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Fm: TOF

Re: IBM Network Centric Study

Attached is a cleaned up version. This has been received well within IBM. Many of the numbers, analysis and observations do not appear in INPUT reports currently; there is certainly no reason why they shouldn't.

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REPORT

SCOPING THE NETWORK-CENTRIC COMPUTING MARKET

Submitted to

IBM

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Prepared by

INPUT

Atrium at Glenpointe
400 Frank W. Burr Boulevard
Teaneck, NJ 07666
201-801-0050
Fax: 201-801-0441

INTRODUCTION

NETWORK-CENTRIC COMPUTING OPPORTUNITIES PROJECT:

BACKGROUND

- Opportunity-driven
 - Near-term opportunities (1996-98) are the target. Analysis and sizing up to 2000 provided for more perspective. (Note: Whenever "near term" is used in this analysis it means up to 1998.)
 - Business-driven rationale is the key used to assess opportunities
 - Prioritization ("triage") required in analysis
- NCC perspective is, to some degree, orthogonal to past categories and analysis (either IBM or INPUT).
 - Part of INPUT's value added has been to take a fresh look at the market.
 - Therefore, analysis for this project has not necessarily been bound by
 - IBM analysis, numbers
 - IBM or INPUT categorization
- Eight days available to complete analysis
 - Past work has been used as a foundation to the extent possible (see separate page on methodology)
 - "Fast track" methodology employed
 - Some analysis began before project was fully defined
 - Certain amount of incompleteness, roughness and inconsistency may remain

FOUNDATION OF INPUT'S ANALYSIS

- Research and consulting on IT-related markets
 - Subscription programs. Many are pertinent to Network-Centric Computing analysis:
 - Client/server software
 - Electronic commerce
 - Internet
 - 16 vertical markets
 - 8 delivery modes (e.g., applications software products, systems integration)
 - Custom research and consulting: Many analysis of new offerings, niches and applications, often involving primary research.
- Core focus: software and services
- Hardware/technology involvement:
 - As part of systems integration
 - As a platform for software and services offerings generally (e.g., client/server, object-oriented computing)
- U.S. and Europe
- Primary research-driven
 - Business and IT drivers
 - Vertical industries and applications
 - Spending and decision making
- Over a dozen people worked on this project. Examples of background:
 - Tom O'Flaherty (300+ INPUT consulting engagements; Editor, Client/Server Developer; IT management; start-up venture)
 - Angela Hey (Director, INPUT's Client/Server Software Program; General Magic, Bell Labs; Ph.D)

NETWORK-CENTRIC COMPUTING OPPORTUNITIES: DEFINITIONS AND SCOPE

- A definition must be pragmatic, avoiding extremes.
 - If too broad a definition, then almost all offerings become part of NCC.
 - Too much focus on "new" opportunities (e.g., electronic commerce on the Internet), increases near-term risk, because of
 - Conflicting evidence of large scale business acceptance
 - Technical uncertainties/risk
 - Timing uncertainties (1997 vs. 1999 becomes a critical issue -- one that in fact may not be resolvable)
- Existing NCC applications and opportunities should be assessed.
 - Big is better, given IBM's own size.
 - Even if the market is already well-served, this may still be a high-priority market, depending on its size and importance to IBM.
 - Special areas of interest:
 - Good growth still expected
 - Changes in market requirements or direction.
- Applications/opportunities that are small now, may still be important if significant growth is expected by 1998.
 - Market shares and positioning are generally more fluid.
 - Sometimes, there are large numbers of small competitors, who would be open to partnering or acquisition.
- Some opportunities may still be small in 1998, but could be much larger in, 2-3 more years.
 - These opportunities may be competing for resources with near term opportunities.
 - Positioning will depend on assessment of eventual market size, risk and minimum investment lead time.

NETWORK-CENTRIC COMPUTING OPPORTUNITIES PROJECT: METHODOLOGY

- Objective: Place opportunities in a business context
- Work through major business segments (see separate page on segmentation)
- Describe the underlying business environment issues (especially those that are changing)
- Describe the IT requirements flowing out of the business environment
- Describe the NCC opportunity(ies)
- Size the NCC opportunity
 - For 1996, 1998, 2000
 - Includes software, services and hardware
 - U.S. and Europe
 - Size ranges
 - Study focus on sorting winners and losers
 - Many NCC opportunities do not map to existing INPUT categories (which are primarily SIC driven). False precision should be avoided.
 - Input believes that this desirable when identifying bona fide new NCC opportunities ("If there's a report on it, you may be too late")
 - Refinement possible in later phase
- Description of competitive environment (general)
- Opportunity summaries across segments

Note: Due to time constraints, there is little explicit analysis on the specific IBM opportunity. The constituents of this analysis, in INPUT's view, is described in the summary section.

MAJOR BUSINESS SEGMENTS IDENTIFIED FOR NCC ANALYSIS

- Basis
 - Prior studies and knowledge of market
 - Initial scan of potential segments and possible NCC opportunities (iterative)
- Industry-oriented segments identified
 - Travel
 - Media
 - Health Care
 - Retail (Individual) Financial Products
 - Business Banking
 - Insurance
- Process/function-oriented segments
 - Product Distribution Chain (primarily inter-enterprise)
 - Industrial Marketing and Sales (primarily intra-enterprise)
 - Financial Operations (primarily intra-enterprise)
 - Trading Systems
 - Information Intermediary Opportunities

SEGMENTS NOT ADDRESSED AT THIS TIME

- National Governments
 - Under intense budget pressure - little "new money" to spend
 - Important as standard-setters, information-suppliers, but much less important as customers
 - Government-owned or nationalized industries are part of the appropriate industry and/or process/function segments

- State/Regional/Local Government
 - Under intense budget pressure - little "new money" to spend
 - Can play a role as information-suppliers; less important as customers

- Education
 - Relatively little "new money" to spend
 - Enormous contributor to NCC (e.g., Internet)
 - Relatively small market in near term for NCC: mainly hardware (which they often get at a discount anyway)

- Utilities
 - Major areas covered in
 - Product distribution chain
 - Financial operations

SECTIONS OF THIS REPORT

This report is organized into the following sections.

| <u>Number</u> | <u>Section</u> |
|---------------|--|
| 1. | Travel |
| 2. | Media |
| 3. | Health Care |
| 4. | Retail Financial Products |
| 5. | Business Banking |
| 6. | Insurance |
| 7. | Product Distribution Chain |
| 8. | Industrial Marketing and Sales |
| 9. | Financial Operations |
| 10. | Trading Systems |
| 11. | Information Intermediary Opportunities |
| 12. | Summary of Findings |

1.

TRAVEL

TRAVEL SUBSEGMENTS

- Airline
 - Hotel/Gaming
 - Resort/Conference Center
 - Cruise
 - Car Rental
 - Travel Agent
 - Tour Packagers
-
- Subsegments not included
 - Other passenger transport
 - Intercity rail
 - Other transit
 - Water
 - Other tourism services
 - Restaurants
 - Airline functions not included
 - Maintenance
 - Marketing (including yield management)
 - Avionics
 - Air traffic control systems
 - Facilities

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TRAVEL INDUSTRY BUSINESS SEGMENT ENVIRONMENT - 1996

| <u>Factor</u> | <u>Air</u> | <u>Hotel</u> | <u>Resort</u> | <u>Car Cruise</u> | <u>Travel Rental</u> | <u>Agents</u> |
|------------------------------------|------------|--------------|---------------|-----------------------|--------------------------|---------------|
| Cyclical business | xx | xx | x | x | x | x |
| Low profitability | xx | x | | | x | x |
| Real/perceived product differences | | x | xx | xx | | |
| Overcapacity | xx | x | x | | x | xx |
| Complex, rapidly rates changing | xx | x | | | x | |
| Underlying growth | | | x | x | | |
| Leveraged, high fixed costs | xx | xx | xx | xx | x | |
| New, lower-cost competition | xx | | | | | |
| Cost reduction | xx | x | | | x | x |
| Regulation/deregulation politics | xx | | | | | |
| Segment Consolidation | | | | | | xx |
| Computer-dependent | xx | x | | | xx | xx |
| Central host driven | xx | x | | | xx | xx |
| Significant local computing | | x | x | | | x |
| New networked initiatives | | | | | | |

x = Important

xx = Very important

TRAVEL INDUSTRY BUSINESS SEGMENT ENVIRONMENT - 1998

| <u>Factor</u> | <u>Air</u> | <u>Hotel</u> | <u>Resort</u> | <u>Cruise</u> | <u>Car Rental</u> | <u>Travel Agents</u> |
|------------------------------------|------------|--------------|---------------|---------------|-------------------|----------------------|
| Cyclical business | xx | xx | x | x | x | x |
| Low profitability | xx | — | | x | x | |
| Real/perceived product differences | | x | xx | xx | | |
| Overcapacity | xx | — | — | x | xx | |
| Complex, rapidly changing rates | xx | x | | | x | |
| Underlying growth | | | x | x | | |
| Leveraged, high fixed costs | xx | xx | xx | xx | x | |
| New, lower-cost competition | xx | | | | <u>x</u> | |
| Cost reduction | xx | x | | x | | x |
| Regulation/deregulation/politics | xx | | | | | |
| Segment Consolidation | <u>x</u> | | | | | xx |
| Computer-dependent | xx | x | <u>x</u> | <u>x</u> | xx | xx |
| Central host driven | xx | x | | | xx | xx |
| Significant local computing | | x | x | | | x |
| New networked initiatives | <u>x</u> | <u>x</u> | <u>x</u> | | | <u>x</u> |

Underline = change
 x = Important
 xx = Very important

TRAVEL INDUSTRY BUSINESS SEGMENT ENVIRONMENT - 2000

| <u>Factor</u> | <u>Air</u> | <u>Hotel</u> | <u>Resort</u> | <u>Cruise</u> | <u>Car Rental</u> | <u>Travel Agents</u> |
|------------------------------------|------------|--------------|---------------|---------------|-------------------|----------------------|
| Cyclical business | xx | xx | x | x | x | x |
| Low profitability | xx | | | | x | x |
| Real/perceived product differences | | x | xx | | xx | |
| Overcapacity | xx | <u>x</u> | | | x | <u>x</u> |
| Complex, rapidly changing rates | xx | x | | | x | |
| Underlying growth | | | x | x | | |
| Leveraged, high fixed costs | xx | xx | xx | xx | x | |
| New, lower-cost competition | xx | | | | | x |
| Cost reduction | xx | x | | | x | x |
| Regulation/deregulation/politics | xx | | | | | |
| Segment Consolidation | <u>xx</u> | | | | | xx |
| Computer-dependent | xx | x | <u>xx</u> | <u>xx</u> | xx | xx |
| Central host driven | xx | x | | | xx | xx |
| Significant local computing | <u>x</u> | x | x | | | x |
| New networked initiatives | x | <u>xx</u> | <u>xx</u> | | | <u>xx</u> |

Underline = change
 x = Important
 xx = Very important

TRAVEL INDUSTRY - NCC MARKET SIZE

| <u>Related Applications</u> | <u>Primary Delivery Mode</u> | <u>IT Vendor Market Size/Probability*</u> | | |
|-----------------------------|------------------------------|---|-------------|-------------|
| | | <u>1996</u> | <u>1998</u> | <u>2000</u> |
| CRS | | | | |
| Functional Enhancements | PS/SI | M-H/.9 | M-H/.9 | M-H/.9 |
| Front ends | PS/SI | M/.9 | M/.7 | M/.5 |
| Next-generation | PS/SI | L/.5 | L/.5 | H/.3 |
| Operations | OS | M-H/.9 | M-H/.9 | H/.6 |
| Hotel and Car CRS | | | | |
| Development | PS/SI | M/.8M | H/.9 | M-H/.9 |
| Operations | OS | M/.8 | M-H/.9 | M-H/.9 |

***Key:**

L = Under \$50MM; M-

L = \$50-250MM;

M = \$250-750MM;

M-H = \$750MM-\$2 billion;

H = Over \$2 billion

Probabilities: from 0.1 to 0.9

TRAVEL INDUSTRY IT TRENDS

Computerized Reservation Systems (CRS)

- These will continue to be the single most important IT element in the industry.
- Next-generation CRSs would have many benefits and be a very important use of NCC:
 - Paper tickets would be eliminated
 - Many distribution and administrative costs could be reduced
 - Multimedia-based marketing would be supported
- A precondition for obtaining the above benefits of a next-generation CRS is that it be a single worldwide system or that airline-controlled CRSs be transparent to each other. Transparency is required for supporting paperless transactions in real time across carriers and their subsystems.

Neither a single system nor interrelated transparent systems is likely in the next five years:

- The dominant CRS and their airline owners will be slow to give up control.
 - They see a competitive advantage in controlling a proprietary CRS.
 - A related issue is the fear that a single system would serve the interests of certain carriers (especially if surviving systems were based on particular CRSs).
 - Funneling profits through the CRS/distribution side of the business helps to put pressure on employees for further compensation give-backs

Therefore, INPUT believes that change will come slowly, outside the five-year time parameter.

- Airline mergers later in the 1990, will complicate systems decision making in the medium term.
- Even with full support and funding, a next-generation CRS would take 3-5 years to construct.
- The core of current CRSs will remain essentially unchanged.

- Attempts will be made to make screen interfaces more modern and understandable.
- The inherent complexity of travel choices (especially airline tickets) will limit the use of "hard core CRS" to travel professionals. By the late 1990s this will include substantial numbers of users based in corporate travel departments.
- "Easyxxxx" access for direct use by travellers will remain a low volume business for the foreseeable future.
- CRSs will enter into partnerships with independent third party IT services providers (such as IBM and EDS) for a mixture of reasons:
 - Sharing development expenses
 - Accessing new, scarce technology skills
 - Help on next-generation CRS design
 - Forming "blocking alliances" against other CRS providers
 - Obtaining preferential treatment in travel bookings
 - Extending the distribution of CRS and related products and services
- Independent third party suppliers should be cautious in working with the proprietary CRSs. The major benefit of such a relationship would be if the CRS ally became the basis for an industry-wide CRS: The prior partner could be very well positioned. However, there are offsetting negatives:
 - At best this will be a long term proposition.
 - Given the politics of airlines and CRSs, it is close to impossible to identify which major CRS has the best chance of survival.
 - A vendor may well be better positioned by not having been a partner at all rather than have partnered with a loser.
 - It is doubtful if much of the 30-year-old CRS technology now provides a long term technical advantage to current owners or partners.

Airlines

- Airlines are under continuing pressure to cut costs. The major cost reduction areas are:

- Mergers
- Personnel costs
- Administrative and ticketing costs
- Distribution costs

Next-generation CRSs could help in all these areas, but for the reasons described above, CRSs are unlikely to change significantly in the next five years.

- In the current environment, mergers will have a mixed impact on IT service opportunities:
 - There will be a significant amount of system conversion and consolidation assistance needed from third parties.
 - However, conversion activities are likely to act as a further delay to next-generation CRSs, as airlines wait for the merger end-game.
- Airlines are focusing much of their medium term IT initiatives on bypassing travel agents by entering into business and technical relationships directly with large corporations. The idea is to split the travel agent commission with the customer. This initiative is unlikely to result in many IT changes and, probably, fewer business benefits than anticipated.
 - Essentially, the existing CRS systems will be used. There are attempts being made to simplify the user interfaces, but
 - These are unlikely to make much impact before 1998
 - Even the modified systems will perform best when used by full-time travel experts, who understand the underlying business logic of the CRS.
- Many of the airline savings will be consumed by having to support a fragmented and less sophisticated user base.
- Airlines, through their CRSs, will continue to experiment with reservation systems that are used directly by travellers. Systems used by travellers are unlikely to have widespread use because of their inherently complexity. Some of the results from traveller-oriented systems could be unexpected and counterproductive from the airlines' standpoint:
 - Ticket consolidators (suppliers of grey market tickets) are likely to be the chief beneficiaries from publicity on using on-line ticketing systems.

Consolidator ticket sales reduce airline revenues to the extent that they displace higher fare tickets.

- Through their contracts with and control over travel agencies, airlines are able to discourage tariff-beating exercises such as back-to-back ticketing or phantom-city ticketing. There are no legal barriers to individual travellers constructing these kinds of trips; "Internet personalities" are likely to learn of and use such expedients quickly.
- Through habit, contractual relationships and ownership major airlines will generally work with third party IT suppliers through their CRSs.

Hotels

Hotel management chains will accelerate their efforts to produce a "middle layer" of automation between individual properties and the CRSs. These will be "mini-CRSs" whose objectives will be optimizing a chain's performance in terms of marketing, revenue maximization and control of internal operations.

- These "hotel CRSs" will increase in importance as the ownership and management of hotels becomes further separated. Because of these diverging interests, the management companies will need better systems.
- Most or all of the hotel management organizations do not have the capability (and probably the desire) to construct and manage their own systems. They will look to outside organizations to do so, CRSs or independent IT service providers

Lotteries

Lotteries are a particular growth area within the gaming industry. Lotteries have many of the characteristics of the on-line services industry and are included in that category.

Resort/Cruise

- These have been the best performing segments and also the ones that have least used automation to date.
- Multimedia (including on-line multimedia) will help them market their products more effectively. They will expect computing initiatives to increase revenues rather than reduce costs.
 - These segments would prefer to piggyback their initiatives on CRSs. However, current CRSs are only marginally suitable for this. Next-generation CRS could be ideally suited as a delivery mechanism. As noted, next-generation CRSs are unlikely in the medium term.
 - Consequently, these segments will be looking for other delivery mechanisms and will work with independent IT services companies.

Car Rental

- The most significant recent event is auto manufacturers giving up control of car rental firms. Car rental firms will become more aggressive and agile.
- However, their weak finances and undifferentiated offerings will prevent them from investing in many major IT initiatives. Instead, they will look to external services providers, including CRSs and independent IT service providers.

Travel Agents

- "Mega-agencies" will continue to absorb others.
- Agencies, especially the mega-agencies, will fight to avoid being bypassed. One of the chief methods agencies will use is supplying IT-based travel management services.
 - The mega-agencies will have the resources to take their own IT initiatives.
 - The smaller agencies will look to outside service companies for support not received from the CRSs.

There will be many sources of travel management services besides agency-developed systems. Competitive sources include:

- CRSs
- ISVs
- Independent -- i.e., non-airline affiliated -- IT services companies (e.g., EDS)

These competitive offerings can be marketed directly by the developer, by agencies or by a combination of channels.

- Agencies will continue to be the key distribution channel for the resort/cruise segments. Most, possibly all, agencies, will not have the capability to create, support and maintain multimedia-based marketing applications. Supplying these applications represents an important opportunity for IT services companies.

Corporate Travel Management

Corporate travel management is a special subsegment, where vendors supply software and/or services to help businesses manage their travel function. This includes offerings such as

- Least cost routing
- Carrier, hotel and car rental usage (for rate negotiation)
- Expense report automation, processing and analysis
- Travel procedure development and enforcement

Both carriers and travel agents have tried to penetrate this market. However, their business objectives involve maximizing revenue; much of travel management involves minimizing it.

Independent software companies have offerings in this market; few other third party providers do.

DISCUSSION OF NCC TRAVEL OPPORTUNITIES

Traditional CRS

The principal changes in the traditional CRSs in the next three years will be to improve their usability and add some functions. Vendor opportunities include:

- Providing functional enhancements
- Helping to add more contemporary front ends
- Providing planning and design for "next generation" CRSs
- Providing operations outsourcing, including network management support

Some of these opportunities could be large (depending on, for example, CRS consolidations). However, as discussed earlier, it is not clear if near term CRS work provides many advantages for developing and operating next-generation CRS.

