THE USE OF DATA PROCESSING SERVICE

CENTERS BY SMALL BUSINESSES

A Thesis

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by

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CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

The small businessman has the constant problem of doing many different jobs, usually not having time enough to do each job thoroughly. This type of business is not able to afford costly non-productive administrative and clerical help to perform these jobs. In many cases, at the present time, the quality of help needed is not available at any price; in other cases the supply of help that will work for small businesses has become non-existent because of better fringe benefits from the larger companies. In effect, the employee benefits given by large companies have eliminated the small businessman from the competition for personnel.

In addition to being more competitive in the personnel market, large companies have overcome the time consuming delays in record keeping, stock control, back-order control, and other information processing through the utilization of automatic data processing systems, thereby becoming more competitive in satisfying the customer's wants.

Many small businessmen have adjusted to these competitive problems by utilizing automatic data processing

service centers. The data processing service centers provide the small businessman with the processing of his data on a fee basis determined by the amount of time it takes to accomplish the processing. Because the cost to the small businessman is for the size of the job done and not for a full month's rental of the equipment the cost becomes feasible.

I. THE PROBLEM

Statement of the problem. The adaptation and use of the computers by large companies to provide fast and economical handling of accounting data, along with making available more complete information in a timely fashion has improved management decision making ability.[1] The computers are now available to the small business- man as an outside service. This is the adaptation of ideas and practices developed by larger concerns by small businesses to improve their management and over- come the problems of old data and insufficient personnel.

The purpose of this study is to investigate the use of data processing service centers by small businesses

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[1]Franklin G. Moore, Manufacturing Management (fourth edition; Homewood, Illinois: Richard D. Irwin, Inc., 1965), p. 11.

in the Kansas City area to determine what, if any,
similarity exists between the uses made of computers by
large companies to the uses made by small businessmen.

II. DEFINITIONS OF TERMS USED

The following terms and words are defined to provide
clarity of thought in this study.

Small Business. The Small Business Administration's
criteria for "small" have been used here. In general,
a small business is independently owned and operated and
is not dominant in its field of operation.[2]

Computer(s). A device with internal storage, be it
core or other type of storage, that can be programmed
internally rather than externally.[3]

On line. In the tele-processing systems sense, an
on line system eliminates the need for human intervention
between source recording and the ultimate processing
by a computer.[4]

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[2]James L. Gibson and W. Warren Haynes, Accounting in
Small Business Decisions (Lexington, Kentucky: University
of Kentucky Press, 1963), p. 2.

[3]Walter W. Finke, "Computers Yesterday, Today and
Tomorrow," Credit and Financial Management, Jan., 1966, pp. 18-

[4]James F. Holmes, Data Transmission and Data Processing
Dictionary (New York: John F. Rider Publisher, Inc., 1965), p

⅄ Batch processing. The accumulation of like data
into large batches for economical or efficient processing.[5]

Data Processing. A generic term for the operations
carried out on computing and auxiliary equipments especially
as applied to business situations.[6]

ᵅ Program. Series of sequential instructions required
for a computer to perform an operation or operations.[7]

Punched card equipment. Units of equipment referred
to as unit record equipment such as key punches, sorters,
collators, etc., that use punched cards as information
media.[8]

Un-structured interview. The stimulus and response
of the formant is left free so that any answer is relevant
and acceptable.[9]

Kansas City area. The metropolitan area that includes
both Kansas City, Missouri, and Kansas City, Kansas; and
the other numerous towns and cities that comprise the
trading area.

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[5]Ibid., p. 8.

[6]Ibid., p. 23.

[7]Ibid., p. 70.

[8]Ibid., p. 71.

[9]John Madge, The Tools of Social Science (London:
Longmans Green and Co., Ltd., 1963), p. 165.

Computer Service Bureaus. A computer service
center sells computer time and may also sell computer-
related services such as problem analysis and programming.
Service bureaus, in terms of ownership, fall into two
catagories -- those owned by computer manufacturers and
those independently owned.[10]

✓ Packaged Programs. The assembly of a composite
computer program or a series of computer programs to
do the data processing. The programs and the selection
are done by the service center, with little or no choice
of composure available to the customer.

III. ASSUMPTIONS AND LIMITATIONS

ASSUMPTIONS

In this study several assumptions must be made.
Since the study is limited to one geographic area and
based on those businesses whose management were willing
to provide the information needed, rather than specific
selections, the findings should be taken as indicative
of what uses are made by small businesses in this area.

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[10]Gordon B. Davis, An Introduction to Electronic
Computers (New York: McGraw, Inc., 1965), p. 482.

It may be assumed, however, if a similar study were to be conducted in another geographic area or with another group of selected businesses that like results would be found.

For this study, the large companies' uses of computers for management information, forecasting, and decision making reviewed in Chapter II will not be investigated, but will serve as the basis of comparison of small business utilization of computers.

It is assumed that the economic theories and principles for the management of small businesses and large companies are the same.

Further, it is assumed that the use of computers by small businesses for statistical analysis or for data reduction beyond normal income and expense accounting transactions is using the computer in management decisions.

LIMITATIONS

This study is limited geographically to the Kansas City metropolitan area. The study is further limited

to a group of service centers whose management were willing to provide the information needed to complete this study.

IV. METHOD OF PROCEDURE

The procedure for the making of this study started with a literature survey which involved the use of William Allen White Library located in Emporia, Kansas, the use of Linda Hall Library located in Kansas City, Missouri, and the Kansas City Public Library, Technical and Business Section, Kansas City, Missouri. From these libraries the background information necessary was secured and the references presented in the study were selected.

The selected references from the review of literature relative to (1) ability of computers to provide management information systems; (2) role and limitations of accounting systems; (3) similarity of management decisions for small businesses and large companies; (4) needs for adequate and accurate information for management decisions; and (5) large company uses of computers; are presented in the study.

The first step in conducting the interviews was to list all the data processing service centers in the Kansas City area from the June, 1966, issue of Computer and Automation magazine, "Rosters of Electronic Computer and Data Processing Service Centers". The list included the name of the executive to be contacted. The list was then compared with the Telephone Directory Yellow Page Advertisements and the Kansas City Chapter of Data Processing Management Association listing of members. From these sources the listing of service centers in the Kansas City area was developed and is presented in Appendix A of this study.

Following the compilation of the list of service centers in the Kansas City area, the necessary appointments were made and the information for this study was obtained by interviewing the service center executives. The result of each interview was transcribed as soon after the interview as possible to retain the maximum value of the notes of the interview. These reports of the interviews of the service center executives are attached to the study in Appendix C.

This chapter has stated that the purpose of this
study was to investigate the use of data processing
centers by small businesses in the Kansas City area to
determine what similarity exists between the uses made
of computers by large companies to the uses made by
small businesses. Following the statement of the
problem are the definitions of the terms used. This
chapter then lists the assumptions and limitations
that have been made for this study, that the study is
limited to one geographic area and limited to those
businesses whose management are willing to provide the
information needed. For this study, the writer made
the following assumptions: that the uses large
companies make of computers for management information,
forecasting, and decision making will serve as a basis
of comparison and will not be investigated; that when
a small business is using a computer for statistical
analysis that they are using it for management
decisions; based on the review of literature presented
in Chapter II.

The following chapters contain the literature that
had been reviewed and the data gathered by the interviews.
Next is the analysis of the data, which attempts to

determine the "state of the art" of small business

data processing uses compared to the uses of computers

by large companies that have their own computers.

Following the analysis of the data is the summari-

zation of the data collected, and the development of

specific conclusions. These include how this technologi-

cally oriented change in the management information

system has altered the concepts of business practices

with possible resultant effects on the business

education.

CHAPTER II

REVIEW OF THE LITERATURE

A review of research within the area of small business management utilization of data processing service centers did not produce any previous studies.

With the introduction of the first computer to be used for commercial processing in 1951 by the U.S. Census Bureau and the subsequent introduction in 1955 by a non-governmental environment,[1] the acceptance and use of computers by large companies has been greater than predicted.

Ability of computers to provide management information:

The introduction and use of computers to relieve business management of repetitive and sometimes tedious bookkeeping chores, to give correlation of large masses of data, and to provide stimulation for the exploration of new ideas has resulted in many changes in managerial techniques and methods.

> Computers add a fourth new dimension today that didn't exist in the past. They are so wonderful and so fast and economical for handling data, making calculations, and printing out results that they do most of the work of payroll accounting, cost accounting, controlling inventories, customer billing, and the handling of receipts. And they calculate answers to complex problems.

