REMOTE BATCH MARKETPLACE-

REQUIREMENTS FOR ENTRY

FINAL REPORT

JUNE 30, 1975

INPUT

REMOTE BATCH MARKETPLACE -

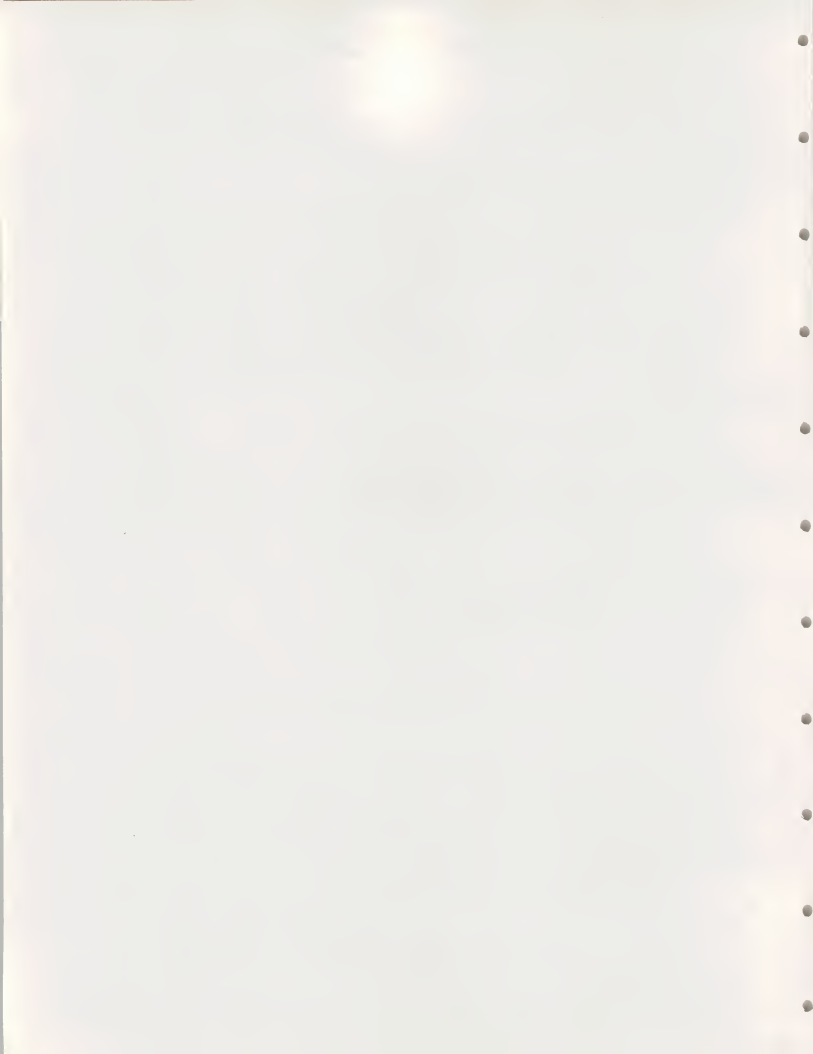REQUIREMENTS FOR ENTRY

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I.   INTRODUCTION

I. INTRODUCTION

• A study of the remote batch marketplace was conducted during May and June, 1975, to meet the specific needs of three major remote computing service companies. It was structured and executed to make the results applicable to other companies in the industry facing the same critical decisions. This report contains the results of, and conclusions from, the study effort.

• The objectives of the study were to identify opportunities with significant revenue potential within the remote batch (R/B) computer services market and to develop the information essential to the preparation of a business plan to take advantage of these opportunities. In particular the study examined:

- Current and future nature of the remote batch services markets

- Technical requirements to compete in these markets

- Marketing requirements to compete in these markets

- Competitors in the markets, their revenues, approaches and plans.

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- Care has been taken from the initial design of the study through to the final preparation of the report to make the information produced directly usable by managers responsible for marketing, market and financial planning, and technical development within companies in the remote computing services industry.

- To identify market opportunities interviews were conducted with computer service vendors, computer service users, and leading edge computer users who do not use services in order to:
    - Analyze and evaluate the current and future market from a variety of perspectives,
    - Analyze and evaluate the current and future markets for different variations of remote batch services, and
    - Develop useful competitive information designed to complement that information which is generally available.

- To develop necessary business plan inputs, in-depth interviews were conducted with current users of remote batch services to determine:
    - A wide variety of detailed technical requirements,
    - Communications needs related to terminal speeds and network utilization, and
    - A broad range of essential marketing information relating to users' attitudes and desires.

- The report is based upon the authors' previous experiences plus an analysis of interviews designed and conducted primarily by telephone expressly for this study. The interview base was:

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– Scientific and engineering R/B users	15
– Business applications R/B users	17
– Users of remote computing services	7
– Timesharing only service users	6
– Federal government R/B users	5
– Miscellaneous R/B related users	5
– Remote computing service vendors	10
– Other	4
Total:	69

• With the exception of some of the interviews (which were conducted by computer industry professionals), the work herein is the product of Peter A. Cunningham, President of INPUT, a market research and consulting organization, and Robert B. Field, a self-employed consultant to the computer services industry. Both men have had extensive and successful experience within the computer services industry as well as significant experience conducting market research projects of this type.

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II. SUMMARY AND KEY FINDINGS
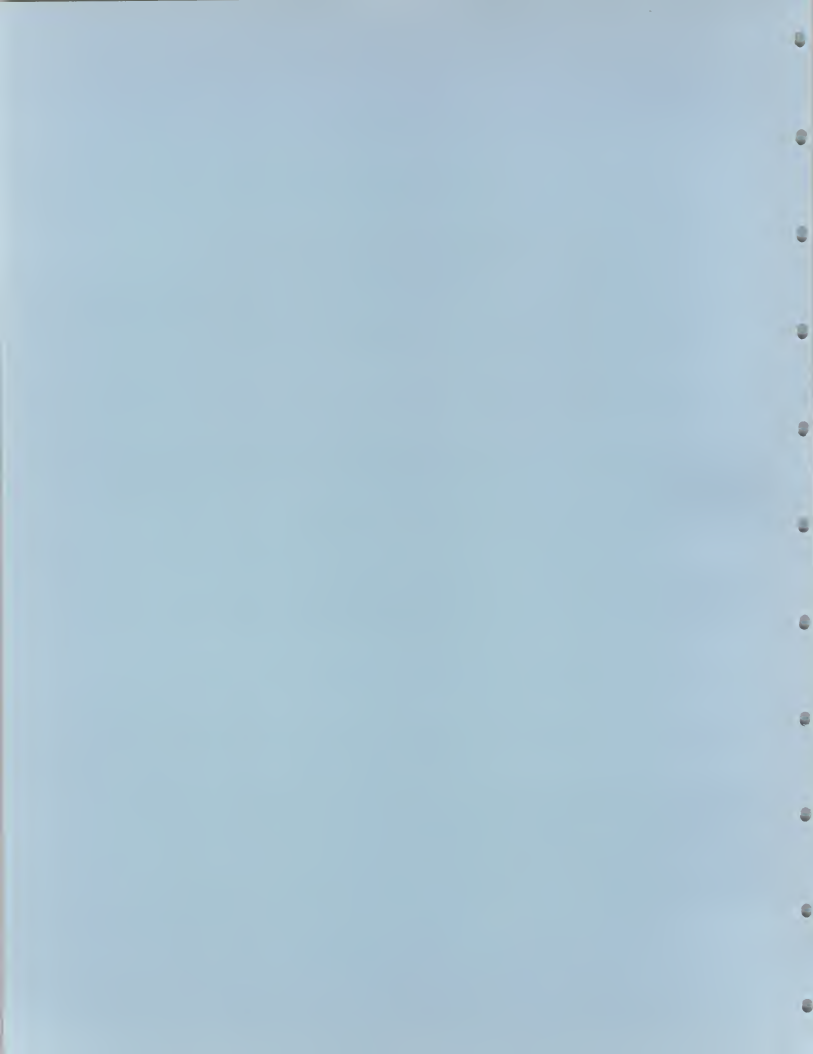
II   SUMMARY AND KEY FINDINGS

A.   REMOTE BATCH MARKETS – CURRENT AND FUTURE

- Remote Computing Services Market Growth.
    - Remote batch market will grow from $280 million in 1975 to
      $890 million in 1980.
    - Interactive market will grow from $700 million in 1975 to $1900
      million in 1980.
    - Data base market will grow from $120 million in 1975 to $450
      million in 1980.

- The real growth in remote computing services is in markets with mixed
interactive/remote batch components.

- Scientific and Engineering (S & E) Remote Batch Market.
    - Will grow from $130 million in 1975 to $320 million in 1980
    - Two thirds of the user expenditures are from very large companies
      with extensive in-house capabilities.
    - Average account size is significantly larger (maybe by a factor
      of 2) than business accounts.
    - There is a smaller requirement for an interactive component than
      with the business sector.

- Business Remote Batch Market.

  - Will grow from $110 million in 1975 to $440 million in 1980.
  - One segment of the business market is computer substitution for medium and small companies: this fast growing segment is the most secure of the remote batch markets.
  - The other segment is supplemental applications processing to enhance in-house capability: this is the least secure of the remote batch markets.
  - Both segments have significant interactive component requirements.

- Federal Government Remote Batch Market.

  - Will grow from $40 million in 1975 to $130 million in 1980, dependent on policy determinations.
  - The new GSA contract will not damage CSC and will cause other vendors to the federal government to give similar substantial discounts.
  - Not all remote computing procurements will be covered by the contract; vendors with specialized services need not obtain a GSA contract.

- Sources of Remote Batch Expenditures.

  - User expenditures are primarily for new applications.
  - There is little use of proprietary vendor programs.
  - No evidence of significant conversion of timesharing to remote batch or of overflow processing was found.

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- Of applications, modelling and simulation is important to business and scientific users.
- The small users are companies in high technology or growth environments which need some access to a large computer.

B. COMPETITIVE ENVIRONMENT

- Competitive vendor groups:
    - Spinoffs are the predominant remote batch vendors with 43% of the market, and their importance will increase*.
    - Computer manufacturers, with the exception of CDC in the S & E market, are, and will continue to be, minor participants.
    - Independents' market share will grow from only 32% as timesharing companies start to offer remote batch and multi-mode services.

(* Figures do not include spinoffs 'captive' revenues from their parent companies).

- Revenues generated on IBM mainframes account for almost half the total remote batch market and this proportion will increase due to the growth of the IBM-oriented business remote batch market.

C. MARKETING REQUIREMENTS

- Why users select to use remote batch services:
    - Service users with in-house computers are buying special hardware or software.

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- Service users with no or small in-house capability are buying the most economical approach.
- Increases will come from variety of growth factors; decreases will come primarily from in-house conversion.
- Non-users don't use because they feel they have the capability in-house, but might use for proprietary software or overload relief.

- How vendors are selected:
  - Prime considerations are hardware type and price.
  - Also important are the service factors: reliability, turnaround, and user support.
  - Less important are vendor provided applications, network availability, and user proximity to vendor hardware.
  - Users will switch vendors if their performance on the service factors (reliability, turnaround, and user support) deteriorates from present, generally satisfactory, levels.

- Pricing considerations:
  - Assuming similar services, the average user will require a 23% price difference to switch vendors.
  - Terms and conditions vary through a variety of special arrangements.
  - Users have few ideas about pricing but like quantity discounts and, under some conditions, long term contracts.
  - Users expect remote batch to cost about half as much as time-sharing.

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- The decision-makers:
  - Two-thirds of the affirmative decision-makers were other than chief D.P. manager.
  - 80% of the negative decision makers were the chief D.P. managers.

- Field personnel requirements:
  - Relatively little technical support required, generally agreed to be less than for timesharing.
  - Sales people should possess technical knowledge, empathy, and honesty.

D. TECHNICAL REQUIREMENTS

- Compatibility requirements of current users:
  - Two-thirds of users have strong preference for particular mainframe type.
  - Less than half of users have strong preference for particular operating system and most of them are business users.
  - Few users have requirements for a particular DB/FM system, special systems features, or special hardware.

- Current typical scientific job characteristics:
  - 320K bytes of core, large amount of execution time.
  - Small files, small I/O.
  - Two-thirds of jobs require turnaround of less than 2 hours.
  - Various jobs submitted daily or many times per week.

- Current, typical business job characteristics:
  - 90K bytes of core, moderate amount of execution time.
  - Small to medium files, moderate I/O.
  - One third of jobs require turnaround of less than 2 hours.
  - Various jobs submitted daily or many times per week.

- Data communications requirements:
  - Only one third of current users require multi-city network, and the network need not be sophisticated.
  - Terminal speeds will increase some; 9600 baud will satisfy almost all requirements.
  - Almost all users access remote batch services via local dial or leased line which is frequently managed by the vendor.

E. STRATEGIES AND OPPORTUNITIES

- General Recommendations:
  - All remote computing services vendors must develop an integrated remote batch and interactive capability.
  - Remote batch vendors should emphasize the business market, but not exclude the scientific and engineering market.
  - Remote batch vendors should integrate the use of intelligent terminals into their product line.
  - Remote batch vendors must have a strong data base handling capability.
  - Sales efforts should be aimed at new users rather than replacement

selling.

- 'Service' is of prime importance to remote batch users; 'reliability' is more important than in timesharing.

- Sales personnel must be user/applications oriented.

- Scientific and Engineering Market.

  - Vendors in this market should emphasize state-of-the-art developments including advanced graphics features.

  - Vendors in this market should apply their sophisticated tools to the solution of business problems requiring large scale computing.

  - These vendors should enhance the file handling and I/O capabilities of their equipment to match business users needs.

- Business Market.

  - Vendors should offer IBM-based services for maximum market penetration.

  - The main target market should be computer substitution to companies in the $10 million - $50 million annual revenue range in high technology and/or growth industries.

  - In order to penetrate this market, vendors should acquire a comprehensive set of standard business software and problem-solving tools.

  - Computer substitution and industry intensive sales require separate marketing and sales forces.

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- Federal Government Market.

    - This market offers significant business opportunities but at a
      relatively high entry cost and with substantial discounts.
      Vendors should carefully compare the opportunities in this
      market with those in other markets.

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III. THE REMOTE BATCH MARKETS –
CURRENT AND FORECASTED

III   THE REMOTE BATCH MARKETS - CURRENT AND FORECASTED

The remote computing services market in 1975 has three major
components:

• Interactive/Timesharing - characterised by interaction of the user
with the system, primarily for problem-solving timesharing, but also for
data entry and transaction processing: the user is 'on-line' to the
program/files.

• Remote Batch - where the user hands over control of a job to the
computer, which schedules job execution according to priorities and
resource requirements.

• Data Base Inquiry - characterised by the retrieval of information from
a vendor maintained data base.

The components are not easily distinguishable in many cases: the
borders between them are, in fact, becoming less distinct. For example,
deferred timesharing runs have been available for several years on most
major timesharing companies, together with the option to use high speed
printers at the vendors' local offices for volume output. Vendor revenues
for a deferred run could be classified under 'timesharing' (where the job

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initiated) or 'remote batch' (the manner in which it was performed), or split between the two categories. For the purposes of this analysis we allocate them between the two. We estimate between 5% and 10% of 'timesharing' vendor revenues are derived from 'deferred run' or remote batch activities.

The breakdown between the market components are shown in Exhibit III-1. Growth rates in the market shown in Exhibit III-2 are dependent on a number of factors:

• The economy – growth rate in remote computing in 1975 will be only 15% compared to a normal 30% because of the impacts of the recession. There is a lag time of approximately 3 months between user decisions and the impact on vendor revenues. Therefore the first quarter of 1975 has seen continued fairly high growth rates. The slowdown will be apparent in the second quarter financial performance. More normal growth will resume in 1976.

• The impact of minicomputers will be felt mainly from 1978 onwards: this is discussed later in the report. Suffice to say that the minis. will take over the interactive component for many large remote batch services with significant interactive expenditures. They will also convert some production-oriented timesharing to mini. processing.

• Remote batch in the scientific and engineering problem solving area will **expand** at a 15% – 20% rate. Faster growth will be in the trans-action processing market for both business and scientific and engineering applications. However, this applications dependent business is a longer

EXHIBIT III-1

U.S. REMOTE COMPUTING SERVICES EXPENDITURES
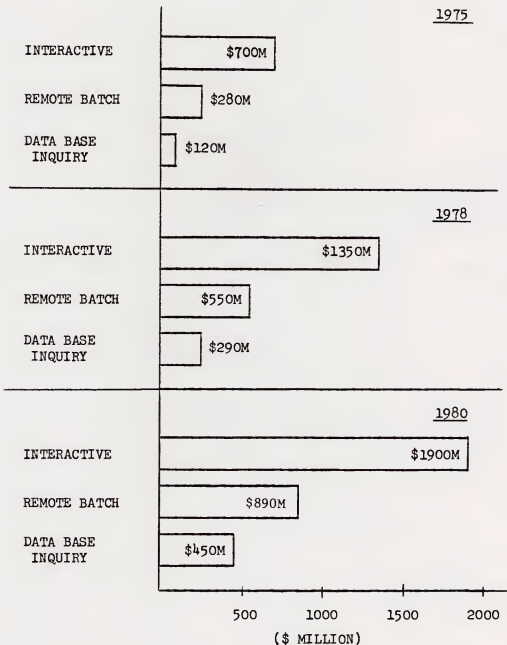
TOTAL: 1974 $950 MILLION   1978 $2,190 MILLION
        1975 $1,100 MILLION   1980 $3,240 MILLION

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EXHIBIT III-2

REMOTE COMPUTING SERVICES GROWTH RATES
(IN %)*

	1975	1976	1977	1978	1979	1980
INTERACTIVE	15	25	26	23	22	15
REMOTE BATCH	12	21	24	31	29	26
DATA BASE	20	33	38	32	28	22
TOTAL	15	25	27	26	23	19

*1975 FIGURE = $(\frac{1975-1974}{1974})100\%$

sales lead time and effort compared with problem-solving timesharing.
Consequently its growth rate will lag initially. However, the combination
of minicomputers and remote computing services will provide for large
account growth in the late 1970s.

- The need for information of all kinds appears insatiable. Consequently
data base services will be the fastest growing segment of the market. Any
industry which has a 'broker' arrangement will require data bases to
support the business: also government regulation will be a major factor in
the establishment and use of data bases. These data bases will also lead
to major timesharing revenues as users process data from the data bases
through their own models. A classic example is the use of the Chase
Econometrics model on Cyphernetics: each $ of data base usage has $2 - $4
of associated processing of users' own models. Initially the saturation of
the stock quotation market dampens the growth rate in this sector.

- The reduction in communications cost and the need for voice input/
output, video, graphics and other features will insure the continued growth
of the interactive/timesharing mode. Mass storage devices will allow for
significant reductions in storage costs of files with sufficiently fast
access-times to satisfy many interactive user requirements. Also, the
average timesharing account size of $1000 per month will not be sufficiently
large in itself to attract mini-replacement, although aggregate amounts
will in some cases. Similarly relatively expensive intelligent terminals
will only be affordable for larger account sizes; thus conversion to remote
batch will not be feasible in many cases. As interactive terminals become

cheaper, the threshold will be lowered for new and existing applications consequently the average account size will decrease towards the average batch service bureau account size.