Next Generation CRSs

It is very unlikely that there will be very large revenue opportunities in the next three years involving next-generation CRSs.

The major competitors for this type of work are current CRS firms (including EDS in this category)

Hotel and Car Rental CRS

These represent good near-term NCC opportunities because there is

- High need, both real and perceived.
- There are few vendors with an inside edge (with the possible exceptions of EDS and Litton)
- Although limited, these could represent a "1.5" generation in CRSs.

The major vendor activities are

- Development and other systems integration tasks
- Applications and network management

Multimedia Marketing Applications for the Resort, Cruise and Conference Subsegments

This opportunity is described in the "Information Intermediary" section.

Corporate Travel Management

Corporate travel management represents an opportunity for a third party. However, the purchasers are relatively low level and businesses do not appear to be prepared to pay much above 1% of their travel expenses for arduous work.

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MEDIA MARKET

Media Market Analysis For Network Centric Computing

Introduction

The media market is analyzed from two perspectives, markets and applications. For each market segment and each application opportunities that IBM may pursue are discussed.

Scope

Focus

The main focus is on the market for applications software, most of which consist of packaged software with some integration and customization. Service opportunities are also discussed, but in less detail. It is assumed that all large software applications create their own systems integration and support opportunities. Also IBM's opportunities that IBM is already pursuing through its current global network business are not discussed in detail. The focus is on emerging opportunities.

Segments Covered

This analysis covers the following segments:

- Print Publications
- Broadcasting
- Advertising
- Direct Marketing
- Online Services
- Telecommunications

It excludes:

- Media content from other sources:
 - Motion picture and TV production
 - Video games
 - Sports
- Other distribution channels
 - Video rental
 - Theaters
- Product fulfillment, inventory activities in direct marketing
- Systems supporting switching, transmission and outside plant in telcos

Applications Covered

It also covers applications that may span the market segments. A brief description of each application and the opportunities they present is provided.

Applications covered include:

- Asset management
- Billing systems
- Call center systems
- Collaborative publishing
- Customer service and support
- Data mining and visualization
- Information search and retrieval
- Internet broadband broadcasting
- Internet marketing
- Job tracking, program scheduling
- Mailing list, subscriptions and directory management
- Network management
- Online service software/systems
- Video delivery (video-on-demand and pay-per-view) systems

Market Segments

Print Publications

Current Business Environment

- Mergers of major publishers and media companies
- Stagnation of printed newspaper circulation
- Increased production and distribution costs of print media
- Generalist publications are being replaced by more specialized ones
- Print publications are also appearing online, on CD-ROM, on Internet WWW and in databases
- Agile media that can be converted into any type of output is needed
- Print publications vulnerable to replacement by other media for certain applications, e.g. reference and training materials may be on CD-ROM

IT Trends

- Collaborative journalism using software like Lotus Notes, shared whiteboard video-conferencing and workflow software to support remote journalists is appearing. It is being customized for journalistic applications.
- Remote printing of newspapers
- Online content supplements newspaper (e.g. Mercury Center (AOL), Mercury Web (Internet), for the San Jose Mercury News)
- Evolution of networked systems that connect publishers to support syndicated articles, royalty tracking, updates, dissemination of articles and transmission of digital photographs
- Integration of desktop publishing, layout, pre-press and advertisement management systems to support different media

IT Variances Between the US And Europe

- US - English Language, Europe - Multiple Languages
- More computer literate journalists in the U.S., more mobile computing, better support for mobile computing (phone jacks in airports)
- GSM digital cellular standard in most countries, other than the U.S.

Opportunities For IBM in Print Publications

Hardware Opportunities

- IBM can partner with existing publishing systems vendors to make IBM hardware, including PCs and AIX workstations, the underlying hardware platforms of choice

Application Opportunities

- Existing systems need upgrading to make them support different types of media. IBM can integrate and extend packaged software solutions based on Lotus packages - Ami Pro, Freelance and Notes - to address this requirement
- Integrate Lotus Notes with more publishing software to address collaborative journalism applications
- There are well-entrenched companies supporting the printing and publishing industries, many of these vendors could enhance their products with network centric approaches, IBM may consider acquiring some of these companies and making their products reach across corporate boundaries using products and services like Lotus Notes and the IBM Global Network. For example, Adobe has good publishing software but is unable to provide the global and networking support that IBM can. Xerox has document publishing systems that could also benefit from being integrated into global systems.

- Asset management, job tracking, online applications to support publishers

Service Opportunities

- Asset management services to offer management online of publishing assets - photographs, articles
- Online newspaper hosting
- Web hosting and Internet applications for publishers

Broadcasting

Current Business Environment

- Many more channels and more niche productions
- Interest by TV broadcasters in using the Internet
- Advertisers looking for new angles
- Different financial models - paid for by viewer, paid for by advertiser, government subsidies, viewer licenses
- Merging of TV and cable companies

IT Trends

- Video-on-demand trials, massive investment in technologies - Oracle, Sybase, HP, AT&T, Digital - customer demand uncertain
- Set top box wars emerging - PC-based vs. non-PC based - Microsoft view of set-top box is a PC v.s. Oracle view is set-top boxes for TVs
- Current technology - RCA, Thomson one-way download by satellite communicate requests by phone or modem in set-top box - thin pipe by modem (optional) from viewer to service provider, thick pipe by satellite from service provider to viewer
- Special effects - 3-D animations, morphing
- Wideband Internet broadcasting emerging - MBONE
- Broadcasts on online services for headline news, sports scores
- Move away from specialized hardware for creating movies and special effects
- Internet broadcasting requires new protocols - instead of sending 100 news items to 100 individuals at a company need to send one message across the Internet that is replicated 100 times at the receiving company and then distributed locally
- Modern equipment enables movies to be produced on low-cost hardware, what is needed is low-cost distribution system
- MPEG standards rapidly evolving for video compression

IT Variances Between the US And Europe

- Heavy regulation, protection in Europe
- Cable more prevalent in the U.S. than in Europe where over-the-air and satellite transmissions are popular
- Fewer channels to choose from in Europe, more languages to support

Opportunities For IBM in Broadcasting

Hardware Opportunities

- Servers for advanced TV and broadband applications. Internet servers.
- Workstations and PCs
- Kiosks configured with software to support broadcasts

Application Opportunities

- Development of new technology standards for high bandwidth broadcasting over networks - much is being done, but endorsement by IBM of a standard could help IBM's market position - this needs to be supported by products and high speed network services
- Corporate broadcasting systems - to broadcast corporate video to select workgroups and sites to conference rooms and desktop systems

Service Opportunities

- High speed, reliable online services that support broadcasting.
- Broadcast system management for corporations that want to produce their own broadcasts on online services.
- Provide hardware, software and services that support broadcasting for major media events - Olympics, disasters
- Broadcasting over online services to vertical markets - e.g. stock prices to banks, sports events to sports bars

Advertising

Current Business Environment

- High growth in the 80s has slowed
- Global agencies that can provide worldwide support are growing, smaller agencies compete by understanding market niches - different systems requirements
- PR is generally separate from advertising within an agency, PR is becoming more multimedia-oriented - presentations, video-clips, multimedia theatrical product announcements globally

IT Trends

- Major advertising agencies, either on their own or in partnership with smaller vendors, are creating groups for electronic marketing (building web pages)
- Internet is one vehicle for delivering advertisements, profiling users will be an advantage of the Internet that lends itself to targeted advertising
- Color-matched systems based on technologies from companies like EFI and Kodak for distributing proofs of adverts based on standard hardware, previously on specialized equipment (e.g. proofing machines)
- Intense interest in Web for promotion and sales support literature
- Collaborative systems for producing advertising materials. Freelance artists, copywriters and editors may all be on Lotus Notes or similar groupware to enable them to share documents.
- Online stock photographs, used to be ordered on paper. Now CD-ROMs are common and instant access to large libraries of stock art (videos as well as still photographs) for advertisements using online services will grow.
- Videoconferencing and shared whiteboards with clients for storyboarding

IT Variances Between the US And Europe

- More multimedia in the U.S.
- Larger advertising and promotional budgets in the U.S.
- U.S. (California in particular) ahead in Web marketing

Opportunities For IBM in Advertising

Hardware Opportunities

- Turnkey systems that can support advertising agencies and PR agencies
- Web servers with special software for advertisers
- Mobile computers and handheld devices for account managers that need to be at a client's site, yet have access to corporate information

Application Opportunities

- Asset management, collaborative publishing, customer service, information search and retrieval, Internet marketing, job tracking, network management, video delivery systems

Service Opportunities

- Online services to support advertising agencies with databases of marketing information, key industry influencers, stock photography, samples of adverts, key directories of advertising opportunities with rates
- Internet services to support web advertising and electronic marketing - hosting, maintenance, directories
- Network and systems management support of globally distributed ad-agencies to help them support global ad campaigns and manage their dispersed offices, integrating them with virtual LANs

Direct Marketing

Current Business Environment

- Major list publishers like Dun & Bradstreet
- Increased use of quantitative and database analysis to target customers precisely
- Many small players, highly fragmented market
- Some third class mail may be replaced by Web pages, but not all because Web is only for active users that seek information, not for passive users
- Direct marketing is often outsourced

IT Trends

- Larger systems integrators, like EDS targeting the market with systems that can visualize demographics
- Visualization of data, data mining
- More sophisticated consumer and business profiling
- Increasingly companies value content obtained from building customer profiles, this may be resold
- Massive data warehouses
- Better tracking of direct marketing respondents

IT Variances Between the US And Europe

- U.S. less concerned with privacy laws, more opportunities for collecting data on purchasers, for example via credit card databases. Europeans have stricter privacy laws that may prevent them from accessing such data.
- Less “junk mail” in Europe
- More focused direct mail campaigns in the U.S., e.g. profiling targets using ZIP codes

Opportunities For IBM in Direct Marketing

Hardware Opportunities

- Networked servers that can gather corporate information for mailing directories from multiple sources
- Web servers pre-packaged for mailing houses and mailing list management companies
- Turnkey systems for mailing houses with online service access for renting and updating lists

Application Opportunities

- Call centers, customer service, data visualization and mining, information search and retrieval, job tracking, mailing list applications (based on IBM’s extensive data management expertise), network management

Service Opportunities

- Managing mailing lists on online services
- Distributing mailing lists over online services
- Internet mailing and list management services (including Internet LISTSERV support)

Online Services

Current Business Environment

- Professional companies - high-priced, trying populist services, experienced at pricing by value of information - Lexis.Nexis, Knight-Ridder (Dialog), Dow-Jones - under competition from services targeted at individual PC users
- CompuServe, AOL, MSN target individuals - all offer Internet browsers - their content will be on the Internet, if not already, service offerings will be combined with Internet access - value of these services is in the data collections they offer. Some believe that the online services are under threat of extinction in the next 5 to 10 years from the Internet. On the other hand the online services are able to index and attractively package information, providing value that users will continue to pay for. Online services, far from being threatened by the Internet are likely to benefit from it and be perceived as valuable sites on the Internet for finding well-organized information and valuable goods and services, Microsoft aims to make MSN one of the most desirable places to visit on the Internet.

IT Trends

- Agent technology for searching - on the Internet - Infoseek
- Internet interfaces - at least terminal emulation for Dialog and Lexis/Nexis, more sophisticated systems to follow

IT Variances Between the US And Europe

- Language differences for different European companies, more market fragmentation in Europe
- More willingness for individuals to pay in U.S. for online services, greater use of them in the U.S. than in Europe, in part because of low cost or free local phone calls
- ISDN access costs lower in the U.S., however Europe is expected to lower tariffs and install ISDN widely

- Minitel in France and videotext in other European companies mean that consumers in Europe are used to getting some information more readily than in the U.S. Minitel is vulnerable to competition from the Internet, however its presence will also make it harder for Internet providers to attract French consumers. Minitel has recently announced it will upgrade its service using Telescript-based agent technology from General Magic. Continuous investment by France Telecom in Minitel means that it is unlikely to disappear within the next 5 years, however competition will increase and there is a risk that it could severely affect Minitel. This presents an opportunity for IBM to offer Internet services that connect and complement Minitel with the goal of luring customers away from the system.
- Minitel means French consumers know what to do with online services - e.g. reservations, ticketing, directory lookup

Opportunities For IBM in Online Services

Hardware Opportunities

- Hardware platforms for major online service providers, particularly for operations support systems like billing systems that require large databases
- Consumer Pcs (appliances) and kiosks that are pre-configured to access online services

Application Opportunities

- OS/2 WARP applications
- Collaborative applications on online services, e.g. scheduling systems (group scheduling, reservation systems, tournament and conference planning)

Service Opportunities

- IBM Global Network
- IBM-branded Internet applications and services

Telecommunications

Current Business Environment

- Increased competition for telcos from cable and wireless companies
- Increase in data services - AT&T Network Notes
- Increased focus on consumer messaging
- Intense pressure for regulated telcos who seek unregulated markets that they can compete in
- Telcos spinning-off ventures - Air Touch = wireless venture of Pacific Bell
- MCI acquired SHL Systemhouse - telcos look to systems integration and services for growth
- Long term pricing is unlikely to be distanced based so that telco pricing becomes like that of the Internet.
- Telcos are highly likely to absorb the “data dialtone” market that is currently provided by Internet access providers. They already provide Internet backbone services and are expected to expand in this area.
- Convergence of communications, computers, content, context is under debate with break up of AT&T and acquisition of SHL Systemhouse by MCI. Long term there is good opportunity for high profits in Internet Access by the telcos because it leverages their existing business, whereas competitors cannot compete cost-effectively (they have to lease lines, staff up with support and maintenance teams and invest in costly operations support).

IT Trends

- More modular operations support systems for telcos
 - Telco operations support systems have traditionally been massive in-house projects.
 - Modern programming technology means that organizations like Bellcore and AT&T Bell Labs are under pressure to compete with more modular systems from outside companies.
- IBM can help telcos define their standard operating environments (SOEs), based on IBM products and applications software. Extend traditional data center SOEs to departmental and workgroup environments using packaged software applications.
- More sophisticated data warehouses that can combine systems for inventory, service orders, work orders.
- More sophisticated customer support systems that integrate billing and engineering systems with customer records.

- Network management using object-oriented and agent technologies
- Broadband to the home with narrowband from home to the telco.

IT Variances Between the US And Europe

- U.S. 10 years ahead of Europe in deregulation
- Strong national competitors trying to go international, either directly or through alliances, e.g. BT/MCI
- GSM digital mobile telephony, infrastructure for mobile data, international standard - Europe, Australia, etc. (not popular in U.S.)

Opportunities For IBM in Telecommunications

Hardware Opportunities

- Build on installed mainframe base, expanding data center systems, but also spread across networks with more distributed platforms.
- CIT - Computer Integrated Telephony - integrate IBM platforms with PBXs and call center equipment.
- Mobile data devices and notebook computers (miniaturize Thinkpad)

Application Opportunities

- Billing systems, call centers, customer service, internet marketing, mailing list and directory systems, network management, provide telcos with software for building online services, operations support systems, video delivery systems
- Object-oriented OSS (operations support system) frameworks that can be rapidly customized and interfaced to existing systems enabling IBM's customers to compete with Bellcore and other providers more cost-effectively (e.g. NeXTStep enables MCI and McCaw to gain competitive advantages with flexible systems)
- Data warehouses with visualization that interface to systems built using IBM's database technology
- Object-oriented network management for broadband networks
- Common Operating Environments based on IBM applications software
- In the video-on-demand market the original idea of replacing Blockbuster and video stores with online delivery of videos to the home is being refined to provide consumers with alternatives that include a rich array of information services, such as travel planning, personalized news, investment advice etc.

Service Opportunities

- Software maintenance and upgrade services using networked systems for telcos
- Interface IBM Global Network to telco services to gain more customers, provide telcos with IBM Global Network services so that they can offer a richer set of services.

Application Descriptions

Asset management

Description

In the media industry, asset management systems manage the assets of the business such as photographs, documents, videos and publications. Multimedia assets require a whole new class of systems that can not only store assets, but also track how they are used, support the payment of royalties and distribute them across a network to customers.

Critical requirements

Multimedia, fast workstations and servers, high performance systems, partnerships with asset owners.

Strong partners as both customers and suppliers of content.

Opportunities for IBM

This is an emerging area with opportunities for creative application of networking technologies that enable assets to be shipped electronically to remote sites. Systems that enable potential customers to browse assets are needed. These systems can range from a CD-ROM of digitized photographs to full systems for a production studio that needs management of movies. Services related to the management of assets is an opportunity that may be considered.

Billing systems

Description

Billing systems vary with the application. For an online service provider a billing system may bill according to length of time on the service, type of information retrieved or other criteria. For a directory publisher a billing system may need to bill advertisers. There are many different types of billing systems.

Critical requirements

Interfaces to other accounting and financial systems, like credit card billing systems.

Reliability, security.

Performance requirements vary with size of system.

Interfaces to customer systems.

Opportunities for IBM

Supplier of readily customizable software of large complex billing systems. This is an opportunity for IBM to invest in objects and component software that can support a variety of billing jobs.

IBM may consider offering billing services for Internet publishers or online services.

Call center systems

Description

These systems may be used in customer service centers to handle large numbers of phone calls. The software required to support these systems is changing and there are new opportunities in the media market segment. These include call centers for Internet publishers to supplement interactions on the Internet with phone support.

Critical requirements

Alliances with major telephone equipment vendors.

Opportunities for IBM

To provide software that makes call centers more intelligent and inter

Customer service and support

Description

Customer service systems provide customers with information via customer service representative (on the phone), the Internet, fax-back and online services. They may also enable customers or service reps to enter data into trouble reporting and work order systems. They need to integrate information from engineering, billing, customer record and other databases. They are becoming more networked across enterprise application areas.

Critical requirements

- Customer service reps need one or more large screens to display multiple datasets so that they can rapidly answer questions (c.f. IBM's installation at USAA)
- Interfaces to existing databases and systems
- Rapid response
- Easy to use interfaces
- Multiple interfaces to the customer, depending on customer preference
- One-stop shopping for the customer

Opportunities for IBM

- Support and integrate customer service systems.
- Run customer service centers for smaller organizations.

Data mining and visualization

Description

View data visually from multiple databases that has been consolidated and cross-linked in a data warehouse. Systems enable users to drill down on requirements.

Critical requirements

3-D visualization workstations and related software.

Understanding of database interfaces and ability to integrate them.

Data warehouse. High bandwidth networking.

Opportunities for IBM

To provide data visualization systems that interact with its current databases.

Internet broadband Broadcasting

Description

This involves sending music and video over the Internet.

Critical requirements

High bandwidth networking.

Opportunities for IBM

To set standards and provide high speed broadcasting facilities on its networks.

Internet Marketing

Description

This is mainly web related software and services. It includes the use of web pages for advertising and promotion, as well as customer profiling.

Critical requirements

Ability to partner with small, innovative Internet companies.

Ability to integrate Internet applications into existing systems.

Messaging systems management expertise.

Opportunities for IBM

IBM can help large corporations integrate systems for the Internet for both internal and external systems.

IBM can offer Internet applications on its online networks and the Internet.

Job tracking, program scheduling

Description

Track jobs at customer sites for printing, advertising, etc.

Critical requirements

Range of software packages and understanding of the business processes.

Opportunities for IBM

A range of opportunities in packaged software and systems for larger corporations.

