MS/IBM SYSTEMS SOFTWARE PLAN: 1990-92

Contents:

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1. THE ENVIRONMENT

1.1 HARDWARE BASE

Key Issues/Implications:

a. **Strong Shift in mix from 286 to "386"**

	1990	1992
286	50%	35%
386	30%	55%

b. **Emergence of RISC on Desktop:**

	1990	1992	1995
RISC	<1%	3%	15-20%

c. **Growth of new types of "PC" machines at low and high-ends:**

Low-end: Notepad, Laptops, Multimedia
High-end: Multiproc. Servers, Workstations

Implications:

- **must stay competitive on "386"**
- **must address new types of platforms with family of products.**

1.2 APPLICATION SOFTWARE

a. **Rapid movement to GUI** - all "new" versions of apps dependent on GUI:
   - application integration desired
   - high quality WYSIWIG (display/print) desired

b. **Certain App categories will move to exploit linear, 32bit quickly:**
   - CAD, DB, Spreadsheet

c. **New application categories will be in:**
   - Email/group information
   - Personal, graphical "4GL" tools

d. **Platform Independence**
   ISV's view market percentages in 1992 to be:

DOS/Windows:	40%
OS/2:	15-20%
Mac:	10-15%
Unix (some flavor):	10-15%

i.e.. view Windows as being highest volume, but limited (no 32-bit, no RISC, no "open", no server, etc.), but view no other alternative as being dominant.

Current response by ISV's:
   - **wait/see**
   - **seek to be platform independent**

Key Implications:

1. **GUI will be accepted/required across product line**
2. **32bit linear on 386 will be important**
3. **"LAN" enabling will be important to new "group" apps., hence will become tangible issue to end-users.**
4. **ISV's will:**
   - seek to minimize platform specific investment until they can see clear paths/winners.
   - will prefer toolsets that promise to span platforms.

1.3 KEY CORPORATE FACTORS

Corporations ("Fortune 500"):

1. **DOS still reigns supreme on desktop:**
   - 90% market share
   - large investment in DOS infrastructure (apps, peripherals, scripts, training, etc.)

2. **GUI accepted as future** - transition will occur over period (90->92):
   - number of apps/PC will increase
   - integration will be demanded

3. **Spread of LAN's** - penetration:
   - 1990 - 20% of PC's
   - 1992 - 35-45% of PC's
   - 1993 - 40-55% of PC's

4. **Usage of PC platforms for MIS Purposes:**
   - running internally developed apps.
   - running off-the-shelf DB and Comm. software (increasingly client/server mode)

6. **Flirtation with UNIX:**
   - some corps. attracted by "open"/standards message.
   - DB2/SNA still only really tangible/accepted parts of SAA.
   - govt. giving leadership to UNIX movement

   Currently limited issue, but could become large scale movement if viable, alternative vision not supplied.

KEY IMPLICATIONS:

a. DOS will not go away:

- Corporations will seek to build off their DOS investment; Transition to any significantly different platform will be slow.
- Adding GUI to DOS will be popular strategy for them.
- DOS Client, XXX Server (OS/2 , Netware, or UNIX) will be popular strategy.

b. LAN Environment:

- A server OS (multitasking, high performance file system, secure, MP) is needed for PC platforms.
- Administration of LAN environment will be MAJOR issue.
- An peer enabled client OS will be required over time.

c. UNIX:

- MS/IBM need to give corps. clear vision of future
  - How they get to new capabilities
  - How they get benefits of multi-vendor world
  - How they build off DOS

  else risk ceding share in large way to UNIX over time

1.4 COMPETITION:

Key Competitors:

1. UNIX
2. DOS clones & extenders
3. "Environments" (New Wave)
4. MacIntosh
5. Network operating systems

1.4.1 UNIX

a. Key Players:

AT&T, SCO, OSF, SUN, NeXT, IBM/AIX

b. Products:

AT&T UNIX System V.4
SCO System V/Open DeskTop
SunOS
NeXT OS
AIX
OSF/x

c. Key Attributes:

Portable (x86, 68000, RISC, etc)
"32bit"
Secure
Standards Compliant

d. Positioning/Game Plan

"Open" (i.e. not under control of single entity, standards compliant)

More amenable to hardware advances (RISC)
More amenable to networking

Benefit from industry "contributions"

Game plan of AT&T USO, SCO, SUN:
- license "binary standard"/shrink wrapped UNIX to achieve "PC phenomenon"

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e. **Key Strengths:**

Occupy the "open" (noble) position

Portable product line

Lots of technology to draw on

f. **Key Weaknesses:**

Lack of Binary standard - no such thing as generic, shrink wrapped "UNIX" software

Lack of large personal productivity base to call on.

