Enclosed are the main (and backup) overheads used for the "Products in the $2M Plus price band" presentation given at the March "Commercial Woods" meeting.

If you have any questions or concerns, please don't hesitate to contact me.

Regards.
MARKET DATA
Anker Berg-Sonne

IBM OFFERING IN 1990
Paul Kampas

DIGITAL OPPORTUNITY SUMMARY
Anker Berg-Sonne

TWO VIEWS IN DETAIL
Science Mike Peterson
MIS Per Hjerppe

BUSINESS ANALYSIS
Larry Rosenberg

QUESTIONS, ISSUES, RISKS
Gary Eichhorn
$2M PLUS MARKET STUDY

• Monolithic Systems
  - No clusters or cluster add-ons
  - ONLY net equipment sales

• Market size
  - External/Internal

• Digital opportunity

• IBM scenario

• Business analysis
PRESENTATION FORMAT

• Conclusions presented first
  - Supportive data to follow

• Detail available in package
Groups participating in study

Product Marketing (OIS,LDP,MFG,ESG,MIS)

HPSC

Corporate Finance

Corporate Marketing

Product Operations

Management Sciences

Education

Medical

DECwest

GSG

TIG

MSB
Summary Conclusions

$2M Plus

- IBM dominance - no surprise
  - can Digital provide alternative

- First pass estimates are, Digital can achieve 6-8% market share by 1995

- Investments required
  - Applications
  - TP
  - Vectors
  - Mass storage
  - Reliability

- Profitability
  - Exclusively $2M+
Summary Conclusions

(continued)

- TO COMPLETE THE STUDY
  - Iterate $2M+ numbers
  - $1-2M price band
  - Field issues
$2M PLUS MARKET

HIGHLIGHTS

• Long-term business decision; NOT a product decision

• $1 billion cash investment; recovery 10 years out

• Must take share and real growth from entrenched competition

• Profitability goals might be elusive
  - Competitive reaction
  - Internal risks

• Limited success results in substantial penalties
### $2M \text{ PLUS MARKET}

**MARKET POTENTIAL/OPPORTUNITY**

<table>
<thead>
<tr>
<th></th>
<th>$\text{BILLIONS}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1985</td>
</tr>
<tr>
<td>DEC</td>
<td>0.0</td>
</tr>
<tr>
<td>AMDAHL</td>
<td>1.2</td>
</tr>
<tr>
<td>BURROUGHS</td>
<td>1.6</td>
</tr>
<tr>
<td>OTHER</td>
<td>0.6</td>
</tr>
<tr>
<td>FUJITSU/HITACHI</td>
<td>1.2</td>
</tr>
<tr>
<td>IBM</td>
<td>12.4</td>
</tr>
<tr>
<td>TOTAL</td>
<td>17.0</td>
</tr>
</tbody>
</table>

### REVENUE DISTRIBUTION*

(* BILLIONS)

<table>
<thead>
<tr>
<th></th>
<th>1985</th>
<th>1990</th>
<th>1995</th>
<th>1990-95 CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEC</td>
<td>0.0</td>
<td>1.0</td>
<td>2.2</td>
<td>17%</td>
</tr>
<tr>
<td>AMDAHL</td>
<td>1.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BURROUGHS</td>
<td>1.6</td>
<td>3.8</td>
<td>4.6</td>
<td>4%</td>
</tr>
<tr>
<td>OTHER</td>
<td>0.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FUJITSU/HITACHI</td>
<td>1.2</td>
<td>1.7</td>
<td>2.4</td>
<td>7%</td>
</tr>
<tr>
<td>IBM</td>
<td>12.4</td>
<td>17.5</td>
<td>24.8</td>
<td>7%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>17.0</td>
<td>24.0</td>
<td>34.0</td>
<td>7%</td>
</tr>
</tbody>
</table>

* ASSUMES IBM AND FUJITSU/HITACHI MAINTAIN SHARE, AND DEC ACHIEVES PLANNED VOLUMES.
$2M PLUS MARKET
BUSINESS POTENTIAL/OPPORTUNITY

HARDWARE GROSS MARGIN
TOTAL OPERATING PROFIT
ASSET ASSUMPTIONS - INVENTORY TURNS
- DSO
$2M PLUS MARKET
BUSINESS POTENTIAL/OPPORTUNITY