Mailing List, Subscriptions and Directory Management

Description

Databases, directories and lists to support direct marketing.

Critical requirements

High performance, easily maintained databases, content partners.

Opportunities for IBM

Partner with companies that have content and supply large and small direct marketing companies with turnkey and customized systems.

Host online services.

Network management

Description

Network management ranges from LANs to telcos.

Critical requirements

Scalability, high performance, reliability.

Opportunities for IBM

To manage networks of all sizes in the media segment and provide software.

Online service software/systems

Description

Software for vendors intending to set up niche-oriented online services. IBM can also offer its own online services.

Critical requirements

Ability to attract vendors, advertisers and users.
Differentiation from existing online services.

Opportunities for IBM

IBM Global Network
Internet services
Electronic Commerce

Video Delivery (video-on-demand and pay-per-view) Systems

Description

These systems are any that deliver video via multimedia PCs or set top boxes on TVs. They may be for corporate or public services.

Critical requirements

- High bandwidth, high speed computer architectures, video server technology.
- Ability to organize massive databases.
- Reliable service to customers.

Opportunities for IBM

IBM can concentrate on the operations support side of the video market. This is less vulnerable to trends in video technology and consumer fads. The operations support side builds on IBM's expertise in telecommunications markets with large databases and hardware.

Summary of IBM's Opportunities In Media

There are many emerging opportunities in the media market segment. IBM needs to consider its strengths:

- Ability to integrate massive systems
- Support for massive databases, particularly in telecommunications markets
- Thinkpad computers
- Lotus software
- IBM Global Network and corporate network expertise
- AS/400

IBM is well-positioned to support corporations that want to extend their businesses globally with industrial strength systems, particularly those based on databases. Linking mobile professionals seamlessly to large databases and online services is where IBM can play to its strengths in network centric computing. Another area is in groupware, where

combining its Internet expertise with Lotus Notes provides excellent opportunities for supporting creative professionals in the media segment.

| 1996 | Print Publications | Broadcasting | Advertising | Direct Marketing | Online Services | Telecommunication |
|--|--------------------|--------------|-------------|------------------|-----------------|-------------------|
| Factor | | | | | | |
| <i>Environmental and Government</i> | | | | | | |
| Reduction in public subsidies | | XX | | | | |
| Deregulation | | | | | | XX |
| Language Dependent | XX | X | XX | XX | X | X |
| | | | | | | |
| <i>Financial</i> | | | | | | |
| Low profitability | XX | XX | | XX | | |
| Tariffed pricing | | | | | | XX |
| Price by value of information | X | | | | X | |
| Price by amount of service/product used | X | X | | | X | XX |
| Seller pays for product/service | X | X | XX | XX | X | |
| Rising costs | XX | | | XX | | XX |
| | | | | | | |
| | | | | | | |
| <i>Product and Technical</i> | | | | | | |
| Web pages for delivery of products | X | | XX | X | X | |
| High use of mainframe computers | | | | X | | XX |
| High use of graphical workstations | X | XX | X | | | X |
| Network management experience | | | | | X | XX |
| High bandwidth multimedia | | XX | X | | X | XX |
| | | | | | | |
| | | | | | | |
| <i>Market Analysis</i> | | | | | | |
| Strength of competition | X | XX | X | X | X | XX |
| Cartel of large players | X | X | | | | XX |
| Cottage industry of small players | XX | | X | XX | X | |
| New market competitors | X | X | X | X | XX | XX |
| Cash cow businesses under threat | XX | | | | X | X |
| | | | | | | |
| | | | | | | |
| <i>Areas of Investment</i> | | | | | | |
| Online delivery of information | XX | XX | XX | XX | XX | |
| Higher capacity bandwidth | | | | | | XX |
| Operations support systems | | X | | | X | XX |
| Customer profiling | X | X | XX | XX | XX | XX |
| Customizing offering for individuals | XX | | X | XX | XX | X |
| Educational applications | X | XX | | | X | XX |
| Expansion in consumer markets | XX | XX | XX | XX | XX | XX |

| | Print Publications | Broadcasting | Advertising | Direct Marketing | Online Services | Telecommunication |
|--|--------------------|--------------|-------------|------------------|-----------------|-------------------|
| 1998 | | | | | | |
| Factor | | | | | | |
| <i>Environmental and Government</i> | | | | | | |
| Reduction in public subsidies | | X | | | | |
| Deregulation | | | | | | X |
| Language Dependent | XX | X | XX | XX | X | X |
| | | | | | | |
| <i>Financial</i> | | | | | | |
| Low profitability | XX | XX | | XX | | |
| Tariffed pricing | | | | | | XX |
| Price by value of information | XX | | | | XX | |
| Price by amount of service/product used | X | X | | | X | XX |
| Seller pays for product/service | X | X | XX | XX | X | |
| Rising costs | XX | | | XX | | XX |
| | | | | | | |
| | | | | | | |
| <i>Product and Technical</i> | | | | | | |
| Web pages for delivery of products | XX | X | XX | XX | XX | |
| High use of mainframe computers | | | | X | | X |
| High use of graphical workstations | X | XX | X | X | X | X |
| Network management experience | | X | | | XX | XX |
| High bandwidth multimedia | X | XX | X | | X | XX |
| | | | | | | |
| | | | | | | |
| <i>Market Analysis</i> | | | | | | |
| Strength of competition | XX | X | X | X | XX | XX |
| Cartel of large players | X | X | X | | | XX |
| Cottage industry of small players | XX | X | X | XX | X | |
| New market competitors | X | XX | XX | XX | XX | XX |
| Cash cow businesses under threat | XX | | X | X | X | X |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| <i>Areas of Investment</i> | | | | | | |
| Online delivery of information | XX | XX | XX | XX | XX | |
| Higher capacity bandwidth | | | | | | XX |
| Operations support systems | | X | | | X | XX |
| Customer profiling | XX | X | XX | XX | XX | XX |
| Customizing offering for individuals | XX | | X | XX | XX | X |
| Educational applications | X | XX | | | X | XX |
| Expansion in consumer markets | XX | XX | XX | XX | XX | XX |

| | Print Publications | Broadcasting | Advertising | Direct Marketing | Online Services | Telecommunication |
|--|--------------------|--------------|-------------|------------------|-----------------|-------------------|
| 2000 | | | | | | |
| Factor | | | | | | |
| <i>Environmental and Government</i> | | | | | | |
| Reduction in public subsidies | | | | | | |
| Deregulation | | | | | | X |
| Language Dependent | XX | X | XX | XX | X | X |
| <i>Financial</i> | | | | | | |
| Low profitability | XX | X | | XX | X | |
| Tariffed pricing | | | | | | X |
| Price by value of information | XX | X | | | XX | |
| Price by amount of service/product used | X | X | | | X | XX |
| Seller pays for product/service | X | X | XX | XX | X | |
| Rising costs | XX | | | XX | X | X |
| <i>Product and Technical</i> | | | | | | |
| Web pages for delivery of products | XX | X | XX | XX | XX | X |
| High use of mainframe computers | | | | X | XX | XX |
| High use of graphical workstations | XX | XX | X | X | X | XX |
| Network management experience | | X | | | XX | XX |
| High bandwidth multimedia | X | XX | X | | X | XX |
| <i>Market Analysis</i> | | | | | | |
| Strength of competition | XX | XX | XX | XX | XX | XX |
| Cartel of large players | X | X | X | | | XX |
| Cottage industry of small players | X | X | X | XX | X | |
| New market competitors | X | X | X | X | X | X |
| Cash cow businesses under threat | XX | | X | X | X | X |
| <i>Areas of Investment</i> | | | | | | |
| Online delivery of information | X | X | XX | X | X | |
| Higher capacity bandwidth | X | XX | X | X | XX | XX |
| Operations support systems | | X | | X | X | XX |
| Customer profiling | XX | XX | XX | XX | XX | XX |
| Customizing offering for individuals | | | XX | XX | | |
| Educational applications | XX | XX | | | XX | XX |
| Expansion in consumer markets | X | X | X | X | X | X |

| Print Publications | Broadcasting | Advertising | Direct Marketing | Online Services | Telecommunications | | Primary Delivery Mode | Competition | IT Vendor Market Size/Probability | | |
|--|--------------|-------------|------------------|-----------------|--------------------|--|---------------------------|--|-----------------------------------|---------|---------|
| Systems and software solutions opportunities | | | | | | | | | 1996 | 1998 | 2000 |
| Applications | | | | | | | | | | | |
| X | X | X | | X | | Asset Management | SI, VAR | Emerging Companies | L/0.8 | L-M/0.8 | M/0.6 |
| X | XX | | | X | X | Billing Systems | PS, SI | Bellcore, CBIS, CSC, GTE Data, Kenan | M-H/0.9 | M-H/0.8 | H/0.8 |
| | | | X | | X | Call Center Systems | Direct, SI, via telcos | AT&T, EDS, Northern Telecom | M-H/0.9 | H/0.8 | H/0.8 |
| X | X | XX | | | | Collaborative Publishing | Direct, Reseller, SI, VAR | Adobe, Asymetrix, Macromedia, Microsoft, Netscape (Collabra), Quark, Scitex, Sybase | L/0.8 | L-M/0.8 | M-H/0.8 |
| X | X | X | X | X | X | Customer Service | PS, SI | Andersen Consulting, Clarity, EDS | M/0.7 | M-H/0.7 | H/0.7 |
| | | X | XX | | | Data Mining and Visualization | Direct, SI | Cognos, EDS, Nielsen, Oracle/IRI, SAS Institute | L-M/0.9 | M/0.8 | H/0.6 |
| X | X | X | X | XX | | Information Search and Retrieval | SI/SW Vendor | Dataware, Fulcrum, Verity | L-M/0.9 | M/0.8 | H/0.7 |
| | XX | | X | XX | | Internet Broadband Broadcasting | PS/SI | Various Universities | L/0.9 | L/0.8 | L/0.8 |
| X | X | X | X | X | X | Internet Marketing | SW Vendor/SI | Digital, HP, SGI, Sun | L-M/0.8 | M-H/0.6 | H/0.6 |
| X | X | X | X | | | Job tracking, program scheduling | Direct/SI/VA R | AT&T Istel, CACI, Dun & Bradstreet, QAS Systems, The Computing Group, Peachtree Andersen | L/0.8 | L/0.8 | L-M/0.7 |
| X | X | X | X | X | X | Mailing list, subscriptions and directory management | Direct/PS/SI | Consulting, Digital, EDS, HP, MCI/SHL, Memorex/Telex, Novell, Unisys Apple, AT&T | L/0.8 | L-M/0.8 | L-M/0.8 |
| X | X | X | X | X | X | Network Management | SI/HW Vendor | (Easylink and Istel), GEIS, Knight-Ridder, Lexis/Nexis, Sterling Software | L/0.9 | L-M/0.9 | L-M/0.8 |
| | | | | XX | | Online Service Software/Systems | PS/SI | | L-M/0.8 | L-M/0.8 | M/0.8 |

| Print Publications | Broadcasting | Advertising | Direct Marketing | Online Services | Telecommunications | | <u>Primary Delivery Mode</u> | <u>Competition</u> | <u>IT Vendor Market Size/Probability</u> | | |
|--------------------|--------------|-------------|------------------|-----------------|--------------------|----------------------------|------------------------------|--|--|-------|-------|
| | XX | | | X | X | Operations Support Systems | PS/SI | AT&T Network Systems, Bellcore, CBIS, GTE Data | H/0.9 | H/0.9 | H/0.9 |
| | X | X | | X | X | Video Delivery Systems | PS/SI/Direct | AT&T, Digital, HP, Oracle, Sybase | M/0.8 | H/0.7 | H/0.8 |
| | | | | | | L - Low | <\$50M | | | | |
| | | | | | | M-L - Medium to Low | \$50-\$250M | | | | |
| | | | | | | M - Medium | \$250M - \$750M | | | | |
| | | | | | | M-H - Medium to High | \$750M - \$2B | | | | |
| | | | | | | H - High | >\$2B | | | | |

3.

HEALTH CARE

HEALTH CARE SUBSEGMENTS

- Managed care (including HMOs, National Health plans, and other coordinated insurance plans)
- The following provider subsegments, to the extent they are separate entities (i.e., not part of managed care)
 - Hospitals
 - Physicians and other professional providers
 - Long term care (Nursing homes and other)
- Health insurance that is not part of managed care: payments are per treatment to providers and/or patients

-
- Not included
 - Retail drug stores
 - Medical education/schools
 - Pharmaceutical/medical suppliers' "horizontal functions"

HEALTH CARE BUSINESS ENVIRONMENT

- Aging populations and higher health care expectations
- Costs increasing faster than inflation worldwide. U.S. most extreme case, with health care costs almost 15% of GNP (double that a generation ago). Cost problems caused by:
 - Counterproductive payment systems
 - Until recently, most were, cost-plus
 - Aggravated in U.S. by fee-for-service insurance
 - Unusual relationship of technology and costs: Costs increase as more advanced technology is used.
- Health care has very high visibility. Politics and regulation a fact of life.
 - Many prices controlled.
 - Access to health care is increasingly rationed (formally or de facto)
 - Relatively little control on the practice of medicine (starting to change).
- Pharmaceutical companies: thirty years of high growth, high profits coming to an end.
 - Increased regulation, managed care controls
 - Few new "big winner" drugs on horizon
 - Cash cows going off-patent
 - Affiliations with managed care organizations
- "Managed care" (under different names) a trend in much of the developed world.
 - Cost-driven:
 - Control access to expensive care
 - Soon, some controls on practice of medicine
 - U.S.: Biggest need, furthest ahead

HEALTH CARE BUSINESS ENVIRONMENT (cont'd)

- Managed care
 - Leading to extensive mergers, consolidations of providers.
 - In the U.S. 5,000 hospitals may over time be consolidated into several dozen groups.
 - Similar trends in Europe
 - Provider affiliations with managed care organizations become critical to provider success (and, sometimes, existence)
 - A good "mid-term" fix; can reduce health care inflation, possibly below general inflation.
 - Unclear if managed care benefits will last more than ten years: Managed care does not deal with the issues of aging and expectations.

- Long term care
 - Social and economic time bomb
 - Managed care does not have answers
 - Unlikely to be addressed until after 2000

HEALTH CARE IT

Overview

The health care sector, especially the health insurance and hospital subsegments, have historically been among the most intensive users of IT.

- Hospitals have focused on coordinated departmental systems and applications.
- In the past IT use has tended to be isolated, i.e., within a single hospital or health insurance organization.
- The main benefits of IT have been the maximization of traditional cost-based reimbursement for individual providers (in the U.S.).
- Generally speaking, the benefits of automation have been less in the health care sector than in most other sectors (e.g., manufacturing).

Managed Care IT

Managed care has begun to change the IT environment and will make enormous changes during the rest of the 1990s.

- These trends are more apparent in the U.S., are occurring earlier and will have a larger impact on IT and the underlying health care system
- Similar, weaker trends are evident in Europe.

IT in a managed care organization combines many of the aspects of health insurance and provider IT within the same organization.

- Above all, a managed care organization must "get the numbers right" from an actuarial/enrollment standpoint, if it is going to succeed (or, in some cases, stay in business).
- In setting contracts with providers, managed care organizations must balance cost savings, customer (patient) satisfaction, quality, efficiency in both the short and long run. The media, politicians and regulators are always looking out for perceived problems.

Successful IT is critical to the success of managed care organizations, i.e., enabling them to profitably compete for patients. Examples of IT functions include:

- Demographics of covered patients
- Encounter analysis
- Service utilization vs. norms
- Individual and collective provider profiles
- Price setting

Managed care organization success comes from driving hard bargains with providers. In self-defense, providers, especially hospitals, must reorient their own IT systems to produce new kinds of data needed for the new environment, e.g.;

- Profitability by patient, diagnosis and treatment
- Impact on profitability by changing patient mix
- Classification of physicians by quality, cost and revenue generation
- Price setting
- Assessing the financial impact of affiliations with other providers
- Comparison of its own provider network to its competitors and other norms

Next-Generation Applications

Managed care will require the replacement of most provider IT applications.

- The decentralized/departmental operations model will remain, because that reflects the ways providers conduct their business. However, there will be significant changes:
 - There will be many more links to external providers and provider networks.
 - Some links will be between providers at the upper, overall provider level.
 - Other links will be at the subprovider level, e.g., between hospital departments and physician specialists.
 - These links will have to be very flexible

- Providers may belong to overlapping or competing managed care organizations
 - Provider alliances may change.
 - Managed care affiliations may be dropped or modified.
- Providers will have to support extensive data mining from "megabase" data warehouses.
 - Providers will have to perform a "mini" or mirror version of the large scale analyses conducted by a managed care organization.
 - Many providers will not have the knowledge or critical mass to allow them to be able to perform this kind of analysis. They will have to use outside vendors.
 - The attached exhibit illustrates this activity.

Most current operations support applications (whether a software packaged, customized system or a processing service) will not be able to support these new functions. This will provide a significant opportunity for new entrants.

Health Care Megabases©

- Hospitals
- Physician groups
- Health networks

- Managed care
- Insurers
- Pharmaceutical manufacturers
- Governments



Outputs

- Actuarial analysis
- Public health studies
- Outcome analysis
- Provider scorecards
- Cost norms
- Treatment protocols

Uses

- Drug studies
- Marketing scenarios
- Patient-mix models
- Provider negotiations
- Partnering
- Mergers and acquisitions
- Network modeling
- Pricing modeling
- Coverage alternatives

NCC OPPORTUNITIES

The main opportunities in the U.S., even in the near term, will be managed care-related.

Managed care-related activity will not be a significant factor in Europe until the late 1990s.

- The situation and initiatives vary by country.
- The market will develop more slowly because there is neither the sense of crisis that there is in the U.S. and government plays a much larger role in their health care systems.

"Traditional" NCC-type applications should be pursued differently in the U.S. and Europe:

- Because of the rapid environmental changes going on in the U.S., these should be viewed as "harvest mode" activities. This includes:
 - Traditional health insurance outsourcing
 - Current hospital and physician systems
- Investments and initiatives in Europe that have a 3-5 year payback are acceptable.

HEALTH CARE NCC MARKET SIZING

(\$ Billions)

U.S.

| <u>Applications</u> | <u>1996</u> | <u>1998</u> | <u>2000</u> |
|---------------------|-------------|-------------|-------------|
| "Traditional" | M-H/.7 | M-H/.7 | M-H/.6 |
| Managed Care | H/.7 | VH/.8 | VH/.8 |

EUROPE

| <u>Applications</u> | <u>1996</u> | <u>1998</u> | <u>2000</u> |
|---------------------|-------------|-------------|-------------|
| "Traditional" | M/.7 | M-H/.7 | H/.6 |
| Managed Care | M/.5 | M-H/.6 | VH/.7 |

*Key:

L = Under \$50MM

M-L = \$50-250MM

M = \$250-750MM

M-H = \$750MM-\$2 billion

H = \$2-5 billion

VH = Over \$5 billion

Probabilities: from 0.1 to 0.9

COMPETITIVE ENVIRONMENT

There are several hundred vendors now offering products and services to the health care sector. The attached exhibit show representative specialist vendors who support traditional applications.

Many current vendors will not be able to "graduate" to managed care applications. Vendors supporting managed care applications will have the following characteristics:

- Have a thorough understanding of managed care operations, practices and systems
- Able to support large, complex environments.
- After 2-3 years, offer "health care objects"
- Be ready to invest significant amounts in people, technology and dollar over the next 3-5 years, usually before full payoff.