Coverage of spectrum of PC hardware

DOS is entrenched.

g. **Projected Market Share:**

	1990	1992
All PC's	2%	3%
386/RISC PC's	6%	7%

1.4.4. Apple Macintosh

a. Product:

System 7.0

b. Key Attributes:

Multi-processing
Established Macintosh GUI

c. Positioning/Game Plan

Build more OS features under established GUI

Retain ease of use, user loyalty-- the "Apple Advantage"

Focus on vertical solution selling for entry into corporations

- Design & Modelling
- Information Management
- Desktop Publishing & Presentations

d. Key Strengths:

Fanatically loyal installed base

Desktop Publishing standard

Multimedia tools

Strong reputation for user-friendly system

e. Key Weaknesses:

High price points-- no strong low-end machine

Perceived connectivity weakness

"New-age" marketing strategy: the "feel" of a Macintosh

f. Projected Market Share:

	1990	1992
All personal computers	10%	10%

2. CURRENT MS/IBM PRODUCT LINE: MARKET POSITION

2.1 REPORT CARD

1. **DOS is still entrenched, but becoming dated**
   - still 85% market share
   - DOS has not been evolving, exposed to clones
   - Fragmentation occurring as result of lack of evolution and no clear successor OS.

2. **Windows will be successful/high-volume on desktop**
   - meets real market requirement
     (offers access to GUI/multi-app, but retains DOS investment)
   - mature (polish, device support)
   - but limited in growth path
     - 32-bit
     - RISC
   - not good server OS

3. **OS/2 is having mixed/poor acceptance:**

   - OS/2 is not selling onto desktop in volume:
     - not mature (polish/usability, performance, device support)
     - difficult migration
       - runs DOS apps, not DOS
       - does not preserve investment in device drivers, scripts, etc.
     - not differentiated sufficiently from Windows:
       - perceived benefits of OS/2 over Windows do not justify add'l. hardware resources required
       - both can't win desktop in 1991

   - Reasonable applications support in works, but late. No compelling application.

3. **OS/2 is having mixed/poor acceptance (con't):**

- OS/2 is not succeeding as a server OS:
  - outsold by Netware
  - outpositioned by UNIX
  - desktop OS/2 applications give no leverage
  - server applications all available on UNIX

- OS/2 is winning some designs in large corporations against UNIX, largely on:
  - faith in IBM/MS,
  - SQL/Svr, EE wins
  - lack of confidence in UNIX

Currently OS/2 is "neither fish nor fowl":
- not direct "successor" to DOS
- not good server OS
- not "open/portable/hi-tech"
- is SAA

4. **IBM/MS does not have clearly visible/timely plan to address all platform types and corporate needs:**
- MP, RISC missing
- Migration path not differentiated
  - DOS —> OS/2 vs. UNIX
  - Windows —> OS/2 vs. UNIX
- administration of large LAN environments

2.2 FORECAST given current "POR"

2.3 MAJOR EXPOSURES given "POR"

2.3.1 Principal:

a. DOS desktop user base does not make switch to GUI on either DOS/WIN or OS/2, goes to UNIX.

Causes:
- confusion compared to alternatives
- neither DOS/Win nor OS/2 alone are competitive on required range of popular hardware
- OS/2, Windows don't build on each other

Implication:
- above all win Desktop GUI.

Options:
1. build plan that leverages best strength today (Windows)
2. drive OS/2 to high volume very quickly

b. Lose RISC desktop to UNIX:

Implication:
- defined smoother growth path for GUI user to MS/IBM RISC software products

c. DOS Clone reaches high-volume
Lose ability to influence future migration
Loss of funds to invest in future

Implication:
- keep DOS competitive by investing in it

2.3.2 Secondary (all UNIX!):

a. **Lose the server OS to UNIX**
(UNIX will then push down onto desktop)

Implication: - offer competitive server OS offering
(MP, security, scaleabe/portable)

b. **UNIX viewed as more supportive/complete for distributed processing/network administration**

Implication: - make sure PC/GUI is good client
- competitive LAN integration
(DFS, directory, RPC, security, mail, etc)
- release desktop offering that is peer on network

c. **UNIX viewed as more productive for application development (particularly in Corps).**

Implication: - ensure development tools keep pace,
pioneer in personal "4GL" category

d. **UNIX builds critical mass in Govt. markets**

Implication: - meet current rules (POSIX, C2)
- change future rules (make DOS/Win "open")?

e. **UNIX becomes more unified than MS/IBM product line:**
- API's
- Device drivers
- Enhancements (e.g. multimedia)

Viewed as safer/more manageable platform by ISV's/OEM's/Corps.