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[1] Walter W. Finke, "Computers Yesterday, Today and Tomorrow," Credit and Financial Management, January, 1966, pp. 18-20.

In the past, managers always had to manage from only piecemeal bits of information about the activities of their organizations. Worse yet, the information they got was always old before they got it. Today they can have virtually complete information right up to the minute.

Managers can also let computers solve certain kinds of problems for them. They can put into a computer all the facts relating to a problem and let the computer calculate how different courses of action will probably work out. Then they can choose the best course knowing that it is the best.[2]

These advantages of computers have been used by the majority of large companies to operate and manage. This use has improved their control and by increasing efficiency has improved their competition with other businesses.

The role and limitations of accounting systems.

In a study of accounting uses in small businesses the authors found that accounting plays a large role in decision making of management.

Accounting is one of the greatest factors in motivating management to initiate the decision-making process. Managers commonly have predetermined notions of what constitutes satisfactory accounting results, and if they are dissatisfied with current results, they exhibit a homeostatic tendency to search for improvements. The income statement is particularly important in this respect; if the net income figure falls short of aspirations, new alternatives are sought.[3]

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[2]Franklin G. Moore, Manufacturing Management, (fourth edition: Homewood, Illinois; Richard D. Irwin, Inc., 1965), p. 11.

[3]James L. Gibson and W. Warren Haynes, Accounting in Small Business Decisions,(Lexington, Kentucky: University of Kentucky Press, 1963), p. 114.

The role of accounting and economic logic in making
management decisions has been defined as that of accounting
providing the data and managerial economics providing the
system.

> It is generally recognized that both accounting
> data and logic of economics enter into business decisions.
> Exactly what their respective contributions are or
> what they potentially might be is, however, not clearly
> defined.... Accounting provides the data while
> managerial economics offers a system for handling those
> data in making decisions; such, roughly, is the
> nature of the relationship between accounting and
> economics.[4]

The problems in the application of data that has been
provided by accounting for use by management is the data
being oriented to the past rather than the future, and the
data is very structured by the accounting profession and
regulatory agencies.

> The primary task of accounting is the recording
> of historical events, as opposed to the estimation of
> future, uncertain events. There is a strong tradition
> that accounting should reflect actual incurred costs.
> The accounting profession and regulatory agencies have
> attempted to limit the amount of personal judgement
> by establishing "conventions", "principles", or
> "standards". These "guides to action" govern the
> manner in which data are treated in accounts.

> The managerial economist is less interested than
> the accountant, however, in such historical costs and
> events. He is concerned with future revenues and costs,
> and the impact of decisions on these costs. To the
> economist, it is irrational to permit past costs to
> influence movements toward optimum positions of the
> future.[5]

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[4]Ibid., p. 4.

[5]Ibid., p. 20.

In the same study, the authors made the following statement about the inadequacy of accounting systems for decision making because of improper design.

> The accounting systems are rarely designed to develop relevant data explicitly for internal decision making. On the contrary the systems exist to provide data for external parties (mainly government agencies) and for financial control.[6]

Similarity of management decisions in small businesses and large companies.

The small businessman performs the same functions and makes management decisions concerning these functions very similarly to large companies except for the difference in size.

> The small businessman, however, must perform various functions -- planning, production, scheduling, selling, labor relations, public relations, accounting, etc., -- leaving little time for the necessary ingredient of adequate capital budgeting -- search.[7]

The fact that systematic control of a business need not to be complicated nor need to be expensive is stated by Rodgers.

> Setting aside the notion that systematic control is for giants and only possible at great expense with complicated systems is the first step toward understanding and using effective means of control in all businesses regardless of size.[8]

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[6] Ibid., p. 45.

[7] Ibid., p. 114.

[8] Jack D. Rodgers, Managing the Independent Business, Ed. Lee E. Preston (Englewood Cliffs, N.J.,: Prentice-Hall, Inc., 1962), p. 128.

Need for adequate and accurate information.

In order to overcome the limitations of an improperly designed accounting system that does not provide adequate or timely data Gibson and Haynes have stressed changes that will improve small business decisions.

> We thus stress several requirements for improved small business decisions -- better education in the meaning of the data supplied by the present accounting systems, improved skills in adapting these data to individual decision-making problems, greater attention to the relations between past and future data, recognition of the nonaccounting variables that must be combined with accounting estimates to permit complete analyses, and a fuller recognition of the fundamental economic concepts that are needed for the correct interpretation of the various types of information that are available.[9]

The requirement that accurate information be used in making good management decisions is essential.

> Aside from advantages of location that a firm may possess, or the advantage of having a unique product, or the benefits that it derives from a good reputation (all of which, incidentally, may be due to earlier wise decisions), probably the main determinant of an enterprise's success is the quality of the decisions made by its management. Good decisions alone, however, cannot suffice. They must be implemented. Moreover, good decisions generally cannot be made in the absence of accurate information. Essentially, control of business operations consists of providing means for assuring (1) that decisions result in appropriate operations and (2) that information about operations is generated so that decisions can be made.[10]

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[9]Gibson, op. cit., pp. 126-127.

[10]Rodgers, op. cit., p. 128.

Small businessmen have resorted to the use of outside services to overcome the problems that they have in maintaining records and in securing specialized help.

> The use of outside services in the small business can be of great value in providing specialized services not otherwise obtainable. Through a public accounting firm, management can hire one-third of an accountant, or through a management consulting firm, acquire perhaps one-quarter of a purchasing agent or one-fifth of a marketing research department; and through similar specialized agencies similarly acquire that amount of specialized knowledge needed in the particular business under consideration.[11]

Large company uses of computers.

A very recently published report by the American Management Association that investigated the current "state of the art" in computer applications found that the uses of computers have shifted from primarily a piece of office equipment to the use of a computer as a management tool for a control system approach.

> Analysis of computer information from the standpoint of the participating companies' applications verifies the well-known fact that routine clerical applications are in common use. But it also points out that sales analysis and inventory control now outnumber accounting applications.

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[11] John T. Wheeler, Managing the Independent Business, ed. Lee E. Preston (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1962), p. 296.

In order of frequency, the companies participating in this study have the following applications:[12]

Function:	No. of Companies:
Payroll	247
Sales Analysis	235
Inventory control	211
General accounting	197
Billing and invoicing	195
Cost accounting	188
Accounts receivable	183
Accounts payable	152
Personnel	136
Production control	133
Production planning	128
Shipping--distribution	106
Sales planning	95
Purchase--ordering	89

The computer in the hands of large companies has changed the management of the companies since it has become the tool to provide the means to make the management sciences and techniques work. When a company makes EDP the management tool for information the data processors and systems functions are normally united.

Companies which adopted the computer as a piece of office equipment have found that EDP is not easily relegated to the accounting department. Corporations which purchased the computer to serve as a management tool without first analyzing their needs have found their problems maximized rather than minimized. Many

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[12]M. Valliant Higginson, Managing with EDP A Look at the State of the Art,(New York, N.Y.: The American Management Association, 1965), p. 111.

of the basic issues relating to data processing have been revealed as basic issues of management -- for example, what kinds of information are needed to run the company; what are the critical areas of the business; how much emphasis should be placed on planning; how closely should the company be controlled; should the organization be centralized or decentralized.

As a result, some companies have allied EDP with their corporate control or planning functions, some have converted it to a "management information system", and some have linked it with management engineering or consulting services. In some corporations, data processors report to systems managers; in others, the reverse is true. But there are few instances in which the functions are separate.

Thus the fields of data processing and management sciences have merged and the techniques of the latter, which made little headway as "systems and procedures" and "operations research", have gained a new impetus. And since computers are being used to perform the work of companies rather than merely to solve problems, it seems likely that EDP, and management science, are here to stay.[13]

The literature reviewed for this study has noted that the Electronic Data Processing (EDP) system provides a valuable tool in improving management decisions by providing adequate and accurate information. The literature has shown, in addition, the capability of an EDP system in implementing and overcoming the limitations of an accounting system. The review further identified the use of outside services by small businesses for overcoming record maintenance

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[13]Ibid., p. 25.

problems and in securing help that they are not able
to otherwise obtain. The use of data processing service
centers as an outside service is one of the helps
available to small business managers.

The following chapters of this study present the data
gathered from the interviews, the analysis of the data, and
the summary, conclusions, and recommendations of the study.