The strongest vendors will be those who can compete across the board, providing their own core competencies as well as those of selected partners. Other vendors will occupy niche areas, such as managed care actuarial systems.

INPUT believes the following vendors have the potential to compete across the board in the managed care market:

- Andersen
- CSC
- EDS
- HP
- IBM

Other specialists, like Systematics and SMS, could provide the core of a managed care support business.

ibheal

Information Services Vendors to the Health Services Industry

| Company Name | Headquarters | Significant Product/Service Offerings |
|---|----------------------|---------------------------------------|
| ALLTELL (Systematics Health Care Services) | Atlanta, GA | AS, ProcSvc, Outsrc |
| Andersen Consulting | Chicago, IL | AS, PS, SI |
| Cerner Corporation | Kansas City, MO | AS, Tky |
| Citation Computer Systems, Inc. | Chesterfield, MO | AS, PS |
| Clini-Com | Boulder, CO | AS, PS, Tky |
| CSC Healthcare Systems | Farmington Hills, MI | SW, Si, Outsrc |
| CyCare Systems, Inc. | Scottsdale, AZ | AS, SI, NS |
| Electronic Data Systems (EDS) | Plano, TX | Outsrc, SI |
| First Data Corporation | Hackensack, NJ | ProcSvc, Tky |
| First Financial Management | Atlanta, GA | ProcSvc, Outsrc |
| HBO & Company | Atlanta, GA | AS, Tky, PS, Outsrc |
| Hewlett-Packard (Healthcare Info. Mgmt. Grp.) | Andover, MA | AS, PS, SI |
| IBM (Health Industry Unit) | Atlanta, GA | PS, SI |
| IDX | Burlington, VT | AS |
| Management Systems Associates | Raleigh, NC | AS, SI, PS |
| Medical Systems Corporation | Evanston, IL | AS, SI, Outsrc |
| MEDITECH | Westwood, MA | AS, Tky |
| Reynolds and Reynolds - National Medical Computer (NMC) Service | San Diego, CA | AS, Tky |
| Sachs Group | Evanston, IL | AS (databases) |
| Shared Medical Systems Corporation (SMS) | Malvern, PA | ProcSvc, Outsrc, NS |
| 3M | Salt Lake City, UT | AS |
| Unisys | Blue Bell, PA | AS, PS, SI |

Source: INPUT

4. RETAIL FINANCIAL PRODUCTS

RETAIL, INDIVIDUAL FINANCIAL PRODUCTS

- Segments Analyzed
 - Demand Deposits/Electronic DDA
 - Savings
 - Lending Products
 - Investment and Insurance Products
 - Card Based Services and EC
 - Retail Cash Management
- Business Segment Environment: 1996, 1998, 2000
- IT Trends
- NCC Applications Examples
 - Sizing/Prioritization Example
 - Potential Application Exclusions

RETAIL, INDIVIDUAL FINANCIAL PRODUCTS - 1996
Line of Business

| <u>Factor</u> | <u>Demand Dep/Elec. DDA</u> | <u>Sav.</u> | <u>Pers. Serv Lend.</u> | <u>Invest. & Insur.</u> | <u>Card Based</u> | <u>Retail CMA</u> |
|-----------------------------------|-------------------------------------|-------------|---------------------------------|-------------------------------------|-----------------------|-----------------------|
| Low Profit | y | y | | | | |
| Perceived Prod Differentiation | yy | | y | | y | |
| Growth | y | | y | y | y | |
| High Fixed Costs | yy | | | | | |
| Low Cost Competition | y | y | | yy | y | |
| Cost Red. | yy | y | y | | y | |
| Reg/Dereg | y | y | y | | y | |
| Segment Consolidation | yy | y | y | y | y | y |
| Computer Dependency | y | | y | | y | |
| Central Host | y | | y | | | |
| Network Dependency | y | | | | y | y |
| Signif. Local Comp | | | y | | y | |
| New Net. Initiative | y | | | y | y | y |

y = important;
yy = very important

RETAIL, INDIVIDUAL FINANCIAL PRODUCTS - 1998
Line of Business

| <u>Factor</u> | <u>Demand Dep/Elec. DDA</u> | <u>Sav.</u> | <u>Pers. Lend. Serv.</u> | <u>Invest. & Insur.</u> | <u>Card Based</u> | <u>Retail CMA</u> |
|-----------------------------------|-------------------------------------|-------------|----------------------------------|-------------------------------------|-----------------------|-----------------------|
| Low Profit | yy | y | | | y | y |
| Perceived Prod Differentiation | yy | | y | y | y | y |
| Growth | y | | y | y | y | |
| High Fixed Costs | yy | | y | | | |
| Low Cost Competition | y | y | | yy | y | |
| Cost Red. | yy | y | y | | y | y |
| Reg/Dereg | y | y | | y | y | |
| Segment Consolidation | yy | y | y | y | y | y |
| Computer Dependency | y | | y | | y | |
| Central Host | y | | y | | | |
| Network Dependency | y | | y | y | y | y |
| Signif. Local Comp | y | y | y | y | y | y |
| New Net. Initiative | y | | | y | yy | y |

y= important
yy= very important

RETAIL, INDIVIDUAL FINANCIAL PRODUCTS - 2000
Line of Business

| <u>Factor</u> | <u>Demand Dep/Elec. DDA</u> | <u>Sav.</u> | <u>Pers. Lend. Serv.</u> | <u>Invest. & Insur</u> | <u>Card Based</u> | <u>Retail CMA</u> |
|-----------------------------------|-------------------------------------|-------------|----------------------------------|------------------------------------|-----------------------|-----------------------|
| Low Profit | yy | y | | y | y | y |
| Perceived Prod Differentiation | yy | | y | y | y | y |
| Growth | y | | y | y | y | |
| High Fixed Costs | yy | | | | y | |
| Low Cost Competition | y | y | | yy | y | y |
| Cost Red. | yy | y | y | y | y | y |
| Reg/Dereg | y | y | y | | y | |
| Segment Consolidation | yy | y | y | y | yy | y |
| Computer Dependency | y | | y | | y | y |
| Central Host | y | | | | | |
| Network Dependency | y | y | y | y | y | y |
| Signif. Local Comp | y | y | y | yy | yy | y |
| New Net. Initiative | y | | y | yy | yy | y |

POTENTIAL SEGMENTS OMITTED FROM RETAIL, INDIVIDUAL FINANCIAL PRODUCTS

- Other retail segments
 - Traditional retail payment services including collection and traveller's checks
 - Mortgage banking
 - Private, high net worth banking (except as covered by retail CMA and other products analyzed)
- Wholesale Banking
 - Correspondent Banking
 - Corporate Banking
 - Real Estate
 - Trust
 - Trading (handled separately) and Treasury

RETAIL, INDIVIDUAL FINANCIAL PRODUCTS IT TRENDS

Demand Deposits/Electronic DDA

The use of imaging is increasing in banks, particularly in larger ones, and banks including the Federal Reserve are developing strategies to provide copies of images to satisfy inquiries.

Demand deposit systems will continue to upgrade on-line capabilities although there will be efforts to reduce costs at the same time. One on-line capability that will help to achieve this objective is banking by the individual from home computers or terminals including ATM's or kiosks. As this type of banking grows, the costs of maintaining branch operations can be reduced. A number of approaches are being tried out including software packages that will encourage banking from home as well as new types of phone terminals, advanced ATM units and kiosks. Many depositors still feel existing approaches are not simple enough for them, however.

Electronic debits and credits are still growing in volume and are being applied to more financial activity. Arrangements to post accounts automatically for preauthorized payments or charges has been extended to a host of deposit instruments including welfare checks and payment for a host of services. Debits authorized for payment by phone are growing with the popularity of services such as "First Direct" and Chase "Direct" which combine access to customer information and financial data with personal contact and polished sales techniques.

Savings

A trend will continue to move savings accounts to on-line facilities. Automatic means of interesting savers in some alternate savings/investment opportunities through on-line and "First Direct" types of services.

Personal Lending Products

There is a continuing trend to provide means of electronically transferring funds to make loan payments. Complexity and the number of features of retail loan systems are increasing and causing continuing upgrades to be made to loan software products. There are also more frequent changes to lending rates and regulations that require updates. In addition, many of the software products in use for lending have not been adjusted to meet changes caused by the year 2000.

Card Based Products

There are a number of developments taking place in card use. Smart cards are being introduced for applications including payment through the Internet as well as various types of cash disbursement or card use without access to bank authorization systems.

The use of cards and networked devices to support them is growing in use. Some stores as well as banks are attempting to have customers utilize cards for more of their transactions. There is a trend for the development of more complex devices or terminals that will use cards including advanced ATM units and Kiosks, which will provide a set of services together with cash disbursement.

Retail CMA

Network use to gather information so that individuals can review their transactions and account and lending balances as well as data for use in making investments is increasing at banks as well as brokerages. Middle class and wealthy individuals as well as businesses run by one person or a small family group are using these accounts. As a result, additional features and linkages are being developed by many of the providers and some financial institutions are developing more complex forms of the systems for use by wealthy individuals, if they choose to.

NCC OPPORTUNITIES

Demand Deposit/Electronic DDA

Steps should be taken to develop an aggregate DDA capability on a regional basis. Federal Reserve districts are now developing the means of imaging all checks received and many electronic items are flowing through networks from terminal units including home banking systems. Banks are locating units close to RCPC's to receive traffic from them. There will be a trend toward regional concentration of work that could be performed on an aggregate basis for banks. The banks would receive a stream of debits and credits on networks, with the ability to obtain images of checks received by the regional processors. A major IT vendor(s) will be involved in the operation of these centers.

In addition to the home banking systems with money management software products being introduced by banks, there is a need for a limited (Easy Initiation) service, that would be nearer to what a depositor can do with the advanced "pay by phone" or "First Direct" types of services. This could be provided through multimedia from a CD-ROM together with network use. It would make it possible for a person to get through banking actions with less thought or steps than is now required with the use of current software packages. This large scale service could make use of a private network for certain levels of security and the Internet for some traffic. This could also be used with savings products.

Personal Lending Products

Aggregate loan operations, an economy of scale type of processing, could be offered with increased network capabilities. This would enable sales activities and information as well as the gathering of data from a borrower to be handled more rapidly and at lower cost. Some banks are already offering this capability for certain types of personal loans.

Investment/Insurance

A simple approach to sales and service initiation would enable potential, inexperienced clients to obtain information and try out what would happen scenarios ("what if" models) without committing or even identifying themselves. The sales techniques utilized with "First Direct" types of services could also be employed when prospects sought further information.

An "Aggregate Back Room" type of service could be offered by a vendor. This type of service is now being offered by some vendors, but they are not employing network or consolidation capabilities to the extent possible in processing.

Card-Based Services (Big Switch)

This approach would offer an improved network capability that could take advantage of the Internet for some traffic and private networks, to gain faster response and more security if and when needed. A double barrel capability would provide more economy and better service than the older, private networks now in use for card processing. This network approach would enable a vendor to provide processing and other card services as well although a financial intermediary would be needed for some merchant services.

Card-Based Services ("Internet Plus")

A coordinated set of improvements for use of the Internet and terminal capabilities should be undertaken as one concerted effort ("Internet Plus"). The developments being made in terminals for use in card based systems are not being considered together. An overall approach could be taken with advanced ATMs, kiosks, home banking units, modified phone terminals and other units that enabled a set of terminal capabilities to be offered to meet the market needs of banks. This activity should be undertaken with steps that permitted a selection of communications over the Internet, when possible, and over private networks when desirable or requested by clients.

Retail CMA

A vendor can develop a system for aggregation and delivery of CMA information. That would enable multiple delivery means including the Internet or private networks to be used based on the choice of customers. Multimedia techniques could be employed to bring information to the attention of recipients and offer product differentiation for banks.

A variation of CMA statements and services could be offered for bank customers more active in money management or who managed activities of a small business through a CMA capability. This sophisticated version of the CMA Delivery product discussed above could be provided by a vendor together with information selected by the client and the ability to interact with the vendor in developing and initiating transactions.

RETAIL, INDIVIDUAL FINANCIAL PRODUCTS - NCC APPLICATIONS

| Primary/ Related App | Competition | IT Vendor Market Size/Profitability | | |
|---------------------------------------|------------------------------------|-------------------------------------|--------|------|
| | | 1996 | 1998 | 2000 |
| <u>Demand Dep./Electr. DDA</u> | | | | |
| • Aggregate DDA | ALLTEL Fiserv | M/.4 | M-H/.5 | H/.5 |
| • Easy Initiation Lending Prod. | Msoft, Intuit | M-L/.7 | M/.7 | M/.5 |
| • Aggregate Loan Operations | ALLTEL, Fiserv | M_L/.4 | M/.5 | H/.6 |
| <u>Investment/Insurance</u> | | | | |
| • SimpleStart | Schwab, Merrill Banks (Limited) | L/.4 | M/.6 | M/.7 |
| • Aggregate Back Office | | L/.4 | M-L/.6 | H/.6 |
| <u>Card Based Services</u> | | | | |
| • Big Switch | Card companies | M-L/.5 | M/.5 | H/.7 |
| • Internet Plus | GEIS, Sterling | M-L/.4 | M/.4 | H/.6 |
| <u>Retail CMA</u> | | | | |
| CMA Delivery | Banks(Limited) Brokerages | M-L/.4 | M-H/.5 | H/.5 |
| “Key” | | | | |

L=Under \$50MM

M-L= \$50-250MM

M=\$250-750MM

M-H=\$750MM-\$2 Billion

H=\$2-5 Billion

VH=Over \$5 Billion

Probabilities: from 0.1 to 0.9

5.

BUSINESS BANKING

BUSINESS BANKING SEGMENT

- Segments Analyzed
 - Money Transfer and Swift
 - Electronic Commerce
 - International Services (Trade Services and Foreign Exchange)
 - Other Payment Services
 - Commercial Lending
 - Cash Management
- Business Segment Environment: 1996, 1998, 2000
- IT Trends
- NCC Applications Examples
 - Sizing/Prioritization Example
 - Potential Application Exclusions

**BANKING INDUSTRY BUSINESS MARKET SEGMENT - 1996
(PART OF WHOLESALE BANKING)**

| <u>Factors</u> | <u>Money Tran/ Swift</u> | <u>Elec Comm</u> | <u>Int'l Serv</u> | <u>Other Pmt. Serv.</u> | <u>Commerc. Lending</u> | <u>Cash Mgmt</u> |
|----------------------------------|----------------------------------|----------------------|-----------------------|---------------------------------|-----------------------------|----------------------|
| Low Prof | y | y | y | yy | | y |
| Meeting Targets for \$ Volume | | | | y | yy | |
| Perceived Product Differences | y | | | y | y | yy |
| Source of Funds | | | | | yy | |
| Complex and changing rates | yy | | y | | yy | y |
| Underlying Growth | | | | y | yy | |
| High fixed costs | yy | | y | | y | y |
| Lower cost compet. | | y | | y | yy | |
| Cost reduction | y | y | y | y | y | y |
| Regulat./Dereg. | y | | y | y | y | y |
| Segment Consol. | | y | | y | y | y |
| Computer Depend. | yy | y | y | y | y | y |
| Central host driven | yy | | | | y | |
| Signif. Loc. Compet. | | y | | y | yy | y |
| Network Dependent | y | y | y | y | | y |
| New Network Initiat. | | y | | y | y | |

**y=important;
yy=very important**

**BANKING INDUSTRY BUSINESS MARKET SEGMENT - 1998
(PART OF WHOLESALE BANKING)**

| <u>Factors</u> | <u>Money</u> <u>Tran/</u> <u>Swift</u> | <u>Elec</u> <u>Comm</u> | <u>Int'l</u> <u>Serv</u> | <u>Other</u> <u>Pmt</u> <u>Serv</u> | <u>Comm</u> <u>Lending</u> | <u>Cash</u> <u>Mgmt</u> |
|-----------------------------------|--|----------------------------|-----------------------------|---|-------------------------------|----------------------------|
| Low Profitab. | y | y | y | | yy | y |
| Meeting Targets for \$ Volume | y | | | y | yy | y |
| Perceived Producty Differences | y | | | y | y | yy |
| Source of Funds | | | | | yy | |
| Complex and changing rates | yy | | y | | yy | y |
| Underlying Growth | | | | y | yy | |
| High fixed costsyy | | y | | | y | y |
| Lower cost compet. | y | | | y | yy | y |
| Cost reductiony | y | y | | yy | yy | y |
| Regulat./Dereg.y | y | | y | y | | y |
| Segment Consol.y | y | y | | y | y | y |
| Computer Depend.yy | y | y | | y | y | y |
| Central host driven | yy | | | | | y |
| Signif. Loc. Compet. | y | | | y | yy | y |
| Network Dependent | y | y | y | | y | y |
| New Network Initiat. | y | | | y | y | y |

y=important

yy=very important

**BANKING INDUSTRY BUSINESS MARKET SEGMENT - 2000
(PART OF WHOLESALE BANKING)**

| <u>Factors</u> | <u>Money Tran/ Swift</u> | <u>Elec Comm</u> | <u>Int'l Serv</u> | <u>Other Pmt Serv</u> | <u>Commerc Lending</u> | <u>Cash Mgmt</u> |
|-----------------------------------|----------------------------------|----------------------|-----------------------|-------------------------------|----------------------------|----------------------|
| Low Profit. | y | y | y | | yy | yy |
| Meeting Targets for \$ Volume | | yy | | yy | yy | yy |
| Perceived Producty Differences | yy | | | yy | yy | yy |
| Source of Funds | | | | | yy | |
| Complex and changing rates | yy | | y | | yy | y |
| Underlying Growth | | y | | | y | yy |
| High fixed costs | yy | | y | | y | y |
| Lower cost compet. | y | y | | y | yy | y |
| Cost reduction | yy | y | y | yy | yy | y |
| Regulat./Dereg. | y | | y | y | y | y |
| Segment Consol. | | y | | yy | yy | yy |
| Computer Depend. | yy | y | y | y | y | y |
| Central host driven | y | | | | | |
| Signif. Loc. Compet. | y | | | y | yy | y |
| Network Dependent | y | y | | y | y | y |
| New Network Initiat. | y | | | y | y | y |

**y=important
yy=very important**

POTENTIAL SEGMENTS OMITTED FROM BUSINESS BANK ANALYSIS

- Other wholesale segments

- Correspondent Banks
- Trading (handled separately) and treasury
- Real estate
- Government
- Trust
- Pension
- Safekeeping
- Other stockholder services

- Retail banking

- Demand Deposits/Retail EFT
- Savings
- Lending Products
- Investment and Insurance Products
- Card Based Services
- Retail Cash Management

BUSINESS BANKING IT TRENDS

Money Transfer Systems and Swift

The systems implemented by larger banks (and central banks including the Federal Reserve) as well as by Swift (the international money transfer capability implemented by a committee of banks) are under constant pressure to upgrade technology so that information on transfers can be provided more rapidly. This is essential to help companies meet business needs as well as to help banks meet balance, country, currency and other requirements.

The pressure to upgrade means that there will be a continuing reliance upon high fixed cost computing and network capabilities. There has been and will be consolidation of money transfer business resulting from bank merger activity. New network initiatives are of considerable importance, and changes in technology are explored and utilized over a period of time.

Used together with cash management systems, money transfer capabilities have helped bank customers to avoid having funds sit idle as well as to support business plans in a timely fashion. Funds can be devoted as quickly as possible to the business needs of a company or be put into investment accounts or vehicles.

