INFORMATION SERVICES INDUSTRY

ANNUAL PRESENTATION 1985

INPUT

About INPUT

INPUT is a worldwide consulting and market research firm uniquely focused on the information technology services and software markets. Executives in many technically advanced companies in North America, Europe, and Japan rely on INPUT for data, objective analysis, and insightful opinions to support their business plans, market assessments, and technology directions. By leveraging INPUT's considerable knowledge and expertise, clients make informed decisions more quickly, and benefit by saving on the cost of internal research.

Since 1974, INPUT has compiled the most extensive research base available on the worldwide information services market and its key segments, providing detailed market forecasts, vertical industry sector analysis and forecasts and analysis of vendor strategies and products. INPUT delivers specific expertise in the fast changing areas of outsourcing, systems integration, EDI/electronic commerce, software development/CASE, and on the impact of downsizing.

Consulting services are provided by more than 50 professionals in major international business centers. Clients retain INPUT for custom consulting/ proprietary research, subscription-based continuous advisory programs, merger/acquisition analysis and detailed studies of U.S. federal government IT procurements.

Most clients have retained INPUT continuously for a number of years, providing testimony to INPUT's consistent delivery of high-value solutions to complex business problems. To find out how your company can leverage INPUT's market knowledge and experience to gain a competitive edge, call us today.

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1985
MAPS

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INFORMATION SERVICES INDUSTRY

Peter A. Cunningham
President
INPUT

This presentation to clients of INPUT's Market Analysis and Planning Service is based on 1985 research. It addresses U.S markets for processing/network services, professional services, software products and turnkey systems. As well as providing forecasts of market growth through 1990, it analyzes the state of the industry, the performance of public companies and the environmental issues.

AGENDA

Information Services Industry—Slow-Down or Speed-Up

What segments of the industry are affected by the computer industry "slump" and why?
What will happen over the next five years?

Annual Presentation by Peter A. Cunningham
President, INPUT

1. INTRODUCTION

   - Research Base
   - Forecast Parameters

2. STATE OF THE INDUSTRY

   - 1984 Status
   - What Has Happened This Year
   - Overall Forecasts Through 1990

3. ENVIRONMENTAL CONSIDERATIONS

   - Industry Slowdown
   - Buying Process Changes
   - Information Systems Trends

4. MARKET FORECASTS

   - Forecasts By Type Of Service
   - Key Factors In Each Market
   - Performance Of Leading Companies

5. CONCLUSION

   - INPUT Recommendations
   - 1986 INPUT Program

6. DISCUSSION

   - Questions And Answers

The length of the presentation can be varied from one to two-and-one-half hours with a maximum of half an hour for discussion. A 10-minute break is recommended for presentations longer than one hour.

A hard-copy of the visual material used will be available before the presentation.

The information services industry growth slowed dramatically in 1985 from 1984's pace. Will this slow down continue? Or will the industry speed up over the forecast period? In order to answer these questions the reasons for the slow-down will be examined in this presentation. After all

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the information services industry has been growing at 20% for many years while the GNP has been growing at a 3% rate - eventually these growth rates must conform. Has this process started?

SLOW-DOWN OR SPEED-UP?

2MAP5

Most companies saw substantial changes in their markets in 1985. Are these changes temporary or are they permanent? How must companies react to them? Through the presentation we will try to identify these changes and comment on their continuity.

TEMPORARY OR PERMANENT CHANGES?

The Introduction describes briefly INPUT and the sources of the information ~~presented~~ contained in this presentation. In the State of the Industry, the reasons for the industry slow-down are examined. Environmental Considerations discusses the Information Systems (IS) issues and trends in areas such as micro-mainframe and telecommunications. In INPUT®

Market Forecasts we analyze each of the Information Services modes of delivery

CONTENTS

- Introduction
- State of the Industry
- Environmental Considerations
- Market Forecasts
- Conclusion
- INPUT Services

The Conclusion contains a summary of key points and INPUT's recommendations. INPUT Services is an Addendum describing INPUT's 1986 services in the U.S. and Europe.

INPUT clients use three types of services. Subscription programs and multiclient studies are INPUT's own 'products' akin to software products, while custom consulting is composed of individual one-on-one projects for specific clients. Custom projects represent about

one third of our business and range from acquisition search to customer satisfaction surveys.

INPUT RESEARCH SOURCES

- **Subscription Programs**
- **Multiclient Projects**
- **Custom Consulting**

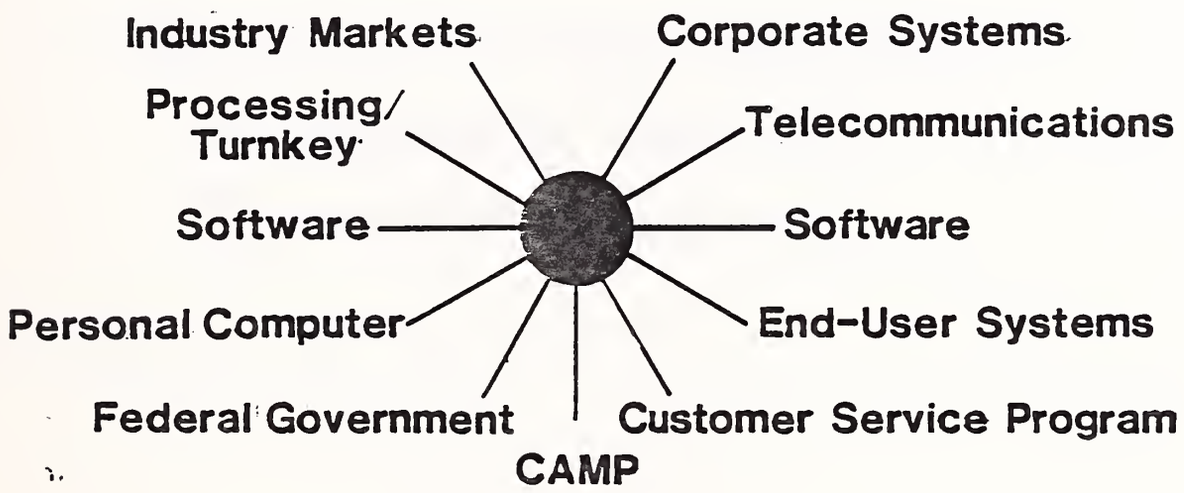
One of the trends that we have noticed in our business in recent years is that even in our product business there is an increasing need for customization - clients need information in a time and manner to meet their needs rather than in a general form that they must then customize.

We believe this trend is endemic to the whole industry - users of systems whether individuals, departments or companies want the systems to be adjusted to their perceived needs and characteristics. They also recognize that these needs will change continuously. Then systems need to be adaptive and adaptable.

These programs form the information base from which this presentation is derived. #2 The Corporate Systems, Telecommunications, Software, and End-User Systems programs, are parts of the Information Systems Program and are primarily intended for user organizations, Information Systems departments in large organizations. The

Industry Markets, Processing/Turnkey, Software, and Personal Computer programs are parts of INPUT's Market Analysis and Planning Service. The Federal

INPUT SUBSCRIPTION PROGRAMS



Government program is generated from INPUT's Washington D.C. office and tracks government procurement of systems, software and services programs through a data base of over 800 programs which will have planned expenditure commitments over $2 million, and also provides agency and market analysis. The Company Analysis and Planning Program provides profiles on hundreds of companies and has a data base of over 4000 companies.

Each year INPUT interviews, at least once, all vendors suspected of having over $10 million of U.S. information services revenues and thousands of these under $10 million. Through the ISP research hundreds of IS executives are interviewed on budget and issue questions for the annual report. Buyers ~~and~~ are also interviewed continually for specialized studies.

RESEARCH BASE

- **Vendor Interview/Analysis**
  - **All Over $10 Million**
  - **Thousands Under $10 Million**
- **Buyer Interview/Analysis**
  - **IS Manager Surveys**
  - **Specialized Surveys**

Computer Intelligence data base is used for site information and INPUT also has an extensive library for secondary research. Stanford University libraries are also used for this purpose.

RESEARCH BASE

- Use of CI Data
- Secondary Research

Forecasts are presented in current dollars which therefore include inflation. Inflation rates assumed are reduced slightly from last year. These predictions are based on econometric forecasts available in mid-1985, more recent predictions lead to a maximum inflation rate of around 4% over the next 5 years. The GNP is assumed to have steady growth. There will probably be another recession in the forecast period but predicting this is outside the scope of INPUT's charter. The growth rate assumed is about 3% to 4% annually over the forecast period.

FORECAST PARAMETERS

- **Current Dollars**
- **GNP – Steady Growth**
- **Inflation Assumptions:**
  - **1985: 3%**
  - **1986: 4%**
  - **1987: 5%**
  - **1988–1990: 6%**

This section reviews the state of the information industry in general and the information services industry in particular.

STATE OF THE INDUSTRY

We are lead to believe by the Wall Street Journal and Business Week as well as other magazines that we are in a middle of a computer industry slump. Part of the reason they call it a slump is that their advertising revenues have slumped substantially since the heady days of 1984. The industry is not in a slump in a sense that it is not growing or shrinking in fact, the industry continues to grow. It is just that the inflated growth rates of the early 80's in some industry segments, particularly the personal computer area have slowed dramatically.
The general economy has been through 1985 and into 1986 reasonable healthy. It has been growing, albeit slowing. All our research and everything else indicates that there is an increasing demand for systems to support companies and organizations in the competitive world in which we live today.

INDUSTRY SLOWDOWN

Why, therefore, do we have industry which is growing more slowly than we would otherwise expect.

ECONOMY

- Strong Dollar
- Slowing Industrial Base
- "Ripple" Effect
- Uncertainty

One reason is the economy. This industry, information systems industry in general, is now so large that it is effected by the economy. We have a strong dollar with other factors resulted in a slowing industrial base. Although manufacturing in this country has grown compared to 5 years ago, in the last year or so, it has slowed, whereas, our GNP has grown, the manufacturing segment of the GNP has not grown. There are segments of this country, notably in the midwest and also the agricultural states which have been in a very severely hit in the last several years. Those companies for example, fertilizer suppliers, seed suppliers, equipment manufacturers that support the agricultural community have been hit. There is a ripple effect out of the areas that have problems. It affects insurance companies, banks, etc. Through the 1985 period, in particular, this ripple effect spread and caused uncertainty in many areas. Plus the federal budget deficit have caused increased uncertainty. In timesof uncertainty, senior executives do not make significant changes of directions for their company. If things are very bad, or they look to be bad, then they will make changes. If things are good, or look to be good, they will make changes. When they are uncertain, they tend not to make definited decisions. An important point to recognize is that major information systems today are expensive not only in terms of their direct cost but in terms of their indirect cost. They affect the way companies do their business .Executives are lead to believe that this is the case and, in fact, it is true. As a result, people do not want to chnage their business dramatically when they are uncertain of what is going on.

The economy has affected the industry and the uncertainty in the economy and the pockets of negative performance have affected the growth rates.

There is also some very fundatmental change that is going on. Senior Executives are asking what is the benefit that I am getting from my IS investment? What am I getting from the dollars I am spending to-date? Where is the productivity for the systems I have spent money on?

OVER----------

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Once example that we tend to use is that of Bank of America. A year ago Max Hopple was quoted as saying the bank was going to spend $5 billion in 5 years in order to bring its systems up to speed. Well Max Hopper is now no longer at B of A., but even when he was there there was an organization unit just down the road from Mx Hopper's office that was looking at the current return to the bank on the money it was spending then. Under the new regiem you can expect to see costs cutting rather than more expenditures in short term. However, does that mean the bank is any less commited to information systems? Absolutely not. What it means is that when an organization shines a search light on its information systems area it tends to find waste and more effective ways of doing things and will often try and get its existing systems in some kind of good order before moving forward.

FUNDAMENTAL QUESTION OF BENEFIT FROM I.S. INVESTMENT

- Where's the productivity?

What would happen, for example, if a major organization cut out all their systems development activity, got rid of all the people, the equipment that supported those development activities? What would happen? How long would it be before their business was affected by that decision? Immediately there would be a positive impact on the bottom line because the expenses of development are fairly significant in the IS world today. How long would the company survive or continue without suffering from competitive disadvantage? Would it be 3 months, 6 months or 3 years?

Another question is being asked how much money should I spend on information systems? Last year in our presentation we said that the tablets that came down from the mountain that defined the percentage of your revenues or costs that you should spend on informati systems were broken. If they were broken, what standards, what guidelines are there to replace them?

We have one client that is looking at doubling its expenditures on IS and potentially saving 4,000 people. What would happen if they triple their expenditures?

Senior executives today believe what they are being told that is that information systems are critical to their future. Therefore, they start to examine it. When they start to examine it, the question comes up as we described above. What should we do? We can't look at other companies, because they may be lagging, leading, or just in the middle. We have to define ourselves where to go. That means a plan, a strategy, and a set of objectives. For many companies, they don't have adequate plans, objectives, and targets. As a result they need to develop them. What happens in that event? They start to contract with consultants and develop study teams to examine where they should go and how much they should spend. In this kind of circumstan again, companies will tend not to make major decisions, not to make major changes in direction, not to make major purchases unless they are clear which direction to go to. It is our contention that most major U.S. companies do not have a clear direction today in the information systems area and even if they are in the process of getting one are finding that their puchasing decisions are being inhibited or delayed by these basic considerations.

BUYING PROCESS CHANGING

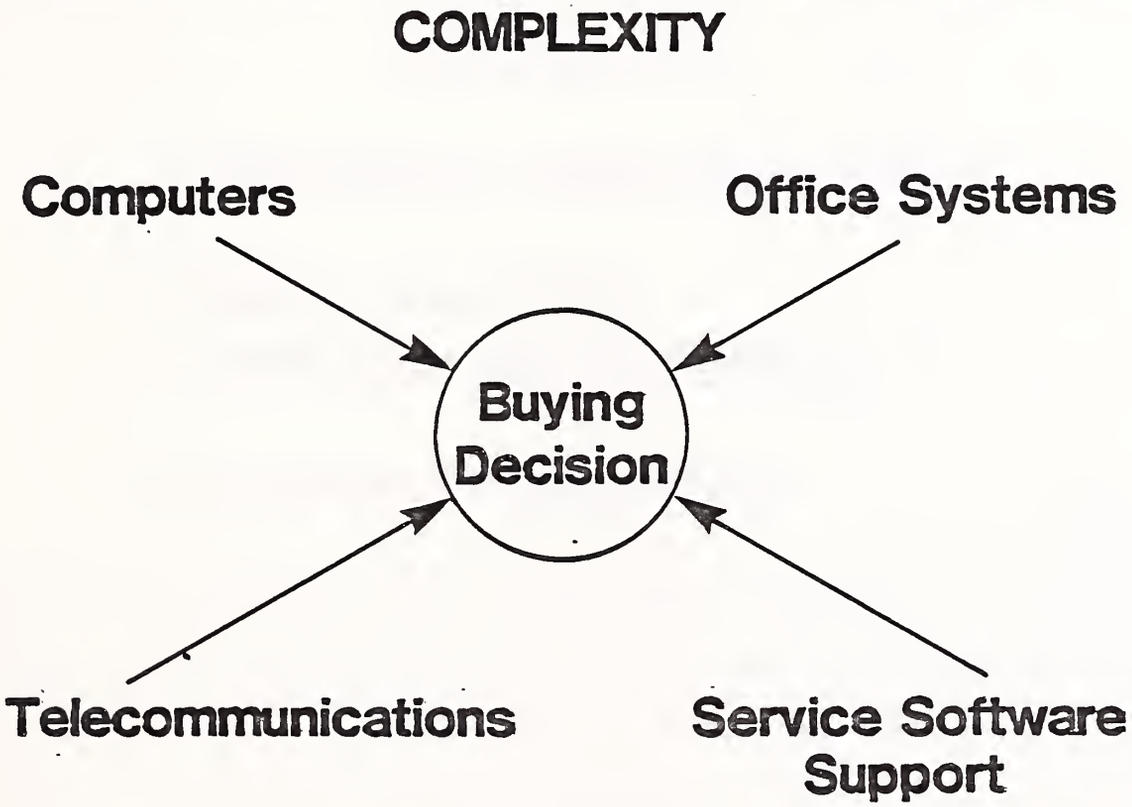
- Involves
  - Users
  - IS Management
  - Finance
  - Corporate Management
- More Specialists

The implications of the above is that the buying process for information systems is changing. It used to be that the only repository of technical expertise in the company relative to computers and communications wasn't in the data processing or IS management area. Today there are experts in the user organizations, in the IS management group, in the financial group that tends to look at return at investment analysis, and very particularly, in corporate management. Many large organizations today have many separate information technology planners, or corporate information officers that are not directly involved with information systems management.

Everybody has their own specialists. What happens when you get a bunch of specialists together to discuss a particular issue or directions? They disagree, It's the very spread of the skill and capability through organizations that is now complicating the buying process.

What happens in most organizations when a new issue or activity comes up? A task team is set up. It is our contention that the number of task teams in the U.S. businesses has grown exponentially in the last 5 years at least those involved in information systems. As these tasks teams are formed their boundaries are overlapped, they start to run into each other and they cause even more change in the buying process. The buying process has changed substantially and vendors have to recognize that.

Of course, one of the things we have been saying for many years is that the complexity of the decision making process has changed. It used to be that you could buy a telephone a computer, and a typewriter and they were completely autonomous, separate decisions. Today nobody in their right mind is going to buy a telecommunications system without considering what the impact is on the office and nobody is going to go out and buy and office system without considering that the tie in is going to be with their main computers and communications network. This is the main problem that Wang have felt in the last year or so in the office environment. It used to be that buyers could choose Wang without consideration of their central IBM mainframes. That is



absolutely not the case today.
Furthermore, service, software, and support have all become much more important in the buying decision in the last several years. If you are going to install an on-line, realtime, corporate-wide user interactive information system, you better make sure that it is going to operate successfully and effectively and is properly supported.
Many of the evaluation criteria and service software and support are more difficult to measure than in computers or communications or even the office computers. You are not dealing with physical measurements, you are dealing with intangibles, you are dealing with soft dollars, you are dealing with people issues. In many cases, there are not adequate measurement systems to deal with these issues in a new systems environment.
The complexity and the factors making up the decision process again have changed substantially in the last few years.

COMPLEXITY

- **Alternatives within Each Area**
- **Make versus Buy (In-House versus Service)**
- **Problem of Integration**

There are alternatives in each area, not only is it a choice between which computer you use but what computer architecture do you use. Are you going to go centralized with relatively dumb terminals? Will you go de-centralized with a network of workstations connected to a central mainframe or would you decentralize more with network minicomputers that do most of the work hooked up to terminals or do you go to a decentralized activity. In telecommunications area, for example, there used to be virtually only one solution. Today there are numerous solutions. The change in technology and the availability of services and solutions in the office in the communications area is extremely rapid, more rapid perhaps in the computer environment today. Evaluating these alternatives takes time and skill.

As we have moved non-information technology managers into the IS environment, increasingly we find organizations looking at the make versus buy decision. Should they go and buy a solution or should they make a solution. Many companies have opted to take the buying solution recently, so that the first place they start to turn to is the software market. In many cases, they are not properly equipped to carry out these evaluations and they have to evaluate the interaction between the software, hardware and the systems before they make a decision.

Perhaps the key problem facing everybody today is the problem of integration. How do you make different applications work together.

Over the last several years we have done a reasonably good job of developing functionally specialized applications. Thus, in the mafg. environment we have pretty good production applications, a separate inventory applications, separate marketing applications, etc. The problem is that when you change the organization to a more customer oriented approach as opposed to functionally oriented approach all of a sudden you find that the basis system architecture breaks down. This is true in the banking area, insurance, and mfg. The functionally specialized applications that have been developed over the last 10 years are almost intractable in terms of intgration into new systems.

The problem, of course, is that it is very rare that in any sizeable organization that you could install a complete set of new systems at the same time which would all work together. You have to start with one system, work through that then move to the next system. While you are installing the new system in one

application area that has to interface with old systems in other applications systems areas. Yet the new system you are trying to build is "unintegrated" system.

We feel this problem has generally been unrecognized by the vendors. However, it is perhaps the most significant problem facing users today.

LAW 1

Rate of Supply >

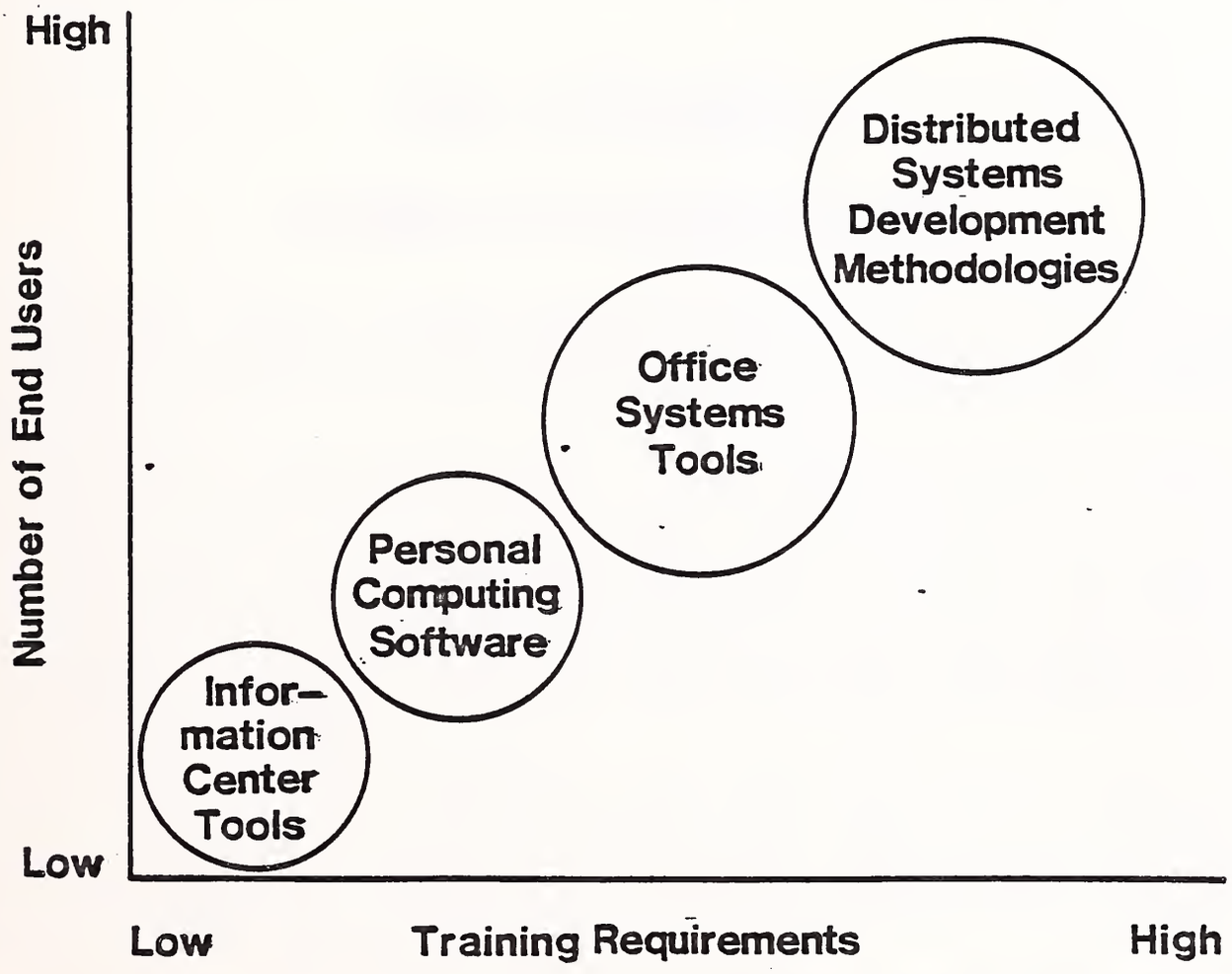
Rate of Absorption

As a result of what is going on here we have coined a couple of laws to describe the situation.

The first law is that rate of supply of new technology is now outsripping the rate of absorption. In order to absorb new technology you have to be able to apply which means you need a system. In order to install a system, you need to be able to have the people in the organization to assimilate it.
If what we believe is true is that current day systems are changing the way an organization performs its business, then those organizational changes have to occur at the sametime the system implementation goes through. Organizations are made up of people, policies, procedures, pay scales, and culture, among other things. Changing these is not a trivial activity that can be accomplished overnight. It takes a lot of work.
Furthermore, executives and managers are ill-prepared to deal with a continuing change required by a series of systems changes.
There is a limit of speed at which companies and organizations can absorb technology. It is rather like taking a cup of coffee and adding sugar. At some point, it doesn't matter how much more sugar you add it ceases to disolve. We believe that in much of American industry and commerce today we have reached a saturation level in terms of the aborption of technology.
Many vendors are not addressing this are still trying to push products into an increasingly resistent envirnment. The intelligent vendors recognize that what they have to do is increase the rate of absorption if they are going to be able to deal with their growth rate.
One good example of how in the large organization deals with the problem of absorbing technology is what GM and Ford do in large automobile plants. If they want to introduce new manufacturing technology into a plant what do they do? Basically, they close the plant and either spend 6 months, a year, refurbsihing it or they open another plant elsewhere. This is a very draconian way of addressing the problem. There are few companies that can adopt that kind of solution "closing down an operation in one place and opening up an operation with the new systems in the next place." However it it an alternative that major companies have to consider.

As we can see from this chart, as we move from information center tools through personal computing into office systems or departmental systems environments and eventually to distributed systems development, we are dramatically increasing the number of end users or customers that interact with systems and we also are starting to increase their training requirements. Simply using Lotus 1,2,3 on the standalone personal computer is a much less complicated training issue than dealing with applications development in a multi-workstation environment, file sharing with your central computers, and communicating with the external world through those systems.

THE GROWING TRAINING PROBLEM



LAW 2:

Rate of Change <

Length of Decision Process

The second law is that the rate of change is now actually faster than the length of the decision process. As we mentioned earlier, we have a continuing increase in the number of tasks teams formed, the complexity of the decision process going up and the numbers of people and departments involved in major decisions increased dramatically.

All these impacts increased the level of time it takes to arrive at buying decisions. The problem then occurs that while that evaluation and decision process is actually going on we find that there is a new product, new services, new price changes, etc., in the marketplace that feed back into that decision process. The classic example of the situation where the decision process got so long that it became ludicrous was in the U.S. federal government where 5 years ago it took so long to procure a new computer that by the time it was delivered it was a whole generation out of date. As you know the government changed its procurement practices in order to get rid of this ridiculous situation.

There are many commercial organizations today that have to take similar kind of actions. Many companies today are buying systems, using the same buying processes that they used 5 years ago and yet as we have seen above the buying process has changed. They are not equipped to deal with this change in buying process. They haven't got the system, the structures, the facilities, the policies that are around for the types of decisions that are needed.

The result of all this is that the buying decision has substantially slowed down in 1985. This started in 1984, and was hidden a little bit by the tremendous boom in the economy and has continued substantially in 1986.

What happens when the buying decision slows down? The sales decision takes longer. What happens when the sales decision takes longer? The sales costs go up. What happens if the sales costs go up and you want to retain your margins? You have to increase prices How many companies increased prices in 1985? Very few. It's interesting that IBM in the software are was one of the few companies to actually increase prices in 1985.

What most companies did when the buying decision slowed down and the sales process took longer, is that sales managers started to panic. They went out and did deals: there were discounts, unadvertised, but never the less real all over the place in 1985 and continuing into 1986. Sales managers essentially started to push a limp piece of spaghetti.

The problem was they didn;t realize that the reason they weren't making the sale wasn't a lack of demand, wasn't that their product was necessarily bad or the pricing was poor, it simply was there was not a good connectivity between the buying process and the sales process.

BUYING DECISION SLOWING DOWN

Con't from p.19

We went from a decision process which is the equivalent of a 6' long 6" pipe in the 1982-1984 timeframe to a 10' 10" pipe in the 1985 timeframe. As a result decisions simply weren't coming out of the pipeline.

RESULTS

- **Healthy**
- **Too Much Product**
- **Too Few Solutions**
- **Clogged Channels**
- **Lack of Support Infrastructure**

What are the implications of this? In INPUT's opinion they are healthy. This sounds a little calous to say when there are a number of companies that have had severe problems in the last year. We think we had an overblown situation in the 1984 timeframe.
There was too much product, too few solutions, clogged channels of distribution, and a lack of fully trained people to implement systems. Very importantly, there was also a lack of support infrastructure to enable systems to be properly installed and operated so that the buyers would get the full benefit of the dollars they were investing.

IMPLICATIONS FOR SERVICES

- **Positive for Some Areas**

  - **Systems Integration**
  - **Facilities Management**
  - **Network Services**
  - **Turnkey Solutions**
  - **TPM**
  - **Education & Training**
  - **Consulting**

We think that the implications of what has happened for services have been quite positive in a number of areas. Particularly in the areas where vendors take responsibility for a solution. That is through systems integration, facilities management (which is the ultimate solution), network services, by putting the connectivty together, and turnkey solutions. Not turnkey systems sold on a take and leave basis, but essentially organizations putting together package solutions somewhat similar to the systems integration project and continuing to support the solution.

We also feel that people related businesses will do very well and the actuality has prove this right here. As we said last year areas like consulting, systems development, education and training and third party maintenance and indeed they have done exceptionally well in many cases.

IMPLICATIONS FOR SERVICES

- **Negative for Some Areas**
  - **Software Tied to "Box" Sales**
  - **Fragmented Product Lines**
  - **Obsolete Products**

There are some negative implications for some service areas.. Software that is tied to box sales has suffered. There were fewer personal computers sold in 1985 than in 1984. Therefore, software tied to those sales suffered somewhat. Also, there were fewer IBM 4300's sold as information centers in 1985 than in 1984. So the vendors such as Cullinet, ADR that sold a quarter to one-half million dollars of software tied to those information centers did not get as many sales. This has shown up in their financial results.

If what we say is true and there is an increasingly complex world out there, rational buyers are trying to reduce the number of variables in the buying decison by avoiding fragmented product lines and buying integrated lines. We think this is one of the major problems that IBM has suffered through in the last 1½ year and they do not have an integrated product line. On the other hand we feel one reason DEC has done so well is that it does have the integrated product line right from the lowest level workstation up to its large computer system.

