

# Global Communications Industry IT Spending Forecasts, 1997-2002





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# I. Introduction





## **A. Overview**

This 6<sup>th</sup> edition of the G2R *Global Communications Industry, IT Spending Forecasts 1997-2002* report reveals some important market trends and insights. Compared to last year, the market has increased its breakneck growth slightly to 10.3% from 9.9%. The total IT spending number for 1998 is within 1% of last year's forecast. In addition to validating last year's forecasts, our primary research has allowed us to adjust the regional, market segment and application spending numbers in the new forecasts to better fit current market realities:

### ***Regional Trends***

IT spending has maintained its high growth worldwide with the following modifications: 1) Asia Pacific's previous high growth is modified slightly downward due to the economic crisis affecting some countries. 2) Wireless spending in Asia Pacific and Latin America is higher in 1997 than previously forecasted and will be experiencing greater growth. 3) G2R has reclassified the following countries from the Rest of World segment to the Europe segment: Bulgaria, Romania, Russia, Turkey and Ukraine.

### ***Segment Trends***

As G2R indicated in its Global Wireless report, IT spending as a percentage of revenue in the wireless industry is a lower ratio (4 to 6.5% of revenue) than that of wireline (8% to 10% of revenue). There are two main reasons: 1) Wireless carriers generally exhibit higher revenues per customer and IT dollar than wireline carriers do. 2) What would typically be IT spending on processes like billing systems tends to go to outside vendors through Business Process Outsourcing contracts. G2R has changed the way we track spending on business process outsourcing services to reflect changes in market dynamics. G2R defines business process outsourcing as the delegation of one or more IT-intensive business processes to an external provider to improve overall business performance in a particular area. For vendors, BPO entails the ownership, administration, operations, and management of a customer's business process(es). As such, when a carrier elects to outsource a process the expenditures typically comes out of the operating budget rather than IT budget.

Since carriers treat BPO expenditures differently, much of BPO spending was included in our IT forecasts. In the past, we also decided to include billing process outsourcing in the billing IT spending numbers. Removing BPO spending from IT spending on wireless billing had a misleading affect on those numbers by deflating the real size of that solution space. Our new IT spending numbers focus squarely on IT spending expenditures and remove the BPO portion. This change was made because there is increasing traditional IT spending on billing systems and since BPO is becoming easier to separate from IT spending.



### *Application/Process Trends*

Billing and customer care spending will continue to receive considerable attention over the next three to five years. The reasons are many: 1) The billing system is the heart of a communications carrier and acts as a competitive differentiator for capturing and retaining customers. 2) Competition fuels the need to cross discount multiple products (bundling and convergence) and to rapidly implement new pricing and packaging. 3) In the U.S., Europe and several other regions wholesale billing enhancements are required as a result of deregulation.

Competition is also driving increases in IT spending for marketing. This typically occurs in the form of data warehousing to combat churn and refine market segmentation.

Operations Support Systems spending is being driven by interconnection and other regulatory requirements in the U.S. and Europe. Provisioning and network management appear to be the most effected. G2R expects spending on OSS to increase as a result of regulatory and interconnection requirements. We also believe that this market space will be increasingly redefined as carriers fold these functionalities into other processes (like message collection into billing, provisioning into sales, or service assurance into customer care). IT vendors must carefully watch how they define a solution in this shifting environment.

Intelligent Network spending will grow as a result of 1) the need for revenue from new enhanced services (in competitive markets), 2) satisfying regulations (like Local Number Portability in the U.S.), and 3) installation of out-of-band SS7 (or equivalent) signaling systems.

### **B. Intent**

IT spending forecasts can be used most powerfully when IT vendors understand the data source, underlying assumptions and forecast methodology upon which they are built. This report is designed to equip IT vendors with valuable market data based upon interviews with the IT decision makers of communications carriers around the world.