The adherence to government regulations as well as the efficiency, speed, complexity and security of the installed capabilities make it unlikely that other service initiatives can be found to handle any meaningful segment of this work load during the next five years even if much improved technology were utilized.

Alternatives to money transfer that make use of networking initiatives are being explored by planning groups in some financial institutions. These explorations are based upon existing activities that allow a group of companies that have continuing business relations to net out debits and credits as is done in the petroleum industry.

- The initiatives being explored would involve setting up a schedule of anticipated activities between corporations with assets and creditworthiness of certain levels who have the potential to net out a sizable potential of business with each other.
- Within this group of corporations, orders, investments and other activities that would have led to money transfers between the banks of these corporations will be settled through netting arrangements and supplemented by much less frequent money transfers. There could be adjustments to the periodic money transfers based upon changes to anticipated activities.

Although this type of development could be classified as electronic commerce, it is being explored as an alternative to money transfers by financial institutions and processors serving this market.

This type of development is unlikely to have an impact on money transfer during the next five years, however.

The use of Swift to carry informational messages is something that could be addressed with alternative networks, providing that tight security or coding of messages could be achieved for some of the information. The possibility of gaining revenue from this activity apart from an electronic commerce initiative appears slight. If companies want to send such messages apart from Swift, they have a variety of means to accomplish it through coded communication.

Electronic Commerce

Electronic commerce is growing rapidly among companies and individuals. There are opportunities to become an active player in providing network access and use, software products and catalogs of information about products for sale by companies who support electronic commerce for orders.

Banks play a passive role in electronic commerce. They are the recipients of payment instructions that result from electronic commerce, but they do not market network services to support it as GEIS does nor do they market software products to support it like Sterling or a catalog product or service like HP or Texas Instruments.

- The provider with the greatest revenues from electronic commerce is GEIS which gains their revenues from network services. This is the area of greatest opportunity in electronic commerce at the present time, and other vendors are exploring initiatives that would involve use of the Internet to replace use of proprietary networks such as the GEIS capability.
- The vendor, Premenos, has introduced a software package, Templar, that enables users to make use of the Internet for Electronic Commerce. There are about 15 users, but it does not appear that sales will be significant enough to make this an opportunity. Other vendors such as Sterling are developing competitive packages that will take a share of the market, and some users are developing their own software.

There is already indication that some banks will provide a set of software and network services for companies and individuals to use for electronic commerce. From the standpoint of banks, these products may help to attract additional accounts, particularly merchants who want to sell products via networks as well as companies who order or sell a number of products. These banks also feel that electronic commerce services could provide the differentiation in service that has been difficult for financial institutions to achieve.

International Services

These include trade services such as letter of credit and statutory credit as well as foreign exchange.

- Trade services are usually performed by units devoted to lending and credit within the operations departments.
- Foreign exchange is usually performed by units of the trading or treasury department.

There is a steady growth in usage of these services. There is also a trend for increasing use of computing and network capabilities to support them.

Trade services are both necessary and desirable for banks to offer since many corporations need them to support international trade, but they do not provide substantially to the earnings of banks. They are also difficult to perform and can require the attention of highly experienced personnel. The messages that are sent in relation to trade arrangements are different from electronic commerce. They set up a legal arrangement for obtaining credit to help to reduce the risk of supplying goods for a seller but have safeguards to aid buyers from paying for goods that haven't been received.

- The use of lower cost or improved network capabilities might lower costs somewhat, but they wouldn't add sufficient value to attract corporations to use the service, and banks would be needed to support the exception processing often required.
- Banks active in international business must perform this service to support corporate customers and correspondent banks. If an outside service could perform the function, the larger banks would still need the capability to satisfy some clients, who would not trust vendors due to the problem encountered in the past in using trade services.

Foreign exchange involves a trading function as well as the use of on-line information. Some banks use the expertise they gain in foreign exchange trading for clients in taking positions in currency and bond markets.

Network services that provide on-line information and/or communication between buyers and sellers provide services to banks and other financial institutions as well as companies engaged in foreign exchange trading.

- Information services are now being provided on the private networks such as CompuServe, Prodigy and America On-line as well as on the Internet. A more comprehensive information service could be launched on these networks, but it is difficult to compete in the near future without acquiring an existing provider of information and that would involve taking over an inventory of business rather than just a provider of on-line information.
- There are vendors and financial institutions engaged in trading in foreign exchange including highly experienced firms such as Reuters. Some trading companies are now offering trading services on private networks such as CompuServe as well as the Internet, but security considerations limit activity. It is unlikely that large trades such as those being made to support corporations will be made via these networks in the next five years.

Other Payment Services

There are a number of general services performed for corporate customers of banks including collection, remittance, reconciliation, lock box, preauthorized actions, zero balance and customer information facilities. Payment services involving electronic commerce, money transfer and cash management information systems are being considered separately.

Overall, the trend is for payment services to increase in use and require more information technology resources. However, the margin for these services remains low and encourages mergers since the overhead can be spread over more customers and transactions.

Lower cost network facilities can reduce the cost of some of these services as well as offer the means of improving services.

Corporate Lending

There has been a trend of increasing competition for lending business from non banking institutions. These institutions, both brokerage and general financial organizations, have been able to take advantage of lower cost structures for selling and processing loans, which has enabled them to compete successfully for bank business.

One of the most important factors in lending is to gain the primary responsibility for a large lending arrangement that will involve many banks. The bank in that position will be able to gain a higher interest rate for the funds provided versus funds provided by other banks who are part of the lending arrangement.

The complexity and changing rates involved in the loan business have had more of an impact on loan business over time, making it essential to use information systems. Banks have made continuing investments to upgrade their lending systems, particularly systems handling international loans. These loans have a high level of complexity in terms of their funding requirements, the laws of countries that involved, the currency requirements, the limits that are set for currencies and countries involved and the evaluation of credit and collateral.

Network capabilities have not been essential to book business although there is a need to gain information and instructions from borrowers and transfer money to them rapidly. This can be done through money transfer and Swift systems. Requests for information and notices can also be sent by electronic mail, Fax and other means.

Recently, some banks and other financial institutions have utilized networks in a new type of lending initiative. Chase Bank, for example, has uncovered lending needs in South America, and used its network to contact potential lenders in various global markets and put together a loan participation to meet the needs of a borrower. In most of these arrangements, Chase has not supplied funds itself. It charges the borrower fees for putting together such arrangements.

Entrepreneurs have been considering new means for arranging smaller business loans via the Internet, but the steps that are most visible on the Internet in regard to bank loan business are activities of banks such as Wells Fargo who are trying to market personal loans on the Internet.

An additional means of raising funds that some banks provide for corporations is through assistance in the issuance of commercial paper. This capability can be enhanced through the use of networks to allow corporations and banks to exchange information, providing that security can be maintained.

Cash Management

This service provides on-line information about current transactions and balances of a bank's customer, together with information useful in banking activities and means of sending input or other instructions or information to a bank. The information can include information on its balances or activities at other banks as well as rates being paid on deposits and investments, exchange rates on foreign exchange and lending rates. The cash manager or controller at a corporation can use this information to move money to meet balance requirements at the corporation's banks and rapidly invest or move excess balances to meet business requirements.

These services have been delivered on private networks of NDC, GE, timesharing vendors and networks owned by banks. They have become part of the means of conducting business for cash managers at many companies. Some banks provide more limited applications of this type of service to small companies as a form of on-line reporting.

NCC Opportunities

Money Transfer and Swift

A networked based money transfer service could be offered by vendor(s) for regions of countries, or groups of countries that would be able to utilize much more modern technology in general as well as a combination of network capabilities from private networks for reasons of security or high speed in some circumstances to the Internet where informational messages might be sent quite economically. Although this system could originally be offered to replace part of or entire bank money transfer systems, negotiation could be initiated with central bank facilities such as the Federal Reserve to replace centralized functions. Provisions could be made for government monitoring.

As discussed in the previous section, an opportunity also exists to replace a percentage of money transfer activity with netting arrangements. If a large enough group of companies with shared business activities can be tied together through a network capability, there could be an opportunity to forecast net exchanges of money between them and exchange data about exceptions to the planned exchanges. A vendor could develop plans for the capability and take steps to find banks that wanted to participate.

Electronic Commerce

A vendor could take steps to develop a competitive service to the GEIS EDI and Electronic Commerce facility. A number of banks would consider partnering with a vendor in the development of a competitive system which gave them the opportunity to participate more in earnings from the electronic commerce service. Such a service might start by providing an interface between GEIS and other networks for certain traffic.

Many banks see their role in the electronic commerce market, today, as a passive one in which the accounts of their corporate customers are posted as a result of electronic commerce activities. Banks could work with a vendor in the development of electronic commerce between companies and deciding when the Internet could be used for network capabilities for the business.

The Internet could also be used for the dissemination of information about EC and the distribution and updates of software products for bank customers to utilize in conducting the business.

The combination of reduced costs and joint activity with banks could enable market share to be taken from GEIS.

Another opportunity in EC would involve developing an upgraded capability which used new technology and security procedures (third party etc.) on the Internet.

Other Payment Services

A service capability could be offered to banks by a vendor that would utilize network capabilities for performing these services for a customer and obtaining necessary data from the bank and customer. The Internet could be used where possible to make the services more economic. The vendor could use various types of service options including multimedia to customize the services with features that would give bankcustomers a feeling of product differences versus other banks.

Corporate Lending

A large scale network and processing capability could be developed for corporate lending which would service a group of banks with newer technology and lower cost functions. Economies of scale would be obtained in processing and the use of common on-line systems to calculate credit worthiness and evaluate collateral.

There is also an opportunity to develop an information capability similar to the one developed by Chase Bank for South American corporations, but which would service smaller companies. Details about credit needs and corporate factors could be distributed on a private network to a group of potential lenders including non-financial corporations who have interest in taking positions in certain industries.

The vendor offering the service would interact with potential lenders and bring information about possible arrangements to the attention of prospective borrowers. For smaller companies (to be defined), this type of business is currently taken care of by financial agents or middlemen or relationships with banks or brokerage firms who act as sources of information. The ability to seek out arrangements in an informal manner that allows information to be disclosed before parties are identified would permit many more relationships to be considered.

A system that supported the issuance of commercial paper for banks and agents could also be offered on a network. Since it is an alternative to obtaining credit, it might be considered as a supplement for commercial loan capabilities.

Cash Management

A service capability could be established to assemble and deliver cash management reports to corporate customers for a number of commercial banks. The system could also provide information and assistance in helping companies initiate transfers to meet business goals and to invest excess balances. This system would compete with cash management capabilities now provided by banks and vendors, but it could offer more modern network and technology including the use of capabilities to reduce costs such as the Internet for certain types of information messages.

One of the possible projects that could be initiated would be to provide cash management services for a group of smaller or midsized companies that do nothing more than monitor balances at the present time to make sure that balance requirements of banks are met and funds are transferred to locations where they are needed for business activities.

These services are currently supplied by some large banks and vendors, but many smaller and midsized companies who use the service do not realize the potential of cash management services (or don't use it) since there might be a large investment of time for a relatively small pay off. Information from these companies could be aggregated for the purpose of joint investments by a vendor who was providing transmitting data on transactions and balances. The vendor might develop the service together with one bank or a group of banks.

BUSINESS BANKING - NCC APPLICATIONS

| <u>Primary/ Related App.</u> | <u>Primary Delivery Mode</u> | <u>Competition</u> | <u>IT Vendor Market Size/Probability</u> | | |
|---|--------------------------------------|-----------------------------------|--|-------------|-------------|
| | | | <u>1996</u> | <u>1998</u> | <u>2000</u> |
| <u>Money Transfer Swift</u> | | | | | |
| The Transfer Network Service | SI | None; GEIS and NDC (ltd) | M/.3 | H/.3 | VH/.3 |
| Large Scale Netting | SI | GEIS (limited) | M/.4 | H/.5 | H/.3 |
| <u>Elect. Comm.</u> (Includ. EDI) | | | | | |
| EC Partner | PS/SI | GEIS | M/.6 | H/.7 | VH/.6 |
| Internet EC Upgrade | PS/SI SW | GEIS, Sterling | M-L/.5 | M/.7 | H/.7 |
| Intnat'l Serv | | | | | |
| <u>Other Payment</u> | | | | | |
| Networked Services | PS/SI | FiServ etc. SW | M/.3 | M-H/.3 | H/.3 |
| <u>Commerc. Loan</u> | | | | | |
| Loan Service/ Processing | SI | FiServ, Alltel (limited parts) | M/.4 | M-H/.4 | H/.4 |
| Network Based Lending | PS/SI | | M-H/.5 | H/.5 | H/.6 |
| Comm'l Paper Net | PS/SI | ISC, Alltel | M/.4 | M/.4 | M/.4 |
| <u>Cash Mgmt.</u> | | | | | |
| Cash Mgmt. Service | SI | GEIS, NDC | M/.5 | M-H/.5 | H/.6 |
| Consolidated Investing | PS/SI | Chemical and NDC (ltd.) | M-L/.6 | M/.6 | H/.6 |

***Key:**

L = Under \$50MM

M-L = \$50-250MM

M = \$250-750MM

M-H = \$750MM-\$2 billion

H = \$2-5 billion

VH = Over \$5 billion

Probabilities: from 0.1 to 0.9

6.

INSURANCE

INSURANCE SEGMENTS

Subsegments

- Life insurers
 - Health
 - Life
 - Investment products
- Property/casualty insurers: Commercial
- Property/casualty insurers: Personal
- Insurance agents

Subsegment/Processes Included in Other Segments

| <u>Subsegment/Process</u> | <u>Segment</u> |
|--------------------------------------|--------------------------------------|
| Investment products | Retail Financial Services |
| Health insurance | Health Care |
| Sales and marketing | Part of "Industrial Marketing Sales" |
| Policy sales | Information Intermediaries |
| Insurance agents | Information Intermediaries |
| Policy processing/ administration | Financial Operations |

No significant NCC-related opportunities remain in the "pure insurance" category.

ibins

7. PRODUCT DISTRIBUTION CHAIN

PRODUCT DISTRIBUTION CHAIN SUBSEGMENTS

Manufacturers

Wholesale distribution (independent, manufacturer)

Retail

Freight transportation

Financial intermediaries

Not included

- Advertising, direct marketing (in Media)

PRODUCT DISTRIBUTION CHAIN
Market Size by Industry (\$ Billion)

| <u>Segment</u> | <u>1996</u> | <u>1998</u> | <u>2000</u> |
|----------------------|-------------|-------------|-------------|
| Retail | \$9 | \$11 | \$16 |
| Wholesale | \$7 | \$9 | \$12 |
| Manufacturing | \$26 | \$37 | \$53 |
| Freight Transport | \$4 | \$5 | \$9 |
| Banking | \$9 | \$12 | \$16 |
| Total | \$55 | \$74 | \$106 |

NCC PRODUCT DISTRIBUTION CHAIN APPLICATIONS MARKET SIZING

U.S.

| <u>Applications</u> | <u>IT Vendor Market Size/Probability</u> | | |
|--|--|-------------|-------------|
| | <u>1996</u> | <u>1998</u> | <u>2000</u> |
| Electronic Commerce | M-H/.8 | VH/.9 | VH/.9 |
| Manufacturing Reengineering | H/.9 | H/.9 | VH/.9 |
| Electronic Payments | H/.9 | H/.9 | VH/.9 |
| Derived Marketing Information | M-H/.5 | H/.7 | H/.8 |
| Mass Customization | L/.3 | L-M/.5 | M/.7 |
| Electronic Financial Services (consumer) | L/.3 | L-M/.4 | M/.5 |

Key

L = Under \$50MM
 M-L = \$50-250MM
 M = \$250-750MM
 M-H = \$750MM-\$2 billion
 H = \$2-4 billion
 VH = Over \$4 billion

Probabilities: from 0.1 to 0.9

NCC PRODUCT DISTRIBUTION CHAIN APPLICATIONS MARKET SIZING

EUROPE

IT Vendor Market Size/Probability*

| Applications | 1996 | 1998 | <u>2000</u> |
|--|--------|--------|-------------|
| Electronic Commerce | M/.7 | H/.7 | H/.9 |
| Manufacturing Reengineering | M-H/.9 | M-H/.8 | H/.9 |
| Electronic Payments | M-H/.9 | M-H/.9 | H/.9 |
| Derived Marketing Information | M/.4 | M/.7 | M-H/.8 |
| Mass Customization | L/.3 | L-M/.5 | M/.5 |
| Electronic Financial Services (consumer) | L/.3 | L-M/.4 | M/.3 |

Key:

L = Under \$50MM
 M-L = \$50-250MM
 M = \$250-750MM
 M-H = \$750MM-\$2 billion;
 H = \$2-4 billion
 VH = Over \$4 billion

Probabilities: from 0.1 to 0.9

COMPETITIVE ENVIRONMENT

Product distribution chain capabilities are not so much an opportunity as a necessity for many vendors, i.e., those who are in and want to remain competitive in one of these industries or applications.

| <u>Applications</u> | <u>Representative Vendors</u> |
|-------------------------------|--|
| Electronic Commerce | ATT, EDS, GEIS, IBM, Sterling |
| Manufacturing Reengineering | Andersen, Baan, CA, CSC, EDS, IBM, SAP |
| Electronic Payments | ATT, Amex, Equifax, First Data, MasterCard, NDC, Major Banks |
| Derived Marketing Information | Acxiom, D&B, Equifax, MasterCard, Visa |
| Mass Customization | D&B, Equifax |
| Electronic Financial | ATT, First Data, MasterCard, Visa |

Currently, it is quite feasible to specialize in different niches. In the future (after 1998) there will be an increased premium placed on covering increasingly large portions of the market. This will often require long term partnering and/or acquisition.
Services (consumer)

PRODUCT- DISTRIBUTION CHAIN ENVIRONMENT - 1996

| <u>Applications</u> | <u>Mfrs</u> | <u>Wholesale</u> | <u>Retail</u> | <u>Freight Trans</u> | <u>Fin'l Inter</u> |
|--|-------------|------------------|---------------|--------------------------|------------------------|
| Electronic Commerce | x | xx | xx | xx | xx |
| Manufacturing Reengineering | xx | | x | x | |
| Electronic Payments | x | x | xx | | xx |
| Derived Merchanising Information | x | x | x | | |
| Mass Customization | x | x | xx | | |
| Electronic Financial Services | | | xx | | xx |

x = Important
xx = Very Important

PRODUCT DISTRIBUTION CHAIN ENVIRONMENT - 1998

| <u>Applications</u> | <u>Mfrs</u> | <u>Wholesale</u> | <u>Retail</u> | <u>Freight Trans</u> | <u>Fin'l Inter</u> |
|--|-------------|------------------|---------------|--------------------------|------------------------|
| Electronic Commerce | x | xx | xx | xx | xx |
| Manufacturing Reengineering | xx | | x | x | |
| Electronic Payments | x | x | xx | | xx |
| Derived Merchandiising Information | x | x | xx | | x |
| Mass Customization | x | x | xx | | |
| Electronic Financial Services | | | xx | | xx |

x = Important
xx = Very Important

PRODUCT DISTRIBUTION CHAIN ENVIRONMENT - 2000

| <u>Applications</u> | <u>Mfrs</u> | <u>Wholesale</u> | <u>Retail</u> | <u>Freight Trans</u> | <u>Fin'l Inter</u> |
|--|-------------|------------------|---------------|--------------------------|------------------------|
| Electronic Commerce | <u>xx</u> | xx | xx | xx | xx |
| Manufacturing Reengineering | xx | <u>x</u> | <u>xx</u> | <u>xx</u> | |
| Electronic Payments | x | <u>xx</u> | xx | | xx |
| Derived Merchanising Information | <u>xx</u> | x | xx | | <u>xx</u> |
| Mass Customization | x | x | xx | | |
| Electronic Financial Services | | | | xx | xx |

x = Important
xx = Very Important

8. **INDUSTRIAL MARKETING AND SALES**

NCC Industrial Marketing and Sales Segment

- Segments Analyzed
 - Product Management
 - Marketing
 - Sales
 - Sales Support
 - Order Processing

