

Trends in secondary computer hardware 2006-2009

An AME Research study carried out by order of
CBE Computer Brokers Exchange



cbe computer brokers exchange



Company & Market analysis

Date: September 2006, Author: Adriaan Meij, Email: adriaan@ame.nl

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AME Research point of view

Information technology and telecommunications (ICT) deal with innovation and therefore with new systems, software and service offerings. As with any type of consumer goods, existing systems and software grow old and need to be replaced by new state of the art technologies. At that moment the owner of obsolete equipment discovers the remaining value and the existence of a vast and vivacious secondary market for ICT equipment. The used ICT equipment and complete configured second hand networks are largely traded over the Internet through auctions or closed user trading groups.

This market should not be underestimated: in 2007 the global value of this type of equipment from about 4,000 manufacturers is expected to reach €260 billion. No less than €156 billion worth of equipment in this market is traded by about 40,000 independent computer brokers, wholesalers and value added resellers to end users worldwide, being small and medium sized companies as well as governments and institutions seeking a first or better connection to the worldwide web. Over €100 billion worth of used computer products, components and networks is traded back to manufacturers, leasing companies and repair and maintenance divisions. They refurbish, test and configure the used equipment and resell it worldwide. This happens sometimes, as in the case of IBM, over corporate auction sites for used systems.

Improving macro-economic conditions, rather low interest rates and strongly increasing business in emerging countries in continental Europe, Asia-Pacific, the Middle East and Africa is expected to foster growth of the used computer and telecommunications equipment market to an average of 5.5% annually up to 2010. Stronger growth is to be expected in volume servers, portable devices, mobile and wireless networks, and storage servers and networks. Faster communication over the Internet such as through auction sites shortens transaction times and increases business volumes, while increasing interest rates are shown to be advantageous for leasing contracts.

The secondary market follows the same technology trends as that of new systems. Many owners of used systems underestimate the real remaining value of their systems. It is estimated that some 15% is recycled or thrown away without commercial transactions. The dynamics of the global economic revival present excellent perspectives for traders in used systems and networks.

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Methodology

The mature ICT industry is subject to macro-economic trends and conjuncture movements. Our research is based on that assumption. In order to integrate the ICT industry in the economy AME Research continuously studies short and long term interest rates, stock market indices, ICT sector investment funds, currency rates, and prices of raw materials such as gold, platinum, copper, aluminum, corn, sugar, coffee, gas and key crude oil prices.

AME Research also interprets the meaning and influence of geopolitical developments and trends for the economic perspectives and trade movements. We take into account periodical macro-economic outlooks of the IMF, World Bank, OECD, Eurostat, National Bureau of Statistics of Japan and China and other important institutions such as the Federal Reserve Bank (FED) and local research institutes such as the Central Planning Bureau (CPB), Central Bureau of Statistics (CBS) and the Central Bank of Europe (CBE) and the Netherlands.

AME Research uses public sources such as the European Information Technology Observatory (EITO) and publicly available information from IDC, Gartner, Aberdeen Group, the American Ministry of Trade and international branch organizations such as the Semiconductor Industry Association.

Often we discuss our findings with CEOs and member of management teams of ICT companies, listening to their views about developments and trends. We keep abreast of new reports and publications and regularly attend seminars and conferences on specific topics.

An important source of current and background information is found in quarterly and annual reports, presentations and management discussions of publicly traded companies and their filings at the Securities and Exchange Commission, as well as these companies' assessments of technology trends.

We analyze annual reports of over 300 ICT related companies worldwide and perform benchmarking and competitive analyses based on real in-depth financial information of these companies stored by peer groups and market segments in our database AME ANALIST ONLINE, which contains AME indicators focusing on profit maximizing. This framework of economic trends and continuous company analyses enables us to perform short and longer term prognoses of market developments.

AME Research transforms this raw data into structured reports, analyses and studies, based on own standardized models (5WH & WIPPAW).

Executive summary

There is a large market for secondary ICT equipment out there. The market comprises systems and networks that have been used by initial primary users for at least three months and then passed on to another party. There are a number of participants in this market, such as original equipment manufacturers, leasing companies, resellers, brokers and recyclers. The equipment can have a lifetime of on average 10 years and be resold several times. Several fates may await the equipment such as reuse, refurbishment, recycling, donation or landfill. Most machines enter the market after being written down in three to five years. We assume that about 36% of all new equipment is reused. The market for new equipment sets the opportunities for the secondary marketplace and the calculations for the market size in the future.

The market forecast for new ICT equipment from 2005-2010 shows a stable growth rate of on average 8 percent annually. The growth trend varies by geographical region and by product line. Growth in mature markets such as Europe, North America and Japan is expected to be moderate, while robust growth is expected in Eastern Europe, Russia, Eurasian oil states, the Middle East and Africa, Latin America and Asia Pacific, and particularly in India, Vietnam, Indonesia and China. In terms of hardware products we believe printers and servers to maintain a lower growth rate, while mobile devices, storage systems and networks will show stronger than average growth.