A. USER EXPENDITURE ANALYSIS

The remote batch and interactive markets can be analyzed also by the type of service used rather than by the mode of service provided. In this regard the degree to which remote batch and interactive are separable from the users' viewpoints must be examined. Exhibit III-3 shows that the remote batch/interactive part of the total market is the fastest growing of the segments. By 1978, the pure remote batch and pure interactive markets will together be smaller than the segment where both modes are required.

1. BY TYPE OF SERVICE

● Scientific and Engineering remote batch market is the largest service area in 1975 as shown in Exhibit III-4. It is based on large-scale CDC 6000, Univac 1100 and, to a more limited extent, IBM 370 series computers. Four vendors, CDC, McAuto, UCC, and UCS account for 60% of the market.

● Growth in the S & E market will be steady rather than spectacular, averaging 15% - 20%. The increasing use of simulation and design tools in areas such as pollution control, energy usage, construction, and Defense projects will be a main source of new revenues. Models which are concerned with the way a product or service is designed, built or operated are included in this category.

● In the remote batch business market the two subsegments are:

    - computer substitution where the user gets all or nearly all its
      computer processing through the remote computing service. The

EXHIBIT III-3

REMOTE BATCH/INTERACTIVE MARKET COMBINATION

1975

PURE INTERACTIVE	$560M
PURE REMOTE BATCH	$220M
REMOTE BATCH/ INTERACTIVE COMBINED	$200M

1978

PURE INTERACTIVE	$540M
PURE REMOTE BATCH	$280M
REMOTE BATCH/ INTERACTIVE COMBINED	$1100M

1980

PURE INTERACTIVE	$600M
PURE REMOTE BATCH	$290M
REMOTE BATCH/ INTERACTIVE COMBINED	$1900M

500   1000   1500   2000
($ MILLIONS)
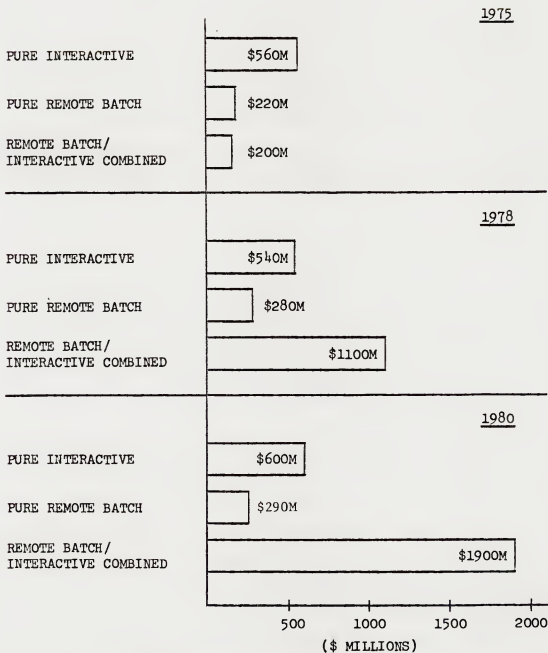
AFTER 1978, REMOTE BATCH AND INTERACTIVE SERVICE REVENUES
WILL BE INSEPARABLE IN MOST CASES.

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EXHIBIT III-4

REMOTE BATCH MARKET BY USER TYPE

USER TYPE

1975

USER TYPE	
SCI. & ENG.	$130M
BUSINESS	$110M
FED. GOVT.	$40M

1978

SCI. & ENG.	$220M
BUSINESS	$250M
FED. GOVT.	$80M

1980

SCI. & ENG.	$320M
BUSINESS	$440M
FED. GOVT.	$130M

100   200   300   400   500

($ MILLIONS)

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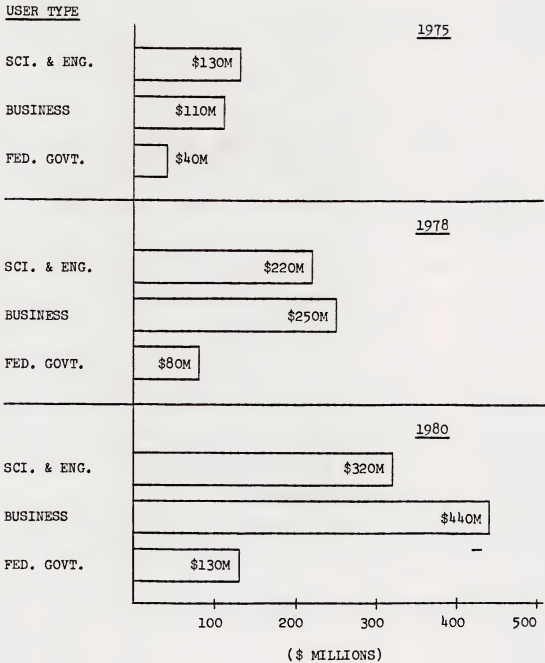
user can have had a computer and replaced it by the service (as happened with 5 of the survey respondents) or started and grown with the services concept without ever having an in-house computer (as was the case with the remaining 5 respondents in the business area without a computer).

NOTE: This borders on remote facilities management but is not characterized as such because of the absence of long term contracts and management factors.

- Applications processing, where the user buys remote batch services for particular applications to supplement its own in-house capability. In this area, the business analytical type of application is very important: such applications are financial and market modelling, scheduling, and sales analysis. The establishment of business data bases for analysis and network-based data collection are also included in this. The remote batch portion of primarily interactive applications services, such as those offered by XCS, NCR, Keydata, National Data, and TRW, are included here together with remote batch applications services such as are offered by OSI and MMDS. The remainder of the market is derived from custom user programs.

Growth of the various subsegments of the business remote batch market is shown in Exhibit III-5.

• The federal government market is discussed separately.

EXHIBIT III-5

BUSINESS REMOTE BATCH MARKET GROWTH

MARKET SECTOR

1975

COMPUTER SUBSTITUTION — $40M

APPLICATIONS PROCESSING — BA $10M | TP $45M | DB $15M | $70M

1978

COMPUTER SUBSTITUTION — $100M

APPLICATIONS PROCESSING — BA $25M | TP $90M | DB $35M | $150M

1980

COMPUTER SUBSTITUTION — $200M

APPLICATIONS PROCESSING — BA $40M | TP $150M | DB $50M | $240M

(\$ MILLIONS)
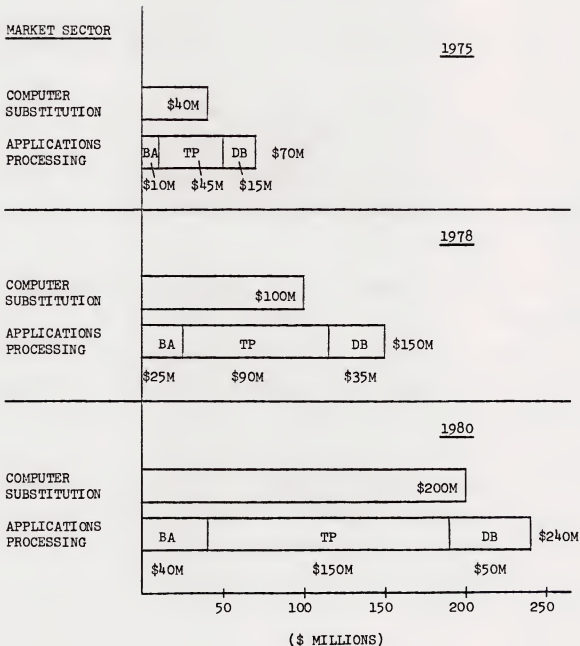
BA = BUSINESS ANALYSIS
TP = TRANSACTION PROCESSING
DB = DATA BASE CONSTRUCTION AND USE

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2. BY INDUSTRY

• For the scientific and engineering remote batch market the prime
using industries are:

- electric power utilities - engineering design and nuclear codes;

- electrical and electronics industries - simulation and circuit
  design;

- aerospace manufacturers - structural analysis;

- engineering research and design organizations;

- process manufacturers - oil companies for rig design and modelling.

There is also deferred run business which generally parallels the
interactive market.

• For the business remote batch market, there are a wider variety of
user industries:

- computer substitution is particularly successful where the user
  has need of limited access to a large computer but can't afford
  it in-house. Such industries as state and local government,
  manufacturing (including metal parts and pharmaceutical),
  professional organizations, service companies such as architectural
  and engineering companies, hospitals and other users of medical
  data bases contain such users.

- applications processing includes particular network oriented
  applications, such as order entry and labor distribution, in
  manufacturing and wholesaling. Large data base handling with
  requirements for ad hoc reporting are common in the utilities,

manufacturing, banking, government and research industries.

3. BY COMPANY SIZE

• The scientific and engineering remote batch market is dominated by the aerospace, utility, and large equipment manufacturing users. Consequently two-thirds of the market is with very large organizations as shown in Exhibit III-6. Significant revenues come from research and development organizations, engineering companies, and advanced technology based companies in the small and medium-sized categories.

• The business remote batch markets, on the other hand, lie heavily with the medium and small company through the provision of complete data processing capabilities or through the provision of applications beyond the scope of the in-house group to develop or operate, for example PICS or order entry.

• In the business area, divisions of medium, large and very large companies are often serviced as small independent entities, particularly when the parents lack the resources to devote to their offsprings' data processing needs. In the survey, 4 of the users fall into this category.

• In banking, two 'vendors' were interviewed which provided bank data processing to over 100 small, correspondent banks. These vendors were both subsidiaries of bank holding companies. This market is basically 'captive' and unavailable for open competition. To a certain extent, it is open to joint venture approaches, such as those of BCS, MMDS, and Computeristics, or can be taken over, as with National Sharedata.

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EXHIBIT III-6

REMOTE BATCH MARKET BY COMPANY SIZE

COMPANY SIZE	SCIENTIFIC & ENGINEERING
VERY LARGE	$85M
LARGE	$20M
MEDIUM	$15M
SMALL	$10M

	BUSINESS
VERY LARGE	$25M
LARGE	$20M
MEDIUM	$25M
SMALL	$40M

50   100

($ MILLIONS)

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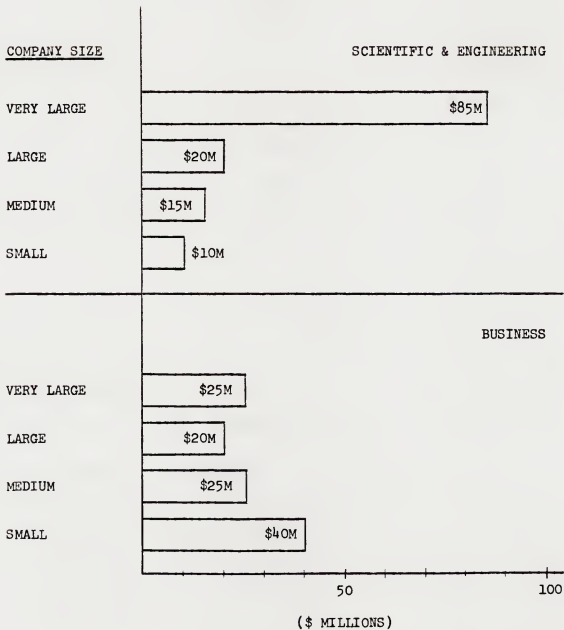
B. RANGE AND DISTRIBUTION OF ACCOUNT SIZES

- Average account size was $20K per month for scientific and engineering users surveyed, compared with $10K per month for business respondents. As shown in Exhibit III-7 the range of account size is significantly different as well, with the scientific and engineering group having almost 40% of respondents with expenditures over $20K per month compared with only about 10% for business respondents.

- In the limited sample, the distribution of federal government agency expenditures more closely paralleled the scientific and engineering users.

- There was no significant difference in account size when examining the respondents purely on the basis of whether or not they had an in-house computer, as shown in Exhibit III-8. However, there is some indication that:

    - business users with in-house computers spend less (about $6K per month on average) than business users without a computer (about $11K per month on average);

    - scientific users with in-house computers spend more (about $23K per month on average) than similar users without a computer (about $13K per month on average).

- Of 11 respondents giving indications of 1974 expenditures, one was spending the same amount in 1975 and one was spending less: the average increase was 32% for the remaining respondents, with the exception of one respondent which went from $0 to $50K - $100K per month.

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EXHIBIT III-7

ACCOUNT SIZE BY USER TYPE

USER TYPE — NUMBERS OF RESPONDENTS BY MONTHLY EXPENDITURE RANGE

SCIENTIFIC & ENGINEERING

BUSINESS

FEDERAL GOVERNMENT

(\$000 PER MONTH)
<5   5-10   11-20   21-50   >50
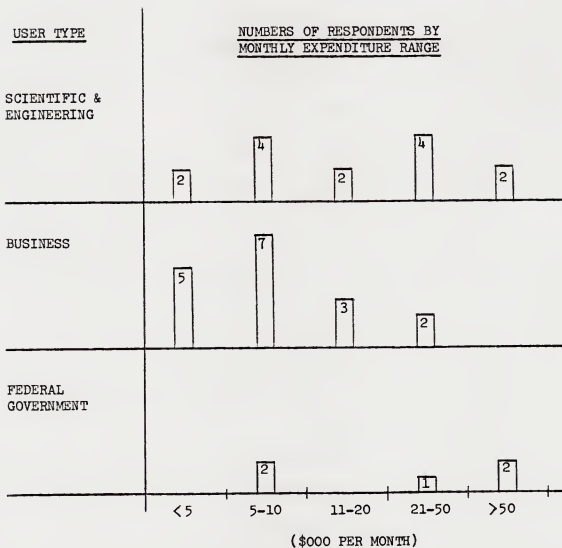
EXHIBIT III-8

ACCOUNT SIZE BY COMPUTER STATUS

| COMPUTER STATUS | NUMBERS OF RESPONDENTS BY MONTHLY EXPENDITURE RANGE |

RESPONDENTS WITH AN IN-HOUSE COMPUTER

RESPONDENTS WITHOUT AN IN-HOUSE COMPUTER

5   5-10   11-20   21-50   50
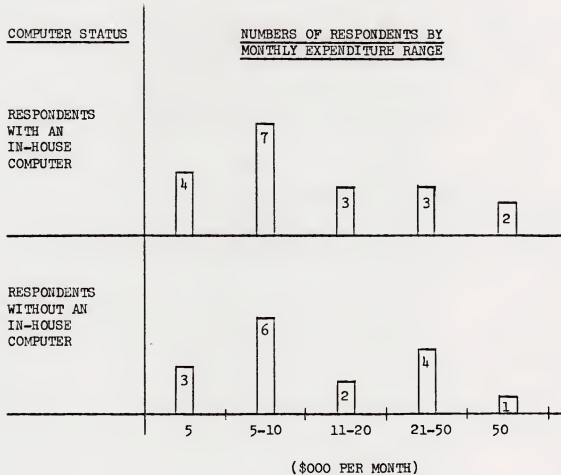
($000 PER MONTH)

- 50% of respondents will increase their expenditures in 1976 and 27% expect to remain the same, as shown in Exhibit III-9.
    - The average account size of the business respondents will increase from $10K per month to $12K.
    - The average account size for scientific and engineering respondents will increase from $20K to $22K per month.
    - In the government, the largest single user among all the respondents will go in-house, reducing $2 million per year of remote batch expenditures with GSA/INFONET to $0 eventually.

- The most exposed remote batch services revenues come from business users with in-house computers: several indicated they would take the business in-house. As shown in Exhibit III-10, for all respondents with in-house computers, there was an even distribution of account growth intentions for next year and three years' time. Contrasted with this, respondents without computers, heavily favored account growth in their replies, with an average overall increase for 1976 of 30%.

EXHIBIT III-9

ACCOUNT GROWTH BY USER TYPE

USER TYPE	NEXT YEAR	3YRS/NEXT YEAR
SCIENTIFIC & ENGINEERING		
INCREASE	6	3
SAME	5	2
DECREASE	2	1 (TO ZERO)
BUSINESS		
INCREASE	7	4
SAME	2	4
DECREASE	4 (1 TO ZERO)	1
FEDERAL GOVT.		
INCREASE	2	3
SAME	1	–
DECREASE	1 (TO ZERO)	–
TOTAL		
INCREASE	15	10
SAME	8	6
DECREASE	7	2

(NUMBERS OF RESPONDENTS)

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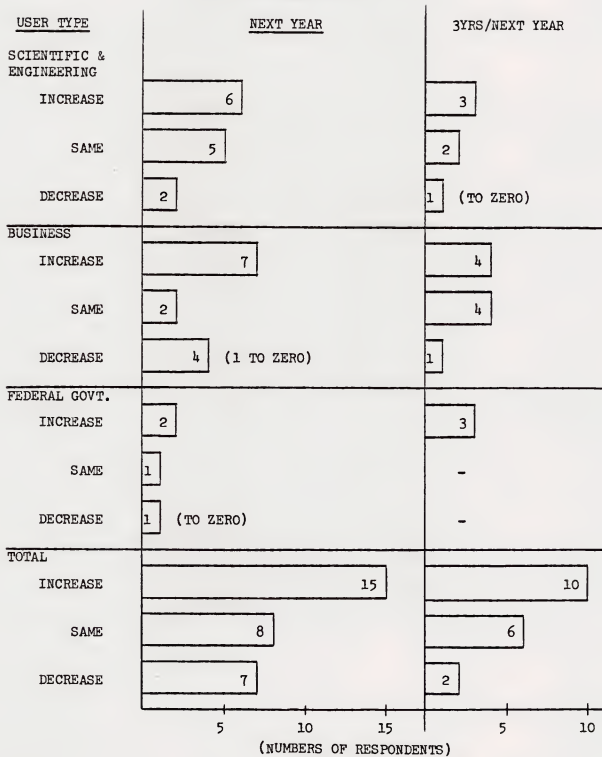
EXHIBIT III-10

ACCOUNT GROWTH BY COMPUTER STATUS

COMPUTER STATUS

WITH AN
IN-HOUSE
COMPUTER

    INCREASE   6   2

        SAME   5   2

    DECREASE   5   2

WITHOUT AN
IN-HOUSE
COMPUTER

    INCREASE   9   7

        SAME   3   4

    DECREASE   2   1

                5   10   5   10

(NUMBERS OF RESPONDENTS)

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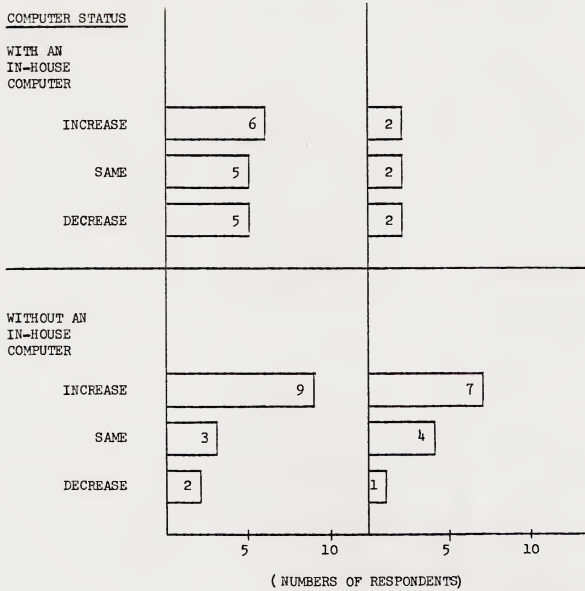
C. SOURCE OF REMOTE BATCH EXPENDITURES

• In the following exhibits the percentage responses from users have been tabulated without regard for account size. We assume that differences among account size will not significantly alter the findings.