- Business Segment Environment: 1996, 1998, 2000

- IT Trends

- NCC Opportunities

Business Segment Environment -- 1996

| FACTOR | PRODUCT MANAGEMENT | MARKETING | SALES | SALES SUPPORT | ORDER PROCESSING |
|--|-----------------------|-----------|-------|------------------|---------------------|
| Dispersion of Constituents | XX | X | XX | X | |
| Constituent Linkage | XX | XX | | X | |
| Use of Divergent Information Sources | XX | X | | | |
| Complex, Rapidly Changing Rates | X | X | | X | X |
| Perceived Business Impact | | X | X | | |
| Cost Reduction | | X | X | | X |
| Regulation/ Deregulation/ Politics | X | | | | |
| Segment Consolidation | X | X | XX | X | |
| Computer- Dependent | X | X | XX | XX | XX |
| Central Host- Driven | XX | XX | | XX | XX |
| Significant Local Computing | X | X | XX | X | |
| New Networking Initiatives | XX | X | | X | XX |

X = Important

XX = Very Important

Business Segment Environment -- 1998

| FACTOR | PRODUCT MANAGEMENT | MARKETING | SALES | SALES SUPPORT | ORDER PROCESSING |
|--|-----------------------|-----------|-----------|------------------|---------------------|
| Dispersion of Constituents | XX | X | XX | X | |
| Constituent Linkage | XX | XX | <u>X</u> | X | <u>X</u> |
| Use of Divergent Information Sources | XX | X | <u>X</u> | | |
| Complex, Rapidly Changing Rates | X | <u>XX</u> | | X | X |
| Perceived Business Impact | <u>X</u> | X | <u>XX</u> | | <u>XX</u> |
| Cost Reduction | | X | X | | X |
| Regulation/ Deregulation/ Politics | X | | | | |
| Segment Consolidation | <u>XX</u> | X | <u>X</u> | X | |
| Computer- Dependent | <u>XX</u> | <u>XX</u> | XX | XX | XX |
| Central Host- Driven | XX | <u>X</u> | | XX | XX |
| Significant Local Computing | X | <u>XX</u> | XX | X | |
| New Networking Initiatives | XX | <u>XX</u> | X | X | XX |

X = Important

XX = Very Important

Underline= Change from prior period

Business Segment Environment -- 2000

| FACTOR | PRODUCT MANAGEMENT | MARKETING | SALES | SALES SUPPORT | ORDER PROCESSING |
|--|-----------------------|-----------|-----------|------------------|---------------------|
| Dispersion of Constituents | XX | X | XX | X | <u>X</u> |
| Constituent Linkage | XX | XX | <u>XX</u> | X | X |
| Use of Divergent Information Sources | XX | <u>XX</u> | <u>XX</u> | | |
| Complex, Rapidly Changing Rates | <u>XX</u> | XX | | X | X |
| Perceived Business Impact | X | X | XX | <u>X</u> | XX |
| Cost Reduction | | X | X | | |
| Regulation/ Deregulation/ Politics | <u>XX</u> | | | | |
| Segment Consolidation | <u>X</u> | X | X | — | |
| Computer- Dependent | XX | XX | XX | XX | XX |
| Central Host- Driven | <u>X</u> | X | | <u>X</u> | XX |
| Significant Local Computing | <u>XX</u> | XX | XX | <u>XX</u> | |
| New Networking Initiatives | <u>X</u> | XX | <u>XX</u> | <u>XX</u> | <u>X</u> |

X = Important

XX = Very Important

Underline= Change from prior period

Potential Segments Omitted from Industrial Marketing and Sales Analysis

- Standalone sales presentation systems (e.g. computer-based demonstrations)
- Advertising and promotion modeling tools
- Territorial alignment systems
- Resource management systems used with outside sales organizations (e.g., building maintenance, fleet management)

Industrial Marketing and Sales Information Technology Trends

Overview

- This segment represents a “diagonal” view of marketing and sales that is cross-industry in its application and industry-specific in its content. It includes all those activities of the sales cycle from the identification of the opportunity to the processing of orders. Two interrelated “networks” are usually involved, one vertically-oriented within the segment and the other horizontally-oriented across segments. In this segment the widely dispersed constituents are tethered to the company by the “network,” a collection of communications, meetings, processes, management structures, and the like that keep all those responsible for marketing and sales “in the loop.”
-

Product Management

- The essential activity of this sub-segment is targeting: identifying and describing the product/service opportunity and its appropriate market, overseeing the development of the product/service, pricing, product training, and so on.
 - Product managers have typically been the “customer” of systems owned by others (e.g., demographers, manufacturing/production, legal) with their only owned system being project management used for overseeing the product/service through development. All of these systems are typically central-host driven, but multiple hosts representing the various suppliers.
 - The desire is for an integrated functionality where, for example, target market demographics may be directly compared to company sales results in that market. Product managers do not want to own any of these systems but want to create the multi-supplier network that will facilitate this integration of information. Logical links to all information (demographics, product characteristics, and sales) associated with the product or market is desired.
-

Marketing

- This sub-segment is mostly focused on positioning the company and its product/service in the larger context of the market. Advertising and promotion are key activities. Marketing also includes the process of identifying and selecting sales prospects.
 - Marketing tends to represent the creative side where the metrics are reach and frequency; how many prospects in the marketplace are we reaching and with what frequency. Typically, this has meant the development and distribution of sales literature for specific markets. Networked computing has not been a major issue.
 - This is changing rapidly, however, as companies realize that electronic links to the marketplace change both reach and frequency. Internet, for example, offers as many as thirty million prospects for the cost of a site and links around Internet to this site. Positioning takes on new meaning as the company is now visible globally. Seemingly overnight marketing has moved their creative endeavors to electronic media.
-

Sales

- Sales involves delivering the details of the product/service (features, benefits, price, terms and conditions) to sales prospects. Actual "detailing" may occur through a variety of media: mail (direct marketing), telephone (telemarketing), direct (field sales), or some combination.
 - Along with order processing, sales is the most computer-intense sub-segment. Many sales organizations are automated, regardless of their sales vehicle--mail, telephone, face-to-face. Systems to track sales activities by lead from generation to close are part of the sales person's standard tools. In some companies these tools are mainly for sales support (e.g., expense reporting, time management), but more and more, the focus is turning to use of computing in the sales process (e.g., presentations) or even in a competitively advantaged way (e.g., keeping track of the customer's inventory and automatically replenishing it as needed).
-

Sales Support

- These are essential support activities involved with "servicing" the sales organization. Activities include lead generation and tracking, distribution of sales aids such as brochures and samples, expense report processing, meeting logistics, calendaring, and so on.
 - A key component of sales is the link to sales support. This link moves support from the back-office to the front-office: linking the sales person to his/her management and company. The key content is communications--electronic mail--that directs the daily activities of the sales person, monitors these activities, and collects the results in the form of call reports or sales made.
 - This computing is network-centric and includes host, server, and desktop/laptop computing across dispersed geographies.
-

**Order
Processing**

- Orders that are generated are entered into the company's system for fulfillment and reporting. The fulfillment request interfaces to other company departments that are not covered here. Reporting is covered as marketing and sales management must maintain the "loop" with the sales organization to provide feedback on results, and to (re)direct activities based on these results or changing company events.
 - Typically, orders are taken by sales persons or mailed/telephoned to the company's order processing function. Better systems not only capture the order but provide service to the customer in the form of information about inventory, ship dates, total cost, and so on. Links are usually made to production, distribution, and accounting to share this order information.
 - Because the order represents the culmination of the activities of the other segments, critical links back to these sub-segments are necessary. This completes the horizontal loop.
-

Industrial Marketing and Sales NCC Opportunities

Integrated Product Management System

- This network-centric application links all the various data sources and tools of the product manager into a consistent whole, allowing comparisons between and among any and all data elements. For example, the product manager would be able to model the impact on market share if prices were raised by X%, given data about the competitive structure of each market segment and price elasticity data.
- The data involved would likely be local to the provider (e.g., market research supplier, prospect database developers, credit report vendors, sales organization, order/fulfillment services, etc.) and updating would be constant.

Targeted Marketing

- This system, also network integrated, applies data (e.g., credit, demographics, buying history, preferences, behavior) from a variety of sources to lists of "suspects" in an attempt to pre-qualify prospects.
- The ideal system would be automated to deliver customized marketing and sales materials to prospects based on immediately past behavior. (Electronic couponing at supermarket checkouts is a primitive example of this system.)

Competitively- Advantaged Sales Automation

- While sales force automation continues to dominate the technology of this segment, the focus is only on supporting the administrative tasks of the outside sales person. Significant opportunities to create systems that add value to the customer are being missed. For example, a pharmaceutical sales representative might keep the physician's drug sample inventory records. These records, which must be maintained for FDA reporting, would not only provide an added value for the pharmaceutical, but would provide critical competitive information. The volume of data would require that records be maintained in a repository larger than the representative's laptop, creating a network-based service.

Sales Performance Reporting

- Just as product managers need to model strategy scenarios on marketplace characteristics, sales managers and sales representatives need to review actual sales results vis-à-vis sales activities and marketplace characteristics. This system would provide timely reports on sales effectiveness. This is a much more sophisticated system than the delayed reports of sales because it directly connects activities to results in a dynamic market, allowing sales management to quickly redesign strategies and redirect activities.
-

NCC Applications -- Industrial Marketing and Sales

| PRIMARY/ RELATED APPLICATIONS | PRIMARY DELIVERY MODE | COMPETITION | IT VENDOR MARKET SIZE/PROFITABILITY* | | |
|--|--|--|---|------------|------------|
| | | | 1996 | 1998 | 2000 |
| Integrated Product Management System | PS/SI for development, OS for operations | Claritas/NPDC Marketworks Nielsen NA IRI | M-L 0.7 | M 0.6 | M-H 0.5 |
| Targeted Marketing | S/W PS for customization OS for operations | Group 1 S/W Dun & Bradstreet Axcion DiMark Many list vendors | M 0.9 | M-H 0.9 | H 0.8 |
| Competitively-Advantaged Sales Automation | S/W PS for customization OS for operations | Sales Technologies Dendrite Brock Control Many contact management products Emerging market for Big 6 | M-H 0.9 | H 0.9 | H 0.9 |
| Sales Performance Reporting | S/W PS for customization OS for operations | IRI Software Saratoga Systems National Mgmt. Systems | M-L 0.8 | M 0.7 | M-H 0.6 |

Key: L = Under \$50MM; M-L = \$50-250MM; M = \$250-750MM;
M-H = \$750MM-\$2 billion; H = Over \$2 billion

Probabilities: from 0.1 to 0.9

*Product management issues/opportunities are global in reach. Targeted marketing, sales automation, and performance reporting are very strong in the U.S., growing in Europe, and emerging in the rest of the developed countries.

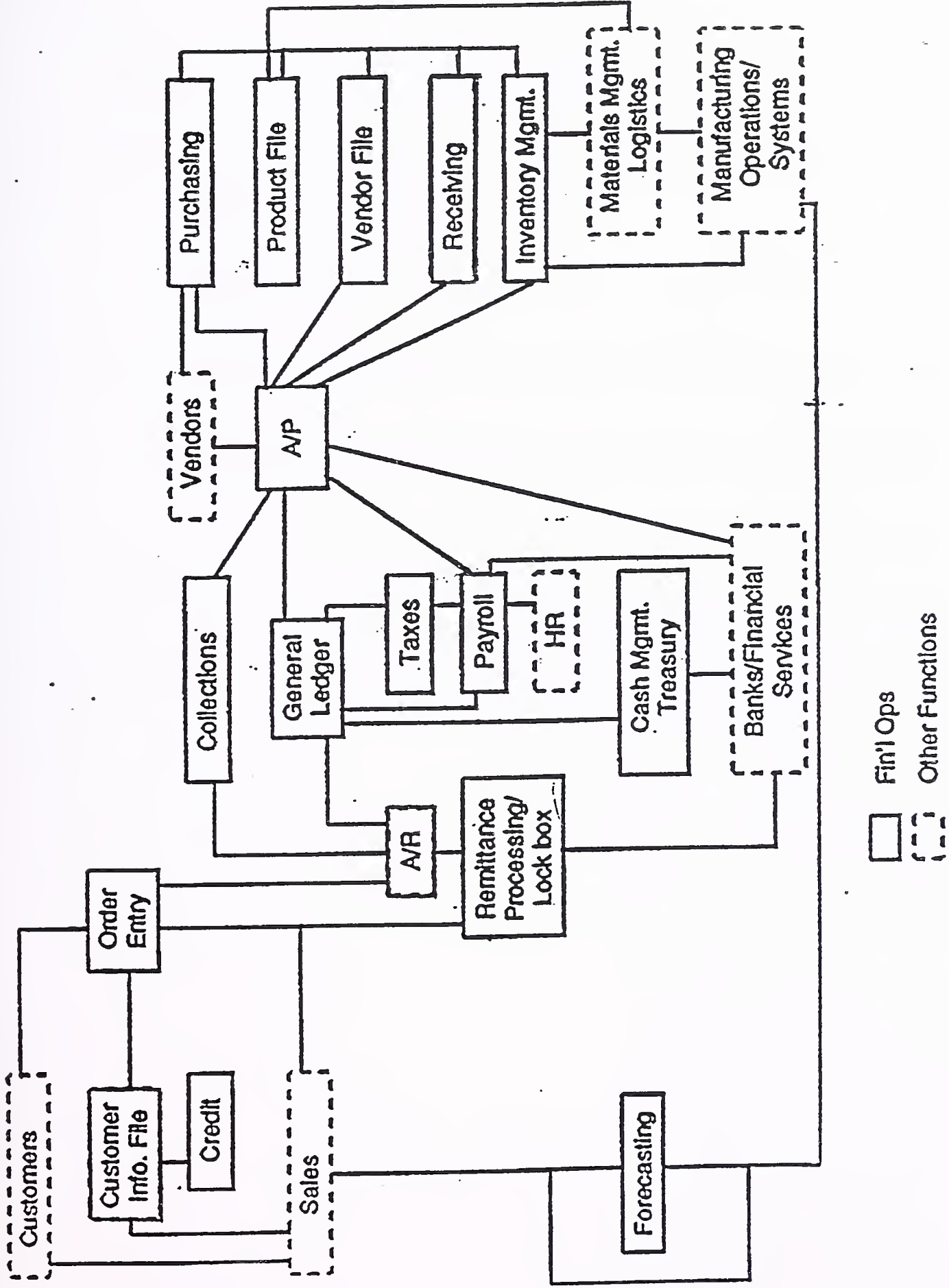
9.

FINANCIAL OPERATIONS

FINANCIAL OPERATIONS OVERVIEW

- Interlinked financially-oriented functions/applications
- Main focus is within an enterprise
- Horizontal in nature, but with some customizing, depending on
 - The industry
 - Sets of applications
 - Specific customer requirements
- Will often have linkages to other functions and applications, both within and outside of the enterprise.
- See attached chart

Financial Operations



FINANCIAL OPERATIONS: BUSINESS ENVIRONMENT

- Core financial/administrative functions are in a state of change. They are being reengineered, decentralized and/or downsized.
- There is widespread recognition that these functions need to be better integrated.
 - For faster, more effective operations.
 - To obtain management data to make further improvements to financial functions.
 - To obtain management data to make improvements to other corporate functions.
 - This is equally true, although harder to achieve, in a decentralized environment
- These ideas are widespread, supported by
 - Many management consulting firms that have been stressing BPR.
 - Success stories in the business press (e.g., on SAP)

FINANCIAL OPERATIONS: IT TRENDS

- Business needs are the main driver of changing to "distributed, but integrated" applications. SAP has had, in essence, the right product at the right time.
- In addition to the business logic supporting change is that fact that many of the applications themselves are ripe for renewal
 - Many are a generation old
 - Many systems replaced in the last ten years are themselves considered obsolescent.
- Customers expect to obtain the required functionality using customizable software products.
 - Customers often pay several times the cost of the package for consulting, customizing, installation and training.
 - Generally the customizing is performed by a separate services firm, not the software package firm. Here, also, SAP has established a norm. (Services firms now act as de facto SAP lead generators.)
 - There is a long term market for business objects that perform these functions. This is 3-5 years or more away.
- The market is only partly developed.
 - No single applications vendor yet comes close to supporting all the functions shown on the definition chart.
 - However, many vendors agree with the logic of the chart and expect to eventually support these functions, either independently or in partnerships.
- The software and services parts of this market are increasingly linked as vendors form alliances.
 - Hardware and software platforms are becoming semi-commodities.
 - A follow-on market for applications management/systems operations is emerging.
- The outsourcing of the underlying business functions is also occurring:
 - This is limited to particular financial functions.
 - The pace is just beginning to pick up.

FINANCIAL OPERATIONS: NCC OPPORTUNITY

The Opportunity:

Supplying and supporting "distributed, but integrated" applications.

- **Supplying:** Consulting/BPR, application software products, professional services, systems integration
- **Supporting:** Applications management, business function outsourcing

Initially, the number of applications/functions addressed will be limited to subsets of the overall opportunity. In time (five years plus), these subsets will coalesce into larger areas.

Opportunities for niche suppliers will not go away, but the competitive position of niche suppliers will become more difficult.

Financial operations is about where product distribution management was five years ago.

FINANCIAL OPERATIONS: MARKET SIZE

U.S.

Size/Probability

| <u>1996</u> | <u>1998</u> | <u>2000</u> |
|-------------|-------------|-------------|
| H/.9 | V H/.9 | V H/.9 |

EUROPE

Size/Probability

| <u>1996</u> | <u>1998</u> | <u>2000</u> |
|-------------|-------------|-------------|
| H/.9 | VH/.9 | VH/.9 |

Key:

L = Under \$50MM

M-L = \$50-250MM

M = \$250-750MM

M-H = \$750-\$2 billion

H = \$2-5 billion

VH = Over \$5 billion

FINANCIAL OPERATIONS: COMPETITIVE ENVIRONMENT

Every accounting software company states in some form that it is supporting the NCC approach.

- Larger firms are attempting, in essence, to emulate SAP.
- Smaller firms are seeking partnerships (which may in the end be mergers)
- The reality of many of these assertions is still to be tested

SAP has by far the largest "mind share" in this market and is the firm to beat, or find a way around.

The top dozen professional services/SI firms are increasingly important influencers or de facto purchasers.

- This trend is reinforced by the "hollowing out" of many MIS departments.
- These firms would prefer that a "second SAP" existed. As a group they feel too dependent on SAP:
 - SAP is known for being a hard firm to work with and could withdraw its favor.
 - SAP could have business or technical problems.
 - However, in the near term no other firm is likely to draw up close to SAP.

ibfinops

10.

