OPPORTUNITIES IN USER SITE

HARDWARE SERVICES

INPUT

ABOUT INPUT

THE COMPANY

INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions. Continuing services are provided to users and vendors of computers, communications, and office products and services.

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff members analyze and int
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OPPORTUNITIES IN USER SITE HARDWARE SERVICES

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INPUT

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1 INTRODUCTION

I INTRODUCTION

A. PURPOSE AND SCOPE

- This report is produced by INPUT as part of the Market Analysis Service (MAS) for the Computer Services Industry.

- The intent of the study was to provide a research update to earlier work performed by INPUT in ascertaining vendor plans and market opportunities for the installation of computers by remote computing services (RCS) vendors at user establishments.

- The market addressed emphasizes those offerings which:

  - Place programmable hardware on the user site (as compared to the EDP center).

  - Offer access to a communications network.

  - Offer access through the network to the RCS vendor's larger computers.

  - Offer significant software as part of the offering.

- For purposes of this report, the offerings are termed user site hardware services (USHS).

- It was INPUT's purpose to sample selected portions of the user environment in order to determine:

  - Early user reactions to current products.

  - Other user sentiments regarding the viability of USHS as a product/market concept.

- Alternately, INPUT was also interested in reviewing the development of the USHS market with a cross section of RCS vendors and determining the extent to which these suppliers were developing USHS products.

- The above information, when integrated with other related research performed by INPUT, serves as the basis for generating USHS market projections through 1983.

- Quantitative and qualitative issues that were also addressed included:

  - The extent to which the RCS market would be effected by the USHS concept.

  - The expected role of IBM and other hardware vendors.

  - The degree of RCS vendor vulnerability to in-house conversion.

  - The relationship of distributed data processing (DDP).

  - The DP manager as a "new" sales/marketing target.

B. RESEARCH AND METHODOLOGY

- The research for this study was predicated upon two sets of questionnaires developed by INPUT and utilized during both telephone and on-site interviews with both users and vendors.

- A total of 12 vendor interviews were conducted with one of these vendors functioning as an OEM hardware supplier to one of the USHS market participants.

- Eight of these vendors were interviewed in person.

- These respondents included senior marketing, planning or operating executives.

- A total of 20 user telephone interviews were conducted with primarily Fortune 500 classes of companies. Eight of these respondents were either using an ADP ONSITE system or were seriously considering an announced USHS product offering.

- Respondents were either DP managers or senior decision making individuals within the user timesharing environment.

- The focus of the interviews was to determine representative user and vendor attitudes regarding USHS with due recognition of the fact that there are currently probably less than 15 USHS installations in the United States.

- Accordingly, other market related information developed by INPUT, coupled with our subsequent perspective of the evolution of the USHS market, served as the basis for the market projections developed herein.

- Client inquiries and comments are invited.

II EXECUTIVE SUMMARY

II EXECUTIVE SUMMARY

A. MAJOR CONCLUSIONS

- INPUT believes that user site hardware services (USHS) represent a significant new delivery system for traditional remote computing services (RCS) that is being driven principally by the continuing reduction in computer hardware costs.

- These "new hardware economics" are causing vendors to rethink the manner in which they service RCS requirements with resultant changes in the traditional role that remote computing service firms have had in addressing this market.

- Users will increasingly examine in-house conversion options which, if not challenged by RCS vendors, will result in:

  - Erosion of their client base and,

  - Missed opportunities in participating in the growing distributed data processing (DDP) market.

- However, largely because of the defensive nature of USHS offerings and the current substantial size of the RCS market, INPUT does not believe that the evolution of the USHS product concept will result in a significant change in the size or growth rate of the RCS market through the next three to five years. The basis for this statement is the following:

  - New RCS entrants to the USHS market will not complete making their initial new product introductions for at least another year.

  - Large users will require one to two years of operating experience with the concept before making large scale commitments.

  - Most RCS vendors will require several years to develop the resources necessary to satisfy the maintenance requirements of serving a nation-wide network of distributed systems.

  - RCS vendors will have to develop new sales and marketing methods in order to sell to the data processing manager who has not traditionally been involved with RCS.

  - Distributed data processing products offered by traditional hardware vendors pose a significant competitive threat.

  - The net effect of USHS on RCS revenues is still uncertain from a user viewpoint. Users interviewed were evenly divided in their opinion as to the impact; half felt RCS revenues would increase, and half thought they would decline.

- In the period beyond 1982, if RCS vendors overcome the above retarding factors, the positive impact of USHS on revenues will be greater than forecast in the following section, exceeding $1 billion in 1983.

B. MARKET FORECASTS

- INPUT projects the USHS market in 1983 as being in the $617 million to $959 million range which is 9-14% of the total $6.9 billion RCS market projected for 1983. Results are shown in Exhibit II-1.

- Most of these revenues will be derived from the industry specialty and utility (particularly DBMS based applications) portions of the 1983 RCS market. The reasons for the lower growth rates for general business and scientific and engineering types of business are:

  - General business applications are being addressed by standalone hardware from minicomputer and turnkey suppliers.

  - Scientific and engineering applications typically are more mature and not as adaptable to a USHS environment.

- The reasons for the higher growth rates for industry specialty and utility types of business are:

  - Industry specialty represent the strongest services offerings in terms of specialized software and networking which are essential elements of USHS.

  - Utility services address two key segments of USHS, first DBMS services such as Nomad, and second, traditional timesharing which will be converted to USHS because of improved price/performance of USHS.

- EDP department expenditures for in-house interactive utility services (in-house timesharing) will experience dramatic growth through the forecast period and exceed $6 billion in 1983, as shown in Exhibit II-2. The reasons for this growth include:

EXHIBIT II-1

USER SITE HARDWARE SERVICES (USHS)

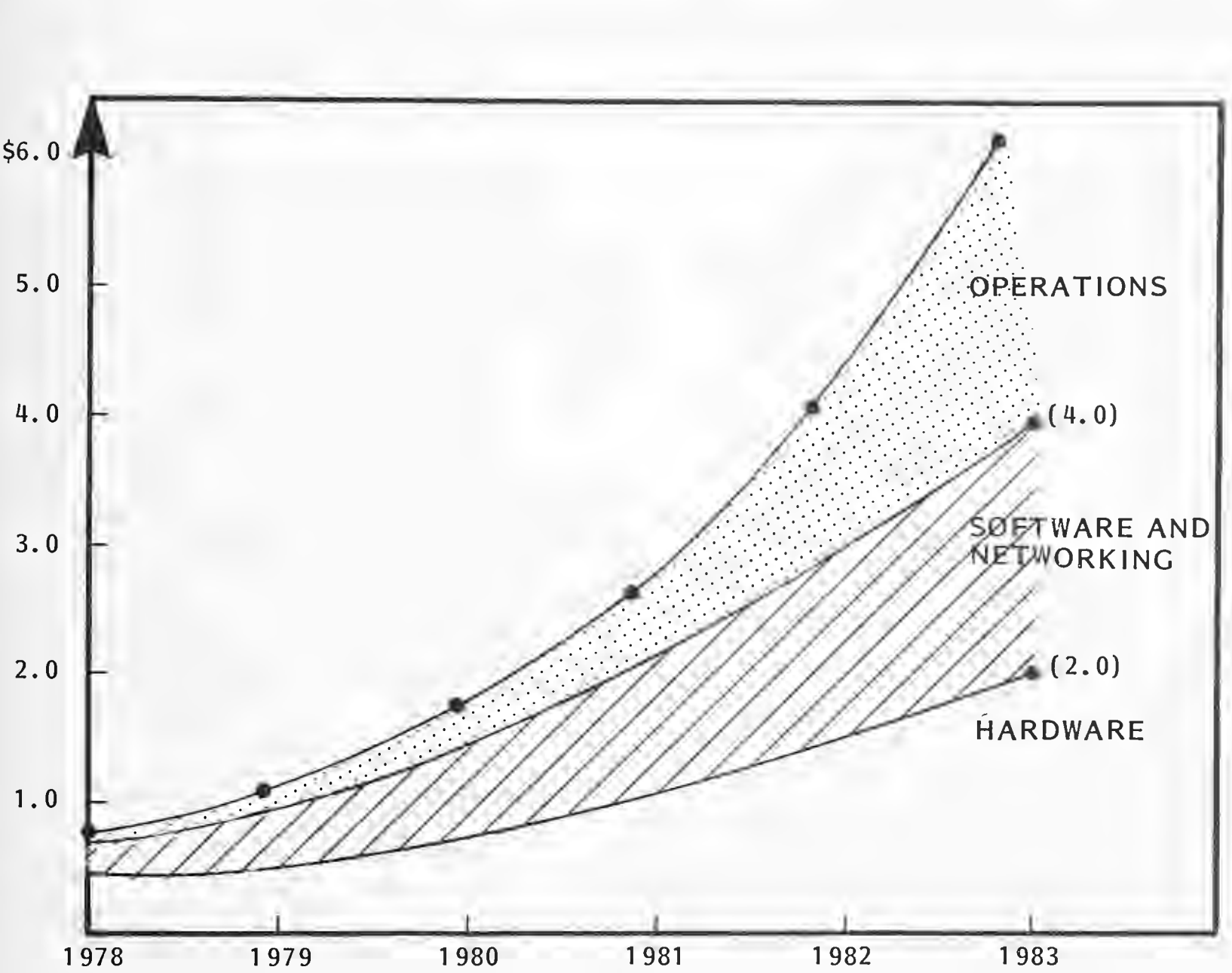
MARKET IN THE U.S. 1978-1983

MODE	TYPE	RCS REVENUES 1978 ($M)	AAGR (%)	RCS REVENUES 1983 ($M)	USHS PENETRATION (%)	USHS 1983 ($M)
REMOTE COMPUTING SERVICES	GENERAL BUSINESS	$ 283	23%	805	5-10%	$ 40- 80
	SCIENTIFIC & ENGINEERING	301	16	640	5-10	32- 64
	INDUSTRY SPECIALTY	1,403	21	3,700	10-15	370-555
	UTILITY	720	19	1,740	10-15	175-260
	TOTAL	$2,707	20%	$6,885	9-14%	$617-959

EXHIBIT II-2

THE IN-HOUSE INTERACTIVE MARKET IN THE U.S.