The final point here is that obsolete products simply will not sell today. In the context, it does not matter what the vendor describes or what INPUT describes it matters what the buyer thinks. How is the buyer conditioned? The buyer is conditioned by what he or she reads in the business press and trade press. They are lead by those vehicles to believe that a given system today needs to be an on-line, fault tolerant, interactive, screen driven, window oriented, data base supported which interfaces with natural languages, can be easily maintained because of structure and probably has expert systems overtones. If you take these conditioning factors down one axis and then plot software and systems along the other axis and look for the matches, you find there is a large amount of white space. Many of the products that are on the market today are obsolete. They were developed 10-15 years ago. They have been maintained but they certainly do not meet current technological criteria. What is more important they do not meet current market requirements criteria.

Buyers are not stupid: they recognize when a product is obsolete or obsolescent. It does not matter that the vendors say or promise that the new products will be out in a year or so, the buyer is not going to buy until those new products are demonstrated. They have enough problemss with buying products that have not performed as promised:

What has actually happened in the industry in the last few years? The next set of charts show 1981 through 1984. The growth of the industry as measured by INPUT, the adjusted annual inflation for that particular segment of the industry, since each segment has a different adjustment factor for the rate of inflation. The net of real growth is shown.

As we can see in the processing services environment, it is pretty well had a standard real growth of 10% over the 1981 1984 timeframe. This accelerated in 1985 as we will see later.

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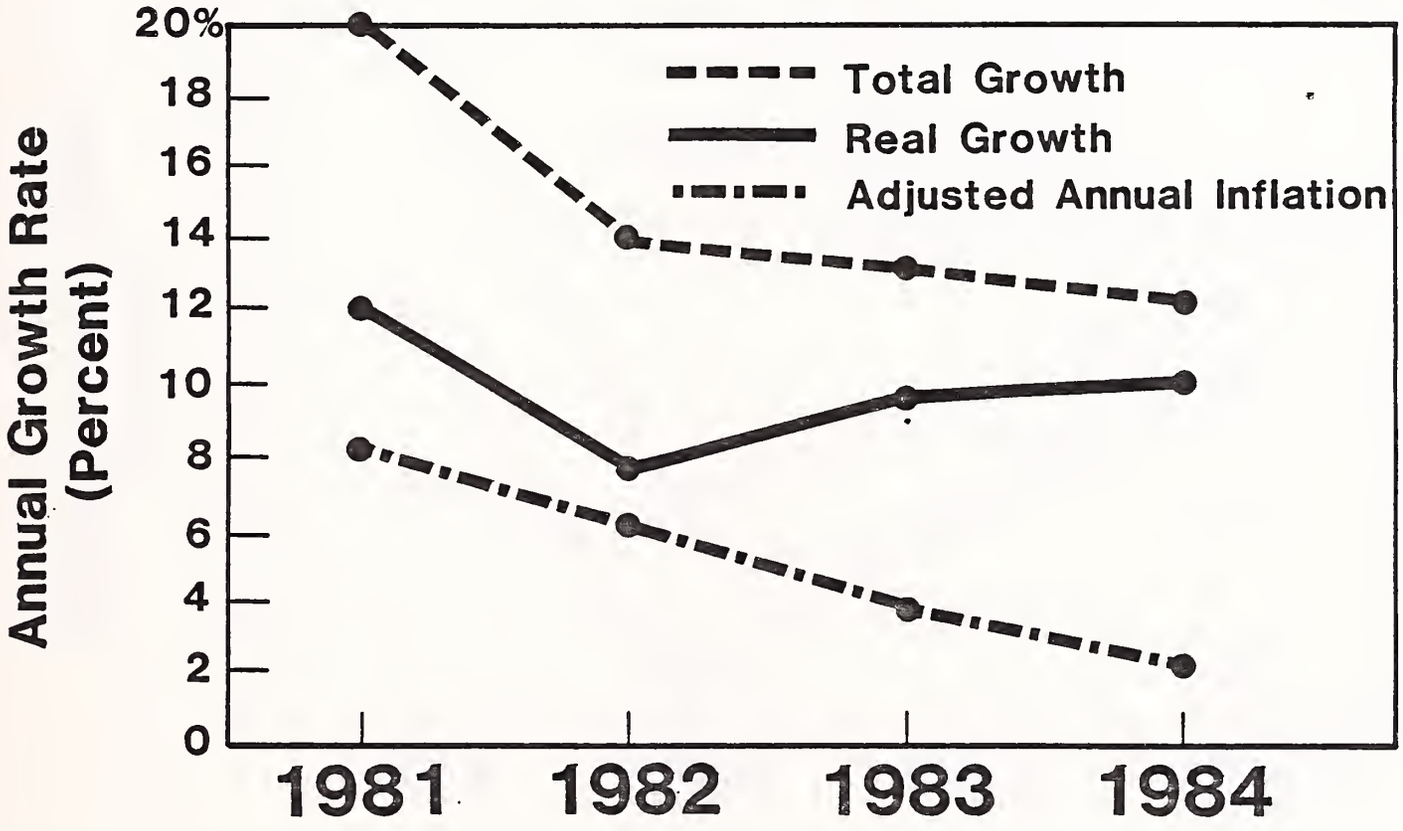
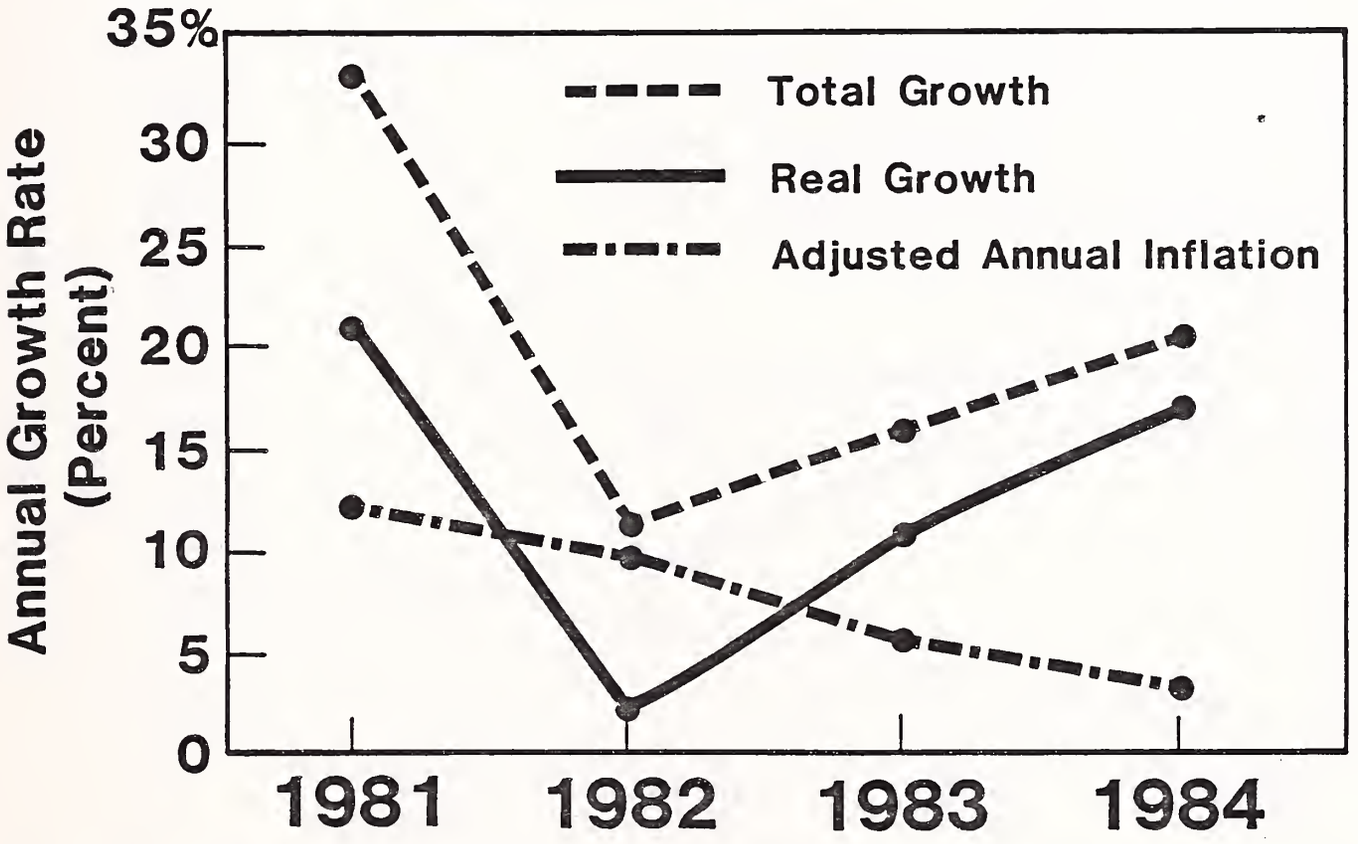
PROCESSING SERVICES GROWTH: 1981-1984

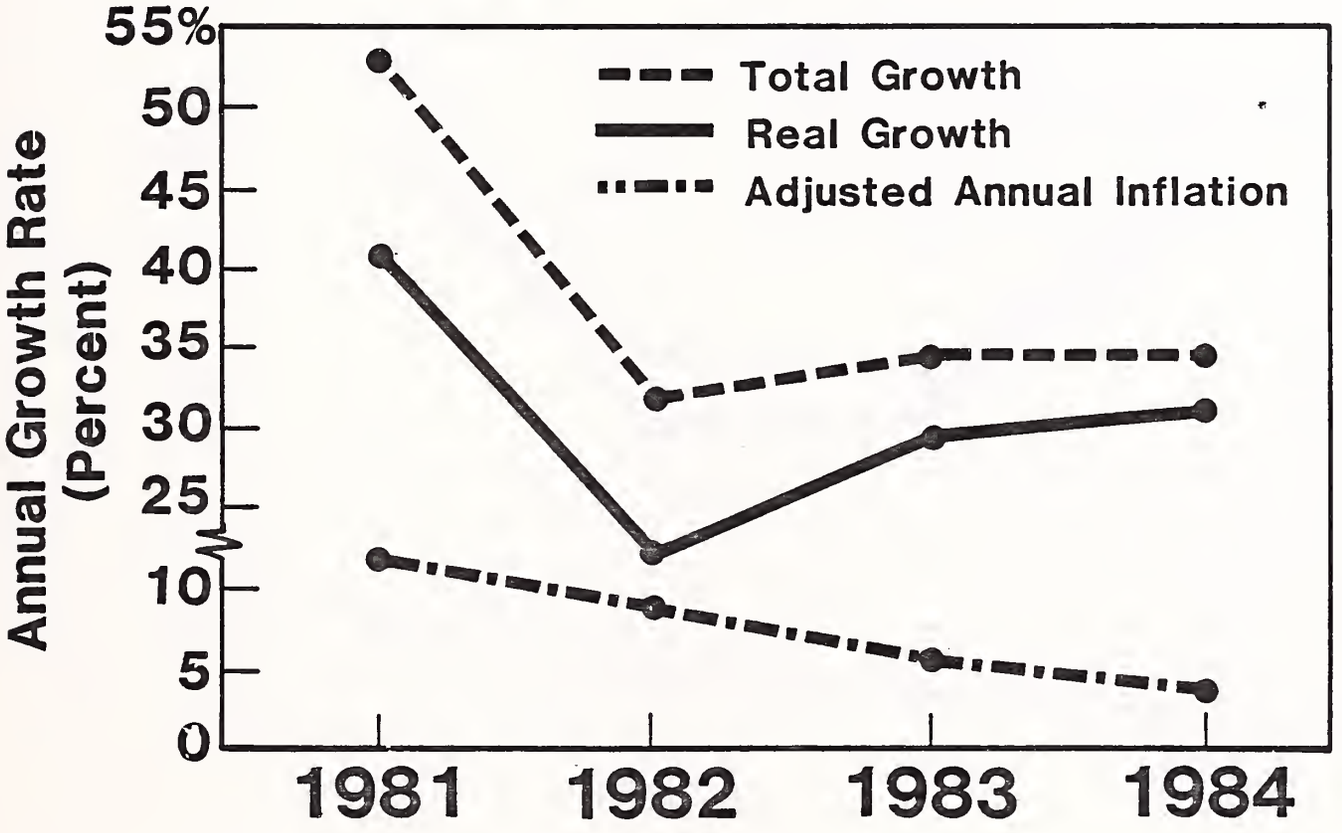


PROFESSIONAL SERVICES GROWTH: 1981-1984



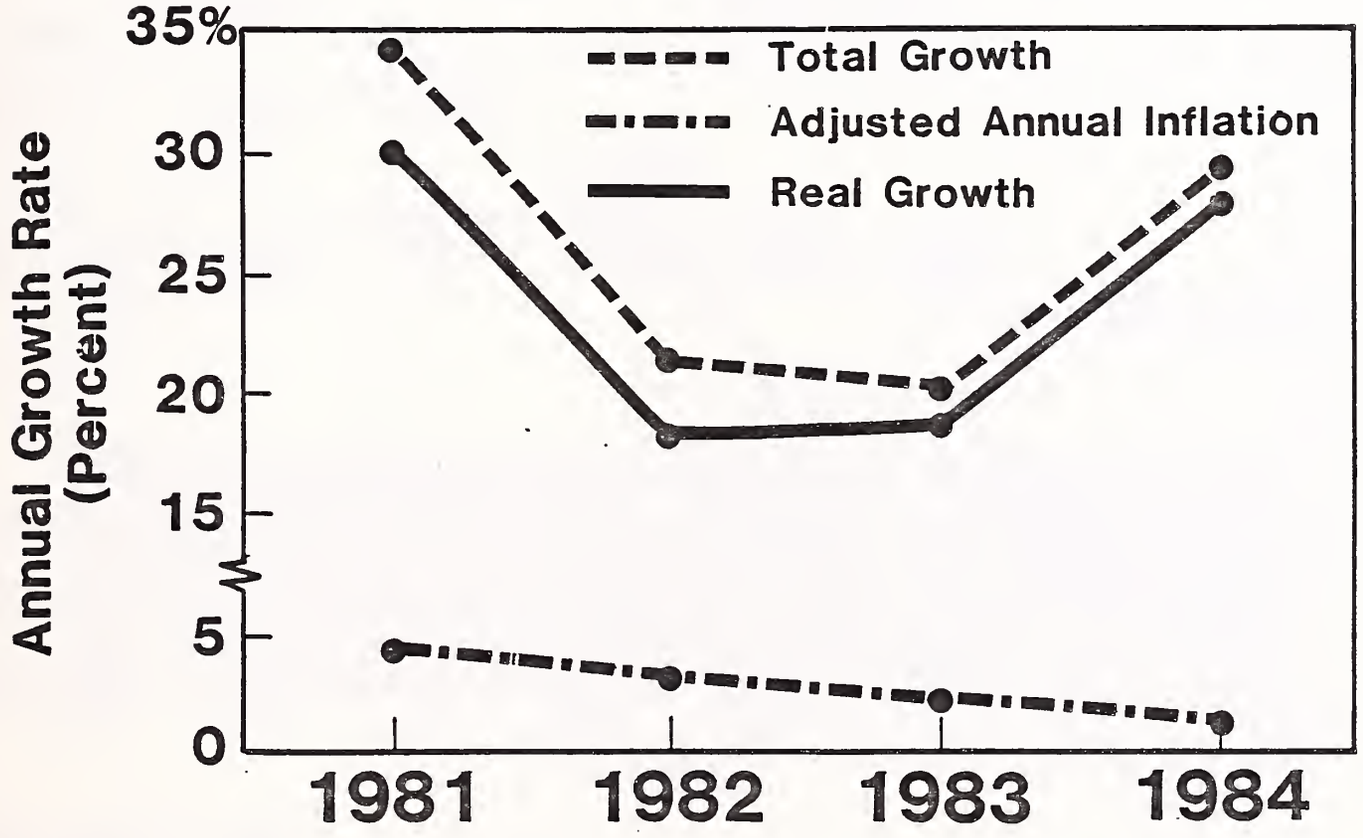
Professional services bottomed out in 1982 in the middle of the recession when people were protecting their internal labor force. But has since ~~has~~ accelerted its growth rate quite substantially. This chart shows professional services have a fairly high tie-in with recessionary cycles.

SOFTWARE PRODUCTS GROWTH: 1981-1984



Software products growth rate on the other hand has tended to spike up in 1983, 1984 and then slowed down dramatically in 1985.
~~Turnkey-systems-real-growth~~

TURNKEY SYSTEMS GROWTH: 1981-1984



Turnkey systems real growth was affected by the recession in 1982 then increased into 1984. It is interesting that turnkey systems were much harder hit by the slowdown in 1985 as opposed with the real recession in 1982. The large of this could be due to the fact that they were in a much more muture business by 1985.

This chart shows the performance of the public information services companies in the 1985 timeframe.
Note to the reader: be sure to get the lastest set of charts.
An evaluation of the public information services companies performance, and these companies account for a significant proportion of the total industry, shows that it sppears that the industries is in trouble. From a growth rate in 1982 and 1983 of the low 20's, it shot up into the mid-20'2 in 1984, but then declined substantially in 1985.

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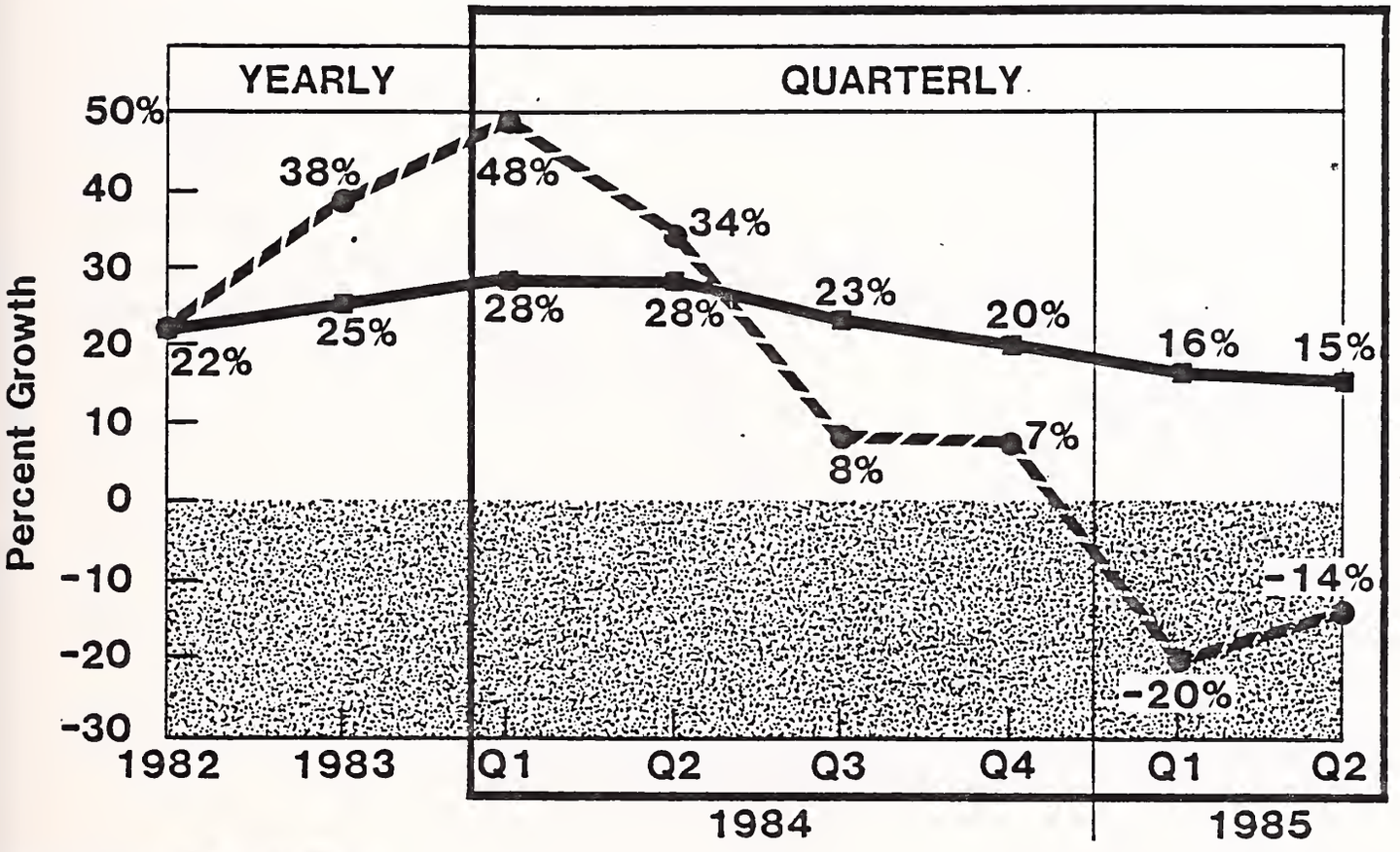
PUBLIC INFORMATION SERVICES VENDORS

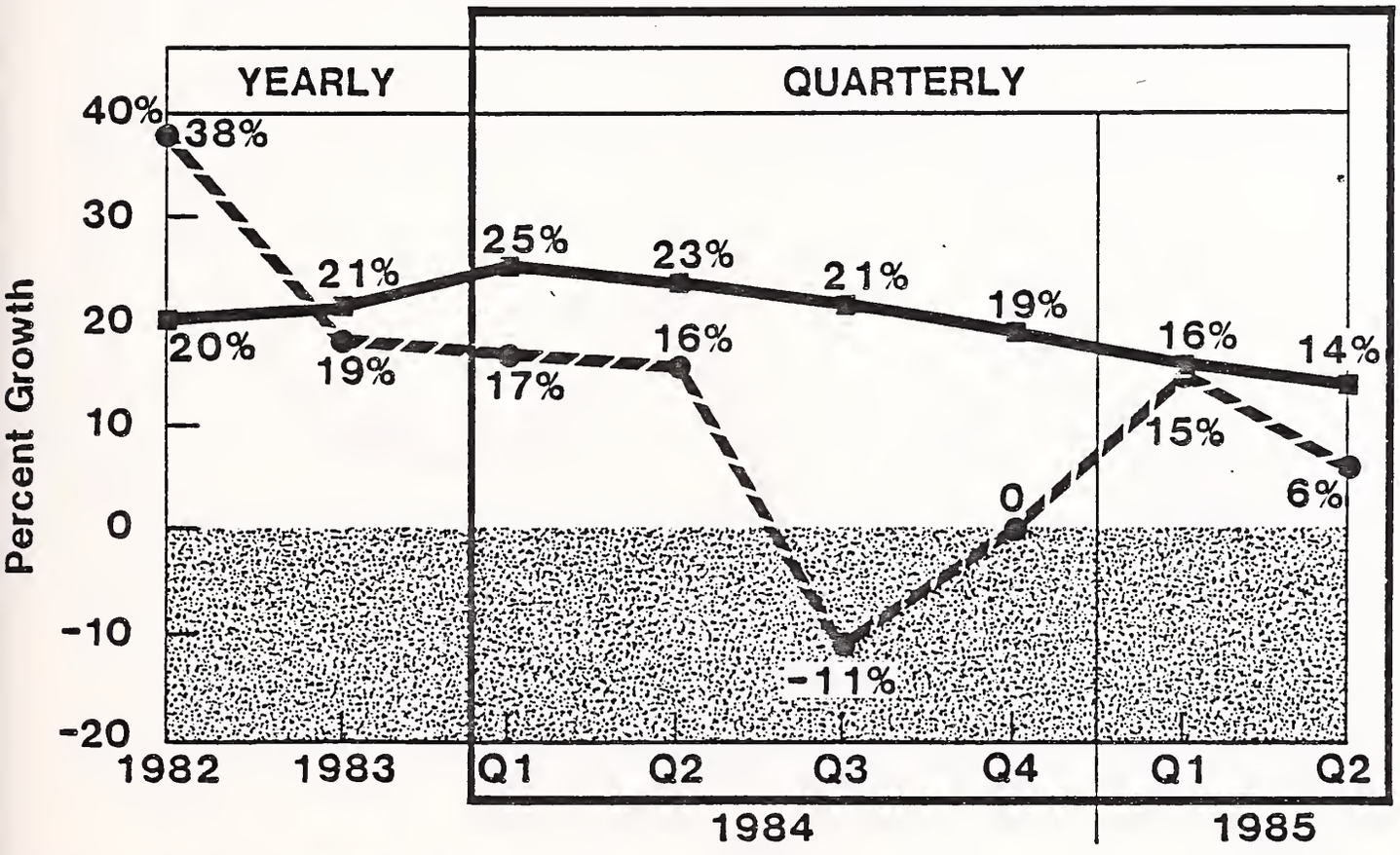


Last Update: 10-01-85

If we look at the growth rate and what it was made-up of in 1985 we see that 15% growth in 1985 was real growth. There was very little inflationary impact. Whereas, back in 1982, 1983 the inflationary impact was in the order of 10% to 11%. There was more real growth in 1985 in the industry than there was in 1982 and a large part of 1983 and 1984. The only time when real growth was probably higher was in the late 83's , early 1984 timeframe when you had a tremendous boom in the information services business. That boom is unlike any we have had.

The processing services company we can see have tended to flatten out around about the 14,15,16% growth rate in 1985 largely real growth. As we mentioned it started to accelerate.

PUBLIC PROCESSING SERVICES VENDORS



Revenue

Income

Note: Excludes Anacomp

Last Update: 10-01-85

The public professional services companies are a very unique group. They had a revenue growth of 15% in 1982, 1983, and 1984. Incredibly consistent. Although, remembering that the inflation factors in 1982 made the real growth very low. Whereas, by 1985 the beginning of the year the 15% real growth there was virtually all real growth.
This is the only group of companies over the last 6 quarters has seen an acceleration in their growth rate.

This has been recognized somewhat belatedly in the stock market. ~~As a result the currency~~ With a result that the

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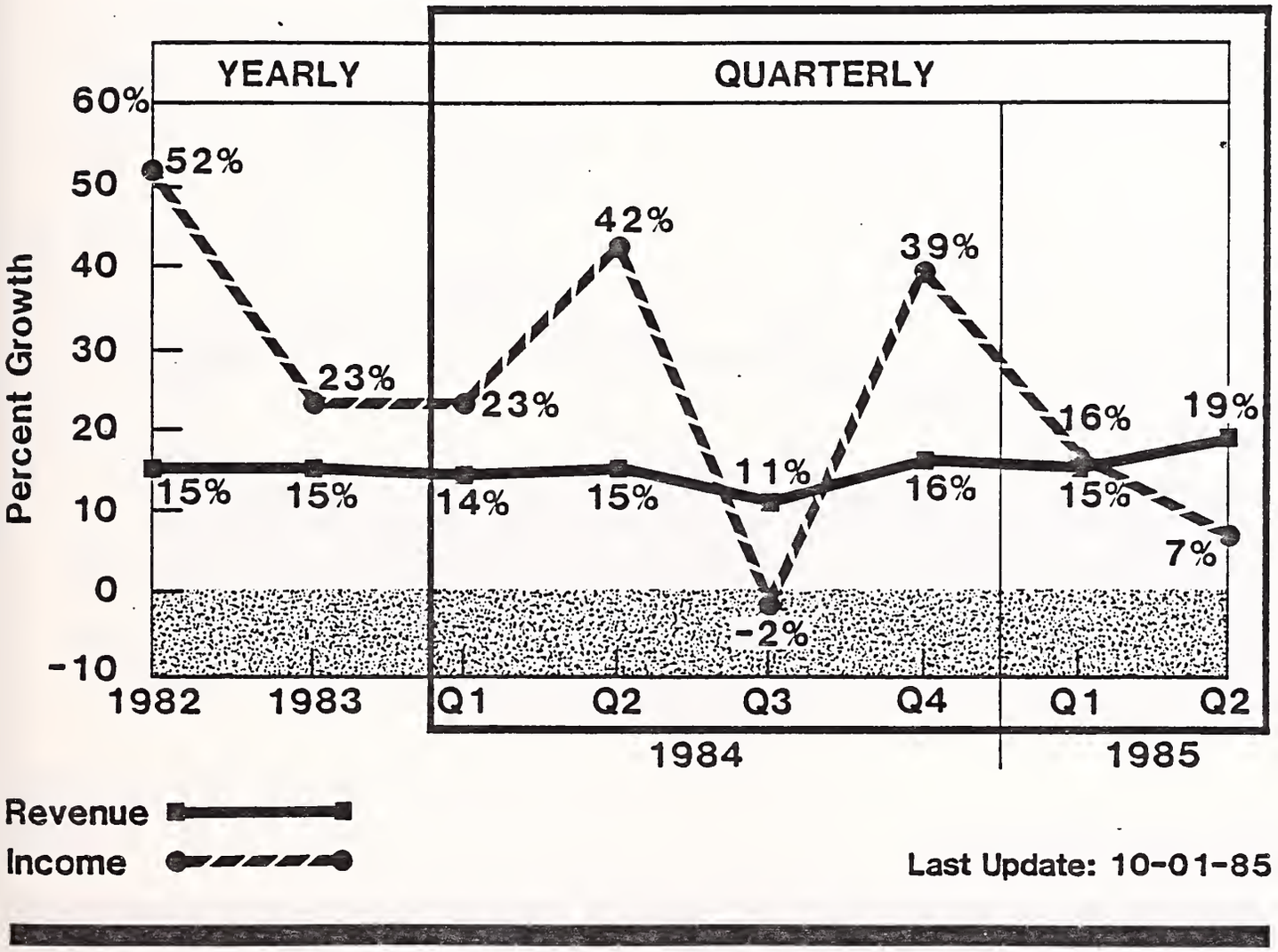
current situation is that many professional services today have a market valuation

PUBLIC PROFESSIONAL SERVICES VENDORS



3 times the level at the beginning of 1984 and are attracting a lot of publicity. This growth and attention for the professional services area is absolutely in line with the analysis we presented earlier of what is going is on in the industry. When you have problems in making decisions, carrying out evaluations or absorbing new systems, the group you would tend to turn to are professional services organizations.

The pulbic software product companies have had a real roller coaster. There was incredible growth in the ned of 1983 and the beginning of 1984 in public software companies and this roll through to the end of 1984 when we had a really poor 4th quarter performance. This signaled the problem that moved into 1985 when growth rates were substantially lower than had previously been obtained by this software product companies.