• 'New applications' are the prime source of remote batch expenditures, accounting for over 60% of use as shown in Exhibit III-11. The next largest category was conversion from in-house computers and accounted for 27% of use. Other sources, including conversion from timesharing, were relatively small.

• As expected, business respondents indicated the highest rate for conversion from in-house batch (over 40%); however, the amount of scientific and engineering converted from in-house to remote batch was also significant (16%) and appeared to be due to turnaround and similar problems with internal operations.

• Also as expected, new applications will account for a greater share (70%) of the use in future, with conversion from batch in-house dropping to 20%. Again, however, there is no indication of significant conversion from timesharing. In the users' minds, it appears these are two very distinct services at the moment.

• As shown in Exhibit III-12, there is a minimal amount of overflow processing, as such. However, there is a significant amount of conversion from batch in-house for those respondents with computers, as well as for those where services replaced in-house computers. This portion of the remote batch revenues is probably highly transitory.

EXHIBIT III-11

SOURCE OF REMOTE BATCH SERVICES USE
BY USER TYPE

USER TYPE & SOURCE	CURRENT SHARE WEIGHT*	FUTURE SHARE WEIGHT*
SCIENTIFIC & ENGINEERING		
a) CONV. FROM BATCH SERVICE BUREAU	105	50
b) CONV. FROM TIMESHARING	26	50
c) CONV. FROM BATCH IN-HOUSE	245	200
d) NEW APPLICATIONS	1099	700
e) & f) OVERFLOW & OTHER	25	0
BUSINESS		
a)	20	105
b)	65	65
c) (AS ABOVE)	730	330
d)	845	900
e) & f)	40	0
FEDERAL GOVERNMENT		
a)	50	30
b)	40	30
c) (AS ABOVE)	40	0
d)	300	300
e) & f)	70	50

*ACCUMULATED PERCENTAGES FROM RESPONSES TO THE QUESTION 'WHAT PER CENT
OF YOUR CURRENT/FUTURE R/B SERVICES USAGE WOULD YOU CHARACTERIZE AS:
LIST a) THROUGH f) AS TABULATED.

EXHIBIT III-12

SOURCE OF REMOTE BATCH SERVICES USE BY COMPUTER STATUS

COMPUTER STATUS AND SOURCE	CURRENT SHARE WEIGHT*	FUTURE SHARE WEIGHT*
RESPONDENTS WITH AN IN-HOUSE COMPUTER		
a) CONV. FROM BATCH SERVICE BUREAU	135	15
b) CONV. FROM TIMESHARING	76	50
c) CONV. FROM BATCH IN-HOUSE	435	295
d) NEW APPLICATIONS	1419	1090
e) & f) OVERFLOW & OTHER	135	50
RESPONDENTS WITHOUT AN IN-HOUSE		
a)	40	125
b)	55	35
c) (AS ABOVE)	580	235
d)	825	810
e) & f)	0	0

*ACCUMULATED PERCENTAGES FROM RESPONSES TO THE QUESTION 'WHAT PER CENT OF YOUR CURRENT/FUTURE R/B SERVICES USAGE WOULD YOU CHARACTERIZE AS: LIST a) THROUGH f) AS TABULATED .

D. NATURE OF REMOTE BATCH PROCESSING SERVICE

1. ON-LINE COMPONENT

• The comment was made by one respondent that 'remote batch without timesharing capability is obsolete'. The same user also stated that probably 80% of timesharing could be deferred without too many compaints.

• As shown in Exhibit III-13 there is a major difference between business users and scientific and engineering users in their use of on-line, interactive components with remote batch services. In future, respondents reported that almost half the use in the business area will require an on-line interactive capability.

• As shown in Exhibit III-14, there does not appear to be a clear difference between those respondents with an in-house computer and those without, except that those with a computer expect a greater on-line component in future. However, the sample response is so varied (6 respondents in the group replied 100% pure batch and 3 replied 0% pure batch) that conclusions drawn from this would be unreliable. There is some indication the wide variation is application related.

2. REMOTE DATA ENTRY/REMOTE JOB ENTRY

• Almost all the scientific and engineering work involves remote job entry, as shown in Exhibit III-15. In business, certain applications use remote data entry: usually this is collected from various points by the vendor in a data base, using the user's own-coded programs. This portion

INPUT

EXHIBIT III-13

REMOTE BATCH USE WITH INTERACTIVE COMPONENT BY USER TYPE

USER TYPE	CURRENT USE WITH INTERACTIVE COMPONENT	FUTURE USE WITH INTERACTIVE COMPONENT
SCIENTIFIC & ENGINEERING	9%	19%
BUSINESS	41%	47%
FEDERAL GOVERNMENT	21%	35%
TOTAL	26%	35%

(AVERAGE % REPORTED BY RESPONDENTS)

EXHIBIT III-14

REMOTE BATCH USE WITH INTERACTIVE COMPONENT
BY COMPUTER STATUS

USER STATUS	CURRENT USE WITH INTERACTIVE COMPONENT	FUTURE USE WITH INTERACTIVE COMPONENT
RESPONDENTS WITH AN IN-HOUSE COMPUTER	29%	43%
RESPONDENTS WITHOUT AN IN-HOUSE COMPUTER	22%	24%

(AVERAGE % REPORTED BY RESPONDENTS)

INPUT

EXHIBIT III-15

REMOTE JOB ENTRY/REMOTE DATA ENTRY USE BY USER TYPE

USER TYPE	CURRENT RJE USE	FUTURE RJE USE
SCIENTIFIC & ENGINEERING	95%	98%
BUSINESS	82%	79%
FEDERAL GOVERNMENT	74%	82%
TOTAL	86%	90%

(AVERAGE OF REPORTED PERCENTAGE OF RJE USE)

of the market will grow rapidly with the growth of special applications processing.

3. DATA BASE/FILE MANAGEMENT REQUIREMENTS

• Over 50% of current users do not require a DB/FM language of any kind, as shown in Exhibit III-16. However, four respondents did indicate they were totally dependent on a data base system such as IMS.

• As expected, business respondents used data base/file management systems more heavily than the scientific and engineering, and federal government respondents.

• As shown, there will be an increasing use of DB/FM systems, but it will be a gradual increase. One reason could be the overhead which the users would be required to pay for. Many of these users are very cost conscious and will avoid unnecessary frills.

EXHIBIT III-16

DATA BASE/FILE MANAGEMENT REQUIREMENTS BY USER TYPE

USER TYPE	PERCENTAGE OF R/B SERVICES USING DB/FM				
	0%	1%-25%	26%-50%	51%-75%	76%-100%
CURRENT USE					
SCIENTIFIC & ENGINEERING	10	3	2		
BUSINESS	8	3	2		4 (All 100%)
FEDERAL GOVERNMENT	2	2	1		
TOTAL	20	8	5		4
FUTURE USE					
SCIENTIFIC & ENGINEERING	7	2	2		
BUSINESS	6		3	1	4
FEDERAL GOVERNMENT	1	2	2		
TOTAL	14	4	7	1	4

(NUMBER OF RESPONDENTS BY CATEGORY)

INPUT

E. APPLICATIONS ANALYSIS

1. VENDOR/USER SUPPLIED

• There was little use of vendor supplied software in the survey, as shown in Exhibit III-17. In the S & E market, most of the vendor supplied software is actually in the public domain through the federal government (NASTRAN, for example) or through universities working on federal grants.

• There was little identifiable trend to the use of vendor supplied applications software, by these respondents. In future, however, there will be a definite trend for new users to be attracted by vendor software. Also, clients of applications specialized vendors such as XCS, Keydata, etc., were not interviewed as part of this study as they are primarily on-line users.

2. APPLICATIONS USED

• In S & E, building models and using simulation tools together make up the major demand for remote batch services as shown in Exhibit III-18. Software in the public domain is used for nuclear code testing and large scale structures design. Although the software is available, most users regard it as more economical to process such applications on a large scale vendor machine. Many of the applications are separable so the user may, and often does, have several vendors.

• The business market is more prosaic, with standard accounting, production, and labor and personnel systems. Over 60% of the respondents

EXHIBIT III-17

USE OF VENDOR SUPPLIED PROGRAMS BY USER TYPE

USER TYPE	PERCENTAGE OF USE OF VENDOR SUPPLIED PROGRAMS	
	CURRENT	FUTURE
SCIENTIFIC & ENGINEERING	34%	27%
BUSINESS	17%	19%
FEDERAL GOVERNMENT	4%	6%
TOTAL	20%	20%

(AVERAGE OF RESPONDENT PERCENTAGES)

INPUT

EXHIBIT III-18

APPLICATIONS USED BY RESPONDENTS

USER TYPE	APPLICATION	NO. OF MENTIONS
SCIENTIFIC & ENGINEERING	PUBLIC DOMAIN – NUCLEAR CODE	4
	" " – STRUCTURAL ENG.	4
	MODELS	6
	SIMULATION	3
	DATA REDUCTION/FILE MANAGEMENT	1
	LOAD LEVELLING, PROJECT MONITORING	)
	CIRCUIT ANALYSIS, CHIP DESIGN, ENG. DESIGN	)1 EACH
BUSINESS	ACCOUNTING	8
	PRODUCTION	4
	LABOR DISTN./PERSONNEL/PAYROLL	7
	PLANNING & SCHEDULING	4
	DATA BASE/FILE MANAGEMENT	6
	ORDER ENTRY	3
	CITY BUSINESS, ENG. APPNS., TRUST ACCTG.	)
	PROG. DEVELOPMENT,CHECK WRITING	)1 EACH
FEDERAL GOVERNMENT	MODELS & MNGMNT. SCIENCE TECHNIQUES	3
	ENGINEERING DESIGN	1
	REMOTE DATA ENTRY AND DECENTRALIZED PROCESSING OF INSURANCE APPN.	1

INPUT

were primarily using these applications. Of the remainder, data base
handling was important to a third of the respondents. Planning,
scheduling and forecasting were also key applications areas for about 25%
of respondents. In several cases, this involves considerable model
building. Remote order entry was used by three respondents, particularly
from remote locations.

•   In the federal government, model building is again rated highly both
for S & E and 'business'. The major application, in terms of $ volume,
is an insurance package to support mortgage insurance: the annual
contract value is approximately $2M, but it is going in-house on a
Univac 1108 when a conversion and network construction project is
finished.

F.   THE FEDERAL GOVERNMENT MARKET

1.   GSA DEVELOPMENTS

• The ADP Teleprocessing Services Contract Program being developed
by GSA to cover the purchase of teleprocessing services by federal
agencies is planned to go into effect on January 1, 1976. This contract
program will replace the GSA contract with CSC/INFONET.

- The intent of this program is to expand the scope of authority
  of GSA in the purchase of teleprocessing services by federal
  agencies.

- It will bring other remote computing activities than those
  presently covered by the GSA/INFONET contract under one umbrella
  contract. (At present use of CSC/INFONET is only for applications
  requiring access to a data base from more than one geographic
  point and in both interactive and remote batch modes.)

- It is an attempt to obtain pricing discounts of 20% -30% on many
  of the services currently being provided to federal agencies
  outside the scope of the CSC/INFONET contract.

• The scope of the contract has not yet fully been defined: July 1 is
the target for release of the final solicitation contract. It is unlikely
that it will cover the provision of all remote computing services to all
agencies.

- The instructions to agencies leaves scope for them to award
  contracts based on special requirements.

- The key, however, is that waivers will have to be obtained from GSA on the use of any teleprocessing (remote computing) service not on the approved list.

- The provisions of the contract are such that large agencies notably DoD and HEW, will virtually continue to do as they wish. Smaller agencies will be 'pushed around' more by GSA.

- Vendors with unique capabilities, such as DRI, are better off staying away from the contract. They will still be able to sell their services and not give the discount.

- There is some slight advantage to vendors on the approved list in that they will have less involvement with individual agency contracting officers; in other words, the problems of persuading the individual agency contracting office to allow a contract after the technical people have been sold is considerably reduced. This is offset by the regomarole the technical people must go through to select the vendor with 'the least cost'.

- The 'benchmark' provisions are extensive: vendors should charge for all benchmarks as agencies will be required to perform them.

- A contract with GSA will not generate any revenues in itself. The vendor must still 'sell' individual agencies: the concept of the agencies 'shopping around' for services is untenable. However, by 1978 the majority of federal government remote batch expenditures will be through GSA contract as shown in Exhibit III-19.

EXHIBIT III-19

FEDERAL GOVERNMENT REMOTE BATCH MARKET

1975

TOTAL $40M

GSA CONTRACT $15M

1978

TOTAL $80M

GSA CONTRACT $65M

50   100

($ MILLIONS)
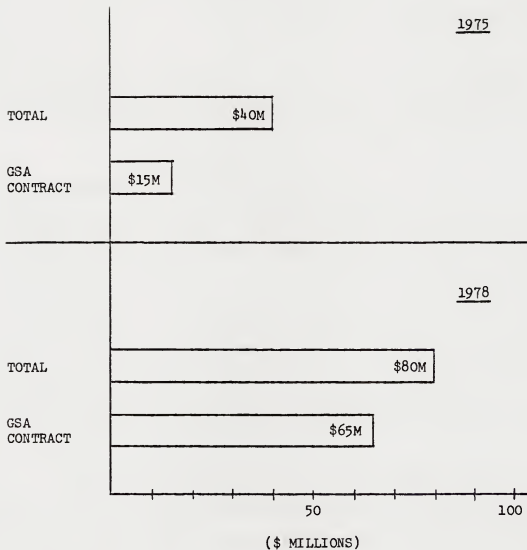
2. AGENCY REQUIREMENTS AND TRENDS

- Although individual agencies responding to the survey did not indicate a high use of DB/FM systems, this is, and will be, a major requirement in future. In particular, as standards are developed through NBS and ANSI, the federal government will mandate their use. In the meantime, IMS, System 2000, ADABAS, CC204, and others, are being acquired by most large agencies: implementation of systems is proving a problem however.

- The growth of government responsibilities and the expansion restrictions placed on individual agencies will be major drivers to the use of outside services. Furthermore, the inability of ADP groups within agencies to respond to the rapidly changing demands will also cause use of outside services. Therefore new agencies and those with added responsibilities are prime candidates for the use of services.

- The government requirements for reporting continue to increase, thus data base establishment and maintenance to support federal programs is a major application area. In conjunction with this, the need for ad hoc reporting requirements to meet congressional, public interest group, and constituent demands for information is increasing rapidly. Again, in-house groups are not geared to satisfying these demands.

- Decentralization of programs from central agency offices in Washington will continue and will generate needs for support in regional and local offices. The Housing and Urban Development mortgage insurance business reported in the interviews is a classic example of this. The

large scale requirement ($2 million per year) has caused the agency to establish its own network to support the application and bring the processing in-house. Residual processing will remain with the vendor.

- An alternative to the use of outside remote computing services, as such, is the use of facilities management, such as the contracts OSI has with EPA and FEA, or CSC has with NASA. In future, agencies will tend to use the EPA/FEA approach, whereby the vendor operates computers for the agencies off-site, as opposed to the older, NASA approach, where the computers are owned by NASA and operated on-site. In many cases the border between facilities management and remote computing will be hard to determine. GSA will undoubtedly try to get its hands on the remote FM business as well.

In this context, NASA stands out as a government agency which has performed eminently successfully, in large part due to its contracting-out policy and intelligent use of computer and software services.

IV.   TECHNICAL REQUIREMENTS
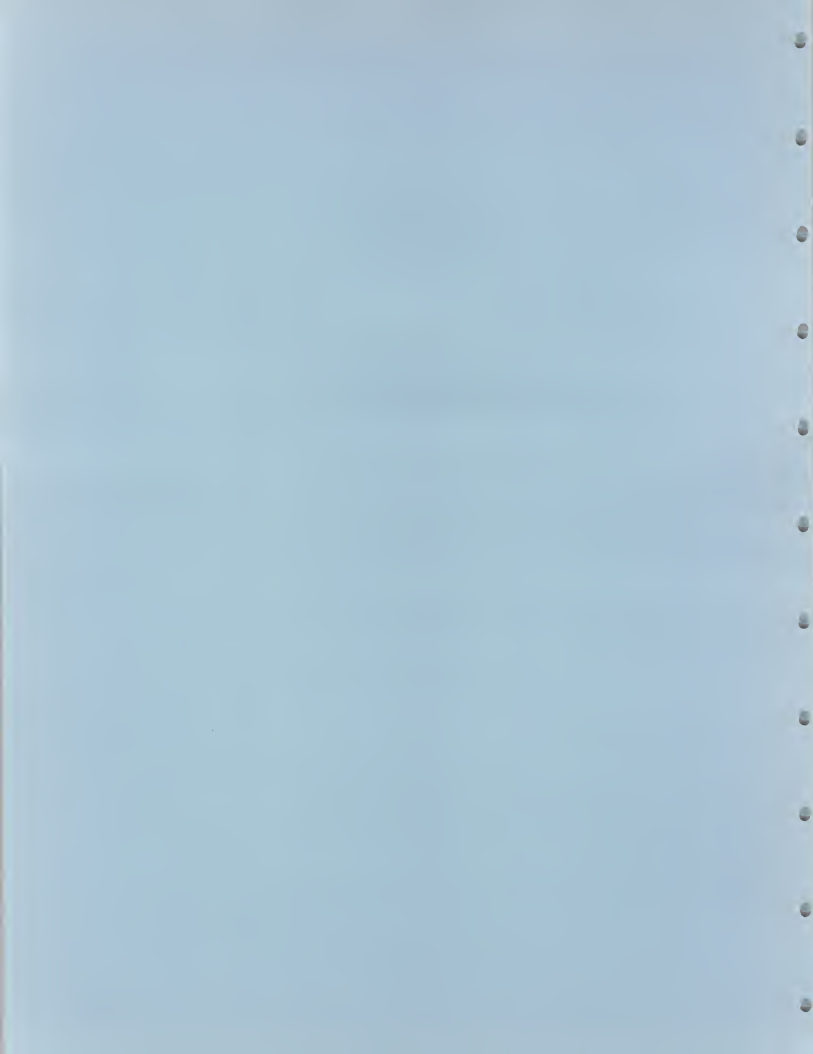
IV. TECHNICAL REQUIREMENTS

A. COMPUTER MAINFRAMES

Exhibit IV-1 indicated the mainframes types in use, on a remote batch service basis, by the respondents. After a discussion of their current and planned activities, the users were asked if they required these particular mainframe types. Exhibit IV-2 illustrates, along with other factors, the users' attachment to particular mainframe types.

• More than two-thirds of the users responded that they either required or had a strong preference for the particular mainframe(s) which they currently used for remote batch services.