(1978-1983)



- The lower cost of available in-house systems timesharing from IBM and other hardware vendors.

- The explosive growth in the number of users of terminals fed into an in-house computer (such as in the hospital industry sub-sector).

- This market will experience modest penetration (or conversion) by RCS vendors offering USHS plug compatible mainframes similar to the strategy that is being employed by National CSS with its IBM compatible System 3200.

  - This market conversion will represent revenues of up to $360 million in 1983 to USHS vendors targetting the in-house interactive segment.

  - These revenues are included in the forecast shown in Exhibit II-1.

  - They are spread across the types of business with relatively heavier penetration in utility services.

- The expected 9-14% penetration of USHS in 1983 is consistent with the penetration anticipated by six current vendors interviewed.

  - These vendors anticipate a 15-20% penetration which is above average for all RCS vendors.

  - Other RCS vendors, particularly smaller ones, will participate to a lesser extent or not at all.

- One of the major unknowns in the market growth is the direction of recently announced, or still unannounced, products.

  - GE's Marklink announcement is an example, particularly since it is priced at approximately 10% of the earlier ADP and NCSS announcements and can tap a totally new market segment.

- Interviews and analysis presented in this study were completed prior to the GE announcement and therefore the impact of this product cannot be fully evaluated at this time. (INPUT currently intends to evaluate the USHS market again in late 1979 to address the products announced by that time and track emerging attitudes in the user environment.)

C. MARKET STRUCTURE

- All major RCS vendors are expected to have an initial USHS product introduced within the next 12 months. INPUT believes that their rationale is, in part, defensive in nature so as to protect their existing customer base from erosion resulting from:

  - Attractive USHS products and pricing being offered by services competitors.

  - Conversion of outside services to in-house systems.

- However, there are additional advantages offered by an USHS strategy that are significant and include:

  - A means of participating in the DDP market.

  - A potential method of getting a piece of the in-house timesharing market.

  - Developing an integrated network and software service package for the post-1980 timeframe.

  - Providing entry into the small user area; i.e., $500 to $2,000 per month in billings.

- Although vendors are counting heavily on their applications and systems software expertise coupled with a networking capability, most vendors had no current intention of filing as a value added network (VAN) for reasons related to a desire not to:

  - Compete directly with AT&T or,

  - Become regulated.

- The probability that the FCC will require VAN status of the communications portion of USHS was not addressed within the research phase of the study.

  - At the present time, the status of future regulation is a "grey area" and INPUT has not developed a forecast on the issue.

  - The tendency of the FCC to foster competition in the communications marketplace opens the possibility that VAN status will not be required for the communications portion of many USHS offerings.

- Vendors diverge in their plans for establishing separate sales teams or in the methods by which they intend to solve the maintenance requirements dictated by the future establishment of a nationally installed hardware base.

- Users with monthly RCS expenditures ranging from $2,000 to $20,000 are believed to be capable of conversion to an USHS system by vendors. On average, $8,500 per month was regarded as the current threshold level for potential conversions with $5,000 per month certainly being feasible by 1982.

- Vendors interviewed for this study believed 20-30% of their systems cost should be hardware related in USHS offerings. The percentage is significantly higher in current offerings with the expectation that the percentage will drop as USHS vendors are successful in obtaining a premium for software and communications services.

- Although RCS vendors will sell USHS initially to the traditional timesharing user base, they will increasingly be forced to deal with senior data processing personnel.

- Not surprisingly, IBM's 8100 and System 38 are regarded as strong competing products; particularly in supporting in-house DDP and timesharing efforts.

  - Furthermore, IBM is expected to become more of a services competitor by virtue of the potential approval of Satellite Business Systems (SBS) network in which IBM has a partnership interest.

  - Also, IBM is expected to re-enter selected portions of the processing services business, a forecast shared by several RCS vendors interviewed for this study.

- Major RCS vendors, in conjunction with traditional hardware suppliers, will place increasing competitive pressure upon RCS vendors with sales in the $5-25 million range. Such vendors, many of whom provide general purpose applications services, are vulnerable to USHS inroads while handicapped by their inability to afford the investment necessary to enter the market.

- INPUT believes that the 250 RCS companies in the United States with revenues in the $2-25 million range, in addition to software companies, will offer an important source of merger and acquisition candidates to bolster USHS and related market strategies.

- All of this will serve to further blur the lines of distinction between traditional hardware, software and services vendors.

D. CURRENT MARKET PENETRATION AND USER ATTITUDES

- The installed base of USHS installations as of the end or 1978 is less than 15, with most users limited in their familiarity with the concept. Vendors interviewed also continue to have limited visibility as to the total number of installed USHS sites expected within the next 12 months.

- Nonetheless, INPUT's limited user sample generally appeared favorably disposed to the USHS concept, citing factors related to flexibility, cost, and security as favorable features. These are driven by user desires to:

  - Get tighter control of their total computer environment.

  - Gain the advantage of improved support and expansion capability.

  - Develop more in-house features.

- Perceived unfavorable facets included:

  - Concerns and requirements for higher level support personnel and the demands associated with providing adequate physical facilities for a computer site.

  - A potential vendor inability to provide adequate maintenance to a geographically dispersed user base.

  - Some user concerns over a single vendor "lock-in."

- Of the USHS products introduced to date, INPUT is struck more by their differences than their similarities. However, as the concept evolves, vendors are expected to increasingly develop a vertically integrated line of products offering computing power both above and below the current megamini class of machines.

- User respondents overwhelmingly favored a short-term lease package (possibly with a purchase option) reflecting both their caution over the USHS concept as well as a desire to:

  - Avoid capital outlays.

  - Maintain flexibility in the face of technology change.

  - Having "known" fixed monthly charges.

- Although users did not currently seem particularly intrigued with vendors' networking capabilities, INPUT believes this feature will develop increasing importance as users eventually come to grips with growing data communications requirements.

- Not surprisingly, vendor selection criteria emphasize software, price/performance features and maintenance capabilities.

E. RECOMMENDATIONS

- RCS vendors must address a USHS product strategy or risk erosion of their existing client base and lose opportunities to participate in DDP and related markets. Those deciding against introducing USHS products must have a strategy for competing against those who do.

- The USHS product concept represents not only another delivery system for RCS services but will also function as an in-house interactive system.

  - As such, traditional RCS vendors must increasingly develop sales/marketing expertise with DP managers who will become involved in the sales cycle.

- There is little evidence to date that RCS vendors are developing this expertise, preferring rather to call on their traditional customers.

- USHS must be viewed in the context of a value added service with the principal components focused on a vendor's ability to fully maintain hardware, systems and applications software, and communications in a comprehensive package. Corporate weaknesses in any of these areas must be remedied either through "grass roots" investment or acquisition, therefore, only larger companies will be able to participate fully.

- Smaller RCS vendors, lacking the resources to address all of these issues should begin structuring market niche or specialty strategies; e.g., USHS packages for highly specialized applications.

- Although the short-term USHS "sell" should be focused within the Fortune 1000 class of company, longer term strategies should not ignore the small user portion of the market. Opportunities in this market will become increasingly apparent as the cost of hardware continues to erode affording vendors the means of addressing this market with combined hardware/software/communications (USHS) offerings.

- RCS vendors are advised to broaden their market base in order to appeal to a larger cross-section of the information processing community. USHS will be the delivery mechanism in many cases. Adjunct services that could be offered in the future should include:

  - Communications-coupled word and text processing capabilities that constitute "electronic mail."

  - Administrative message switching.

  - Computer graphics capabilities.

- Eventually, merged text, data and graphic creation, transmission and storage facilities.

- RCS vendors should structure a long-term strategy that, in part, assumes that AT&T and SBS will prevail through the regulatory maze attendant to approval of their service offerings.

  - As such, both companies will find themselves as value added network (VAN) vendors with the capability of adding remote computing services.

  - RCS vendors must, therefore, assume significant communications offerings from AT&T and SBS in the 1980s. These offerings will provide both competition and opportunity to those companies who compete in the RCS marketplace.

III USER SITE HARDWARE SERVICES (USHS) CHARACTERISTICS

III USER SITE HARDWARE SERVICES (USHS) CHARACTERISTICS

A. USER SITE HARDWARE SERVICES DESCRIPTION

- A new offering from several major remote computer services (RCS) vendors has caused a stir throughout the entire RCS marketplace. The offerings announced by ADP and NCSS involve placing a computer on-site with the service user, combined with significant software and communications features.

- The general concept of ADP and NCSS is that a better price performing service may be offered to customers who elect to utilize a vendor service company's computer. The computer will normally be located at the user's site and will be dedicated to that user's work.

- A communication link between that user and the service company vendor (e.g. ADP, NCSS) will be primarily utilized (at least initially) for system checkout and error detection.

- The communication link could eventually lead to distributed data processing (DDP) for the user. INPUT has found no users currently employing DDP with their USHS, but anticipates that DDP usage will appear.

- A primary benefit that a user receives from USHS is the software systems that the RCS vendors have developed and refined over the years. These systems include operating systems, communications and applications systems.

- The user of USHS still looks to the RCS vendor for support, but the user now has more operating control over scheduling and data security.

- In large USHS applications, a user could construct a system with greater flexibility, reliability, and back-up than could be obtained from typical RCS vendor services. For example, multiple CPUs could be employed in a USHS application that could support the extra investment in hardware.

B. USHS USER BENEFITS

- USHS can be more cost effective than RCS. The cost savings are typically found through a fixed fee contract (using USHS) rather than transaction pricing (of RCS).