Implication: - have to present unifying plan
(i.e reduce current plethora)
for API's and DD's over time.

2.3.2 Summary of Implications:

- Secure desktop with a personal GUI solution that builds on our strength
  - high-volume applications
  - DOS heritage

- Secure the RISC workstation early:
  - Provide offering early in growth cycle of RISC
  - Compete by offering a clear migration path for high-volume desktop applications

- Secure the server with full-featured server OS (scaleabe, portable, secure, high-performance, etc.)

- Compete with and be differentiated from UNIX
  - be LAN enabled (client and server)/LAN friendly (admin.)
  - be portable, secure, etc.
  - have unique features

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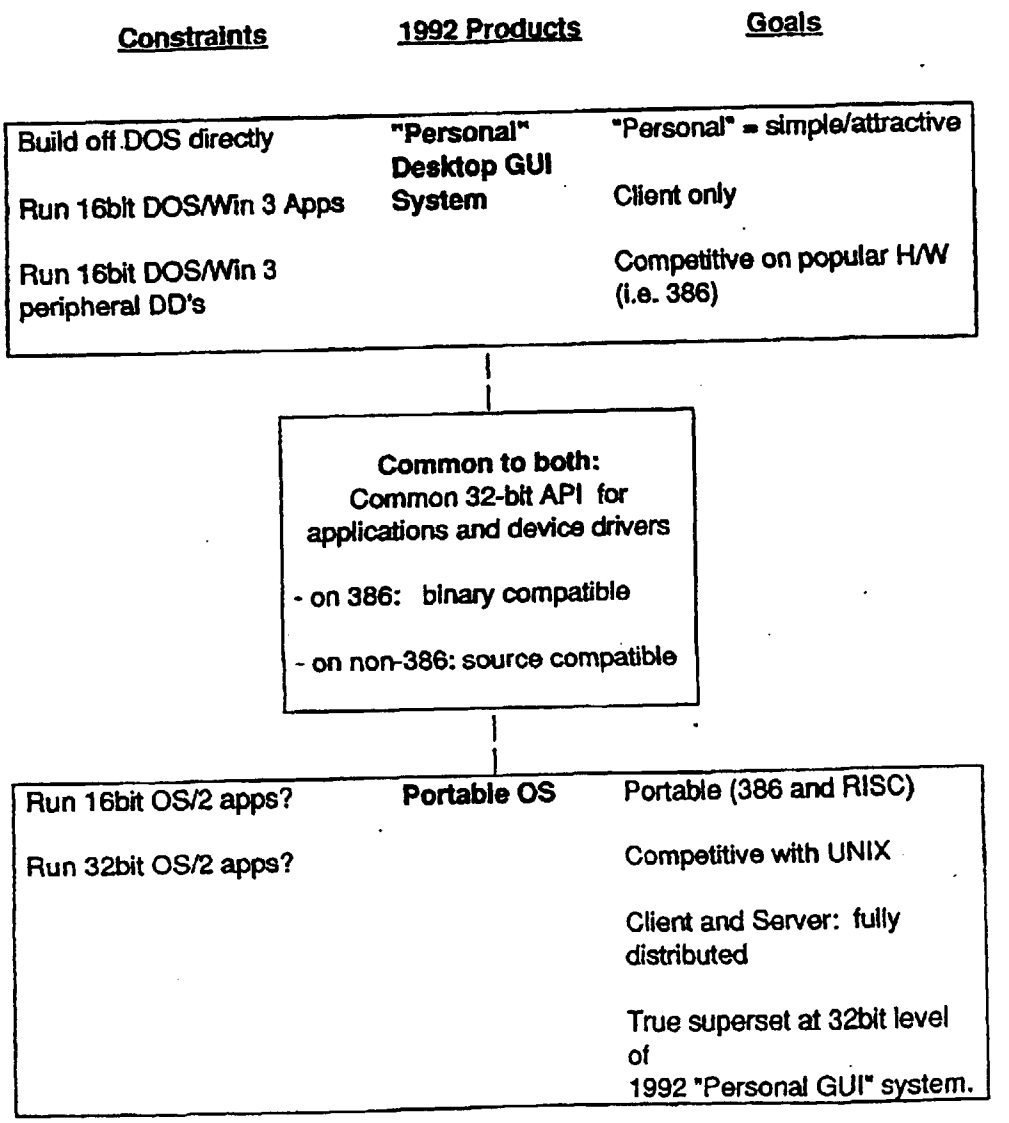
3. PRODUCT LINE PLAN

3.1 "IDEAL " 1992 PRODUCT LINE



3.2 KEY ISSUES IN BRIDGING FROM "POR" TO "IDEAL":

a. What is the 1992 Personal GUI: Windows or OS/2?