H/W GM 65%

H/W GM 55%

1005 MARKET SHARE %
$2M PLUS MARKET
BUSINESS CUMULATIVE CASH FLOWS

$ Billions
-1.400 -1.300 -1.200 -1.100 -1.000 -0.900 -0.800 -0.700 -0.600 -0.500 -0.400 -0.300 -0.200 -0.100 0.000 0.100 0.200 0.300 0.400 0.500 0.600 0.700 0.800 0.900 1.000 1.100 1.200 1.300 1.400

$2M PLUS MARKET

COMPETITION

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>1985 SHARE</th>
<th>GROSS MARGIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM</td>
<td>73%</td>
<td>60%*</td>
</tr>
<tr>
<td>FUJITSU</td>
<td>4%</td>
<td>?</td>
</tr>
<tr>
<td>HITACHI</td>
<td>3%</td>
<td>?</td>
</tr>
<tr>
<td>BURROUGHS</td>
<td>9%</td>
<td>40%</td>
</tr>
<tr>
<td>CDC</td>
<td>2%</td>
<td>25%</td>
</tr>
<tr>
<td>AMDAHL</td>
<td>7%</td>
<td>50%</td>
</tr>
<tr>
<td>OTHER</td>
<td>2%</td>
<td>?</td>
</tr>
<tr>
<td>DEC</td>
<td>0%</td>
<td>65%</td>
</tr>
</tbody>
</table>

*Higher for mainframes
$2M PLUS MARKET

LIMITED SUCCESS CASE ASSUMPTIONS

• Engineering, marketing, and selling grow in anticipation of achieving planned volumes

• At year-end 1990, new forecasts indicate volume likely to be at 50% of original plan
$2M PLUS MARKET
LIMITED SUCCESS CASE CASH FLOWS

$ Billion

$2M PLUS MARKET

ISSUES

- Gross Margin percentage achievement
- Market share achievement
- Selling/marketing investment to achieve share
- Parallel engineering efforts
- Ability to deliver ‘complete’ systems
- When and how will IBM react?
  - When DEC achieves X% share
  - Now? (is IBM reducing price to compete with Digital)?
- Technical and MIS markets may have unique requirements
MATERIAL FOR $2M+ SYSTEMS IN SCIENCE MARKET

MAIN MESSAGES

0 OPPORTUNITY IS SMALL FOR $2M+ "IBM-STYLE" SYSTEMS USED FOR SCIENTIFIC RESEARCH

BECAUSE...

0 SCIENTIFIC COMPUTING STYLE FAVORS DISTRIBUTED COMPUTING WITH ELEGANT ACCESS TO LARGE, COMPUTE RESOURCES (...OR SPECIALIZED ONES)
STRATEGY

- Represents market for complete systems for basic and applied research
  - Biological sciences (including medical and life sciences)
  - Physical sciences (physics, chemistry, math, etc.)
  - Social sciences (economics, population dynamics, etc.,)
  - Engineering sciences (especially university eng depts)

- The market pull for this space is for computing environments that...
  - Provide distributed, small to midrange systems
  - Provide elegant access to the largest possible scientific computer (supercomputer and/or dedicated applications engines...)
PURCHASING CRITERIA

1. PERFORMANCE

2. FUNCTIONALITY (# APPLICATIONS)

3. RELIABILITY
BARRIERS TO SUCCESS

○ Scientific application mix favors many small systems (price <$2M), with ready access to the largest possible computer (Cray class).

○ In the scientific market we're winning today against IBM for scientific research centers with our existing product and application strategies.

  - CERN
  - ORNL (replace 2 3033)
  - SLAC (2 sites, 1 308X, 1 3090)
  - FERMI (CDC replacement)
  - LBL (CDC replacement)

○ Digital's reputation (poor H/W reliability, difficult to do business with, "mini" mentality).

○ IBM is entrenched.

