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# THE CREATION AND OPERATION OF A DATA-BASE SYSTEM FOR ABSEL RESEARCH

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## ABSTRACT

The task at hand is to propose a system of data-base management for the stream of empirical studies anticipated as a result of the Consortium to be held at the 1986 ABSEL National Conference. The stated purpose of the Consortium is to generate a dialogue on an agenda of jointly-conducted research projects addressing relevant, prioritized ABSEL empirical questions. The author finds it somewhat difficult to anticipate the guidelines on which the Consortium members will agree, but it seems reasonable to assume that the outcome will embrace the dictates of "good" empirical research design. Given this starting point, this paper addresses five areas: (1) a general description of a data-base system (DBS); (2) a schematic overview of its components and operation; (3) phased design and implementation decisions which must be made for the ABSEL DBS; (4) specific design details; and (5) auxiliary considerations.

## DESCRIPTION OF A DATA BASE SYSTEM

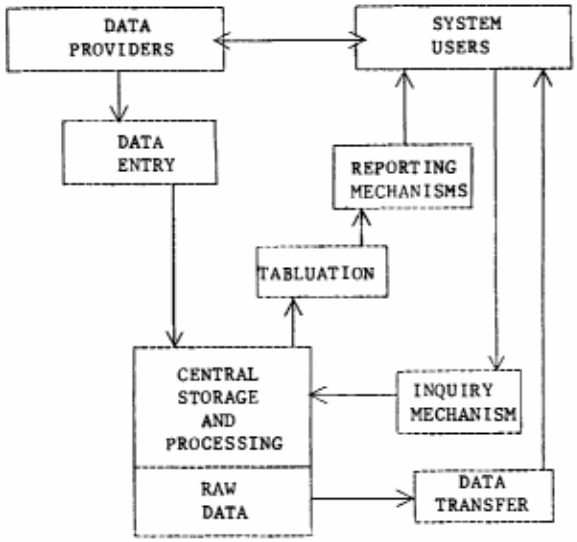
Described succinctly, a data base system is a depository of knowledge. Two interrelated conditions give rise to the usefulness of the depository concept. First, there is the condition that there are many seekers of this knowledge base, each with his/her own specific questions or applications. Second, there is a belief that the aggregation of knowledge will be synergistic. That is, the combining of data and judicious perusals through it will generate findings more powerful than for any single data component. Implicit in the entire notion of a data base system (DBS) is the scientific method wherein a scientist engages in considerable observation; formulates hypotheses of the relationships of phenomena; designs inquiring studies; tests his/her hypotheses; and iterates through the process based on findings. A DBS fits into the observation stage quite well, and it has much potential to provide the raw data for tests of hypotheses if it is designed with this objective in mind. Thus, from the onset the view proposed to ABSEL Consortium members is that in addition to the mechanical pooling of raw data, the ABSEL DBS can serve a valuable service as an evolving depository of research findings, articles, and working papers.

The benefits of the expanded view of a DBS are perhaps apparent, but it seems worthwhile to dwell on them momentarily in this introduction. There are four benefits which accrue directly from a DBS, each of which is relevant to all ABSEL researchers. First, there is the benefit of accessibility. A DBS is a convenient and readily accessible (via computer link-up) store of knowledge. If designed properly, it can greatly reduce literature search as well as provide a ready data base on which to perform hypotheses tests. Next, there is the benefit of uniformity. The data is retrievable in a shape so as to be uniform across different studies, authors, research environments, and so forth. Third, the benefit of generalizability, or external validity, comes about from the breadth of data sources in the DBS. Content analyses of abstracts or analyses of pooled raw data overcome sample constraints on generalizability of findings. Finally, there is the benefit of objectivity. This last benefit refers to the "disinterested" researcher model which we all should embody but which few of us embrace. The separation of the scientist-analyst from data generation helps to ensure objectivity. Certainly all four benefits are sought by our membership, and a device which can deliver them has great appeal.

## OVERVIEW OF THE DESIGN AND OPERATION OF A DATA-BASE SYSTEM

One final section in the way of introduction involves a simplistic schematic of the components and operation of a DBS. Figure 1 offers a basic picture of how the ABSEL DBS is envisioned to operate. The Figure presents an open system of Data Providers, DBS, and System Users. The Data Providers are those researchers who generate data which is fed into the System. The Data Entry mechanism refers to abstracts, digests, or other reformatting of the data to render it compatible with the system's configuration. Depository aspects are the storage and rudimentary processing components of the DES. The assumption in this example is that our Depository will be computer-based; consequently, storage and processing will be limited only by computer capacity and speed. The System Users are those individuals who benefit from the reports generated by the DBS and who make inquiries of their own to have alternative tabulations performed by the system. Alternatively, the System Users may request partitions of raw data and perform separate analyses at their own sites.