CHAPTER III

THE INTERVIEW RESULTS

In order to secure the information needed for this study, interviews of executives of service centers in the Kansas City metropolitan area were made. The interviews were to determine the type and nature of data processing services provided to small businesses. Executives interviewed represented all the service centers in the Kansas City area who were willing to cooperate in this study. The list includes, but is not limited to, the service centers listed in the "Roster of Electronic Computer and Data Processing Services", in <u>Computer</u> <u>and</u> <u>Automation</u> magazine of June, 1966.

Because of the relatively small number of service centers in the Kansas City area no attempt was made to utilize statistical sampling. Also, the use of sampling techniques were eliminated because of the anticipated possibility that some firms would not be able to cooperate in this study because of the nature of the data.

Unstructured interviews were used to gather the data for this study. The use of structured interview or questionnaire would tend to restrict the responses of the interviewee limiting significant data that would be of value to this study.

From the executives interviewed attempts were made to secure the names of executives of the small businesses that are using the service centers in order to gain the customer's attitudes and expectations of the use of the service centers. The small business executive interviews were not conducted due to the refusal of the service center executives to divulge the names.

Since the service centers are providing packaged program services to their customers it is the opinion of the author that interviewing customer executives would not provide the information desired by this study. Because the packaged program is not changeable to provide additional special analysis of the customer's data, the information about the customer's evolution of the use of data processing could not be determined.

The customer banks were not interviewed since the packaged approach again limited the amount of information about the management decisions that could be gathered.

In general, the interviews were conducted to answer the questions outlined in Appendix B. Each interview was conducted at the convenience of the executive interviewed and on the average took approximately two hours. After completing each interview with a management executive of a service center a narrative report was written covering

the interview. Each report is presented in Appendix C.
In this chapter the data found is presented in summary form.

There are three different types of service centers
available to Kansas City small business management. The
largest group of available service centers are the data pro-
cessing centers of banks. The second group of service centers
are those owned by the data processing equipment manufacturers,
while the remainder of service centers are those companies
organized for data processing work. The data gathered from
the interviews will be presented under the ownership
designations of Bank Service Centers, Equipment Manufacturer
Service Centers, and Independent Service Centers.

I. BANK SERVICE CENTERS

The data processing service centers in banks were
developed to provide income for the data processing
operation of the bank to offset the high costs of machine
and personnel so that the bank could do its own data
processing. The typical service offered by banks seems
to fall into these general catagories: the processing of
accounts for other banks; work for corresponding and
associated banks, sometimes a requirement to improve the
business's records to secure a loan; and to provide service
for their customers.

The service centers in banks provided the same packaged programs for their bank customers that they used to process their own data. The largest volume of processing by the banks is that of demand deposit accounting. All bank service centers use Magnetic Character Imprint Reading equipment, but one center is in the process of adding punch tape equipment. In addition to the processing of other banks' data, bank service centers do work for other business customers. The most common function they do for these customers is accounts receivable billing and analysis. Payroll accounting is another popular service offered by most of the bank data service centers. The banks have also developed additional services for their customers. Examples of these are an accounts receivable accounting system for hospitals, National Defense Student Loan collection and accounting service, and a construction contractor cost control program. Significantly, none of the bank service centers offer an inventory control program, nor do they offer accounts payable programs; in addition, none provided a complete accounting and general ledger program. The executives interviewed stated that they encountere the lack of understanding of the systems approach necessary for automated data processing by their customer executives.

It was the opinion of the bank service center executives
that the customer executives were not able to analyse their
own business operations in the light of a total systems
approach.

The executives of older bank service centers interviewed
expressed the fact that they had tried to provide any-type
service their customer desired in the beginning and had to
stop because the center was losing money. They all have
changed to a few specific packaged program services. In
this same area it was noted that the newest bank data
center has expressed the willingness to do any and all
services that the customer would want.

The bank operated service center executives all
stated that the writing of a program for a service customer
was expensive. The exact expense varied with the service
center and the complexity of the service to be provided
from ten thousand dollars to over twenty thousand dollars.
It may be significant that the Kansas City banks have been
very reluctant to do a complete analysis of their own
total operations, but have been primarily interested in
the use of the computer for those jobs that are high volume.
The banks are starting to consider the development of a
systems analysis of their own operations.

The six bank owned service centers interviewed for

this study used IBM equipment predominantly. Four of
the service centers used IBM 360 computers, one bank
had a Burroughs computer, and one bank had a National
Cash Register Computer.

Table I on page 26 shows the data processing
services performed by the six bank owned service centers
in the Kansas City area. All the six bank service centers
do the same demand and time deposit operations for other
banks that they do for themselves. The next most frequently
offered services to customers are accounts receivable billings
and payroll accounting and paycheck writing. Half the bank
service centers, three, do cost allocation work, normally
in conjunction with payroll accounting. Only one bank service
center, not always the same one, does the remaining work
of savings and loan bank accounting, hospital accounts
receivable system, National Defense Student Loan collection,
Service Personnel Allotment Disbursement, and freight billing
control accounting.

TABLE I

THE NUMBER AND TYPES OF SERVICES PERFORMED
BY SIX BANK SERVICE CENTERS IN THE
METROPOLITAN KANSAS CITY AREA

Demand and Time Deposit Accounting	6
Accounts Receivables / Billing / Analysis	5
Payroll Accounting and Paychecks	5
Cost Allocations	3
Savings and Loan Bank Accounting	1
Hospital Accounts Receivable System	1
National Defense Student Loan Collection	1
Service Personnel Allotment Disbursement	1
Freight Billing Control Accounting	1

TABLE I

THE NUMBER AND TYPES OF SERVICES PERFORMED
BY SIX BANK SERVICE CENTERS IN THE
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Demand and Time Deposit Accounting	6
Accounts Receivables / Billing / Analysis	5
Payroll Accounting and Paychecks	5
Cost Allocations	3
Savings and Loan Bank Accounting	1
Hospital Accounts Receivable System	1
National Defense Student Loan Collection	1
Service Personnel Allotment Disbursement	1
Freight Billing Control Accounting	1

II. EQUIPMENT MANUFACTURER SERVICE CENTERS

The data processing equipment manufacturer operated
service centers provide full systems data processing. These
service centers provide packaged program services for
inventory control, accounts receivables, and general ledger
accounting. The Univac center, that has a new manager, is
in the market for any data processing business. They will
do batch processing of one-shot overload type work in
addition to complete, full systems processing. The Kansas
City branch of Service Bureau Corporation, a subsidiary of
IBM, has progressed to the position of doing a sub-system
or complete system package. They refuse to do any more
one-shot overload type of work. Service Bureau Corporation
is selling and promoting the full systems data processing.
They offer their customers a complete service, including
a systems analysis of the customer's business, then design
and implement the data processing system found to be needed.
Thus, they overcome the customer's lack of systems knowledge.
Generally, they found that their customer executives did
not know systems concepts. Service Bureau Corporation did
not find programming costs to be expensive. The reduced
costs were attributed to better personnel, who were better
trained in systems and programming. The more capable
personnel were not just program coders that many other
service centers used for this work.

Univac Data Processing Center has a Univac computer. Service Bureau Corporation was the only service center in Kansas City area with more than one computer. They have one IBM 360-30, one IBM 1460, and one IBM 1401.

Table II on page 29 shows the services that are available in the Kansas City area to small business customers of the equipment manufacturer owned service centers. Both of the service centers perform full systems data processing, inventory control, accounts receivable billing and analysis, accounts payable accounting, and statistical analysis work. Only one center will do punch card machine work and overload one-shot data processing.

TABLE II

THE NUMBER AND TYPES OF SERVICES PERFORMED BY
TWO EQUIPMENT MANUFACTURER SERVICE CENTERS
IN THE KANSAS CITY METROPOLITAN AREA

Full System Data Processing	2
Inventory Control	2
Accounts Receivable / Billing / Analysis	2
Accounts Payable	2
Statistical Analysis	2
Punch Card / Machine Work	1
Overload / One-shot Operations	1

III. INDEPENDENT SERVICE CENTERS

The independently owned service centers provide the largest variety of EDP services for the small business customer in the Kansas City area. The services provided range from batch processing of one-shot overload work by two service centers to full systems data processing. The independent service centers also provide full general ledger accounting data processing, inventory control, accounts receivable accounting and accounts payable accounting.

One service center, Automated Data Service Company, limits their work to only accounts receivables and associated sales analysis. They provide the billing services and do analysis of the sales by any variables the customer may desire.