• The reasons for this included:

- Compatibility with in-house systems

- Special hardware characteristics (such as 60-bit words)

- Availability of programs written for certain systems only

- Cost of conversion of existing programs

EXHIBIT IV-1

REMOTE BATCH VENDOR'S MAINFRAME TYPES USED BY RESPONDENTS

Computer Manufacturer	System/Model	Frequency	
		Model	Manufacturer
IBM			33
	370/195	1	
	360/85	1	
	370/165-168	12	
	370/155-158	9	
	360/65	5	
	370/145	1	
	Unknown	4	
CDC	6600-7600		12
UNIVAC	1108		9
Burroughs	Unknown		1
DEC	PDP 10		1
G.E.	Unknown		1
Total			57

INPUT

EXHIBIT IV-2

CURRENT HARDWARE/SOFTWARE REQUIREMENTS

Category	% of Users
Particular mainframe type	67.5%
Particular operating system	41%
Particular DB/FM system	11%
Other (system) software	5%
Other hardware (e.g., COM, PLOTTER)	3%

% of Users

INPUT
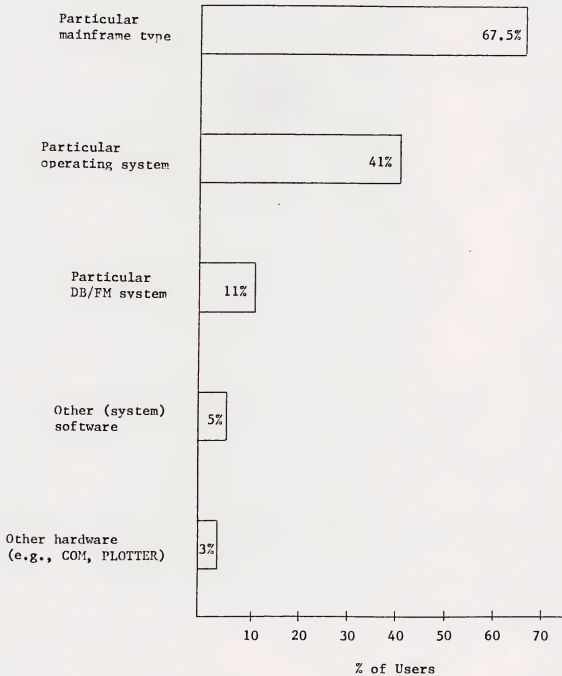
- There was no significant difference in attachment expressed by the business and scientific users of remote batch services. In other words, the ability to get users to switch mainframe types is independent of these two market segments.

B. OPERATING SYSTEMS

Exhibit IV-2 also illustrates the users' requirement for a particular operating system. Again, after a discussion of current and planned activity, they were asked if they required a particular operating system.

• Forty-one percent of the users indicated a requirement or strong preference for a particular operating system. However, this may be somewhat misleading since many respondents indicated a need for an operating system by manufacturer type only. That is, they stated that they required IBM but did not state a requirement for either OS, VS, or VM in particular. OS was the dominant IBM operating system in use.

• Reasons for operating system preference were:
    - Compatibility with in-house
    - Resistance to having to learn a new system
    - Procedural and program incompatibilities and the required conversions

• The scientific users were more willing to change operating systems than were the business users. This is not surprising considering business applications generally make greater use of operating system facilities and tend to develop file dependencies.

C. OTHER FEATURES

Users were quite independent of other service features. Exhibit IV-2 illustrates the degree of dependency upon other software facilities or special hardware.

• Eleven percent of the users required a particular data base or file management system. IMS was found to be in moderate use and it did, of course, create such a dependency. Other DB/FM systems were also in use but the users did not generally feel that their continued use of those particular systems was a requirement.

• A small number of users expressed a requirement for system features other than those mentioned above. TSO was mentioned as a requirement by one user.

• Special hardware was the least required feature by the users surveyed. COM was frequently in use but there was no requirement for the remote batch vendor to supply it; generally, COM conversion was done in-house or by a service bureau. Plotters were also in frequent use by the scientific users but, once again, they did not require the vendor to provide the plotting facility. In both cases the appropriate software routines are all that the remote batch services vendor need support. No cases of mass storage were encountered or foreseen by the users surveyed. Graphics was encountered with one user and foreseen by one government user.

D. PROGRAM CHARACTERISTICS

1. CORE REQUIREMENTS TEND TO BE LARGE

Exhibit IV-3 illustrates the core requirements of the programs currently run by users of remote batch services. The upper figure depicts the typical program; the lower figure depicts their largest programs. Responses were converted to be roughly equivalent to IBM bytes for ease of reference.

• Typical programs tend to be large, certainly by traditional time sharing standards, with almost 50% of them exceeding 200K bytes. Of these typical programs, only about on in five occupied less than 100K bytes of core. These figures reflect the core requirements when (if) overlaid; they are not the size required if the programs were written without overlays.

• The average typical program required 230K bytes of core. As might be expected, business users' typical core requirements were less than those of the scientific users. The typical business program averaged about 90K bytes; the typical scientific program averaged about 320K bytes. The two largest typical scientific programs were 600K and 1100K bytes; with these removed from the sample, the average for typical scientific programs is about 200K. (Reference Exhibit IV-4.)

• The largest programs being run on remote batch services required substantial amounts of core. Almost one-third of the user's largest

-57-

EXHIBIT IV-3

CORE REQUIREMENTS - TYPICAL REMOTE BATCH PROGRAMS

(AVERAGE = 230K BYTES)
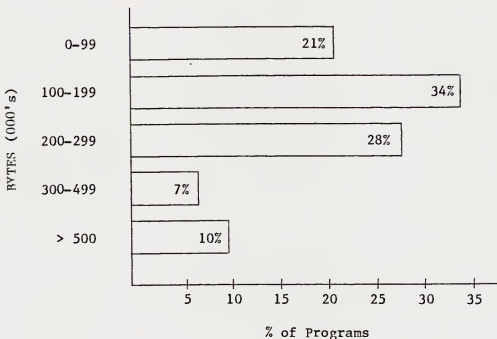
CORE REQUIREMENTS - MAXIMUM REMOTE BATCH PROGRAMS

(AVERAGE = 612K BYTES)

INPUT
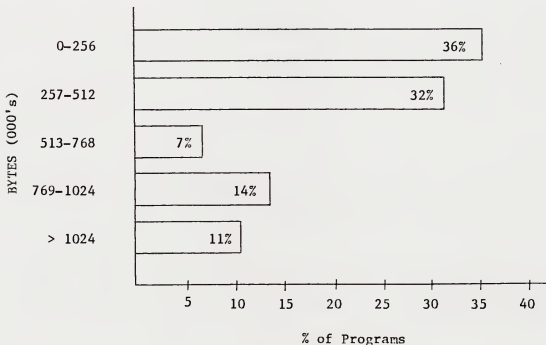
EXHIBIT IV-4

AVERAGE CORE REQUIREMENTS

REMOTE BATCH PROGRAMS

Nature of Use	Typical Program	Largest Program
Business	90K	245K
Scientific & Engineering	320K	885K
Combined Average	230K	612K

INPUT

programs require in excess of one-half million bytes and two-third's require more than one-quarter million bytes. Again, this is the requirement when overlaid.

• The average maximum core requirement was 612K bytes. Once again, there was a great discrepancy between the requirements of the business and scientific users. Business users' maximum program size averaged almost 250K; scientific users' maximum program size average almost 900K. (Reference Exhibit IV-4.)

2. FILE SIZES RANGE WIDELY BUT TEND TO BE SMALL

Users found the questions about file sizes difficult to answer. Often this was due to an inability to speak for a number of different users within the organization. Exhibit IV-5 lists the responses obtained.

• Typical files are generally small; it was rare to hear of a typical file size of over one million characters.

• Maximum file sizes ranged from only 350K to 100 million characters. In general, the largest file sizes reported would be easily managed on any remote batch system.

• As expected, business users' file requirements far exceeded those of the scientific users. The government users surveyed reported larger files than either the business or scientific users in the commercial sector.

EXHIBIT IV-5

REMOTE BATCH USERS' FILE SIZES - (CHARACTERS)

User Type	Typical	Maximum
Business	Small	---
	Small	2 MM
	Small	25 MM
	240 K	---
	1 MM	2 MM
	2 MM	90 MM
	---	60 MM (total)
	---	100 MM (total)
	15 MM	100 MM (total)
Scientific & Engineering	Small	---
	Small	---
	Small	1 MM
	72 K	350 K
	100 K	---
	130 K	---
	130 K	650 K
	300 K	2 MM
Combined Business & Scientific	Small	4 MM
	600 K	5 MM
	6 MM	---
Federal Government	1 MM	15 MM
	2 MM	---
	2 MM	11 MM
	20 MM	---
	40 MM	100 MM

K = Thousands
MM = Millions

INPUT

3. INPUT/OUTPUT REQUIREMENTS ARE NOT CLEAR

●   At one time or another, many users surveyed use vendor provided
facilities for output. Typically, bulk printing is done either at the
remote computer center or at a medium-high speed printer in the local
sales office.

●   Less frequent was the use of vendor provided facilities for input.
Two users had no terminals of their own and used local office terminals
exclusively. Tape input was rarely encountered and in those cases the
mail was used to deliver the tapes to the remote computer center.

●   Input/output volumes are not clear to us as the users found such
questions difficult to answer. The few intelligible responses indicated
relatively low volumes routinely and occasionally higher volume output
which was done either on their terminal equipment or at the vendor's
site. Exhibit IV-10, illustrating current and future terminal speeds,
may give an indirect indication of the input/output volumes associated
with remote batch usage.

4. TURNAROUND REQUIREMENTS ARE DEMANDING

    Exhibit IV-6 illustrates the turnaround requirements - in terms of
the percentage of jobs - as expressed by the users surveyed. The less
than one-half hour category was added after the mid-point of the study
and, hence, the sample is smaller than for the other data. The figure
was derived by computing the < 1/2 hour/1/2-2 hour ratio for those users

EXHIBIT IV-6

TURNAROUND REQUIREMENTS FOR REMOTE BATCH JOBS

Less than 1/2 hour	16%
1/2 - 2 hours	26%
2 - 8 hours (same day)	19%
Next day	39%

```
              10        20        30        40
```

% of Jobs

INPUT
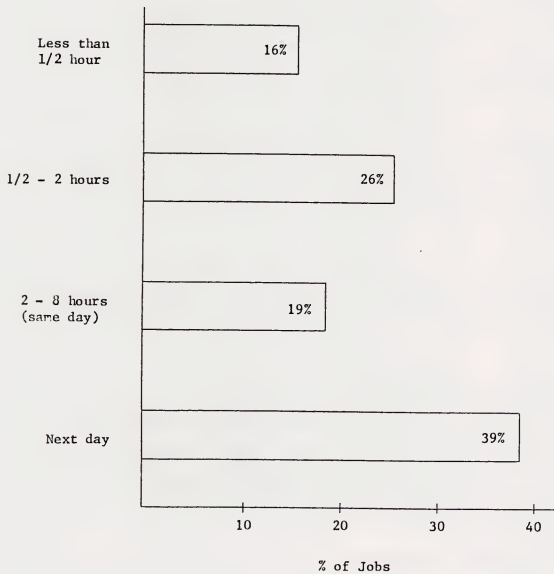
who were asked and applying the result to the less than two hour percentage
given by those who were not asked for a less than one-half hour percentage.

● Over 40% of the jobs require turnaround of two hours or less; one job
in six requires turnaround of less than one-half hour.

● About 40% of the jobs are not required to be processed the same day
and overnight processing is deemed adequate. The balance of 20% is re-
quired the same day but there is no need for great haste.

● Under subsequent questioning, users indicated that poor turnaround
was one of the major reasons why they would consider switching vendors
of remote batch services. However, the turnaround requirements as
reported by the users are generally being met by remote batch vendors at
this time.

● Scientific users demanded two-thirds of their jobs run in less than
two hours; business users demanded one-third of their jobs run in less
than two hours.

● Scientific users could wait until the next day for almost all jobs
that were not demanded in less than two hours and expressed very little
"same day" demand. About one quarter of the business jobs could be
satisfied by "same day" processing while close to half could be run
overnight.

● Government users surveyed on the question of turnaround answered
very much like the scientific users: About two-thirds of their jobs

require less than two hours turnaround; there is very little "same day" demand; the balance of about one-third is satisfied by overnight processing.

5. EXECUTION TIME RANGES UP TO HOURS

Exhibit IV-7 depicts the distribution of execution time required by typical and maximum runs. It was not possible to correlate the execution time responses to particular mainframe types and thereby derive some sort of standard by which to measure the times. The reader is directed to Exhibit IV-1, which lists the mainframes in use by the respondents, to get a feel for the size of these jobs. In general, the systems in use are the largest available and these times should be viewed as "very large minutes".

• Three out of four typical jobs require execution time of less than ten minutes; most of the balance require less than one-half hour of execution time.

• Maximum jobs are quite large with about 40% of the largest runs requiring in excess of one hour of computing. Half of the maximum jobs required from five to sixty minutes of processing and the balance of about 10% of the jobs required less than five minutes of execution time.

• The longest run times were not exclusively generated by scientific users. Many of the business users ran models of one sort or another that also required large amounts of processing. While to the computer system these may look like scientific programs, the applications and the users are business oriented.

EXHIBIT IV-7

REMOTE BATCH JOB EXECUTION TIME - TYPICAL RUN

< 1 minute	20%
1 - 10 minutes	56%
11 - 30 minutes	20%
> 30 minutes	4%

% of Users

EXECUTION TIME - MAXIMUM RUN

< 5 minutes	9%
5 - 30 minutes	32%
31 - 60 minutes	18%
1 - 3 hours	23%
> 3 hours	18%

% of Users

INPUT
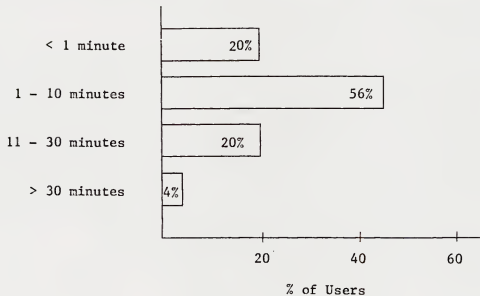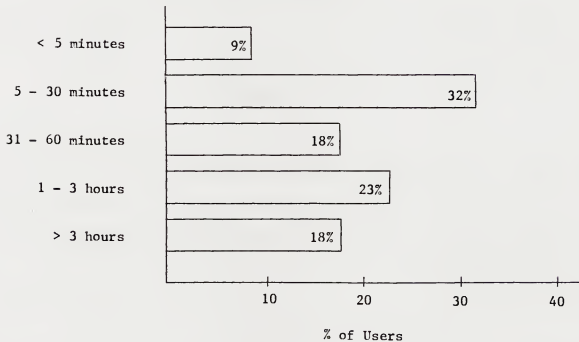
6. JOBS ARE RUN FREQUENTLY

Exhibit IV-8 displays the frequency with which the remote batch users surveyed executed jobs. No attempt was made to determine the actual number of jobs submitted over time; this is merely an indication of the frequency of their use of a remote batch service.

• More than half of the users run jobs on a daily basis; many of these run jobs a number of times within a day.

• Another one quarter of the users run jobs weekly resulting in a total of about 80% of the users being quite regular in their use of services. This is consistent with the use of remote batch for production type work.

• The remainder — or about one user in five — only execute programs on a monthly basis or even less frequently. Their use tends to be project oriented and comes and goes with the nature of their business mix.

• There was no discernible difference between business and scientific users on the question of frequency of execution.

7. MAJOR LANGUAGES ARE ALL IN USE

• Exhibit IV-9 indicates the frequency with which users gave various responses when asked what languages they were using. A number of users gave multiple responses which indicates the variety of applications being run on remote batch by single companies.

EXHIBIT IV-8

FREQUENCY OF REMOTE BATCH JOB EXECUTION
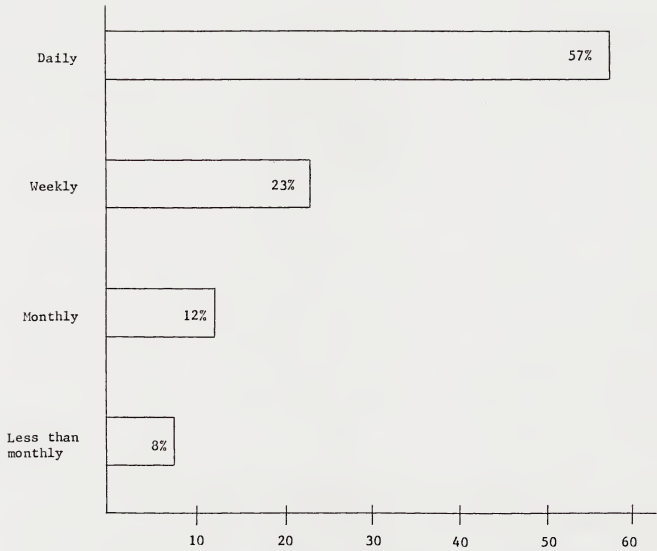
Average Percentage of Users' Expenses

INPUT

EXHIBIT IV-9

LANGUAGE USED BY USERS

OF R/B SERVICES

Language	Frequency
Fortran	14
COBOL	11
Assembler	6
PL/I	6
Other * (RPG - 2) (GPSS - 1)	3*

Number of Respondents

- No language stood out as being dominant over the others; no major language stood out by being absent from the list. Remote batch users will require that all major languages be supported.

INPUT

E.   DATA COMMUNICATIONS

1.   TERMINAL SPEEDS INCREASING MODESTLY

•   Exhibit IV-10 illustrates the trend toward higher speed terminals which will be in use by users of remote batch services.

•   In general, the low speed users will migrate to 6-1200 BPS and the medium speed users will tend to go up one notch faster than they are at present. Only one user of more than 9600 BPS (50 KB) was discovered.

•   No users expressed that their use of remote batch was significantly hampered by terminal speeds or output capacities. In addition, the increased speeds planned would adequately cover future volumes and convenience considerations.

•   Some users will continue to rely upon vendor provided facilities for all of their terminal and data communications needs.

•   Virtually all medium speed terminals reported were of the 2780 compatible type. Only two small computers were uncovered being used as terminals: an HP-2100 by a scientific user and a System/3 by a business user. In both cases the small systems were also used for some local processing.

•   Ten users reported submitting jobs from low speed terminals. Some of these users had no medium speed capability and relied on vendor facilities for all bulk output.

EXHIBIT IV-10

COMMUNICATION SPEED IN USE - CURRENT/FUTURE

Line Speed in Baud

0 - 300	Current = 10 / Future = 7
600 - 1200	1 / 3
2000 - 2400	Current = 10 / Future = 6
4800	Current = 15 / Future = 16
7200	1 / 2
9600	5 / 8
> 9600	1 / 1
Vendor facility	2 / 2

Number of Responses

2 4 6 8 10 12 14 16 18 20 22

INPUT
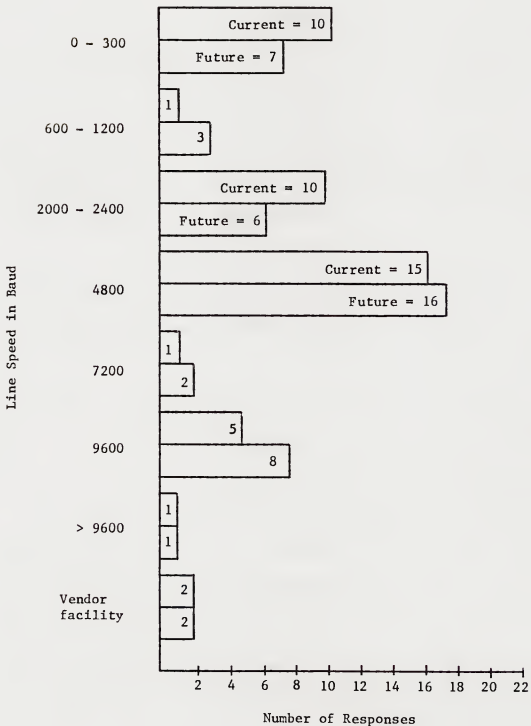
2.   TECHNICAL REQUIREMENTS OF NETWORKS ARE EASY TO MEET

•   No user was encountered with a need for a highly sophisticated data
communications network.   Virtually all of the users surveyed would be
satisfied with a star network composed of leased lines and perhaps
complemented with WATS.