Again, you must contrast the performance in 1985 with 1984. The end of 1983 to the middle of 1984 was an incredible period for software products.

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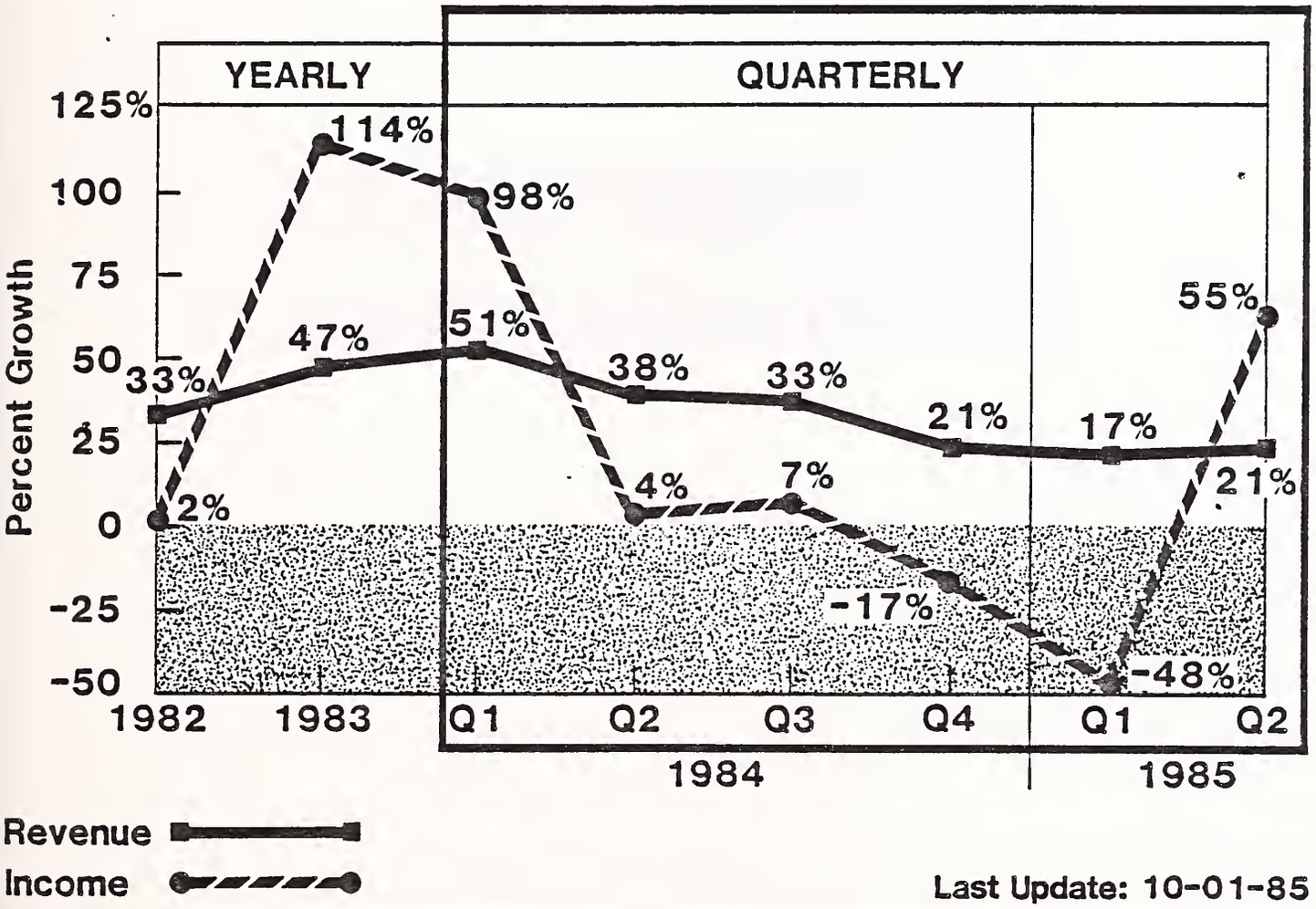
PUBLIC SOFTWARE PRODUCTS VENDORS



companies. There was a big boom. In 1985 in a period of economic uncertainty there was growth but it was on top of this hyper inflated growth in 1984 and as a result many of the results did not show such a rapid increase. We will see later the software business seems to be settling down and we think will accelerate again but not to the levels of the early 1980's. When you examine the ~~probability issue~~ profitably issue you see many of the companies really did not start to cut their costs until late 1984 to early middle 1985 and that severely impacted their income statements.

I would like now to look at what is happening in the information systems environment which impacts the information services business.

ENVIRONMENTAL CONSIDERATIONS

The first thing is that the myths continue to explode. The myth that we would have voice data integration, the myth that we would have a PC on every desk, and others have exploded.
Sometimes the reaction has been overly negative.
One of the pheonomena that we have in the industry today is that any new technology or major information systems directions attracts a very powerful group of followers. You first of all have the vendors themselves, often supported by venture capital money that are interested in hyping the area.
The are then market research organizations, particularly the specialist ones that try and make a name for themselves in that

MYTHS CONTINUE TO EXPLODE

- Voice/Data Integration
- PC on Every Desk

area and, as a result, publish inflated forecasts, and estimates of the impact of technology.
The third group that is involved is the financial community, venture capitalists in particular but often the underwriters and investment bankers that are often quoted in prestigious magazines and newspapers on the benefits of particular companies and these new directions. Therefore, you have the vendors, "researchers" and the financial community all hyping the particular direction. Unfortunately for them the only group that is left out of these little cavols are the buyers. Their exclusion ultimately leads to the downfall f these hype groups.
Unfortunately there is often real damage caused to companies and to sound directions by this kind of charletan approaches.
To these myths we might well add artificial intelligence, UNIX, and perhaps will be CD Rolms.
In all these cases there is real benefit and real direction in them. It simply a matter of time, consistency, rational in terms of analysis and forecasts.
INPUT really cautions its customers to be careful. There are often internal advocates of these directions or lines that want to believe the misinformation that was propagate through the business and the trade press.

It is generally recognized that INPUT's position of IBM being in a major period of change is an accurate reflection.
There is not a clear direction in terms of distributed processing systems or network systems, nor in the office environment. Perhaps where there are directions established there are not products to fulfill them. Thus the users are waiting to see which direction IBM will take in the industry and also when will the products exist. This is true in the software and hardware environment.

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"WAIT AND SEE" ATTITUDE PARTICULARLY RE IBM

Each year INPUT goes out to survey hundreds of information systems executives in large organizations. Some of the things we look at are what issues affect them. In the strategic area, for the next 5 years, the attached chart shows the ranking of theissues.

The number 1 issue for ~~issue~~ IS in the strategic environment is how do you use information systems for cost containment inside an organization. Not containing the cost of information systems but containing the cost of the organization. The next ranking issue is somewhat of a surprise in that it is how with IS do you deal the issues of government deregulation.

There has been deregulation of the telecommunications, financial, and transportation

MAJOR I.S. ISSUES

STRATEGIC
Cost Containment
Government Deregulation
Non-Traditional Competitors
Apply New Technology
Network Demands

industries in the last several years that have fundamentally impacted information systems within organizations. In a number of cases, existing systems simply cannot deal with the changes that have occured.

The third ranking issue is how do you deal with information systems with the new non-traditional competitors that the organizations are facing. For example, if your bank, your new competitor, maybe an insurance company or a brokerage organization. If you are a manufacturer, your new competitor may be from Korea for Taiwan. If you are an insurance company it might be a bank. The organization itself has to deal with these changes in competition and the systems that support it have to change in concert. An example here is what GM had to look at when it wanted to change its organization to deal with competition primarily from Japan and how it eventually went to EDS to address its information systems needs.

~~How-to-apply-the~~
The next issue is how to apply the new technology. On one hand you have this cornucopia of technology. On the other hand, you have this demand and its how do you bridge that gap that is a significant issue. The first specific issue that relates to IS that can be couched into some kind of technical term, is that of network demand. How do you deal with networks?
We feel this accurately reflects the fundamental change that is going on information systems today. Fundamentally, computers are becoming less important and communications networks are becoming more important.
You used to draw a computer network by drawing a box in the middle of the page then zig-zag lines out from that box. Today you draw a network by drawing the topography of a network then putting little boxes attached into that network. It reflects this continuing change in importance from computers to communications.

When you ask information systems executives about their tactical issues you find again the cost containment ranks #1. Over the next several years, the next most important IS issue is information delivery. How to get the information to the right person at the right time in the right manner. This is extremely difficult because it is the customer, or end-user, that defines what is "right." This is where we expect to see major growth in the use of displayed technologies, graphics technology,

MAJOR I.S. ISSUES

TACTICAL
Cost Containment
Information Delivery
Integrate IS and Corp. Planning
Customer Oriented Systems Architecture
Management Perception of IS

information delivery mechanisms, especially those which can be customized to the individual. Tactically a key issue is how do you integrate information systems with corporate planning. Information systems and corporate plans have different formats, table of contents, and methods of development. They cannot be developed separately. Yet there is a great deal of difficulty in putting them together. The 4th most important issue (IS) in the tactical sense is how do you develop customer oriented systems architecture. This goes back to my point earlier on that we have developed very effective functionally oriented systems in the last several years, but not customer oriented.

The issue of management perception of IS is a continuing problem. We feel this is because information systems organizations do not tell their story effective enough. They need to be much more marketing oriented and regard themselves as a vendor and their users as a customer not as captives.

When we start to look at operational issues in IS we find that for the first time an issue that ranks higher than containing costs and that is the adverse of it which is improving productivity. How do you get more productivity out of your existing equipment software, particularly people. The third and fourth ranking issues are related to some tactical issues we identified earlier which was improving information delivery and dealing with customer oriented architectures. Another tactical issue that ranked quite high is this expanding their use of technology IS people recognize there are major benefits to be obtained by using this new technology, but they are not sure how to do it and how does it integrate, what the benefits are, what the costs are, etc.

MAJOR I.S. ISSUES

OPERATIONAL
Improve Productivity
Contain Costs
Improve Information Delivery
Establish Customer Oriented Data Bases
Expand Use of New Technology

Just in support of the tactical point we made earlier about information systems and corporate planning activities, we did a survey last year that looked at the distribution of companies use of IS in corporate planning. We found that in less than 20% of companies was information systems regarded as a peer in a planning process, whereas, in the same number of companies it had absolutely no role at all.

Since we were talking with the information systems executives, this chart is probably overstated. If we ask the same set of questions of the corporate planners, we would find IS ranking much further down.

This is a problem because every company today is affected by information systems and information technology.

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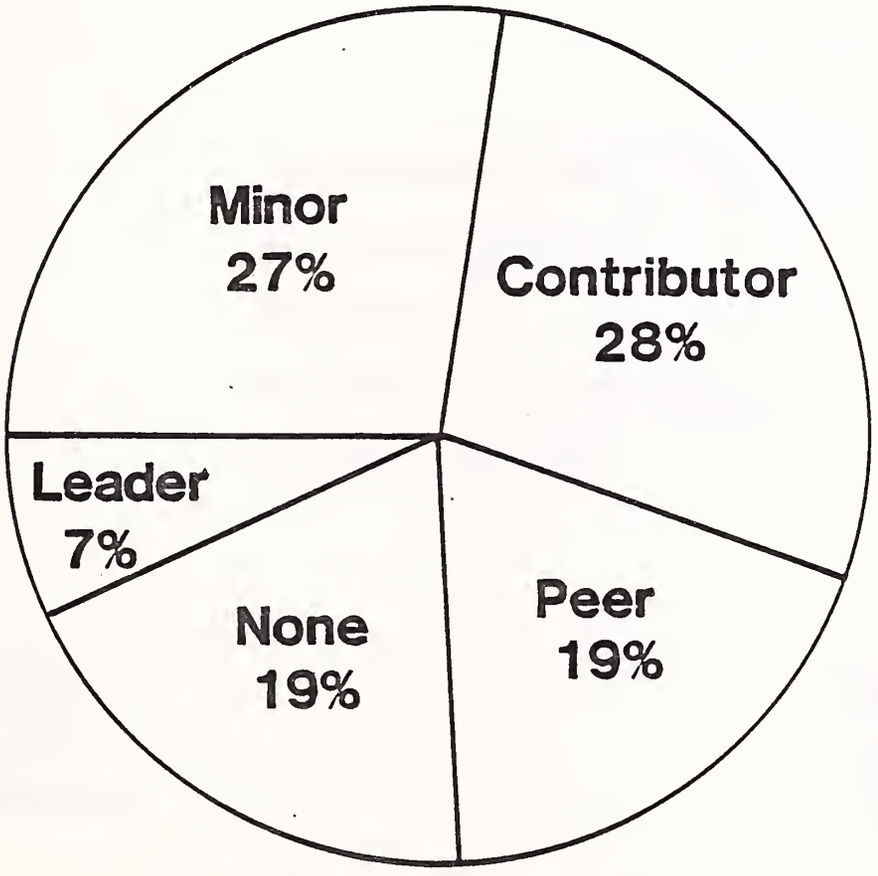
I.S.' ROLE IN CORPORATE PLANNING



Percent of Responses

CHARTS 42 - 51 are adequately covered in the Information Systems presentation write-up

CURRENT I.S. ENVIRONMENT

- Central Mainframes
- Terminals
- Micros
- Office Automation
- Info. Center

Single Data Center	Distributed Information Systems

FUTURE I.S. ENVIRONMENT

- Central Mainframes
- Distributed Minis and DBMS
- Intelligent Workstations
- M-M Links
- DSD
- Office Systems
- LANs

Single Data Center	Distributed Information Systems

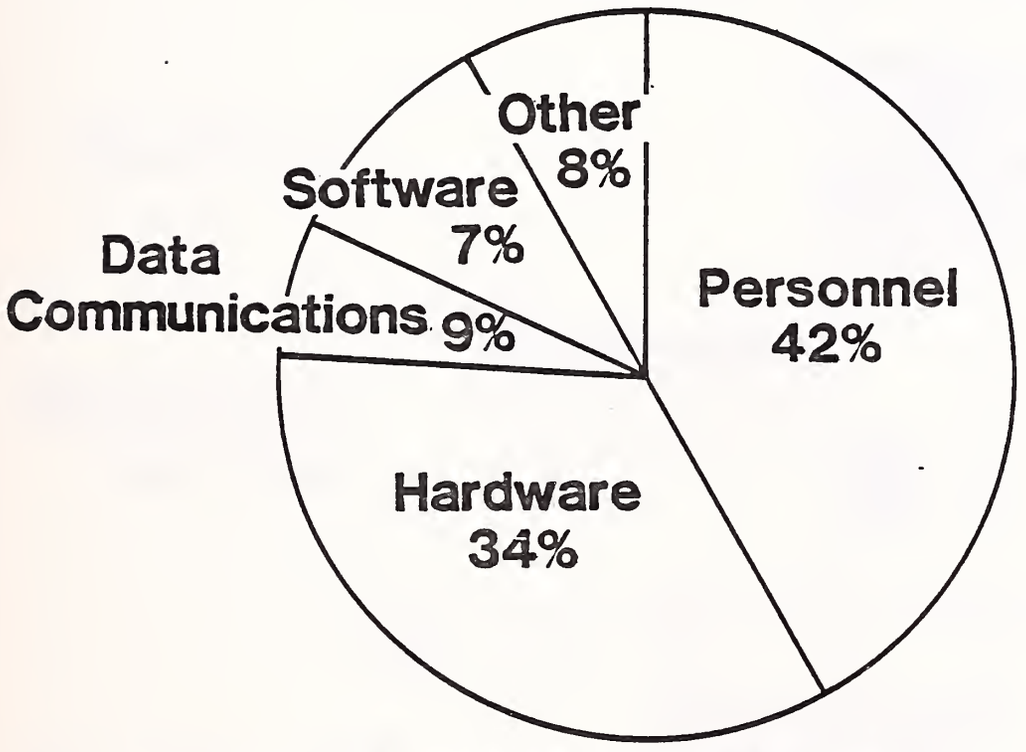
IMPACT OF TECHNOLOGY

	IMMEDIATE	NEAR TERM	LONG-TERM
Relational Data Bases	Low	Low	Low/ Medium
Voice/Data Integration	Low	Low	Medium/ High
LAN	Low	Low	Low

IMPACT OF TECHNOLOGY

	IMMEDIATE	NEAR TERM	LONG-TERM
End User Computing	(High)	Medium	Medium
Departmental Processing	Low	Low	(High)
Distributed Systems Development	Low	Medium	Medium

I.S. BUDGET DISTRIBUTION
1985

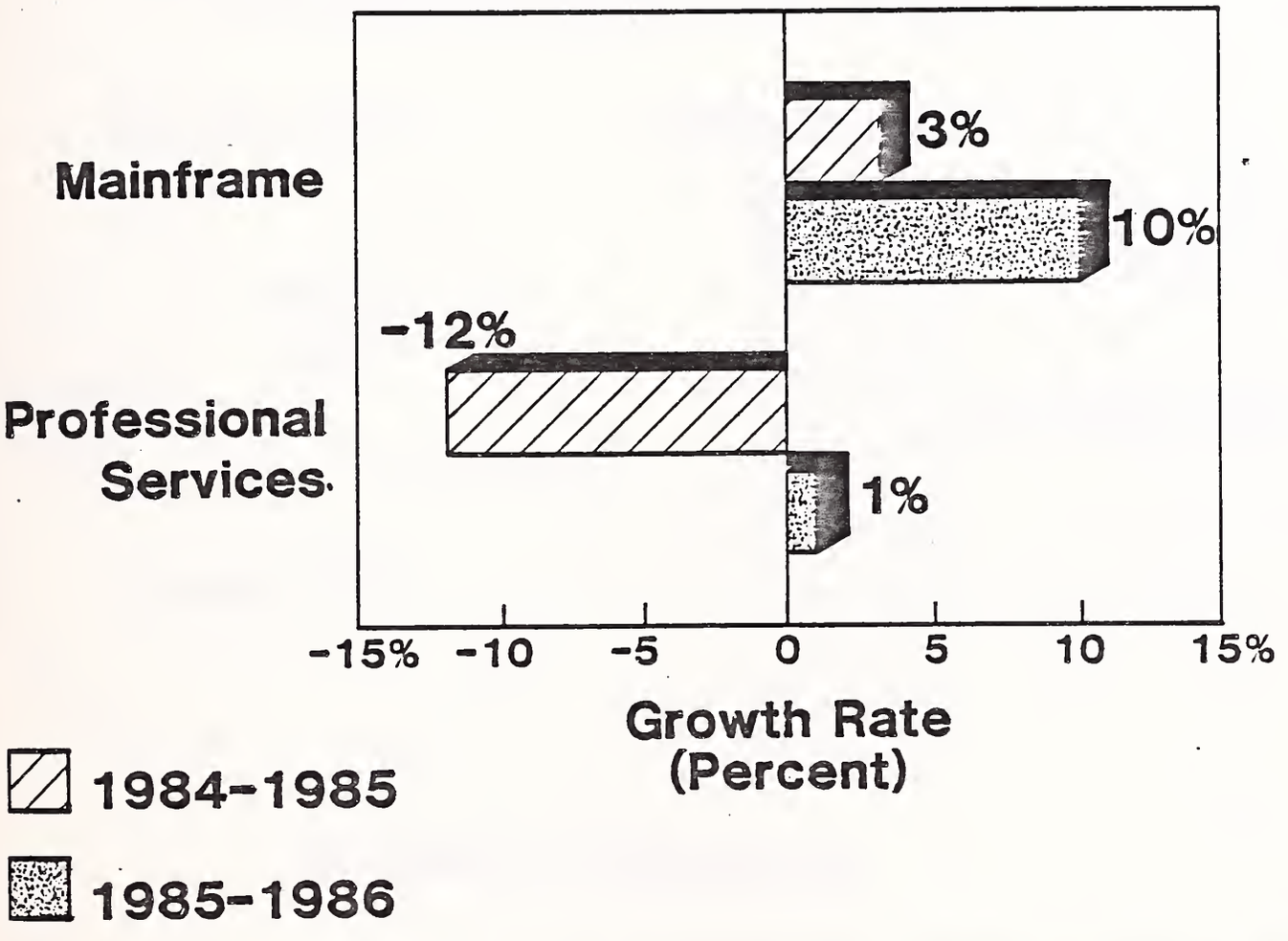


Percent of IS Budget

Budget Growth 1984-1985 - 10.0%
1985-1986 - 10.2%

The key point in this chart is that every year we asked the IS executives what their plans were for the purchase of professional services the following year. Every year since we started the survey 8 years ago, IS managers and executives said they were going to purchase less professional services the following year than they were that year. Yet each year professional services has grown. The first time ever in 1985 when we asked IS executives what they were going to do about their professional services purchases they said they were going to increase them. Only by 1%, but bearing in mind that professional services have grown even when IS managers

LARGEST CHANGE IN BUDGET GROWTH

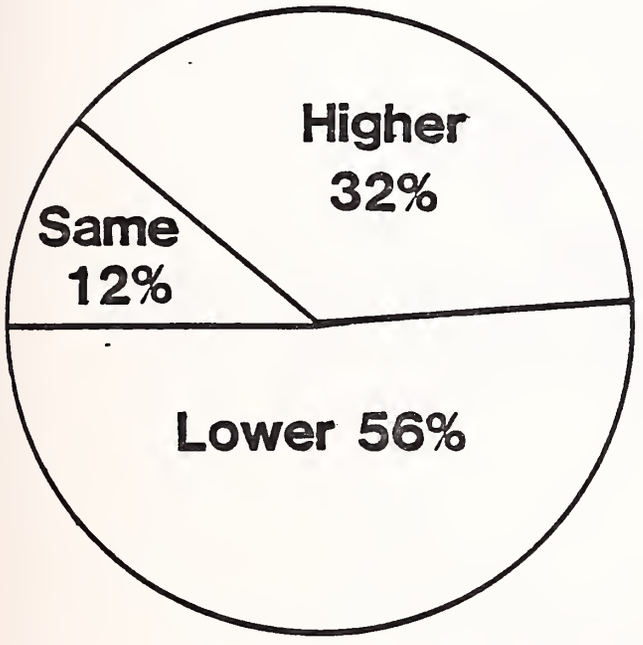


said they were going to shrink them, 1986 could be a phenomenal year of growth for information services.

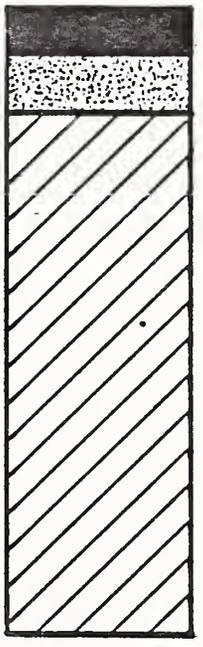
Another factor or change is in the gorwth in the budgets for large scale systems. Although IBM has theoritcally has had a slow start for the year, we do believe that with some new announcements and confidence in the economy that you may well see the mainframes come on very strongly. In fact, IBM has said that its mainframe problems are in other areas in terms of growth. INPUT believes that IBM will do very well in large scale mainframes this year.

MOST BUDGETS WILL INCREASE BUT AT A LOWER RATE THAN IN 1985

Growth Rate



1986 Budgets



Decrease 4%

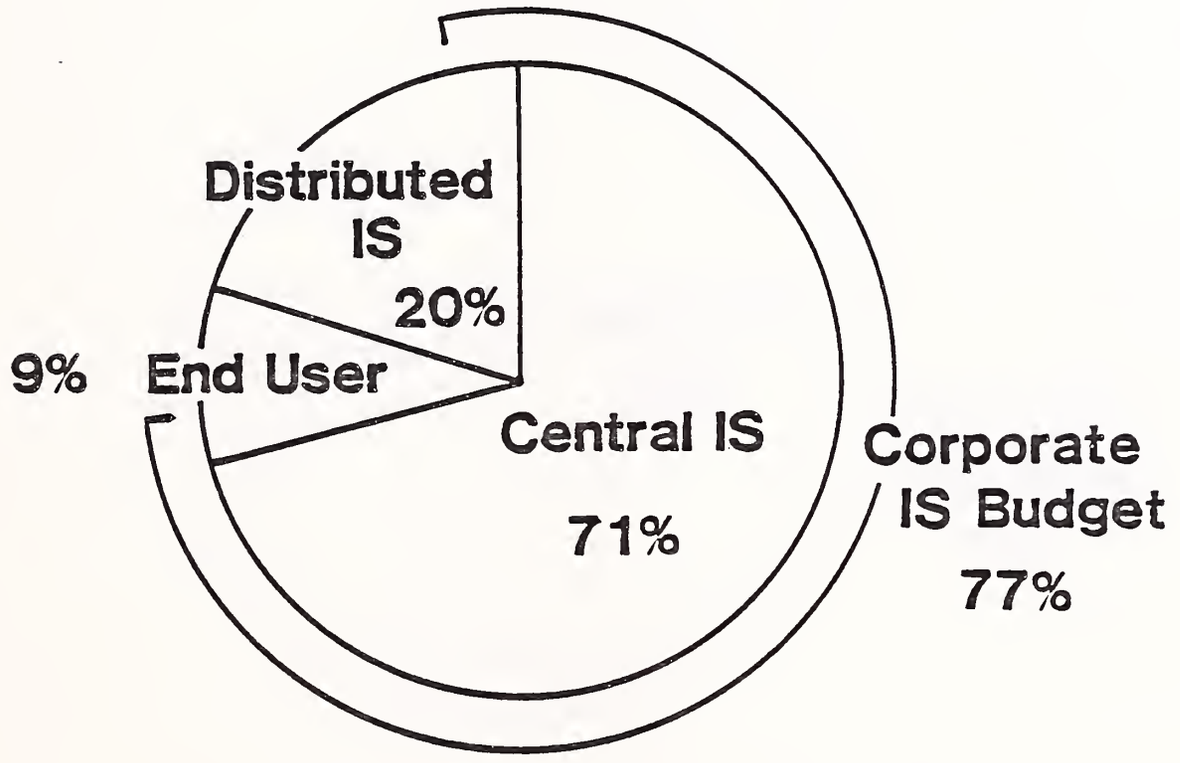
No Change 10%

Increase 84%

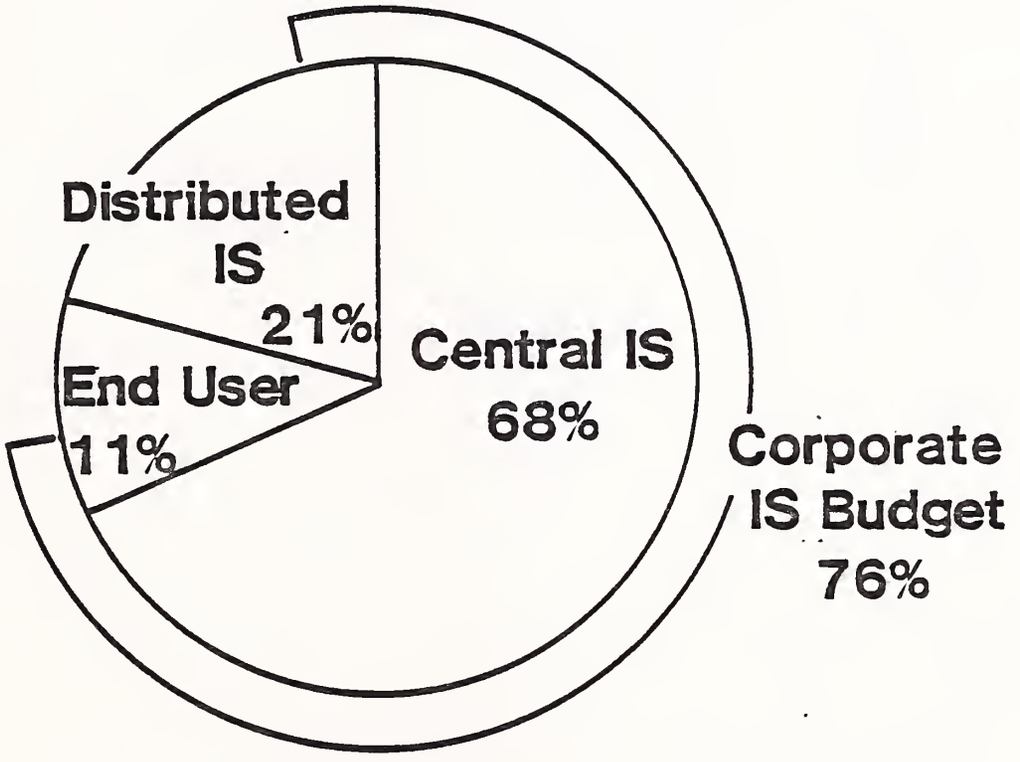
Percent of Responses

DISTRIBUTION OF I.S. EXPENSES

1985



PROJECTED DISTRIBUTION OF I.S. EXPENSES 1986



In this chart we examine the source of new applications in organizations. It is indicative to note that 2/3 of these applications are still regarded as coming from internal sources. INPUT would've considered that by this time there is at least half of the applications would have come from the outside. We do believe that this line between internal and external will shift around more in favor of external, despite new applications development methods which will the internal organizations be more effective.