Servers

Branding is an important issue on the demand side of the secondary market as new users demand quality products. The secondary brokerage market for servers from IBM, HP, Dell, SUN and Fujitsu –Siemens had a value of \$9.8 billion in 2005. HP and IBM each represent about \$2.8 billion; SUN and Dell represent a share of \$1.2 billion. The segment of volume servers priced below \$25,000 has a share of 25% in the total secondary server market. This segment grows above average and faster than the segments of high end and midrange servers.

Storage

The secondary brokerage market for storage servers was valued \$3.9 billion in 2005. EMC servers lead this market with a value of \$1.2 billion. Value Added Resellers who can configure complete storage networks from components have the best chances in this market if they provide licenses, testing, configuration and guarantees. Many governments in emerging countries such as Sudan that cannot afford new systems seek these solutions in order to improve their information networks.

World market

The world market for used ICT equipment traded by independent brokers is estimated at €156 billion in 2007, growing annually on average 5.4% to €183 billion in 2010. The market share of Original Equipment Manufacturers is expected to decrease as the machines grow older. We believe the market share of independent computer brokers will increase from 40% to 60% as equipment grows older by 3 to 5 years. Equipment of more than 5 years old decreases in volume and price and is therefore less attractive to active professional computer brokers.

The secondary market is derivable from the new market. The new global market of seven ICT product lines grows annually by 5-6% from a value of €2,509 billion in 2007. This means that the secondary hardware market operates in a strong and financially healthy ecosystem.

We assume from calculations in other markets for used equipment that a little more than one out of three products finds its way into the secondary market for ICT equipment. Therefore the market value for used equipment amounts structurally to some 36% of the new marketplace. Growth is not as strong as the new equipment market because of restraints such as the need for refurbishment, in addition to complex supply chains and regulations that one encounters when entering emerging markets. Therefore we believe the total market to increase on average by 5.4% annually up to 2010 with differences in product lines.

The bulk of used systems enter the market from large companies and governments that are keen on technology innovation. Most of these systems are three to five years old. Focusing on A-brands and systems from this age leads to the largest trade volumes. Exploring emerging economies while adding value in technology and fulfillment is important because it provides key competitive advantages in this fragmented, opportunistic and disorganized marketplace.

Challenges

The secondary market faces a number of challenges such as:

- issues of transferring ownership of licenses for operating systems and embedded software from the first user to the next, in particular while assembling networked configurations
- environmental issues reflected in increasingly stringent recycling legislation particularly in the European Union in order to prevent e-waste
- World Trade conferences that do not sufficiently decrease import tariffs in emerging markets
- Increasing energy prices and therefore transportation expenses that increase the cost of ownership, whereas new equipment is vulnerable to continuous price erosion. These trends narrow the price gap between new and secondary equipment.

Marketplaces like eBay or specialized eMarkets for closed user groups generally match supply and demand of used systems without many added services. Added values such as configuration, refurbishment, testing, shipping, insurance, other fulfillment, transport, escrow or leasing is very fragmented in the current marketplace. AME Research believes demand for used systems is particularly large in upcoming regional markets where governments and companies demand inexpensive solutions. This represents a great opportunity for specialized brokers as well as for large distributors who are able to recognize this market as financially lucrative.

Twenty-five owners of the global ICT market

Let's have a closer look at the global ICT market and its powerhouses before discussing trends, threats and challenges in trading secondary hardware. This will allow us to better understand the key trends that influence trade.

AME Research believes there are only 25 concerns pushing and designing the future information age, which has now become widely prevalent in both the business and consumer markets.

From 2003-2006 these multinationals increased their revenues annually on an average of 9%. On an annualized basis they are expected to cross the barrier of \$1,000 billion in revenues for 2006-2007. In the years ahead they will continue to grow at the same swift speed, provided there will not be a new world disorder.

We divide the offers of the 25 largest and most influential concerns into four product lines: Hardware, Software, Communications and Services. These product lines are the catalysts of the following mega trends:

- Increasing investments in mobile and wireless Communications. Mobility and Internet provide for the largest revenue growth
- A continuous growth shift to the Asia Pacific region with China and India as drivers and emerging economies in Eastern Europe, Russia and the Eurasian oil belt.
- Convergence of hardware, software and electronics is vast; fixed, mobile and wireless networks diminish the value of separate systems and datacenters.
- Global communications require massive capacity in connected datacenters and storage networks that form the computer.

These solutions are scarce in the mentioned emerging economies. Demand in these areas lacks investment capital. Therefore demand will outpace supply in these regions and create interesting business opportunities for very professional trade in sophisticated supply chains.

These 25 leading technology innovators not only compete but also cooperate, thereby making them co-dependent on one another.

1. **Hardware:** Intel, Motorola, IBM, HP, Hitachi, Sony, Nokia, Cisco, Sun, EMC and Dell
2. **Software:** Microsoft, IBM, HP, Hitachi, Sony, Oracle, SAP.
3. **(Tele) Communications** owns the information highway on which massive data streams travel. Verizon, AT&T, Vodafone, Time Warner and Qwest.
4. **Services** connect, maintain and support these three components of the information ecosystem. IBM Global Services, HP Services, Hitachi Services, Sony Services, Fujitsu Services, EDS, Accenture and Computer Science Corporation (CSC) dominate the services market.
5. **Internet** as emerging services industry. Microsoft, Google and Yahoo.