•   Slightly less than one-third of the users expressed any need for a
multi-city network at all.   In two-thirds of the cases they were only
concerned with reasonable access from one location.   Exhibit IV-11 depicts
this lack of a need for a network by most users.

•   Exhibit IV-11 also illustrates the incidence of various means of
accessing the main computer systems.   (The figures add to over 100%
because of multiple systems use by some of the users.)   Only one user
accessed the services vendor by long distance dial exclusively; all
other users make connection via local dial and/or leased line.

•   When a leased line is installed for a particular user it is common
for the remote batch vendor to install and maintain the service and pass
the cost of the circuit along to the user as a separate item on the
computer services invoice.

•   Users were only informally queried on their future use of networks
and all that can be said is that they do anticipate some increased need
for such a capability.   In addition, it appears that some non-users can
be induced to use remote batch services in conjunction with a network
capability.

-73-

EXHIBIT IV-11

USER REQUIREMENTS FOR MULTI-CITY NETWORK

% of Users
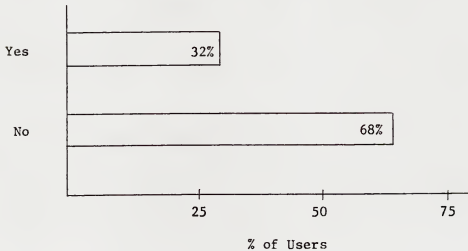
CURRENT ACCESS TO R/B SYSTEM

% of Users
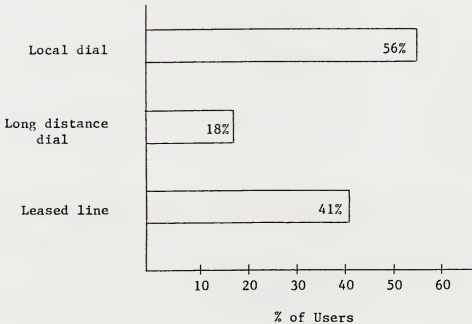
NOTE: Adds to over 100% because of multiple systems use by many users.

INPUT

V. MARKETING REQUIREMENTS
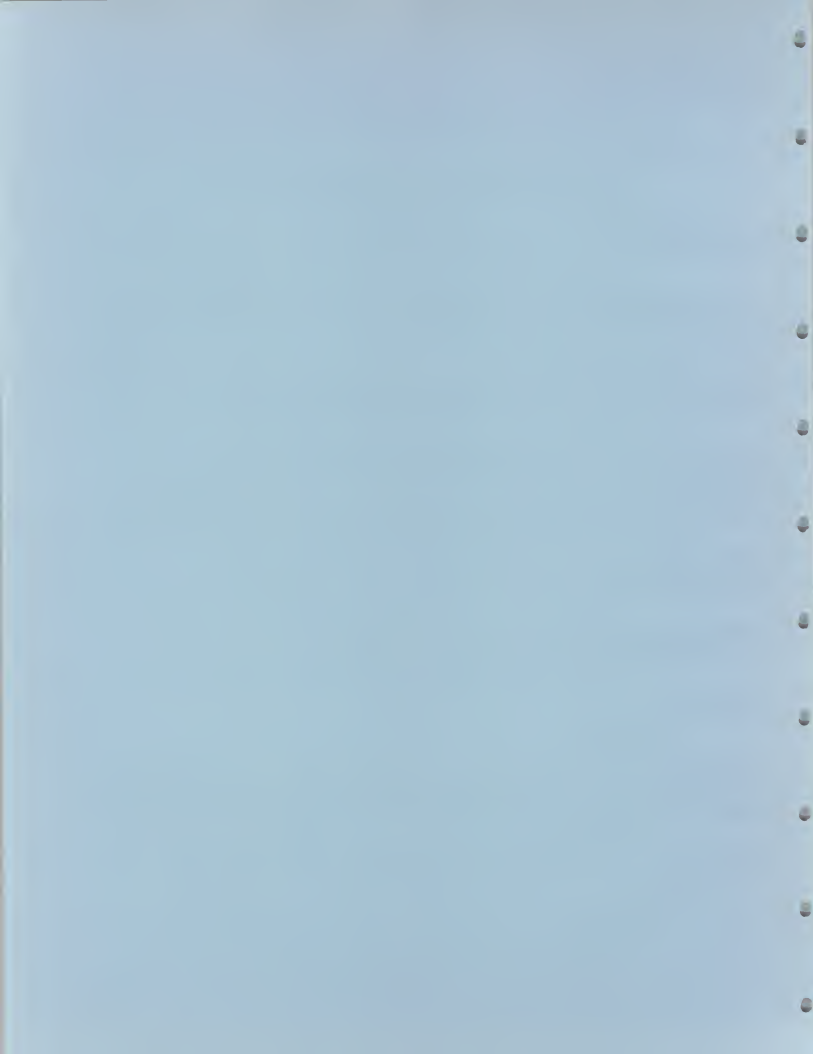
V.   MARKETING REQUIREMENTS

A.   WHY USERS USE REMOTE BATCH SERVICES

1.   USERS WITH IN-HOUSE SYSTEMS ARE BUYING SPECIAL HARDWARE OR SOFTWARE

Users of remote batch services with medium to large scale in-house computer systems were asked why they used outside remote batch services; Exhibit V-1 depicts their responses. In some cases multiple responses were given by individual users.

• Special hardware capability was the most frequently given reason by this group of users for the use of outside services. More specifically, they indicated their need for:

    - Larger word size necessitated by some applications such as nuclear code work

    - Larger memory than presently available on the in-house systems

    - Greater CPU power, which was generally required for scientific applications, but some business users had large models requiring more processing than could be handled by present in-house systems

-75-

EXHIBIT V-1

WHY USERS WITH MEDIUM-LARGE

IN-HOUSE SYSTEMS USE R/B SERVICES

Number of Responses
(Total = 31)

INPUT
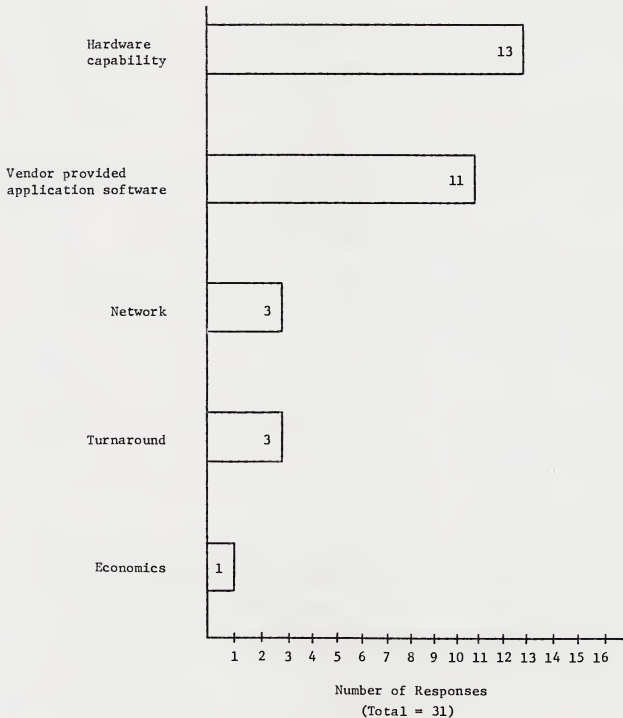
● Vendor provided application software was the second most common reason given by these users for the use of remote batch services. This cause was ranked close to special hardware requirements and each of these factors were far more common than any other reason.

    - In some cases this software was not strictly proprietary but, rather, in the public domain. The vendors had modified these programs to run on their systems and sometimes made functional improvements.

    - Some users commented that the conversion costs involved in order to make these programs run in-house were prohibitive. If it were not for that cost they would run the jobs on their in-house systems.

    - The balance of the cases were true proprietary application systems developed by the vendors for specific markets. These cases were, however, in the minority.

● Network availability was given significantly fewer mentions although it is a key factor for some current users with in-house capability. These users were typified by geographically dispersed operations centers with a need for common programs and/or data base.

● Turnaround was also mentioned – although infrequently – as a reason to go outside. In these cases the in-house systems could not satisfy all using departments' turnaround requirements or justify the additional facilities required to satisfy the most demanding users.

• Economics was only mentioned once as a reason to use outside services by those users having significant in-house capability. While it is true that all of the above mentioned reasons can be considered economic in nature, it is interesting to note that they are not discussed in economic terms by the users. The thought process of these users is to do their work in-house unless they are prohibited by economics; users with no in-house systems or small in-house systems look for the most economic solution first and do not display the bias for in-house. (See the following.)

2.   USERS WITHOUT IN-HOUSE SYSTEMS ARE BUYING ECONOMICAL SOLUTIONS

Users of remote batch services who did not have in-house systems or who only had small in-house systems were also asked why they used outside remote batch services. Exhibit V-2 depicts their responses to this question.

• Economic considerations were by far the major reason given for the use of services. This is in sharp contrast to the users with larger in-house systems who consider economics a secondary issue. In essence they feel that the most cost effective way for them to meet their data processing needs is to use a small part of a large machine. Users with small in-house systems often used them in a fashion which was complementary to the remote batch service.

• Unique hardware capability was mentioned by scientific users who expressed their familiar, unique requirements.

EXHIBIT V-2

WHY USERS WITH SMALL OR

NO IN-HOUSE SYSTEM USE R/B SERVICES

Hardware
capability — 3

Vendor provided
application software — 2

Network — 1

Turnaround — 0

Economics — 12

```
    1  2  3  4  5  6  7  8  9  10 11 12 13
```

Number of Responses

(Total = 31)
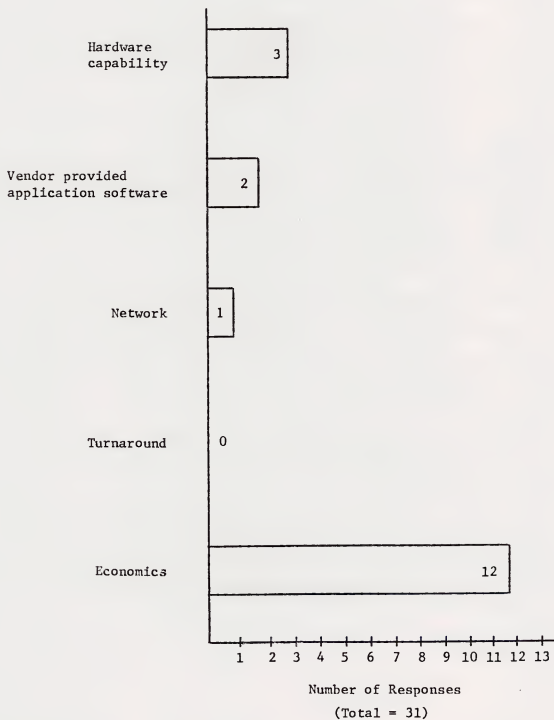
- Vendor provided applications currently play a minor role for these users. More typically the vendor is being used as a "computer utility".

- Only one user with little in-house capability mentioned a network as reason for the use of outside services. These smaller data processing users tend to be smaller organizations and, therefore, tend not to have the multiple locations.

3. "GROWTH" THE MAJOR FACTOR LEADING TO INCREASED USE

Current users were asked what developments might lead to increased use of remote batch services; their responses are presented in Exhibit V-3. The following three causes were given in remarkably even proportions:

- Normal, expected growth of their present business and applications was considered to be a cause for increased use. Either programs would be run more frequently or file sizes would expand causing a corresponding increase in processing charges.

- An equal number of users foresaw new applications relating to their present business as a source for increased use of services.

- Almost as many users felt that new business activity would generate additional remote batch usage. Included in this area were new areas of business as opposed to additional work in their present areas.

EXHIBIT V-3

FACTORS CAUSING AN INCREASE

OR DECREASE IN USE OF R/B SERVICES

Increase Factors	Number of Responses
o Growth of existing business and applications	6
o New applications related to existing business	6
o New business	5
Decrease Factors	
o Conversion to in-house	11
o Use of minis to reduce (not displace) R/B	2
o Decline in related business activity	2

NOTE: Eight users had current plans to reduce usage of R/B services.

4. CONVERSION TO IN-HOUSE IS MAJOR CAUSE OF DECREASED USE

Current users of remote batch services were also asked what developments would lead to a decreased use of services. Exhibit V-3 presents their responses. Three reasons were given for decreased usage:

- By far the most commonly mentioned development which would lead to decreased usage of remote batch services was a conversion to in-house processing. Eight of the eleven users responding in this fashion had current plans to bring some or all of their remote batch usage in-house within one year. Additional computer systems, computer upgrades, and operating system enhancements were all mentioned as the vehicles for this conversion.

- Also mentioned was the use of minis which would result in some decreased usage. These devices would be used in conjunction with present services and were not intended to displace the services; some amount of local processing or data collection would be done by the minis and the balance of the work would be done on the service computer. (Note that this is actually a permutation of the in-house conversion situation.)

- A small number of users foresaw a potential decrease in their business activity which related to remote batch usage. As a direct consequence their use of services would also decline.

B. WHY NON-USERS DO NOT, BUT MIGHT, USE REMOTE BATCH SERVICES

Non-users of remote batch services were surveyed to determine why they are not using such services and under what conditions they might. These non-users consisted of companies which use no outside services and companies which use outside time sharing but no outside remote batch. In all cases the companies surveyed were Fortune 500 or equivalent companies and all had substantial in-house capability. The consistency of their responses led us to drop further study at the mid-point of the study.

1. IN-HOUSE CAPABILITY ELIMINATES NEED FOR OUTSIDE REMOTE BATCH

• Invariably the reason for not using remote batch services was the current availability of a competitive in-house capability.

• No significant difference in responses was determined between the non-service users and those who used time sharing.

• Exhibit V-4 is a collection of colorful comments from non-users which will give the reader a feeling for the situation.

2. PROPRIETARY SOFTWARE IS LEADING REASON WHY NON-USERS MIGHT USE

• Exhibit V-5 lists the reasons given by non-users of remote batch services for potential future use. Software and hardware capabilities were the major reasons given.

EXHIBIT V-4

WHY NON-USERS DO NOT USE R/B SERVICES

Comments from Non-Users

"Rates attractive enough for emergency need but not for regular use"

"Experience is that in-house is a fraction of the cost of out-house"

"Difficulty of getting reliable and firm cost estimates for budgeting results in reduced use of services"

"Have not yet had a need we could not fill with in-house capability"

"Only if our backs are to the wall"

"Jobs brought in-house (TSO/155) cost 1/4 to 1/2 of outside services"

"Hard to get anything done outside; operating efficiency cut about 50%"

EXHIBIT V-5

WHY NON-USERS MIGHT USE R/B SERVICES

Reason Given	Frequency	% of Non-Users*
Proprietary Application Software	7	58%
Overflow Processing	5	42%
Proven More Economical	2	17%
Use of Network	1	8%

* NOTE: Exceeds 100% because of multiple responses by users.

INPUT

• Proprietary application software availability was the prime reason foreseen for potential use. If the development/conversion cost exceeds the remote computer service charges, they will use the service. However, if they can see a way to do it in-house, they probably will.

• An overload situation on the in-house systems was also seen as a common potential need for remote batch services. This need would be eliminated as soon as the in-house systems could be expanded to handle the load. A useful analogy might be the way one would perceive a bald spare tire.

• A small number of non-users stated that they would use remote batch services if it could be proven to be more economical. No judgment can be made from the data as to how many of these non-users would "play fair" in the cost comparisons necessary to resolve this issue.

• One non-user stated that a potential future need for a network capability could result in the use of remote batch services.

C. VENDOR SELECTION CRITERIA

1. HARDWARE AND PRICE CONSIDERED MOST IMPORTANT

Exhibit V-6 illustrates the relative importance users placed upon a variety of factors evaluated in the process of selecting a vendor of remote batch services. Surprisingly, the responses for each factor ranged from one to ten; the average value is presented in the Exhibit. Where government users varied significantly from the commercial users, the appropriate comment is made.

● User Proximity to Vendor Hardware: While logically it might seem to be a virtually irrelevant issue, many users continue to express a preference for proximity to the vendor's hardware. 20% of the respondents rated this an eight or higher in importance to them. The average value is low, however, because almost half of the respondents rated this factor at two or less. In some cases the availability of a nearby line printer/card reader will satisfy the users demanding proximity. Government users rated this factor more important than did the commercial users.

● Availability of a Multi-City Network: The average may be somewhat misleading since the respondents tended to fall at one end of the scale or the other. One-third of the users rated it eight or higher while about one-half rated it two or lower. One in three remote batch users presently require a multi-city network for their applications and the availability of such a network will increase in importance in the future.

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EXHIBIT V-6

REMOTE BATCH VENDOR SELECTION FACTORS

Factor	Relative Importance
User proximity to vendor hardware	4.3
Multi-city network	4.6
Vendor provided applications	4.7
Technical support and training	6.5
Price	7.4
Vendor hardware and operating system	7.7

Relative Importance
(1 = unimportant; 10 = critical)
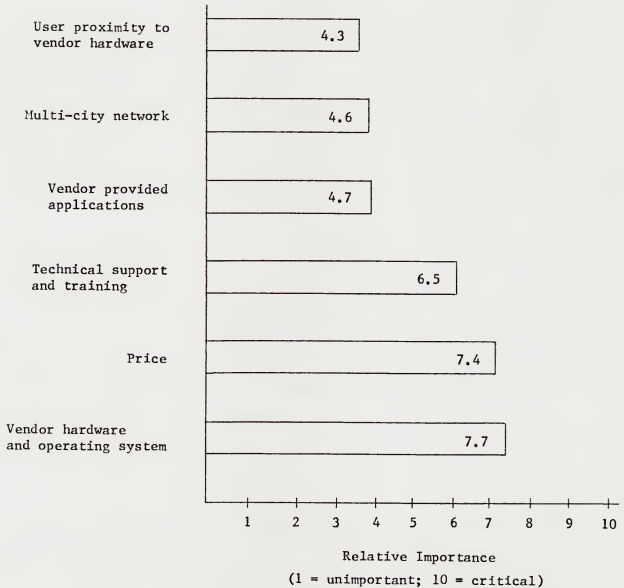
OTHER: (Frequently mentioned as being very important)

RELIABILITY
TURNAROUND

INPUT

● Availability of Vendor Provided Application Programs: Once again few users gave the average response to this factor. About 40% rated this at two or less while about 30% rated it at eight or more. The availability of software packages was frequently mentioned by non-users as a condition under which they might use remote batch services in the future.