  ○ Only 10% is new business, the rest is replacement of which the bunch will get about 15% to 18%.
INVESTMENT REQUIRED

MARKETING INVESTMENT MUST BE TO:

1. UNDERSTAND THE CUSTOMER'S BUSINESS (I.E., SCIENCE)
   - SCIENTIST PROFESSIONALS IN MARKETING
   - SYSTEMATIC APPLICATION CHARACTERIZATIONS
   - DEDICATED FIELD APPLICATIONS SUPPORT PROFESSIONALS

2. MOTIVATE PROJECT-ORIENTED SALES TEAMS
   - RESEARCH PROJECTS ARE OFTEN WORLD-WIDE OPPORTUNITIES
   - INCENTIVES TO PURSUE LONG TERM BUSINESS OPPORTUNITIES

3. PROMOTE THE DEC STYLE FOR SCIENTIFIC COMPUTING
   - MANY SMALLER MACHINES SERVED BY ONE OR MORE REALLY BIG ONES
     (...OR SPECIALIZED ONES)
   - WE'RE WINNING TODAY - DON'T FIX IT, IF IT AIN'T BROKE

4. OTHER INVESTMENTS REQUIRED:
   - S/W TECHNOLOGY
   - MASS STORAGE
     - RELIABILITY
     - BALANCED I/O
     - CAPACITY
**SYSTEM REQUIREMENTS**

- **APPLICATION THROUGHPUT** (see attached descriptions for details)
  - STRUCTURAL ANALYSIS (SIMULATION/MODELING)
  - COMPUTATIONAL CHEMISTRY (SIMULATION/MODELING)
  - SIGNAL PROCESSING (DATA ACQUISITION AND ANALYSIS)
  - EVENT RECONSTRUCTION (DATA ACQUISITION AND ANALYSIS)

- **SYSTEM METRICS** (as determined by above)
  - By 1990, a $2M+ scientific system will provide the application throughput of a CRAY XMP/48 today, but with the interactive elegance of a VAX
  - DECNETABLE
  - VMS FORTRAN COMPATIBLE (source code, including system services, RTL, etc)

- **MESSAGE:** Must be well-balanced...
  - CPU SPEED
  - I/O
  - MASS STORAGE
OPPORTUNITY

UNITS

<table>
<thead>
<tr>
<th></th>
<th>'90</th>
<th>'95</th>
<th>LIFETIME</th>
<th>MARKET SHARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 BUSINESS AS USUAL</td>
<td>8</td>
<td>24</td>
<td>73</td>
<td>5% - 8%</td>
</tr>
<tr>
<td>2 LEADERSHIP SYSTEM</td>
<td>32</td>
<td>60</td>
<td>230</td>
<td>16% - 18%</td>
</tr>
</tbody>
</table>

1 EXTEND VAX TECHNOLOGY (PRICE/PERFORMANCE) INTO THE $2M - $5M RANGE (25-30 MIPS/CPU)

2 VAX OR VAX-COMPATIBLE SYSTEMS OPTIMIZED FOR SCIENTIFIC COMPUTING

3 AT IBM'S EXPENSE
### Science Market

*(By Application Taxonomy)*

<table>
<thead>
<tr>
<th></th>
<th>'85</th>
<th>'86</th>
<th>'90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Size</td>
<td>2200</td>
<td>2300</td>
<td>4309</td>
</tr>
<tr>
<td>CAGR</td>
<td>-</td>
<td>16.0%</td>
<td>18.0%</td>
</tr>
<tr>
<td>MkT Share</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital</td>
<td>27.0%</td>
<td>28.7%</td>
<td>36.0%</td>
</tr>
<tr>
<td>IBM</td>
<td>40.1%</td>
<td>39.1%</td>
<td>34.0%</td>
</tr>
</tbody>
</table>

### Science (FY '86)

<table>
<thead>
<tr>
<th></th>
<th>HPSC</th>
<th>DAAC</th>
<th>ILA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simulation/Modeling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAGR</td>
<td>52%</td>
<td>18%</td>
<td>30%</td>
</tr>
<tr>
<td>Total</td>
<td>$650M</td>
<td>$1075M</td>
<td>$575M</td>
</tr>
<tr>
<td>DEC</td>
<td>200M</td>
<td>300M</td>
<td>100M</td>
</tr>
<tr>
<td>IBM</td>
<td>100M</td>
<td>550M</td>
<td>250M</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. R&D spending/GNP ratio will continue to increase through 1990.