FIGURE 1
BASIC OPERATION OF A DATA-BASE SYSTEM




It is important to note that the Data Providers and the System Users are in all probability the same people in our case. At least for the initial phases of the ABSEL DES, it seems highly likely that the individuals who generate data will be most likely to maintain vigilance over its outputs and performance in general. In one sense, this duality of roles is fortuitous as it constrains the frame of reference to

one. In another sense, however, there is the danger of shortsightedness. For this reason, it is important to consider the ABSEL DBS as an ever-evolving tool, designed with the ability to change as the research priorities of its originators and users shift over time.

## PHASES IN THE DESIGN, OPERATION, AND EVOLUTION OF THE ABSEL DBS

This last point introduces the topic of how the ABSEL DBS will develop over time. It seems unreasonable to assume that we will design and implement the perfect DBS at out first attempt. Figure 2 Identifies three phases envisioned for the evolution of out DBS. Phase I commences with the Consortium of interested parties. Hopefully, the outcome will be an agreed-upon mission for the DBS as well as sentiments for the method of DBS design. This initial phase will require the specification of the basic structure of the DES including procedures on how data will be stored, updated, and accessed by Users. It will also necessitate site determination, agreement on operating policies, and the identification of a person or persons who will start up the DBS. Phase II will entail Start-up of the DBS, including procurement of hardware, physical data entry and storage, tabulation procedures, report formats, inquiry mechanisms, and necessary debugging. Ideally, the ABSEL DES could approach the end of Phase II inside of one calendar year. Phase III pertains to an ongoing review and refinement of the DBS as it performs over time.

## PROPOSED PHASE 1 DESIGN OF THE ABSEL DBS

Phase I, System Development, is the only relevant stage presently. It is necessary to assume that the Consortium will yield agreement on the research design requirements of each Data Provider. Beyond this research program which will be accommodated by the ABSEL DBS, there will continue to be the individual research projects of ABSEL members (and others) which should be accommodated by the ABSEL DBS as well. In short, this proposal specifies that our DBS should house two types of research endeavors: (1) Coordinated Research and (2) Ad Hoc Research. The former refers to a host of empirical investigations, guided by the research priorities and dictates of the Consortium. That is, it seems logical to expect data collection to occur across several sites, situations, and business disciplines, but all geared to certain, central hypotheses agreed upon by the Consortium fellows. For instance, it may eventuate that several studies are launched to investigate the relative efficacy of microcomputer sessions across disciplines (accounting, finance, management, etc.) and levels of classes (sophomore, junior, etc.). For these studies, the ABSEL DBS will act as a depository or raw data, allowing pooling and/or partitioning of the various studies while providing primarily the benefits of uniformity and generalizability, not to mention the increased sample size useful in chasing down individual differences and necessary to apply multivariate statistical techniques.

The mechanics of the Coordinated Research DBS will be perfunctory since it is proposed that a mainframe computer statistical analysis package such as the Statistical Analysis System (SAS) or the Statistical Package for the Social Sciences (SPSS) will be employed as the data manipulation and processing software. Both packages allow extensive merging of different data sets, subject to a few common variables. Of course, there must be rules and regulations regarding the orderly entry of raw data into the system. For the present, it seems best to have fairly stringent policies to ensure uniformity and to protect the security of the system. Consequently, the requirements noted in Figure 3 are proposed as examples. Of course, the research priorities of the Consortium need to be spelled out, questionnaires or other measuring instruments coordinated, and study populations decided before the precise coding schemes can be finalized. But, if the essence of the regulations proposed in Figure 3 is adhered to, it seems that the raw data entry aspect of the ABSEL DBS presents little problem.

FIGURE 2
STAGES IN THE DEVELOPMENT OF THE ABSEL DATA-BASE SYSTEM

PHASE I: SYSTEM DESIGN
- -Specification of Fundamental Objectives
- -Identification of Basic Components
- -Consensus on Basic Operation
- -Data Base Configuration Design
- -Data Entry Procedures
- -Storage Design
- -Tabulation Procedures
- -Report Design
- -Inquiry Mechanism Detailed
- -Data Transfer Methods Established
- -Specification of Operating Policies
- -Determination of Location
- -Assignment of Management Responsibilities

PHASE II: SYSTEM START-UP
- -Physical Entry of Data Inventory
- -Installation of Data Deposit Mechanism(s)
- -Installation of Tabulation Procedures
- -Report Prototypes
- -Installation of Inquiry Mechanism(s)
- -Establishment of Data Transfer Devices
- -Installation of Security Procedures
- -Trial Runs
- -Debugging
- -Day--to-day Maintenance

PHASE III: SYSTEM EVOLUTION
- -Establishment of System Review Procedures
- -Review and Refinements of Basic
- --Creation of Task Forces for Redefinition, Redesign, etc.
- -System Redesign
- -Redesign Installations
- -Troubleshooting