- A USHS vendor can offer a wide array of software, technical support, and networking capabilities.

- Typical USHS services include:

  - Tracking and monitoring usage.

  - Remote performance monitoring and fault diagnosis.

  - Remote hardware and software maintenance.

  - Back-up.

  - Special peripherals such as plotters and typesetters, when needed.

  - Access to shared data bases.

  - Access to overflow processing, if needed.

- USHS vendors offer professional training and documentation to ease the task of using their systems.

- A summary of user alternatives and implications is shown in Exhibit III-1.

C. USHS USAGE AND USER EXPERIENCE

- Prior to commissioning this study, INPUT conducted interviews with ADP ONSITE users. One user was willing to be identified (American Appraisal Company in Milwaukee).

- The experience of American Appraisal is included here because of the relevancy of this data to the current study.

- American Appraisal Company expresses a great deal of satisfaction with the system. Their DP Manager says their 16-port, 360 megabyte disk system replaced outside timesharing costing over $25,000 per month at a fixed monthly fee of $17,583.

- Approximately one-quarter of the usage is dedicated to a new terminal-oriented outside service offered by their Boeckh Publications Division, a replacement cost estimating system for residential and commercial building assessment. The package calculates replacement value based on input parameters describing the structure and a data base containing labor and material costs for each locality.

- The system arrived during the third week of September 1978, and was accepted and operational on October 4, 1978. There were some "difficulties" at first, but performance has smoothed out.

- Remote fault diagnosis "actually works," according to this user, and machine availability is now comparable to that experienced with outside services.

EXHIBIT III-1

USER ALTERNATIVES AND IMPLICATIONS

DIMENSION	ALTERNATIVE APPROACHES			
	USER SITE HARDWARE SERVICES	RCS OFF-SITE	IN-HOUSE MAINFRAME	IN-HOUSE MINICOMPUTERS
POTENTIAL COST/ EFFECTIVENESS	EXCELLENT	FAIR	FAIR-GOOD	EXCELLENT
LEVEL OF USER COMMITMENT	MEDIUM	LOW	HIGH	HIGH
VENDOR SUPPORT AVAILABLE	HIGH	HIGH	LOW-HIGH	LOW
WIDE RANGE OF AVAILABLE SOFTWARE — SYSTEMS / APPLICATIONS	GOOD / SOME	GOOD / SOME	FAIR-GOOD / LOTS	POOR / NIL
IMPLEMENTATION EASE	GOOD	EXCELLENT	FAIR	DIFFICULT
TECHNICAL REQUIREMENTS	LOW	LOW TO NIL	MEDIUM-HIGH	HIGH
SKILLED TECHNICAL SUPPORT LABOR MARKET	LITTLE REQUIREMENT	LITTLE OR NO REQUIREMENT	HIGH REQUIREMENT BUT GOOD AVAILABILITY	HIGH REQUIREMENT AND VERY LITTLE AVAILABLE
RELIABILITY	EXCELLENT	GOOD	GOOD	EXCELLENT
MAINTAINABILITY	GOOD BUT UNPROVEN	EXCELLENT	EXCELLENT	QUESTIONABLE
ADAPTABILITY TO FUTURE REQUIREMENTS	EXCELLENT	EXCELLENT	GOOD-EXCELLENT*	QUESTIONABLE
DEPENDENCE ON VENDOR	HIGH	VERY HIGH	MEDIUM-HIGH	LOW-NIL
RISK OF VENDOR DEFAULT	HIGH	HIGH	LOW	HIGH BUT NOT A FACTOR
DEGREE OF CONGRUENCE WITH TECHNOLOGICAL AND ORGANIZATIONAL TRENDS	HIGH	HIGH BUT EXPENSIVE	LOW**	HIGH

*POTENTIALLY EXCELLENT, BUT SIZE AND COMPLEXITY OF CENTRAL SYSTEMS OFTEN IMPEDES ADAPTABILITY TO NEW REQUIREMENTS.

**LOW IN THE EYES OF MANY END USER COMMUNITIES, REGARDLESS OF THE TRUE MERITS, POSSIBLY BECAUSE OF FACTOR NOTED ABOVE.

D. USHS VENDORS

- The most important question facing the RCS vendor is, "Why should USHS be considered in my strategic planning process?"

- The three primary reasons for an RCS vendor to consider (USHS) are:

  - Defensive. Hardware vendors such as Digital Equipment Corporation, IBM, and Hewlett Packard are in a position to make significant inroads into RCS revenues by offering users less expensive in-house alternatives. RCS vendors saddled with costly networks, large mainframes, and associated overhead may have no alternative but to reply in kind after exhausting cost-cutting opportunities within their present product delivery structure.

  - Providing Economics. A clear trade-off exists between the costs associated with processing the customer's work on his site versus the costs of communicating to and from the vendor's site. Although some modest reductions in communications costs have been achieved through employment of more sophisticated networking methods, the cost of hardware is decreasing far faster, tilting the balance in favor of distributing computing resources closer to the point of consumption.

  - New Markets. Some RCS vendors perceive on-site hardware as an attractive vehicle for various new industry and applications-oriented services, up to and including packaged "turnkey" type problem solutions, and secondly, as an offensive weapon with which to capture revenues that traditionally belong to the hardware manufacturers.

- There are currently four USHS products that have been announced by RCS vendors. Exhibit III-2 summaries the current and some expected USHS product announcements.

EXHIBIT III-2

SELECTED USER SITE HARDWARE OFFERINGS BY RCS VENDORS

VENDOR	PRODUCT	HARDWARE	BUNDLED WITH SERVICE	PRICE RANGE	LEASE OR PURCHASE	NUMBER OF PORTS	SIZE OF MEMORY	SIZE OF DISK STORAGE
ADP NETWORK SERVICES	"ONSITE"	DEC 2020	YES	$5-15,000 PER MONTH	LEASE ONLY	8-32	1-2+ MB	45-300+ MB
NCSS	"3200"	TWO PI 3200	NO	$185,000 TO $800,000	PURCHASE ONLY	1-32	0.25- MB	200-2000 MB
ITEL*	SMALL BUSINESS STANDALONE	DG CS SERIES	YES	$15,000 TO $100,000+	LEASE AND PURCHASE	AS APPROPRIATE TO THE APPLICATION		
KEYDATA*	"UNITY" SMALL BUSI-NESS STAND-ALONE	DG NOVA 3/D	YES	$48,000 TO $100,000+	PURCHASE AND MONTHLY SOFTWARE FEE	AS APPROPRIATE TO THE APPLICATION		
GE	"MARKLINK"	TI MINI	YES	$21,230 TO $93,290 OR $800 TO $3,690 PER MONTH	LEASE AND PURCHASE	1-16	24-352	10-20
STSC	"QUAD 100"	NOT YET SELECTED	NO	$500,000 TO $1,000,000	PURCHASE ONLY	5-16	1+ MB	UN-ANNOUNCED
TYMSHARE, COMPUSERVE, RAPIDATA	NOT FORMALLY ANNOUNCED	DEC 2020	UNKNOWN, BUT PRESUMED SIMILAR IN PRICE AND CAPABILITY TO ADP's "ONSITE"					

*ARE NOT INTEGRATED WITH A NETWORK AND THEREFORE ARE NOT CONSIDERED USHS AND ARE NOT INCLUDED IN THE FORECASTS OF USHS DEVELOPED IN THIS STUDY; THEY ARE SHOWN ON THIS CHART FOR PURPOSES OF COMPARISON ONLY.

- In the forecast in this report, only the offerings which include a network are treated. The Itel and Keydata offerings are therefore excluded from the forecasts.

- Other offerings, such as United Computing's successful turnkey system for distributors, are excluded for the same reason.

- The impact of these non-network offerings on services revenues is expected to be primarily on batch revenues, rather than on the RCS revenues which relate directly to USHS offerings as reported in this study.

IV ANALYSIS OF USER ATTITUDES AND MARKET CHARACTERISTICS

IV ANALYSIS OF USER ATTITUDES AND MARKET CHARACTERISTICS

A. APPROACH

- The analyses and conclusions that follow were derived primarily from data collected during 20 user telephone interviews.

- The industry mix of user respondents was very diverse and included manufacturing, utilities, education, insurance, and other services firms. Most of these firms were randomly selected although several were known by INPUT to be particularly knowledgeable about USHS.

- An attitude survey such as this includes questions of an open ended nature which yield highly qualitative responses. A number of these have been directly quoted or paraphrased (without attribution).

B. USER PROFILE

- Eight of the respondents were either using an ADP ONSITE system or were seriously considering a USHS product offering. One of the respondents claimed to have served as a limited NCSS test site for the 3200.

- Remaining respondents were familiar with the product concept through a combination of advertising, promotional literature and sales presentations.

- Most of the manufacturing and services respondents had annual revenues in excess of $100 million with eight reporting revenues greater than $1 billion. Educational institutions had student enrollments in excess of 10,000.

- Approximately 86% of the respondents' annual data processing budgets was spent (on average) for in-house service functions. Of the remainder, approximately 65% was spent on RCS services. This equates to about 9.7% of the total annual DP budget.

- The average expenditure for outside RCS services was approximately $18,500 per month.

C. ANALYSES OF SURVEY RESULTS

1. USER SENTIMENTS TOWARD USHS

- Of the total of 20 respondents:

  - Eleven were currently negative toward installing such a system.

  - Four were either committed to, or had actually implemented such a system.

  - Five remained open to the possibility.

- Reasons presented in favor of installation included the following interrelated factors:

- Capital budget limitations precluding the procurement of additional central site hardware systems.

- The benefits of a total package; i.e., technical expertise at a fixed cost.

- Excess in-house costs.

- Cost/performance advantages of minicomputers.

- Reasons presented against an USHS installation included:

  - Outside RCS monthly expenditures were too small to currently justify; e.g., $3,000-5,000 per month.

  - A belief that applications processed outside were both unique and sophisticated and required large machines.