2. Distribution of R&D spending shifting massively toward physical and engineering sciences - 74% of total U.S. outlays for R&D (54% today) - IBM's weakest market, DEC's strongest!

3. Decline because IBM mainframe growth, in science, is much less than overall science market growth (16% vs. 7%-9%)

4. IBM will not have a minisuper offering by 1990. Minisuper market will be $2.9B by 1990 (Data Quert)
Hypothetical customer RFP

YEAR: 1990

BUDGET: $2,000,000 *

IBM PRODUCTS & PRICES?

Scenario 1:
Business as usual (70% share)

Scenario 2: *
Some competition (60% share)

Scenario 3:
Serious competition (50% share)

* expected scenario
## IBM revenue/profit: 1985

<table>
<thead>
<tr>
<th>Category</th>
<th>$B</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>DP Processors</td>
<td>12.135</td>
<td>24%</td>
</tr>
<tr>
<td>Peripherals</td>
<td>12.676</td>
<td>25%</td>
</tr>
<tr>
<td>Office/Wkstn</td>
<td>10.533</td>
<td>21%</td>
</tr>
<tr>
<td>Software</td>
<td>4.165</td>
<td>8%</td>
</tr>
<tr>
<td>Maintenance</td>
<td>6.103</td>
<td>12%</td>
</tr>
<tr>
<td>Supplies/U-R</td>
<td>2.134</td>
<td>5%</td>
</tr>
<tr>
<td>Federal</td>
<td>2.057</td>
<td>4%</td>
</tr>
<tr>
<td>Other</td>
<td>0.073</td>
<td>--</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>50.056</td>
<td>100%</td>
</tr>
<tr>
<td><strong>PBT</strong></td>
<td>11.619</td>
<td>23%</td>
</tr>
</tbody>
</table>
IBM revenue/profit: 1985-1984

<table>
<thead>
<tr>
<th>Category</th>
<th>1985 ($B)</th>
<th>1984 ($B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DP Processors</td>
<td>12.135</td>
<td>11.919</td>
</tr>
<tr>
<td>Peripherals</td>
<td>12.676</td>
<td>11.652</td>
</tr>
<tr>
<td>Office/Wkstn</td>
<td>10.533</td>
<td>9.955</td>
</tr>
<tr>
<td>Software</td>
<td>4.165</td>
<td>3.197</td>
</tr>
<tr>
<td>Maintenance</td>
<td>6.103</td>
<td>5.266</td>
</tr>
<tr>
<td>Supplies/U-R</td>
<td>2.134</td>
<td>2.235</td>
</tr>
<tr>
<td>Federal</td>
<td>2.057</td>
<td>1.645</td>
</tr>
<tr>
<td>Other</td>
<td>0.073</td>
<td>0.068</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>50.056</strong></td>
<td><strong>45.937</strong></td>
</tr>
<tr>
<td><strong>PBT</strong></td>
<td><strong>11.619</strong></td>
<td><strong>11.623</strong></td>
</tr>
</tbody>
</table>
Summary of predictions

SCENARIO 1:
- Continuation of two CPU, two family (43xx, 30xx) approach.
- 1990 introduction of 4391 & SUMMIT (9,30 MIPS/CPU).
- Continuation of same price points, spacing, mark-ups.
- PBT = 22%

SCENARIO 2:
- Same as above plus . . .
- Upward extension of 4391 to $2M with 4x SMP or clusters.
- Moderate SUMMIT repricing and earlier mid-life kickers.
- PBT = 16%

SCENARIO 3:
- Same as above plus . . .
- 1989 4391/SUMMIT introduct’n.
- More drastic price cuts.
- Rapid move to next generation technology.
- PBT = 10%
Scenario 1: Business as usual

SETTING:
IBM market share in 70% range; Japan, BUNCH, DEC sticking to their knitting.

IBM STRATEGY:
Use moderate technologies; continue two family approach; introduce 4391, SUMMIT in 1990; maintain price points, spacing, mark-ups.