The forecasts represent the aggregation of CIO business plans, not the revenue goals of the IT vendor community. As a result, the numbers are appropriately conservative. Given that business strategies provide the foundation and direction for IT investment, interviewing the decision makers who implement those strategies provides a strong insight into IT spending patterns. In addition to the end user data source, G2R uses supply side research, secondary research and a global industry econometric model from the Columbus Group to generate these forecast numbers.



The forecasts in this report are presented in table, bar graph and line chart form to provide different perspectives on the data. The forecast table provides users with the detailed process/application layer data. The bar graphs display relative size, and line charts reveal relative growth. IT vendors who purchase this report or receive it through a program subscription can also receive it in electronic form, in its native format.

Since forecasts often need to be customized to fit specific geography, market or application definitions, G2R has developed a system for custom forecasting. By using either consulting hours or a custom project, IT vendors can drill down into specific numbers or redefine certain line items. These forecasts are also available at a country level in the form of a separate forecasting module.

### **C. Forecast Methodology**

G2R's data sources include end-user primary research, supply-side revenue data, IT contract data and government data.

- **Econometric model:** G2R and the Columbus Group jointly developed a global model of IT spending by country and by industry.
- **End user primary research interviews:** Every year, G2R interviews the IT decision makers of industries around the world. In 1997, as part of its baseline research, G2R interviewed over 1,000 companies. Of these companies, more than 120 were communications carriers. After including IT spending and trends based upon data garnered through proprietary research engagements, the number of carrier interviews exceeds 300.
- **Supply side revenue data:** From our frequent interaction with IT vendors, G2R is able to validate forecast results for specific processes and applications.
- **IT contract data:** G2R uses contract size to approximate the minimum levels of IT spending for specific processes, applications and components. Both secondary research and end-user interviews serve as the source for contract data. Contract information can provide quantitative data such as contract length, cost of engagement or percentage hardware, software and services.
- **Secondary resources:** Aggregate industry data from the government and secondary research is used to validate G2R forecasts.



## *Methodology*

G2R uses primarily a “bottom-up” forecasting methodology based on our primary research. End users, not IT vendors, know the relative distribution of IT spending on their own applications and processes. Therefore, industry and application level forecasts can best be developed from the demand-side. However, in nascent service markets such as business process outsourcing, IT suppliers tend to drive the product and service definitions and level of industry spending. Therefore, G2R will leverage different data sources according to the level of confidence they provides. For example, end users provide the most consistent data with respect to component spending (e.g. hardware, software), but certain types of outsourcing services are best forecasted from IT vendor revenues.

1. From end-user interviews, G2R gathers the level of IT spending by region, market sector, component and process.
2. G2R applies these results to a econometric forecasting model developed by the Columbus Group, an economic analysis firm that tracks and forecasts worldwide economic activity. Through this formal relationship with the Columbus Group, G2R is able to consistently forecast IT spending across multiple geographies and industries. G2R adopted this methodology for creating the top-line forecasts for IT spending for all industries including the communications industry. This ensures that forecasts are consistent with:
  - a) Historical IT spending patterns by industry;
  - b) Macroeconomic growth expectations; and
  - c) Country-specific industry composition.
3. G2R and the Columbus Group work together on a daily basis to provide worldwide forecasts for the IT industry. The Columbus Group & G2R execute a two staged approach:
  - a) Model worldwide “output” by industry and geography as a function of the stage of economic development of each economy (as derived from a pooled-cross-sectional time series model developed for advanced and developing economies). What results, as an example, is an estimate of the current and future total sales revenue of all communications companies in Canada from 1997 through 2002.
  - b) Using G2R’s primary research data on IT spending as a percentage of revenue, G2R translates the Columbus Group’s output into total IT spending. The G2R/Columbus Group model produces top-line IT forecasts for the total communications industry and its subsegments: wireline, wireless and media distribution.