  - The DEC system (ADP's ONSITE) believed to be "overpriced."

  - Higher internal priorities with in-house expertise.

- The following alternatives were being considered in lieu of a USHS installation:

  - Expansion of the central computer facility and/or installed base of minicomputers. However, these options were recognized as requiring the development of relevant software.

  - Continued usage of remote computing services (without on-site hardware).

- User attitudes regarding the USHS concept were generally "wait and see" to positive.

- Not surprisingly, a strong credibility problem currently exists with the concept which can only be bridged by a significant increase in user installations coupled with positive reports concerning the maintenance issue.

- Several of ADP's initial sites received favorable reviews with only one complaint being uncovered. This centered on problems associated with physical site preparation and the difficulty in setting up administrative software control.

2. PERCEIVED USHS STRENGTHS AND WEAKNESSES

- In addition to the specific reasons that respondents cited in support of their own positions vis-a-vis USHS, INPUT solicited general comments as to their perspectives of both the favorable and unfavorable features of the product concept.

- On a relative basis, respondents spent more time discussing their perceptions of the current and potential benefits (rather than disadvantages) to be derived from an USHS product offering. Although comments varied widely, they seemed to focus into three areas:

  - Flexibility.

  - Cost.

  - Security.

- USHS flexibility advantages may be illustrated in the following ways:

  - The concept limits the extent to which a company may have to develop an in-house capability with its concomitant investment in capital equipment and sustaining resources. As such, it offers a transition option for medium sized establishments, particularly if vendors offer a vertically integrated family of computer products.

- Users generally have the option of not owning the hardware.

- It's an easy way to justify internally getting a computer without a long-term commitment.

- USHS affords a gradual introduction to networking.

- It promises a pre-processing benefit with faster turnaround.

- USHS may be packaged as a complete turnkey system for small users.

- It offers an alternative to resource utilization in that one uses money rather than people.

- Users are provided good software.

- It retains a level of IBM compatibility (in the case of the NCSS 3200) such that applications may be offloaded from the USHS product to the main IBM computer.

- The system could be used on a standalone basis or hooked into a national network.

- Cost benefits were cited by several respondents as an advantage although a few users remained unconvinced as to the reality of actual cost savings.

  - A key ingredient in perceived cost savings was the availability of packaged software that serves to spare users development costs.

  - One introspective respondent believed that cost really wasn't an issue in procuring a system. Rather the underlying issue was the potential capability of a USHS product to keep abreast of a company's growth and EDP utilization requirements.

- The security advantages of USHS may be best summarized as follows:

  - It affords less risk for small companies interested in a package deal.

  - As one individual said..."it can provide some tremendous emotional detoxification...that is, you could let a using department have the feeling that they have their own computer and were masters of their own fate when in fact, they aren't. So you can defuse a lot of emotional and political problems..."

  - Software, communications, and networking expertise become available.

- Comments reflecting positive factors surrounding USHS appear in Exhibit IV-1.

- Alternately, the possible disadvantages to the user of an USHS product were far more succinctly phrased and included:

  - The potential difficulties and hidden costs associated with higher levels of support personnel and "...the care and feeding" of a computer; i.e., providing facilities.

  - Potential security problems, and a lack of control of programs and documentation which could eventually lead to an RCS vendor lock-in.

  - The potential inability of vendors to support the maintenance requirements of a geographically dispersed (including remote sites) network user.

  - The requirement to reorient (train) an IBM shop to be able to deal with DEC equipment.

- Respondents generally did not have any unique concerns with regard to the quality, availability, and maintainability of software provided by the large USHS vendors.

EXHIBIT IV-1

USER COMMENTS REFLECTING POSITIVE FACTORS SURROUNDING USHS

- "NCSS software availability and commitment...(they) have a 200 man software engineering group devoted to making the system useful."

- "Users of data processing in our corporate office are very high on this (ADP ONSITE). They don't have to go through our DP department now. They can write their own programs and get their instantaneous turnaround."

- "...smaller companies can get in."

- "...provide needed flexibility for a growing company."

- "...availability of pre-written software."

- "Definite cost savings. We were using three outside services prior to USHS installation. We spent $20,000-30,000/month and our bill was escalating. We signed an agreement for a fixed fee three-year lease of $17,000/month...and it will be unlimited use for that amount of money!"

- "Based on current pricing...price/performance appears to be substantially better than conventional remote computing services...but the machine is not now fully loaded so we can't be sure."

- "We use their international communications network for a fixed charge of $5/hour. They do all the support...I don't have to hire any telecommunications experts..."

- This reflects the proven nature of software in current USHS offerings.

- However, one very large user was seriously concerned about the unbundling of software provided by third party software vendors and whether such software packages would run effectively on USHS machines.

- Comments reflecting negative factors regarding USHS appear in Exhibit IV-2.

3. PRODUCT DEFINITION AND REQUIREMENTS

- Of those users that had installed the ADP ONSITE hardware, the systems configuration appeared relatively straightforward and consisted of the DEC 2020 with one or more disk and tape drives in addition to a printer.

- One user reported significant problems in physically installing the ONSITE system, particularly with regard to additional:

  - Air conditioning.

  - Three phase power.

  - Security features.

- Respondents were generally critical of the limited nature of current USHS product offerings; i.e., only megaminis.

  - Vendors are expected to be able to offer a range of CPU hardware capable of handling the disparate requirements of users.

  - Clearly, this suggests the development of an integrated family of products, perhaps similar to the PDP-11 line and capable of integration with medium to high speed peripherals.

EXHIBIT IV-2

USER COMMENTS REFLECTING NEGATIVE FACTORS SURROUNDING USHS

- "How are they going to solve the hardware maintenance problem?"

- "Inherent in the RCS business is spiraling price increases once you're locked into them. Even with hardware product offerings...you may enter their service at a low level but as your volume goes up their prices rise even faster."

- "...responsibility for the operations side including file backup, staffing, security...(we're) doing massive reorganization of data bases at night and experiencing capacity limitations."

- "You're responsible for the mini...have to house and feed it."

- "The absence of interconnection between different service networks weakens the value. For instance, if you're using NCSS and then decide you'd like to use Scientific Timesharing's APL Plus in conjunction with the NCSS net, you can't get access."

- Ideally, the USHS implementation should be operationally easy to use such as to negate the requirement for a professional programming staff. Although there is a strong desire on the part of remote users to develop a higher level of autonomy associated with a dedicated machine, users remain concerned over the servicing implications of such a move.

- Services that are both desired and are being provided through USHS include:

  - Interactive engineering and various modeling systems.

  - CPM scheduling.

  - Cost estimating, MIS and other standard financial systems.

  - DBMS applications and file manipulation systems.

  - Networking software.

- Respondents were also interested in those jobs (frequently of a standalone nature) that could be accomplished with small scale computer resources and that normally require rapid turnaround.

- Respondents were overwhelmingly in favor of a short-term (one to three year) lease financial package for the usual mix of reasons, including:

  - Avoiding capital outlays.

  - The capability to terminate the lease.

  - "Known" fixed monthly charges.

  - Flexibility in the face of technology change and competitive product offerings.

Several respondents did not rule out a purchase option.

- Users were evenly divided as to whether USHS costs should be bundled or unbundled.

  - Proponents for unbundling desired the present timesharing billing approach with flexibility to pick and choose various service packages.

  - Furthermore, they desired separate cost identification for customization of software and services as well as quantified communications costs.

- In this context, it is important to note that specialized software packages were being supplied to one USHS user by a third party with royalties being paid by the respondent on an unbundled basis. This may represent an awkward arrangement for both users and vendors under some circumstances.

- Respondents currently regarded the availability of the network portion of the USHS product as possessing limited significance. Reasons offered for this judgement focused on the:

  - Relatively narrow range of applications to be serviced at the processing site.

  - Existence of a telecommunications network within the respondent's firm.

  - Limited geographical dispersion of the company.

- However, several respondents suggested that such a networking capability would develop increasing importance in their decision making process as a function of their ability to integrate their own machines (in addition to the USHS product) onto the network. This includes coordination of daily communications as well as host backup.

- INPUT concludes that a networking capability will develop increasing importance in respondent considerations of an USHS product as users come to terms with growing data communications requirements.

4. THE MAINTENANCE ISSUE

- Respondents generally expected USHS vendors to provide both hardware and software maintenance in return for an agreed upon monthly fee.

- Several users balked at the prospect of third party maintenance as a result of:

  - Some concerns over technical proficiency.

  - A desire to "dial one number."

  - However, users questioned whether RCS vendors had the resources to provide their own maintenance organizations with geographical coverage to be provided in each major city.

- Respondents seemed to be well aware of the remote diagnosis features offered by some vendors and reacted positively to it. However, they regarded this maintenance/monitoring feature as only one facet of a service posture that must include the capability of providing a timely response to trouble calls by system software specialists and hardware technicians.

5. POTENTIAL INSTALLATIONS AND MARKET OUTLOOK AMONG RESPONDENTS

- INPUT undertook efforts to make some determination of the USHS sites that would be potentially available among the respondent sample.

- There were 91 potential installations existing in 16 respondent organizations. The other four respondents reported "none" or could not make a determination.

- One major Fortune class of company identified ten possible installation sites within the next one to two years with the potential for 30-50 more in the early 1980s time frame.

- Most respondents envisioned a near term potential of a single system serving as many as 12 users with terminal populations ranging as high as 36 units.

- Several very large corporations with geographically and organizationally diversified operating companies, divisions, or manufacturing sites reported USHS potentials for each of these facilities.

  - Although the bulk of potential USHS installations was centered in the Fortune class of surveyed companies, INPUT found smaller universities and companies with sales below $100 million with requirements for multiple units. These appeared to be intended for specialized applications requiring CPU capabilities below that of the mega-mini class of machine.