IBM PROPOSAL:
$2M - nothing
$3M - SUMMIT 150
$4M - SUMMIT 180
$8M - SUMMIT 200
$16M - SUMMIT 400
IBM LARGE SYSTEMS POSITIONING: 1970-1990

P. Kampas, HPS
3/23/86

MIPS (log)

REAL AVERAGE SYSTEM VALUE (log)
IBM LARGE SYSTEMS POSITIONING: 1970-1990

SCENARIO 1: BUSINESS AS USUAL

P. Kempas, HPS
3/23/86

REAL AVERAGE SYSTEM VALUE (log)
Scenario 2: Some competition

SETTING:
IBM market share falling to 60% range; Japan capturing some high-performance sales, DEC getting some $1-3M sales.

IBM STRATEGY:
Extend 4391 to $2M with 4x SMP/cluster; reprice SUMMIT downward moderately and move in mid-life kickers.

IBM PROPOSAL:
$2M - 4391 x 4
$2.5M - SUMMIT 150
$3.5M - SUMMIT 180
$6.5M - SUMMIT 200
$13M - SUMMIT 400
IBM LARGE SYSTEMS POSITIONING: 1970-1990

P. Kampas, HPS
3/23/86

* SCENARIO 2: SOME COMPETITION

REAL AVERAGE SYSTEM VALUE (log)
IBM LARGE SYSTEMS POSITIONING: 1970-1990

SCENARIO 2: SOME COMPETITION

P. Kampas, HPS
3/23/86
Scenario 3:
Serious competition

SETTING:
IBM market share falling to 50% range; Japan, DEC threatening to crack IBM’s dominance, price umbrella.

IBM STRATEGY:
Move 4391/SUMMIT introductions to 1989; dramatically price SUMMIT line downward; move in mid-life kickers; advance rapidly to next generation technology to regain margins.

IBM PROPOSAL:
$2M - SUMMIT 150 or 4391 x 4
$3M - SUMMIT 180; SUM+ 150
$4M - SUMMIT 200; SUM+ 180
$8M - SUMMIT 400; SUM+ 200
$16M - SUM+ 400
IBM LARGE SYSTEMS POSITIONING: 1970-1990

SCENARIO 3: SERIOUS COMPETITION

P. Kampas, HPS
3/23/86

MIPS

| 100 --+ |
| 50 --+ |
| 20 --+ |
| 10 --+ |
| 5 --. |
| 2 --. |
| 1 --. |

$0.5M$1M$2M$4M$8M$16M

GOODNESS

1.8-2x PERFORMANCE BOOST

40-50% PRICE CUT

4 X 4381 SMP OR CLUSTER

AVERAGE SYSTEM VALUE (log)
$2M PLUS PROJECT

MARKET DATA

- Large market - $20B in 1990, 24% of total
- Low growth - 7% CAGR
- Technical segment - $4B in 1990, 15% CAGR
- Dominated by IBM and PCMs - 87% of revenues
- Almost all systems run traditional, commercial production applications - 93%
- All $2M+ mainframes are purchased as replacements or additions to existing mainframe installations
$2M PLUS PROJECT

$2M+ Market Relative to Other Markets
WW Shipments, US Vendors Only (Gartner)

<table>
<thead>
<tr>
<th>Segment</th>
<th>1985 $</th>
<th>1990 $</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2M+</td>
<td>$14B</td>
<td>$20B</td>
</tr>
<tr>
<td>$250K-$2M</td>
<td>$11B</td>
<td>$15B</td>
</tr>
<tr>
<td>Minl</td>
<td>$17B</td>
<td></td>
</tr>
<tr>
<td>Micro</td>
<td>$9B</td>
<td>$12B</td>
</tr>
<tr>
<td>Total</td>
<td>$51B</td>
<td>$85B</td>
</tr>
</tbody>
</table>
### Mainframe Market Relative to Other Systems Markets

(WW Shipments, US Vendors only)