Another service center, Statistical Tabulating Corporation, provides any amount of data processing service their customer desires. A unique service they furnish is the development and printing of mailing lists and labels by EDP.

The Charles R. Overfelt Company, Inc., is best known in Kansas City for EDP work in inventory control. Actually, they are doing full data processing for any service the customer desires, from batch type one-shot overload work to full EDP systems work. They also provide the only data-link from the customer to the service center encountered by the

author in the interviews for this study. A stock broker customer is connected by data-phone to the service center for transmission of data and return of the reports. The Overfelt company is moving into complete data processing systems work and doing less one-shot processing. The executive interviewed at Overfelt stated that he thought the costs of doing programming for a customer were not nearly as expensive as stated by the bank service centers. The difference was attributed to better personnel, the use of systems oriented programmers, not program coders.

Another unique EDP service center interviewed was Midwest Research Institute. Although this service center is providing only business service for one customer, at the time of interview, they have done feasibility, operations research and other simulation studies. Because of the scientists and research personnel on the staff of this Institute, the data center does, or has done, practically all types of business and scientific data processing.

The independent data processing service centers use packaged programs, and in cases of one-shot overload work they can use the customer's programs. The systems analysis and program development are done by the service center, thereby overcoming the customer's inability to perform this function. The independent service centers all used IBM equipment. The smallest computer used was an IBM 1401 with

4,000 core at Automated Data Service Company, while the others used IBM 360 computers. No independent service center had more than one computer. Charles R. Overfelt Company, Inc., was renting time on a bank IBM 360-30 computer and had ordered an IBM 360-20 computer to expand their capacity.

Table III on page 33 lists the services available to the small businessman in the Kansas City area at the four independently owned service centers. The only service available from all four service centers is accounts receivable billing and sales analysis. This is because one independent service center does only this type of work. The remaining three service centers perform processing of the customers' data for payroll accounting, inventory control, accounts payable, cost allocation, and full data systems processing. Only two of the independent service centers expressed a willingness to do punch card machine work and one-shot overload processing, while only one independent service center stated that they prepared mailing lists and labels, and only one service center did operations research, simulation, and feasability studies.

TABLE III

THE NUMBER AND TYPES OF SERVICES PERFORMED BY
FOUR INDEPENDENT SERVICE CENTERS IN THE
KANSAS CITY METROPOLITAN AREA

Accounts Receivable / Billing / Sales Analysis	4
Full System Data Processing	3
Accounts Payable	3
Inventory control	3
Payroll Accounting	3
Cost allocation	3
Punch Card / Machine work	2
Overload / One-shot processing	2
Mailing Address Lists and Labels	1
Operations Research and Simulation	1
Feasability Studies	1

In summary, the data gathered from the interviews of data processing service center executives in the Kansas City area found that the small business executive has the choice of three different types of service centers. Although the ownership of the service center may be a bank, or a data processing equipment manufacturer, or an independently owned company, all of them used their own developed package of programs to process the data. Again, despite the service center ownership, the executives interviewed stated that the small business executives they came in contact with were lacking in knowledge and understanding of the systems concepts necessary for data processing applications. This lack is reflected in the service center developed packaged programs provided by all centers and systems analysis provided by some service centers.

The bank owned service centers stated that program development and writing was expensive, while the remainder of the service centers did not find this to be true. The bank service centers provided limited and specified services, where the other service centers provided any accounting type service plus full systems data processing. The number of service centers that provided batch type one-shot overload data processing was limited to three service centers, and one of these preferred not to do this type of work.

The predominant equipment used is IBM, and the most popular computer is the IBM 360-30 model. Only one service center had more than one computer; that is the IBM subsidiary which has three computers.

The next chapter will present an analysis of the data that has been gathered by this study. Following the analysis of the data is the summarization of the data collected and the development of specific conclusions. These include how this technologically oriented change in the management information system has altered the concepts of business practices and possible resultant effects on the teaching of business practices.

ANALYSIS OF DATA

The first chapter stated the problem to be investigated
by this study and defined the terms used; in addition, the
procedure for conducting the study was stated in Chapter I.
In Chapter II a review of related literature was made to
establish the feasibility of small business use of data
processing service centers. Chapter III is the presentation
of the data gathered from interviews of twelve service center
executives in the metropolitan Kansas City area. In this
chapter the data presented in Chapter III is analyzed. The
analysis considers the following sections; cost, types of
services offered, and problems encountered.

I. COST

The service center executives interviewed had different
opinions of the cost of providing data processing service
for a customer. The bank service center executives found
that the costs of development of individual programs, which
required a system analysis, was too much for their customers
to afford. Therefore, to make data processing feasible for
the bank service center customers the costs have to be spread
over many customers by the use of specific packaged programs.
The non-bank service center executives did not agree with

this opinion. They felt that the cost of analysis was not too great, due to their more capable employees. This difference in opinion of the costs to the customer is reflected in the services they provide. The bank service centers provide selected packaged programs of services while the other service centers promote and provide full systems service available from a wider variety of packaged programs.

II. TYPES OF SERVICES OFFERED

Both bank service centers and other service centers have changed from any-type service to a packaged program approach as they gained experience in providing customer services. The development of the packaged program approach has been defended by the executives interviewed for numerous reasons. In the processing of bank data the natural pattern would be for packaged programming to develop because of the structured requirements of the cognizant regulatory authorities, which would be the same for all banks under the same authorities. In effect, the structured requirements have produced the same processing by all bank service centers of bank data. The only variation noted was the method for the removing of stop-payment checks from processing.

The problems of system analysis of the customer's operation, the resultant time consuption, and the cost to the service center already discussed, has strengthened the package approach. With a package of services the center can detail the services they will provide their customer and can give the customer a firm, fixed price. Although two service centers stated they were individualizing each job, on further probing of the answers the author feels they are actually choosing from existing packages the parts that fit each customer. While this choice may result from the service center's systems analysis, in the author's opinion this is really a package approach and more a case of semantics than a case of individual, tailor-made systems. However, the interviews showed that the non-bank service centers are doing full systems data processing.

III. PROBLEMS ENCOUNTERED

The service center executives interviewed have expressed the constant problem of having to educate the small business manager in the systems approach. This problem of the lack of systems understanding is overcome with two different approaches by the Kansas City service centers. The first approach is for the service center to determine what information is needed from the data

in certain standard business operations such as accounts
receivable, and to design a specific package program to
provide that information. The second approach is for the
service center to perform a systems analysis of the customer's
business. From this analysis the center determines what
information is needed by the customer. The center then
selects the parts of existing package programs that are
appropriate. In both instances the service center takes
the initiative.

Summary of Analysis. In the data gathered by inter-
views of service center executives it was found that the
service centers in the Kansas City area were owned by banks,
equipment manufacturers, or independently owned. Despite
the difference of ownership there were many similarities
in the problems executives faced in providing data processing
services for small business customers.

The bank owned data processing service center executives
interviewed expressed the problem of the high expenses of
systems analysis, program writing, and program developing.
The non-bank service center executives interviewed stated
that they do not find systems analysis and programming to
be nearly so expensive.

The bank owned service centers do not provide full
systems data processing, only selected packaged programs.

The non-bank service centers provided full systems data
processing, and a wide variety of services.

The lack of understanding and knowledge of the
systems concepts by small business executives was noted
by all the service center executives interviewed. The
offering of a service center designed package program and
the making of a systems analysis of the customer's business
were two methods of circumventing the small business customer's
lack of systems knowledge.

The next chapter will give the summary, conclusions
of this study, and the recommendations that automated data
processing service center use by small businessmen has on
the teaching of business subjects.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The small business adaptation of large company developed ideas and practices of computer use to improve their management and overcome the problems of old data and insufficient personnel by the use of data processing service centers was investigated by this study to determine what, if any, similarity exists between the uses made of computers by large companies and the uses made by small businessmen.

I. SUMMARY

The small businessman in the Kansas City metropolitan area has the choice of many service centers for his data processing. The service centers are owned by banks, equipment manufacturers, and independents. Although the service center ownership differed, the study found that similarities existed in the data processing services provided.

The bank service center executives were all of the opinion that the expenses of making a systems analysis of the customer's operation and the subsequent program development were too much for their business customers to afford. The non-bank service center executives did not

agree with this opinion, and stated their costs were less because of more qualified personnel.