4. Process level spending is forecasted using end-user interview data, IT contract sizes and known vendor revenues specific to particular applications and processes.
5. G2R validates the forecasts by comparing the IT spending results in different industries with IT vendor revenues.
6. As a final step, G2R validates its forecast results with secondary research and government resources.

## **D. Definitions**

G2R derives its forecasting definitions from end-users, IT vendors and process categories that reveal underlying spending trends and dynamics. G2R forecasts Communications Industry IT spending (hardware, software, internal spending, professional services and support services) along several dimensions including: components, market sector, process/application area and geography.

### **Components**

**IT Spending** encompasses hardware, software, external services and internal services. **External Spending** refers to hardware, software and external services. All application layer forecasts include only external spending.

**Hardware** includes systems hardware and operations support network communications hardware (not transport network hardware). The hardware category is made up of the computing unit, peripherals and a variety of user input/output devices, such as keyboards, monitors and printers.

**Software** includes systems/utilities software, network operation software, hardware operating systems and application software. This component is composed of computer programs containing instruction codes that control the operations of the computer and network hardware in order to perform certain sequences of operation(s).

**Internal Services** refers to salaries paid to the information services staff which includes all company employees who plan, develop, implement and maintain information systems.

**External Services** is made up of **Professional Services** and **Customer Support Services**.

**Professional Services** encompasses all services purchased from external parties for planning through implementation of information systems: IT Consulting, Systems/Network Design, Software Development, Integration Services, Education & Training and Data Extraction.



**Customer Support Services** includes all external services purchased for support and maintenance of information systems: Facilities Management, Maintenance and IT Outsourcing. This is typically a post-sales engagement which entails servicing equipment and software.

### Market Sectors

**Wireline:** Communications (voice or data) over a fixed wire network. Includes POTS (plain old telephone service), value-added services and private networks.

**Wireless:** Non-fixed wire communications (voice or data) through paging, cellular and PCS technologies.

**Media Distribution:** The business of providing video, text, or image distribution services. This sector includes the cable TV, satellite, Internet Service Providers and broadcast markets. Media content providers are not included in this segment.

### Process/Application Area

#### Business Support Systems (BSS)

**Billing & Records** includes all the revenue recognition steps that take place after message collection. This includes adjusting pricing/discount tables, rating and calculating, invoice formatting and bill production. The process also covers printing, stuffing, remittance processing and collections.

**Customer Care/Assistance** encompasses all processes and systems which support customer interaction outside of marketing, sales or collections. Directory assistance, billing inquiry, service questions, adds & changes, 911 calls and repair requests all fall into this category.

**Marketing & Sales** cover all processes and systems from product idea creation to service order entry. Marketing includes market research, product trial & development, product management, advertising, marketing, campaign management, profit analysis, and customer segmentation analysis. Sales includes telemarketing, incoming call center sales, commission tracking & management, service negotiation and order entry.

**Directory/Publications** includes systems and processes which support the accumulation, organization, management and production of electronic and hardcopy directory databases and publications.



## **Operations Support Services**

**Operations Support Systems (OSS)** facilitate the operations of the communications carrier's transport network.

**Planning & Engineering** includes all the steps from network planning to network construction. IT spending in this domain takes into consideration systems like GIS, CAD/CAM, budgeting, procurement and line and service testing.

**Provisioning** includes all systems and steps related to the process of implementing a new customer account or service.

**Inventory Management** covers all network or facilities equipment tracking and management. In this on-going process all installed and "on hand" network assets are tracked for efficient inventory, procurement, repair and reuse.

**Workforce Management** is made up of all activities surrounding work assignment, coordination and tracking. The process involves assuring that personnel with the appropriate qualifications are given the correct equipment at the right time and place. Example IT applications and systems supporting workforce management are dispatch, workflow management and project tracking.

**Message Collection** pulls CDRs and other network events off of the network switches, standardizes them and stores the data for OSS analysis and billing. Message collection factors in the front-end or pre-billing portion of the billing process.