Those 25 multinationals design the future of the ICT industry, though they do not own the value of the world market. Focusing on their technology and market strategies will allow us to understand what's ahead and by whom they are challenged. The combined IT and telecommunications industry is over twice as big as their revenue with strong players in Europe, Japan, China and India.

Table 1 Global Top 25 by revenue 2003-2006

In \$ Million. Source: AME ANALIST ONLINE

		2003	2004	2005	2006	
1	IBM	89,131	96,293	91,134	98,425	Hardware, Software, Services
2	HP	73,061	79,905	86,696	92,765	Hardware, Software, Services
3	Verizon	67,468	71,283	75,112	90,000	Communications
4	Hitachi	68,265	81,438	84,365	86,500	Hardware, Software, Services
5	Sony	62,280	72,081	66,912	67,000	Hardware, Software, Services
6	AT&T	40,498	40,787	43,862	66,000	Communications
7	Dell	35,404	41,444	49,205	55,908	Hardware
8	Vodafone	47,390	49,500	50,300	51,200	Communications
9	Microsoft	32,187	36,835	39,788	44,282	Software, Internet
10	Time Warner	39,563	42,089	43,652	44,200	Communications
11	Intel	30,141	34,209	38,826	42,400	Hardware
12	Nokia	29,455	29,267	34,191	39,000	Hardware
13	Motorola	27,058	31,323	36,800	39,000	Hardware
14	Cisco	18,878	22,045	24,801	28,484	Hardware, Networks
15	Fujitsu Services	18,429	19,255	21,000	23,000	Services
16	EDS	20,570	20,669	20,701	20,900	Services
17	Accenture	11,818	13,670	15,547	16,500	Services
18	CSC	11,162	13,447	14,058	14,900	Services
19	Qwest	14,288	13,809	13,903	13,990	Communications
20	SUN	11,434	11,185	11,070	13,068	Hardware
21	Oracle	9,473	10,155	11,799	12,300	Software
22	EMC	6,237	8,229	9,664	11,404	Hardware
23	Google	1,466	3,189	6,139	10,743	Communications, Internet
24	SAP	6,233	6,049	6,776	7,500	Software
25	Yahoo	1,625	3,575	5,258	7,361	Communications, Internet
	Total	773,514	851,731	901,559	996,829	
	% Change		10	6	11	

The World market for new ICT equipment

The market for new ICT equipment is part of a global market in Hardware, Software, Communications and Services which will grow to €2,509 billion in 2007. In this market equipment has a share of 29% or €728 billion, with an annual average growth of 5.4% up to 2010. This market contains computer hardware (15%), office equipment (1%) and communications equipment (13%).

Software (applications and operating software) covers 10% or €251 billion of the total market, showing an average growth rate of 9% annually. Software growth outperforms hardware growth as it increasingly introduces process automation which increases productivity.

ICT services represent 19% of total revenue with a value of €477 billion in 2007. This segment contains consultancy, outsourcing, managed services, application services, implementation projects, management, maintenance and repair.

Carrier services transporting information over networks is the biggest market with a share of 42% in total expenditures of €1,054 billion in 2007. This market grows by five percent on average, transforming services on fixed networks to mobile and wireless networks. This segment is responsible for the lower average growth trend of the whole ICT market, which is however, twice as fast as the western economies as a whole.

The World market for ICT equipment ended up in stagnation in 2003. Since then annual growth averaged 9% in a strong recovery driven by mobility, desktops, storage systems and networks. Regional differences are substantial, reflecting regional economic circumstances. AME Research takes the following product groups and systems into account by measuring the ICT equipment market:

- Computer hardware
- Data communication equipment
- Desktops
- Disk storage systems
- High end servers > €500,000
- Midrange servers > €25,000 < €500,000
- Mobile Networks
- Network equipment (LAN,WAN)
- Office equipment
- Personal Computers
- Point of Sale Systems
- Portables
- Printers
- Storage area networks
- Tape storage systems
- Telephone equipment
- Volume servers < € 25,000
- Workstations

For the years ahead until 2010 AME Research expects a slowing down of this growth in ICT Equipment to an average of eight percent annually. Growth of ICT equipment sales is to be lower than in the nineties and eighties for a number of reasons:

- Absence of technology shifts
- Mature markets
- Increasing interest rates
- Increasing energy prices
- Unstable geopolitical environment
- Modest economic growth in European Union and United States
- Hesitant adoption of economic transformation pushed by technology
- Longer use of new systems

At the average 8% growth of the global market of new ICT equipment an important shift occurs in the share of regions in the Total market. The share of Europe, Japan and the USA is diminishing in favor of the Asian economic basin, including China and India. The share of Asia Pacific will continue to rise, from 32% in 2003 to 40% in 2009. Eastern Europe, Russia and Eurasian states are growing faster than average as well. Trade is to shift further in these directions.

Important note. EITO/IDC estimates the total world market for ICT Equipment in 2005 at €656 billion or \$522 billion. IBM, HP, Dell, SUN, EMC, Fujitsu-Siemens en Cisco have a share of \$129 billion according to their real hardware revenues. This suggests that they are not the market leaders who generate over 70% of total revenue.

The explanation is that EITO includes telephony equipment, workstations, desktops and personal computers. These items are not accounted for in the revenues of the seven companies mentioned above.. Because of the fact that the market for Telco equipment is part of the global market for ICT equipment the average revenue growth of the total market is lower than the growth of the product lines in table 2.