The bank service centers offered their customers certain specified packaged programs. In the case of other banks, the customer was offered the same data processing package the service center performed on its own data. For their other business customers the bank service centers offered a specific packaged program, such as accounts receivable accounting, or payroll accounting. The bank service centers did not offer a full data processing system to their customers. The non-bank service centers offered a large and varied amount of data processing services. They provided from individual accounting functions, such as accounts receivable, accounts payable, inventory control, to a fully automated data processing system. In addition, some of the non-bank service centers would make a complete systems analysis of the customer's operation and design and provide the complete package of data processing system. In either case, the specified package service of the bank service centers or a full data system of the other service centers, the service center selected and designed the data processing program, not the customer.

All the service center executives interviewed stated they had the problem that the customer executives did not

understand the systems concepts and were unable to make
a systems evaluation of their own business operation.

II. CONCLUSIONS

The conclusions presented here are based upon the
literature reviewed and the data given subjectively by the
twelve service center executives interviewed in the
Kansas City area. It may be reasonably assumed that
similar situations exist in other metropolitan locations
in the United States. However, no claim is made that the
findings any conclusions presented here are applicable to
any circumstances other than those immediately involved.
It is assumed that, in general terms, the results of this
study constitute valid evidence of the applications
available to and the uses made by small businessmen of
service centers.

On the basis of the findings in this study the
author concludes that:

1. The application of automated data processing to
a small businessman's operations does entail costs for
systems analysis and program development.

2. The small business executive has the choice of
service centers with different ownership in the Kansas City
area. The choice not only involves the type of ownership,
but also involves the types and amounts of data processing

services provided by the service center. This may become a problem to the customer should he start with one center and then desire more data processing, which the center does not provide. The other extreme is possible also, in that the customer may become involved in a full data system before it is wanted or needed.

3. The lack of knowledge by small business managers of systems analysis and the systems approach is a basic problem. This lack of knowledge and understanding of the systems concepts makes the optimum use of data processing more costly and delays utilization of the services. This problem impedes small business managers in the application of data processing because they either must accept an outside specialist or consultant's opinion, or not know if they are being provided good service or getting the most return for their expenses.

4. A possible similarity may exist between the uses made of computers by large companies to the uses made by small businesses in the Kansas City area. The reason that the extent of correlation could not be determined was that the small business executives' names were not divulged. Therefore an investigation of their use could not be made. In addition, the small business customer does not control the content of the data processing programs done

by the service centers. This has resulted from the use of packaged programs by the service centers which would seem to hinder the natural development from basic accounting data processing through the full range of management information systems.

III. RECOMMENDATIONS

In this study one problem that presents a direct concern to business education has been stated by all the service center management interviewed. This is the problem of the business executive's lack of understanding of the systems concepts. There is a resultant gap in the communication between the small business executive and the service center executive. The communication gap is not only costly, but also, impedes the small businessman from getting the advantages he desires from automated data processing.

In overcoming this lack of systems understanding the educational institutions have a formidable job. The job is one of educating both the present business executives and the future executives. The education of the future executive is perhaps the easier task. The college business education needs to reorient its basic philosophy so that the student, while learning the various parts and pieces that make up the whole does not lose the picture of the complete system that is the whole. The business education

BIBLIOGRAPHY

A. BOOKS

Bingham, Walter Van Dyke, and Bruce Victor Moore. How to Interview. Third revised edition. New York: Harper and Brothers, 1941.

Davis, Gordon B., An Introduction to Electronic Computers. New York: McGraw, Inc., 1965.

Gibson, James L., and W. Warren Haynes. Accounting in Small Business Decisions. Lexington, Kentucky: University of Kentucky Press, 1963.

Holmes, James F. Data Transmission and Data Processing Dictionary. New York: John F. Rider Publisher, Inc., 1965.

Kann, Robert L., and Charles F. Cannell. The Dynamics of Interviewing, Theory, Techniques and Cases. New York: Wiley, 1957.

Laubach, Peter B. Company Investigations of Automatic Data Processing. Boston: The Alpine Press, Inc., 1957.

Madge, John. The Tools of Social Science. London: Longmans Green and Co., Ltd., 1965.

Moore, Franklin G. Manufacturing Management. Homewood, Illinois: Richard D. Irwin, Inc., 1965.

Preston, Lee E., (ed.). Managing the Independent Business. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1962.

Thomas, Shirley. Computers, Their History, Present Applications, and Future. New York: Holt, Rinehart and Winston, Inc., 1965.

Wallace, Frank. Appraising the Economics of Electronic Computers. New York: Controllership Foundation, Inc., 1956.

Higginson, M. Valliant. Managing with EDP A Look at the State of the Art. New York: The American Management Association, 1965.

B.   PERIODICALS

"Time Sharing -- Computer Boon," Financial World, July 27, 1966. pp. 6-7.

"The M.I.T. Press Demonstrates its Computer System," Publishers' Weekly, November 14, 1966, pp. 73-75.

Finke, Walter W. "Computers Yesterday, Today and Tomorrow," Credit and Financial World, January, 1966, pp. 18-20.

Hill, Richard H. "How to Use Outside Programming Services," Management Review, March, 1966, pp. 31-34.

Tesauro, S. J. "Service Centers Bring EDP to Any Business," Office, January, 1966, p. 155.

Ziegler, James R. "Integration of Multiple On-Line User Stations," Data Processing Magazine, August, 1966, pp. 46-48.

APPENDIX A

Service Center Executives Interviewed

Grady R. Hopper
Assistant Vice-President
Commercial National Bank
Sixth at Minnesota Avenue
Kansas City, Kansas

A. J. Lombardo
Vice President
Merchants Produce Bank
531 Walnut
Kansas City, Missouri

Dave Brown, Supervisor
Midwest Data Processing
(Metropolitan National Bank)
7530 Troost
Kansas City, Missouri

Leonard Bettinger
Automated Data Service Co., Inc.
6183 Paseo
Kansas City, Missouri

George C. McCarten, Jr.
Automated Customers' Services
Commerce Trust Company
Tenth and Walnut
Kansas City, Missouri

Lyle Fletcher, Manager
Univac Data Processing Center
1901 Baltimore Avenue
Kansas City, Missouri

T. E. Holdsworth, Manager
Service Bureau Corporation
2911 Main Street
Kansas City, Missouri

Dean Lawrence
Manager, Data Processing
Midwest Research Institute
425 Volker Boulevard
Kansas City, Missouri

Kenneth W. Smith, Sales
Statistical Tabulating Corporation
922 Walnut
Kansas City, Missouri

D. Stanley Love
Assistant Cashier and Manager
Computer Services
City National Bank and Trust Company
Tenth and Grand Avenue
Kansas City, Missouri

Bruce Rider, Manager
Data Processing
First National Bank
Tenth and Baltimore Avenue
Kansas City, Missouri

H. C. Haselwood, Manager
Charles R. Overfelt Company, Inc.
12th and Grand Avenue
Kansas City, Missouri

Harry R. Mayo
Data Processing Systems
Ernst and Ernst
18 East Petticoat Lane
Kansas City, Missouri

Outline of General Questions with Response Tally

Questions for Service Center Executives

Does your service center provide both punch card accounting

    and computer services?   3 Yes   9 No

Are your services furnished on a Batch basis?

                                  12 Yes   0 No

Do you provide on-line services?   1 Yes   11 No

Do you do the programming for all work? 12 Yes   0 No

Do your customers do their own programming for on-line

    services?   0 Yes   12 No

Do your customers utilize your services for a complete

    accounting record system?   3 Yes   9 No

Do you maintain the accounting work on a continuing

    basis?   12 Yes   0 No

    Batch basis?   12 Yes   0 No

What types of analytical or statistical analysis are you

    asked to provide?   Sales, Cost, Inventory, Simulation,

                         O. R.

Do your customers ask that you provide them with assistance

    in systemizing their data?   12 Yes   0 No

Do you think your customers are using data processing as

    a tool of management or are they using it to eliminate

    a tedious job? Or both?   Both   12 Yes   0 No

Do your customers tend to expand their usage of your

   data services as they continue to use them?

                                    5 Yes   7 No

Do you find that you have to revise the format they use to

   present data to you? Service Center designs format - 12.

Questions for Small Business Executives

(These questions were not answered due to inability to
  secure names from Service Center Executives.)

Do you use punch card accounting services?

Do you use computerized services?

Do you use on line computer services?

Do you do your own programming? Want to do your own?

Do you use the services for accounting work such as:

   accounts payable, accounts receivables, expenses, and

   payroll?

Did you start with the amount of services you now use?