**Network Management** includes Configuration Management, Traffic Management, Fault Management, Security Management, Element Management and Performance Management.

## **Intelligent Network Services**

**Intelligent Network Services** includes all traditional IT spending (software, computer hardware and services) that encompass off-switch signaling IT systems and enhanced services for data and telecommunications networks. Signaling systems include all out-of-band IT components such as SSP, SMS, SCP, SCE and STP which make up the SS7 (or equivalent) switching protocols. Network switching hardware such as routers, switches and hubs are not included.

## **Corporate Administration**

**Corporate Administration** includes the general management functions of the carrier: human resources, finance & accounting, business planning, risk management, public & media relations, legal, regulatory and policies & procedures.



## Other Spending

**Other Spending** is made up expenditures on functions that fall outside the management and operations of the carrier. For example, this includes Research & Development and service or product trials.

### E. Spending Classifications

The following outline summarizes the classification system of the four dimensions: components, market sectors, process/application area and geography.

#### Components

- I. Hardware
- II. Software
- III. Internal Services
- IV. External Services
  - A. Professional Services
  - B. Support Services

#### Market Sectors

- I. Wireline
  - A. Long distance wireline
  - B. Local wireline
- II. Wireless
  - A. Cellular (AMPS, etc.)
  - B. Digital PCS (CDMA, TDMA, GSM etc.)
  - C. Paging
  - D. Wireless Data
- III. Media Distribution
  - A. Cable
  - B. Satellite
  - C. Broadcasting
  - D. ISPs



## Process/Application Areas

- I. Business Support Systems (BSS)
  - A. Directory/Publications (Primarily Wireline)
    - 1. Directory Listings and Ad Sales
    - 2. Directory Database Management
    - 3. Yellow & White Pages Production and Distribution
  - B. Fraud Management
    - 1. Cellular and Calling Card Fraud Data Accumulation
    - 2. Fraud Analysis
    - 3. Corrective Action and Notification
  - C. Billing and Records
    - 1. Pricing and Discount Management
    - 2. Design and Formatting
    - 3. Rating, Accounting and Calculation
    - 4. Bill Processing
    - 5. Bill Print, Stuff and Mail
    - 6. Remittance / Payment Processing
    - 7. Collections
  - D. Customer Assistance
    - 1. Billing Inquiry
    - 2. Service Complaints and Questions
    - 3. Directory Assistance
    - 4. Service Adds & Changes
  - E. Marketing and Sales
    - 1. Segmentation Analysis
    - 2. Product Management
    - 3. Profit Analysis
    - 4. Telemarketing
    - 5. Field Sales Force Support
- II. Operations Support Services
  - A. Planning & Engineering
    - 1. Network Planning and Budgeting
    - 2. Network Engineering
    - 3. Network Construction and Testing
  - B. Provisioning
    - 1. Automated Provisioning
    - 2. Database Updates
    - 3. Capacity and Network Testing
    - 4. Service Implementation



- C. Inventory Management
  - 1. Network Related Procurement
  - 2. Network Asset Management
- D. Workforce Management
  - 1. Dispatch Request
  - 2. Workforce Assignment
  - 3. Workflow Management
  - 4. Project Management
- E. Message Collection
  - 1. Usage Collection
  - 2. Data Standardization
  - 3. Storage
- F. Network Management
  - 1. Configuration Management
  - 2. Traffic Management
  - 3. Fault Management
  - 4. Security Management
  - 5. Element Management
  - 6. Performance Management
- III. Intelligent Network Services
  - A. Signaling IT Systems: out-of-band IT systems including SSP, STP
  - B. Enhanced Services Platforms: SMS, SCP, Intelligent Peripherals
  - C. Broadband Systems
- IV. Corporate Administration
  - A. Finance & Accounting
  - B. Risk Management
  - C. Executive and Planning
  - D. Human Resources and Payroll
  - E. Legal and Regulatory Reporting
- V. Other Spending
  - A. Research and Development
  - B. Product and Service Trials
  - C. IT Spending falling outside these predefined applications and processes