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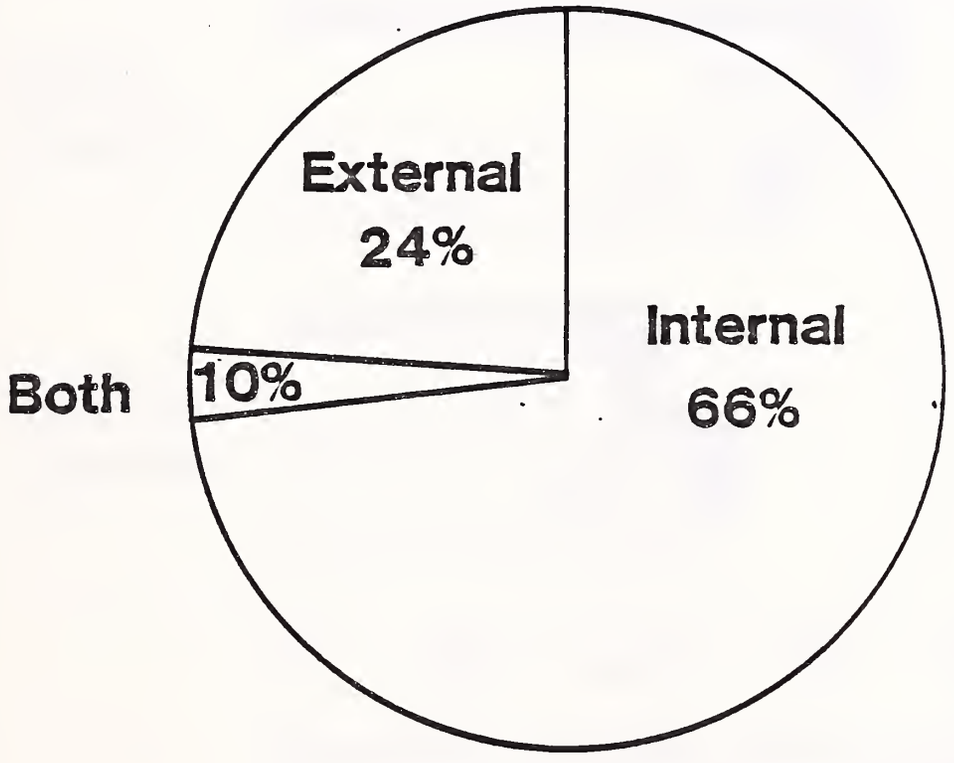
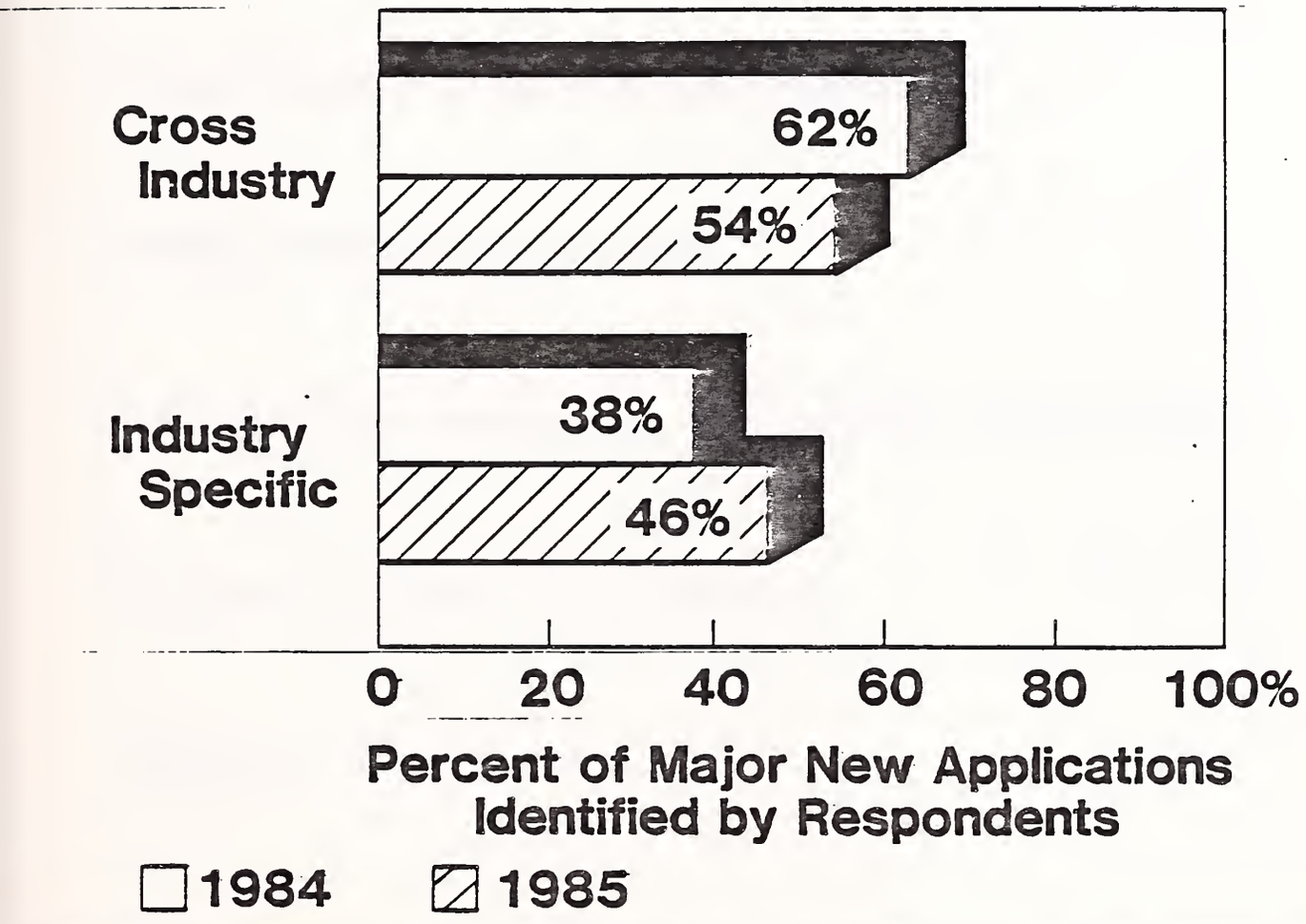
NEW APPLICATION DEVELOPMENT SOURCES 1985



MAJOR APPLICATION DISTRIBUTION
(All Companies)



The future of end user computing is also described in the IS report. Although there are some problems with the concept of distributed systems development, INPUT continues to believe that it will occur, particularly for smaller applications. The fundamental problem with distributed systems development, bearing in mind the issues raised above, you are unlikely to get customer oriented applications developed except in the smallest way through distributed systems development. What you are more likely to get is functionally oriented systems, even when they

THE FUTURE OF END-USER COMPUTING

- Distributed Systems Development
- Micro-Mainframe Links
- Modeling, Analysis, Graphics, Reporting
- Applications Prototyping
- Expert Systems

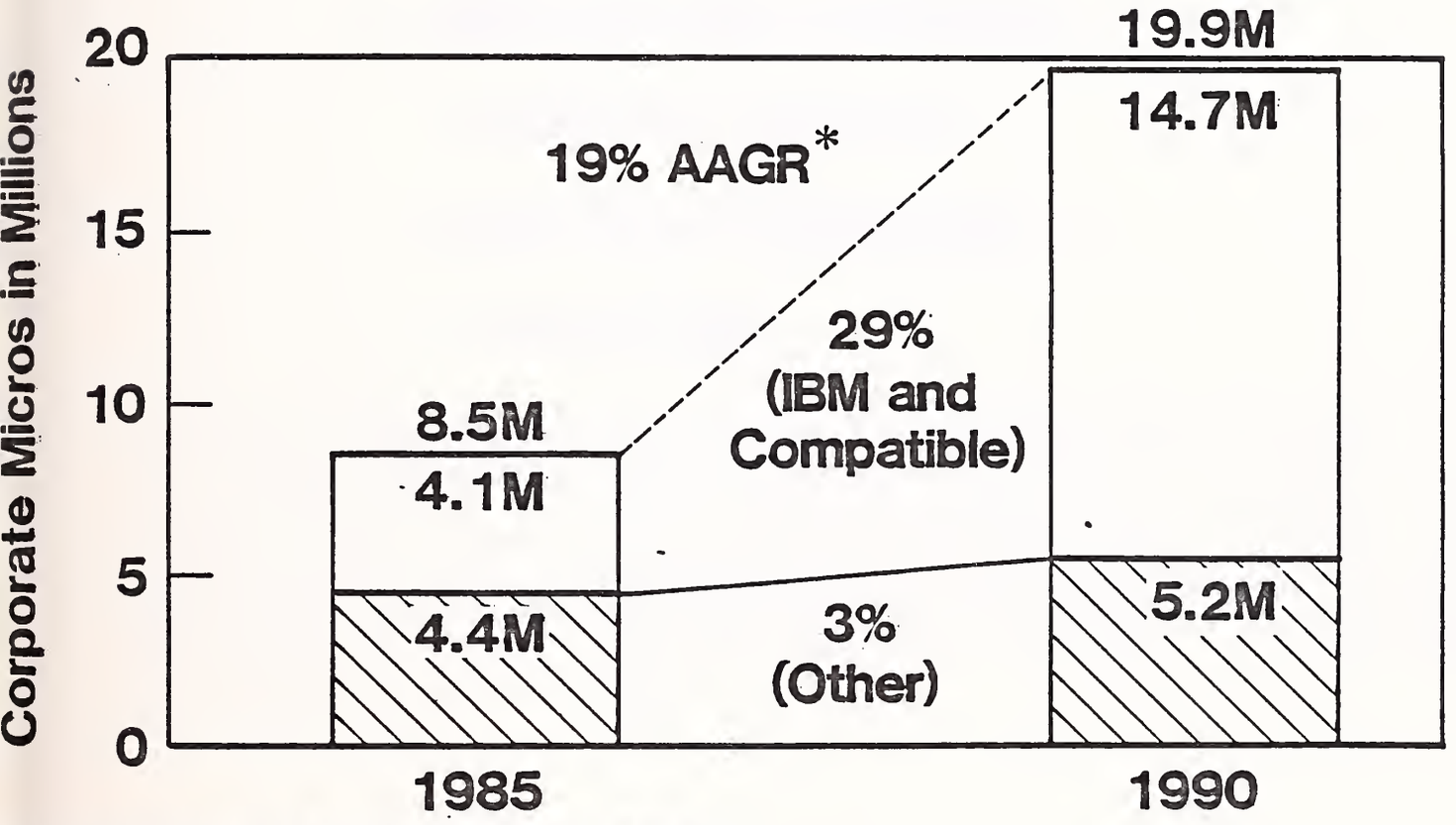
are dealing with customers.
Micro mainframe is an absolutely essential part of end user computing and we will talk more about that later. In line with getting the information delivery issue address, modelling analysis, graphics, reports, capabilities are needed to support end-user computing and they will grow rapidly. We expect to see more applications prototyping at all levels in an organization and some of those prototypes are becoming operational systems. We believe this will start to trends us in the direction of disposable software, particularly at the individual and work group level. We do expect to see expert systems gradually making their way into the end user environment, although ultimately expert systems will replace a number of "end users"

The corporate market growth, INPUT projects a 90% annual growth rate in micros in American business. The growth rate in the IBM and compatibles is close to 30%. We are including Apple now in this category and have opted to work in the IBM context instead of trying to take on the steamroller.

Because some of the areas in the micro business are settling down, we expect to see a much stronger presence in the Japanese companies in the next several years. Products like the

Panasonic, for example, we think will do quite well.

CORPORATE MICRO GROWTH, 1985 - 1990



*Average Annual Growth Rate

However, this is only in a standalone environment. The Japanese are lagging badly in the connectivity area. Thus, although they will penetrate standalone business, they will have very low penetration we think in the multisystems area.

The micro growth in business is actually driven by micro mainframe. Micros are replacing terminals, although as we see later, there are some circumstances where terminals are replacing micros. Micros are going in not as problem solving, decision support tools, but they are going in now within an end user applications environment. In other words, people like insurance companies are installing them in agencies for specific applications.

MICRO-MARKET GROWTH

- **Driven by Micro-Mainframe**
  - **Replacing Terminals**
  - **End-User Applications**
  - **"Virtual" Disk**

Within the micro mainframe one of the strongest trends is the use of virtual disk as an operating environment. There is a product/company in Canada (Micro Temper/Tempers Link) which has cornered about 40% of the market to support micro mainframe using virtual disk. Essentially what virtual disk does, is that it takes a virtual representation of a disk file from a personal computer and moves it to a large scale storage system. Then in the mainframe is a harvest program that goes through and looks at all these virtual disk files, processes them, sends back a copy of the virtual disk file to each user. This very simple application methodology is working.

One key question that comes up today when developing systems is should the systems be planned for a micro mainframe environment, for micro LAN mainframe environment, or for a micro mini mainframe environment? The answer is that developers have to plan for all 3 environments. Similar companies with similar problems are going to choose different methods of solution.

Overall we think the micro LAN mainframe development environment is going to grow more strongly than the others.

Alternatives that are not included on this chart are terminal

Micro-Mainframe

vs.

Micro-LAN-Mainframe

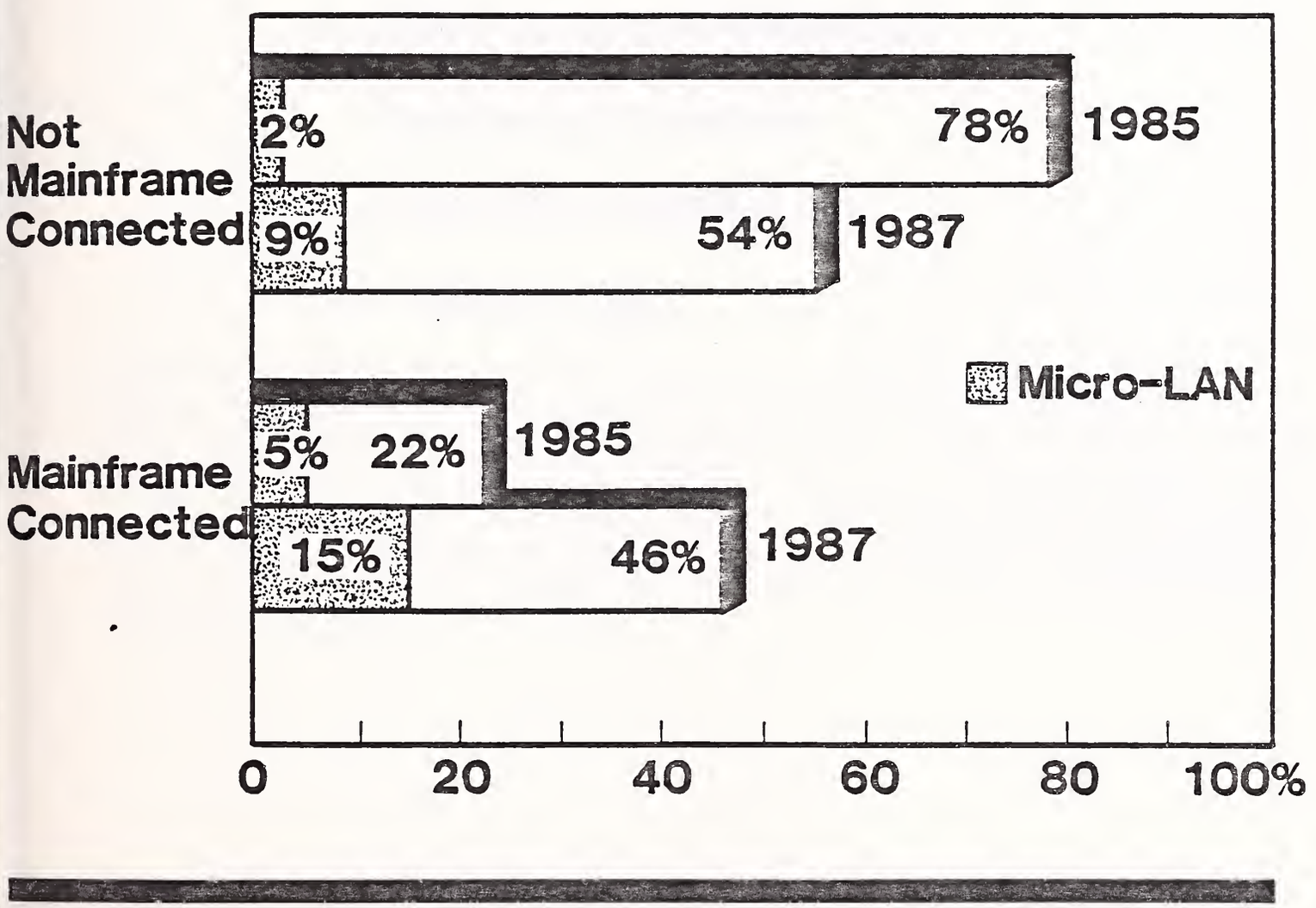
vs.

Micro-Mini-Mainframe

mainframe and terminal mini. We find a number of examples today where companies are saying that it is more cost effective to go terminal mainframe than micro mainframe.

To support the growth of the LAN mode for micro mainframe connectivity, our recent survey showed that the percentage of micros in business that would be connected to a mainframe through LANS would treble by 1987. In fact, we think this might be an understatement. When you consider that the number of micros is also going to increase, it becomes obvious that virtually all micros that are going into the business environment new over the next several years will go into a micro LAN connected environment.

MICRO-MAINFRAME CONNECTIVITY



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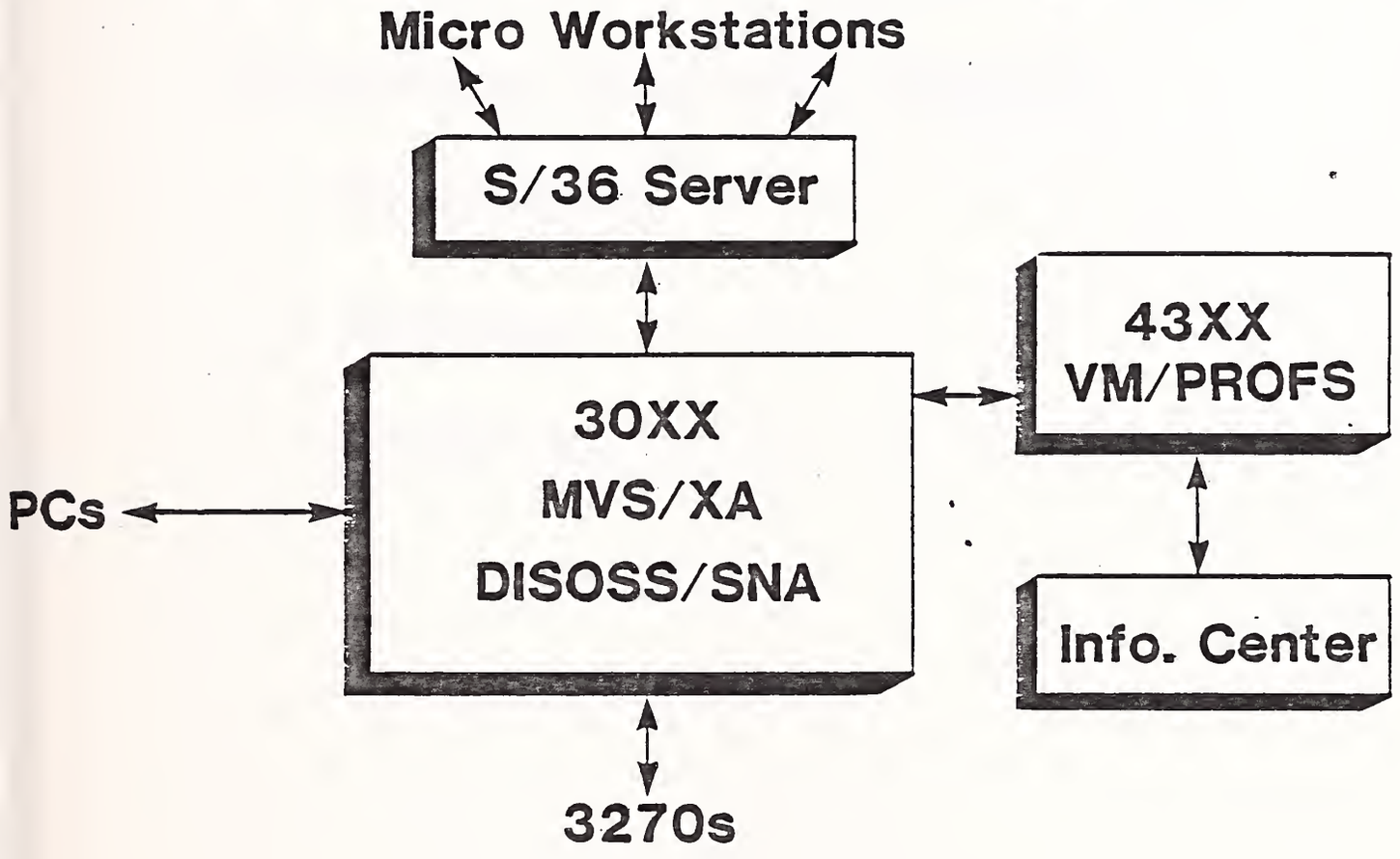
IBM EMPHASIZES CENTRAL CONTROL



MICRO-MAINFRAME

- Requires Increased Capacity
  - Processing
  - Storage
  - Network

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785
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It's very obvious when we look at the current connectivity environment, that there is a lack of support. IBM and other organizations are promising connectivity at the PC workstation level and IBM is emphasizing this is 30XX connectivity. In practice, it is not an easy process. This lack of connectivity is both among the workstations and PC's, and between this level and the mainframe level.
This is not simply connectivity in terms of communications but in terms of data base and application that is lacking.

INPUT®

LACK OF CONNECTIVITY SUPPORT

- At PC/Workstation Level
- At System/36 to 30XX

This really relates to the question of the micro-mainframe market in general. There is a state of confusion today, there are no standards, there is a wide range of function and a wide range of price. A company can pay $100K for the micro mainframe link software that goes on the mainframe and $1K or $500.00 per copy for each micro that is linked in. For 250 micros this suddenly becomes an expenditure of well over a quarter of a million dollars. This is not inexpensive.

Also there is no total solution. You can have an IBM solution

MICRO-MAINFRAME LINK MARKET

- State of Confusion Exists
  - No Standards
  - Wide Range of Function
  - Wide Range of Price
- No "Total Solution"
- Uncertainty

which will not work with an MSA solution, which will not work with the Cullinet solution, which will not work with an ADR solution, which will not work with a Hogan solution. In a complex multi software vendor environment then this complexity and confusion and potential large costs becomes a major problem. Despite IBM announcement in the network area, there is still uncertainty about the direction to go. How much storage should be put at various nodes for example? How much processing should be distributed?

INPUT's research shows that the distributed data processing with micros as workstations is not happening on an ad-hoc basis. It is only going in in designed applications. Organizations such as Longs Drug and Nationwide Insurance are putting in distributed processing systems with micros in design applications.

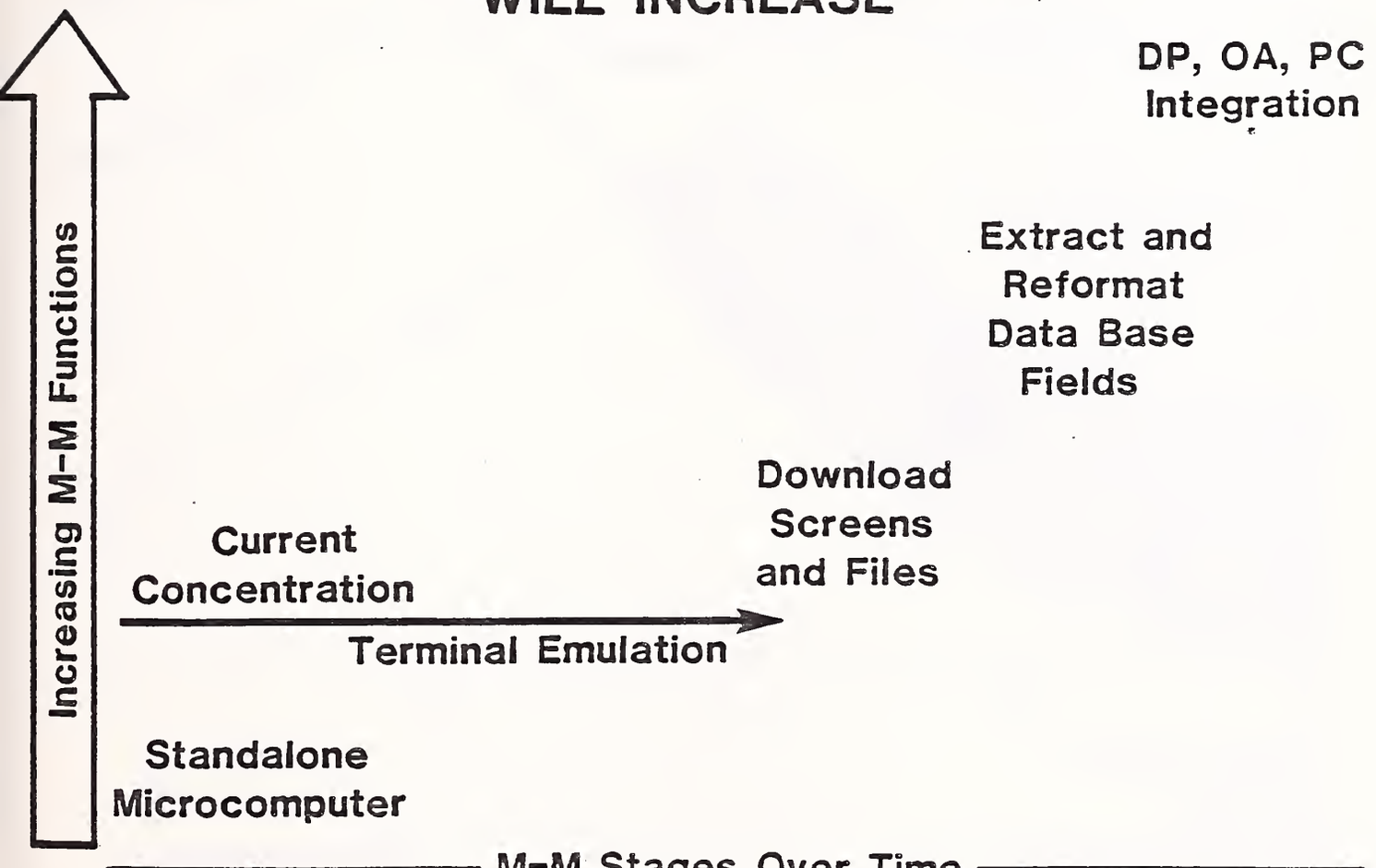
The alternative where existing micros are used together with the mainframe is not proving very successful. For one reason, many micros or PC's have been customized to the addition of particular

DDP WITH MICROS AS WORKSTATIONS

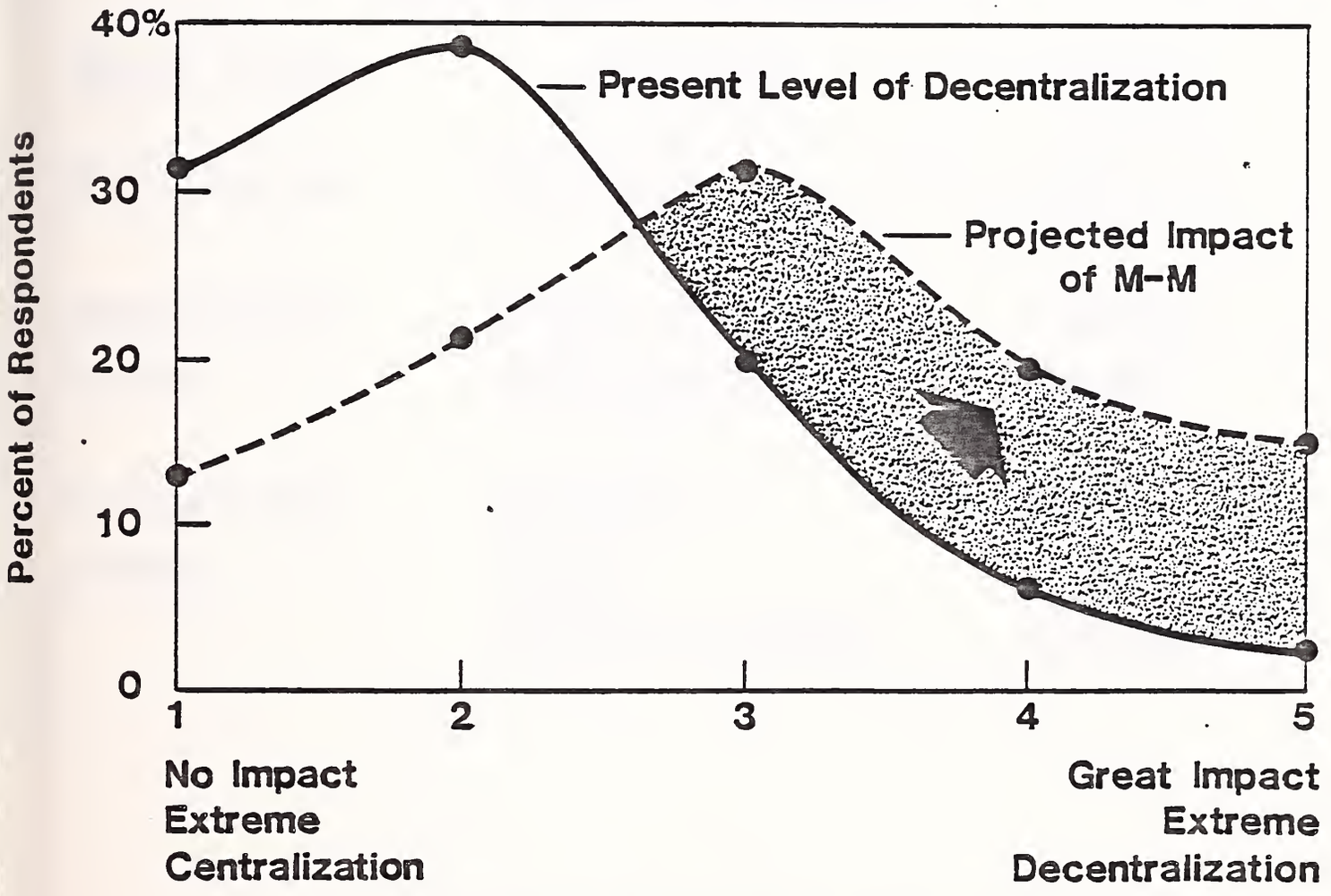
- Only in Designed Applications
- "Long's Drugs"
- "Nationwide Insurance"

boards or extended memories or other characteristics which make it difficult to be sure of compatibility across all in place micros. It is often easier to get rid of the old systems completely and replace them with the brand new set all tied in with the design applications.