Table 2 World Market ICT Equipment 2003-2009

In € million

ICT-equipment	2003	2005	% ch.	2007	% ch.	2009
Western Europe	148,264	156,008	5	162,248	4	171,983
Eastern Europe	11,882	12,976	9	14,274	10	15,558
United States	150,709	161,086	7	170,751	6	182,704
Japan	89,900	99,032	10	106,955	8	115,511
Asia Pacific, Africa, Latin America	185,729	227,807	23	273,368	20	322,575
World	586,484	656,909	12	727,596	11	808,331

Source: EITO/IDC, extrapolation AME Research. At constant currency prices

% change compared to previous year.

Table 3 Regional shift in market share 2003-2009

ICT-equipment	% 2003	% 2009
Western Europe	25	21
Eastern Europe	2	2
United States	26	23
Japan	15	14
Asia Pacific and elsewhere	32	40
World	100	100

Source: EITO/IDC, extrapolation AME Research. At constant currency prices

Table 4 World market in ICT Product Lines 2007

In € million	2007	% share	Growth trend
Computer Hardware	376,343	15	5.40%
Office equipment	25,090	1	5.40%
End user communication equipment	225,806	9	5.40%
Datacom & Network equipment	100,358	4	5.40%
Software	250,895	10	9%
IT Services	476,701	19	6%
Carrier Services	1,053,760	42	4%
Total	2,508,952	100	5.20%

Source: EITO/IDC, extrapolation AME Research. At constant currency prices

Table 5 Market value used ICT equipment 2005-2010

In € million	2005	2007	2009	2010
Market value new systems	651,525	723,789	804,069	847,489
Trade in used systems of: years:				
1	13,030	14,476	16,081	16,950
2	14,835	16,481	18,309	19,298
3	37,534	41,698	46,323	48,824
4	42,734	47,474	52,739	55,587
5	86,495	96,088	106,746	112,510
6	24,619	27,350	30,383	32,024
7	12,457	13,839	15,374	16,204
8	1,891	2,101	2,334	2,460
9	718	797	886	934
10	-	-	-	-
Total market value used systems	234,314	260,303	289,175	304,790
As a percentage of new	36	36	36	36

Source: AME Research B.V.

Global market trends for secondary equipment

New ICT equipment enters the secondary market step by step. A number of trends, drivers and inhibitors work together in this market which has not been subject to intensive research so far.

Trends

- Annual price erosion of 10-20% due to increasing capacity at the same price.
- Longer depreciation times due to technical upgrading of existing server configurations and better management of cost of ownership
- Used equipment enters the market step by step. About 2% of new systems are sold in the first year, due to circumstances such as bankruptcies. After 10 years all systems have been sold at least once.
- The average annual growth of the secondary market has decreased from over 10% in the nineties to about 5.4% annually in the current decade because of changed macro-economic conditions and market maturity.

Drivers

- Growing demand for inexpensive A-brand secondary systems in emerging economies
- Availability of B2B eMarkets efficiently bringing buyers and sellers together
- Secondary market does not harm new market as demand only applies to used systems if it cannot afford new systems.
- Secondary market supports growth of new market as demand will apply to new systems as soon as these become affordable
- Recycling legislation stimulates reuse of systems instead of expensive landfill
- Many customers in emerging economies consider new systems too expensive and choose refurbished and configured existing systems and networks
- Higher capacity used systems will be sold and resold to the vastly increasing numbers of small and medium enterprises in emerging economies.
- Growth of the lease market because of increasing interest rates will bring used systems to the marketplace sooner
- Handling and fulfillment through Internet marketplaces will speed up the number of completed transactions

Inhibitors

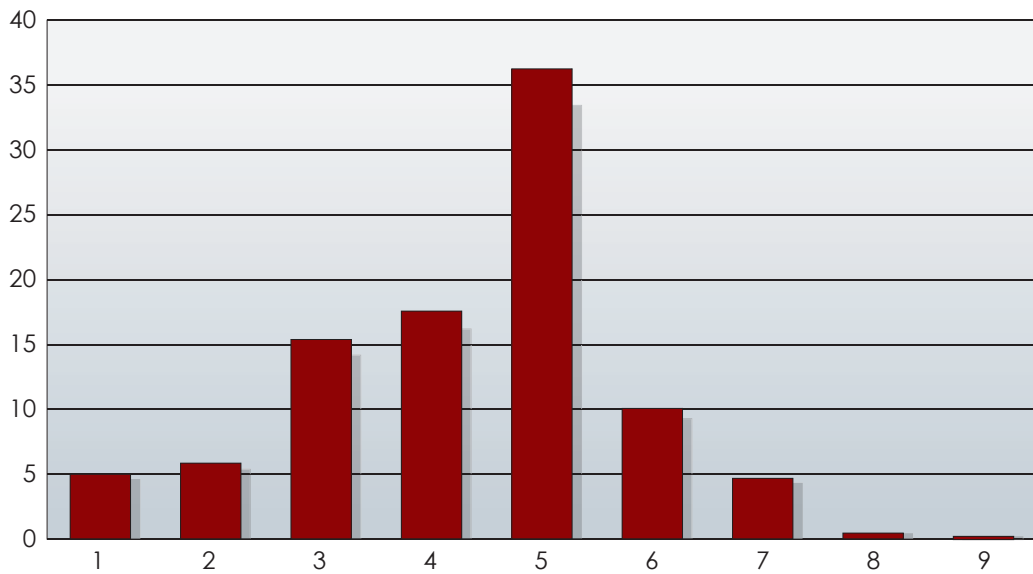
- Reconfigured systems and networks often consist of hardware and software from various brands containing a number of licenses and codes to be transferred from one user to the other. This requires a lot of paperwork
- Import tariffs and import restrictions in a number of countries
- Increasing transportation costs and security expenses