Do you anticipate expanding the amount of data processing

   services you use?

Have you had any statistical or analytical services made

   for you?

What do you like about data processing services?

What don't you like about data processing services?

How has data processing helped you?

How has data processing caused you troubles?

COMMERCIAL NATIONAL BANK

Mr. Grady R. Hopper, Jr., Assistant Vice President

Much interest by business in solving their special and specific problems in management control by use of EDP. As yet, have very few if any to go beyond accounting work. The reasons are two fold:

1. Most people in service bureau business work have made their Data Processing work into a "standardized package", so don't have too much "individualizing" of work to business' needs. (Example: Commerce Trust Bank tried this approach and had to stop because it was too expensive.)

2. Most service bureau operations have not had the amount of equipment to do extensive work for outside businesses The advent of larger sized machines and additional periphal equipment (such as disk files, tape drives, data links, etc.) is just becoming a reality so that the companies can consider becoming more involved in the supplying of services to other companies.

At the present time their data processing center is doing work for 20 outside banks and five businesses. In this work they are providing package services. In that they are doing the same processing for their customers that they are doing for their own bank. They provide demand deposit account work (checking account cancellations), time-deposit account maintenance and other associated work in payroll.

Commercial National Bank (con't.)

For other businesses than banks they are doing work on payroll and accounts receivables. These jobs are done from their own developed packages of programs. The work is packaged in that Commercial National offers the customer such-and-such services for their accounts receivables, and does not attempt to provide more or less than the total package. In fact, Commercial National does not deviate from the established program, rather, make the customer change to fit the services.

In discussing the services offered Mr. Hopper said that he is constantly being consulted by businessmen to assist them in overcoming problems in their operations by using data processing and that he is actively working on and searching for problems to be resolved by their data processing center. At the present time they are increasing their disk storages. They are starting to build-up the data "base" files to provide more services for their customers.

The majority of work in bank data processing is done during the night shift since the data arrives after the closing of the banks. They are considering and evaluating the establishment of a data link to Southwestern Kansas for more data processing services work.

Mr. Hopper stated that basically all the data processing services they were doing for their customers was to

Commercial National Bank (con't.)

provide revenue for the data processing center since the
amount of work in their own bank did not support the costs
of the equipment they had and by doing outside work they
could meet the costs of their equipment.

The data processing center has an IBM 360 computer.

MERCHANTS PRODUCE BANK

Mr. A. J. Lombardo, Vice President

Mr. Lombardo stated that their data processing operation was limited to providing services for other banks. The services provided were primarily in demand deposit and time deposit activity, with check clearance of demand deposit the predominant activity.

The cost of ten to fifteen thousand dollars for the development and writing of programming for another job such as accounts receivable, accounts payable, etc., for business customers made this work too expensive to be considered. The fact that the computer data processing operation can be and is most expensive to establish (up to $35,000 to $50,000 before it even gets operating) means that management is reluctant to increase the investment of more money, which will take years to recover. Because of this costly investment, the best action by a bank is to restrict its services to those for other banks. This does not require the development of additional programs and its increased expenses. The limitation of services to only other banks is very sound since the income will speed the recovery of the initial investment.

Mr. Lombardo explained that their services were done on a batch basis. The processing done on a check cancellation

Merchants Produce Bank (con't.)

involves the following steps:

1. Preliminary proof program, to provide balancing proof.

2. Sort to numerical sequence -- computer sorting while physical sort of checks.

3. Tag out of stop-pay checks.

4. Match to accounts.

From the above programs the following reports are generated:

1. Insufficient-fund checks.

2. Stop-pay checks.

3. New accounts.

4. Lists of overdrafts processed.

5. Closed accounts postings reports.

6. "V-I-P" accounts balances.

Mr. Lombardo stated that to his knowledge, their operation was the only one in Kansas City that provided for extraction of the specific stop-pay check from the transactions at the beginning of the processing. Most operations handle the stop-pay check routine as a manual removal by the customer's bank after processing. This was normal in other operations because of the problem of more checks in the processing batch for the same amount and the difficulties of getting the exact check number in the high volume processing operation.

The services provided other banks are the package of programs they do for their own bank. This is the most desirable approach since all the banks have the same functions and processes to be performed in the processing, and in addition, many of the customer executives are not knowledgable of the systems approach to their needs. In addition, Mr. Lombardo stated that the supplying of a package of services eliminated involved discussions and analysis of the customer's operation, which is costly, and the customer could be shown exactly the services he was to have performed for him. When the data processing center improved their own programs the customers benefitted by getting the improvements, too.

The bank uses a Burroughs computer.

CITY NATIONAL BANK

Mr. D. Stanley Love

In order to have a full understanding of the City National Bank Computer services, Mr. Love explained how they arrived at the present operation. When they started their services they would "rush out and set up a job each time the phone rang" and requested computer services. From this beginning, which proved to be very costly for the bank, the present operation policy developed. The policy adhered to for additional service work requires that data processing must benefit the bank by providing more business and in addition, must be financially self-supporting. In explaining this policy further, Mr. Love stated that what they were looking for and interested in were programs that will increase the accounts of the bank and that there will be enough volume of data processing to make it financially feasible. The problem of low volume work is that the program and systems work expenses make the total costs unreasonable. City National is not a large computer department in the number of personnel it has, and is by policy limited to growth that potentially provides growth for the bank. The amount of work that City National Bank provides is small compared to corresponding West Coast banks, where computer service departments of 50 to 60 people

City National Bank (con't.)

are normal and any and all computer services are done. The
computer service department is only eleven people in City
National Bank, Mr. Love stated, to explain the difference
between Kansas City and the West Coast banks.

The present policy has not eliminated the computer
services to customers, but rather, it has given the depart-
ment a specific policy for the services they provide now
and will develop in the future. They currently are
providing package programs of services for other banks.
They are in their third generation of payroll services;
which provides a combined earnings statement and deposit
receipt for each employee, a printed payroll register for
the company with a breakdown of ten different items such
as: name of employee, deductions, dependents, and so on.
In addition to the payroll register the service provides
additional reports of the Year-to-Date and Quarter-to-Date
totals for all employee's earnings, taxes, and deductions;
a printed deduction register showing the voluntary deductions
of each employee each pay period; the company FICA quarterly
report (IRS Form 941A); applicable Kansas or Missouri state
payroll tax reports; the year-end W-2 tax forms for all
personnel employed by the company.

Other services they provide are a National Defense
Student Loan program for the collection of student loans,

which was developed in cooperation with the Kansas City
Regional Council of Higher Education and is being provided
to the area colleges, and incidentally, the service has
been offered to Kansas State Teachers College for their
consideration and subscription. City National also
provides a Government Allotment Program to act as fiscal
agent for service personnel pay allotments to other loan
agencies or companies. Another program is a service on
Freight Payment. The service is an account type that
handles truck and railroad car loading freight payment
collection control.

They provide account receivable billing services
in addition to the above services. The computer services
department does the machine work for Automated Management
Systems, Inc. The Automated Management Systems Company
branch in Kansas City designs and sells a packaged account
receivable system, primarily to doctors and dentists.
Mr. Love stated they will perform sales analysis for
customers on a special basis when the customer provides
the programming.

They do not do any general ledger, inventory control,
or accounts payable services. They will not rent out
"wholesale" or block time any more, Mr. Love stated.

They use an IBM 360 computer with tape drives.

STATISTICAL TABULATING CORPORATION

Mr. Kenneth W. Smith, Sales

The Kansas City office is a regional office of the company whose main office is in Chicago, Illinois. The company is equipped to perform many and varied data processing work. They can do all the types of data processing from unit record work through automated computer record keeping.

A large amount of their work is in the area of generating and making of mailing lists for their customers; such as wholesalers, for example Zeff Distributing Co., and others that want to cover specific segrements of the market.

In addition, they do continuing work for customers in all fields of business. Some examples of this are their work in providing accounts receivables billing for doctors; insurance agency billings and reports of types, locations, amount of insurance, and expiration dates; sales analysis reports for various companies; accounts payable accounting work; feasibility studies for companies; and payroll accounting work for about sixteen companies, some with cost control reporting.

They will provide overload type work for customers and will provide complete systemized accounting and report work.

The computer used by STC is an IBM 360.

Mr. Leonard Bettinger

They provide service for their customers on accounts receivables and sales only. The sales and accounts receivables were considered by Mr. Bettinger to be for all practical purposes as the same thing.