TRADING SYSTEMS

TRADING PRODUCTS/SERVICES

- Segments Analyzed
 - Brokerage Trading
 - Bank Trading
 - Insurance Company Trading
 - Financial Agent Trading
 - Financial Information, Pricing and Support Information
- Business Segment Environment: 1996, 1998, 2000
- IT Trends
- NCC Application Examples
 - Sizing/Prioritization Examples

TRADING PRODUCTS AND SERVICES IT TRENDS

A trend in all trading related products and services is to utilize more network capabilities. Banks, brokerage firms and other entities handling trading are now employing satellite channels, fiber, sideband transmissions and constantly changing terminal technology. There are plans at most of these participants to upgrade the protocols and communication services (e.g. to ATM, SMS; ISDN) involved. Even the largest firms admit that they are challenged by the planning to support future communication for trading.

Banks that have implemented new trading systems in Asia and South America are concerned about their ability to maintain staff members who can work with the consultants involved.

The distribution of pricing and other information to support trading has also been upgraded to employ new communication technologies and CD-ROM so that multimedia can be received more rapidly through the latest workstation technology. Capabilities are also being developed to improve the ability of delivering information to wireless terminals.

There is also a trend to utilize more computing capability, locally or over networks so that additional analytical detail and multimedia material may be utilized. People involved in trading expect to use of the latest workstations according to executives of Sun, one of the vendors profiting from this trend. There is also continuing upgrade of software products being utilized for trading.

NCC OPPORTUNITIES

There are a number of communications needs that have to be met to support trading. Some are involved with the transmission of information from brokers, banks and agents to prospective traders that can aid in obtaining business as well as aid in securing or confirming input data. This area of communication is aided through the services of a network vendor. Vendors could also provide multimedia to aid in product differentiation as well as to aid traders.

Other communication is involved in obtaining information about the credit of customers from banks and other financial sources. The services of a network vendor is used to aid in these situations as well.

A vital segment of communication is involved with the actual trade. This involves communication among traders, dealers, financial institutions and automated systems handling trades as well as transmission of input instructions from clients and reporting status and results to them. Over a period of time, network capabilities could be developed to support these types of activities.

Network and processing capabilities are also offered to handle processing work at brokerage houses and banks.

Vendors with network capabilities are utilized to provide pricing and other information to functions in brokerage firms and banks to aid in advising clients, performing necessary accounting and evaluating holdings or collateral.

Trading Systems - NCC APPLICATIONS

| <u>Primary/ Related App</u> | <u>Competition</u> | IT Vendor Market Size/Profitability | | |
|--|--------------------|--|-------------|--------------|
| | | <u>1996</u> | <u>1998</u> | <u>2000*</u> |
| Network Support | ADP, EDS, GEIS | M/.5 | H/.5 | VH/.5 |
| Trade Processing | SEI | M/.4 | M/.4 | VH/.5 |
| Pricing and Information Services | Reuters, Telerate | M/.4 | H/.4 | VH/.4 |

TRADING SYSTEMS - 1996
Line of Business

| <u>Factor</u> | <u>Network Support</u> | <u>Trading</u> | <u>Pricing and Information</u> |
|------------------------|------------------------|----------------|--------------------------------|
| Perceiv. Prod Diff | y | | |
| Growth | y | y | y |
| High Fix. Costs | y | y | y |
| Low Cost Compet. | | y | y |
| Cost Red. | | y | y |
| Reg/Dereg | | y | y |
| Segment Consolid. | y | y | |
| Computer Dependen. | y | y | |
| Central Host | | y | |
| Network Dep. | y | y | y |
| Signif. Loc. Comp | | | |
| New Net. Initiativ. | | | y |

y = important
yy = very important

TRADING SYSTEMS - 1998
Line of Business

| <u>Factor</u> | <u>Network Support</u> | <u>Trading</u> | <u>Pricing and Information</u> |
|------------------------|------------------------|----------------|--------------------------------|
| Perceiv. Prod Diff | y | <u>y</u> | y |
| Growth | y | y | y |
| High Fix. Costs | y | y | <u>y</u> |
| Low Cost Compet. | <u>y</u> | <u>yy</u> | y |
| Cost Red. | | <u>yy</u> | |
| Reg/Dereg | | <u>yy</u> | |
| Segment Consolid. | y | y | <u>y</u> |
| Computer Dependen. | y | y | <u>y</u> |
| Central Host | | y | |
| Network Dep. | y | y | y |
| Signif. Loc. Comp | | <u>y</u> | <u>y</u> |
| New Net. Initiativ. | | | y |

y = important

yy = very important

Underline= Change from previous period

TRADING SYSTEMS - 2000
Line of Business

| <u>Factor</u> | <u>Network Support</u> | <u>Trading</u> | <u>Pricing and Information</u> |
|------------------------|------------------------|----------------|--------------------------------|
| Perceiv. Prod Diff | y | y | y |
| Growth | y | y | y |
| High Fix. Costs | y | y | y |
| Low Cost Compet. | y | yy | y |
| Cost Red. | y | yy | |
| Reg/Dereg | | y | |
| Segment Consolid. | y | <u>yy</u> | y |
| Computer Dependen. | y | y | y |
| Central Host | | | |
| Network Dep. | <u>yy</u> | <u>yy</u> | y |
| Signif. Loc. Comp | y | y | y |
| New Net. Initiativ. | y | y | y |

y = important

yy = very important

Underline= Change from previous period

11.

**INFORMATION INTERMEDIARY
OPPORTUNITIES**

INFORMATION INTERMEDIARY OPPORTUNITY

Business Environment

Many businesses exist in large part to act as information agents or brokers. There may be considerable amounts of computer-based assistance, but this is imposed on top of a traditional business structure. Classic examples are

- Real estate brokers
- Insurance brokers
- Travel agencies

In each case the agent represents many sellers and tries to match a buyers' need to an appropriate seller. This process is at best, inefficient and often does not meet all the needs of one or both sides in a potential transaction:

- Agents usually do not represent all sellers that could potentially meet the buyer's requirements. The more important buyers recognize this.
- The information from sellers is often incomplete, incorrect or out-of-date. The more important buyers recognize this.
- The personal experience or recommendation of an agent is often used to fill the gaps in objective information. In some cases this is useful or perceived as such (e.g., a resort recommendation by a travel agent).
- Agents present themselves as neutral go-betweens to buyers, but are in fact generally sellers' agents. Many buyers wish they had access to more truly objective information.

In spite of automation, there are still significant amounts of human time spent by agents on both completed and uncompleted transactions.

- This is borne out by the fact that general commission levels are equal or greater to those of a generation ago for travel, insurance and real estate agents.
- Wasted time plus mediocre results often raises questions on value received.

Sellers, especially, do not believe they are receiving value for this commission, as shown by attempts by sellers to "disintermediate", i.e., deal directly with the ultimate customer.

- Insurance companies as "direct writers" for personal insurance.

- Airlines encouraging large corporations to set up in-house travel "agencies".
- Flat rate property referral services.

These efforts at disintermediation, taken as a whole, have so far had only a marginal impact of these businesses.

- Efforts to bypass agents often are sponsored by a single seller; consequently, they restrict, rather than expand, the choices among buyers. The information provided is often no better than obtained through traditional means.
- Not surprisingly, these bypass efforts have received little support by agents.
- None of these efforts have yet reached a critical mass. They have not had a major impact on their industries.

REQUIREMENTS FOR NEW INFORMATION INTERMEDIARIES

To succeed, a new form of information intermediary should

- Draw from a pool of sellers at least as large as the leading agents do today.
- Offer considerably better, more easily available information in terms of
 - Completeness
 - Accuracy
 - Objectivity
- Allow information to be extracted, organized and presented in multiple ways.
E.g.,
 - Comparisons of rates/coverages in insurance.
 - Pictures of outside views, facilities and specific rooms in cruise ships and resorts
 - Pictures that show a "drive" to a property, with outside views and specific inside views.
- Allow choices of using/navigating the information
 - By current agents, as a way to add value and become more efficient
 - By buyers, with the ultimate transaction being directly with a seller
 - By combinations of buyer and agent interaction, with the agent role being transformed from what it is today.

Networks: Enabler for New Information Intermediaries

The significant growth of on-line information networks, especially the Internet, is the key enabler for establishing new information intermediaries.

- Rapid market growth and flexible information linking are the critical objective preconditions for success.
- At least as important is the greatly increased mindshare that on-line services now have, largely due to the "halo effect" of the Internet.

There are two elements to establishing an information intermediary:

- (1) A value-added master directory which ultimately points buyers to
- (2) Seller home pages (or, more typically, one or more specific points within a home page)

Conceptually, the master directory is a relational database containing structured information on seller offerings.

Examples of directories/offerings include (but are not limited to):

- Personal insurance offerings (policy coverage, underwriting standards, etc)
- Commercial insurance offerings
- Residential real estate (localized)
- Commercial real estate (localized)
- Resorts/conference centers (e.g., location, price, features)
- Cruises

With the example of the Yellow Pages in mind, these services should attract a high proportion of motivated buyers.

The master directory could reside on any easily accessible network.

In principle, both buyers and sellers can be charged for this service, since both are receiving considerable value.

- Buyers are saving time and receiving much better information. For each access they could pay a nominal charge of \$5-10.
 - This would be credited against an actual purchase made in the next x days.
 - Non-subscribers should be allowed access to these services (assuming technical feasibility) for a slightly higher charge.
 - Special offers can be also made to subscribers and new subscribers.
- Sellers would receive great value. Their fees would be a commission, set at a level below their "warm prospect" marketing costs (say, 20% of current commission levels).

Operationally, buyers would enter a search argument (using user friendly dialogs, windows, etc.) and be linked to one or more seller home pages for more information (e.g., actual insurance policy terms; pictures of resorts, room layouts, etc.).

- The home pages could be those of an ultimate seller, or of an agent for the seller. This arrangement would allow agents to continue play a (restructured) role in the process, to the extent they could add value. At the least this should reduce agent opposition.
- Sellers would supply data for the master directory, taking responsibility for its accuracy and timeliness. (The master directory operator would specify the data elements.)

The success of the service will be dependent on recruiting a large number of sellers as quickly as possible:

- Once an intermediary has established a dominant position, it will be very difficult for a second vendor to become established. The analogy is the failure of "second source" yellow pages in the 1980s.
- The master directory can be on any on-line service. However, seller home pages must be on the Internet, so that the directory can easily access any of them. (Being on the Internet will also give sellers the illusion of control and freedom, by being able to attract buyers directly.)

The added value of this service lies in

- Managing a structured directory.
- Allowing comparisons across seller offerings.

In principle, buyers could access seller pages themselves. In practice there will be virtually insuperable barriers to independent access:

- The generic Internet directories are (and will be) limited to relatively crude indexing based on key words and titles.
- "Intelligent agents" will have the same problems in parsing meaning.
- In any event, the typical buyer will have neither the aptitude nor interest in using such technology. (The technology may, in fact, be used by the directory manager to recruit sellers.)

It would be virtually impossible for buyers to construct the same kinds of comparisons.

NCC INFORMATION INTERMEDIARY OPPORTUNITY

There are several levels of opportunity, ranging from the attractive (but untried) to those that are less attractive.

1. First Level Opportunities

This analysis of opportunity has focussed on

- Real estate brokers
- Insurance brokers
- Travel agencies

These offer excellent near term opportunities (1-2 years) because

- There is significant dollar volume in each of these segments.
- Commissions are high (6-15%)
- Conventional automation is used extensively in some areas of the business.
 - Automation itself has not had the effects promised.
 - There is high need in several unautomated areas.
- Past attempts at conventional "disintermediation" show the market is ripe for change.

Part of the attractiveness is that the window of opportunity is still open. This also introduces an element of risk: There are no full-fledged businesses to serve as a model.

2. Second Level Opportunities

There are a number of areas, not analyzed here, which appear to offer good medium term opportunities (3-5 years). E.g.,

- Medical treatment and pharmaceutical information for laymen. (Sponsored by health care providers and drug companies.)
- Hospital and, especially, nursing home information
- Other brokering activities (e.g., yachts, fine art, etc.)

There is a good probability that a information intermediary service could create a new market in these areas.

- However, the absence of existing well-developed agency structure makes these businesses riskier.
- In the best case, extra time (probably years) would be spent in creating the market for a new form of intermediary. This is in contrast to first level opportunities where the issue is substitution, rather than creation.

3. Third Level Opportunities

This class of opportunity provides information in such areas as

- Consumer/electronic goods
- Cars
- Hotels
- Restaurants
- Mortgage rates
- "Yellow Page" services

Part of the reason for these being less attractive is that they are already being offered or discussed in some form. However, there are more basic drawbacks:

- Much of this information already exists, often in convenient print form.
- Network-based consumer goods retailers have been unwilling to set up (or even allow) links to other home pages so that buyers can compare similar products from different sellers. This is unlikely to change.
- Many consumer goods and cars have very similar functional characteristics. Pricing is often the most important information point desired by buyers. It is highly unlikely that many sellers will provide their true pricing.
- The amount that either buyers or sellers can pay is relatively small, compared to first level opportunities.

4. Geography

The U.S. market is the best near-term opportunity:

- The on-line/Internet market is more developed.
- The market is much larger, since there is no "European" market, per se, but national markets with various levels of protection and control in all these segments.

INFORMATION INTERMEDIARY MARKET SIZING

The following are INPUT's estimates for the U.S. markets. As discussed above, the European markets do not look like they would be ripe enough in the near term for inclusion in the opportunity analysis.

U.S.

| <u>Area</u> | <u>IT Vendor Market Size/Probability</u> | | |
|-------------|--|-------------|-------------|
| | <u>1996</u> | <u>1998</u> | <u>2000</u> |
| Real Estate | L/.1 | M/.4 | H/.6 |
| Insurance | L/.2 | M-H/.6 | H/.7 |
| Travel | L/.3 | M-H/.7 | H/.8 |

INFORMATION INTERMEDIARY: COMPETITIVE ENVIRONMENT

Companies involved in these sectors, either alone or in combination, have attempted to offer somewhat analogous services. However, these services have suffered from the inherent conflicts in supplying competitive information about and for competitors.

INPUT regards as a near certainty the interest of EDS in these sorts of services for insurance and travel.

The Moore Corporation is active in supporting "last generation" real estate information. Since Moore also has imaging capabilities elsewhere in their organization, it is possible that they could offer a real estate service along the lines described here.

In general, however, this represents virgin territory (as do most Internet-related opportunities).

c:IBIIb

12.

SUMMARY OF FINDINGS

SUMMARY OF FINDINGS

Summaries by Opportunity Size

Exhibit A provides a summary of the size of each opportunity by year.

Exhibit B takes this same information and shows the growth of each opportunity over the five year period.

- A few opportunities "top out" even after five years in the medium-low category.
- Most are reach the medium or high category by the year 2000.
- A few are large opportunities now.

Exhibit C takes the mid-point of the ranges shown in Exhibit A and extends them from 1996 to 2000. These numbers are for information and illustration only; the reasons for using ranges in the individual analyses remain.

As discussed in the introduction, INPUT does not believe that an opportunity's priority is necessarily determined by its size alone. Other factors include:

- Market risk/acceptance
- Technical risk
- Competitive situation
- Investment required
- IBM's opportunity selection criteria (this is addressed on the next page)

Other Observations

An issue that was not always clearcut in individual segment analyses is the "global market" issue.

- As noted in the Introduction, INPUT's analysis and sizing focussed on the U.S. and Europe. These two geographies account for about 80% of this market.
- However, it is open to question whether there is a true European market for new NCC products and services.
 - National markets seem very much alive and well in Europe.
 - Telecommunications deregulation (or non-deregulation) in Europe can only muddy the waters further in the near term.

- For many NCC-related offerings Europe lags the U.S.
- Because of the near term focus of this study, the U.S. market would appear the better bet for achieving near term results in many of these segments.

INPUT's analysis for this (and other) studies indicates that many applications, especially NCC-type applications, are driven largely by software and services offerings.

Systems software and hardware platforms acquisition are often

- "Unhooked" from the basic application decision;
- In consequence, are becoming semi-commodities.

INPUT believes that this is a very important issue for IBM and should be assessed further.

Further Analysis Required

Given the time parameters of this study, it is no surprise that there is more analysis required. Some of the items that have come to INPUT's attention in our review include:

- Further refinement/iteration on the NCC concept itself. INPUT has some ideas in this respect, based on the overview analysis conducted for this study.
- It was not feasible in this phase to "unpack" the capabilities and delivery modes required to pursue individual opportunities. This will be a significant undertaking and will involving priority-setting.
 - The "platform issue", raised in the preceding section, would be a part of this analysis.
- As part of the two points, the sizing of opportunities could be made more detailed (although not necessarily more useful).
- The most obvious need is to set IBM's own NCC priorities. One result of the analysis in this study has been to convince INPUT that even IBM cannot address all of the NCC opportunities described here. INPUT's view follows below.

Analysis Required For Selecting IBM's NCC Opportunities

The following is INPUT's view of the activities required for IBM to select and prioritize its NCC opportunities.