#### Revenues ($B)

Excluding Software and Services

<table>
<thead>
<tr>
<th></th>
<th>1985</th>
<th>%</th>
<th>1990</th>
<th>%</th>
<th>CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainframe($2M+)</td>
<td>$14B</td>
<td>27%</td>
<td>$20B</td>
<td>24%</td>
<td>7%</td>
</tr>
<tr>
<td>Mainframe($250K-$2M)</td>
<td>$11B</td>
<td>22%</td>
<td>$15B</td>
<td>18%</td>
<td>7%</td>
</tr>
<tr>
<td>Mini</td>
<td>$17B</td>
<td>33%</td>
<td>$38B</td>
<td>45%</td>
<td>18%</td>
</tr>
<tr>
<td>Micro</td>
<td>$9B</td>
<td>18%</td>
<td>$12B</td>
<td>14%</td>
<td>6%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$51B</td>
<td>100%</td>
<td>$85B</td>
<td>100%</td>
<td>11%</td>
</tr>
</tbody>
</table>

ASV in the $2M+ bracket is $5M

Digital growth from LRPs is 27%

Gartner
Represents only hardware revenues. Software and services excluded.

Software and services represent approximately the same amount of revenue.

The mainframe end of the market grows at a much smaller rate than the minicomputer end that we are familiar with.

The $5M average system value in the $2M+ bracket indicates that the market spans a very large size range.
$2M PLUS PROJECT

$2M+ Market by Market Type
WW Shipments, US Vendors Only (Group)

$29B

$21B
$16B
$12B
$4B
$2B
$8B
$14B

$1B
$2B
$3B
$4B
$5B
$6B
$7B
$8B

Commercial
Technical
Total

$ Billion

1985 $  1990 $  1995 $
$2M+ Mainframe Revenue by Market Type

(WW Shipments, US Vendors only)
1985 Revenues($B)

<table>
<thead>
<tr>
<th>Year</th>
<th>Commercial</th>
<th>Technical</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985$</td>
<td>$12B</td>
<td>$2B</td>
<td>$14B</td>
</tr>
<tr>
<td>1990$</td>
<td>$16B</td>
<td>$4B</td>
<td>$20B</td>
</tr>
<tr>
<td>1995$</td>
<td>$21B</td>
<td>$8B</td>
<td>$29B</td>
</tr>
</tbody>
</table>

CAGR

<table>
<thead>
<tr>
<th>Year</th>
<th>Commercial</th>
<th>Technical</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985$</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1990$</td>
<td>6%</td>
<td>15%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Team consensus
The is lower than average growth in the commercial segment of the mainframe market.

In spite of much higher than average growth in the technical segment, it will continue to be much smaller than the commercial segment for the foreseeable future.
$2M PLUS PROJECT

$2M+ Market by Application
% US Installed Systems 1/1/85 (COMTEC)

Production: 93%
Professional: 55%
Scientific: 25%
Total:

Application Type

% of all Systems
Segmentation by Application
---------------------------
(Large Systems $2M+)
% US Installed Systems as of 1/1/85

<table>
<thead>
<tr>
<th>Application</th>
<th>% of all Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td></td>
</tr>
<tr>
<td>On-line TP</td>
<td>-</td>
</tr>
<tr>
<td>Accounting</td>
<td>72%</td>
</tr>
<tr>
<td>Data entry</td>
<td>-</td>
</tr>
<tr>
<td>Data Base Mgmt</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>93%</td>
</tr>
<tr>
<td>Professional</td>
<td></td>
</tr>
<tr>
<td>Time Share</td>
<td>-</td>
</tr>
<tr>
<td>Distrib. Proc.</td>
<td>-</td>
</tr>
<tr>
<td>Word Proc.</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>55%</td>
</tr>
<tr>
<td>Scientific</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25%</td>
</tr>
</tbody>
</table>

Percentages do not add up to 100% because of systems running multiple applications

COMTEC
Percentages add up to less than 100% because a single system may run applications from several classes.

93% of mainframes run traditional mainframe production systems, and 72% run accounting.

55% run professional applications, most probably because of "excess capacity".