Windows forecast:
OS/2 forecast:

a. Does Windows go "32-bit"?
With what API?
- OS/2 subset?
- Win?
- "new" (e.g. Objects)

b. How do we provide migration path for current OS/2 investments assuming Portable OS is optimized for common 32-bit API?

- 16 bit OS/2?
- 32 bit OS/2?

c. What level of investment do we put in current OS/2:
- 16bit OS/2 ("Cutter")
- 32bit OS/2 ("Cruiser/Yawl")

3.3 MS View of Priorities and Issues:

Priority #:

1. Windows - keep strong, provide 32-bit capability, provide migration path

2. NT OS/2 - establish on Server and RISC asap, provide upward compatibility with:
   - Win 32 bit (source on RISC/binary on 386)
   - Win 16 bit (binary only on 386)
   - OS/2 32bit (source on RISC/binary on 386)
   - OS/2 16 bit (binary only on 386) if resource allows

3. Keep DOS protected

4. Complete OS/2 2.0:
   - make as good as can be with first release (i.e. provide viable 386 platform for current OS/2 investments)
   - position as first link in migration chain
   - thereafter minimize investment

5. Don't do Cutter
   - 16-bit API's already dead-ended
   - 32-bit API's will be available with Cruiser
   - Forecast does not support continued investment in 16-bit OS/2

6. BACKUP

A. THE ENVIRONMENT:

1. KEY HARDWARE/PLATFORM FACTORS

a. Processor/Platform Sales Growth (In M's):

Processor	1989 actual	1990	1991	1992
86	4.4	1.8	1.0	0.5
% 86's	34%	14%	7%	4%
286	6.5	6.4	5.0	3.6
% 286's	51%	48%	36%	25%
386SX	0.0	1.7	2.9	3.5
386	1.9	3.0	3.7	4.2
486		0.2	0.6	0.9
% 386's	15%	37%	53%	62%
RISC	0.0	0.1	0.5	1.3
% RISC	0%	1%	3%	9%
TOTAL	12.8	13.2	13.6	14.0
% growth		3%	3%	3%

Notes:
1. Years are MS Fiscal (Jul->Jun)
2. Source: IDC plus MS
3. RISC = RISC machines costing < $50K

IMPLICATIONS:
1. Strong shift to 386, 486 over plan period (28% to 54%)
2. 286 peaks but remains substantial
3. Shift to 386 might be even faster among corporate and institutional buyers, based on survey of planned 1990 purchases
4. RISC starts to grow
5. Industry growth moderates

b. **Change in Platform Types:**

Typical "PC" HW Manufacturer Product Line:

1990	1992
Laptop (86/286, Bty pwr)	Laptop (386LP, VGA, HD, Bty pwr)
Desktop (286/386, VGA, HD)	Desktop (386SX, 386, Super VGA, HD)
Server (386, large disks)	Server (486, larger disks)
	Notebook (small form factor, writing)
	MP Servers (1-8 x 486's, fault tolerant)
	RISC Workstation (RISC, 8MB, 1Kx1K graphics)

IMPLICATIONS:

1. **"PC" H/W manufacturers will extend downwards and upwards with product lines.**
2. **Growth/profit will come from new platform types (Notebook, MP Server, RISC)**
3. **More important than ever to have system software product line that:**
   a. **covers low to high end**
   b. **covers new platform types**

c. Capability growth:

System List Price	$1000		$3000	
	1990	1992	1990	1992
Processor	86/286	386SX	286/386SX	386SX/386
Memory	1MB	2MB	2MB	4MB
Hard Disk	-	30MB	40MB	80MB
Display	VGA	VGA	VGA	Super VGA
Market Share by units	20%	25%	55%	45%

System List Price	$6000		$15000	
	1990	1992	1990	1992
Processor	386/25	386-33,486,RISC	386/33	2x486,RISC
Memory	4MB	8MB	8MB	16MB
Hard Disk	60MB	120MB	360MB	1GB
Display	VGA	Super VGA/1Kx1K	1Kx1K	1Kx1K
Market Share by units	24%	25%	1%	5%

KEY IMPLICATIONS:

1. **Bulk of market moves from 286/386SX to 386(SX)/4MB.**
2. **Growth occurs in low and high end.**

B. PRODUCT PLAN

RELEASE: OS/2 3.0 386

RELEASE OBJECTIVES:

Competitive Server offering to UNIX on MP 386 machines:

MP Support on 386
C2 Security
Based on portable kernel

PROJECT MILESTONES:

Dev Start: underway
System Test Entry: 6/91
Release to Manufacturing: 10/91

SIZING:

Item:	KLOC /EffortTotal	KLOC/Effort to go
Kernel	17	17
File I/O	24	14
Device drivers	54	46
subsystems	47	33
Utilities	133	129
PM	298	221
TOTAL	573	460

RELEASE: OS/2 3.0 RISC

RELEASE OBJECTIVES:

Competitive Server offering to UNIX on RISC Uni-Processor machines:

Supports selected RISC Processors
Establish OS/2 as an OS for future architectures.

PROJECT MILESTONES:

Dev Start: underway
System Test Entry: 8/91
Release to Manufacturing: 12/91

SIZING:

Item:	KLOC /EffortTotal	KLOC/Effort to go
Kernel	12	12
Device Drivers	53	53
PM	31	31
TOTAL	96	96

RELEASE: OS/2 2.1 (YAWL)

RELEASE OBJECTIVES:

Enhance cruiser position as a competitive OS offering for 32 bit x86 systems.

Improved shell
Object orient enabled

PROJECT MILESTONES:

Dev Start: underway
System Test Entry: 12/91
Release to Manufacturing: 4/92

SIZING:

Item:	KLOC /EffortTotal	KLOC/Effort to go
Kernel/Device drivers	15	15
Shell	35	35
PM	8	8
TOTAL	58	58

RELEASE: OS/2 1.3 (CUTTER)

RELEASE OBJECTIVES:

Reduce entry-level memory requirements for 286 systems

PROJECT MILESTONES:

Dev Start: 8/90
System Test Entry: 7/91
Release to Manufacturing: 11/91

SIZING:

Item:	KLOC /EffortTotal	KLOC/Effort to go
Base	6	6
Shell	1	1
PM	26	26
Total	33	33

RELEASE: OS/2 3.1 386

RELEASE OBJECTIVES:

Support Yawl functionality on NT base

16-bit PM applications
MVDM
KBD/VIO/MOU
Porthole

PROJECT MILESTONES:

Dev Start: 3/91
System Test Entry: 7/92
Release to Manufacturing: 11/92

SIZING:

Item:	KLOC /EffortTotal	KLOC/Effort to go
MVDM	37	37
KBD/VIO/MOU	39	39
Unattended Ops.	20	20
Other Base	27	27
16-bit PM	5	5
Porthole	25	25
Misc. Improvements	100	100
TOTAL	253	253

RELEASE: OS/2 3.1 RISC

RELEASE OBJECTIVES:

MP Enabled

PROJECT MILESTONES:

Dev Start: 8/91
System Test Entry: 9/92
Release to Manufacturing: 1/93

SIZING:

Item:	KLOC /EffortTotal	KLOC/Effort to go
Total	100	100

RELEASE: OOPS 1.0

RELEASE OBJECTIVES:

Object-oriented development tools under OS/2 and Windows

Competitive with UNIX (Next)

PROJECT MILESTONES:

Dev Start: underway
System Test Entry: 4/91
Release to Manufacturing: 8/91

SIZING:

Item:	KLOC /EffortTotal	KLOC/Effort to go
Total	80	50

RELEASE: OOPS 2.0

RELEASE OBJECTIVES:

Object-oriented development tools under OS/2 and Windows

Competitive with UNIX (Next)

PROJECT MILESTONES:

Dev Start: 8/90
System Test Entry: 11/91
Release to Manufacturing: 3/92

SIZING:

Item:	KLOC /EffortTotal	KLOC/Effort to go
Total	50	50

RELEASE: DOS 5.0

RELEASE OBJECTIVES:

Get market to single DOS version:

Reduce DOS resident base memory requirements while improving performance
Add/Enhance utilities
Retail Upgrade Package

PROJECT MILESTONES:

Dev Start: underway
System Test Entry: 5/90
Release to Manufacturing:8/90

SIZING:

Item:	KLOC /EffortTotal	KLOC/Effort to go
XMS Driver in BIOS Run DOS/BIOS from HMA Size reduction of Resident Dos Shell Install New/Enhanced Utilities Disable 4.0 IFS		
Total	37.8 man-months 19 KLOC's	10.6 man-months 5 KLOC's

RELEASE: DOS 6.0

RELEASE OBJECTIVES:

Win against clones and other products (be the best low-end OS):