As we believe the market value of secondary systems is at any moment 36% of the new value the secondary market value will be in 2007 €260 billion. Table 5 breaks down this figure in systems from 1-10 years. Table 6 shows the age of systems and their share in the market of every age category. AME Research estimates an average annual market growth of 5.4%. The larger value of secondary systems is in the age categories of 3, 4 and 5 years. These systems account for 71% of all secondary systems. Lease companies, Original Equipment Manufacturers, large companies, governments and institutions mostly take this equipment to the secondary marketplace. Focus on this market segment leads to the largest trade volumes.

Table 6 Market value of secondary systems by age category 2007

Market value 2007 € million	Age in years	% Total
14,476	1	5.6
16,481	2	6.3
41,698	3	16.0
47,474	4	18.2
96,088	5	36.9
27,350	6	10.5
13,839	7	5.3
2,101	8	0.8
797	9	0.3
260,303		100.0

Table 7 Used equipment by age group



Horizontal: age in years. Vertical: percentage or original equipment sold.

Market share of independent computer brokers

As we have seen there is a huge market for secondary hardware out there. Trade volumes will grow to more than €300 billion in 2010. This market is not structured at all. There are neither market leaders nor market leading B2B exchanges. We believe the majority of the secondary systems sold do not leave the country where they are sold and even settle down in the region of origin. The flow of systems from mature economies towards emerging economies yet has to begin.

Globally there are some 4,000 manufacturers of ICT equipment and components of which only the biggest brands are familiar to the trade community. A lot of specialized equipment is only known to technology experts. We believe some 40,000 traders worldwide operate with secondary systems. Half of them work in and from the United States of America and in the remainder of them may be found in Europe, the Far East and elsewhere.

Large suppliers of secondary systems are:

- Computer Leasing companies
- Wholesalers in secondary systems
- Third party maintenance companies
- Original Equipment Manufacturers
- End user maintenance and repair companies
- Distributors of new and used systems
- Computer repair companies
- Electronic recycling industries
- Computer service en maintenance companies
- Computer trading companies
- Value-added resellers

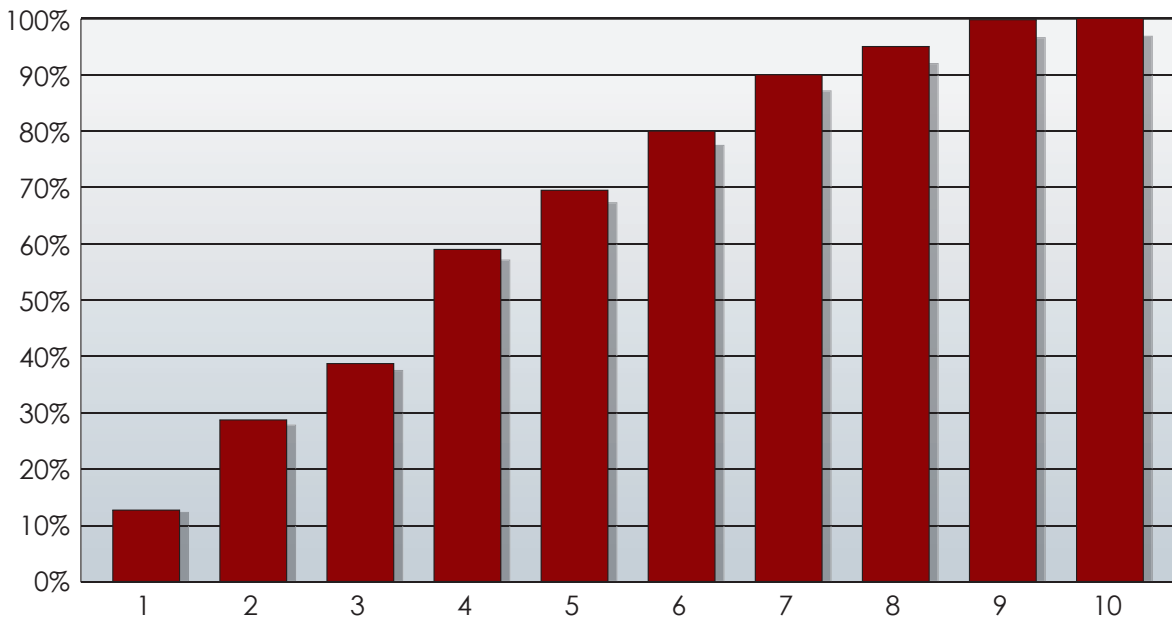
OEMs and leasing companies dominate most of the market, reselling written down and replaced equipment from their own original customers. The older equipment has a better chance of being re-sold if it is directly sold to independent secondary brokers or VARs. We believe in the age category of equipment from 3-5 years the market share of independent brokers is increasing from 40% to 60% of the market. Consequently, the total share of independent brokers in the total market is now at about 60%.