FIGURE 3
REQUIREMENTS FOR RAW DATA DEPOSIT INTO ABSEL DBS

A. CARD COLUMN SPECIFICATIONS

| CARD COLUMN(S) | ITEM |
|---|---|
| 1-3 | RESPONDENT IDENTIFICATION NUMBER |
| 4 | CARD NUMBER (ASSUMING MORE THAN ONE PER RESPONDENT) |
| 5-6 | STUDY IDENTIFICATION NUMBER |
| 7-10 | RESERVED FOR SPECIAL DESIGNATIONS |
| 11-80 | RAW DATA |

B. STUDY IDENTIFICATION SPECIFICATION

-Each Data Provider must submit an Abstract (see text)

-Each Data Provider must be a member of the ABSEL DBS Consortium

-Each Data Provider must be identified with a unique code

C. DATA ENTRY POLICIES

-All data must conform to Consortium DBS specifications (to be determined at the Consortium)

-Entry must be granted by the DES Manager

-Entry will be to "TEMP" files only, never to the Master Data base

-Data Providers can download data to TEMP files or request that the DBS Manager do so

D. MISCELLANEOUS POLICIES

-Data Providers must guarantee high quality of raw data (completeness, verification, etc.)

-Reverse-scaled data must be recoded to be negative to positive

The Ad Hoc Research Facet of the ABSEL DES will serve as its narrative alter ego. The model suggested here is similar to other data bases where the information is textual rather than numerical. It is advantageous to maintain a depository of abstracts describing the various research endeavors of subscribers to the ABSEL DBS as well as research performed by nonsubscribers but also relevant to ABSEL subscribers. This aspect of the ABSEL DBS is envisioned as partially complementary to the Coordinated Research as it will contain narratives of specific research studies which become part of the Coordinated Research data base as well as those which do not fit into it but which are also input to the DBS as raw data contributions. Figure 4 offers a structure of the information template which a Data Provider would input to the narrative depository. This template suggests that the author(s) provide an abstract of no more than 50 words which an on-line Inquirer could scan quickly. In addition, the template requires specifics on research objectives, theoretical issues, constructs, operationalizations, statistical tests, and findings which would be pulled up by an Inquirer should he/she desire more detail without seeking out the entire manuscript. Finally, the Locational Parameters would assist those Users who wished to access that study's raw data stored somewhere else in the DBS. The primary benefits garnered by Users of the ABSEL Ad Hoc Research DBS here would be accessibility and objectivity: the Ad Hoc studies data base would be readily available to anyone with computer communications capabilities, and each study could be compared to others or reanalyzed and essentially scrutinized by impartial judges.

FIGURE 4
TEMPLATE FOR REPORT ABSTRACTS COMPONENT OF ABSEL DBS

A. Title of Manuscript

B. Author(s)

C. Author(s) Affiliation(s)

D. Author(s) Address(s) and Phone Number(s)

E. Publication location of manuscript (if any)

F. Narrative Abstract (50 word maximum)

G. Research Design Specifics

1. Research Objective(s)
2. Underlying Theory
3. Hypotheses
4. Operationalizations of constructs
5. Findings:
   a. Statistical Hypothesis Tested
   b. Dependent variables, independent variables
   c. Statistical Test Used
   d. Computed Statistic; Table Statistic; Significance Level
   e. Comments

H. Locational Parameters (system codes to identify the raw data location, if any exits, for this study)

I. Keywords

SOME ADDITIONAL THOUGHTS ON THE ABSEL DBS

This paper has sought to propose a structure for the ABSEL DBS. The proposal is a blend of conceptual structure and some specific suggestions for the mechanics necessary to make the system work for its intended Users. Before parting, some additional considerations should be pointed out. Again, these points are a blend of practical considerations and more thorny esoteric questions. Four issues are

presented here in temporal sequence.

WHAT HARDWARE SYSTEM? Implicit throughout the discussion is the use of a computer system to house the ABSEL DES. The obvious question is, "Which one?" the most likely response is undoubtedly a strong vote for an IBM system due to compatibility with Users' local equipment. Given the increasing ease of communications between different manufacturers' brands, the choice of hardware is less critical with each passing day.

WHOSE SYSTEM? Inasmuch as ABSEL has no budget for this system, and further considering the difficulties in securing private sponsorship, it seems highly likely that the ABSEL DES will exist only under the auspices of some ABSEL member who can convince his/her dean or university officials to donate the computer and other support.

WHO'S RESPONSIBLE? A DBS is only as good as its upkeep allows. If file& are not maintained; errors not detected and purged; reports not generated; Users not oriented and updated; and security not insured, the DBS will diminish in accuracy and value. Attendant to this issue is the question of compensation for the Data Base Manager.

WHO GETS THE CREDIT? The traditional research paradigm expects the researcher to be primarily involved from problem formulation through preparation of the manuscript; however, the DBS concept as it is proposed here opens question of how much credit should be given to a Data Provider when someone else makes a significant discovery through use of the raw data base or of working paper abstracts.

Granted, these are troublesome questions, but they are not insurmountable. For the present, let's agree on the basic structure of the ABSEL DES, wrestle with the practical design and implementation problems, and leave the more philosophical issues until we are certain the DBS works.