also needs physical actions for the collection, selection, storage, and retrieval of data (e.g. a clerk who has to look up some data in a ledger). We want to associate these physical actions within the IS with category (i), clerical cost replacement by computers. Here the computer can be compared to any other machine that generates physical output, in our case payroll checks, invoices, etc. This output is not needed for managerial decision-making but is required by employees (paychecks), customers (invoices), stockholders (profit-and-loss account) and government (tax reports), etc. Computers are useful here for their role in the reduction of human and physical labor. In decision-making, however, they have an indirect utility, namely improvement of decision-making. Our idea may be compared to Churchman (1972, pp. 210-212) who discusses 'routine data systems' for meeting 'legal and bureaucratic' requirements, versus MIS's for decision-making.[1] A natural consequence of our picture is that the IS needs... an IS to control itself. Little research has done on those aspects that should be controlled by such a meta-IS, in order to make the IS cost-effective. Observe that the effectiveness of computers in category (i) is a classical investment analysis problem (comparison of several alternative production methods with varying degrees of capital intensity). Category (ii) is not really a classical problem for economists or management scientists but remains relatively easy. In this category models can be easily developed for decisions mainly at the operational level. Here the relationships among data, decision rules, and results can usually be modelled adequately. In category (iii), however, the relationships are much more fuzzy, since they do not concern internal relations (within the company) but external relations with customers, competitors and government, etc. Research in this category however, has scarcely been started. A small informal group of industry and university researchers is currently investigating methodologies for the evaluation of financial benefits of computers. Details on this group can be obtained from the author.

1. Churchman, C. W., Management and planning problems. In: *Computers and the Problems of Society,* edited by H. Sackman and H. Borko, AFIPS Press, Montvale, New Jersey, 1972, pp. 209-230.

Press release 1

Computer Resources, Inc., Cleveland, Ohio based lessor and manufacturer of computer disk packs and cartridges, has acquired a majority interest in Constant Data Control of West Palm Beach, Florida. Constant Data Control performs on-site maintenance and refurbishing of disk packs and cartridges out of four locations which include Washington, D.C., Atlanta, Cleveland and West Palm Beach. J. W. Constantino, President of Constant Data Control, was a founder of Precision Methods, Inc. a nationwide disk pack maintenance and repair company. He also has worked for two major disk memory manufacturers. M. H. Emmerich, President of Computer Resources, Inc., says the acquisition of Constant Data Control extends its present ability to offer complete disk pack services to include on-site inspection and minor repairs. Computer Resources, Inc. maintains one of the largest independent facilities which perform complete disk pack rebuilding and repair.

Press release 2

Computing and People '76

The conference aims to present a select set of papers concerned with the human side of computing. The papers have been chosen for their plain language explanation of research and experience relevant to current computing practice. Questions and contributions from the floor will be welcomed.

Brief details

Location
Leicester Polytechnic,
Leicester, England

Dates
20th–22nd December, 1976

Sponsors
Leicester Polytechnic

Programme

Presentations, discussion, and exhibition

Session 1: Human factors in the development of computer systems

Session 2: Human factors in systems design

Session 3: People in computing

Session 4: Social and professional issues

Speakers and Chairmen

M. Adler and D. du Feu, University of Edinburgh; A. H. Bridges, ABACUS; L. Capper, Hatfield Polytechnic; P. L. Cloot, Barclays Bank; L. Damodaran, Loughborough University; S. Donaldson and B. Lee, Huddersfield Polytechnic; K. D. Eason, Loughborough University; G. A. Fisher, Associated British Foods; B. R. Gaines and P. V. Facey, University of Essex; R. J. Geeson, Liverpool Polytechnic; D. L. Hebditch, Online Expertise; F. J. M. Laver; A. Parkin, Leicester Polytechnic; J. Payne, Medical Research Council; G. Penney, National Computing Centre; P. Spurgeon, University of Aston; R. K. Stamper, LSE; T. F. M. Stewart, Loughborough University; R. Turton, Hatfield Polytechnic; M. Weir, Manchester Business School; D. Yeates, British Oxygen.

General information

Registration fee £39, includes conference papers.

Accommodation can be arranged in Halls of Residence or at local hotels.

Further information

The Conference Secretary,
Computing and People '76,
Room W2.21A,
Leicester Polytechnic,
P.O. Box 143,
Leicester LEI 9BH, England
Telephone: 0533 50181, Ext. 2621
Telex. 34429

Press release 3

GMD publishes reports on ADABAS and IMS

The GMD (Gesellschaft für Mathematik und Datenverarbeitung/Mathematics and Data Processing Corporation Limited) is a large-scale research institution funded by the government of the FRG.

In its Institute for Information Systems a project group tests and evaluates data base systems under realistic conditions. The major findings obtained by these tests and a comprehensive analysis of the systems are contained in the series 'Data Base Systems – Investigation Reports –'. The reports allow for a comparison of different systems due to a common frame of reference.

The two reports describing ADABAS of software ag and IMS of IBM are now published in English. The tests of ADABAS were based on version II and III, those of IMS on versions 360 and VS.

The reports include a detailed description of the system features. The advantages and weaknesses of the systems are brought out clearly. Topics that are covered among others are:

- construction of a data base (data structure, data description, initial load)
- use of the system (installation, functions, user orientation)
- privacy, security
- performance
- range and quality of documentation

A further paragraph covers the problems of the integration of the systems into the organization, especially into the computer centre. Other topics discussed are the costs involved in purchase of the systems, the expenditure to be expected as far as personnel and material is concerned (training of users, conversion costs, required hardware and software) and the support by the maker.

Price of each report (2 vols): DM 100.—.

Orders to:

Gesellschaft für Mathematik und Datenverarbeitung,
Abteilung für Informationswesen,
Postfach 1240,
D-5205 St. Augustin 1,
Germany