  - Based on this limited sampling, INPUT concludes that current USHS vendor marketing strategies seem to make sense as far as addressing the Fortune class of companies. However, significant opportunities may exist among smaller entities, particularly in the event that a vertically integrated CPU product line may become available, with smaller CPUs for smaller establishments.

- Of the 16 respondents that had either currently rejected or were considering an USHS product, six expected to reach some sort of decision in 1979.

- The balance were either categorically opposed to the concept or did not anticipate making a decision through the next several years.

- Respondents were a mix of timesharing coordinates, DP managers, and end users; e.g., in engineering or manufacturing.

- Most of the users believed that it would require three to five years before the USHS product concept would develop significant market acceptance. The tone of these comments were generally optimistic. Representative comments appear in Exhibit IV-3.

6. DISTRIBUTED DATA PROCESSING (DDP) AND HOST OFFLOAD

- Within user limitations of understanding the DDP concept and its perceived limitations, respondents generally believed that USHS products "...push you further along the DDP path..."

- Respondents went on to disagree as to the extent to which the desire to offload the host would influence a USHS product decision.

- In the event that a host facility was approaching or had reached saturation, users would obviously be more favorably inclined toward offloading applications onto a USHS product.

- Host offloading was not regarded as a USHS influencing factor for the following articulated reasons:

- Concerns over creating redundant data.

- Selected applications being traditionally done outside of the host environment through an outside service and therefore not part of the host work load.

EXHIBIT IV-3

USER COMMENTS REGARDING USHS PRODUCT ACCEPTANCE

- "Within five years it will reach epidemic proportion."

- "It won't come about as fast as some people think. We're not pioneers. I'm not an early user of anything. I figure it takes three years to iron out the kinks (networking problems, job disbursement; i.e., what to do on a local device as opposed to host)."

- "It's an interesting idea, but I have a healthy skepticism and think it may never happen. It may be gobbled up by the mainframes before it ever gets a chance to come to fruition."

- "Within five years. The impact there is the 8100. I don't think anyone really understands the full impact that it will have, including IBM. I think in the next five years we're going to see Future Shock. People will be offering networks...everyone and everywhere! Every major computer vendor will copy IBM by offering a non-intelligent terminal to a mini to work off the host computer. When IBM sneezes everyone rushes in."

- "Should be getting into full swing in 1979."

- "I think it's time has come...it depends now only on the vendor's ability to market it!"

- "There is room for 2,000 to 3,000 systems by 1981-1982. I think the applications will grow more rapidly than mini/micro manufacturers can manufacture equipment!"

7. THE USHS DECISION MAKING PROCESS

- There is little evidence that suggests that the USHS decision making process differs significantly from other DP analyses, justifications and procurement methods.

- With hardware now actually being delivered and maintained on-site there is more involvement on the part of the senior divisional or corporate DP functionary in the selection and approval cycle. This participation is in addition to the usual mix of user groups (financial, engineering, etc.) and those personnel nominally charged with "timesharing coordinator" responsibilities.

  - It is significant to note that RCS vendors, who have traditionally dealt with user groups, will have to broaden their sales and marketing skills in dealing with the DP manager.

  - The final decision or approval level will now frequently scale up to a senior operating officer which could include a vice president, general manager, or president.

8. VENDOR SELECTION CRITERIA

- INPUT polled respondents as to those vendor characteristics that are deemed most important in selecting an USHS vendor.

  - These results are presented in Exhibit IV-4 which lists particular characteristics, their relative rankings and the total number of respondents in each rating category.

  - Not surprisingly, the vendor's software capability, in conjunction with system price/performance features, are clearly of most importance. These characteristics were closely followed by the vendor's maintenance capability which was ranked highly by respondents with remote location concerns.

EXHIBIT IV-4

RELATIVE IMPORTANCE OF

USHS VENDOR CHARACTERISTICS

AS PERCEIVED BY RESPONDING USERS

CHARACTERISTICS	RELATIVE RANKING	NUMBER OF RESPONDENTS		
		VERY IMPOR-TANT	SOME IMPOR-TANCE	LOW IMPOR-TANCE
VENDOR'S SOFTWARE CAPABILITY	1	14	2	2
VENDOR'S NETWORK CAPABILITY	7	5	4	7
ABILITY TO TURNKEY	6	8	2	7
MAINTENANCE CAPABILITY	3	11	5	1
VENDOR'S INDUSTRY KNOWLEDGE	9	3	4	11
VENDOR'S REPUTATION	4	10	5	2
PRODUCT PRICE/ PERFORMANCE	2	13	2	2
VOLUME DISCOUNTS	8	4	5	6
HARDWARE CAPABILITY	5	10	4	1

- On the other hand, the vendor's industry knowledge, availability of discounting features, and networking capability ranked at relatively low levels.

- These responses tend to support the basic concept of current USHS offerings which emphasize software and price/performance.

- Exhibit IV-5 offers selected respondent comments. The wide range of opinions reflects the degree of uncertainty relative to USHS resulting at least partly from the short time since the products were announced.

9. IBM COMPATIBILITY

- Although respondents generally thought IBM compatibility was important with regard to a USHS product offering, they were divided as to the exact conditions under which this should occur.

- Most respondents believed that a capability to communicate with IBM machines is a decided product plus.

- However, the machines' ability to run IBM software was questioned in light of the specialty nature of USHS applications and the availability of packaged applications and operating software from vendors.

- Exhibit IV-6 offers representative comments on this issue.

10. THE SELF IMPACT ISSUE

- INPUT formulated a series of quesitions that were posed to respondents in order to determine their perceptions of the impact of the USHS product concept upon future expenditures for outside services.

EXHIBIT IV-5

SELECTED USER COMMENTS REGARDING VENDOR SELECTION CRITERIA

- "From our applications mix these USHS offerings are 'nowheresville.' If they had more capability in a number crunching way, it would have some meaning."

- (The vendor's software capability)..."must convince me that I can use this system from the start. It should include a library of packaged programs which will stay up...not crash!"

- (The vendor's network capability (ADP))..."provides us a net between the U.S. and Canada that we don't have to maintain."

- (The vendor's ability to turnkey)..."is like Grimm's fairy tales...there is no such thing."

- "No one knows the construction industry."

- "Price - there are a number of other people offering network services and USHS products...by and large their products will become transparent such that price becomes the key consideration...being cheaper than the other guy."

- "Just delivering software is an empty exercise. I got lots of software that doesn't work!"

EXHIBIT IV-6

USER COMMENTS REGARDING IBM COMPATIBILITY

- "Not at all important."
- "Very, very important. We are an IBM shop...must interface with our host."
- "...most people would be offloading IBM equipment."
- "Except for the ability to communicate it is of zero interest."
- "...went into the evaluation (ADP) thinking that it was an important factor...but DEC is not at all compatible...so as it turned out it was not important. All the benefits offset the compatibility thing."
- "I don't know what that really means...the phrase is nifty keen and allows a lot of people to avoid getting down to the level of actual machine operational specifications...those specs are available from IBM only with great difficulty."
- "If a company is into scientific consulting, then it's not necessary to be IBM-compatible. But, if they have pre-existing dependence on IBM or if they are an historical batch oriented business then IBM compatibility would be required."

- Of those respondents who might choose a USHS product in the future (nine of twenty respondents), all believed that an increasing percentage of their expenditures for outside services would be directed at such a product.

  - In their view, by 1980, an average of 35-40% of outside service expenditures would go to an USHS product.

  - By 1983, this projected statistic increased to the 60-65% range.

  - These respondents are clearly the "leading edge" users and will move more quickly than the general user population.

- Respondents were evenly divided as to whether they believed that their net expenditures for outside services would increase or decrease as a result of the USHS product.

  - Those users believing that net outside services expenditures would decrease argued that corporate goals would dictate such cost reductions except where specialized products could not be developed internally; e.g., econometric models.

  - It was also argued that internal data processing organizations continue to be emotionally and politically committed to bringing work in-house. To the extent that DDP products are becoming increasingly available to support distribution of processing, it is believed that this will act to reduce the growth of USHS expenditures.

  - Other users did agree, that in the short-term expenditures for outside service would drop; however, they envisioned a net increase in outside expenditures over the longer term as a result of the value added features surrounding USHS which users will come to recognize. These include:

  - The existence of credible applications and system software.

- Network services capable of being tailored to suit specific user requirements.

- The general shortage of trained personnel to design, install, and maintain software and hardware systems of increasing complexity.

V ANALYSIS OF VENDOR ATTITUDES AND THE USHS COMPETITIVE ENVIRONMENT

V ANALYSIS OF VENDOR ATTITUDES AND THE USHS COMPETITIVE ENVIRONMENT

A. APPROACH

- The analyses and conclusions that follow were derived primarily from data collected during 12 vendor interviews. One of these vendors is actually an OEM supplier of hardware to one of the USHS market participants.

- Eight of the vendors were interviewed in person, with discussions generally lasting between one to two hours. The remaining interviews were performed over the telephone, and averaged one hour in length.

- Open ended questions yielded qualitative responses of which a number have been quoted or paraphrased (without attribution).

B. ANALYSES OF SURVEY RESULTS

1. VENDOR USHS INTENTIONS

- Of the 11 services vendors interviewed, eight had already introduced or were planning to introduce a hardware based product within the next two years. The balance of the vendors either refused to comment or were uncertain as to whether they would make a USHS market move.

- In addition to the existing mix of currently announced products, services vendors planned on integrating hardware from the following OEMs:

  - Honeywell.

  - IBM.

  - DEC.

  - Texas Instruments.

- Product offerings are expected to include standalone systems which are provided on a turnkey basis (without ongoing vendor support) as well as equipment that may not necessarily be installed on the premises; i.e., serviced and maintained at the vendor's facility. As mentioned earlier, these stand-alone offerings do not meet the USHS definition used in this study because they do not include a network; they are excluded from the forecast.

- Vendors were generally in agreement that part of their rationale in entering the USHS market was defensive in nature; i.e., protecting their existing customer base from erosion as a result of:

  - Attractive USHS products and pricing being offered by services competitors.