25% run scientific applications, statistics, modeling, simulation, etc.
$2M PLUS PROJECT

$2M+ Market by Vendor
WW Shipments, WW Vendors (InfoCorp)

- 2% Cray
- 2% CDC
- 3% Hitachi
- 4% Fujitsu
- 7% Amdahl
- 9% Burroughs
- IBM 73%
- NEC 0%
<table>
<thead>
<tr>
<th>Vendor</th>
<th>Revenue</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM</td>
<td>$10,890M</td>
<td>73%</td>
</tr>
<tr>
<td>Burroughs</td>
<td>$1,275M</td>
<td>9%</td>
</tr>
<tr>
<td>Amdahl</td>
<td>$1,051M</td>
<td>7%</td>
</tr>
<tr>
<td>Fujitsu</td>
<td>$ 568M</td>
<td>4%</td>
</tr>
<tr>
<td>Hitachi</td>
<td>$ 442M</td>
<td>3%</td>
</tr>
<tr>
<td>CDC</td>
<td>$ 345M</td>
<td>2%</td>
</tr>
<tr>
<td>Cray</td>
<td>$ 285M</td>
<td>2%</td>
</tr>
<tr>
<td>NEC</td>
<td>$ 28M</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$14,884M</strong></td>
<td><strong>100%</strong></td>
</tr>
<tr>
<td><strong>PCMs</strong></td>
<td>$ 2,061</td>
<td>14%</td>
</tr>
</tbody>
</table>

IBM+PCMs = 87% of total

Infocorp Forecast
IBM and PCMs account for 87% of the revenues

Burroughs is the only significant non-IBM-compatible vendor
$2M PLUS PROJECT

Mainframe Purchasing Plans 1985–1986
For $250K+ from US Establishments

New (13.0%)
Add (9.0%)
Replace (78.0%)
$2M PLUS PROJECT

Mainframe Purchasing Plans 1985-1986
For $2M+ from US Establishments
New (0.0%)
Add (13.0%)
Replace (87.0%)
Mainframe Purchasing Plans 1985–1986
For $250K+ from US Establishments

- New (13.0%)
- Add (9.0%)
- Replace (78.0%)

Mainframe Purchasing Plans 1985–1986
For $2M+ from US Establishments

- New (0.0%)
- Add (13.0%)
- Replace (87.0%)
Mainframe Purchasing Plans
--------------------------------
(US Establishments planning to purchase during '85-86)

<table>
<thead>
<tr>
<th></th>
<th>% $250K+ units</th>
<th>% $2M+ units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace</td>
<td>78%</td>
<td>87%</td>
</tr>
<tr>
<td>Add</td>
<td>9%</td>
<td>13%</td>
</tr>
<tr>
<td>New</td>
<td>13%</td>
<td>0%</td>
</tr>
</tbody>
</table>

COMTEC
All initial mainframe purchases are systems smaller than $2M

Most mainframes in the $2M range are purchased by mainframe installations
Market Data

Large market - $20B in 1990, 24% of total

Low growth - 7% CAGR

Technical segment - $4B in 1990, 15% CAGR

Dominated by IBM and PCMs - 87% of revenues

Almost all systems run traditional, commercial production applications - 93%

All $2M+ mainframes are purchased as replacements or additions to existing mainframe installations
$2M PLUS PROJECT

Requirement & opportunity summary

- **NEEDS**
  - Office and manufacturing have no need for a large monolithic system
  - Engineering & science need systems with very high disk & floating point performance & good price/performance
  - MIS needs a commercial transaction processing, information center, and production system

- **OPPORTUNITY**
  - Small outside the MIS area
  - Represents the tail end of a large opportunity in the $1M to $2M space
Requirement and opportunity summary

(continued)

• Critical investment areas

- Production system applications
  Transaction processing
- Scientific application performance -
  Vectors
- System/peripheral reliability and performance
- Balanced system performance
  MIPS
  MFLOPS
  Single channel disk I/O

• All these investments are needed even if we do not build a monolithic $2M+ system
$2M PLUS PROJECT

Purchasing criteria (market groups)

- Ability to do the job
  - Applications
  - Performance

ESG, LDP; Application turnaround
MIS: Transactions per second
OIS: Number of users supported
Purchasing Criteria

(continued)

- System reliability
  - Application MTTR most critical
  - Application MTBF close to a year

- Vendor recognition
  - Business partner
  - Viable

  Committed to solving their problems
  Dependable
<table>
<thead>
<tr>
<th></th>
<th>OIS</th>
<th>ESG</th>
<th>MFG</th>
<th>LDP</th>
<th>MIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applications</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>System reliability</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Performance</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Vendor recognition</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