## Geography

- I. United States
- II. Canada
- III. Europe
  - A. Austria
  - B. Belgium
  - C. Bulgaria
  - D. Denmark
  - E. Finland
  - F. France
  - G. Germany
  - H. Greece
  - I. Hungary
  - J. Ireland
  - K. Italy
  - L. Netherlands
  - M. Norway
  - N. Poland
  - O. Portugal
  - P. Romania
  - Q. Russia
  - R. Spain
  - S. Sweden
  - T. Switzerland
  - U. Turkey
  - V. Ukraine
  - W. United Kingdom
- IV. Japan
- V. Asia Pacific
  - A. Australia
  - B. China
  - C. Hong Kong
  - D. India
  - E. Indonesia
  - F. Malaysia
  - G. New Zealand
  - H. Pakistan
- I. Philippines
- J. Singapore
- K. South Korea
- L. Taiwan
- M. Thailand
- VI. Latin America
  - A. Argentina
  - B. Bolivia
  - C. Brazil
  - D. Chile
  - E. Colombia
  - F. Costa Rica
  - G. Ecuador
  - H. Honduras
  - I. Jamaica
  - J. Mexico
  - K. Panama
  - L. Uruguay
  - M. Peru
  - N. Venezuela
- VII. Rest of World
  - A. Bangladesh
  - B. Cameroon
  - C. Egypt
  - D. Iran
  - E. Israel
  - F. Jordan
  - G. Kenya
  - H. Kuwait
  - I. Morocco
  - J. Saudi Arabia
  - K. Senegal
  - L. South Africa
  - M. Sri Lanka
  - N. Tunisia
  - O. Zimbabwe

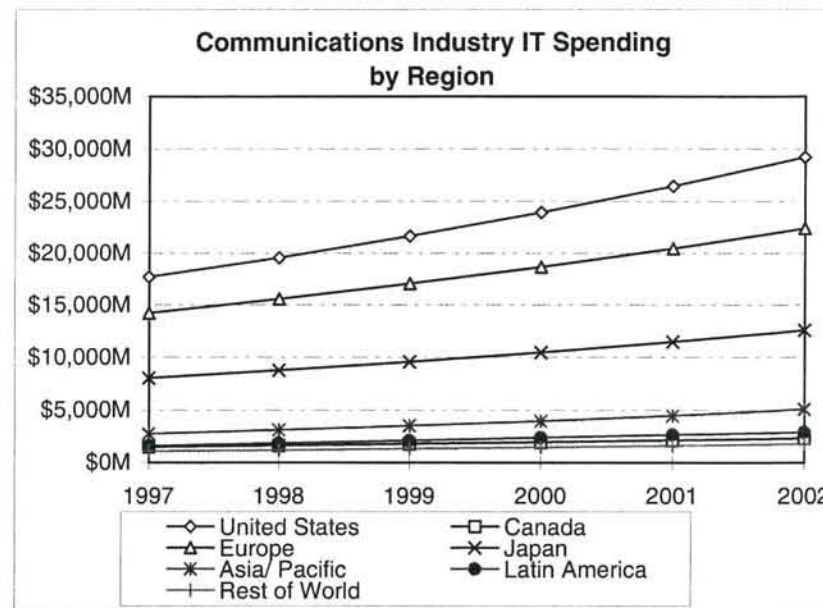
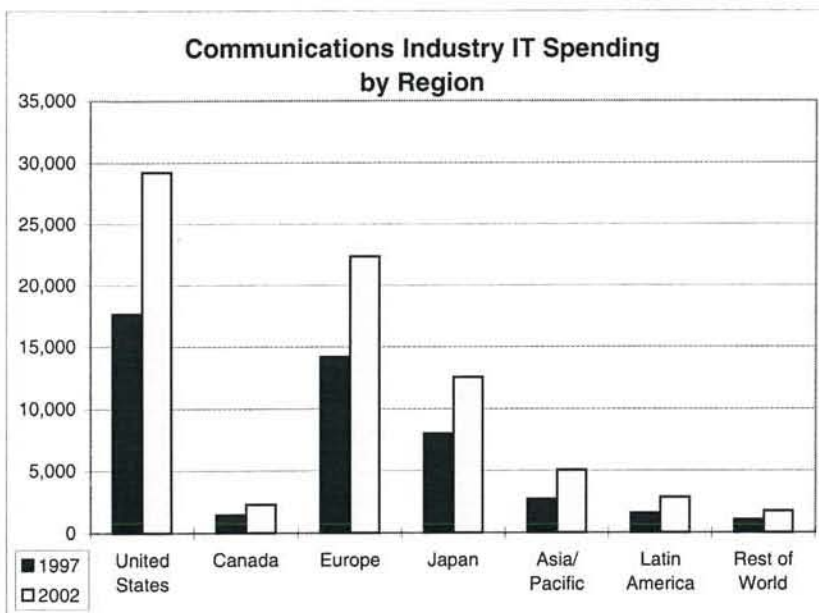
## **II. Component Level Forecasts**