Their company was started by present personnel to provide these services to their customers through the companies rental of "wholesale" computer time from other sources and has progressed to where they have their own small size (4,000 core) machine without any disk packs or tape drives.

They will provide the customer with accounts receivable billing of invoices, and do any and all types of statistical reports on the sales. The areas covered in the reports are product mix and its changes, area and product relations, area and salesmen comparison, or any other type of report the customer desires.

Further inquiries into the customers types of business size of customer companies and more specific information or examples of the reports were answered by Mr. Bettinger that the company policy was not to discuss their customers in more than a general nature and that they could not divulge any more information.

CHARLES R. OVERFELT CO., INC.

Mr. H. C. Haselwood

The Overfelt Company specializes in data processing for accounting and business. Mr. Overfelt is a Certified Public Accountant and has developed the data processing operation as a business service business. They lease block time from the Traders National Bank IBM 360-30 computer for their computer needs. In addition they have their own unit record machine with keypunches, collator, sorter, IBM 403 accounting machine and an IBM 1050 Data Link machine.

Mr. Haselwood explained that their entire operation is for commercial or business data processing. They do not do any scientific or engineering work. Their work is about 20% for manufacturing companies, the remainder for retail stores, medical clinic billings, insurance agency work, wholesale distributors, and stock brokers. The stock broker account is located in the Plaza area (47th Street) and the data is transmitted throughout the day to their machine room (at 12th and Grand) by the Data Phone and IBM 1050. They process the incoming data and send the results back to the customer over the Data Phone link.

They will do any amount or type of data processing from one-shot work to designing and doing a total system

Charles R. Overfelt Co., Inc. (con't.)

for the customer. Mr. Haselwood stated that they handle

each system on an individual basis and tailor it to the

customer's needs. They find this provides more of their

customer's need and is not that difficult or expensive to

accomplish.

Mr. Haselwood said that they could provide each

customer with a Data Processing system tailored to his

operation since their programming costs were much less than

most service centers. This was due, he felt, to a higher

caliber of programmers they employed, and they only wanted

to recover the programming costs on each job and make their

income on the processing work. Mr. Haselwood stated that

in most cases there was not adequately qualified management

and supervision of the computer area; and the programming

personnel were merely coders not capable of making a

systemized program -- unable to think through the needs

and then the coding out of the program is very simple and

easy.

The smaller accounts they have are normally straight

accounting such as: monthly billing, calculating and

writing payroll checks; while the larger accounts are more

of a systems work with statistical or analytical reports.

The size of the company's operation determines the type

of services they want or use; although this is not always

true. Normally, the larger (gross income) business wants

Charles R. Overfelt Co., Inc. (con't.)

more information and a complete automated data system
because of the speed in getting the information and
due to the reduced costs.

They also do inventory work for the major department
and women's and men's wear stores in Kansas City. This
work is usually every six months. They keypunch the
physical inventory reports and consolidate them into one
report, giving the various departmental and other breakdowns
requested by the customer. It is handled as an individual
requirement basis for each customer, although portions of
the program that are the same are used whenever possible.

Mr. Haselwood said that their work was well enough
diversified and did not include any few predominant
customers so that the loss of any account would not cause
a great problem. Their biggest problem in the service
business was on determining the pricing on the "peak load,
one-shot type" jobs since it was hard to estimate the efficiency
that they could do any unfamiliar job; and, also, whether
or not some problem would crop up that would reduce their
efficiency.

Mr. George C. McCarten, Jr.

Commerce Trust provides packaged services for their
data processing customers. This policy has evolved as the
only logical approach to sound management of service
centers, Mr. McCarten stated. In the beginning they tried
to do anything a customer wanted, and found the costs of
providing the services were prohibitive. Mr. McCarten
explained that the basic problem of automated data processing
is that the business executive does not understand his own
operation adequately enough to be able to know how or what
he wants from the automated data processing beyond the
"I have a problem" stage. To provide knowledgeable services
to the business executive the service center is required
to first make a thorough systems analysis and then by
educating the business executive in order to give him a
better knowledge of his operation and problems so he can
make an adequate definition of the goals he is trying to
accomplish. This requires considerable time by personnel
of the service center and is not feasible unless they have
an adequate staff, and then this is only possible when
the amount of potential data processing business will
justify the expense through adequate revenue. In addition
to the analysis and enlightenment problems is the one that
the designing and development of a specific computer program

will add more costs to those already incurred; this can result in the costs for a control type program for a customer resulting in expenses of up to $20,000 for the service center. For the service center to survive and prosper the development of specific packages has evolved. Normally, the programs are sold in a package to many customers thereby providing a smaller cost per customer and making the data processing service costs within reason for each business customer.

Mr. McCarten explained that Commerce Trust is currently providing services for 21 banks and 45 businesses, with four more banks having signed service contracts with them for service to begin shortly. In discussing the various business customers they have, Mr. McCarten stated they have been doing a labor cost control program for a construction company in Santa Barbara, California. The data is forwarded to them by mail -- which provides an average of one day service from the West Coast and is much cheaper than a phone line data link.

The construction company labor report provides not only the current "this week" costs for the four hundred odd control centers, but also provides analysis of the costs. The costs are shown for the total to-date expenditure on each control center with an analysis of the total spent against the bid estimate and the detailing of percentage

of completion and the status of the control center being over or under estimated total.

In addition to the construction labor report they can provide labor distribution reports by job number, or other control factors for manufacturing firms as an additional service for their customers payroll computations, when the additional information is provided on the individual time cards. By providing the data center with sufficient data Commerce Trust has a package program for analysis and reporting of the data. This data can be provided by the customer simply by using the format and method of the package; in other words by adjusting his data to the package.

Another example of a systemized application is their package for hospitals accounts receivable billing and control. The discharge of the patient starts the operation of the system. The information on the patient -- name, type of hospitalization coverage, the timing of the billing (viz: member of staff, don't bill, send bill for remainder not paid by insurance, bill each thirty days, and etc.,) and the amount of the bill are fed into the system at this point. From this initial data, the computer updates its files that contain history and status of the family's account and total of amount due, with sub-total for the various sources of payment, such as Medicare, Blue Cross,

Commerce Trust Co., (con't.)

Blue Shield, patient, and other sources. The first
report prepared shows the patient's account and
balance with annotations of the source or method of
payment. The next report generated is a listing of
accounts annotated with the source and method of payment,
with a further breakdown showing the age of the balance
due. The final report generated was one detailing the bal-
ances due the hospital broken down into the sources of
payment and further categorized into current, 30, 60, and
90 day or longer balances with a final composite balance.
Mr. McCarten said that the hospital in St. Joseph, Mo.,
they had started doing this work for had experienced
an increase of over 40% reductions of their accounts
receivables with an increase of 30% faster payment.
This would certainly be an improvement since the report
he used had a balance of over four hundred thousand dollars
in open billing. He further stated that because of the
ability of the computer to provide fast reports it was
the only case he knew where a current up-to-date report
of the hospital accounts receivables was being made that
was in balance.

Commerce Trust does not do any inventory control
work. Mr. McCarten said inventory control has presented
so many variables, from company to company, that they

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found they would have to make a tailored program in each instance and therefore haven't done any of this work.

Another area they are studying for expansion of services is the stock control of department stores. IBM has been working with the major mail order companies and have spent over $15 million in the development of computerized control techniques in this area, Mr. McCarten stated. He further stated that the IBM control techniques had shown how the store could get more volume while reducing the total stock by responding to customer demands faster and by spotting customer changes in buying faster. The biggest problem that he said he had had in his talks with local stores was the executive's lack of knowledge of the specifics of their own operation so they were unable to understand the computer system and discuss their problems.

Their computer equipment is an IBM 360.

MIDWEST DATA PROCESSING

Mr. Dave Brown

The installation of a National Cash Register Model 315 computer in January, 1967, was the start of data processing for this service center. Primarily the data processing is for the Metropolitan Bank, and they are in the initial stages of expanding their business.

At the time of the interview they were doing demand and time deposit processing for five additional banks. They expressed the desire to do any business data processing they can get as soon as they can get it.

Mr. Brown, supervisor of the Data Processing, stated they had their computer delivered on January 1st and were operational before the end of the month. They are now getting punched tape equipment for processing demand accounts. Under this technique, the customer bank generates a punched tape of all transactions that are encoded by them, then, the punched tape is forwarded to the data center for processing and the checks are not needed for the data processing. The checks can be forwarded where necessary for clearing. This will provide at least one day speed-up in the clearing, and will benefit the banks in the suburbs.