**OIS**
- Approach - Integrated systems
- Capacity and ability to grow
- Ability to support large numbers of users

**MIS**
- Adequate systems for job at hand - reliability
- Recognition as viable vendor
- Application support
  - Internal applications development
  - Third party software

**MFG**
- Complete solutions
- System reliability
- Support

**SCI**
- Performance
- Functionality (# of applications)
- Reliability

**ESG**
- Ability to do job - Performance in M/GFLOPS
- Reliability of system
- Service Capabilities
$2M PLUS PROJECT

Barriers to Digital success

(Market groups)

- Perceived system reliability
  - MTBF to short
  - MTTR to long
  - Greatest problem with peripherals

- Image/recognition
  - Business partnership
  - Not viewed as a commercial vendor
  - Ability/commitment to provide "fail safe" service
<table>
<thead>
<tr>
<th></th>
<th>OIS</th>
<th>ESG</th>
<th>MFG</th>
<th>LDP</th>
<th>MIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Image/recognition</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>Perceived reliability</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>Ability to sell</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>Alternate solutions</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

**OIS**
- Digital not viewed as a provider of mainstream applications
- Digital's ability/commitment to provide "fail safe" service

**MIS**
- Investment in existing software systems
- Lack of image as a Commercial IS vendor
- Lack of software (TP, Database)

**SCI**
- IBM entrenchment
- Application either run on smaller or larger computers
- Digital's reputation for poor reliability, difficult to do business with

**ESG**
- Ability to provide systems with perceived value of $2M
- Perceived problems with system reliability
- Ability to maintain leadership in interim period
$2M PLUS PROJECT

Investment/system requirements (Mkt. groups)

- Applications

- Floating point performance - Vector H/W
  - Transparent, Automatic Decomposition/Vectorization

- Transaction processing
Investment/system requirements (Mkt. groups)

- Disk I/O
  - Throughput to application
  - Backup performance

- Reliability

- System management
  - Large databases
<table>
<thead>
<tr>
<th>OIS</th>
<th>ESG</th>
<th>MFG</th>
<th>LDP</th>
<th>MIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction processing</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Performance, MFLOPS/MIPS</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Performance, Disk</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Automatic Decomp./Vect.</td>
<td>*</td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

**MIS**
- Storage 6-8GB/MIP
- Transaction processing @ 150 TPS
- Dramatically increased reliability

**OIS**
- Recommends investing in distributed processing

**SCI**
- Project-oriented sales teams
- Application throughput
  - single job
    - 400 MFLOPS
    - 200 VUPS
    - 10-30 MB/SEC single channel I/O
- VAX fortran compatibility

**ESG**
- High reliability
- Fast memory/disk access
- SMP
Opportunity for Digital

(Market groups)

<table>
<thead>
<tr>
<th></th>
<th>1990</th>
<th>1995</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>units</td>
<td>units</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>Engineering</td>
<td>20</td>
<td>35</td>
</tr>
<tr>
<td>Office</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Science</td>
<td>32</td>
<td>60</td>
</tr>
<tr>
<td>MIS</td>
<td>340</td>
<td>700</td>
</tr>
<tr>
<td>TOTAL</td>
<td>422</td>
<td>875</td>
</tr>
<tr>
<td>Market share</td>
<td>4.4%</td>
<td>6.4%</td>
</tr>
</tbody>
</table>
• No cluster add-ons included

• System value over $2M
Requirement and Opportunity Summary

Needs

Office and Manufacturing have no need for a large monolithic system.

Engineering and Science need systems with very high disk and floating point performance with good price/performance.

MIS needs a commercial transaction processing, Information Center and production system.

Opportunity

Small outside the MIS area.

Represents the tail end of a large opportunity in the $1M to $2M space.
Requirement and Opportunity Summary

Critical investment areas

Production system applications
  Transaction processing
Scientific application performance
  Vectors
System/peripheral reliability and performance
Balanced system performance
  MIPS
  MFLOPS
  Single channel disk I/O

ALL THESE INVESTMENT ARE NEEDED EVEN IF WE DO NOT BUILD A MONOLITHIC $2M+ SYSTEM
$2M PLUS PROJECT

RISKS

• Program incomplete before product
• Retaliation by IBM
• Japan
• Opportunity risk