Let us now turn to a number of conclusions.

Conclusions

- The World market of secondary ICT equipment traded by independent brokers is estimated at €156 billion in 2007 and is expected to grow at an annual average of 5.4% to €183 billion in 2010.
- On average 60% of secondary systems is traded through independent computer brokers. Their share increases over time as the equipment gets older.
- OEMs, computer leasing companies, large multinationals and governments are the biggest suppliers of the markets.

Table 8 Market share computer brokers in secondary market



Horizontal: age systems in years. Vertical: % market share independent brokers

Table 9 Trade volume brokers in used systems 2006-2010

In € million; by ages in years of the systems

Years	2006	2007	2008	2009	2010
1	1,373	1,448	1,526	1,608	1,695
2	4,691	4,944	5,211	5,493	5,789
3	15,825	16,679	17,580	18,529	19,530
4	27,025	28,484	30,022	31,643	33,352
5	63,816	67,262	70,894	74,722	78,757
6	20,759	21,880	23,061	24,306	25,619
7	11,817	12,455	13,128	13,837	14,584
8	1,894	1,996	2,104	2,217	2,337
9	756	797	840	886	934
Total	147,955	155,945	164,366	173,241	182,596

Focus on hardware markets

This report about used systems focuses on hardware markets, which are driven by innovations in the semiconductor industry and software inventions. Key product lines in ICT equipment are Servers, Storage devices, Printers, Mobility and Networks. Seven dominating manufacturers are: IBM, HP, Dell, SUN, EMC, Fujitsu-Siemens and Cisco Systems.

Their combined hardware revenue in 2005 was \$129 billion, increasing by 10% from 2004. Servers had a share of 30.5%, Storage 12.1%, Printers 20.4% and Mobility systems and Networks 18.5%. This breakdown in the revenue streams is rather stable with an increasing share of Mobility and Networks.

Growth per product line differs a lot. Mobility (mobile systems, mobile and wireless networks and switches and routers) showed the strongest growth with 18% in 2005. In the years ahead these product lines will grow considerably faster than the server and printer lines and therefore disperse growing volumes to the secondary market. Storage and Networks also grew above average with almost a 15% rate in 2005, and tend to continue this growth, reflecting distributed data storage in datacenters and connected networks. IBM, EMC, Sun and Cisco lead these markets.

The server market from these seven industry leaders is the largest; however, growth was limited to 6.6%. High-end printers in which also Xerox and Océ are key players shows limited growth due to the continuous digitalization of documents.

Table 10 Hardware sales Top 5 Manufacturers 2003-2005

\$ million	2003	2004	2005	% total
Servers	34,332	36,990	39,439	30.5
Storage	13,163	13,883	15,622	12.1
Printers	23,913	25,442	26,291	20.4
Mobility	16,622	20,223	23,863	18.5
Networks	18,550	20,853	23,917	18.5
Total	106,581	117,391	129,132	100.0
% change	2003	2004	2005	
Servers		7.7	6.6	
Storage		5.5	12.5	
Printers		6.4	3.3	
Mobility		21.7	18.0	
Networks		12.4	14.7	
Total		10.1	10.0	

Market leaders in server systems

The global market of server systems was valued at about \$45 billion in 2005. HP, IBM, SUN and Dell dominate this market, followed by Fujitsu, Fujitsu-Siemens, Bull, Silicon Graphics and others. Though IDC reports a temporary dip in sales, our long term revenue projections suggest an annual growth rate for all the server segments together of 6.6%. Strongest current growth is shown for Microsoft Windows- and Itanium-based servers. SUN is the most successful in 2006 with a revenue growth of 15.5% in the second quarter pushing its market share to 12,9%. Underlying trends of market expansion to emerging markets, the need for more capacity and technological innovation will lead to an average market growth of 5-7% in the years ahead.

The six largest manufacturers realized \$45.3 billion revenue in 2005. HP and IBM have an almost equal market share and together a market share of 58%. SUN and Dell follow. The remaining manufacturers have 13% of the market.

From these basics we can calculate a market for used servers from these leading manufacturers of \$16.3 billion, of which independent brokers have a share of 60% mainly in 3-5 year old systems. This market size is \$9.8 billion of which \$2.8 billion for HP and IBM each. SUN and Dell represent a secondary market owned by independent brokers of over \$1.2 billion each. This means that we are looking at huge markets which allow for brand specialization and a focus on specific product lines.

Table 11 Server revenue Top 5 2003-2005

Server Systems	2003	2004	2005	% total
HP	11,090	11,877	13,325	29.4
IBM	11,148	12,460	12,900	28.5
Others	5,130	5,527	5,893	13.0
SUN	6,243	5,854	5,826	12.9
Dell	4,300	4,900	5,400	11.9
Fujitsu-Siemens	1,551	1,899	1,988	4.4
Total	39,462	42,517	45,332	100.0
% change		7.7	6.6	

Table 12 Broker share Top 5 2003-2005

\$ million	2003	2004	2005	% total
Secondary servers	14,206	15,306	16,320	100%
Broker share	8,524	9,184	9,792	60%
Manufacturer share	5,683	6,123	6,528	40%

Table 13 Revenue growth Servers Top 5 2003-2005

Server Systems	2004	2005
HP	7.1	12.2
Dell	14.0	10.2
Others	7.7	6.6
Fujitsu-Siemens	22.4	4.7
IBM	11.8	3.5
SUN	-6.2	-0.5
Total	7.7	6.6

Growth in % versus previous year.