### Communications Industry IT Spending Regional Analysis (in \$ millions)

Total IT Spending*	1997	1998	1999	2000	2001	2002	AAGR
<b>World</b>	46,686	51,482	56,772	62,605	69,037	76,130	10.3%
<b>United States</b>	17,670	19,544	21,615	23,902	26,429	29,219	10.6%
<b>Canada</b>	1,468	1,601	1,748	1,910	2,089	2,287	9.3%
<b>Europe</b>	14,198	15,548	17,027	18,646	20,419	22,361	9.5%
<b>Japan</b>	8,009	8,744	9,557	10,456	11,454	12,561	9.4%
<b>Asia/ Pacific</b>	2,721	3,068	3,467	3,924	4,452	5,060	13.2%
<b>Latin America</b>	1,581	1,822	2,077	2,340	2,610	2,879	12.7%
<b>Rest of World</b>	1,038	1,154	1,283	1,426	1,585	1,761	11.1%

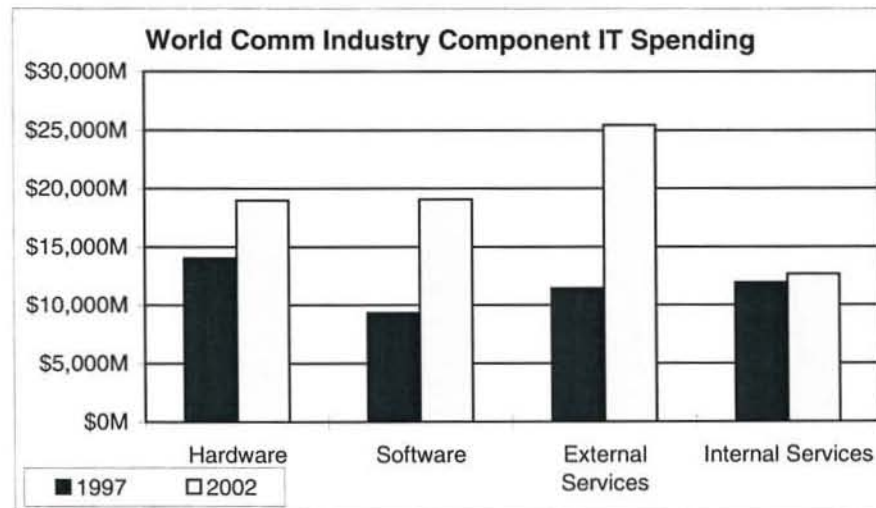
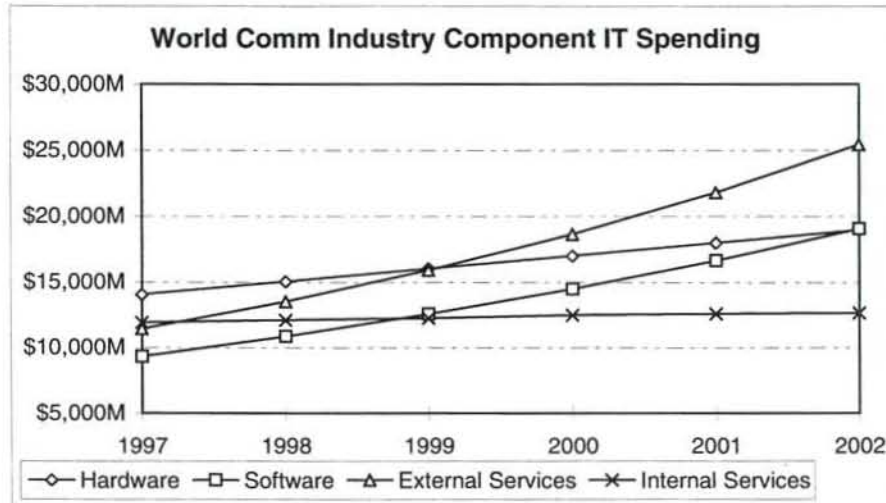