● The Quantity and Quality of Technical Support and Training: The responses here were more evenly distributed and such support was considered to be a relatively important factor. Users do not tend to require a lot of support in terms of hours per week and, therefore, judge the support in terms of how quickly they can get their questions answered correctly.

● Price: Less than 10% of the users rated price lower than five in importance to them; it is clearly one of the prime factors in their analysis of a potential vendor. As might be expected, the government users rated this factor as more important to them than it was to the commercial users. In addition to its importance in selecting which service vendor to use, price is also key in the decision to use services as opposed to an in-house solution and, therefore, low prices will be key to overall market development.

● Particular Vendor Hardware and Operating Systems: Current users rated this the most important factor in their selection of a remote batch vendor for a variety of reasons: the cost of converting present programs, the availability of programs for certain systems only (e.g.,

nuclear code programs written for CDC equipment), and a desire for compatibility with in-house systems. The strong attachment was to mainframe type with particular operating system playing a relatively minor role. Obviously, business users were partial to IBM while scientific users were partial to CDC and Univac.

- Other Factors: When asked if other factors were important in their selection process many users volunteered reliability and slightly fewer mentioned turnaround. When asked to rank reliability, they almost invariably replied with eight or greater. Also mentioned were security, financial stability, billing flexibility, and ease of use.

2. USERS WOULD SWITCH VENDORS IF "SERVICE" DETERIORATED

The conditions - other than price - under which users would switch vendors were explored in the course of this study. (For a discussion of price sensitivity, see the following section.) In general, a deterioration in existing "service" levels would be required to cause a switch in the absence of price considerations; users are generally satisfied at this time. Exhibit V-7 illustrates the relative importance of the various "service" components.

- Reliability was discussed in terms of both computer system and network failures. Much of the use of these services are production in nature and cannot stand processing failures of any kind.

- Poor turnaround was the next most frequently reported condition which could result in a vendor switch. Users complained of poor turn-

EXHIBIT V-7

WHY CURRENT USERS WOULD SWITCH VENDORS

Availability of
improved application
software — 4

Poor user
support* — 5

Poor
turnaround* — 8

Poor
reliability* — 10

Non-specific
"poor performance"
or "better service"* — 9

1 2 3 4 5 6 7 8 9 10

Number of Responses
(Total = 36)
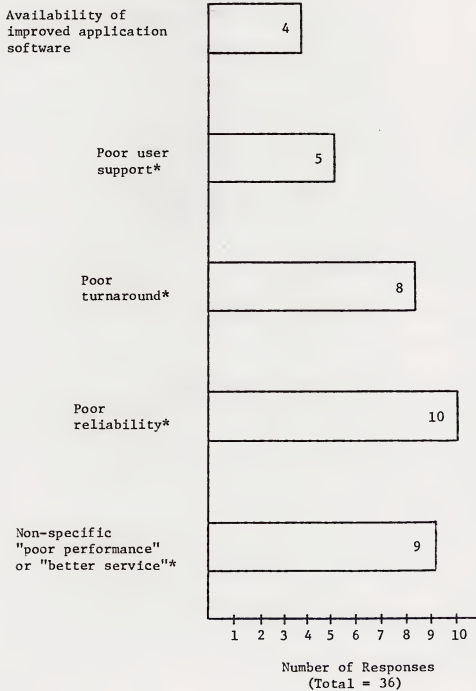
* NOTE: Users spoke of a hypothetical worsening of service;
present conditions are generally satisfactory.

INPUT

around conditions being allowed to persist too long before additional hardware was brough in by the vendors.

- Unsatisfactory user support or problem solving was somewhat less frequently mentioned as a switch condition. As shown in a later section, these users are fairly self-sufficient and do not require a lot of technical support so their demand for it is lower than their demand for system performance.

- Non-specific conditions of "poor performance" or "better service" also ranked high and are presented separately because it is not known into which of the three above categories they should be sorted.

- "Service" to these users means reliability, turnaround and user support.

- The only condition under which users would switch which was not related to service was the potential availability of improved application software. These users would switch if the package were functionally superior to the one presently in use.

D. PRICING

1. USERS SENSITIVE TO MODERATE PRICE DIFFERENCES

Exhibit V-8 illustrates the difference in price which would be required by a user to switch to another vendor offering an otherwise similar service.

- The average price difference which would cause a switch in vendors was 23%.

- Many users objected to our attempt to isolate price from other considerations but only 14% replied that it was not a significant factor and that they would not switch for price alone.

- More than half (54%) would switch vendors for a price difference of 20% or less.

2. TERMS AND CONDITIONS ARE VARIABLE

- Most users have short term contracts which obligate them to little other than to pay for services used. The term is nominal, the prices are standard, and the services offered are the ones normally provided.

- About 20% of the users had signed longer term contracts which often obligated them to use a specified amount of service over the life of the contract. The long term feature was the most common variable encountered and often, but not always, involved a reciprocal discount.

-93-

EXHIBIT V-8

PRICE SENSITIVITY

Price Difference Required

Price not a factor	14%
40% less	11%
30% less	21%
20% less	36%
10% less	14%
Same price	4%

(AVERAGE = 23%)

5 10 15 20 25 30 35 40 45 50

% Users Who Will Switch

INPUT
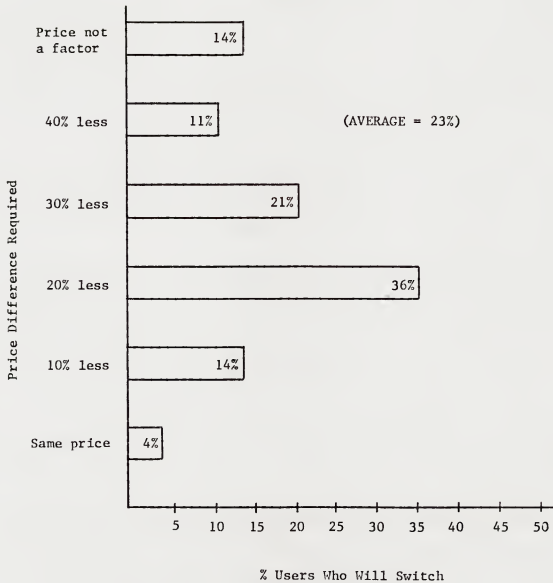
• Quantity discounts existed as characteristics of standard price schedules and also as part of special contracts involving large scale usage and long term commitment. Contracts of this nature were encountered with about 15% of the users surveyed.

• A number of interesting special arrangements were uncovered of a type which may be innumerable in variety:

- A free 2780-like terminal for each $5,000/month of usage,
- A change in the billing algorithm to reduce the importance of core utilization for a particular user,
- Super-discounted time for promotional use (such as preparation of proposals by the customer which, if accepted, would result in computer services business for the vendor), and
- An agreement with a particular user to move jobs up in the queue to insure processing by the end of the day submitted.

3. PRICING METHOD PREFERENCES ARE MUNDANE

A lack of enlightening responses to questions in this area caused us to drop further research at the mid-point of the study. There were some definite trends, however:

• Users are familiar with and favorable toward quantity discounts and do not expect to have to make a long term commitment to get them.

• Long term contracts are only attractive when there is some certainty about their future service needs and volumes and the users will normally expect some type of favorable condition in return.

INPUT

• The basic units of charge are in terms of machine resources used (with few exceptions which are application oriented) and the users have no objections or preferences to this approach.

• One colorful comment was, "I have tried to price the in-house system and am familiar with the problem -- whatever is fair!"

4. USERS EXPECT REMOTE BATCH TO BE ONE-HALF THE PRICE OF TIME SHARING

Exhibit V-9 depicts the expected price difference between remote batch services and time sharing services. Many users commented that they would never use time sharing if remote batch could do the job and one user went so far as to say that time sharing was only a state of mind! Users do, however, have clear expectations of the relative costs:

• Without exception, no user expects to pay more for remote batch than they would pay for time sharing. Only one user (3% of the sample) thought the cost would be about the same for their applications.

• Ninety-seven percent expect to pay more for time sharing (less for remote batch) for a service which is otherwise similar. (Note that otherwise similar includes turnaround time.)

• The common expectation is that remote batch services should cost about one-half as much as otherwise similar time shared services.

EXHIBIT V-9

EXPECTED PRICE DIFFERENTIAL BETWEEN TIMESHARING AND REMOTE BATCH

% of Users
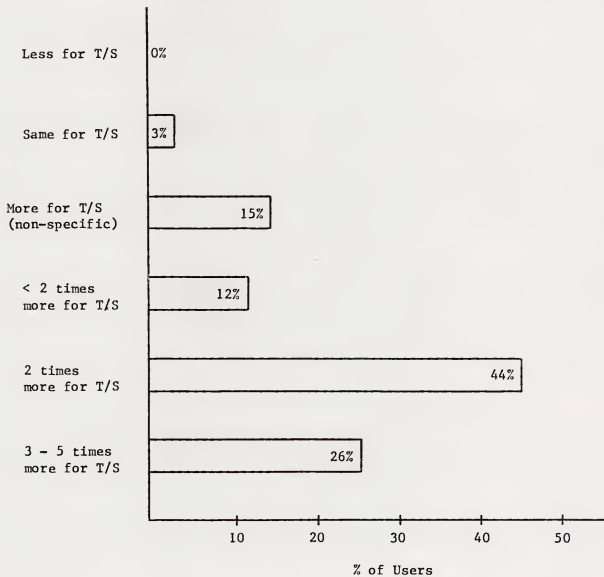
E. REMOTE BATCH SERVICES DECISION MAKERS

• Exhibit V-10 presents by title or function who in the companies surveyed made decisions about whether or not to use remote batch services and, if so, which vendor or service to use.

• In the non-using companies, it was almost exclusively the chief data processing manager who made the decision.

• Among using companies the chief data processing manager was the most frequently mentioned decision maker, making the final decision in about one-third of the cases. However, in two-thirds of the using organizations, the decision maker was someone other than the D. P. manager.

• The end user very infrequently was empowered to authorize expenditures for computer services. Commonly, however, the request for an outside service was initiated and justified by the ultimate end user of the service.

• For better or for worse, it is clear that when the D. P. manager does not control the decisions regarding services vs. in-house, a wider variety of solutions are employed.

EXHIBIT V-10

R/B SERVICES DECISION MAKERS

Title or Function	Frequency		Percent	
	Users	Non-Users	Of Users	Of Non-Users
Chief Data Processing Manager	11	10	36%	84%
Manager or Director of Using Department or Division	6	1	20%	8%
Committee	4	–	13%	–
D. P. Analyst	3	–	10%	–
Chief Operating Officer	2	–	6%	–
VP Operations	2	–	6%	–
Manager General Services	1	–	3%	–
Financial Officer	1	1	3%	8%
User	1	–	3%	–

F.   FIELD PERSONNEL REQUIREMENTS

1.   TECHNICAL SUPPORT IS AN ISSUE OF QUALITY, NOT QUANTITY

• As shown in Exhibit V-11, almost two-thirds of the users stated that they required one hour or less of technical support per week. Generally this is in the nature of problem solving and includes questions relating to network problems.

• The technical support required tends to be quick answers to minor problems which are holding up production. Consequently, users are looking for ready access to support personnel who can come up with accurate and complete answers in a very short matter of time.

• Exhibit V-11 also illustrates the widely held belief that time sharing requires substantially more user support than does remote batch. Users estimated that time sharing required from 25% more to ten times as much technical support.

• The relatively low utilization of technical support by remote batch users can be attributed to a number of factors:

- Generally the users are sophisticated in data processing,
- Much of the work is production in nature and has become more or less routine, and
- Remote batch operating systems seem to be more stable than time shared operating systems and, therefore, generate fewer problems.

EXHIBIT V-11

TECHNICAL SUPPORT REQUIRED BY REMOTE BATCH USERS

HOURS/WEEK
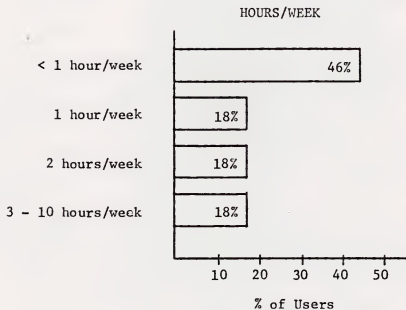
REMOTE BATCH VS. TIMESHARING

INPUT
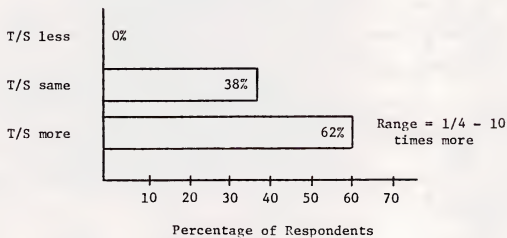
2. SALES PERSONNEL SHOULD POSSESS PRODUCT KNOWLEDGE, EMPATHY, AND
   HONESTY

With relatively few exceptions, the users surveyed were quick to
point out desirable characteristics of salespeople of remote batch
services (see Exhibit V-12). While some users commented on their
satisfaction with their present salesperson, and some talked about
used cars, most merely stated what they would like to see:

- Product Knowledge: This characteristic was mentioned by more users
than any other and was generally considered to be in short supply.
Technical awareness of the system's capabilities, ability to discuss
available applications, and knowledge of pricing arrangements were all
covered by their comments. While the users do not expect salespeople
to be able to provide technical support, they do expect to be able to
discuss functional capabilities of the various service offerings.

- Ability to Understand the User's Situation: The next most commonly
desired characteristic was the ability to understand and relate to the
user's environment and needs. In addition to the product knowledge
required for this, the users were looking for the salesperson to be able
to take the user perspective and to have enough data processing experience
to be able to comprehend the situation.

- Honesty: Equal to empathy in importance to the users was honesty.
This heavenly characteristic was also discussed in terms of believability
and integrity. In essence, the users demand salespeople who do not
misrepresent or exaggerate the service and who do keep their word on

EXHIBIT V-12

DESIRABLE CHARACTERISTICS OF R/B SALESPEOPLE

Characteristic	Value
Technical knowledge	14
Honesty/integrity	8
Ability to understand user needs	8
Ability/desire to solve problems	5
Low-key approach	3
Patience	2
Professionalism	1
Humility	1

INPUT
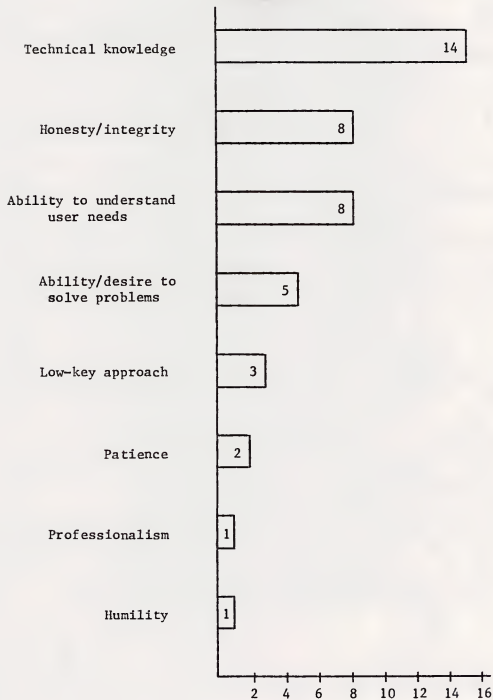
personal promises. Improved product knowledge may go a long way in increasing believability.

- **Ability to Solve the User's Problems:** The other commonly mentioned desirable characteristic was the salesperson's willingness and ability to quickly solve the user's problems. Commonly what is involved is the mustering of the appropriate company resources as demanded by the particular problem. The users greatly prefer to have a single contact who can get to an answer rather than to have to call around the service company themselves.

- **Miscellaneous Characteristics:** Also mentioned, in order of frequency, were a low key approach, patience, professionalism, and humility.

VI. COMPETITIVE ENVIRONMENT
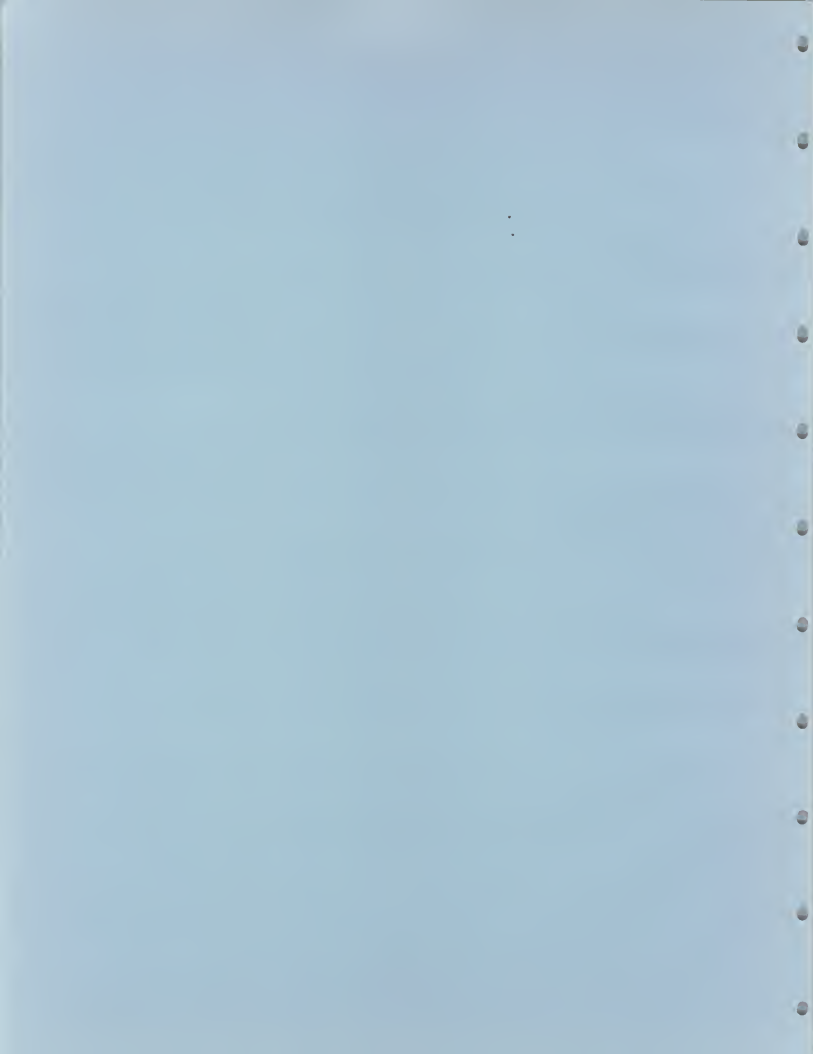
VI   COMPETITIVE ENVIRONMENT

A.   VENDOR GROUPS AND STRATEGIES

1.   COMPUTER MANUFACTURERS WILL EMPHASIZE COMPUTER ENHANCEMENT

•   IBM does not obtain US revenues from remote computing services and
will not until its agreement with CDC expires. However, at about 1979/80
IBM will introduce a new range which will have as a component the provision
of computer enhancement through a network. This will provide an upgrade
path for the 360/30 and 370/135 installations in particular.