DEMANDS FOR MICRO-MAINFRAME LINKS WILL INCREASE



M-M IS SHIFTING I.S. TOWARDS DECENTRALIZATION



MEDIA INTEGRATION

Base Type	Present	Future
Data Bases	Magnetic	Optical
Information Bases	Paper (Files) Micrographic	Optical Paper
Knowledge Bases	Humans Paper (Books & Files)	Humans Paper Optical

PROCESSING INTEGRATION

Processing Type	Present	Future
Data Base Processing	Mainframes	DBM, Mini/Micro
Information Base Processing	Human Interaction PC/WP, Graph.	Human Interaction Integrated Networks
Knowledge Base Processing	Human Interaction	Human Interaction Human-Computer Interaction

TELECOMMUNICATIONS IN TRANSITION

DEREGULATION AND WHAT IT HAS DONE

- Confused the User
- Opened Up the Marketplace
- Increased Phone Costs
- Decreased Services and Service Levels

DEREGULATION AND WHAT IT HAS DONE

- Increased Competition
- Forced Companies to Adopt Bypass
- Pushed the Technology into New Areas, e.g., Satellite, Fiber
- Confused the User!

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INPUT considers that one of the major problems that users face today in the telecommunications area is dealing with this concept of the corporate network. There is a move for it to rationalize all networks into one corporate network. The analogy that INPUT draws is with the concept in the early 1970's of taking all the corporate data and putting it into one corporate data base, managed by one corporate data base management system allowing everybody to have access to that data base. This concept proved to be totally unwieldy and unworkable.

TELECOMMUNICATIONS

Corporate network as much a myth as the corporate data base.

In the data base area, what has happened is that most companies have a number of different data base management systems, have separate data bases, and in some cases, conflicting, and have specialized or functionally specialized the data bases in order to meet the customer demands.
INPUT considers it is the same in the network area. If an organization tries and takes all its networks and put it into one network, there probably going to sub-optimize each one of the networks that are included in the overall network to the extent that the users of all the networks are dissatisfied.

After all, trying to mix a high volume, high speed infrequent message traffic network with a low volume, low speed continuous traffic flow it means you have to have networks that are very expensive or which do not meet the needs.

Thus, we think what organizations need to do is certainly derationalize their networks and manage their networks in a coordinated way, but they should be looking to interface networks as opposed to trying to integrate them all into one.

General Motors is supposed to have well over 120 networks, Bank of America over 50 networks, Ford over 30, and these companies are still counting. In fact, most of them are creating networks faster than they are rationalizing them.

Since the users feel networks are becoming increasingly important to their future they are going to want to own their own networks as opposed as simply being part of an "overall" corporate network. Just as we saw a battle for ownership of data bases fought in the 1970's we think there is going to be a battle for the ownership of networks in the 1980's and 1990's.

The second myth relative to telecommunications is that voice and data re being integrated. INPUT's research to date shows they are simply not being integrated. In many cases, they are cohabiting, i.e., voice and data traffic is going down the same line, but there is no integration of applicatio.
We find in many organizations that although the voice organization and the data organization are now reporting to the same person, and therefore appear to be organizationally integgrated, we find that the voice planning management people are in one floor of the building and the data management planning people are in another building. In practive, intggration is not occuring. We think there are some organizational issues involved here as well as equipment technology and service iisues that have not yet been resolved.

TELECOMMUNICATIONS

Voice and data are not being integrated.

There is a real question of whether it is valid to integrate voice and data given the mix in requirements. One can build a case that it is not until we have voice annotation of doucments, and true integration of communications whether it is voice, text, message, and data, that we will need the networks to be integrated.

I.S. FOR COMPETITIVE ADVANTAGE

COMPETITIVE ADVANTAGES OF INFORMATION TECHNOLOGY

- Effective Decision Support
- Improved Customer Service
- Reduced Operating Costs
- Effective Sales/Marketing
- Improved Time Management
- Rapid Response to Change

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In this section, INPUT presents its forecasts for the 1985-1990 time period. The distribution is by mode of service as opposed to the industries served or functions served. In INPUT's annual report data is provided by industry and functional area.

MARKET FORECASTS

In contrast with what is popularly believed and has been promulgated by a number of "obsefvers" of the industry, the processing and network services business is not dying. It's growth is accelerating. There are certain segments of the business which have suffered quite properly from the growth of the personal computer and the impact of the improved price performance in hardware,

PROCESSING/NETWORK SERVICES - GROWTH ACCELERATING

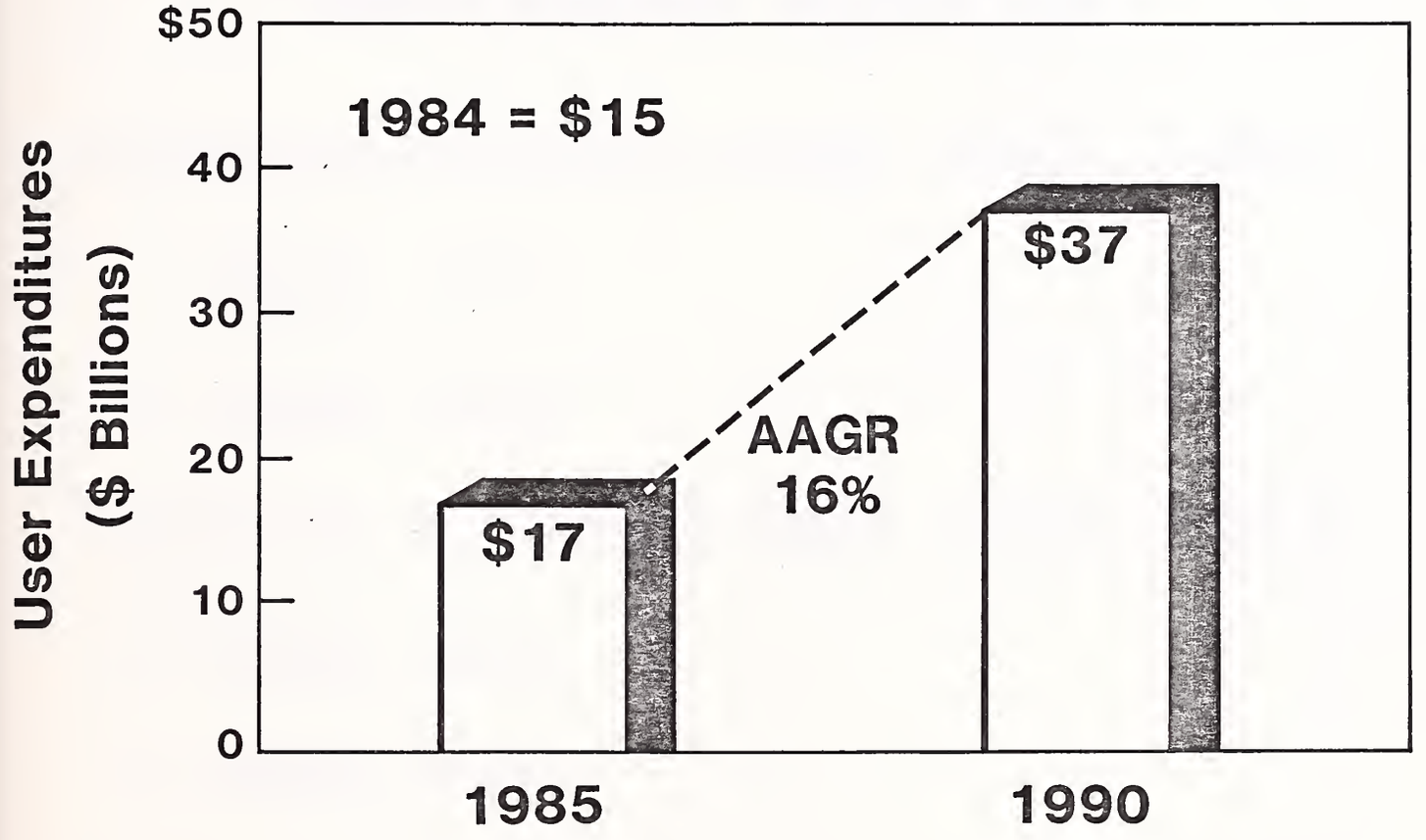
but these segments, such as timesharing, have now largely been "slimmed down." On the other hand, there are major new services areas which are growing quite rapidly which are overcoming the slowdown in what are now relatively small obsolete areas.

That is not to say that this process of obsolescence in processing network services will not continue. It will but the opportunities we think will make up for the fall-out.

One key think to note in terms of changes is the name change.

As shown in this chart, the market will more than double over the next 5 years. Also, we should remember that this 16% growth reflected here has a very low inflation rate built into it compared to the 20% plus growth rates that we have 3 or 4 years ago where there was a realtively high inflation rate.

PROCESSING SERVICES MARKET



When we examine the changes we made in processing services forecasts from 1984 we find the first difference is that the growth in 1984 that we had expected to be about 12% was actually about 16%. The industry did a lot better than we had thought. ~~This was made up for the a~~ The areas that made up for the decline in timesharing that we had expected to have a strong impact outperformed our expectation This was primarily in the industry specialized and data base areas.
For 1985 the growth rate for both years, 1985 and prior year 1984 we felt would be at 14%, again it looks as though the industry out performed that number achieving a growth rate of 16% or 17%.

CHANGES FROM 1984 PROCESSING SERVICES

- **Change in Growth Rate 1983/1984**
  - **1984: 12%**
  - **1985: 16%**
- **Change in Growth Rate 1984/1985**
  - **1984: 14%**
  - **1985: 14%**

We reiterate that contrary to popular expectations, processing services are growing slightly faster than forecast.

One of the key things to examine in terms of change is that instead of regarding the service area as processing we regard it as processing network services.
As we have mentioned earlier in this presentaiton, computers are getting less important in the services aspect and the network is getting more important. This is reflected in the name change and what it is that customers are buying.

INPUT®

CHANGES FROM 1984 PROCESSING SERVICES

- Name Change
  - "Processing" to "Processing/ Network" Services

If we look at the change in the out year growth rates, we have accelerated the growth in 1985 from 13% in the 1984-1989 time period to 16% in the 1985 1990.
This is partially a result of the evidence of the company performances in 1984 and 1985 and also because we see this acceleration of vertical horizontal and specialized network services towards the end of the decade.
One competitive factor that affects us is the strong

CHANGES FROM 1984 PROCESSING SERVICES

- Growth Rate 1984/1989 versus 1985/1990
  - 1984: 13%
  - 1985: 16%

movement of the telephone companies, particularly the RBOC's and ATT into the network services environment, to the extent regulation allows them.

A landmark that occured in 1985 which achieved very little fanfare was that Automatic Data Processing became the first billion dollar independent information services company. An ADP does it in standard processing services. They have specialization in commercial services particularly payroll which continues to be their flagship service, but they are also very strong now in financial services and distribution. Far from their growth decelerating, ADP seems to be going from dtrength to strength.

Processing Services Success

Automatic Data Processing - The First $1 Billion Independent Information Services Company!

ADP emphasizes continuing revenues. They capture a client. They keep a client. Many information services companies in the last few years have moved from this concept of being a service company to being a product company and we believe that many of them have suffered as a result.

ADP concentrates on mainline applications, gut level applications that companies can't do without.

ADP is a focussed company and its a firm company. It is also an innovative company. A number of times its innovations do not turn out, but in

ADP - SERVICE COMPANY

- Continuing Revenue
- Mainline Applications
  - Payroll
  - Financial Services
  - Distribution
- Focused and Firm

which case it gets rid of them, but it is willing to take risks and particularly through the acquisition process has entered new markets over the last 10 years. However, the firmness comes in that if the market doesn't hold, doesn't run the product, doesn't take, then they get rid of it.

This area has grown very rapidly. It involves several aspects. The first is on-line data bases which are growing quite strongly and the second is the area of EDI EII. INPUT refers as EDI as electronic data interchange not electronic dcoument interchange. After all, when documents become totally electornic and are completely removed from human kin, will the EDI market disappear? The answer is obviously is not. This is data interchange that INPUT refers to.

INFORMATION DISTRIBUTION

- Data Bases
- EDI/EII

We alos refer to electronic information interchange. Information interchange is essentially unstructured communications between organizations. An example of a relationship between EDI and EII is the communications that surround a purchasing process. A company does not simply enter a purchase transaction into a network and expect delivery of that part in some period of time. No, in the purcashing process somebody gets on the telephone and contacts a group of potential suppliers to get price and availability information. Having got this information, a decision is then made and a purchase transaction is made, the EDI part of the activity. The company then has the problem of shipping the part from the supplier and which case they call transportation companies that can move the products, to get bids, and to get availability and timing. Having done that they then put in the authorization for the shipping transaction. Thus, there is a whole collection of information interchange between organization that leads to one transaction. What INPUT refers to as EII is the electronic process which relates to a specific EDI transaction. The unstrucutured and formal interchanges can also be documented electronically in the same manner that ~~they hav~~ now happens with notes and scraps of paper and handwritten annotations on existing purchase orders.

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When we examine the information services area in more detail we see the information based services, the data base services have companies that are growing in the 20%-30% range, These are companies like Quotron, Telerate, Dialog, and others. The growth has slowed somewhat in 1985 from the heady accerlation in 1984 but this reflects the more cost concience environment in 1985.

PROCESSING SERVICES
INFORMATION BASED SERVICES

- Companies Growing Steadily

  20-30% Range Typical

- Growth Has Slowed in 1985

INPUT continues to expect media transfer in this area which will affect the information based services. Data bases or information bases will continue to be transferred from paper format to electronic and from both paper and electronic to optical storage, CD Rolms. The CD Rolms will absolutely replace static data bases. This will not replace dynamic data bases. In fact, what INPUT expects is that CD Rolms will add to the information (elecronic) distribution market as opposed to simply replacing them. JUst as the electronic airline guide which D&B offered did not replace the paper based airline guide which executives and business people carry around, so neither will CD Rolms replace many of the data

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bases that are distributed electronically today, particulay those that deal in

PROCESSING SERVICES
INFORMATION BASED SERVICES

- **Expect Continued Media Transfer**
  - **Paper to Electronic**
  - **Paper/Electronic to Optical**
- **Additive Rather than Replacement**

the highly volitile information.
Just as with timesharing where standalone, repetitive problem solving went in-house under micros, so with data bases any standalone static data bases with local requirements will go into CD Rolms.
There will be a major market growing up for the distribution of CD Rolms.

There have been areas where there has been notable failures in information based services. In particular, for GTE and other companies, the medical data base area has not flowered. However, for Dialog, the medical data base area has been very successful.

Passive data bases, such as putting the New York Times up in large data bases generally have been unattractive. What people are looking for is specialized, insightful, organized data

PROCESSING SERVICES
INFORMATION BASED SERVICES
Notable Failures

- Medical Data Bases
- Passive Data Bases

bases where there is some value added as opposed to just masses of data or information.

Notable successes in the processing information based services area have been Quotron which has gone up against IBM, Merrill Lynch, and has not only survived but has done very well. Quotron we know continues to be an acquisition target.
Telerate continues to perform well. Telerate captures the financial executives desk. The use of technology through windows, etc., has put them in a preeminent position.

PROCESSING SERVICES
INFORMATION BASED SERVICES
Notable Successes

- Quotron versus IBM/ML
- Telerate
- D & B

D&B continues to accelerate its electronic delivery of information. We think' D&B is one of the great successes of the whole information industry in the way it has gone from a cash rich, low tech company 6 years ago to a cash rich high tech company today. Interestingly enough, this was done by management leadership, and example as opposed to working from the bottom up.

If we look at the second area of this information distribution environment, EDI, EII, we find that there are major opportunities not only for inter-industry services, but also for intra industry services. Some of these services have been provided in the past by associations such as American Railroad Assoication. In future, we see these opportunities spreading into other industries.
Furthermore, the whole EDI EII environment is international in scope. With expanding world trade and the increasing importance of saving time the need for this kind of service becomes

EDI/EII

- Inter/Intra Industry Information Services
- International Scope
- "Consolidation" is Intra-Company EDI
- "Electronic Mail" is EII

essential. After all, one cannot operate a just in time inventory system with wide distribution of suppliers through the mail or even in telex. A JIT system requires that you have EDI EII support.
The whole area of letters of credit, bills of lading, purchase orders, and financial transactions associated with international movement of goods will increasingly be supported by network services.
We have had EDI for many years. Consolidation such as that provided by companies like GEISCO to a bottling company is EDI. Electronic mail, such as that offered by ADP, GEISO, SPC, and others, also forms largely EII. Much electronic mail transaction is associated with the ordering process.

The EDI EII market will not only be a service market it will also be a hardware and software market.
The most developed markets in the true sense are in the banking and retail area where you have ATM switches which act as EDI networks and POS networks which support the relationship of retail and bankers. However, for our purposes we have excluded these particular specialized markets from a general EDI area.
The banking expertise in ~~banking~~ ATM switches and a POS networks raises the real question to what their role whould be in EDI.

INPUT®

EDI/EII

- Service Market
- Most Developed Markets
  - Banking (ATM Switches)
  - Banking/Retail (POS Networks)
- In-House Software Solutions

Banks such as First National Bank of Chicago have already staked out a strong position in EDI and we think this makes a lot of sense.
There are also going to be major oftware markets associated with individual industry and functional areas to hook into networks. The key question here is how much of the translation and interface capabilities goes into a network versus how much goes into software in a computer at an individual companies location.

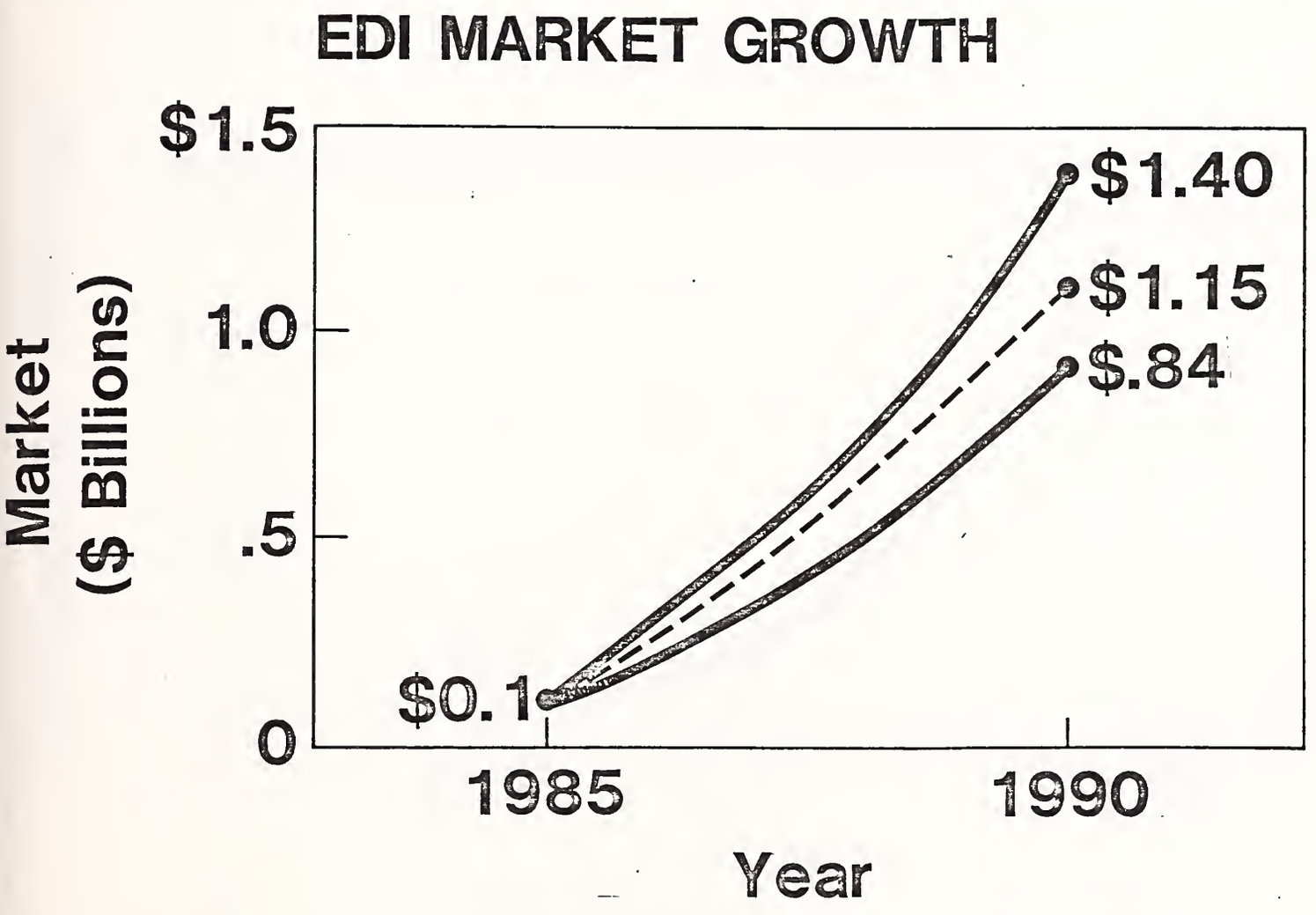
INPUT expects an explosive growth in services related to EDI, both for the standard value network environment where the network does a little more than provide the handshaking protocol interchange and other things that the value added networks do quite well all the way to the complete application involving computers and network. The market growth in dollar terms we feel is very difficult to range.

INPUT®

EDI

- Explosive Growth in Services
  - VAN
  - Network/Processing

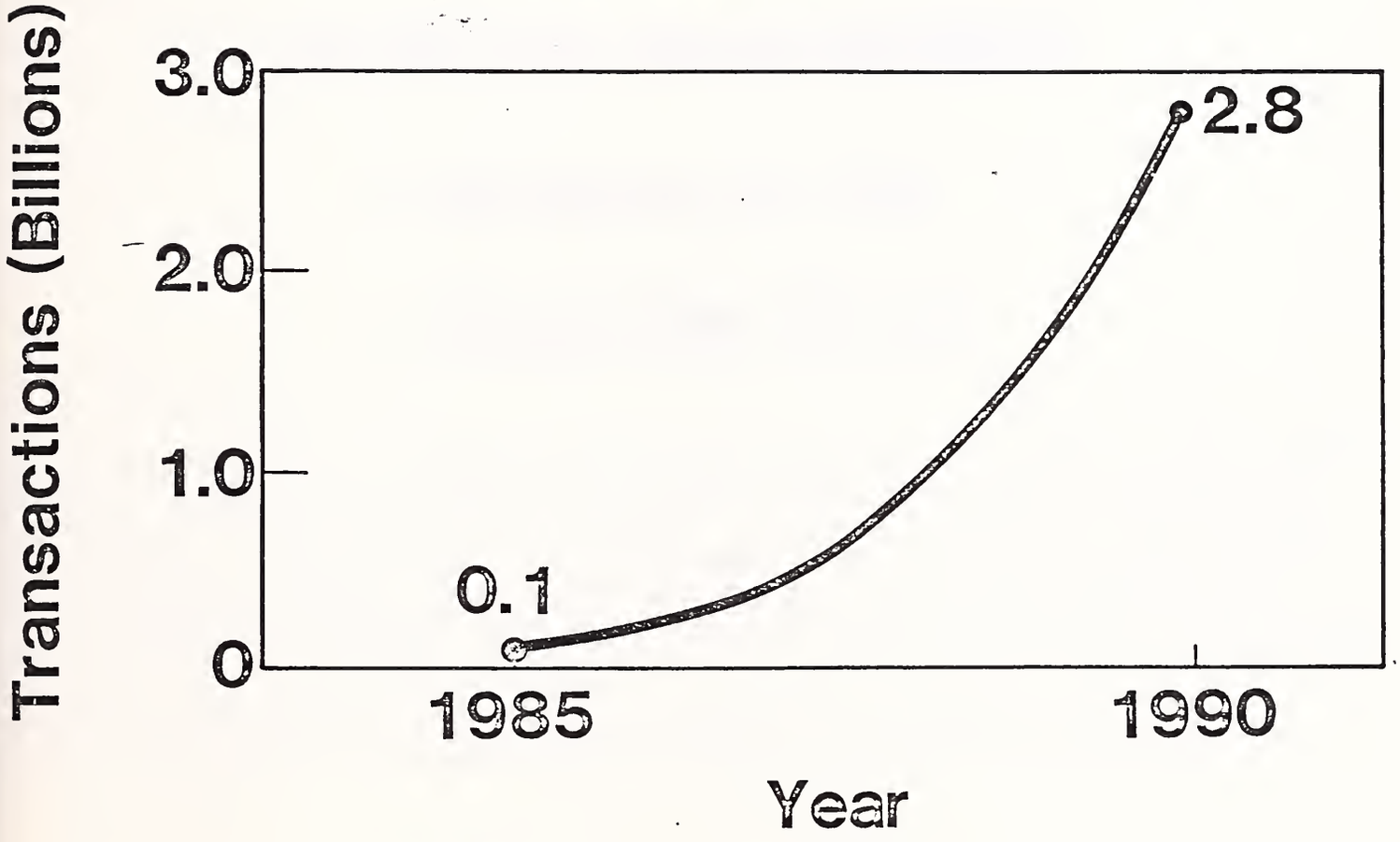
We feel user expenditures were about $100 million in 1985 but this will grow by a factor of 10 by 1990.



The range will be determined by a multiplicity of issues including the ability of our legal and accounting systems to adjust to the concept of electronic as opposed to paper transactions. The issue of standards raises its heads here, but often standards are imposed de facto on the industry. For example, GM telling its suppliers that this is the way you are going to do business with GM has a major impact on the whole infrastructure on the automobile supply business. In an area where standards are slow to develop, companies simply cannot afford to wait.

In terms of numbers of transactions we expect the transactions to flow through EDI processes and services to increase by a factor of 30 whereas the market will only increase by a factor of 10. The reason for this is that whereas it costs $2.00 a trasnaction today through an EDI service, by 1990 we expect that cost to reduce to about .50¢ per transaction.

EDI MARKET



Another area of processing services that is continuing to grow is that of facilities management. The number of vendors that offer these services are fairly limited but their performance, lead by EDS, has been fairly successful.
In future we expect to see systems integration contracts moving into facilities management. This is actually happened in the case of EDS and also now of Arthur Andersen.
Furthermore, we think there is a real opportunity to expand the scope of

FACILITIES MANAGEMENT

- SI Moving to FM
- Expanding Scope

facilities management. An example again would be EDS that is building a very strong manufacturing capability in association with GM. What EDS in future will be able to offer is not only the information systems that support a factory operation but actually will be able to offer facilities management of the factory itself. After all this is what happens in facitlities management in the federal government in terms of places like Goddards Space Flight Center, etc. The facilities become more than just the computer communications facilities and actually move into the functional facilties of the entity being manageed.
This is enormous market opportunity for companies such as EDS and IBM. This is a long term opportunity not in the next 2-3 years but in the next 20-30 years.

Value added network services will continue to grow, although not as rapidly as many have forecasts. What is happening is that although traffic is increasing for value added network services, price pressures are keeping the market growth down. We expect to see price pressures for commodity types of value added network services actually increasing over the next several years. As INPUT has forecasts the specialized network services area is where most profitable growth will occur.

INPUT®

NETWORK SERVICES

- VANS
- Voice Services

In addition to data and message network services, voice network services are beginning to emerge. Not only are corporations putting in-house voice message systems based on products like VMX and ATT's lines, but service comapnies are also starting to emerge such as VoiceCom in San Francisco. These voice services companies not only allow inter change off information within an organization but also interchange across organizations. INPUT expects the voice services market to grow dramatically and this to be supported by technology changes in the storage and processing of voice, particularly in future as it becomes attached to other transaction media such as paper and electronic data interchange.

We find that the basic applications such as accounting, payroll, etc., there is a move by services companies from the traditional batch and remote batch activities to integrated applications which involve computers at the user sites connected through a network to computers at the vendor site.

We also see the concept by companies such as ADP of offering computer hardware, and software at a customers site on a service basis as opposed

BASIC APPLICATIONS GROWTH METHODS

- User Site Hardware Services

- "Turnkey System" → "Service"

to a systems basis or product basis where it it delivered "abandoned!" This concept of the turnkey service where the storage is removed from the vendor site to the customer site, yet the function or application supported is on a service basis, i.e., month to month payment process is being lead by ADP.

Industry specific services continue to expand, particularly in the finance and banking area with electronic banking. The whole area of networks supporting ATM's, POS, and ACH services in increasingly important. Added to this are the credit card and credit processing areas. Health, medical industry is dramatically affected by changes in government regulation and increased cost conciencness here and control of Ford is driving the service need. In the distribution and trade area, international movement of goods, and the need to support just in time systems is drving the EDI market as we have

seen earlier.

INDUSTRY-SPECIFIC SERVICES

- Finance and Banking
- Health/Medical
- Distribution/Trade

We should also not forget basic resources in utilities.
We regard value added network as being largely resource of commodity
kind of services and they are growing. In addition, COM services are growing.
They are not growing as fast as in the past, and they may well be very strongly
impacted by CD Rolm activities in the next several years, but never the less the
whole concept of COM service has continued to be viable.

In addition, new areas are emerging such as laser printing.

INPUT®

RESOURCE/UTILITY SERVICES

- VANs
- COM
- Laser Printing
- Data Entry
- Large-Scale Processing/Networks

Some of the fastest growing service areas are based on organizations procuring
the largest, fastest, most expensive laser printing devices then selling services
based on that to organizations that cannot afford to procure or manage such
a system themselves. This obviously is very much a commodity, timesharing like
business at one extent where many organizations are sharing a large device or system.
However, at the other level it becomes very highly specialized and value added
where the printing service gets into direct mail services integrating computer
printed documents with mail lists and even handle cash returns and orders by voice
service or through the mail. Thus, there is whole spectrum associated with
laser printing from low value added commodity services to a very high value added
specialized services.
In the data entry area, there are service bureaus starting which will convert large
paper based files or "data bases" to electronic format using new readers. This is
another commodity business that simply replaces the old key punching business.
There is also a market for large-scale processing networks. Companies like Litton
Computer Services are building a effective business simply by getting the latest
IBM operating systems and software connecting it with the latest IBM network technologi
putting it all together and making it work. It is not an easy trick to operate
a multihost environment using MVS operating systems under VM connecting with remote
hosts under SNA. Fuel organizations can make such networks work effectively
and continuously without breakdown and therefore there is a market for those
organizations that can provide that very basic utility service. The value added is
making it work.