Market leaders in storage systems

The market value for storage systems and storage networks stood at \$18 billion in 2005, and was much smaller than the server market. However, growth was at 13.3%, which was far better than in the server market. Among other things Dell's price competition resulted in the strongest revenue growth for this concern, but not in the best financial results. EMC is king in this market segment.

Countries and multinationals buy more and more entire storage area networks in order to spread capacity over datacenters and networks. This policy allows for sufficient transport capacity in the networks. Emerging economies and their governments want to do the same thing but lack money to buy new equipment. This is a challenging market for pre-configured complete secondary storage area networks.

The secondary storage systems market for independent brokers was valued at \$3.9 billion in 2005. EMC equipment - with a value of \$1.2 billion – held the largest share. The best opportunities were for VARs offering complete second hand storage networks that were configured, tested, refurbished, guaranteed, with licenses and codes, financed and transported.

Table 14 Market leaders in Storage by revenue 2003-2005

Storage Systems	2003	2004	2005	% Total
IBM	2,854	2,901	3,345	18.5
SUN	1,550	1,501	1,300	7.2
Dell	1,100	1,300	1,900	10.5
EMC	4,206	4,980	5,702	31.6
HP	3,453	3,201	3,375	18.7
Others	1,899	2,044	2,424	13.4
Total	15,062	15,927	18,046	100.0
\$ million	% change	5.7	13.3	

Focus on mobile and wireless networks

Other important product lines in ICT equipment are personal computers (desktops and portables) peripherals (printers and others), end user telephony equipment, office equipment such as copiers, and network equipment used by telecommunication enterprises.

These additional product lines show an average growth comparable to that of the server markets. However, portables, laptops, desktops and mobile and wireless communication equipment for end users and Telco companies show in recent years a growth of 10% annually. Strong economic growth in Asia Pacific and other emerging economies and the need for cost saving process automation in mature economies fuel future growth at the same level.

About 36% of the market value of these product lines enters the secondary market. About 70% of this value is traded by independent and often specialized telecom brokers.

Table 15 Mobility products by region and market value 2005

	EU	East EUR	USA	Japan	Asia-Pacific	World	% Total
€ million	2005	2005	2005	2005	2005	2005	
Portables	16,065	1,236	15,447	9,268	21,626	63,642	10.9
Desktop PCs	20,946	1,611	20,140	12,084	28,197	82,978	14.2
Printers	12,797	984	12,305	7,383	17,227	50,696	8.7
Other add-ons	2,662	205	2,560	1,536	3,583	10,546	1.8
Telephone equipment	4,971	382	4,780	2,868	6,692	19,693	3.4
Mobile phones	17,158	1,320	16,498	9,899	23,097	67,972	11.6
Terminal equipment	3,257	251	3,132	1,879	4,384	12,903	2.2
Office equipment	9,454	727	9,090	5,454	12,727	37,452	6.4
Network equipment	12,891	992	12,395	7,437	17,353	51,068	8.7
Switches & routers	5,757	443	5,536	3,321	7,750	22,807	3.9
Mobile infrastructure	12,574	967	12,090	7,254	16,927	49,812	8.5
Datacom equipment	7,990	615	7,683	4,610	10,756	31,653	5.4

Source: EITO/IDC.

More self service retail store solutions

The global market for payment systems is highly dependent on consumer behavior in mass markets. Market leaders are NCR, IBM, Unisys, Toshiba, and Fujitsu. This is the market for automated teller machines (ATM), Point of Sale systems (POS), Retail Store Solutions.

IBM suffered a revenue decrease of 23% in 2005 after strong growth in 2004 because the company depended heavily on a relatively small number of very large orders. Unisys as well suffered revenue decrease and does not expect the market to change a lot. NCR is moving sales and production to emerging markets such as China, Russia and India. In the United States legislation allowing digital scanning of checks will lead to a strong demand for digital payment and check control systems. Self service in scanning and paying consumables in retail stores in the United States, United Kingdom and continental Europe requires new unmanned payment equipment. Therefore a great number of older cashing technologies are to enter the secondary market trying to find its way to emerging economies.

If IBM, NCR and Unisys own 25% of the global market the total market would be from \$12.2 billion to \$3 billion for secondary systems. Market growth is determined by consumer behavior and the profitability of mass distribution firms like Wall Mart. We believe growth in these markets is to be moderate as more durables are sold through Internet shops. Ever more self service and digitalized paying processes bring technological innovation, thus making an increasing number of existing systems obsolete.