•   The IBM impact on the remote batch market will be the announcement
this year of a new remote computing operating system which will have
interactive and remote batch capabilities to replace TSO, HASP, and
VM/CMS. It will be based on the Advanced Function for Communications and be
in IBM's mainstream of development. Neither TSO nor CMS were developed
as parts of IBM's standard operating systems.

      This software, when debugged, will enable users to effectively mix
remote batch and conversational modes on the same, large-scale computer.
It may be announced with the awaited 370 Model '178'.

      One effect of this will be to create more competition in the market

- 105 -

as large users will more easily be able to offer remote services than
with TSO, for example.

- Honeywell is the most advanced computer manufacturer in terms of its
movement to computer enhancement. DATANETWORK, as their remote computing
service is called, is now offered in conjunction with the 6000 series for
remote data entry, remote job entry, overflow, and backup. Most of the
revenues at this point, however, are interactive.

Honeywell is making a straight play for the large GEIS user using
DATANETWORK as an interim step or to provide features which the in-house
Honeywell system will need, such as the network. This strategy has
succeeded in at least one case in recent months, resulting in the sale
of a large computer.

Honeywell will be a powerful competitor in the computer substitution
part of the remote batch market.

- CDC will emphasize its business problem solving capabilities through
both SBC and CDC. They will still concentrate at the high end of the
market but move down into smaller companies as they develop some industry
applications. One particular target industry will be the finance and
credit industry through the Commercial Credit system.

The CDC emphasis will probably be by industry specialty. SBC
will continue to push the selling of analytical and applications tools at
the strategic level in client organizations, while also moving towards
industry specialization. SBC will emerge as the dominant organization
with CDC services group.

- NCR will concentrate on its on-line savings and mortgage services, and its retail store services. Major tasks are to convert its 40 or 50 U.S. data centers onto one network and expand its capabilities to integrate the banking and retailing functions.

NCR will be a powerful force in the funds transfer area when that gets off the ground. However, to be effective, NCR will need large-scale transaction processing and teleprocessing computers, and a sophisticated network. The situation is tailor-made for further joint NCR/CDC efforts.

- Sperry-Univac does not appear positioned to enter the remote computing market. One area that it is interested in is the retail industry through support of POS devices. The federal government, particularly DoD, and transportation could be other target industry sectors, if it decides to get back into the business.

- Burroughs has the computers and the systems software to be very effective in the remote computing market. Its marketing emphasis so far has been geographically and industrially limited to the New York financial market.

Burroughs would come at the funds transfer business from the other end to NCR, i.e. from big banks as opposed to small thrift and retail organizations.

- DEC appears to have no plans to enter the market. However, its recent network software announcements shows its' ability to service the market with the necessary hardware and software. It probably does not want to compete with its best customers.

2. INDEPENDENTS DO NOT EMPHASIZE REMOTE BATCH

- Computer Sciences Corporation is the largest, independent computer services company in the remote computing market. It is also fairly unique among independents in having a sizable remote batch revenue component in its INFONET service.

    CSC is placing a major emphasis on the growth of INFONET, which had a spectacular increase of over 60% in revenues from 1974 to 1975. Industry emphasis is concentrated on the major industries notably the federal government, which will account for over 50% of 1975 revenues, banking, utilities, and manufacturing. Of the federal government revenues, over 60% are for remote batch.

- Optimum Systems, Inc. will have over 10% of the independents' remote batch revenues in 1975, running third behind CSC and UCC. OSI is the largest independent provider of IBM-based remote batch services.

    At least half of its remote processing revenues come from large, remote facilities management contracts with FEA and EPA. Of the other $10 million projected in remote batch revenues in 1975, half come from industry specialized services and the remainder from 'utility' business, including computer substitution.

- National CSS and Tymshare are running close together in many respects. Their product lines are similar: both basically offer interactive processing with deferred run capabilities. Their geographic coverage is similar as is their approach to, and share of, the market.

However, they are different in several fundamental ways. While NCSS has attempted to push for data base applications and problem solving capabilities, as represented by RAMIS and the professional services group, Tymshare has pushed its network development and features. Also, NCSS has made heavy use of its IBM capability, while Tymshare has only recently added a 370 to its inventory. The Tymshare acquisition of UDC will give it a growth path into the smaller and medium-sized IBM markets which will be important for the future growth of the industry.

- UCC is the largest, independent remote batch vendor with its Univac 1108 and CDC computers. Its main emphasis has been on the scientific and engineering market, with some finance industry processing in New York. It will broaden this base into the business processing area, possibly in conjunction with the banking division.

- Cyphernetics is one of the fastest growing timesharing companies. They provide superb marketing and support together with a very efficient DEC 10 operation. They typically target in on GE or other DEC 10 vendor customers. They appear to have no real remote batch plans.

- COMSHARE, On-Line Systems, and Rapidata are primarily interactive, timesharing vendors with deferred run capabilities. Rapidata has already integrated an IBM System 370 into its network: this has been a costly undertaking for them. Also, they are exposed to N.Y. Telephone's control over a significant part of their revenues.

Both COMSHARE and On-Line emphasize problem solution, in COMSHARE's case primarily for big users.

3. SPINOFFS ARE THE MAJOR REMOTE BATCH MARKET FACTORS

• The largest spinoff, GEIS, is in fact a very small recipient of remote batch revenues. It does perform some remote batch work for another division of GE. GEIS' main thrust has been geographic coverage including the establishment of an international network. Foreign revenues now account for approximately one third of GEIS' revenues.

• McAUTO is the largest vendor of remote batch services through its IBM 195 and CDC 6000 series. It uses Xerox Sigma computers as front ends to the 195s for interactive processing considerations.

The main emphasis for McAUTO has been large structures and engineering applications. Perhaps its most significant standard product revenue generator is IMS: a number of companies use McAUTO to get an IMS-based system operational. Hospital services are mainly interactive.

• United Computing Systems has been very like CDC and UCC in its provision of scientific and engineering services to utilities (including 'phone companies, of course!), large aerospace manufacturers, engineering organizations, and oil companies.

• BCS, Grumman, and Martin Marietta Data Systems are heavily into the remote batch market, although Grumman has a larger interactive component than the others. BCS is actively looking for applications specialized software to put on the network, particularly in the financial industries. MMDS is emphasizing manufacturing applications processing using the MAS software obtained from Hoskyns. Grumman is more of a 'computer utility' concept.

- Xerox Computer Services is different from the other spinoffs in that it was established to operate completely independently of the parent company's data processing. It covers the small and medium sized manufacturer and wholesaler and is the most successful venture of its type. Its remote batch component is very low; consisting of off-line printing.

- Two spinoffs also operating independently from the parents' EDP operations are the GTE and Bunker Ramo stock quotation systems. Neither of these has significant remote batch revenues. However, the GTE organization is probably up for sale and the Bunker Ramo operation is expanding into other application areas involving remote batch and interactive processing.

4. OTHER VENDORS

- The Canadian companies moving into the U.S. remote computing market are doing so mainly in the remote batch area. They are SDL, Multiple Access, I.P. Sharp (which is mainly interactive), and Datacrown. Of these SDL and Multiple Access are both very active: Multiple Access has acquired TCC and has a foothold in the insurance industry.

- Delos from France has purchased ADR's timesharing operation and will expand further. This is the first European company to attack the U.S. remote computing market.

- Another group of vendors that offer competition in the market are those companies which fairly casually sell computing services. Some of

these, such as Fireman's Fund, will move into the category of fully fledged spinoffs. Others will continue to stay local in scope. Nevertheless they do siphon off some of the market. As IBM upgrades its operating software there will be a major increase in vendors of this type.

• A final competitive group is that which contains universities, research establishments and government agencies. Some university 'spinoffs', such as Uni-Coll from Pennsylvania, are quite aggresive in their market approach and Uni-Coll is, in fact, a strong competitor in the Washington, D.C. federal government market.

INPUT

B. VENDOR REVENUE ANALYSIS

1. SPINOFFS ARE THE LARGEST REMOTE BATCH VENDOR GROUP

•   Exhibit VI-1 shows the vendor groups and their remote batch revenues
in 1975. If GEIS, GTE Bunker Ramo, and XCS revenues are removed from
consideration, remote batch services revenues to spinoffs are greater
than their interactive and data base revenues combined: this group is
different from most spinoffs in that they were not established as an out-
growth of the in-house processing department.

•   By far the largest of the computer manufacturers in U.S. remote com-
puting revenues is CDC/SBC, as shown in Exhibit VI 2. Indeed, it is now
larger than any other company in this market. GEIS is slightly larger, at
the moment, in worldwide revenues due to its position overseas. However,
in 1976, CDC may well overtake it in total remote computing revenues.

•   The computer manufacturers, with the exception of CDC and, possibly
of NCR, regard services as an adjunct to equipment sales rather than as
a stand-alone market. If they turn around on this, and we think some may,
they will be a powerful market force.

•   As shown in Exhibit VI-3, the emphasis of the independent vendors is
on interactive as opposed to remote batch services. The area in which
they will move into remote batch is through applications specialized
processing, such as production control for manufacturers.

•   There are an increasing number of spinoffs entering the market. These

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EXHIBIT VI-1

U.S. 1975 REMOTE COMPUTING SERVICES REVENUES
BY VENDOR GROUP

VENDOR GROUP	REMOTE BATCH	INTERACTIVE	DATA BASE	TOTAL
COMPUTER MANUFACTURERS	50	100		150
INDEPENDENTS	90	410	40	540
SPINOFFS	120	170	80	370
OTHERS	20	20		40
TOTAL	280	700	120	1,100

($ MILLIONS)

NOTE: ONLY 'AVAILABLE' REVENUES ARE COUNTED: SPINOFFS REVENUES
FROM PARENTS ARE EXCLUDED.

INPUT

EXHIBIT VI-2

COMPUTER MANUFACTURERS' 1975 REMOTE COMPUTING SERVICES
REVENUES IN THE U.S.

COMPANY	REMOTE BATCH	INTERACTIVE	DATA BASE	TOTAL
IBM				0
HONEYWELL	3	5		8
UNIVAC	2			2
BURROUGHS	3	3		6
NCR	7	15		22
CDC/SBC	28	75		103
SINGER	7	1		8
DEC				0
TOTAL	50	99	0	149

($ MILLIONS)

EXHIBIT VI-3

INDEPENDENT COMPUTER SERVICES COMPANIES'
1975 REMOTE COMPUTING REVENUES IN THE U.S.

COMPANY	REMOTE BATCH	INTERACTIVE	DATA BASE	TOTAL
CSC	17	38		55
NCSS	2*	33		35
TYMSHARE	1*	34		35
UCC	16	1		17
CYPHERNETICS	1*	15	2	18
COMSHARE	1*	14		15
RAPIDATA	2	16		18
ON-LINE		12		12
OSI	10			10
SUB-TOTAL	50	163	2	215
OTHERS	40	247	38	325
TOTAL	90	410	40	540

($ MILLIONS)

* Deferred run.

are parts of large companies in other industries which are chartered to go out and sell computer services to other organizations. Simply selling surplus time does not qualify as a spinoff.

In particular oil companies will move into the market, from 1975 onwards, in a manner akin to the aerospace companies in the late 1960s and early 1970s.

- Spinoffs have heavily emphasized remote batch because that was their original service capability: this was due to the requirements to service their parent organizations. Frequently they had remote locations and extensive remote computing needs, some of which were being met through timesharing.

New spinoffs will continue the remote batch market emphasis. The revenue figures shown in Exhibit VI-4 do not include the revenues which spinoffs receive from their parents.

2. IBM COMPUTERS ACCOUNT FOR ALMOST HALF OF REMOTE BATCH REVENUES

- Because of the dominance of spinoffs in the remote batch market and their predominant use of IBM computers, 44% of the remote batch processing in 1975 will be on IBM computers, as shown in Exhibit VI-5. This is primarily for business processing.

- The next greatest use (27%) is on CDC computers, primarily from CDC itself as a vendor and spinoffs. Aerospace companies are the spinoffs with the in-house requirements for CDC computers.

- Two companies, UCC and CSC account for almost all of the Univac-based

EXHIBIT VI-4

SPINOFFS' 1975 REMOTE COMPUTING SERVICES
REVENUES IN THE U.S.

COMPANY	REMOTE BATCH	INTERACTIVE	DATA BASE	TOTAL
GE	5	80		85
McAUTO	36	14		50
BCS	10	5	1	16
GRUMMAN	3	5		8
MMDS	5			5
LITTON	5	3		8
ACTS	2	2		4
GTE			30	30
BUNKER RAMO			30	30
UCS	18			18
XEROX		20		20
COMPUTERISTICS	6			6
WESTINGHOUSE	5	1		6
IDC		9	3	12
INSCO	5	2		7
SUB-TOTAL	100	141	64	305
OTHER	20	29	16	65
TOTAL	120	170	80	370

($ MILLIONS)

EXHIBIT VI-5

1975 REMOTE BATCH REVENUES BY COMPUTER MAKE

COMPUTER MAKE	SPINOFFS	COMPUTER MANUFACTURERS	INDEPENDENTS	OTHER	TOTAL
IBM	70	10	38	5	123
CDC	35	25	10	5	75
UNIVAC	2	2	30	5	39
HONEYWELL	8	3	4	1	16
BURROUGHS	3	3	3	1	10
NCR		7	1	1	9
DEC	2		2	1	5
XDS			2	1	3
TOTAL	120	50	90	20	280

($ MILLIONS)

remote batch revenues. These consitute 14% of the total.

• The remaining remote batch revenues are largely deferred run on timesharing computers, although Burroughs and Honeywell computers do have some standard remote batch revenues.

INPUT

C.   COMPETITIVE MARKET FACTORS

1.   MINICOMPUTERS ARE AN ADJUNCT TO REMOTE BATCH SERVICES

• Of the respondents to the survey, none viewed minicomputers as competition to remote batch services at the moment. Several users had done extensive studies on replacing the services with minis. and rejected them.

• A potential use of minis. is in the interactive part of the process for large users. For example, one government agency was going to put a Prime computer as a front end for the interactive portions of its engineering design applications. An advantage of this arrangement was the ability to interact with the in-house Honeywell 6000 and the vendor's CDC hardware.

• Vendors regarded the advent of the mini. in a positive light.

• A small computer, such as a HP 2000 or System 3, was being used by several remote batch users to perform some standard applications processing. In these cases the remote system is used for the more complex problem and volume transaction processing.

2.   TREND TO IN-HOUSE PROCESSING

• As shown in Exhibit VI-6, remote batch users in the scientific and engineering area regard an in-house computer as slightly more competitive than business users.

EXHIBIT VI-6

IN-HOUSE COMPUTER AS COMPETITION TO REMOTE BATCH SERVICES
BY USER TYPE
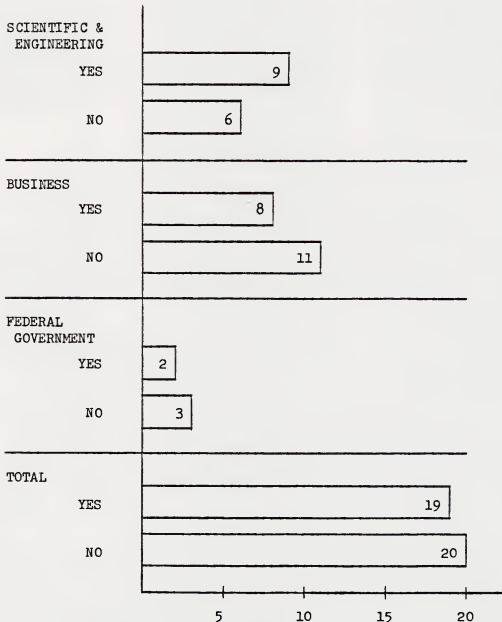
SCIENTIFIC &
ENGINEERING

YES   9

NO   6

BUSINESS

YES   8

NO   11

FEDERAL
GOVERNMENT

YES   2

NO   3

TOTAL

YES   19

NO   20

    5   10   15   20

NUMBERS OF ANSWERS TO THE QUESTION 'DOES AN IN-HOUSE SYSTEM
REPRESENT COMPETITION TO R/B SERVICES?'

INPUT

EXHIBIT VI-7

IN-HOUSE COMPUTER AS COMPETITION TO REMOTE BATCH SERVICES
BY COMPUTER STATUS
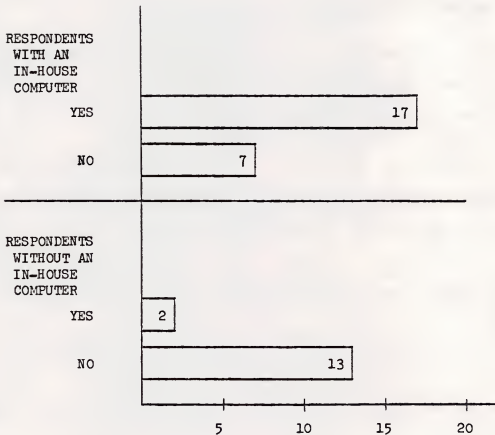
NUMBERS OF ANSWERS TO THE QUESTION 'DOES AN IN-HOUSE SYSTEM
REPRESENT COMPETITION TO R/B SERVICES?'

INPUT

•   However, the real difference in perception of the competition is shown in Exhibit VI-7, which shows that remote batch users without a computer are unlikely to consider getting a computer to replace the services, while over 70% of remote batch users which already have a computer regard the in-house computer as powerful competition to the services.

•   In terms of comparison with timesharing users, the responses of the remote batch users with the in-house computer probably more nearly parallel the expected timesharing user's response.

•   It is important that almost 90% of the respondents who did not have a computer considered that an in-house system did not even represent competition, let alone that a system would replace the service.

3.   TECHNOLOGY DEVELOPMENTS WILL BENEFIT REMOTE COMPUTING SERVICES

•   The introduction of the 3850 and equivalent mass storage devices will significantly benefit all aspects of remote computing services. They will allow for cheaper storage for most applications data. Also the user will be able to increase the size of the data bases that can be economically kept 'on-line' by an order of magnitude. Most applications will allow for several seconds to be used on 'sign-on' to bring the file, or portion of the file, required to disk storage for immediate access.

•   Higher speed printers at more reasonable cost will make volume output cheaper at the user's site, instead of having to go through the vendor's local office. To support this, however, higher line speeds will be required.

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- Vendors considered that remote batch terminals would have to come down in cost to at least half their current price in order to significantly expand the market down to the 'timesharing' account at the $1000 per month level. Remote batch users generally operate at a minimum of $3K per month in order to justify a batch terminal.

- The advent of intelligent terminals and terminals with local storage such as diskettes and tape cassettes, has changed the nature of applications related processing. It is going to become increasingly difficult to call an application 'remote batch' or 'on-line' because it will have both modes used at different times in different ways.

   However, there will be portions of the market dependent on very cheap, 'dumb' terminals which will stay as pure interactive mode, and other portions using minis. for all the interactive components and data entry, which will be pure remote batch.

- Reduction in communications costs and widespread provision of high speed networks will encourage use of remote computing services. Basically the price will drop enough to bring in smaller accounts from the small and medium size user.

- The continuing movement to CRT terminals and graphics terminals means that vendors will have to offer 'high speed' (4800/9600 baud) interactive as well as high speed batch capabilities in order to compete with in-house systems.