Timesharing is still around to a certain extent. Most of the shrinkage has gone. In fact, we find some situation where companies have taken applications off timesharing onto micro computers for a year or so, find that chaos abounds and have gone back to their services vendor to process the application. This tends to be more complex application that require connectivity rather than just a standalone, single person problem solving area. Never the less it is still happening It is instructive to note that organizations such as Comshare which has gone through a major change in direction still have a large part of their business coming from remote computing services, largely

timesharing. This business is extremely profitable and is a very ~~profit~~ postitive cash generator and can lead to future applications expansion,

"TIMESHARING" STILL AROUND MOST SHRINKAGE GONE

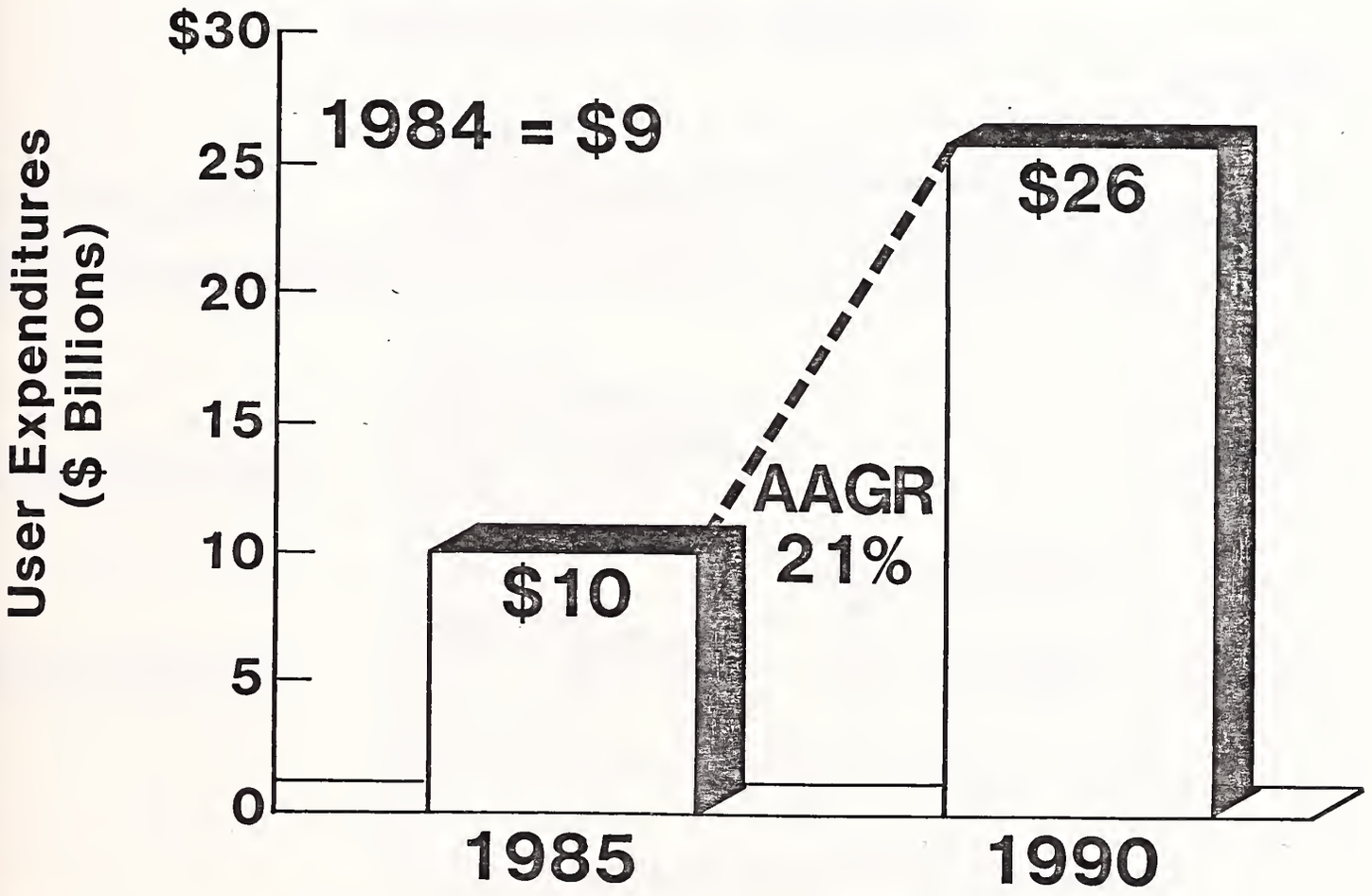
What is happening is that the service offered by these companies are changing from a direction oriented to single site general kinds of applications to multi site applications which are complex specific to a particular industry or functional area and where connectivity is important.

DIRECTION

Single Site		Multi-Site
Simple	→	Complex
General		Specific

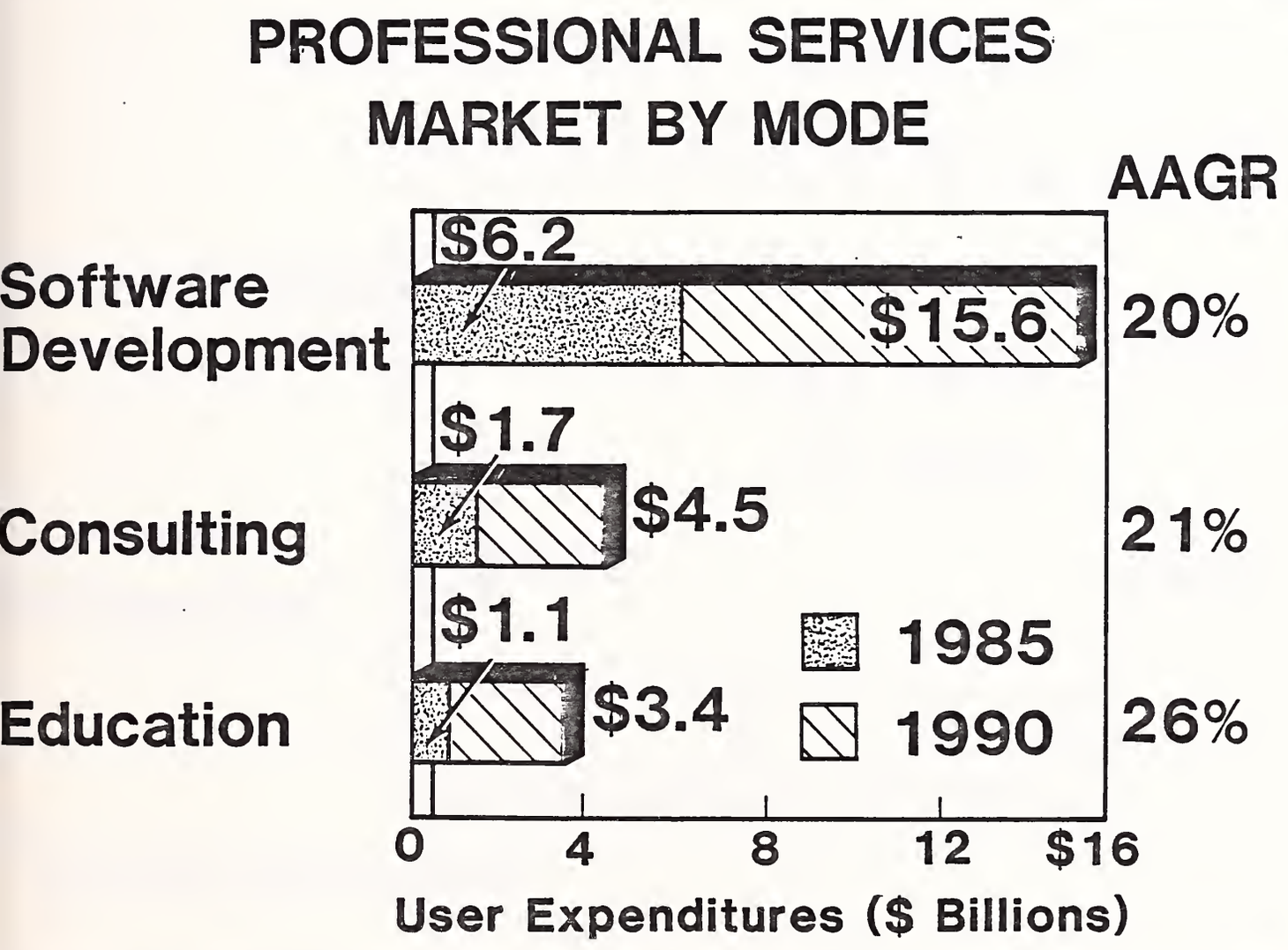
The professional services market. INPUT's forecasts for a 21% growth rate for professional services may well be an understatement of the market growth for several reasons. One is that there are hidden price increases from professional services companies in the sense they are moving relatively inexpensive people that have generic capabilities to being specialized by industry or function. For example, the transfer of a cobol programmer with 5 years experience into a banking software development specialist with 6 years experience can move a billing rate from $500.00 a day to $1,500/day. Another reason for our potentially underestimate of the growth rate is that the

PROFESSIONAL SERVICES MARKET



demand for all kinds of services due to unavailability of internal resources will increase. The pool of people from whom vendors and users can draw from is not increasingly as rapidly as the demand, hence this will put some pressure on the supply and supplier will tend to gravitate to the place where he gets the maximum reward which will tend to be in the professional services environment.

When we examine the professional services market by mode we see that the largest mode of software development, it is still largely a provision of bodies. This is changing and of the $16 billion in 1990 we would expect that a largest segmment was the provision of applications related services. Quite often this software development process will involve application products or specialize development methodologies. The software development market we feel is limited by the availability of people and the ability of organizations to hire, train, and retain the people necessary



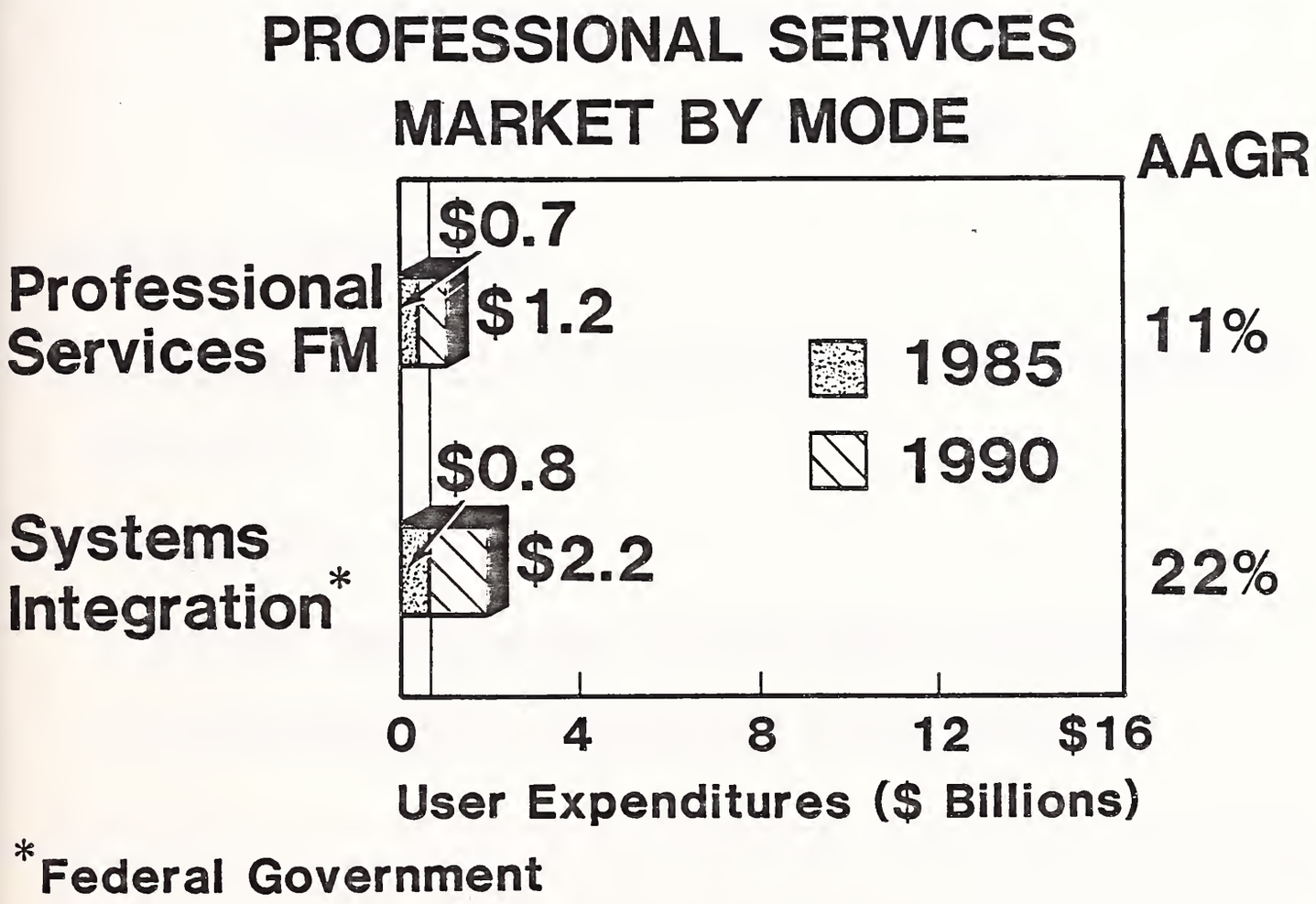
to perform the work.

The consulting business, particularly in specialized areas could grow as rapidly as 30%. The problem is that the credibility of some of the consultants suffers because of potential vested interest. To this point, many ~~eomompn~~ companies have either been consulting companies or software development organizations. We feel this will break down in future as more the software development companies build the expertise that is necessary to enable them to perform true consulting functions. After all, this was a major reason for the success of companies such as EDS was their ability in the early years to provide consulting to organizations separate from their software development and operations business. This separation was somewhat of a Chinese war.

Education and training will grow very rapidly simply because of the numbers of people that have to be trained in computer systems and concepts as the information systems business moves out into the user environment the number of people exposed increases and therefore the demand for training and educ. increases. INPUT defines education as ~~t~~ teaching people what they can do with something and train

The other two modes of professional services, facilities management we have as the slowest growing area. This is where companies put in professional managers into a in-house organization to run that organization. The vendor does not take responsbilitiy or ownership of the hardware. This business is traditionally being fairly slow growing except in the federal government environment. Recently companies like EDS have had great success in moving into troubled organizations and taking over responsibility. EDS has contracted with Triology and more recently a division of Union Carbide to provide generic professional services and facilities

management. In EDS case they have also negotiated on the ownership of equipment issues so tha



these services may eventually more properly fall under processing services. The final market is systems integration. The numbers given here are only for the federal government systems integration market and only for the professional services componenet of it. They do not include the hardware that are associated with these contracts. Typically the amount of hardware, network, and other things associated with a systems integration contract can result in the end value of the contract being 5 times the amount of the initial professional services business. The commercial numbers are not included here although INPUT now has them. We forecast that $100 million or so of professional services in the ~~integration~~ systems integration business will grow to be well over $500 million by 1990 which would be consistent with a total level of business of about $200 billion in that timeframe.

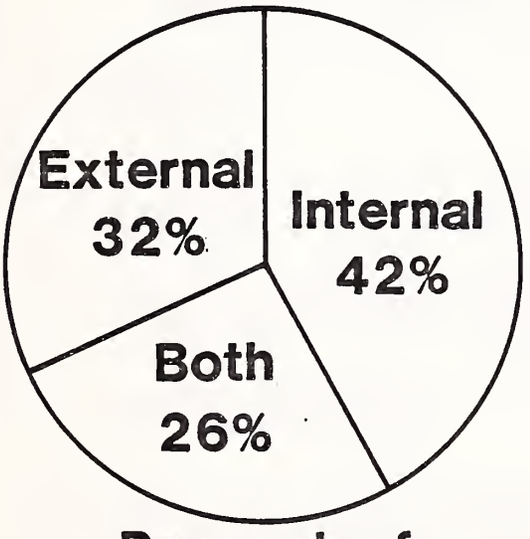
Changes in 1984 have been relatively minor in terms of our forecast of the market. For reasons already mentioned, we feel there is a potential understatement of the market growth because of price increases and commercial systems integration. In examining professional services and its forecast it is important INPUT believes to look at what the basic demand is. To that end, in 1985 INPUT examined IS executives as to their applications requirements and their source of development. The group of organizations which were most responsive to the use of outside sources for the development of software were the

CHANGES FROM 1984 PROFESSIONAL SERVICES

- Minor Changes
- Potential Understatement of the Market Growth
- Reasons
  - Price Increases from Specialization
  - Commercial Systems Integration

banking and financial organizations. INPUT believes this reflects the tremendous pressure of time under which most banking and finance organizations are operating. Only 40% of the applications according to the respondents would be developed purely internally. One-third of the applications would come entirely from the outside. This external source includes both software products and professional services.

BANKING AND FINANCE
SOURCE OF DEVELOPMENT - 1985



Percent of Responses

Cost Range

$15K - $4.5M

Perhaps most important is when asking executives to rank their most important new applications in 1985, most people are stunned to find that the most importan new application ranked in the banking and finance industry was the demand deposit accounting. We have been developing DDA systems for 20 years: there are numbers of DDA packages on the market today and yet the most important new application was DDA and the second most important was the loan application area. The reason for the demand of basic application is the fundamental change in banking that is going on today from a functional orientation to customer

BANKING AND FINANCE MOST IMPORTANT NEW APPLICATIONS - 1985

- DDA
- Loan Applications
- Data Base Management and Query
- ATM/POS
- Customer Information

orientation. Many banks are finding their basic systems architecture does not support this new environment. Recently we spoke with a chief operation officer of one of the largets banks in the country that mentioned they were taking loans that could not be processed through their existing system because the loan types that are prevelent today simply could not be handled by the structure of the applications that they were currently running.

If organizations such as banks are going to change their basic architecture then the basic application such as demand deposit accounting and loan accounting have to be the first ones to change.

In process manufacturing we find that the typical organization does development internally. These are the oil companies and the large chemical companies that have tended not to use external sources of development as much as certainly the banking and finance industry. The size of the applications is fairly large in process manufacturing.

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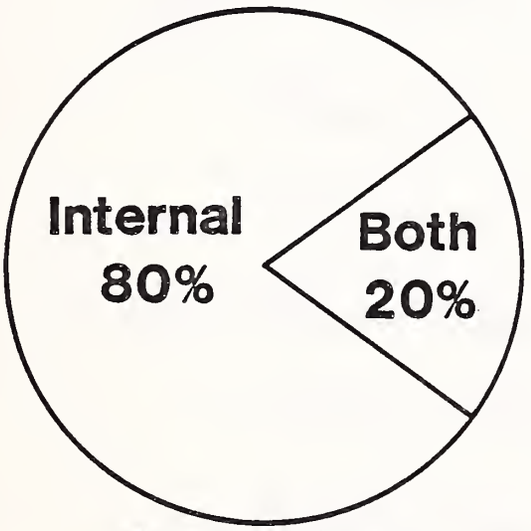
PROCESS MANUFACTURING SOURCE OF DEVELOPMENT - 1985



Percent of Responses

Cost Range

$1.5K - $2M

When you ask the process manufacturing organization what are your most important new applications in 1985? Finance and accounting emerge as #1 and then the basic gut level operations areas of process control and inventory control were the next two. With this kind of ranking of gut level applications, we can see that INPUT statement that 90% of the installed base of software in the U.S. in obsolete is reasonably accurate. Of note here is the emergence of one new area of application and that is of office systems. It is not clear that respondents typically know what is meant by office systems at this point except that they are a form of end user support and are now to be reckoned with. Largely we believe this includes the use of electronic mail, desk top publishing and similar kinds

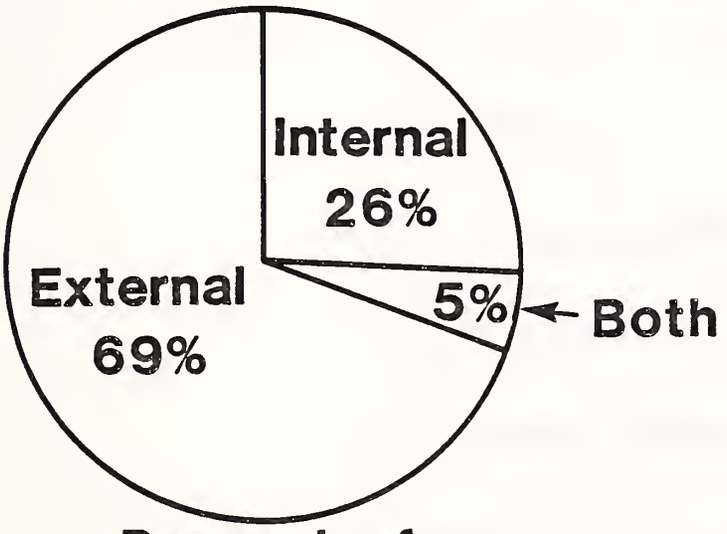
PROCESS MANUFACTURING MOST IMPORTANT NEW APPLICATIONS - 1985

- Finance and Accounting
- Process Control
- Inventory
- Office Systems
- Materials Management

of activities. Another group of companies, albeit small, that had a very propensity to use external sources were the transportation companies; in this case motor freight.

Their usual source of applications was software packages.

TRANSPORTATION
SOURCE OF DEVELOPMENT - 1985



Cost Range

$25K - $120K

Again, when you ask them what are the applications areas most in demand, finance ranks #1 and here office systems ranks #2. Systems software here is not computer systems software, but software related to the transportation ststem.

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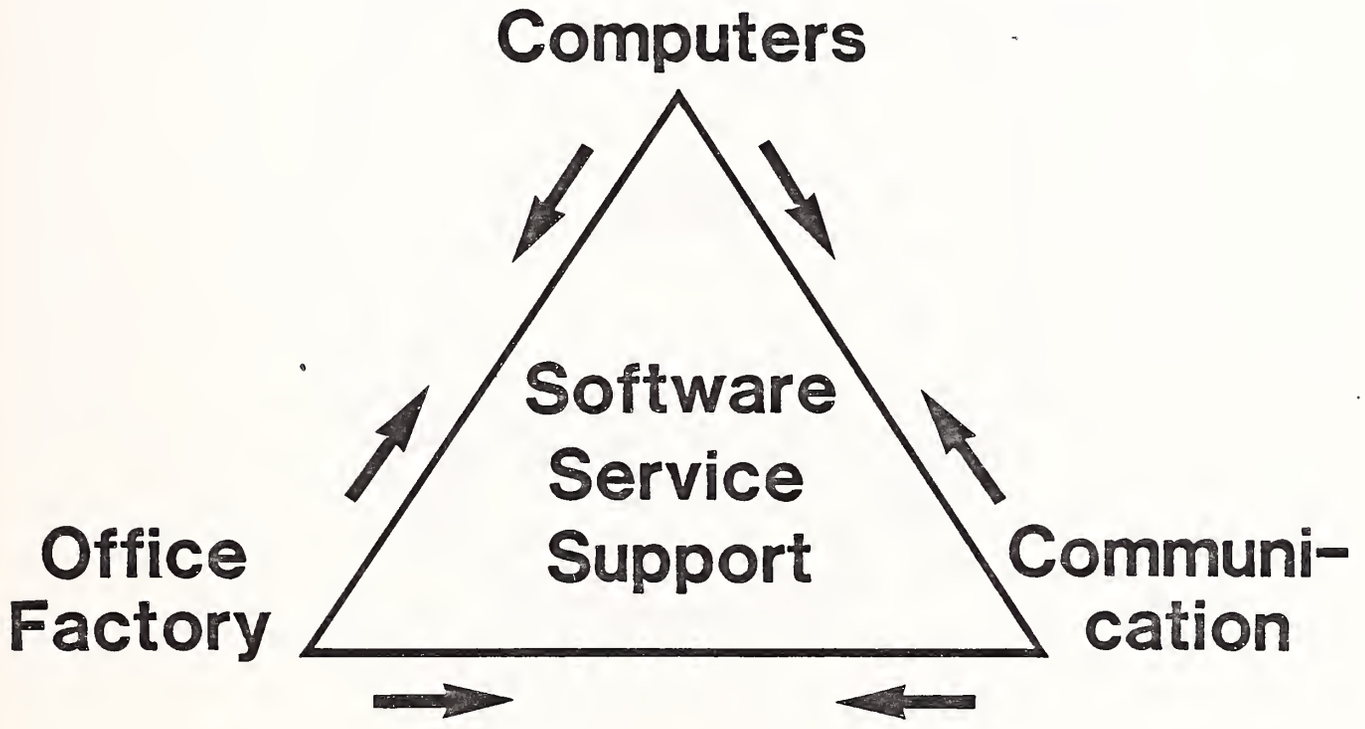
TRANSPORTATION MOST IMPORTANT NEW APPLICATIONS - 1985

- Finance
- Office Systems
- Systems Software
- Human Resources
- Truck Licensing

44 MAP5

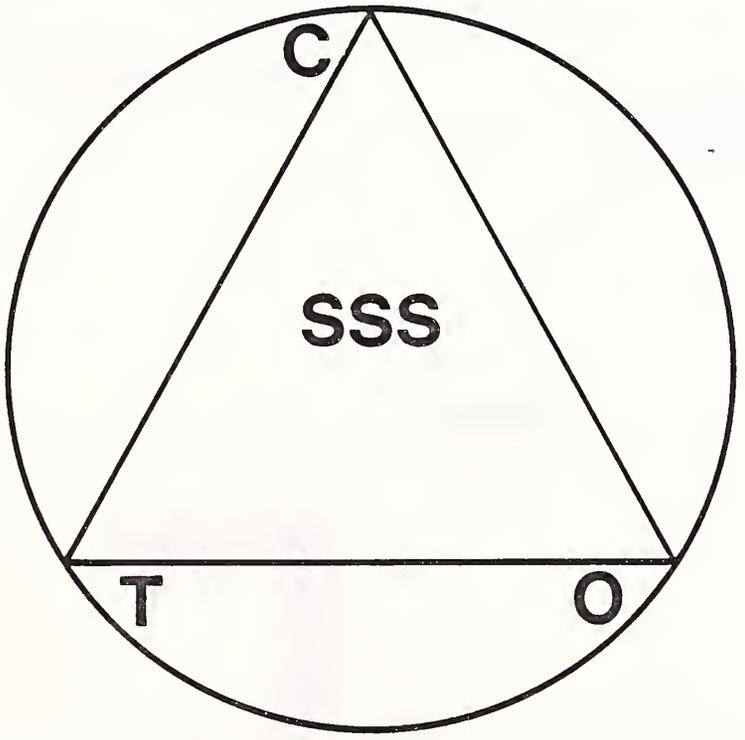
As we mentioned earlier, one of the major problems today in this industry is complexity. Computers, the office, the factory, communications all trying to be pulled together with software service and support in the center. This is the problem that users have to deal with but it is also the opportunity.

PROBLEM - COMPLEXITY



We feel yhr opportunity for services companies is to draw a circle around the computers, office systems, factory systems, communications, software services support and integrate these together into solutions for customers.

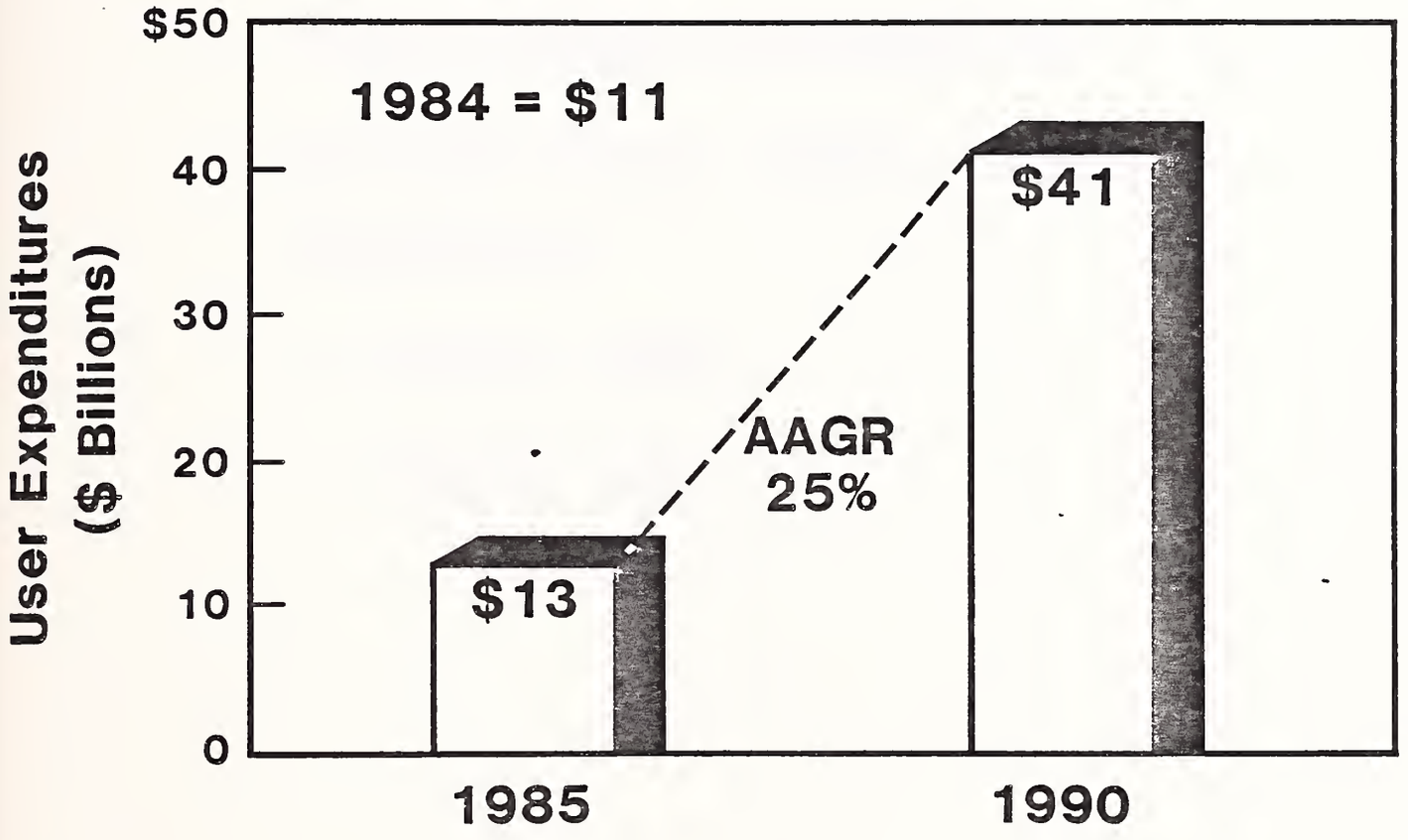
OPPORTUNITY - INTEGRATION



The bloom is off the rose in the software products market in 1985 where the growth has declined to approxiamtely 20%. However, INPUT expects this growth will rebound an average about 25% over the next 5 years. Each year that INPUT develops this forecast over the next 5 years the growth rate will decline substantially and will show the reasons for this in a few charts.

