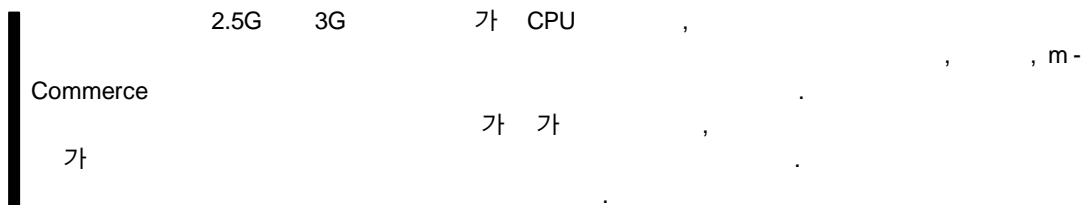
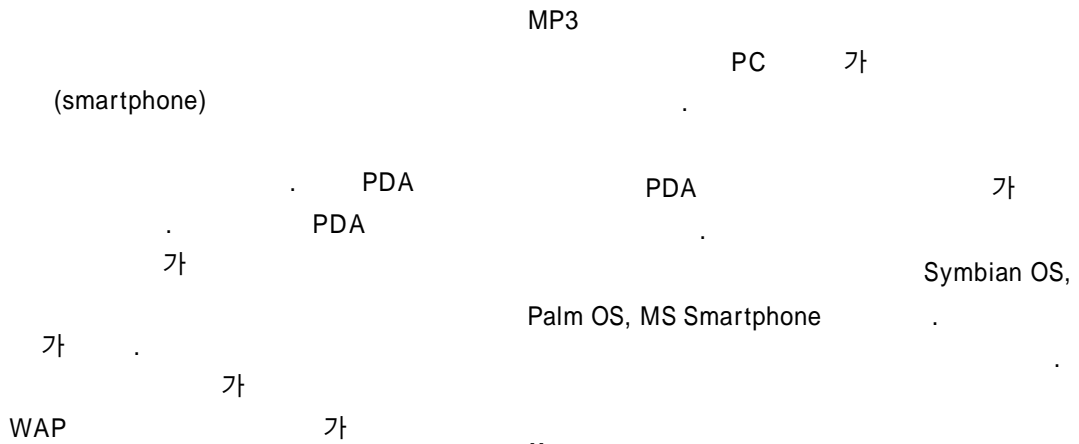


The Trend of Smartphone Operating System Development

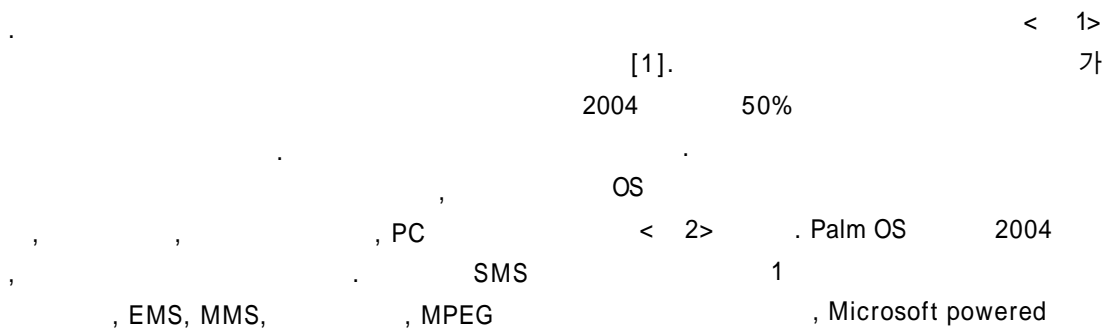
(S.Y. Lee)
 (H.K. Lee)
 (W.S. Kim)
 (J.H. Lee)
 (S.J. Kim)



I.



II.



< 1> Worldwide Smart Handheld Device Shipments, Value of Shipments, and Average System Price, 2003-2008

	2003	2004	2005	2006	2007	2008	2004-2008 CAGR(%)
Shipments(000)	20,341	32,141	50,086	71,486	90,344	111,418	36.5
Growth(%)	NA	58.0	55.8	42.7	26.4	23.3	
Value of shipments(\$M)	6,239.0	9,333.3	12,570.1	16,283.8	18,890.0	21,875.8	23.7
Growth(%)	NA	49.6	34.7	29.5	16.0	15.8	
Average system price(\$)	303	290	251	228	209	196	-9.3
Growth(%)	NA	-4.3	-13.4	-9.2	-8.2	-6.1	

< >: IDC, 2004.

< 2> Worldwide Handheld Device Shipments by Operating System, 2003-2008

	2003	2004	2005	2006	2007	2008	2004-2008 CAGR(%)
Operating system mix(%)							
Palm OS	50.4	45.7	43.2	41.6	39.8	38.4	
Microsoft powered	38.5	44.6	46.8	48.2	49.9	51.2	
Linux	1.7	2.1	2.6	3.1	3.4	3.7	
Symbian OS	0.0	0.0	-	-	-	-	
Other	9.4	7.6	7.3	7.1	6.8	6.6	
Total	100.0	100.0	100.0	100.0	100.0	100.0	
Shipments(000)							
Palm OS	5,473	4,992	4,864	4,833	4,745	4,637	-1.8
Growth(%)	NA	-8.8	-2.6	-0.6	-1.8	-2.3	
Microsoft powered	4,186	4,872	5,270	5,599	5,942	6,179	6.1
Growth(%)	NA	16.4	8.2	6.3	6.1	4.0	
Linux	184	233	293	355	410	450	17.9
Growth(%)	NA	26.7	26.1	20.9	15.6	9.8	
Symbian OS	2	0	-	-	-	-	NA
Growth(%)	NA	-99.8	-100.0	NA	NA	NA	
Other	1,022	834	821	825	816	800	-1.0
Growth(%)	NA	-18.4	-1.5	0.4	-1.1	-1.9	
Total	10,867	10,931	11,248	11,612	11,913	12,067	2.5
Growth(%)	NA	0.6	2.9	3.2	2.6	1.3	

< >: IDC, 2004.