- Conversion of outside services to in-house, largely due to the attractive price/performance available from less expensive hardware.

- However, most vendors went on to comment that they also regarded USHS as offering new market opportunities for the following reasons:

  - Affording those vendors who do not currently serve large timesharing users with a chance to develop market presence in such an area.

  - A means of participating in the distributed data processing market.

  - A potential method of getting a piece of the in-house timesharing market which INPUT believes will grow rapidly over the next several years, as defined in Chapter II.

  - Developing an integrated communications network and software service package for the post-1980 time frame.

  - Providing entry into the small user area; i.e., $500-2,000 per month in billings.

2. MARKET CONSIDERATIONS

- INPUT estimates that the 1978 market for remote computing services is $2.7 billion and is projected to grow at a 20% compound rate to reach a $6.9 billion level by 1983.

- The market forecast was presented earlier on Exhibit II-1.

  - The utility portion of this market (which represents approximately 25% of the total) offers the most likely immediate target for an USHS product.

- The general business and scientific and engineering segments offer lower penetration potential.

- Industry specialty offers the largest ultimate market.

- Reasons for this varied penetration were presented in Section II.

- Vendors estimated that on average 25-30% of their total RCS revenues were vulnerable to in-house conversion. This assumed that they took no action; i.e., did not develop an USHS product strategy.

- Six specific vendors who are committed to an USHS approach believe that on average 15-20% of their corporate 1983 revenues would be derived from USHS sources. (See Exhibit V-1.)

- In formulating the USHS market projections for 1983, the following assumptions and observations are made:

  - The RCS market will not experience any net change in size or growth rate as a result of USHS products which represent a new delivery system for processing services.

  - Most major vendors will complete their USHS plans and make initial product introductions over the next 12 months.

  - Large users will probably require one to two years of operating experience on trial installations before making further commitments.

  - Most vendors will require extended periods of time in order to solve the maintenance problem inherent in servicing geographically dispersed installations.

  - Vendors will have to reorient their marketing approach to encompass the central DP manager.

EXHIBIT V-1

VENDOR PROJECTIONS OF THE PERCENTAGE OF

RCS REVENUES CONTRIBUTED BY USHS

VENDOR	PERCENT OF RCS REVENUES DERIVED FROM USHS			
	1978	1979	1980	1983
1	0%	5%	7.5%	10.0%
2	0	0	0	15-20.0
3	0	0	5.0	20.0
4	MINIMAL	10	20.0	25.0
5	MINIMAL	3	5.0	15-20.0
6	0	2	5.0	20.0
AVERAGE	<1%	<4%	7.0%	18.3%

- DDP systems offered by traditional hardware vendors (and recently through service vendors; e.g., General Electric's MARKLINK System) will increasingly represent a competitive threat to traditional RCS.

- Principally, for the above reasons, INPUT projects the USHS market in 1983 as being in the $617-959 million range, representing a significant, but not explosive, penetration. The great bulk of this penetration will be after 1980.

- INPUT further assumes that the in-house market for standalone turnkey products will experience modest penetration by RCS vendors. This market represents incremental market revenues of $200-300 million by 1983.

- The distribution of installations by equivalent monthly rental is shown in Exhibit V-2, assuming that 1983 revenues for USHS actually reach the lower end of the forecast range or approximately $600 million.

  - Half of the revenues will come from the $2,000-5,000 monthly rental category, as hardware costs continue to decline, allowing USHS to be marketed to smaller establishments.

  - A portion of the $2,000-5,000 per month equivalent monthly rental users actually will be tied into the medium and large USHS installations as DDP evolves, meaning that the actual impact of the larger systems will be greater than their proportionate share of the revenues.

  - The distribution of revenues in Exhibit V-2 also assumes that major USHS vendors introduce a range of offerings across the price spectrum.

3. PRODUCT STRATEGIES

- In structuring a USHS product/market strategy, vendors are counting heavily on their applications and systems software expertise integrated with a networking capability. Also of critical importance is the vendor's ability to provide maintenance, documentation and on-line diagnostic support.

EXHIBIT V-2

1983 DISTRIBUTION OF INSTALLATIONS
BY EQUIVALENT MONTHLY RENTAL LEVEL
OF USHS OFFERINGS

DISTRIBUTION OF 1983 REVENUES BY INSTALLATION SIZE	EQUIVALENT MONTHLY RENTAL		
	$2,000-5,000	$5,000-$10,000	> $10,000
DISTRIBUTION OF AN ESTIMATED $600M OF 1983 REVENUES	$ 300 MILLION	$ 200 MILLION	$ 100 MILLION
ASSUMED AVERAGE MONTHLY RENTAL	$ 3,500	$ 7,500	$ 15,000
RESULTING AVERAGE ANNUAL RENTAL	$42,000	$90,000	$180,000
EQUIVALENT NUMBER OF UNITS INSTALLED	7,000	2,200	550

- Exhibit V-3 offers results of vendor attitudes vis-a-vis these factors.

  - As with users, software is viewed as most important.

  - Turnkey services are not currently viewed with the same importance as other factors. This capability is aimed particularly at smaller users and does not address the communications requirments of large users who are the current targets of USHS.

- In discussing proprietary advantages of their current/projected USHS product, vendors focused on the:

  - Diversity of industry oriented applications software; i.e., industry specialization.

  - Availability of a DBMS product.

  - Flexibility in the communications speeds available to service computer and terminal requirements.

  - Networking to support DDP.

  - Capability to run IBM software.

- Specific types of applications included the full range of financial reporting services, order processing, inventory control, personnel, word processing, message and packet switching, data base applications and business graphics.

- Highly specialized applications for USHS utilization are illustrated by ADP's recent introduction of the Chem-Com Inventory Service which affords users a means of keeping track of the use of chemical substances and can be configured using their ONSITE product.

EXHIBIT V-3

VENDOR RANKING OF
IMPORTANCE OF SELECTED FACTORS
IN STRUCTURING A USHS
MARKET STRATEGY

FACTOR	RANK (PRIORITY)	RATING (# OF RESPONDENTS)		
		VERY IMPORTANT	SOME IMPORTANCE	NOT IMPORTANT
NETWORKING	3	6	2	2
SYSTEMS SOFTWARE	4	6	1	3
APPLICATIONS SOFTWARE	1	8	2	0
RAS (MAINTENANCE, DOCUMENTATION, ON-LINE DIAGNOSTICS)	2	8	1	1
TURNKEY	5	3	4	2

RANKING: 10 = MOST IMPORTANT
0 = UNIMPORTANT

- All of the interviewed vendors recognized the importance of the network portion of a USHS product. However, most vendors had no current intentions of filing as a common carrier principally because they did not wish to:

  - Directly compete with AT&T.

  - Be regulated.

- Furthermore, several RCS vendors did not feel a common carrier filing was necessary with the current availability of such carrier services as Telenet, Tymnet, and the potential availability of AT&T's Advanced Communications Service (ACS).

  - The implication of these latter sentiments is that although network availability is currently very much a part of the value added portion of USHS, it will diminish in importance in the future as ACS and other networks become available.

  - INPUT has concluded that the USHS market is value added in nature and vendors must consider carefully the network aspect of their offering and not expect to depend fully on ACS or other offerings. Success will be predicated upon a vendor's ability to integrate software, processing power, and networking together in a complete package. An inability to do so will severely limit future participation in data communications/processing markets.

- Most vendors intend to develop a vertically integrated USHS product line incorporating CPU capabilities above and below current megamini offerings.

- It is believed by one vendor that such an approach will permit the structuring of tailored industry oriented products that can function as either DDP network nodes or standalone systems. Specialty applications (or modules) may then be developed within each industry sector; e.g., a module for loans and mortgages.

- There are several unanswered questions regarding value added networks and their regulation. Although the vendors either did not or could not address these issues, they will certainly be cause for concern in the future. Some of the issues include:

  - Are there risks or exposure in not filing for a value added network (VAN)?

  - Under what conditions would USHS be in violation of resale regulations if the RCS vendor did not file for a VAN?

  - Is there liable to be any federal action or fallout from the actions of the initial USHS vendors who have not filed for VANs?

- The probability that the FCC will require VAN status for the communications portion of USHS was not addressed within the research phase of the study.

  - The eventual outcome is dependent on a number of factors including FCC actions, the potential market share of the companies offering USHS, and the actions brought by individual competitors.

  - The FCC has demonstrated a willingness to allow certain practices which are in the grey area of data processing services (versus communications services) where the service tends to foster competition, in the view of the FCC.

  - In INPUT's view, the outcome of FCC actions cannot be predicted with any certainty at this time.

4. PRICING ISSUES

- Vendors varied in their intention to bundle or unbundle software.

- Proponents of unbundling thought that users would desire a "shopping list" approach to USHS or would unbundle only in the event of outright hardware purchase.

- Conversely, others argued in favor of bundling in the belief that users desired a package approach and the ease of dealing with one vendor.

- Respondents could not totally agree on the percentages of their total system cost that would be allocated to hardware, software, and network services.

  - In general, vendors believed that between 20-30% of their system costs (on an if-sold basis) should be hardware based.

  - Higher percentages would negate the value added leverage they would be able to exert using software and services.

  - Current offerings have a higher hardware price content, and USHS vendors will have to obtain a greater content from software and network services if they are to realize satisfactory returns.

- Software cost estimates ranged from 5-35% and could scale higher as a function of the speed with which IBM continues to unbundle.

- Most vendors intend to be highly flexible in the manner in which they will offer financing options to the market. One vendor's approach seemed fairly representative and included:

  - Offering lease terms with a broadly based entry level system to small companies.

  - Selling hardware and offering a rent/lease/buy option on software to medium size companies.

- Reselling hardware and software as a package deal (if the customer so desired) in order to provide investment tax credit write-off benefits.