- An assessment of capabilities required to service an opportunity in 1998.
- What the 1995 market position/capabilities should be in order to be competitive in 1998.
- IBM's current position (including the effects of initiatives now underway).
- Gap analysis and recommendations for closing gap.
- Assessment of level of investment, dollar opportunity and risk against
 - Overall size market opportunity (and likelihood of occurring)
 - Potential IBM market share range

| INDUSTRY | APPLICATION OPPORTUNITY | VENDOR MARKET SIZE BY YEAR | | |
|---------------------|---|----------------------------|------|------|
| | | 1996 | 1998 | 2000 |
| Travel Industry | | | | |
| | CRS-Functional Enhancements | M-H | M-H | M-H |
| | CRS-Front-ends | M | M | M |
| | CRS-Next-generation | L | L | H |
| | CRS-Operations | M-H | M-H | H |
| | Hotel & Car CRS-Development | M | M-H | M-H |
| | Hotel & Car CRS-Operations | M | M-H | M-H |
| Media Market | | | | |
| | Asset Management | L | L-M | M |
| | Billing Systems | M-H | M-H | H |
| | Call Center Management | M-H | H | H |
| | Collaborative Publishing | L | L-M | M-H |
| | Customer Service | M | M-H | H |
| | Data Mining and Visualization | L-M | M | H |
| | Information Search and Retrieval | L-M | M | H |
| | Internet Broadband Broadcasting | L | L | L |
| | Internet Marketing | L-M | M-H | H |
| | Job Tracking, Program Scheduling | L | L | L-M |
| | Mailing List, Subscriptions, and Directory Management | L | L-M | L-M |
| | Network Management | L | L-M | L-M |
| | Online Service Software/Systems | L-M | L-M | M |
| | Operations Support Systems | H | H | H |
| | Video Delivery Systems | M | H | H |
| Health Care | | | | |
| | U.S.-"Traditional" | M-H | M-H | M-H |
| | U.S.-Managed Care | M-H | VH | VH |
| | Europe-"Traditional" | M | M-H | H |
| | Europe-Managed Care | M | M-H | VH |
| Retail (Individual) | Financial Products | | | |
| | Demand Deposit-Aggregate | M | M-H | H |
| | Demand Deposit-Easy Initiation | M-L | M | M |

Key: L = Under \$50MM; M-L = \$50-250MM; M = \$250-750MM; M-H = \$750MM-2 billion; H = \$2-5 billion; VH = Over \$5 billion

| INDUSTRY | APPLICATION OPPORTUNITY | VENDOR MARKET SIZE BY YEAR | | |
|--------------------------------|---|----------------------------|------|------|
| | | 1996 | 1998 | 2000 |
| | Lending Product-Aggregate Loan Operations | M-L | M | H |
| | Investment/Insurance-SimpleStart | L | M | M |
| | Investment/Insurance-Aggregate Back Office | L | M-L | H |
| | Card-based Service-Big Switch | M-L | M | H |
| | Card-based Service-Internet Plus | M-L | M | H |
| | Retail CMA-Delivery | M-L | M-H | H |
| Business Banking | | | | |
| | Money Transfer Swift-The Transfer Network Service | M | H | VH |
| | Money Transfer Swift-Large-scale Netting | M | H | H |
| | Electronic Commerce-EC Partner | M | H | VH |
| | Electronic Commerce-Internet EC Upgrade | M-L | M | H |
| | International Service-Networked services | M | M-H | H |
| | Commercial Loan-Loan Service/Processing | M | M-H | H |
| | Commercial Loan-Network-based Lending | M-H | H | H |
| | Commercial Loan-Commercial Paper Net | M | M | M |
| | Cash Management-Cash Management Service | M | M-H | H |
| | Cash Management-Consolidated investing | M-L | M | H |
| Product Distribution Chain | | | | |
| | Electronic Commerce | M | H | H |
| | Manufacturing Reengineering | M-H | M-H | H |
| | Electronic Payments | M-H | M-H | H |
| | Derived Marketing Information | M | M | M-H |
| | Mass Customization | L | L-M | M |
| | Electronic Financial Services (Consumer) | L | L-M | M |
| Industrial Marketing and Sales | | | | |
| | Integrated Product Management System | M-L | M | M-H |
| | Targeted Marketing | M | M-H | H |
| | Competitively-Advantaged Sales Automation | M-H | H | H |
| | Sales Performance Reporting | M-L | M | M-H |
| Financial Operations | | | | |
| | U.S. | H | VH | VH |

Key: L = Under \$50MM; M-L = \$50-250MM; M = \$250-750MM; M-H = \$750MM-2 billion; H = \$2-5 billion; VH = Over \$5 billion

| INDUSTRY | APPLICATION OPPORTUNITY | VENDOR MARKET SIZE BY YEAR | | |
|----------------------------|-------------------------|----------------------------|------|------|
| | | 1996 | 1998 | 2000 |
| Europe | | H | VH | VH |
| Trading Systems | | | | |
| Network Support | | M | H | VH |
| Trade Processing | | M | M | VH |
| Pricing and Modeling | | M | H | VH |
| Information Intermediaries | | | | |
| Real Estate | | L | M | H |
| Insurance | | L | M-H | H |
| Travel | | L | M-H | H |

Key: L = Under \$50MM; M-L = \$50-250MM; M = \$250-750MM; M-H = \$750MM-2 billion; H = \$2-5 billion; VH = Over \$5 billion

| INDUSTRY | APPLICATION OPPORTUNITY | VENDOR MARKET SIZE BY YEAR ACHIEVED | | | | | | | |
|--|---|-------------------------------------|------------|------------|------------|--------|-----------|-----------|-----------|
| | | L | M-L | M | M-H | H | VH | | |
| | | >\$50MM | \$50-250MM | \$250-750M | \$760MM-2B | \$2-5B | | | |
| Travel Industry | | | | | | | | | |
| | CRS-Functional Enhancements | | | | 1996-2000 | | | | |
| | CRS-Front-ends | | | | | | 1996-2000 | | |
| | CRS-Next-generation | 1996-1998 | | | | | | 2000 | |
| | CRS-Operations | | | | | | | 1996-1998 | 2000 |
| | Hotel & Car CRS-Development | | | 1996 | 1998-2000 | | | | |
| | Hotel & Car CRS-Operations | | | 1996 | 1998-2000 | | | | |
| Media Market | | | | | | | | | |
| | Asset Management | 1996 | 1998 | 2000 | | | | | |
| | Billing Systems | | | | 1996-1998 | 2000 | | | |
| | Call Center Management | | | | | 1996 | 1998-2000 | | |
| | Collaborative Publishing | 1996 | 1998 | | | | | | |
| | Customer Service | | | | | 1996 | 1998 | 2000 | |
| | Data Mining and Visualization | | | | | 1996 | 1998 | 2000 | |
| | Information Search and Retrieval | | | | | 1996 | 1998 | 2000 | |
| | Internet Broadband Broadcasting | 1996-2000 | | | | | | | |
| | Internet Marketing | | | | | 1996 | 1998 | 2000 | |
| | Job Tracking, Program Scheduling | 1996-1998 | 2000 | | | | | | |
| | Mailing List, Subscriptions, and Directory Management | 1996 | 1998-2000 | | | | | | |
| | Network Management | 1996 | 1998-2000 | | | | | | |
| | Online Service Software/Systems | | 1996-1998 | 2000 | | | | | |
| | Operations Support Systems | | | | | | | 1996-2000 | |
| | Video Delivery Systems | | | | | | 1996 | 1998-2000 | |
| Health Care | | | | | | | | | |
| | U.S.-"Traditional" | | | | | | 1996-2000 | | |
| | U.S.-Managed Care | | | | | | | 1996 | 1998-2000 |
| | Europe-"Traditional" | | | 1996 | 1998 | | | 2000 | |
| | Europe-Managed Care | | | 1996 | 1998 | | | | 2000 |
| Retail (Individual) Financial Products | | | | | | | | | |
| | Demand Deposit-Aggregate | | | 1996 | 1998 | | | 2000 | |
| | Demand Deposit-Easy Initiation | | 1996 | 1998-2000 | | | | | |

1996

1996

1996

1996

Key: L = Under \$50MM; M-L = \$50-250MM; M = \$250-750MM; M-H = \$750MM-2 billion; H = \$2-5 billion; VH = Over \$5 billion

| INDUSTRY | VENDOR MARKET SIZE BY YEAR ACHIEVED | | | | | | | | | |
|---|-------------------------------------|------------|------------|------------|-----------|-------|--|--|------|-----------|
| | L | M-L | M | M-H | H | VH | | | | |
| APPLICATION OPPORTUNITY | >\$50MM | \$50-250MM | \$250-750M | \$750MM-2B | \$2-5B | >\$5B | | | | |
| Lending Product-Aggregate Loan Operations | | 1996 | 1998 | | 2000 | | | | | |
| Investment/Insurance-SimpleStart | 1996 | | 1998-2000 | | | | | | | |
| Investment/Insurance-Aggregate Back Office | 1996 | 1998 | | | 2000 | | | | | |
| Card-based Service-Big Switch | | 1996 | 1998 | | 2000 | | | | | |
| Card-based Service-Internet Plus | | 1996 | 1998 | | 2000 | | | | | |
| Retail CMA-Delivery | | 1996 | | 1998 | 2000 | | | | | |
| Business Banking | | | | | | | | | | |
| Money Transfer Swift-The Transfer Network Service | | | 1996 | | 1998 | | | | | 2000 |
| Money Transfer Swift-Large-scale Netting | | | 1996 | 1998-2000 | | | | | | |
| Electronic Commerce-EC Partner | | | 1996 | | 1998 | | | | | 2000 |
| Electronic Commerce-Internet EC Upgrade | | 1996 | 1998 | | 2000 | | | | | |
| International Service-Networked services | | | 1996 | | 1998 | | | | | |
| Commercial Loan-Loan Service/Processing | | | 1996 | | 1998 | | | | | |
| Commercial Loan-Network-based Lending | | | | 1996 | | | | | | 1998-2000 |
| Commercial Loan-Commercial Paper Net | | | 1996-2000 | | | | | | | |
| Cash Management-Cash Management Service | | | 1996 | | 1998 | | | | | 2000 |
| Cash Management-Consolidated Investing | | 1996 | 1998 | | 2000 | | | | | |
| Product Distribution Chain | | | | | | | | | | |
| Electronic Commerce | | | 1996 | | | | | | | 1998-2000 |
| Manufacturing Reengineering | | | | | 1996-1998 | | | | | 2000 |
| Electronic Payments | | | | | 1996-1998 | | | | | 2000 |
| Derived Marketing Information | | | | | | | | | | 2000 |
| Mass Customization | | | 1996-1998 | | | | | | | |
| Electronic Financial Services (Consumer) | | 1998 | 2000 | | | | | | | |
| Electronic Financial Services (Consumer) | | 1998 | 2000 | | | | | | | |
| Industrial Marketing and Sales | | | | | | | | | | |
| Integrated Product Management System | | 1996 | 1998 | | 2000 | | | | | |
| Targeted Marketing | | | 1996 | | 1998 | | | | | 2000 |
| Competitively-Advantaged Sales Automation | | | | | 1996 | | | | | 1998-2000 |
| Sales Performance Reporting | | 1996 | 1998 | | 2000 | | | | | |
| Financial Operations | | | | | | | | | | |
| U.S. | | | | | | | | | 1996 | 1998-2000 |
| Europe | | | | | | | | | 1996 | 1998-2000 |

| INDUSTRY | APPLICATION OPPORTUNITY | VENDOR MARKET SIZE BY YEAR ACHIEVED | | | | | | |
|----------------------------|-------------------------|-------------------------------------|------------|------------|------------|--------|-------|--|
| | | L | M-L | M | M-H | H | VH | |
| | | >\$50MM | \$50-250MM | \$250-750M | \$750MM-2B | \$2-5B | >\$5B | |
| Trading Systems | | | | | | | | |
| | Network Support | | | 1996 | | 1998 | 2000 | |
| | Trade Processing | | | 1996-1998 | | | 2000 | |
| | Pricing and Modeling | | | 1996 | | 1998 | 2000 | |
| Information Intermediaries | | | | | | | | |
| | Real Estate | 1996 | | 1998 | | 2000 | | |
| | Insurance | 1996 | | | 1998 | 2000 | | |
| | Travel | 1996 | | | 1998 | 2000 | | |

| INDUSTRY | APPLICATION OPPORTUNITY | VENDOR MARKET SIZE BY YEAR (\$M) | | | | | TOTAL |
|-----------------|---|----------------------------------|-------|--------|--------|--------|--------|
| | | 1996 | 1997 | 1998 | 1999 | 2000 | |
| Travel Industry | | | | | | | |
| | CRS-Functional Enhancements | 1,375 | 1,375 | 1,375 | 1,375 | 1,375 | 6,875 |
| | CRS-Front-ends | 500 | 500 | 500 | 500 | 500 | 2,500 |
| | CRS-Next-generation | 25 | 25 | 25 | 25 | 3,500 | 3,600 |
| | CRS-Operations | 1,375 | 1,375 | 1,375 | 1,375 | 3,500 | 9,000 |
| | Hotel & Car CRS-Development | 500 | 500 | 1,375 | 1,375 | 1,375 | 5,125 |
| | Hotel & Car CRS-Operations | 500 | 500 | 1,375 | 1,375 | 1,375 | 5,125 |
| | Sub-total | 4,275 | 4,275 | 6,025 | 6,025 | 11,625 | 32,225 |
| Media Market | | | | | | | |
| | Asset Management | 25 | 25 | 150 | 150 | 500 | 850 |
| | Billing Systems | 1,375 | 1,375 | 1,375 | 1,375 | 3,500 | 9,000 |
| | Call Center Management | 1,375 | 1,375 | 3,500 | 3,500 | 3,500 | 13,250 |
| | Collaborative Publishing | 25 | 25 | 150 | 150 | 1,375 | 1,725 |
| | Customer Service | 500 | 500 | 1,375 | 1,375 | 3,500 | 7,250 |
| | Data Mining and Visualization | 150 | 150 | 500 | 500 | 3,500 | 4,800 |
| | Information Search and Retrieval | 150 | 150 | 500 | 500 | 3,500 | 4,800 |
| | Internet Broadband Broadcasting | 25 | 25 | 25 | 25 | 25 | 125 |
| | Internet Marketing | 150 | 150 | 1,375 | 1,375 | 3,500 | 6,550 |
| | Job Tracking, Program Scheduling | 25 | 25 | 25 | 25 | 150 | 250 |
| | Mailing List, Subscriptions, and Directory Management | 25 | 25 | 150 | 150 | 150 | 500 |
| | Network Management | 25 | 25 | 150 | 150 | 150 | 500 |
| | Online Service Software/Systems | 150 | 150 | 150 | 150 | 500 | 1,100 |
| | Operations Support Systems | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 | 17,500 |
| | Video Delivery Systems | 500 | 500 | 3,500 | 3,500 | 3,500 | 11,500 |
| | Sub-total | 8,000 | 8,000 | 16,425 | 16,425 | 30,850 | 78,700 |

| INDUSTRY | APPLICATION OPPORTUNITY | VENDOR MARKET SIZE BY YEAR (\$M) | | | | | TOTAL |
|--|---|----------------------------------|-------|--------|--------|--------|--------|
| | | 1996 | 1997 | 1998 | 1999 | 2000 | |
| Health Care | | | | | | | |
| | U.S.-"Traditional" | 1,375 | 1,375 | 1,375 | 1,375 | 1,375 | 6,875 |
| | U.S.-Managed Care | 1,375 | 1,375 | 5,000 | 6,000 | 7,000 | 20,750 |
| | Europe-"Traditional" | 500 | 500 | 1,375 | 1,375 | 3,500 | 7,250 |
| | Europe-Managed Care | 500 | 500 | 1,375 | 1,375 | 5,000 | 8,750 |
| Sub-total | | 3,750 | 3,750 | 9,125 | 10,125 | 16,875 | 43,625 |
| Retail (Individual) Financial Products | | | | | | | |
| | Demand Deposit-Aggregate | 500 | 500 | 1,375 | 1,375 | 3,500 | 7,250 |
| | Demand Deposit-Easy Initiation | 150 | 150 | 500 | 500 | 500 | 1,800 |
| | Lending Product-Aggregate Loan Operations | 150 | 150 | 500 | 500 | 3,500 | 4,800 |
| | Investment/Insurance-SimpleStart | 25 | 25 | 500 | 500 | 500 | 1,550 |
| | Investment/Insurance-Aggregate Back Office | 25 | 25 | 150 | 150 | 3,500 | 3,850 |
| | Card-based Service-Big Switch | 150 | 150 | 500 | 500 | 3,500 | 4,800 |
| | Card-based Service-Internet Plus | 150 | 150 | 500 | 500 | 3,500 | 4,800 |
| | Retail CMA-Delivery | 150 | 150 | 1,375 | 1,375 | 3,500 | 6,550 |
| Sub-total | | 1,300 | 1,300 | 5,400 | 5,400 | 22,000 | 35,400 |
| Business Banking | | | | | | | |
| | Money Transfer Swift-The Transfer Network Service | 500 | 500 | 3,500 | 3,500 | 5,000 | 13,000 |
| | Money Transfer Swift-Large-scale Netting | 500 | 500 | 3,500 | 3,500 | 3,500 | 11,500 |
| | Electronic Commerce-EC Partner | 500 | 500 | 3,500 | 3,500 | 5,000 | 13,000 |
| | Electronic Commerce-Internet EC Upgrade | 150 | 150 | 500 | 500 | 3,500 | 4,800 |
| | International Service-Networked services | 500 | 500 | 1,375 | 1,375 | 3,500 | 7,250 |
| | Commercial Loan-Loan Service/Processing | 500 | 500 | 1,375 | 1,375 | 3,500 | 7,250 |
| | Commercial Loan-Network-based Lending | 1,375 | 1,375 | 3,500 | 3,500 | 3,500 | 13,250 |
| | Commercial Loan-Commercial Paper Net | 500 | 500 | 500 | 500 | 500 | 2,500 |
| | Cash Management-Cash Management Service | 500 | 500 | 1,375 | 1,375 | 3,500 | 7,250 |
| | Cash Management-Consolidated investing | 150 | 150 | 500 | 500 | 3,500 | 4,800 |
| Sub-total | | 5,175 | 5,175 | 19,625 | 19,625 | 35,000 | 84,600 |

| INDUSTRY | APPLICATION OPPORTUNITY | VENDOR MARKET SIZE BY YEAR (\$M) | | | | | | | TOTAL |
|--------------------------------|---|----------------------------------|-------|--------|--------|--------|--------|--------|--------|
| | | 1996 | 1997 | 1998 | 1999 | 2000 | | | |
| Product Distribution Chain | | | | | | | | | |
| | Electronic Commerce | 500 | 500 | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 | 11,500 |
| | Manufacturing Reengineering | 1,375 | 1,375 | 1,375 | 1,375 | 1,375 | 3,500 | 3,500 | 9,000 |
| | Electronic Payments | 1,375 | 1,375 | 1,375 | 1,375 | 1,375 | 3,500 | 3,500 | 9,000 |
| | Derived Marketing Information | 500 | 500 | 500 | 500 | 1,375 | 1,375 | 1,375 | 3,375 |
| | Mass Customization | 25 | 25 | 150 | 150 | 150 | 500 | 500 | 850 |
| | Electronic Financial Services (Consumer) | 25 | 25 | 150 | 150 | 150 | 500 | 500 | 850 |
| Sub-total | | 3,800 | 3,800 | 7,050 | 7,050 | 12,875 | 12,875 | 12,875 | 34,575 |
| Industrial Marketing and Sales | | | | | | | | | |
| | Integrated Product Management System | 150 | 150 | 500 | 500 | 1,375 | 1,375 | 1,375 | 2,675 |
| | Targeted Marketing | 500 | 500 | 1,375 | 1,375 | 1,375 | 3,500 | 3,500 | 7,250 |
| | Competitively-Advantaged Sales Automation | 1,375 | 1,375 | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 | 13,250 |
| | Sales Performance Reporting | 150 | 150 | 500 | 500 | 500 | 1,375 | 1,375 | 2,675 |
| Sub-total | | 2,175 | 2,175 | 5,875 | 5,875 | 9,750 | 9,750 | 9,750 | 25,850 |
| Financial Operations | | | | | | | | | |
| | U.S. | 3,500 | 3,500 | 5,000 | 6,000 | 6,000 | 7,000 | 7,000 | 25,000 |
| | Europe | 3,500 | 3,500 | 5,000 | 6,000 | 6,000 | 7,000 | 7,000 | 25,000 |
| Sub-total | | 7,000 | 7,000 | 10,000 | 12,000 | 12,000 | 14,000 | 14,000 | 50,000 |
| Trading Systems | | | | | | | | | |
| | Network Support | 500 | 500 | 3,500 | 3,500 | 3,500 | 5,000 | 5,000 | 13,000 |
| | Trade Processing | 500 | 500 | 500 | 500 | 500 | 5,000 | 5,000 | 7,000 |
| | Pricing and Modeling | 500 | 500 | 3,500 | 3,500 | 3,500 | 5,000 | 5,000 | 13,000 |
| Sub-total | | 1,500 | 1,500 | 7,500 | 7,500 | 7,500 | 15,000 | 15,000 | 33,000 |

| INDUSTRY | APPLICATION OPPORTUNITY | VENDOR MARKET SIZE BY YEAR (\$M) | | | | | TOTAL |
|----------------------------|-------------------------|----------------------------------|--------|--------|--------|---------|---------|
| | | 1996 | 1997 | 1998 | 1999 | 2000 | |
| Information Intermediaries | | | | | | | |
| Real Estate | | 25 | 25 | 500 | 500 | 3,500 | 4,550 |
| Insurance | | 25 | 25 | 1,375 | 1,375 | 3,500 | 6,300 |
| Travel | | 25 | 25 | 1,375 | 1,375 | 3,500 | 6,300 |
| Sub-total | | 75 | 75 | 3,250 | 3,250 | 10,500 | 17,150 |
| Grand Total | | 37,050 | 37,050 | 90,275 | 93,275 | 178,475 | 436,125 |