Mr. T. E. Holdsworth

The Service Bureau Corporation has changed their
approach on data processing work from batch jobs to a
packaged system approach. They are now offering their
customers a service for one individual system to a total
system data processing system. In the present approach
the system analysts will study your needs and tailor a
data system to their findings and your needs and put it
into operation. They will no longer take batch jobs nor
overload one-shot jobs. Their effort is into providing
the customer with a complete package for either a single
system such as inventory, sales and accounts receivables
or for all your data processing; further, on a two year
contract they are showing a cost reduction for their services
to the customer in the second year. Not only a cost
reduction, but they will if you like, give you all the
programs flow charts and documentation at the end of the
second year so that the customer can operate his own
computer if he likes.

Mr. Holdsworth stated that their biggest competitor
was "Big Brother", the IBM equipment sales office, since
SBC can go into many installations that are renting equipment
and do a better job than the customer is doing and do it

Service Bureau Corporation (con't.)

for "thousands less" than the equipment and personnel costs. They are advancing toward the 1969-70 completion date on the SBC network of centers and feeder inputs. Under this arrangement Kansas City will be a computer center with feeder lines from Denver, Des Moines, Omaha, Wichita, and St. Louis. The work will be fed into 360-20 computers at the feeder cities and will be performed in Kansas City on a 360-30 computer that has been buffered by a 360-20. Should Kansas City find they are not able to perform the work at its arrival the network is capable of shifting the work to the main switching center in Chicago, which can reswitch it to another Central processing office that has free time. The completed work is then routed back to the originator.

The reasons given for SBC's lower cost of operation are two. First, their utilization of their computers is high; at the present it's slightly over 400 hours for the three shift seven day working schedule for three computers; and secondarily, they have realized a 15% decrease on straight run times on their 360 computer over the 1400 series computers. Since they have gotten their Supervisory System program operational they have measured an increase of 26% speed in operations. Thus, the higher utilization and faster operation result in more work for less money to the customer, Mr. Holdsworth stated.

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Mr. Holdsworth stated he did not have any problem
in selling the system approach since he had adequate
manpower to be able to send enough systems analysts into
the customer's business to make a thorough and comprehensive
evaluation, then show the customer management exactly
what they could do and how much it would cost. They also
were in probably the best condition of any competitive
organization since they had a very large library of programs.

At the present time they are using an IBM 360-30, an
IBM 1460, and an IBM 1401 computer. They anticipate
replacing the 1400 series computers with 360 models
in the future.

Mr. Lyle Fletcher

The Univac Data Processing Center provides its customers with package programs of data processing and in addition will do any type of batch operation or machine processing.

Mr. Fletcher has been the manager only two weeks (at time of interview), and stated that he was just getting into the operation. He stated that in brief his problem is one of rebuilding the business volume up to its previous levels and removing the existing loss in operation. Specifically, he said beyond a general desire to do any and all work he could, he just wasn't able to be specific as to the services they could provide, due to his short time in the job.

They use a Univac computer.

Mr. Dean Lawrence

Midwest Research Institute is willing and able to provide any type computer and data services to their customers. They are currently providing a considerable amount of time for scientific-engineering calculation solving work in addition to business and economic type work on their IBM 360-30 computer.

Mr. Lawrence stated that they have been active in doing business studies for many companies. The studies are varied and cover some aspects of the company, for example they have recently done studies for TIME Freight Line and S & H Green Stamps. In addition to the studies and simulations they do, MRI does the payroll for Massman Construction Company.

Mr. Lawrence stated they were able to do about any type computer or data processing work a customer could desire. They have sufficient staff of systems analysts, programmers, and machine personnel, with capabilities in scientific, engineering fields, and business work with the additional support of the Institute's scientific and economic area research personnel; which gives them the ability to do any type job the customer desires.

The only limitation to the job size is the budget imposed by the customer, Mr. Lawrence said.

Mr. Harry R. Mayo

The use of automated data processing service bureaus
by business is increasing and this is normal and good, Mr.
Mayo stated. Not only does the use of a service bureau
overcome the problems of delay and cost of "in house type"
accounting, but it can take a greater volume of data as
the company grows and not cause an increase in company
personnel. Mr. Mayo explained that he had helped a company
set up their system a few years ago with a work force of
three clerical personnel to prepare the company's data
for the service center. Since then the quantity of work
has increased over four times, yet only three clerical
people are needed. This, he felt, is the best part of service
bureau data processing.

In using data processing service centers there are
many problems that the business executive must face and
be prepared to resolve or adjust to them. First, too
many small companies (executives) don't really know what
they want in information and data. The next problem is
the "interface" with the service bureau; the method, manner,
and control of data turned over to the service bureau.
The small business executive turns the work over to a
service bureau and wants to retain control of the data.

Another problem facing the small business executive is that too many service bureaus are basically profit making organizations not service orientated. The service bureaus do not tell their customers all the services they can perform with the data available; and in many cases for a very small increase in cost or no cost to the customer. The lack of well qualified service bureau personnel also presents a problem to the customer.

Many companies have gotten into their own computer because of prestige or status -- not justifiable need. Mr. Mayo said these were the "golf course" or "luncheon" computers. One company executive will announce to the group that his company has installed "a computer", which may be anything from a small desk computational machine to an honest-to-goodness computer. From this announcement, a company executive will return to his office and start action to get "their own" computer since they are just as big and "if the other company has one they certainly need one and they must keep up to date with these new improvements". Without actually investigating the costs, alternatives, or needs they get a computer. Mr. Mayo said he is known as the man "who throws out computers" in Kansas City. This reputation is from being called to justify a larger computer and his findings that the work could be done better and cheaper by a service bureau.

Mr. Mayo said that a company that wants to overcome its data problems by automation has to first make a complete and thorough evaluation of its needs, goals, costs, and then plan the system. After this the problems that are part of service bureau use can be eliminated or controlled. Here in Kansas City the keypunch operators has resulted in the use of punched tape equipment to transfer the customer's data to the service bureau. It is much easier to get a business machine operator and train them to run a punched tape producing business machine, and you can replace them easier than keypunch operators. By making debit and credit "hash totals" and item counts the service bureau customer can keep control of his data, since the service bureau must balance to the customer's totals.

Mr. Mayo said that the package program approach seems to be the best for small business customers. By spreading the program development and debugging costs over many customers the unit costs are very small. For example, he said, that there is a package payroll program now being used that originally cost over $200,000. Because the package has been used many times the costs are less than $20,000 for a customer; yet the customer benefits by having a better package than he could afford to have developed for himself alone. Mr. Mayo asked, "Do businesses want

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to really pay the cost for individuality?" "This needs

some really deep thinking."

In Kansas City the fact that, up until this year,

there were three check clearing houses created the

computer boom by banks. In his estimation many of the

banks would be better off to rent their processing and

have only one or two big computers handling the transactions.

Because every bank got their own computer the service

bureau business has been fragmented by each bank's efforts

to expand their work to pay for their computer. This

has hurt the overall service bureau picture in Kansas City

rather than helped it. Since there now is a consolidation

into one check clearing house in the city and the pull out

of a large trust fund from another bank, the banks computer

departments are being squeezed and this may in time improve

the situation, Mr. Mayo stated.

In Kansas City the primary places a small business

company can go for data processing are limited. Mr. Mayo

stated that he thought Statistical Tabulating was the best

for general work and Charles Overfelt was very good in

his area of inventory and accounts receivable and/or sales.

By staying in the specific speciality that he does,

Charles Overfelt has developed some very good work and does

a very good job. The main difficulty in working with IBM's

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Service Bureau Corporation is that the rapid rotation of
their executives does not help in providing a close customer-
service center relationship.

FIRST NATIONAL BANK

Mr. Bruce Rider

The First National Bank does considerable work for other banks. The processing is done by their own developed package of programs. They do all the same things other banks data processing centers do for their customers. In addition to the normal workloads in demand deposits, savings, they do some bookkeeping work for banks. They also do some mortgage and loan service company data processing; which is not being done by other bank data centers.

The First does considerable payroll data processing for other than financial institutions, Mr. Rider stated. In the area of doing work for businesses Mr. Rider said that at the start of their data processing some years ago they tried the operation of doing any and all work every time the phone rang. They soon found out they were losing money and stopped the work. Now they are very particular about what work they will take. First, it has to benefit the bank, by providing new business, before they will consider the data processing. Then, the data processing must be of sufficient quantity to pay its way.