\* IT Spending includes hardware, software, external services and internal services.

**World**  
**Communications IT Spending (in \$ millions)**  
**by Component**

<b>World</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>AAGR</b>
<b>Communications</b>							
Total IT	46,686	51,482	56,772	62,605	69,037	76,130	10%
External Spending	34,766	39,376	44,515	50,119	56,452	63,474	13%
Hardware	14,038	15,028	16,027	16,994	18,001	18,976	6%
Software	9,308	10,839	12,567	14,477	16,641	19,065	15%
External Services	11,420	13,510	15,921	18,648	21,809	25,433	17%
Internal Services	11,920	12,106	12,257	12,485	12,585	12,656	1%
<b>Wireline</b>							
Total IT	30,391	32,723	35,236	37,944	40,862	44,007	8%
External Spending	22,649	25,039	27,637	30,386	33,423	36,705	10%
Hardware	9,147	9,549	9,933	10,274	10,631	10,953	4%
Software	6,071	6,903	7,817	8,798	9,874	11,048	13%
External Services	7,431	8,588	9,888	11,314	12,917	14,704	15%
Internal Services	7,742	7,684	7,599	7,558	7,439	7,303	-1%
<b>Wireless</b>							
Total IT	7,756	9,018	10,490	12,207	14,212	16,555	16%
External Spending	5,810	6,939	8,277	9,836	11,702	13,904	19%
Hardware	2,347	2,657	2,998	3,367	3,774	4,214	12%
Software	1,557	1,908	2,329	2,826	3,429	4,147	22%
External Services	1,906	2,375	2,950	3,643	4,499	5,543	24%
Internal Services	1,946	2,078	2,213	2,371	2,511	2,652	6%
<b>Media Distribution</b>							
Total IT	8,538	9,741	11,046	12,454	13,962	15,568	13%
External Spending	6,307	7,398	8,602	9,897	11,327	12,866	15%
Hardware	2,544	2,822	3,096	3,353	3,595	3,810	8%
Software	1,679	2,028	2,422	2,853	3,338	3,870	18%
External Services	2,083	2,547	3,084	3,691	4,393	5,186	20%
Internal Services	2,232	2,344	2,444	2,557	2,635	2,701	4%