Reduce size while improving performance
Hardware specific versions
Make cloning DOS difficult
Make Dos more human (Smart CD, etc)
Consistency with Windows and OS/2 (in that order)
NLS Solution

PROJECT MILESTONES:

Dev Start: underway
System Test Entry: 5/91
Release to Manufacturing:8/91

SIZING:

Item:	KLOC /EffortTotal	KLOC/Effort to go
Performance/size		
Help (On-line)		
Single NLS Strategy		
DOS Control Panel		
Full Screen Editor		
Combined Win/DOS		
Install		
Enhanced		
Command.com		
Enhanced/New		
Utilities		
Rom Issues		
Shell Enhancements		
Subtotal	102 man-months 51 KLOC's	101 man-months 51 KLOC's
Other	TBD	TBD

RELEASE: Windows 3.0

RELEASE OBJECTIVES:

Address major problems with 2.x:

- Multiple version (286/386/real)
- Memory
- DOS executive
- 386 issues
- Crude visuals

PROJECT MILESTONES:

Dev Start: April 1988
System Test Entry: August 1989
Release to Manufacturing: March 1990

SIZING:

Item:	KLOC /EffortTotal	KLOC/Effort to go
win386/286 issues		
Printer Drivers		
Display Drivers		
Kernel/User/GDI		
Shell		
Net		
Setup		
Desktop Apps		
SDK/DDK		
Control Panel/Spooler, etc		
OEM/ISV support		
WinOldApp		
Total Win 3.0 Dvlp	450 man-months 225 KLOC's	0 man-months

RELEASE: Windows 3.1

RELEASE OBJECTIVES:

Support Multimedia, NLS, and Royal font engine:

PROJECT MILESTONES:

Dev Start: March 1990
System Test Entry: September 1990
Release to Manufacturing: December 1990

SIZING:

Item:	KLOC /EffortTotal	KLOC/Effort to go
Bug Fixes Fast Disk for 386 mode Multimedia Enabled DBCS Enabled Royal Fonts on the Fly DOS/Win Common Install On-line Docs		
SubTotal	47 man-months 24 KLOC's	47 man-months 24 KLOC's
Other	TBD	TBD

RELEASE: Windows 4.0

RELEASE OBJECTIVES:

Win upgrades and address larger audience

PROJECT MILESTONES:

Dev Start: 1 Qtr 1991
System Test Entry: 3-rd Qtr 1991
Release to Manufacturing: 4-th Qtr 1991

SIZING:

Item:	KLOC /EffortTotal	KLOC/Effort to go
Performance/Size Tuning Rommable Next Generation Shell RTL support 32bit API for win apps/devices Handwriting Support Enhance DIBS/Color model Enhanced DDE Ansii 850		
Subtotal	97 man-months 49 KLOC's	97 man-months 49 KLOC's
Other	TBD	TBD

RELEASE: LanMan 2.0

RELEASE OBJECTIVES:

PROJECT MILESTONES:

Dev Start:
System Test Entry:
Release to Manufacturing:

SIZING:

Item:	KLOC /EffortTotal	KLOC/Effort to go

C. The Competition

A. UNIX COMPETITORS:

1. AT&T:

Product: UNIX System V.4

- Merger of AT&T System V.3.2 and SunOS (Berkeley BSD 4.2)
- X/Windows + AT&T Openlook GUI
- NFS, TCP, ISO

Pricing: OEM license: 1% of hardware list or 10% of software list

X/Windows + Openlook:

Positioning:

- UNIX is scaleabe and portable - 1 set of API's up, down, across the line.
- UNIX implements "open standards". (vendor independence, blessed by govt.)
- UNIX is state-of-art (32bit, etc).
- UNIX is better at networking.
- UNIX can run DOS Apps.
- V.4 is the "standard" version of UNIX - all important strains are united (UNIX, XENIX, BSD)

Market Share: Desktops: < 1% (including SunOS)

Servers: 5%

Strengths:

- complete, portable product line
- "open" image

Weaknesses:

- no binary standards, UNIX market is fragmented
- lack of large/personal productivity application base
- coverage of PC h/w spectrum today
- not "personal" (easy to configure, install, etc.)
- V.4 is not "state of art", will need new kernel for MP, etc.

2. Santa Cruz Operation (SCO):

Products: SCO System V.3.2 - multiuser, packaged UNIX

SCO Open Desktop - above packaged with X/WIN, Motif, NFS/TCP, Ingres DB and packaged for desktop (single install, etc).