- Industry and applications specialized terminals will replace

generalized terminals. These will give more functional capability by industry/application at a lower cost; this will lower thresholds for user entry. The advent of micro-processors makes this possible.

Remote computing services vendors offering applications specialized services, such as TRW, National Data, XCS, and Keydata, will increasingly specify the characteristics of the terminals they need to terminal manufacturers. This will serve as a further 'lock in' to a vendor's service: it will also mean that it will have an increasing share of its revenues from the mark-up on hardware.

4. IBM DEVELOPMENTS ARE CRITICAL FOR REMOTE BATCH VENDORS

• Because of the preponderance of IBM-based revenues in remote batch markets, future announcements by IBM will have more impact on them than on timesharing or data base services.

  - Business users surveyed gave strong preference for IBM mainframe capability, and there is no doubt that this will be an advantage in several of the remote batch marketplaces, notably the computer substitution and the computer enhancement market.

  - The latter case is where a vendor will provide certain applications not easily handled by the in-house computer, because of storage or communications requirements, for example: there will usually be major interface requirements for data exchange and equipment and software compatibility will greatly enhance the likelihood of success for a vendor. An example would be a major order entry system that Computeristics is installing for over

200 offices of a large mining and manufacturing company.

• Vendors will find it necessary to support the communications protocols and access languages that IBM introduces within its overall communications system plans. It may be possible to emulate these through the use of mini and micro processors, but this will cause a significant problem for vendors which are not solely IBM-based.

• The importance of IBM operating systems developments has already been mentioned. The bringing together of the remote batch and interactive modes will be a major benefit to IBM-based vendors, when the software is made to work.

• Support of the IBM data base management and retrieval language systems will be a major requirement for remote batch revenue generation. IMS and CICS, while lacking in function and performance compared to other systems, are nevertheless in the mainstream of IBM developments.

• The midrange of IBM computers, from the System/32 to the System 370/135, appears to be where IBM will emphasize computer enhancement in the late 1970s. It will replace the in-house monolithic computer by 3790 or System/32 work stations connected to its own large computers. This should be the prime target area for computer substitution and enhancement by the remote batch vendors.

• Price/performance characteristics of IBM processors, main storage, peripheral storage and input/output will improve relative to the compe-tition for transaction processing, as opposed to problem solving. This

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will make their equipment even more useful for remote batch work; the
share of the remote batch market dependent on IBM mainframes will therefore
increase.

• Provision of improved capabilities for remote batch from IBM will
increase competition in the remote computing market. Organizations with
industry/applications expertise will find networks easily available
from Tymshare, Telenet, GTE, and others and will be able to obtain, or
already have, the necessary remote computing hardware and operating
system from IBM.

VII. STRATEGIES AND OPPORTUNITIES

VII. STRATEGIES AND OPPORTUNITIES

There are two major identifiable remote batch markets: business, and scientific and engineering. In addition, the Federal Government market has certain unique characteristics which set it apart. The first of the following sections contains recommendations which are generally applicable; recommendations for individual markets are discussed thereafter.

INPUT

A.   GENERAL RECOMMENDATIONS

•   Vendors presently offering remote batch services to the scientific
and engineering market should continue to emphasize their present services
while moving into the business market.   (See Section B below.)

•   Vendors presently offering remote batch services to the business
market should put all of their efforts into that market.

•   Organizations considering entry into either of these markets should
concentrate their efforts on the business market, although, depending
upon target industries, this implies a certain degree of scientific and
engineering capability.

•   All vendors in the remote computing markets must have systems offering
integrated remote batch and interactive capabilities.

•   Vendors should develop techniques whereby intelligent terminals and
minicomputers are integrated into their service capabilities. Vendors
should offer this capability rather than waiting for users to develop it
themselves so that the service company can retain account control and as
much of the processing as possible. A well integrated system will also
be a cost-effective competitor to in-house systems. Some scientific and
engineering users are already using such systems of their own design; more
will certainly follow. As has been characteristic of developments within
the computer industry, the business users will follow in greater numbers.

• Vendors should develop the necessary software and hardware features to support large data bases, both private and shared. Software supported should include a spectrum of data base management software, particularly IBM 'standards' such as IMS. It will be a competitive advantage to be able to use the same data base management software on the central computer and distributed computers in the network.

• Sales efforts should be aimed primarily at new users rather than trying to unhook current remote batch users. It is not practical to take away business based upon price and, unless service deteriorates, users will generally stay with their present vendors.

• "Service" is of prime importance to users and is defined, in this order, as: 1) reliability, 2) turnaround, and 3) responsive user support. Systems design and development should emphasize reliability and maintain acceptable levels of turnaround. Technical support personnel should be readily available to the users as required and should include people who are knowledgeable on applications as well as general systems use.

• Present sales forces are not considered by the users to have adequate knowledge of the products and services they are selling. Vendors of remote batch services should make regular efforts to develop and maintain a high level of product knowledge within the sales force.

• It would be a competitive advantage for the sales force to be able to understand the user needs. This implies an understanding of the users' business and the application of the vendor's services to those needs.

B.   SCIENTIFIC AND ENGINEERING MARKET

•   Vendors in this market should continue to offer state-of-the-art, high technology applications with user-oriented interfaces.

•   Scientific and engineering oriented vendors should penetrate the business market by marketing application programs which take advantage of the hardware strengths of their large-scale scientific computers. In particular, vendors should emphasize analytical problem solving using modelling and simulation tools. In addition, applications such as detailed scheduling, tactical planning, and resource optimization require the type of processing resource that these vendors offer.

•   In order to further penetrate the business market, vendors must develop the capability to handle the file I/O requirements of the business users. In addition, a variety of standard business application software must be made available.

•   There is some indication that graphics will increase in importance in at least the area of structural engineering and design. Therefore, vendors should keep abreast of user needs in this area and be prepared to aggressively market graphics should the demand become apparent.

C. BUSINESS MARKET

• For maximum penetration of this market vendors should offer services on IBM mainframes. This is particularly true for the computer substitution segment of this market but also valuable in the marketing of applications processing. While there are many business applications for which the mainframe type used is irrelevant, business users would prefer IBM because of:

- Compatibility
- Perceived reduction of risk, and
- Availability of personnel and software packages.

• Officers of service companies should try to persuade officers of large computer users to put the in-house D.P. department on P&L basis and allow user groups (departments or divisions) to select between the in-house and the service alternatives.

• Develop, acquire, or joint venture specific business application systems based upon company expertise and processing strengths; value pricing should be used whenever possible.

• The computer substitution market, which offers the greatest potential in the remote computer services area, should be approached with a combined package of:

- Integrated interactive and remote batch capabilities,
- Range of DB/FM systems from an ad hoc report writer up to a large scale file management system,

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- Data communications network,

- Variety of "canned" application programs for general business use, and

- Contract consulting and programming staff

- Good prospects for the computer substitution approach are:
    - Companies with sales of from $5 million to $100 million with emphasis in the range of $10 million to $50 million range,
    - High technology and/or growing companies,
    - Companies with some need for large scale computer capabilities (files, CPU, network), and
    - An agreeable D.P. manager or other decision maker.

- Computer substitution sales will require a separate sales force from the one **selling** the variety of traditional remote computer processing services. In addition, application programs may also require separate sales people. Industry specialized services, such as McAuto's hospital services program, require separate sales and support forces.

D.   FEDERAL GOVERNMENT MARKET

• The GSA ADP Teleprocessing Services Contract Program is a mechanism for obtaining an 'industry' discount from vendors and enhancing GSA's control in this area. Vendors will not obtain revenues through simply being on the approved contractor list; they must sell strongly and competitively to obtain federal government market share.

• Specialized vendors will be able to sell to agencies outside the GSA contract. They should therefore only bid the GSA contract if they determine the profitability of the increased amount of business they will be able to competitively obtain outweighs the reduction of profitability on the specialized business which they would obtain anyway.

• Costs of marketing to the federal government will be high and competition, led by CSC, will be severe. Vendors should carefully evaluate the return on the investment to obtain GSA contract approval and to develop the federal market compared with the return on the investment to develop other markets. If a vendor decides to bid the GSA contract, sales effort should then be applied to a limited selection of agencies to achieve market penetration.
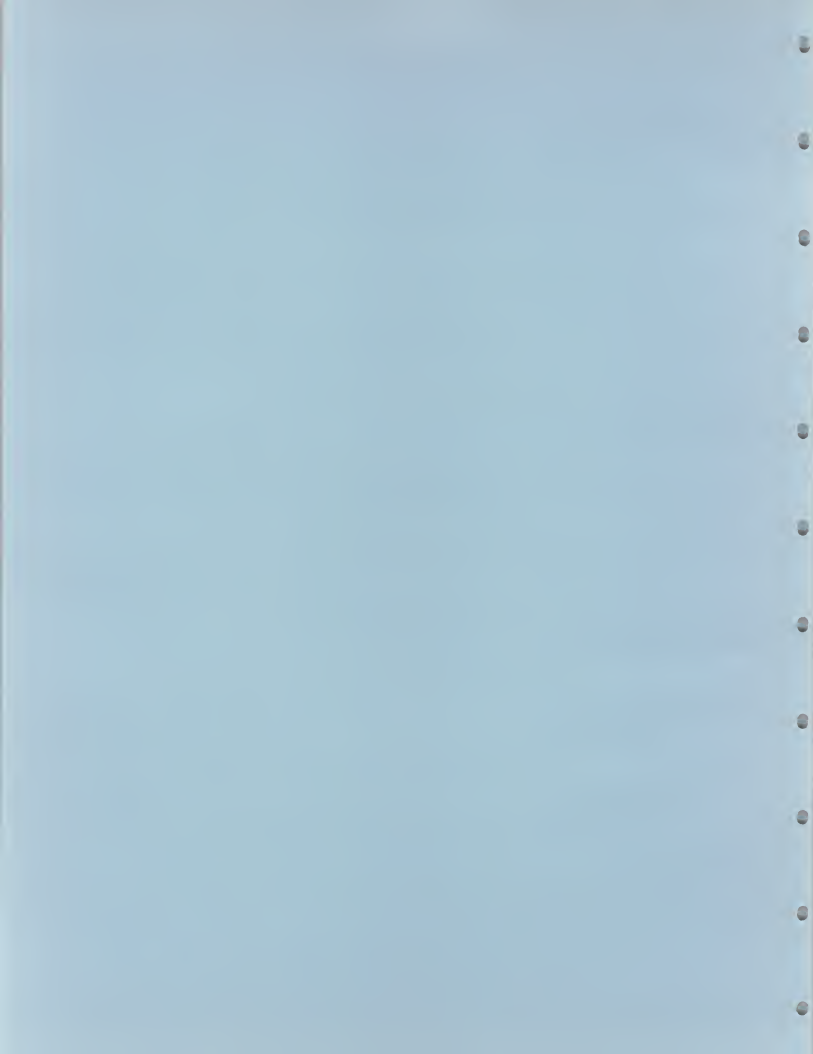
INPUT

VIII. APPENDIX

Catalog Number	Major Use	Industry	Company Size*	Geographic Region
RRB1	SCI & ENG	UTIL, R&D	M	W
RRB3	"	CONSTR.	VL	W
RRB4	"	MFG.	S	W
RRB5	"	MFG.	VL	W
RRB19	"	UTIL.	VL	SE
RRB20	"	MFG.	VL	MW
RRB22	"	MFG.	M	W
RRB23	"	MFG.	M	W
PRB1	"	MFG.	VL	MW
PRB5	"	MFG.	VL	W
JRB4	"	UTIL.	L	SW
CRB3	"	MFG.	L	SE
CRB5	"	UTIL.	VL	NE
CRB8	"	MFG.	VL	NE
CRB9	"	MFG.	VL	MW
RRB2	BUSINESS	ENG. SVC.	S	W
RRB9	"	PUBL.	L	NE
RRB21	"	MFG.	VL	W
RRB24	"	MFG.	M	W
RRB25	"	INS.	S	W
RRB26	"	MFG.	VL	W
PRB2	"	STATE GOVT	–	MW
PRB3	"	MFG.	S	MW
PRB4	"	ENG. SVC.	M	W
PRB8	"	MFG.	L	MW
JRB1	"	MFG.	S	W
JRB2	"	CITY GOVT	–	W
JRB6	"	SERVICE	S	W
CRB1	"	BANK	VL	NE
CRB5	"	INS.	VL	NE
CRB7	"	MFG.	L	NE
CRB11	"	UTIL.	VL	NE

Catalog Number	Major Use	Industry	Company Size*	Geographic Region
PRB6	–	FED GOVT	–	WASH D.C.
PRB7	–		–	"
PRB9	–		–	"
PRB10	–		–	"
PRB11	–		–	"
CRB4	NONE	BANK	VL	NE
RNO6	"	INS.	VL	NE
RNO8	"	RET.	VL	MW
RNO11	"	RET.	VL	MW
RNO14	"	MFG.	VL	MW
RNO15	"	UTIL.	L	SE
RNO17	"	STATE GOVT	–	SW
RTS7	T/S ONLY	MFG.	VL	MW
RTS10	"	MFG.	L	NE
RTS12	"	MFG.	VL	SW
RTS13	"	MFG.	L	NE
RTS16	"	FIN.	L	MW
RTS18	"	MFG.	VL	SE
CRB10	SPIN-OFF	INS.	VL	NE
CRB12	–	R&D	–	MW
CRB13	–		–	SE
JRB3	VENDOR	BANK	L	SW
JRB5	VENDOR	BANK	M	SE

```
SUMMARY:   SCI & ENG      15   (Interviews)
           BUSINESS       17
           FED. GOV'T      5
           NON-USERS       7
           T/S ONLY        6
           OTHERS          5
                         ____
                TOTAL:    55
```

* COMPANY SIZE IN $ MILLIONS IN ANNUAL SALES OR EQUIVALENT:

$$S = \$ \ 0 - 20 \ MM$$
$$M = \ \ 20 - 100 \ MM$$
$$L = \ \ 100 - 500 \ MM$$
$$VL = \ > 500 \ MM$$

CONFIDENTIAL

INPUT QUESTIONNAIRE   CATALOG. NO. ☐☐☐☐☐

REMOTE BATCH (R/B) USER'S QUESTIONNAIRE

CURRENT USAGE

1   Why do you use R/B services?

2. What vendor do you use?

    Why did you choose them?   Are you satisfied?

3. What per cent of your current/future R/B services usage would you
    characterize as:

	Current	Future
(a) Conversion from batch services bureau	___%	___%
(b) Conversion from timesharing services.	___%	___%
(c) Conversion from batch in-house	___%	___%
(d) New applications	___%	___%
(e) Overflow processing	___%	___%
(f) Other (specify)	___%	___%

4. What percent of your current/future usage is pure remote batch **vs.**
    that which has some interactive component (e.g. CRJE, WYLBUR)?

	Current	Future
Pure	___%	___%
Component	___%	___%

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5. What percent of your current/future usage is remote data entry vs. remote job entry?

	Current	Future
Remote data entry	____%	____%
Remote job entry	____%	____%

6. What percent of current/future remote batch service usage is?

	Current	3 Years
Your own programs	____%	____%
Vendor supplied programs	____%	____%

   (a) What percent of this usage requires or will require a Data Base/ File Management (DB/FM) system?

Current	3 Years
____%	____%

7. (a) What applications are presently being run on R/B services?

   (b) What applications are planned for R/B services?

   (c) For what applications would you consider R/B services?

     (DESCRIBE ON FOLLOWING TABLE)

CATALOG. NO. ☐☐☐☐☐

APPLICATION	VENDOR/USER WRITTEN	NEW OR CONVERSION	WHY R/B SERVICE?
CURRENT			
PLANNED			
POSSIBLE			

8. With regard to your current R/B services use:

    (a) How much core to your programs require?   Typical _____

                                                          Max. _____

    (b) How large are your files?   Typical _____ Max. _____

    (c) What file organization do you use?

          _____

          _____

    (d) How frequently do you execute these jobs? _____

    (e) What percent of your jobs require turnaround of:

                                 2 hours   _____ %

                           2 - 8 hours   _____ %

                              Next day   _____ %

    (f) How much execution time is required?   Typical _____

                                                  Max. _____

9. Have you considered using minis as an alternative to R/B service usage? If yes, what was the result?

10. Have you considered using minis in conjunction with a R/B service?

11. What developments will increase or decrease your usage of R/B services?

TECHNICAL USAGE

12. What are your in-house computer mainframes, operating systems, and DB/DC systems? What are those of your R/B service vendor?

	HARDWARE	OPERATING SYSTEMS	DB/DC
IN-HOUSE			
VENDOR			

13. Is it a requirement for the R/B vendor to have that particular:

(a) Computer mainframe? _____

(b) operating system? _____

(c) DB/DC system? _____

(d) other software features or options? _____

(e) other hardware (e.g. COM PLOTTER, 3850)? _____

14. What languages are required?

    (a) For which languages do you require some interactive capability?

15. Do you require absolute compatibility with the computer vendor's software?

    (a) To what extent are missing features or capabilities tolerable?

    (b) Are so-called improvements in functions or performance:

Unacceptable _____   Acceptable _____   Preferable _____

16. Is your usage of R/B services dependent upon the availability of a communications network which can support input and output to and from different cities? Which cities?

17. Is current access to the vendor's R/B system via:

(a) Local dial?   (b) Long distance dial?   (c) Leased line?

If (c): Who is responsible?   Vendor _____   User _____

18. Are there any particular telecommunications access methods which you require?

19. What devices are currently/will be used as R/B terminals? At what baud rates?

Make/Model	Baud Rates	Transmission Protocol
Current		
Future		

20. Do you have any other communications requirements related to R/B service usage?

21. Rank the following factors from 1 to 10 (1 = unimportant, 10 = critical) in your selection of a vendor of R/B services:

Factor	Rating	Comments
(a) Proximity to vendor.		
(b) Network availability.		
(c) Vendor Hardware/ Software Systems		
(d) Vendor Applications.		
(e) Tech. Support/ Training.		
(f) Price		
(g) Other		

22. Which of the following pricing methods are currently being used? Which would you prefer?

Method	Current	Prefer	Comments
By machine resources			
By Transaction			
By No. of records			
Long term contract			
Quantity discount			

(See next page)

22. (Cont.)

Method	Current	Prefer	Comments
Other:			

22(a) What is the term of your contract?

23. Assuming similar services would you switch vendors if another vendor offered service at:

(a) A higher price?_____ .   How much higher? _____.

Why?

(b) The same price:

10% less   _____

20% less   _____

30% less   _____

40% less   _____

50% less   _____

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24. Under what conditions, other than price, would you switch to a new vendor?

25. For an otherwise similar service, what price difference would you expect between Timesharing and Remote Batch?

26. In hours per week, about how much technical support do you require?

    _____

    (a) How much more or less do you think this is than for an equivalent amount of T/S?

    _____

27. What characteristics do you look for in a salesperson of R/B services?

28. Who in your company makes decisions regarding the purchase of R/B services?

29. About how much money per month do you currently/next year/3 years spend for R/B computer services?

   Current $_____

   Next year $_____

   3 years $_____

30. Does an in-house system represent competition for R/B services?

                    Yes _____   No _____

   (a) Under what conditions will an outside R/B service be used?

31. What advice would you give to a vendor of R/B computer services?