INPUT feels this forecast is volitile. This is a much lower probability than the professional services or the processing services forecasts. There are many factors affecting the software products market

SOFTWARE PRODUCTS MARKET



today, not only at the micro level but right through the industry. These factors can seriously impact the growth of the market.

Ih 1984 we had expected the growth rate from 1984 to 1985 to be 33% whereas in fact it has turned out to be more like 20%. INPUT generated this number about 6 months ago for 1985 and it looks as though it has held up pretty well.

CHANGES FROM 1984 SOFTWARE PRODUCTS

- Growth Rate 1984/1985 Reduced
  - 1984: 33%
  - 1985: 20%

What are the reasons for changes? Number 1 is the slowdown in the computer. This slwdown was greater than INPUT had expected and was partially due to the slowdown in the economy but also to the fact that was mentioned previously.
A second contributing factor is severe problems that virtually all software companies have had in delivering the products they promised in the timeframe they promised them at the price users expected. Software ocmpanies have gone bankrupt in the last year because of their inability to deliver their products as promised on time.

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CHANGES FROM 1984 SOFTWARE PRODUCTS

- Reasons
  1. Industry Slowdown
  2. Product Problems
  3. Lower Inflation
  4. Heavy Micro Impact

This has affected the propensity of users to buy. Many of them are concerned that they have spent money on products or have invested in a direction where the outside vendor could not then deliver. This is then made it a lot easier for in-house representations to win in more cases than in the past.
There is a very small inpact of the lower inflation rate on the growth rate. INPUT was expecting an inflation rate of 6% of over the next 5 years are a reduction in inflation expectations also means the market growth less rapidly because of the lack of price increase.

There was a heavy micro impact in 1985. Although INPUT had projected there would be slowdown in the micro computer market it was slightly more extension than INPUT had expecte
Also heavy price discounting was much heavier than expected which impacted the market.

Other changes relate to the growth rate from 1984-1989 versus 1985-1990. As INPUT mentioned previosuly, the growth rate each year will decline because of the size of the market.

CHANGES FROM 1984 SOFTWARE PRODUCTS

- Growth Rate 1984/1989 versus 1985/1990
  - 1984: 31%
  - 1985: 25%

As the market gets to $30-40 billion for software per year, growing a $40 billion market at 25% means another $10 billion of software has to be sold in that year. INPUT does not believe that the distribution and support channels exist today and can exist at that timeframe to support that kind of growth. As we see later we believe there is an inability of user organizations to absorb software delivered at that rate. This implementation bottleneck will have an increasing impact on the industry and is probably the limiting factor on its growth.

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CHANGES FROM 1984 SOFTWARE PRODUCTS

Reasons

1. Sheer Size of Market in 1989/1990

2. Acceleration of Drive to Recurring Revenue

3. Implementation Bottleneck

4. Reduced Inflation

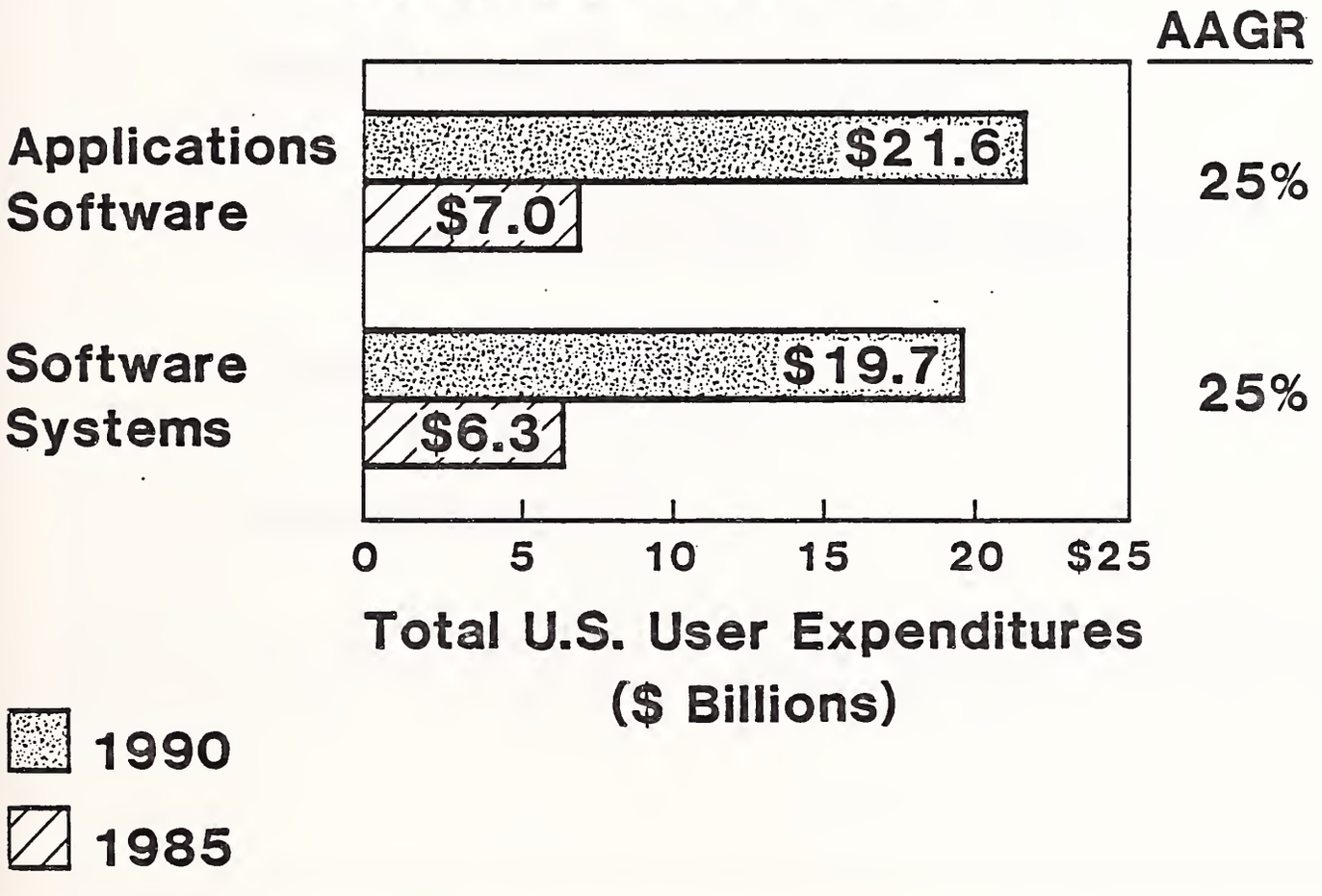
Another reasons to slow the growth of the market is that many software vendors are desparately trying to move their sale from product orientation to service orientation. They want to change from the front end hit to the recurring revenue. It is a lot easier to manage when you are in that situation. Of course, changing from a front end sale to a recurring revenue base actually does slow your revenue growth in the years in which you are doing that. It psuhes out our revenue stream but in the short term it can reduce the growth rates.

When contrasting applications and systems software INPUT predicts about the same level of growth. We feel that

When contrasting applications and systems software INPUT predicts about the same level of growth. We feel that the applications software projection is possibly too optimistic because of the problems of applications vendors and of the implementation bottleneck whereas the systems software projections may be too conservative because of the way the computer manufacturer are increasingly driving into the software environment. New methods of pricing and control of the software environment by manufacturers are evident. We have seen forecasts by competitors that say the total software market will be $70 billion in 1990 and IBM will be $50 billion. We think these numbers

SOFTWARE PRODUCTS MARKETS

~~LONG-TERM OUTLOOK REMAINS POSITIVE~~



are fairly ludicrous. These forecasts are makeable, but again in the applications area possibly a little optimistic.

The positive forces of software growth are just the increase in the base of computer hardware not only in terms of mainframes but in terms of workstations, departmental systems, factory systems, office systems, information center systems, etv. Each one of these systems is a potential software site and will be targetted by vendors. Another positive factor is the recognition of software as a competitive edge. ~~and applications-of-a-compe~~
Companies having recognized that need systems or want to get them fast and will be willing to buy in order to achieve that objective.
Standardization of software interfaces and software environments

INPUT®

POSITIVE FORCES

- Hardware Base Increase
- "Competitive Edge" Recognition
- Standardization
- New Markets

will also help the growth of the market. There will also be a contiuning emrgence of new markets, such as the one for departmental software and software related communications and voice activities. Whole new sets of data base management systems, for example, are emerging to deal new requirements.

Some of the negative forces that affect the industry are the absorption bottleneck that has been mentioned previously and the credibility of a number of vendors because of their inability to deliver. Also, micro-mainframe confusion is slowing things down as is pricing of software in a micro mainframe world. Increasingly buyers are resisting the purchase of multiple copies at full or close to full prices. They want the ability to distribute software without an incremental cost. After all, Lotus 1,2,3 is in many companies the most expensive software product that they have ever bought. Yet it only costs a few hundred dollars per unit.

NEGATIVE FORCES

- Absorption Bottleneck
- System Failures - Credibility
- Micro-Mainframe Confusion

When we look at the next chart 117 and the changes in 1984 as far as applications software products growth is concerned, the reduction has been from 34% to 21%, and this was due to the reasons mentioned previously.

CHANGES FROM 1984 SOFTWARE PRODUCTS

- Applications Software 1984/1985 Growth
  - 1984: 34%
  - 1985: 21%

The prime reason for the systems software drop was that the numbers of computers sold as information centers declined as did the PC's thus the opportunities for systems software sold in association with the boxes declined. This market will continue to be governed heavily by new installs of hardware. A significant part of this market is due to continuing revenues from the computer manufacturers as opposed to front end sales.

CHANGES FROM 1984 SOFTWARE PRODUCTS

- Systems Software 1984/1985 Growth
  - 1984: 31%
  - 1985: 19%

When examining the gorwth rates over the longer terms we can see the application software market growth rate is declined a little bit more steeply than systems software and we would expect this to continue. It may well be that systems software growth rate will accelerate a little bit more over the next several years.

CHANGES FROM 1984 SOFTWARE PRODUCTS

- Systems Software 1984/1989 versus 1985/1990
  - 1984: 29%
  - 1985: 25%
- Applications Software 1984/1989 versus 1985/1990
  - 1984: 31%
  - 1985: 25%

In the micro area there has been a relatively strong micro software growth compared to what one would of expected given the state of the industry. Again contrary to popular opinion the micro software market is not in a complete shamble. Users are still buying micro software. Replacement software is now moving in to play. Very particularly, the whole area of industry specific applications is beginning to emerge. Much of the growth here will be on a very small base but it will occur farily dramatically over the next 5 years,

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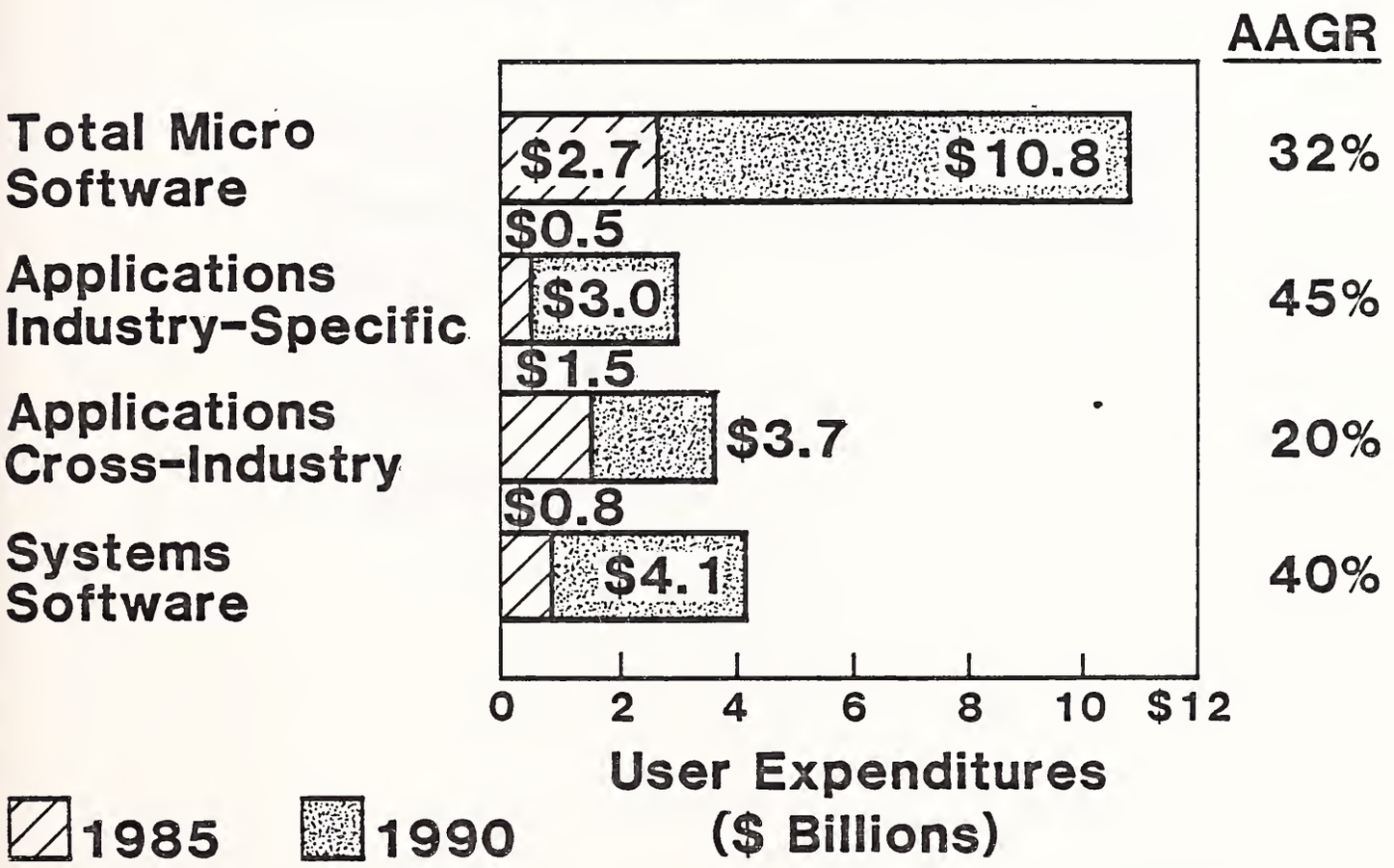
STRONG MICRO SOFTWARE MARKET 1985-1990



INPUT expects much of the software to be sold in a standalone mode but to correspond with the micro LAN environments mentioned previosuly. Thus, micro software will be delivered to work on a file server of a host micro or distributed to users workstations over a LAN.

We reduced the market forecast substantially. Although INPUT had expected a slowdown in the delivery of personal computers themselves, we had not recognized to the fullest extent very strong link between delivery of product of both the hardware and software nature. We had expected that their software market would continue to grow because of delivery of add-on software to existing installations. Although this did occur, it did not occur as a rapid rate as we had expected.

INPUT®

CHANGES FROM 1984 MICRO SOFTWARE PRODUCTS

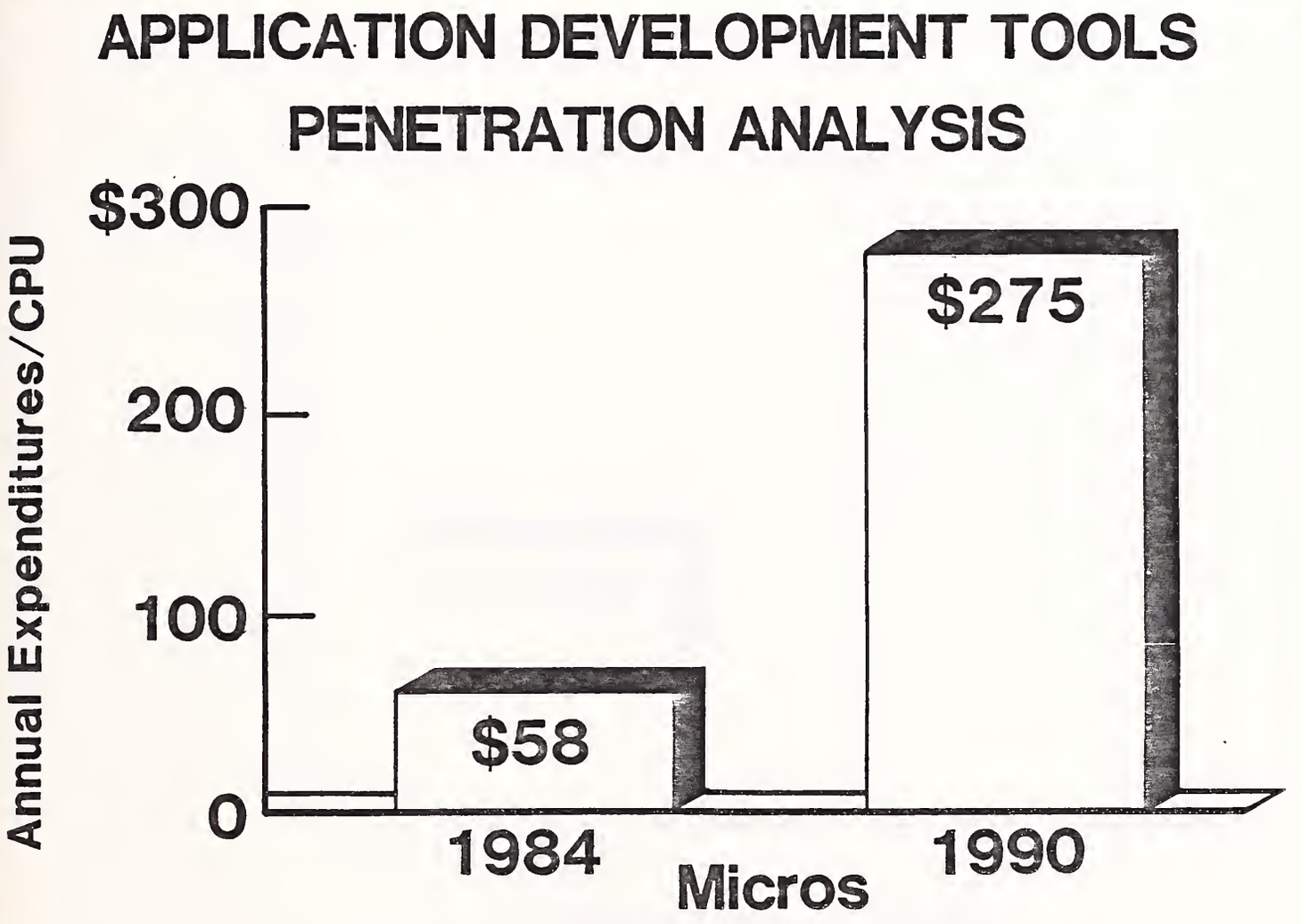
- Cross-Industry Applications Growth 1984/1989 versus 1985/1990
  - 1984: 41%
  - 1985: 20%

As a continuation from this the commodity pricing and site licensing impacts were minimal in 1985 but they were there and will begin to have a much bigger effect in 1986 and beyond.
~~The-market-sti~~

CHANGES FROM 1984 MICRO SOFTWARE PRODUCTS

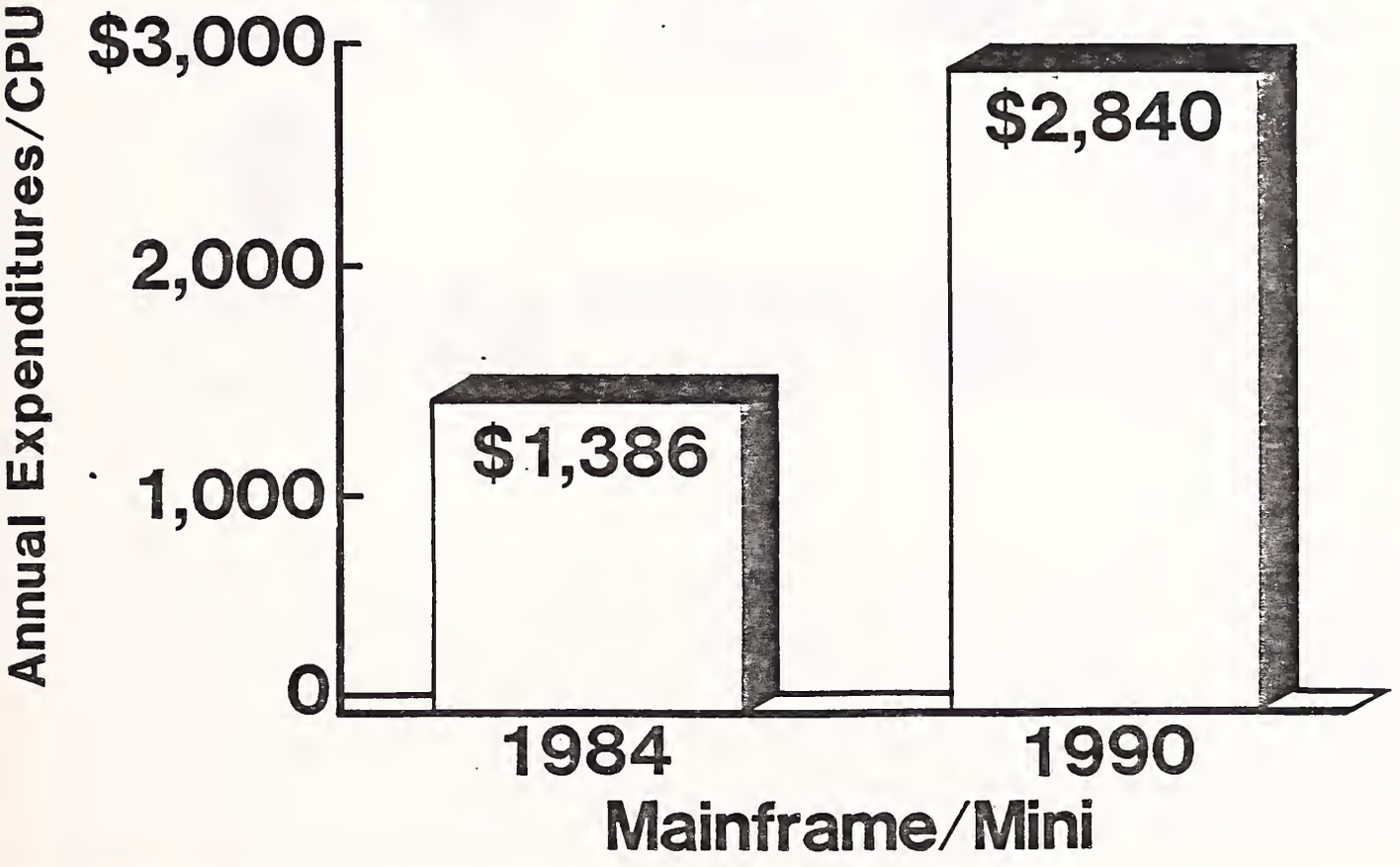
- Reasons
  - Reduction in Installed Base Forecasts
  - Pricing Impacts
    - "Commodity" Pricing
    - Site Licensing

The market still exists and is going to grow. The amount of dollars spent per micro for application development tools in 1984 was only $60.00 a year whereas we expect that to go to over $250 per year by 1990. Similarly in the mainframe area, expenditures for applications development tools will more than double. This does not mean that tools will be twice as expensive. It means tools will be half as expensive, simply that users will have manymore



tools in order to achieve their objectives.
This is true since individual users are going to have some say in the kind of development methodologies that they use. The potential lies here from the information systems managers viewpoint for chaos. Where every group is using a different set of tools, no software is compatible, and there is not adequate support for the tools that are being used.
INPUT is strongly recommending to the user organizations that they do not allow proliferation and multiplicity of tools within their organization because of the control and interconnection problems that will then result.

APPLICATION DEVELOPMENT TOOLS PENETRATION ANALYSIS



In the software area in 1985, we feel many companies suffered from what we called a vicious cycle. They had poor growth in 1985 as they perceived it compared to previous years, although it is a sign of the industry when we regard growth rates of 15% and 20% as being "poor". As a result of what happened in 1985, sales managers tried to stimulate the market by reducing prices. There were many price reductions and deals being offered by vendors in 1985. Often they perceived these price cuts would force decisions whereas they did not recognize that the reasons for their slow decision making progress had nothing

to do with pricing, nor even with the nature of the product. It had everything to do with the change in the buying process we mentioned earlier. The complexity of the issues being addressed and the abilities of the companies to spend the money. As a result in reducing prices, markets shrank in many companies. Starting off in the beginning of 1985 many companies as a result had to reduce their cost and they did it by cutting R&D. They also cut their marketing costs. They did not cut their sales costs. In some companies they increased their sales costs by giving special incentives, bonuses, hiring more salespeople in attempt to push the "limp noodle." The long term result of cuts in R&D and marketing will be a lack of product in these companies which will feed back into poor growth.

What was needed last year was rather than price reductions was price increases. Those companies that had made decisions were largely going to buy the software they decided on in any event. With all the vendors running around making price reductions they got into a pricing war, spiral, which hurt them all.
Their poor decision making in this area resulted from a lack of understanding of what was going on. It was notable that the one software company that increased its prices last year to our knowledge was IBM. A number of companies did increase their prices for maintenance. Comapnies increased prices from 10% of purchase price of 15%: that is a 50% price increase and not a 5% price increase.

The software products trends that INPUT perceives are that they're are going to be continued major changes in the purchasing environment. We expect task teams to be prevelant in the purcashing decision and such decisions will be centralized rather than decentralized even for micro systems.

INPUT®

SOFTWARE PRODUCTS TRENDS

- Purchasing Changes
  - Centralized
  - Task-Team

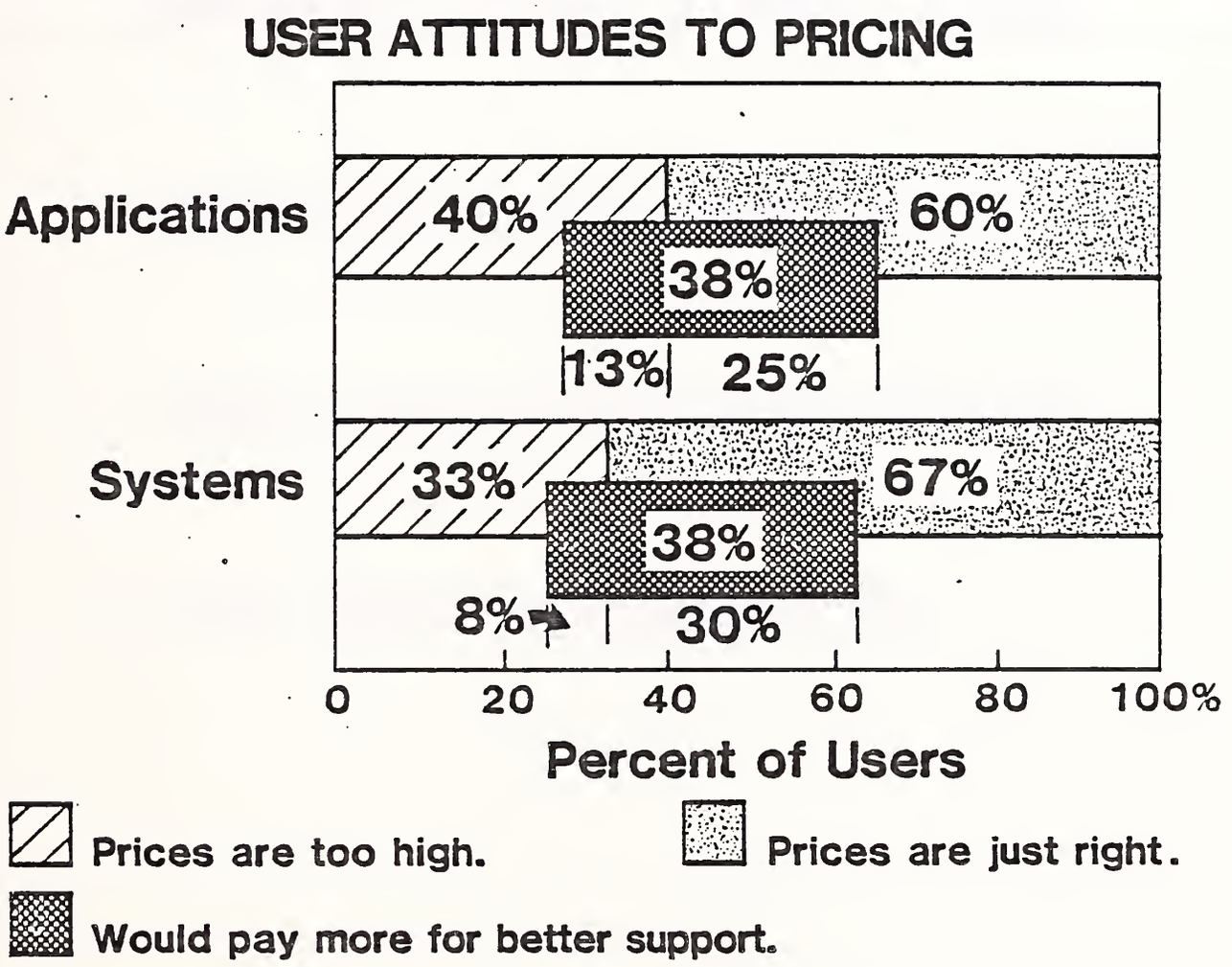
We also expect very significant changes in the pricing methods and amounts. We can expect innovative pricing by manufacturers, even including meter charging. We also find a variety of amounts charged for the same software product because of special deals, connections, etc. Pricing is going to become a much more centralized and important function in any software company. It is vital that senior management pays attention to these pricing issues and not pushes them down into a relatively low level marketing function. Pricing is of paramount important in 1986 and beyond.