- With the exception of NCSS, no vendor intended to pursue a dominantly sales strategy.

  - Many vendors felt that the need to bridge concept credibility coupled with continuing dynamic changes in hardware price/performance would dictate a lease approach.

  - NCSS also will assist in arranging financing if the client demands it.

- However, as the lease base grows, debt servicing could begin to get burdensome and pressure could develop to "sell" users.

5. SELLING AND MAINTENANCE

- Eleven responding vendors do not agree as to the need for the development of a specialized sales force to pursue USHS business.

  - Four respondents are using or will use a separate sales force.

  - Four will not; i.e., will use their existing RCS sales force.

  - Three are undecided.

- Proponents of the need to recruit a new sales force offer the following as justification:

  - Selling a broad package of hardware and applications requires more of a "business generalist" than a technically oriented individual.

- Outright sale or lease of a major piece of capital equipment ($250,000-800,000) requires a different type of salesperson than the traditional RCS "peddler."

- Alternately, other vendors desired to use their existing sales force with appropriate changes in their commission plans.

  - The need for some specialization is recognized.

  - In addition, the "sell cycle" was estimated to be longer than that for traditional RCS and at least six months in length.

- Vendors also offered a diverse collection of maintenance approaches which included:

  - Complete USHS vendor hardware/software maintenance and diagnostics as part of a "one vendor" approach. Several vendors are in the process of evolving a nationwide maintenance organization which will require several years in order to achieve major city coverage.

  - Maintenance of software with the hardware manufacturers taking care of their products.

  - Augmentation of existing of field engineering staff with some third party assistance.

  - Software packages developed by a non-RCS vendor to be maintained by the originating software house.

- Several smaller RCS vendors regarded the maintenance issue as a serious problem (resource limitations) which currently precludes a more aggressive commitment to the USHS market.

6. MARKET TARGETS

- Vendors believed that users with monthly RCS expenditures ranging from $2,000 to $20,000 could potentially convert to a USHS system. On average, $8,500/month was regarded as the current threshold level for potential conversions. (This conclusion was reached before the announcement of GE's MARKLINK offering.)

- With further erosion of hardware costs, particularly in the evolution of PCM equipment, several vendors believed that conversion levels would come down materially; i.e., below $5,000/month in the 1982 time frame. Significant opportunities to exploit a large elastic market would thus be presented.

- Vendors are again diverse in selecting the class of companies to be targetted for an USHS "sell."

  - Approximately 50% of the respondents are limiting themselves in the short-term to the Fortune 500 market with some emphasis in the banking, manufacturing, and distribution industries.

  - Most vendors believe that markets will be segmented by both industry and application specialization.

  - Other vendors are taking a broader market view by attempting to address large RCS users in both Fortune and smaller class companies.

  - One vendor is pursuing users with billings as low as $1,000/month by offering a general purpose USHS product.

- Efforts to increase RCS market share by means of an USHS strategy are evident as vendors are initially trying to avoid converting their own user base while focusing on converting competitor's customers.

- Initially, non-EDP department heads appear to be the key (and RCS traditional) targets with the "sell" directed at the highest level in the user organization; i.e., selling a functional solution to the appropriate business management level. However, several vendors recognize the need to begin selling to the DP manager and INPUT expects increasing efforts in this area.

7. THE FUTURE COMPETITIVE ENVIRONMENT

- The broad consensus among the RCS vendors interviewed in this study is that their future competitive environment will increasingly confront them with both mainframe and minicomputer vendors in addition to several key RCS competitors.

  - Not surprisingly, IBM was at the top of the list, with the 8100 announcement regarded as a potentially strong product, particularly with the development of supporting applications software.

  - The 8100 is not included in the forecasts developed in this study, however, since it is currently marketed by IBM to the in-house DP organization as a hardware sale rather than as part of a services offering.

  - Should the 8100 be enhanced with substantial applications software and a network offering either by IBM or others, however, those revenues would then be included in USHS.

  - Honeywell was also mentioned by several RCS vendors who commented upon their compatible family of minicomputers and mainframes coupled with credibility in selected applications areas.

  - RCS vendors were uniform in their belief that minicomputer suppliers would employ a variety of vertical integration strategies to support entry into the USHS market.

- These include continuing current OEM relationships in the short-term to developing an USHS capability with merged or acquired software houses in the long-term.

- Over the longer term, minicomputer suppliers are expected to increase their software capabilities through acquisition and perhaps add networking capabilities, at which time their hardware/software/network offerings would become part of USHS.

- DEC was frequently singled out as a prime vertical integration candidate because of what is regarded as a cost effective family of machines that is being supported by a growing software commitment.

- Hewlett-Packard in addition to Data General and Texas Instruments were also singled out as strong potential USHS competitors. Data General has been supplying its CS family of computer products to Itel's Data Services Group.

- ADP, NCSS, and to a lesser extent Tymshare, were singled out as the dominant USHS vendors from among traditional RCS suppliers. Expectations were for both Xerox (particularly in light of its Xerox Telecommunications Network filing) and CSC to join the fray.

- General Electric had not made its Marklink System announcement until after the study research had been concluded and was consequently not identified as a key competitor by respondents.

  - INPUT regards the GE product as very significant. It offers an integrated DDP systems approach encompassing remote peripherals and processors tied together within a worldwide telecommunications network that is serviced by three major host centers.

  - Marklink is heavily transaction oriented with an initial marketing thrust aimed at the distribution and hotel industries.

- Although some observers view MARKLINK as a terminal product, it actually has capability to function as a standalone minicomputer and has the network, software, and access to the vendor host computer to qualify as USHS.

- The advent of the USHS product concept will, as a minimum, place a great deal of increased competitive pressure upon those smaller RCS vendors with annual sales of $5-25 million.

- Such vendors, many of whom provide utility processing services, would be vulnerable to USHS inroads while possibly unable to afford the investment necessary to enter the market.

  - This assumes they have a product to begin with that is transferable to a minicomputer.

  - Alternately, those vendors that remain price flexible should be able to resist these pressures.

- There is some risk to the smaller RCS vendors from USHS, but this risk must be qualified.

  - If the RCS vendor is cost effectively serving its marketplace then there is a lessened degree of risk for that vendor.

  - If the RCS vendor has highly specialized applications that could be difficult to reproduce, then there is also a lessened degree of risk for that vendor.

- Exhibit V-4 indicates the perceived level of vulnerability as seen by a sample of RCS vendors.

  - It should be added, however, that the vulnerability perceived is from mini/microcomputer threats of which USHS is just one part.

EXHIBIT V-4

VULNERABILITY OF PROCESSING SERVICES BUSINESS TO MINI/MINICOMPUTERS* AS VIEWED BY VENDORS

SIZE OF COMPANY 1977 REVENUES	COMPUTER SERVICES BUSINESS VULNERABLE TO REPLACEMENT BY MINI/MICROCOMPUTERS?			
	NUMBER OF RESPON-DENTS "YES"	NUMBER OF RESPON-DENTS "NO"	VULNERABILITY-PERCENT OF TOTAL REVENUES	
			AVERAGE	MAXIMUM
<$2M	105	26	36%	100%
$2-10M	33	10	30	100
$10-25M	10	-	25	50
>$25M	12	<5	13	30

*BASED ON QUESTIONNAIRE DATA. VULNERABILITY COMES FROM MINICOMPUTER REPLACEMENT OF RCS VENDORS AS WELL AS USHS REPLACEMENT OF RCS PROCESSING.

SOURCE: ADAPSO TWELFTH ANNUAL SURVEY OF THE COMPUTER SERVICES INDUSTRY, INPUT, JULY 1978.

- Consistent with the earlier analyses, the smaller RCS vendors perceive a much higher vulnerability.

- These results are from a survey of processing services vendors carried out by INPUT in early 1978 on behalf of ADAPSO, and are included to further substantiate the importance of vendor size relative to hardware impact.

- On balance, INPUT believes that the 250 RCS companies in the United States with revenues in the $2-25 million range will offer an excellent source of merger and acquisition candidates for traditional RCS, minicomputer and DDP companies for purposes of bolstering their USHS and related longer term market strategies.

- Most RCS vendors are agreed that software companies will have a major future role in USHS and related markets provided they participate in developing closer working relationships with both RCS and hardware vendors.

- One vendor believed that the "software problem" is more related to its distribution and maintenance rather than its development.

  - As such, RCS and hardware vendors will increasingly become involved in this facet of the business.

  - Liasions between software companies and RCS/hardware vendors would offer complementary benefits to each party.

- Accordingly, the existing base of approximately 3,000 software companies in the U.S. will offer an important source of merger and acquisition candidates to bolster USHS and related market strategies.

8. IBM AND THE COMPATIBILITY ISSUE

- RCS vendors are uniform in regarding recent and anticipated IBM product introductions as promising increased competitive pressures in the USHS market.

- The System/38 is expected to be an outstanding USHS product in the sense that it will aid users in their desires to move timesharing applications in-house. The System/3 and 32 were characterized by one respondent as the ..."original USHS products..." with unrivaled success at the low end of the market.

- The yet-to-be-announced Series E machines are expected to offer attractive price/performance features and possibly serve to narrow the IBM price umbrella over PCMs to the 15-20% range.

- The 8100 is IBM's long overdue response to large users' demands for the offloading of functions from the host. As such, one vendor believed that it corrected Series/1 shortcomings in the availability of local storage, printing, and on-line devices.

- Other RCS vendors also viewed the 8100 as a powerful competitor for USHS applications and may decide to use the 8100 (or PCM versions) as the basis of future USHS products.

- In addition to the above hardware products, several vendors saw IBM also covering themselves in a service sense by:

  - Potentially winning approval for their Satellite Business Systems (SBS) network.

  - Re-entry into the processing services industry on a selective basis.

- Contingent upon IBM's actions in the services area, RCS vendors view IBM's unbundling of software as advantageous for themselves in terms of their ability to provide software below an IBM umbrella.