Table 16 Revenue retail store solutions market leaders 2003-2005

\$ million	2003	2004	2005
Unisys	291	226	184
NCR	1,946	2,234	2,243
IBM	692	814	627
Total	2,929	3,274	3,054
% change		11.8	-6.7

Exciting challenges for computer brokers

The global market for used ICT equipment is a prosperous growing market with many exciting challenges to create a successful profitable business. If brokers and dealers do the right thing at the right time and place they can earn lots of money. Computer brokering first of all requires dedicated professionalism in order to master all complex aspects of the business.

A number of keywords and thoughts cross ones mind thinking about the opportunities in this often hidden and neglected marketplace. Let's sum up a number of impressions.

- the market is huge
- the market is growing
- the market is highly fragmented
- the market requires specialization
- the rules of engagement need to be identified
- the market is financially attractive
- the market is complex
- supply dynamics differ per product group
- demand dynamics evolve with emerging markets
- tariff and trade regulations need attention
- environmental legislation offers new opportunities
- intense product knowledge is required
- fulfillment processes should be automated
- licenses and code policies need to be modernized

Brokers, traders and dealers cope with the following key trends:

1. Price erosion forces ever increasing trade volumes per employee
2. Better lifecycle management brings reliable older systems to the market
3. Secondary demand opens opportunities for new equipment sales
4. New technologies enable upgrading and adding components to older existing systems
5. Environmental legislation requires refurbishment of secondary systems
6. Offering transport, insurances, security, customs handling, finance and other services improves professionalism and therefore profitability
7. Purchasing power shifts to emerging markets and mobile and wireless technologies
8. The market is susceptible to fraud and tax evasion
9. Inventory should be zero
10. Electronic trade is the future

Value added buyers and sellers of secondary systems can run a very profitable business if they have an efficient business model in place. The key issues involved are process automation and efficient service lines. We believe every service line (matchmaking, configuration, managing the supply chain, managing and digitalizing the paper chain, focus on product quality, and financing) can add bottom-line profitability to the business. A target should be an average gross margin of over 25% over the years, an operating margin of 10%+ depending on the services level and a net margin of 1.5% for box movers and 6%+ to real value adding resellers. If companies reach those goals they will be financially healthy, add value not just to their equity but to the economy as a whole and will manage productive value chains of goods and the underlying administrative procedures. Table 17 shows our realistic and existing financial model of a Dutch reseller who is an active buyer in the global secondary market. His company is healthy, heavily automated and very profitable.

Table 17 Financial model successful reseller 2001-2005

Profit and loss account (X €1000)	2001	2002	2003	2004
Revenue	28.308	28.250	32.343	38.999
Gross margin	9.232	8.778	8.765	8.400
Operating result	5.607	4.666	4.034	2.953
Net result	5.191	4.226	3.800	2.616
Return total assets (%)	38.5	26	53.4	23.2
Solvency ./.	83	86	48	55
Net margin %	18.3	15	11.7	6.7
Gross margin %	32.6	31.1	27.1	21.5
Operating margin %	19.8	16.5	12.5	7.6
Revenue per employee (€)	416.294	362.180	490.046	527.014
Personnel expenses as % of revenue	9.1	10	9.9	9.2
Turnover total assets ./.	1.8	1.4	3.7	3.1
AME Indicators	2001	2002	2003	2004
AME Rating = report mark from 0-10	6.6	6.1	6.1	5.9
AME Value line				
in € 1000 added economic value	3.733	2.367	2.820	1.380
AME information productivity %	107.6	60.4	62.9	26.7
AME revenue growth %	46	-0.2	14.5	20.6
Employee growth in %	23.6	14.7	-15.4	12.1

Source: AME ANALIST ONLINE

Trade is a service. Not the transaction but the additional services are those that create wealth, from refurbishment and configuration to insurance and financing. Successful operation requires specialization, making the right choices, and focusing on quality. Focus on selected product lines and brands based on technological innovation and knowledge of emerging demand cycles is paramount. Specialization is important in:

- Product lines
- Brands
- Geographical markets
- Vertical markets
- Refurbishment and configuration
- Shipping, insurance, fulfillment
- Inventory management
- Debtor management

Specialization does not mean a company should offer all existing services themselves. Outsourcing of service lines to trusted partners may be a profitable solution

Electronic trade

Electronic trade is the future for the secondary market in ICT equipment. These electronic marketplaces are based on the old principle of electronic data interchange with as little paper and manual work as possible. The eMarkets improve but they are far from mature. Most of them limit their activities to matching supply and demand and leave fulfillment to others. Trust remains the fundamental value for the business. Profitability in additional services, however, comes from fulfilling the right needs.

Company profile

AME Research BV is the Dutch financial ICT Research Company. We examine and analyze companies, markets, market segments and investments in the Information- and Communication technology industry. We have an in-depth understanding and insight of the Dutch and European ICT market and global ICT strategies. Find our analyses at www.ame.nl

AME Research exploits also the ICT Press-bank at www.persberichten.com. This interactive web site is a virtual pressroom for ICT news with value added services focusing on students, journalists, employees, customers and suppliers of ICT companies targeting the Dutch market.

Mission statement

Our mission is to share with our participants enhanced knowledge and experience about the Information and Communication Technology industry.

Contact

Address: Zuideinde 56; 7941 GJ Meppel; the Netherlands

Phone: +31 522 256470

E-mail: info@ame.nl

Web: www.ame.nl

Web: www.persberichten.com

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