가 phone, Symbain OS가
2004 Palm OS 1% 가 가 .

1. Palm OS

III.

Palm OS

DragonBall VZ

Palm OS, Microsoft Smart -

64K

[2]. Palm OS

PIM	Palm OS	가	가
, to-do	OS	32,000 x32,000	resolution(320 x320)
Palm OS	Palm OS 5.4	가 ADPCM/PCM wav files, MP3, OGG Vorbis	MPEG1, MPEG4
Garnet	Palm OS 6	8/16	16
Cobalt Garnet	Cobalt	PalmSource	API
가. Palm OS Cobalt	Security	E-commerce	, wireless
Cobalt 32bit ARM	VPN	built-in	encryption, authentication, authorization
. Multi Tasking & Protected Memory	가 OS	. Cobalt	가
Cobalt	signed code	가	가
. Wireless Features and Communications	가	PC	가
가	. Synchronization	Synchronization	,
Wi-Fi, GPRS, Serial, Bluetooth	USB,	synchronization	가
. Multimedia	. PalmSource	64K	가
Cobalt	HotSync exchange	hotsync	,
가 가 2D rendering, paths, clipping, video filtering, transparency			

. Developer Tools
 PalmSource Palm OS Cobalt Palm OS Garnet software development tool Palm OS Developer Suite
 . IBM C, C++, Java, COBOL Eclipse open-source, Integrated Development Environment (IDE) PalmSource Metrowerks CodeWarrior, the Eclipse environment, Borland's tool suite, Microsoft NET compatible tools from AppForge

2. Windows Mobile - Based Smartphones

Windows CE Windows Mobile-Based Smartphone
 , , 가 Windows Mobile software가 [3]. Outlook, Pocket Internet Explorer, MSN Messenger, Windows Media Player

가. Pocket Outlook

Outlook e-mail, text message, schedule appointments, manage your contacts, organize your tasks
 PC Microsoft Exchange , PC , ActiveSync

. Messaging

, , SMS ,

inbox

SMS

. Multimedia

Windows Media Player

PC

가

. Card Slot

Secure Digital card slot

. Security

Windows Mobile software environment SSL, WTLS, PPTP

. Developer Tools

Software Development Kit for Windows Mobile 2003-based Smartphones

3. Symbian OS

Symbian OS 32bit

[4].

2G, 2.5G, 3G MMS (Multimedia Messaging Service), IPv6(Internet Protocol Version 6), MIDP(Mobile Information

. PC - Connectivity Toolkit
 PC-Connectivity toolkit Symbian OS
 PC
 . Handhelds dedicated Design: CPU
 , NAND/
 NOR
 . PXA255, S3C2410, 2440,
 24A0 ARM CPU
 DPRAM, DS/MMC, CF, USB Ethernet,
 audio
 . Applications & SDK: Multimedia, Camera,
 PIMs, Internet, System Setup, Synchroniza-
 tion
 Redhat Linux PC
 MIZI XinX PC
 . Security
 Security TLS/SSL, WTLS,
 IPSec , KDevelop , Tiny-X
 가
 Security
 가
 4. Embedded Linux
 가. v2.0
 () v2.0
 가 [5].
 - Talk: CDMA2000 1x EV-DO, 802.11b, IrDA,
 Bluetooth, PPP
 , IrDA beaming Trolltech Troll -

tech's Qt/Embedded [7].
 A-768 4,000
 가 ,
 가 Berkeley DB가
 Sleepycat Software . A-768
 PDA, browser, MP3 music
 playback, full-motion video recording, finance
 utilities .

IV.

Symbian OS, Palm OS,
 Microsoft Smartphone ,
 가 가 . EPOC
 가 , Palm
 . , Microsoft
 가 . Symbian
 OS v8.0

, MS Palm OS Cobalt,
 Windows Mobile 2003-based Smartphones
 Tynux .

- [1] Alex Slawsby, Randy Giusto, Kevin Burden, and David Linsalata, "Worldwide Smart Handheld Device 2004-2008 Forecast and Analysis," IDC, 2004. 4.
- [2] Ryan Kairer, "Palm OS 6 Cobalt Overview: The Palm OS Future," PALM INFOCENTER(www.palminfocenter.com), 2004. 2.
- [3] Windows Mobile-based Smartphones, www.microsoft.com/windowsmobile
- [4] Sander Siezen, "Symbian OS Version 8.0 – Product Description," Symbian Ltd, 2004. 2.
- [5] v2.0 (Smart Phone) , www.mizi.com
- [6] Tynux, www.palmpalm.com
- [7] MontaVista Linux, www.linuxdevices.com/news