- The IBM compatibility issue may be viewed in two respects; i.e., the requirement to communicate with IBM equipment or the need to run IBM software.

- Most vendors agree that communications compatibility is a desirable USHS product feature and one that is achievable today or in the future when some form of a communications standard(s) will hopefully evolve.

- Software compatibility is not generally regarded as an USHS product requirement unless, like NCSS, a vendor has structured a PCM type of strategy.

- RCS vendors in the main had not committed to supporting IBM's Systems Network Architecture (SNA) either out of uncertainty as to the evolution of future network standards or the fact that they simply were not planning on offering USHS products that would be IBM compatible.

9. THE SIGNIFICANCE OF DDP

- Respondents generally agreed that a USHS product was complementary to DDP but were divided as to USHS's utility as a means of offloading a host.

- User demand for USHS products relates to the ease with which certain interactive and time dependent functions can be performed on-site while free from communications failures.

- GE's recently announced Marklink System appears to be the only announced product to date that focuses on DDP as the prime product/market thrust. The product's modular structure permits it to potentially satisfy a USHS site requirement in the event that the user is interested in servicing a single or isolated site requirement.

APPENDIX A: DEFINITIONS

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- A Small Business Computer, for the purpose of this study, is a system that is built around a Central Processing Unit (CPU), and that has the ability of utilizing at least 20M bytes of disk capacity, provides multiple CRT work stations, and offers business-oriented system software support.

- Software Products are systems and applications packages that are sold to computer users by equipment manufacturers, independent vendors, and others. They include fees for work performed by the vendor to implement a package at the user's site.

- A Systems House integrates hardware and software into a total turnkey system to satisfy the data processing requirements of the end user. It may also develop system software products for license to end users.

- A Turnkey System is composed of hardware and software integrated into a total system designed to fulfill completely the processing requirements of a single application.

- An End User may buy a system from the hardware supplier(s) and do his own programming, interfacing and installation. Alternately, he may buy a turnkey system from a manufacturer, systems house or hardware integrator.

- A Hardware Integrator develops system interface electronics and controllers for the CPU, sensors, peripherals and all other ancillary hardware components.

He may also develop control system software in addition to installing the entire system at the end user site.

- A Minicomputer is usually a 12 or 16 bit computer which is provided with limited applications software and support and represents a portion of a complete larger system.

- Distributed Data Processing (DDP)

  - INPUT was unable to find a consensus among both users and vendors as to a definition of DDP. It appears to be a concept that is uniquely structured to satisfy individual vendor and user requirements.

  - Nonetheless, as a result of extensive work in this area, INPUT offers the following hybrid definition:

    "Distributed processing is the deployment of programmable intelligence in order to perform data processing functions where they can be accomplished most effectively, through the electronic interconnection of computers and terminals, arranged in a telecommunications network adapted to the user's characteristics."

- User Site Hardware Services (USHS)

  - These are offerings, typically from RCS vendors, which place programmable hardware on the user site (as compared to the EDP center).

  - Offer access to a communications network.

  - Offer access through the network to the RCS vendor's larger computers.

  - Offer significant software as part of the offering.

APPENDIX B: QUESTIONNAIRES

CATALOG NO. MHWD[ ][ ][ ]

USER QUESTIONNAIRE

1. a. Do you use outside remote computing services?

   ____ Yes ____ No

   b. How much do you spend per month on outside RCS? _____

2. a. What percent of your EDP expenditures are for outside DP services?

   _____ %

   b. What percent of your EDP expenditures are for in-house DP services?

   _____ %

   c. What percent of annual EDP expenditures are for RCS services?

   _____ %

3. What specific RCS/OSH product offerings are you aware of?

   _____ Read Ads Only

   _____ Articles in Trade Journals

   _____ Salesman visit

   _____ Actively considering

4. a. Would you consider installing such a system?

____ Yes ____ No ____ Possibly

Why/why not? (Elaborate on economic factors, pricing, etc.)

b. What alternative options are you considering?

5. a. What possible benefits does RCS/OSH provide to the user, in your opinion? (generally)

5. b. What are possible disadvantages to the user of RCS/OSH? (generally)

6. a. What should the hardware consist of? (megamini ⟶ microcomputer)

b. What software and services should be provided by the vendor?

c. How should the hardware and software be maintained? (what would be most effective from the user point of view)

6. d. How should this product offering be financed? (purchase, rent, lease) Why?

e. Would you prefer that costs be bundled or unbundled? Why?

7. What specific applications would you consider being performed by an RCS/OSH product?

8. How many potential installations for RCS/OSH exist in your company? (who could use it; what departments)

9. a. How important to <u>your company</u> is the availability of the network portion of the OSH product?

b. How important would the availability of the network portion of the OSH product be to users <u>in general</u>?

10. a. In <u>your company</u>, to what extent does the desire to offload the host influence considerations of OSH?

10. b. To what extent would the desire to offload the host influence considerations of OSH for users in general?

11. a. What are the most important software concerns that you have with regard to OSH/RCS?

b. What are the most important network concerns that you have with regard to OSH/RCS?

12. a. Who would be involved in the decision process when considering OSH/RCS?

12. b. Who would make the final decision?

13. a. When might you make a commitment/or decision about RCS/OSH?

Timeframe _____

Expenditure Level _____

Other _____

14. When do you think this product offering will be in its prime? (many vendors offering it, many users using it)

15. Do you think procurement of RCS/OSH will expand, decrease, or not change percentage of outside expenditures for RCS services?

    a. For the industry in general? (please quantify)

    b. For your expenditures? (please quantify)

16. What percent of your outside services expenditures could go toward an OSH product?

    a. In 1980 _____ %

    b. In 1983 _____ %

17. In selecting an OSH/RCS vendor, rate the following factors in order of importance (5 = high, 1 = low)

FACTOR	RATING	COMMENTS
Vendor's software capability (define)	_____	
Vendor's network capability (define)	_____	
Ability to turnkey	_____	
Maintenance capability	_____	
Vendor's industry knowledge	_____	
Vendor's reputation (image/viability)	_____	
Product price/performance	_____	
Volume discounts	_____	
Hardware capability	_____	

18. What do you believe are the most important criteria for the success/ failure of OSH/RCS in your industry?

19. What do you regard as the positive factors surrounding OSH/RCS?

20. What do you regard as the negative factors surrounding OSH/RCS?

21. To what degree do you believe that an OSH product provided by an RCS vendor facilitates or satisfies your intent to distribute data processing?

22. How would you characterize your attitude about OSH systems?

23. How important is IBM compatibility with regard to your OSH decision?

CATALOG NO. MHWD

VENDOR QUESTIONNAIRE

1. Do you intend to include hardware offerings (OSH) as part of your services portfolio?

   a) Within what time frame do you expect to introduce such an offering?

2. a) What percent of your projected revenues do you expect OSH to contribute in:

   1978_____ 1980_____

   1979_____ 1983_____

   b) How do you calculate/estimate that figure?

3. What is your expected RCS revenue base for 1978?

4. Do you foresee these hardware offerings as a means of protecting your service customer base?

   a) What percentage of your current RCS base do you believe is vulnerable to an in-house conversion?

5. Do you regard your current (intended) OSH product offering as a defensive strategy to preserve the existing RCS base or a new services market opportunity? Why?

   a) What role is there in the OSH market for a small RCS company?

6. How do you intend to finance these products?

7. How do you intend to maintain these products?

8. What do you regard as the proprietary advantages of your current/projected OSH product, i.e., why is it unique?

9. To what extent are you targeting your OSH offerings to specific users i.e., Fortune 500 versus others?

10. To what extent are you targeting your OSH offerings to specific industry sectors:

Banking _____ Distribution _____

Insurance _____ Government _____

Discrete & Process Mfg. _____ Health _____

Transportation _____ Education _____

a) Will the market be segmented by industry, application or both?

11. What specific types of applications will your OSH product address?

12. What competitive role, if any, do you believe IBM will have in this market?

a) What do you believe the significance of the 8100 announcement to be vis-a-vis the OSH market?

13. In your judgement how important is IBM compatibility in structuring an OSH product strategy?

a) To what extent are you supporting SNA/ACF networking?

14. Who do you believe will be the major OSH competitors (including in-house) in the post-1980 time frame and why?

a) What role, if any, will software companies have in this market?

15. To what extent do you believe that traditional minicomputer vendors will enter (or have entered) the OSH market?

16. What relationship, if any, do you believe OSH has with DDP? Offloading the host?

17. To what extent is a communications network integrated into your product offering? (Complete description)

a) What degree of importance do you assign to the network portion of the OSH product offering? Are you planning (or have you) filing an application as a common carrier? What action has been taken or is planned?

18. What do you believe will be the split between services revenues and outright system sales?

19. In structuring an OSH/RCS market strategy how would you rate the following factors (5 = high, 0 = low)

Factor	Rating	Comments
Networking	_____	_____
Systems Software	_____	_____
Applications Software	_____	_____
RAS (maintenance, documentation, on-line diagnostics)	_____	_____
Turnkey	_____	_____
Other	_____	_____

20. Will you have a separate sales force to service the OSH market? Why? Why not?

a) What training program have you (do you intend to) implemented?

b) What recruiting program have you (do you intend to) implemented?

21. Do you intend to develop a vertically integrated OSH product line (megaminis down to microprocessor based products)? Why?

22. At what monthly services expenditure level do you believe a user could/should convert to OSH?

23. What would you estimate the percent hardware cost to be of your OSH system on an if-sold basis?

a) Define the key value added components in your OSH product/market strategy.

b) Will you bundle/unbundle software?

c) How much of the total price is (potentially) software?

24. At what functional levels within the user establishment do you intend to target your "sell" e.g., EDP manager, V.P. Finance, etc?

25. What percentage of the processing services market will OSH penetrate by 1983?

26. If OSH product has been announced or is currently being marketed, please send:

- product literature (descriptive)
- price lists

Thank you.