INPUT®

SOFTWARE PRODUCTS TRENDS

- Pricing Changes
  - Methods
  - Amounts

When we tested user attitudes to pricing we have found that software is being underpriced. This chart shows only 40% of applications software purchasers thought the price was too high. We should remember here that these were software purchasers, i.e., they had already purchased the software. Ideally we would like to have 60% or 70% of users thinking that the price was too high. We don't users thinking they have been gouged but you do want them to think they are paying for value. Nobody ever reports prices are too low, by definition but many users would be quite happy to pay more of what it is



they are getting. In fact, we when investigated whether companies (buyers) in one specific are would pay more we found that 38% of the respondents felt they would pay more for better support, including companies that thought the prices were too high in the first place.

We do feel that the market structure will change substantially by 1990. In 1990, 20% of the revenues will come from on-going maintenance for products that were sold before 1990. 40% of the market will come from lease payments on a month-to-month basis from computer manufacturers and independents. The other 40% will come from new procurements bought in 1990 at various size levels. ~~These new procurement~~

MARKET STRUCTURE - 1990

- 20% Maintenance Revenues
- 40% Lease (Month-to-Month)
- 40% New Procurements

These new procurements will be divided 80% on month-to-month payment systems and 20% on front-end payments.
Thus, only 8% of the 1990 will come from new outright sales.

NEW PROCUREMENTS - 1990

- 80% Month-to-Month Payment Systems
- 20% Front-End Payment

We feel that the whole hardware/software environment is changing over the next 5 years and this is something of fundamental importance to software and services vendors.

Before 1985 applications software existed within an applications softwar environment which in turn existed within an operating software environment which in turn was dependent on a set of hardware.

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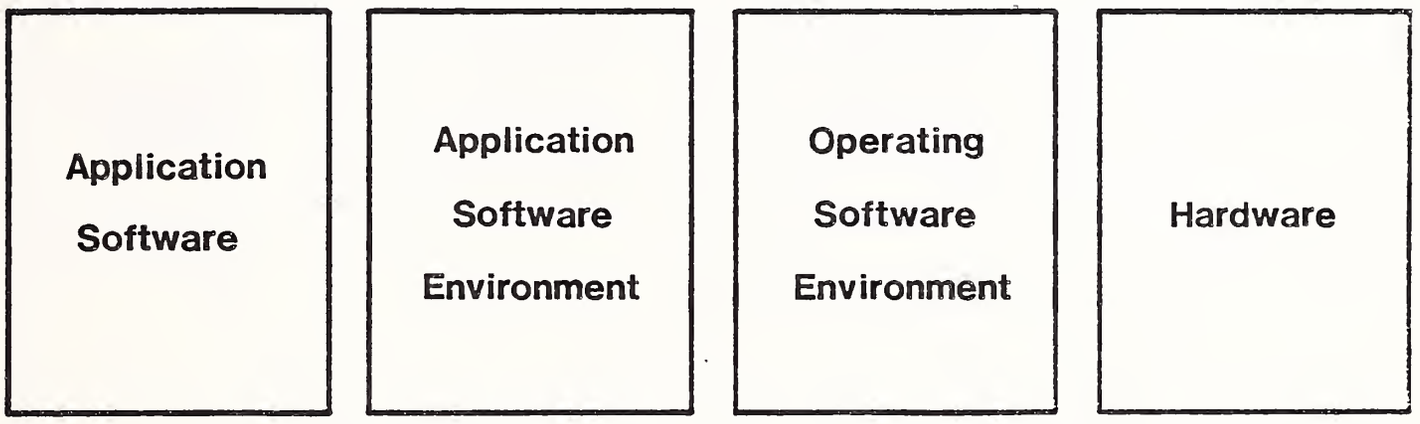
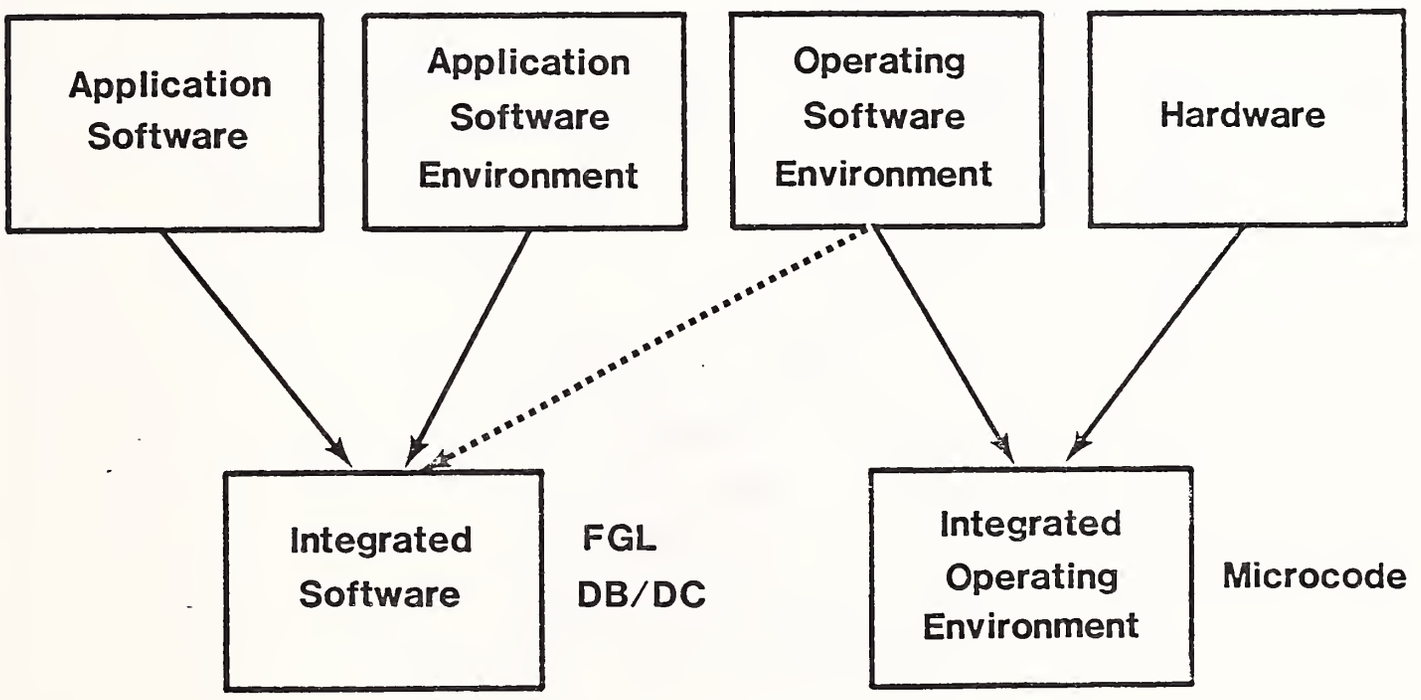
HARDWARE/SOFTWARE RELATIONSHIPS BEFORE 1985



What we see happening in the 1985-1995 timeframe is that applications software is becoming more integrated with applications tools such as graphics, development, data base systems, and includes some of the operating software environment. Thus, fourth generation language, data base, data communications software is being included with the application. After all, a good example is in the micro computer area. When you load an application you often load all the software necessary to have the operating

HARDWARE/SOFTWARE RELATIONSHIPS 1985-1995

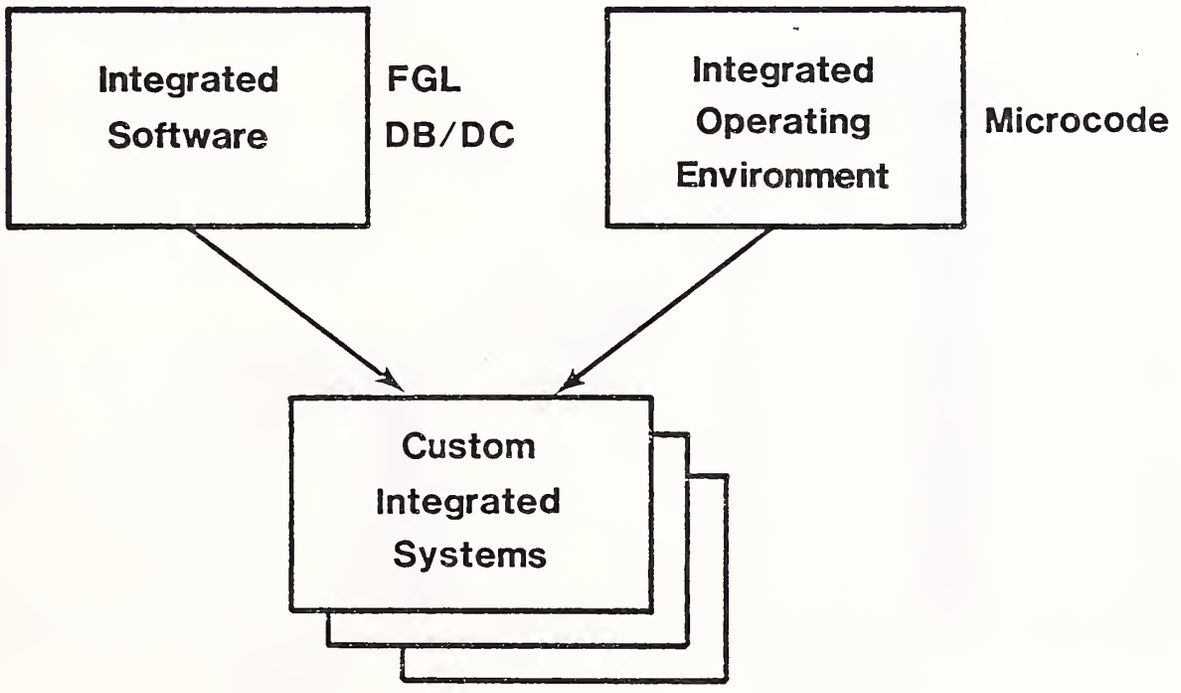


system and the communications capability from the same diskette. It is simply loading the operating system, the applications software environment and the application software at one time.

Thus, we have an integrated software environment and we also are beginning to move operating software in with the hardware or firmware into an integrated operating environment.

By 1995 we had expected to see the integrated software environment start to be integrated with the integrating operating environment into custom integrated systems. CIS is the ultimate in terms of customer sensitivity. Each system, hardware and software, designed and optimized to the needs of the individual customer. Why should a customer that is operating an on-line reservation system have to pay all the baggage to handle remote batch transactions within a totally different operating environment.

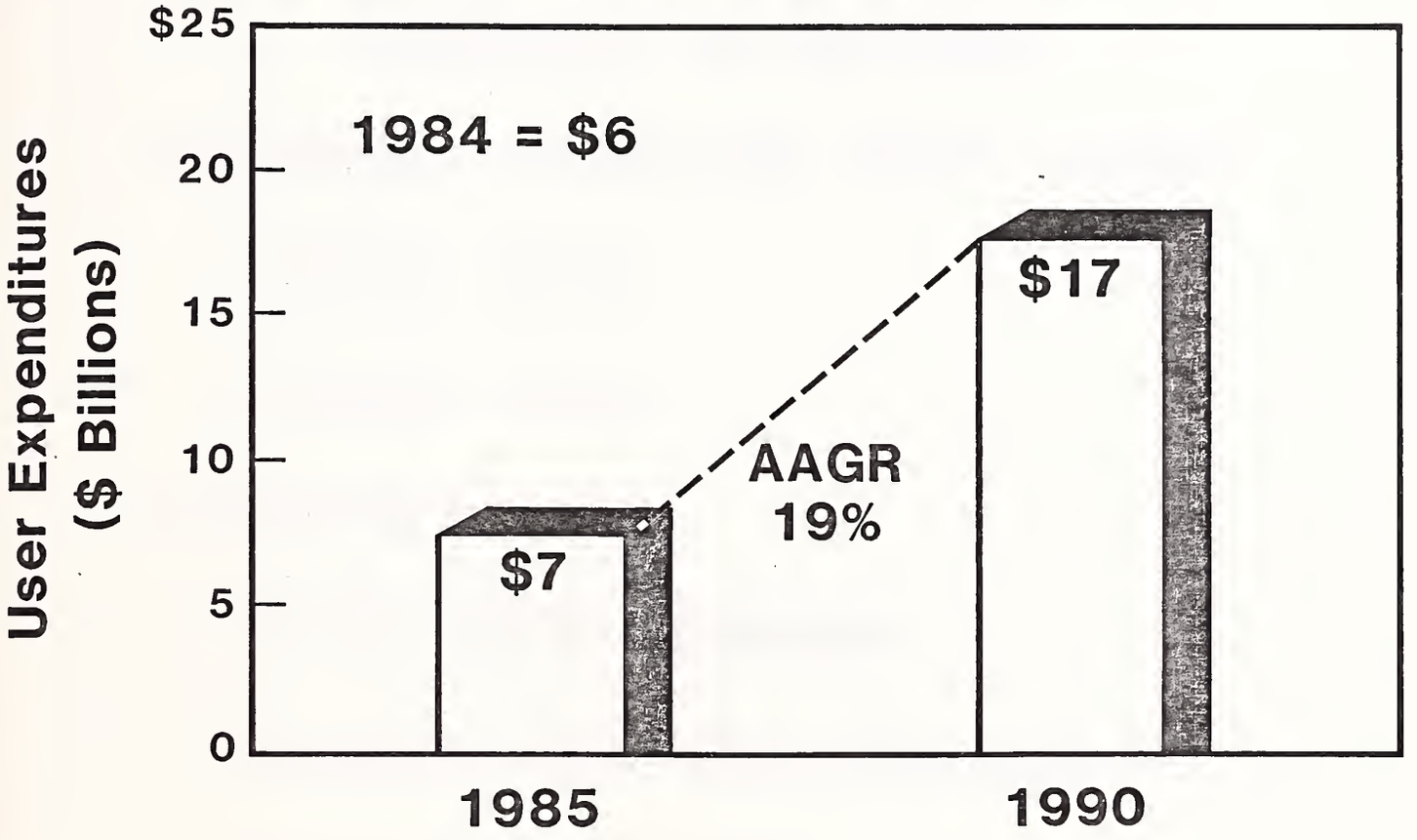
HARDWARE/SOFTWARE RELATIONSHIPS AFTER 1995



This has been the major problem with the IBM operating systems over the last few years and we expect this will be addressed by the 1995 timeframe.

Turnkey systems market faired poorly in 1985 and has continued into 1986.

TURNKEY SYSTEMS MARKET



Changes from the 1984 reports to 1985 show that the growth rate INPUT expected in 1985 of 33% had dropped to 14%. The key reason for this is the major change in the CAD/CAM market. The industrial companies in 1984 hardly grew and were very much hit by foreign competition. As a result, they simply were not spending the money on CAD/CAM systems that had been expected. The capital spending slowdown and intense price pressures caused by some of the new vendors contributed to this.

INPUT®

CHANGES FROM 1984 TURNKEY SYSTEMS

- Change in Growth 1984/1985
  - 1984: 33%
  - 1985: 14%
- Reasons
  - CAD/CAM Changes
  - Capital Spending Slowdown
  - Price Pressures

Another factor in the manfacturing in particular is that manufacturers are recognizing that you don't change a computer system in order to change your business, you have to change your organization as well. These kind of changes take a longer time than vendors generally expect.

~~In terms of the long term growth rate~~

In terms of the long-term growth rate INPUT has dropped its forecast from 1984 to 1989 versus 1985 to 1990 from 27% to 19%. INPUT still believes in the viability of this market segment but in many cases not as it is currently structured. Some of the reasons for the slowdown over the next 5 years in growth rate are a little bit the inflation slowdown beyond what we had forecasted in 1984, the multi year impact of the 1985 problems. Many of the companies in the turnkey business have laid off key people in sales, amrekting, and development which are

INPUT®

CHANGES FROM 1984 TURNKEY SYSTEMS

- **Change in Growth: 1984/1989 vs. 1985/1990**
  - **1984: 27%**
  - **1985: 19%**

going to hinder them in their growth in the out years.

Another issue is the increase of price performance pressure on the hardware side. Since so many of these turnkey companies have unreasonable large percentage of their costs in hardware, changes in price performance in that area have a dramatic impact.

INPUT believes that in order for companies to be viable in this business they must get their hardware costs down to the order of 20% of their delivered price. Five years ago INPUT believed this should be about 30% and now feels that because of increase pressure of competition, support and

CHANGES FROM 1984 TURNKEY SYSTEMS

- Reasons
  - Inflation Slowdown
  - Multi-Year Impact 1985 Problems
  - Price/Performance Pressures
  - Recurring Revenue Drive Accelerating

installation requirements, this margin in the software services for the turnkey sale should be even greater.

The final contributing factor in the slowdown in the forecast is that turnkey vendors are also moving away from the front-end hit concept to the recurring revenue stream. This is very similar to the software products companies.

In the turnkey system projection area, INPUT has a real concern about the whole concept of the value added reseller. We question whether this approach is valid. We also question of whether value added reseller vendors are viable. After all, IBM and DEC and other mfg. are only giving a discount of 10% to 30% on the hardware and are making their profit margins on that hardware. For that small percentage decrease, they are giving up the major problems of sales, installations support conversion, etc., to the value added reseller.

TURNKEY SYSTEMS PROJECTIONS

- Validity of the VAR Approach

?

- Viability of the Vendors

When one asks the question of IBM as to why they are using value added resellers the first response one tends to get is our sales force is too expensive. IBM and the other mfg. feel that their sales force is too expensive to attack the individual, small niche markets that exist. Our question is are the sales forces of the value added resellers any less expensive. Are their sales people paid less? Are their support people paid less? The answer is not enough to justify this kind of response.

The only value added resellers we think as viable are those where they have the hardware cost down to the extent that there is enough profit margin in the software and services business to sustain a viable business, and secondly, where the vendor has associated with the value added reseller business other business areas such as processing services or software products so that the turnkey systems solution is part of a spectrum of solutions for different companies of the same type. That is why companies such as ADP and other that are delivering turnkeys, not as systems but as services have been relatively successful.

In the long run, INPUT believes that the value added resellers will be kept off balance and fragmented by the computer mfg. because their mafg. do not want to see these companies acieve any kind of major account control. As a result, you see IBM and other mfg. foster intense competition between relatively small VAR's. This is another contributing factor to their potential lack of viability.

In our turnkey systems projections we have faster growth at this point for value added resellers and turnkey systems based on standard hardware from IBM, DEC and other companies. In the long run out towards the 1990's, we feel that turnkey companies must use custom hardware in order for them to be viable.
This does not mean they have to turn into computer mfgrs, after all is was several years before Apple was a computer mfgr. What they turn into is systems specifiers and possibly assemblers.
The reason for vendors to move into custom hardware is that they can do two things, they can reduce the hardware cost

TURNKEY SYSTEMS PROJECTIONS

- Standard Hardware (VAR)
  - Faster Growth Now
- Custom Hardware (Integrated Systems)
  - Eventual Growth Faster
  - "Lock-ins"

components substantially in the system and at the same time they can get better performance. One of the negatives is the customers may not like to be locked in to a given custom hardware solution. However, they must recognize they are locked in to the software in any event. The additional lock-in of the hardware is almost irrelevant.
One of the problems that has been advanced is the problem of maintenance of hardware if you make it yourself. This is no longer such a problem because of the existance of third party maintenance organizations and also because most systems today can be self maintained, or maintained relatively easily with use of remote diagnostic depot maintenance etc. Maintenance is getting simpler and easier to handle.
Thus INPUT thinks in the long run, custom systems market will improve more rapidly than the standard system market.

Also in the turnkey systems area, we see cross industry applications are being driven to verticals. In other words, inventory control is not a cross industry application because it has been driven to invventory control to metals parts mfg., inventory control systems in apparel mfg. etc. Sometimes the change from being cross industry to vertical is purely cosmetic and the marketing training examples used in brochures at other times, more often, is very basic.

TURNKEY SYSTEMS PROJECTIONS

- Cross-Industry Being Driven to Industry Specific
- New Functional Areas
  - Marketing
  - Project Management

There are several new functional areas that are growing rapidly in the turnkey market, particularly those associated with marketing and project management.
In the marketing area there is an explosion of information in the consumer products area. Supermarket scanning has increased the amount of information that is available by several orders of magnitude. We also have research organizations such as Artbitron from Control Data Corporation which has introduced scanning in the home that allows vendors to not only find out the viewing or reading patterns of consumers but to specifically tie their purchases to advertising in these media. Thus, the market for systems and services is exploding.
Ohter aspects of marketing such as direct mail, telesales, telemarketing are also growing very rapidly.

We would like to draw some brief conclusions from the general environment for information services and what we see happening over the next five years.

CONCLUSIONS

First of all, the high level information systems trends are that there is a new way of information systems organizations within companies becoming profit centers as opposed to just cost centers. This is where company want to build a service related to its gut level business. Thus, a good example is Dow Jones moving into the information services processing business related to its newspaper. Perhaps more appropriately, banks and financial services companies aare again moving strongly into the information services business lead by organizations such as Citibank and Security Pacific.

INPUT®

HIGH LEVEL STRATEGIC TRENDS

- IS as a Profit Center
- Managing IS through High Level Steering Committee
- IS Moving Up in Visibility
- Marketing IS Services

Another trend is the management of the information systems through the high level steering committee and the use of non-technical people of the management of information systems.

Information systems is certainly moving up in visibility within organizations and this often mixed blessings. As we mentioned we feel this is a contributing factor to the slowdown in the decision process but ultimately will lead to more procurement of outside systems and services.

Another high level strategic trends within information systems today is that information systems organzations within companies are increasingly marketing services to "their customers."

The limits to growth in the information technology business are the absorption rate. This absorption rate is based on what it takes to implement systems, the education and training requirements of systems, organization changes that are impliedby installation of new systems, the resistance to change which must be overcome in executives, management, and information systems organizations, and finally the shear logistics of implementation. In the past when the systems simply had to be implemented at one center on one computer overnight when the system could be closed down effectively has totally gone.

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LIMITS TO GROWTH

- **Absorption Rate**
  - **Implementation**
  - **Education and Training**
  - **Organization Changes**
  - **Resistance to Change**
  - **Logistics**

We now have multi location systems that must be all brought up to speed at the sametime, at the same way and converted properly in order to work. This is exempified by the need for systems in the military. But, it applies to any organization with multiple locations, multiple departments and any sizeable number of people.

We think information services companies by attacking the absorption problem will really differentiate themselves even more and even more positively in the eyes of the buying community.

That is a truism but the rich are getter richer and the poor are getting poorer. The stakes in the game today are higher. It is more and more difficult, if not impossible, for a few people to get together in garage and write the kind of software that is needed in order for significant market penetration to be made. After all today in developing banking software, it is not a question of spending $1, 2, or 3 million but for basic gut level software of investing $40, 50 or $200 million. The to do this are scare.
In the pate 1970's INPUT said many companies in the early

80's were going to be staking out their customer positions. In the late 1980's would be the period when these companies would expand and build within their staked out positions. This is exactly what is happening. It is no good having staked out a position if you are unable to build the structure on that territory that is necessary to be a viable player.

"RICH GETTING RICHER - POOR GETTING POORER"

As a result what is happening is a wave of merger mania feed in some cases by consultants and third parties, but where there is a real justification on part of the seller and the buyer.

A key question that every executive group must ask is what growth are they geared for. As we have seen in the last two years we do not have a smoothly accelerating and decelerating industry and economy. We have one that shifts in fits and starts. Companies need to ask themselves what growth they are geared for and what happens if the growth is higher or lower. After all one of the major problems that software products companies had in 1985 was they had such a successful 1984. This sounds like a contridiction in terms but what happened in 1984 with the tremendous success that they were having companies felt alot of pressure to invest in research and development in new people, INPUT®

GEARING

- What Growth Are You Geared for?
- What Happens if Growth is:
  - a. Higher?
  - b. Lower?

new markets and when the industry slowed dramatically in 1985 they suddenly found themselves with very high fixed costs and investments which were difficult to get out of.

It is also key that companies should not just plan for the lowest growth they feel will be probable. Companies should look at INPUT forecasts and determine the rationale for those forecasts so that they can estimate likely bounds. They should set growth targets which are slightly optimistic but they should have a contingency plan for both lower and higher growth.

Companies need to be aware of the potential for rapid deceleration. They need seatbelts. The advantage of recurring revenues has been demonstrated again and again in the last several years. After all if you are in a car which is making rapid stops and starts, if you don't have seatbelts on and the car stops you can go through the window. The seatbelt keeps you in the seat. It also means that companies must do a much better job of examining frequently the reasons for changes in the marketplace and what they can do about it.

RAPID DECELERATION

- Need "Seatbelts"
- Advantage of Continuous Revenue Stream

Companies continue to make major decisions without adequate information. They tend to rely on existing customers which have bias, their sales force which has biases, or reading a Computerworld which has major problems. Organized and systematic methods of rapidly sensing change in the market is necessary. ~~It is generally recongized today that softwar~~

It is generally recognized today that software is not the solution. We have seen advertisements and promotions in the last several years implying that all you need besides the hardware is the software and you have a solution.

Software is not the Solution.

Software is a very key part of the solution but together with that software you need people, systems, education, training, service, communications.

Software is Part of the Solution.

Our recommendations to both buyers and vendors is that need to codify the buying and sales process. Vendors need to be constantly examining their buyers to distinguish which buyers are making unit decisions, which buyers are making decentralized decisions, which buyers are making integrated decisions. They need to understand various components of the buying process. If they have sales people that are only used to dealing with information systems managers, they now need to redirect those people so they can deal with users and with executives.

INPUT®

RECOMMENDATIONS

- **Codify Buying/Sales Process**
  - **Vendor**
  - **Buyer**

Those companies that have sold to end users must now learn to deal with information systems people. Sometimes this is a very painful process and can mean drastic changes in the salesforce.

We strongly recommend that organizations give pricing a more central role. Pricing should be reviewed frequently. In times of rapid change it should be reviewed much more frequently than annually. We would recommend a quarterly pricing review as a fundmental part of the planning process. Most importantly, pricing must be linked to the financial strategy. Many times we find that there are groww discontinuities between the financial strategy of the company and its pricing strategy.

We think there must be strong central control of discounting. Discounting should be based on long term business objectives

RECOMMENDATIONS

- **Give Pricing a More Central Role**
- **Review Pricing More Frequently**
- **Develop a Supporting Financial Strategy**
- **Set Discounts Based on Long-Term Business Objective**

and not short term benefits. Often discounts are set because of the compensation plans of the managers, executives, and sales people that are involved. With the short term , performance criteria that many companies have in place it's surprising that companies perform long term as well as they do. We feel that DEC's position in this area has shown a very strong sensitivity to this issue. Many services companies may not like DEC's approach but from DEC's viewpoint it makes immenent sense.

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We think companies should consider price increases for products and support as much as they consider price decreases for the delivery vehicle and entry points. Where there are still markets where territory is being staked out then getting account control is extremely important and, therfore, making it easy to enter is vital. Once having established account control, then generally certain companies need to value price their products and to increase the price of the support function. Finally, companies need to firmly enforce their pricing policies. Many companies do not

RECOMMENDATIONS

- Consider Price Increases
  - Products
  - Support
- Consider Price Decreases
  - Delivery Vehicle
  - Entry Point
- Firmly Enforce Pricing Policies

do so with the result that there is in the marketplace conflicting prices being quoted which confuses the buyer. One thing that buyers do not like is to be taken advantage of. A buyer that finds that a similar company got the same product for a vastly desimilar price is very unlikely to go back to that same source.

Recommendations to companies are primarily to improve the absorption rate. As we said earlier, those companies that can improve the absorption rate are long-term going to those that are most successful. Companies should alos continue to sell service and solutions as opposed to selling products. Companies should plan for volitility. They should track their competition extremely aggressively. Many companies today survey their customers, their losy prospects, their lost customers. INPUT is carrying out

RECOMMENDATIONS

- **Improve Absorption Rate**
- **Sell Service/Solutions**

numerous surveys in this area. However, we find few companies that survey their competitors customers. We think this is a vital source of information that is being neglected.

RECOMMENDATIONS

- Plan for Volatility
- Track Competition Agressively

Our final recommendation is for companies to plan. This may sound that we are recommending the establishment or extension of the central planning facility. Far from it. We do not recommend total central planning as we have in the U.S.S.R. neither do we recommend anarchy as we have in some other states. What INPUT recommends is a democratic republic when it comes to planning.
We also strongly recommend that everybody should be involved in planning. Weekly meetings should have several minutes

devoted to the issue have we "found out anything this week that might impact our 12 month plan?" Every month in the monthly meetings we should ask the question "Have we found out anything in this last month that might affect our 3-5 year plans? Quarterly we should be reviewing this results and assimilating them, aggregating them and identifying where we may have problems and then researching them. Thus, everybody is involved in the planning process, not "the planners." Pure planners can plan things to death.
Our storng recommendation is that planning and planning methodology should be spread throughout an organization and everybody should be concerned what the plan

RECOMMENDATIONS

PLAN

is, how it may change, what their position is with it, and what factors they determined or detect in the market that can affect that plan.
The other factor that relates to this is the plans must cease to be tied to artificial horizons. The concept of 5 year planning only taking place at one time in the year or one year plans taking place at only one time in the year has become obsolete. What has happened in the planning process is that financial reporting has driven budgetting has driven planning rather than the other way around. Plans need to be produced in an environment and a timing where they can be most useful. We are all familiar with the syndrome where a plan is produced once a year within 3 months if bears some relationship to reality and by the 11 month it is totally irrelevant. We then go through another regergitation of the plan which again has an expontially declining relationship to reality. With a result of this kind of process is that plans are simply missed and are not effective and do not form an adeuqate guideline for the company. Planning needs to be a continuous process

with continuous review and continuous attention.
In summary, when we recommend an organization to plan we are recommending that they have a continuous planning process which involveseverybody in the organization as opposed to a periodic process which involves relatively few people.
We really think those companies that can determine and detect changes in the market and the environment first are going to be those that are most able to take advantage of it. In order to take advantage of them they must have the methodologies of which to translate those detection systems into concrete and positive action. There are numerous examples in technology of such systems which can be applied in the planning process. There are also examples of very large companies today that are changing their whole process to deal with the new more volitile world in which we li
We think the information services business is going to have a very successful next 5 years through 1990 and we are looking forward to being of service to those companies that participate in it and help them plan more effectively.