Pricing: Base : $695 1-2 users, $895 unlimited users

Open Desktop: $995 1-2 users, $1595 unlimited users (retail prices)

Positioning:

- Combine advantages of UNIX (above) with Binary Standard for PC's.
- Complete ready-to-use product.
- Ease of use, installation.
- Market Share on PC Platforms

Market Share: Desktops: 1%

Servers: 3%

Strengths:

- Good support of reseller channel
- Complete, ready-to-use product

Weaknesses:

- As above for UNIX - lack of application software (particularly graphical), and lack of coverage of h/w spectrum.
- Suffer in wake of AT&T release "churn".

3. **SUN Microsystems:**

Product:

SunOS for SUN SPARC Station

Pricing:

$600 per license (retail)

Positioning:

- the "next" PC Platform
- Binary standard platform
- RISC Performance
- UNIX "umbrella" Advantages
- "PC" prices

Market Share:

Desktops: <1% (incl. AT&T)

Servers: 2%

Strengths:

- Complete design - sw and hw available.
- SUN installed base to lever off.

Weaknesses:

- UNIX issues (lack of application software, etc)
- Industry not buying into their strategy - SPARC not becoming RISC processor of choice.

4. NeXT

Product:

NeXTOS for NeXT workstations

Pricing:

Sold bundled with $10K base system

Positioning:

- First complete, affordable, easy to use UNIX machine.
- Binary standard ala MacIntosh.
- The "next generation" of everything (sound, disks, etc).
- The platform for "interpersonal computing".
- Easy to develop graphical apps.
- MP-enable kernel

Market Share:

Desktops: negligible

Servers: negligible

Strengths:

- Binary standard
- Strong marketing push
- Image of Hi-Tech
- WYSIWYG with DisplayPostscript

Weaknesses:

- UNIX issues.
- Not radical enough.
- Single sourced.

B. DOS Clones & Extenders

1. QUARTERDECK

Products: DESQVIEW

QEMM 386

Pricing:

DESQVIEW $129
QEMM $59

Positioning:

- 85% of capabilities of OS/2
- DOS-BASE/Cheap
- Consistent U on all x86 platform
- Great memory management for DOS Systems (VCPI; QEMM)

Current/Future Penetration:

1989 1%
1992 5%

Strengths:

- Provides benefit to DOS-character mode users.
- Leverages market inertia
- Good technical leadership
- VCPI switcher

Weaknesses:

- Going against the GUI/Pmode tide
- Limited resources

Key Implications:

- MS/IBM solutions have to meet market requirements
- MS/IBM solutions need to address entire market

2. RATIONAL/PHARLAP DOS EXTENDERS

Products: Rational 16-Bit DOS extender

Pharlap 32-Bit DOS extender

Pricing:

Rational: $5000 for developer's kit and license for $200 copies

Pharlap: $495 for developer's kit
$1495 for unlimited distribution license

Positioning:

- Easy/Compatible alternative to solving 640K barrier

Current/Future Penetration:

1989 Rational 2%
Pharlap 4%

1992 Rational 20%
Pharlap 5%

Strengths:

Rational
- Runs on both 286/386
- Lotus 1-2-3 3.0
- Lotus investment

Pharlap
- 32-Bit flat model

Weaknesses:

Both = very limited resources

Pharlap = Borland propping

Key Implications:

- A real market factor to deal with given LOTUS
- MS/IBM position on DOS extenders is soft
- Potential tension of limited outer strategic direction

3. DIGITAL RESEARCH

Product: DR. DOS 3.41

Pricing:

$69 (packaged product)

Positioning:

- Cheap compatible DOS
- Rommable
- Enhanced usability

Current/Future Penetration:

1989 2%
1992 1%

Strengths:

- Reasonably functional clone
- Rommable
- MS/IBM DOS 4.0 is weak
- Responsive to customers
- Enhancements: outline help; full screen edition

Weaknesses:

- Opportunistic vs. strategic
- Compatibility

Key Implications:

- MS/PC-DOS is vulnerable until DOS 3.x/DOS 4.x replaced by single great version
- DOS market requirements expanded/charged given rommable PC's; low-cost PC's

4. OTHER DOS CLONES

Products:

- Its Hi-DOS
- Datalight ROM DOS
- Wendin DOS (U.S.)
- LZ DOS (Brazil)
- IALCOW DOS (Taiwan)
- DIP DOS
- Pirated DOS Copies

Positioning:

Opportunistic

Current/Future Penetration:

1989 10%
1992 10%

Strengths:

- Innovative
- Cheap
- Responsive

Weaknesses:

- Incompatibilities
- Non-Strategic

C. "Environments"

HEWLETT-PACKARD

Product: HP New Wave

Positioning:

Alternative to Office Vision not another OS

Current/Future Penetration:

1989 0%
1992 4%

Strengths:

- Taps Object-oriented interest
- HP is credible/committed

Weakness:

- Luke-warm ISV interest
- HP is not standard-setter technology upside is united

Key Implications:

- MS/IBM need coherent/real object strategy
- MS/IBM need ISV direction soon

D. Macintosh

Product: System 7.0

Pricing:

Sold bundled with hardware

Positioning:

- Build more OS features under established GUI
- Retain ease of use, user loyalty-- the "Apple Advantage"
- Focus on vertical solution selling for entry into corporations
  - Design & Modelling
  - Information Management
  - Desktop Publishing & Presentations

Current/Future Penetration:

1989 10%
1992 10%

Strengths:

- Fanatically loyal installed base
- Desktop Publishing standard
- Multimedia tools
- Strong reputation for user-friendly system

Weakness:

- High price points-- no strong low-end machine
- Perceived connectivity weakness
- "New-age" marketing strategy: the "feel" of a Macintosh

Key Implications:

- MS/IBM must maintain dominant position on desktop by presenting a coherent GUI story
- Stress advantages of a multi-vendor world

E. Network Operating Systems

1. Novell

Product: NetWare 386 v. 3.0

NetWare SFT v. 2.15

Pricing:

$8,000 for NetWare 386

Positioning:

- The "de facto" standard, with greater than 50% market share.
- Supports standards (Will have: TCP, ISO, X.400, X.500)
- Runs everywhere (Portable NetWare)

Market share:

60-70%

Strengths:

- Huge installed base
- Performance
- Good reseller support
- ISV support

Weaknesses:

- Proprietary OS
- No directory service (yet)

2. OSF

Product: DEcorum (An assortment of Distributed Environment technologies)

Pricing:

???

Positioning:

- An open standard
- Chosen from the "best technologies"
- Highly portable and scaleable

Market share:

None today

Strengths:

- Support of heavyweights (IBM, DEC, HP)
- Implements a standard

Weaknesses:

- OSF moves slowly
- Some players might really be more committed to other technology (e.g. DEC/VMS, IBM/OS/2)
- Political compromises could affect product quality

3. USO

Product: NFS

Pricing:

$1000

Positioning:

- Highly portable
- Standard technology
- Easier to use

Market share:

4 %

Strengths:

- Excellent at file sharing (cheap, small, fast)
- Big vendor support (AT & T, Sun)
- Good distribution (ships with every box Sun ships)

Weaknesses:

- Only a file sharing system (no security, directory, etc.)

D. API Path

	1990	1991	1992
DOS 16-bit API	DOS 5.0 WIN 3.0, 3.1 OS/2 2.0	DOS 6.0 WIN 4.0 OS/2 2.1	DOS 6.0 OS/2 3.1 /386
WIN 16-bit API	WIN 3.0, 3.1 OS/2 2.0	WIN 4.0 OS/2 2.1	OS/2 3.1 /386
OS/2 16-bit API	OS/2 1.2 OS/2 2.0	OS/2 2.1	
OS/2 32-bit API	OS/2 2.0	OS/2 2.1 OS/2 3.0 /386 OS/2 3.0 /RISC	OS/2 3.1 /386 OS/2 3.1 /RISC
"WIN" 32-bit API (inc. 32-bit FAPI)		WIN 4.0 OS/2 ?	WIN 5.0 (?) OS/2 3.1 /386 OS/2 3.1 /RISC
OO Support		WIN 4.0 OS/2 2.1 OS/2 3.0 /386 OS/2 3.0 /RISC	OS/2 3.1 /386 OS/2 3.1 /RISC
Multimedia	WIN 3.1	WIN 4.0 OS/2 2.1	WIN 5.0 (?) OS/2 3.1 /386 OS/2 3.1 /RISC

E. LAN Support

	1990 LanMan 2.x	1991 LanMan 2.x	1992 LanMan 3.x
Clients	DOS/WIN OS/2 1.x OS/2 2.x	DOS/WIN OS/2 1.x OS/2 2.x	DOS/WIN OS/2 1.x OS/2 2.x OS/2 3.x
Servers	OS/2 1.x OS/2 2.x	OS/2 1.x (?) OS/2 2.x	OS/2 3.x

E. Driver / OEM Support

	I/O	Graphical		LAN
	Disk, etc.	Display	Printer	
DOS Device Drivers– 16-bit				
Win Device Drivers– 16-bit				
OS/2 16/32 Bit Drivers– 16-bit				
NT OS/2 Drivers– 32-bit				
Win 32-bit Drivers				