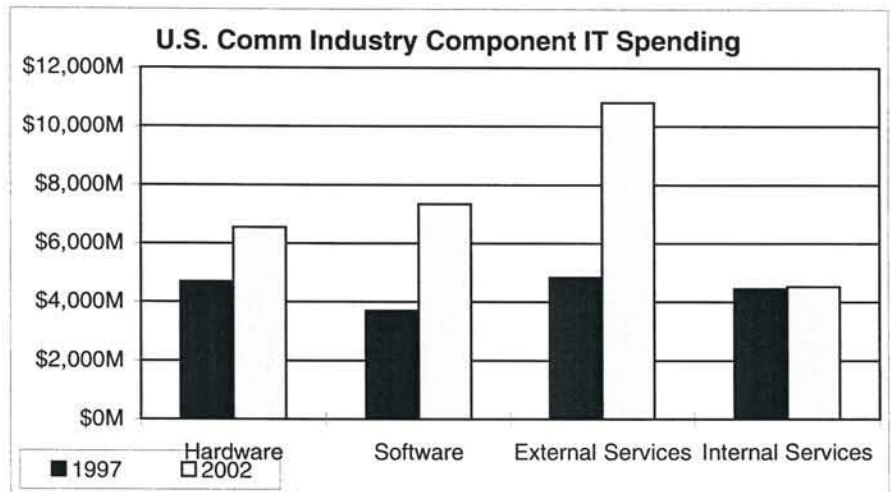
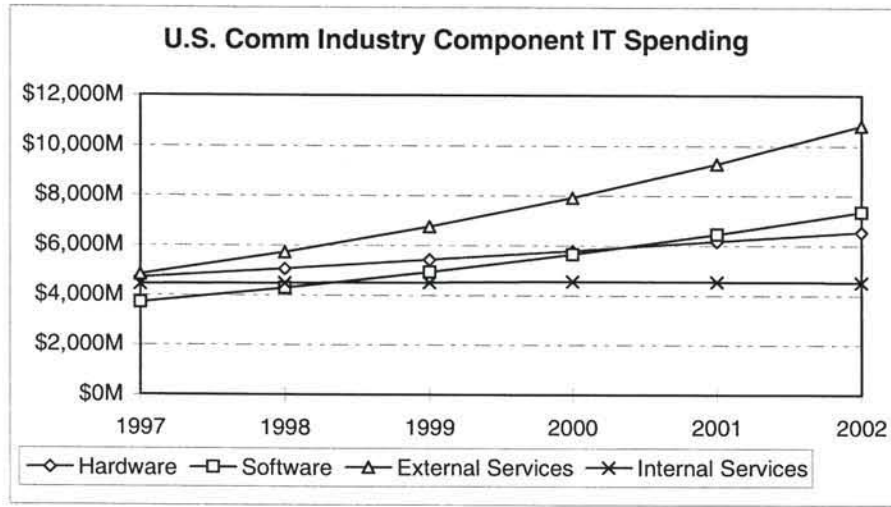
## World Communications IT Spending (in \$ millions) by Component



**United States  
Communications IT Spending (in \$ millions)  
by Component**

<b>United States Communications</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>AAGR</b>
<b>Total IT</b>	17,670	19,544	21,615	23,902	26,429	29,219	11%
External Spending	13,223	15,057	17,109	19,351	21,883	24,695	13%
Hardware	4,695	5,057	5,427	5,788	6,167	6,542	7%
Software	3,697	4,276	4,929	5,644	6,450	7,347	15%
External Services	4,831	5,723	6,753	7,918	9,265	10,806	17%
Internal Services	4,447	4,487	4,506	4,551	4,545	4,524	0%
<b>Wireline</b>							
<b>Total IT</b>	11,657	12,628	13,679	14,819	16,053	17,390	8%
External Spending	8,723	9,729	10,828	11,997	13,292	14,697	11%
Hardware	3,097	3,268	3,434	3,589	3,746	3,893	5%
Software	2,439	2,763	3,119	3,499	3,918	4,372	12%
External Services	3,187	3,698	4,274	4,909	5,628	6,431	15%
Internal Services	2,934	2,899	2,852	2,822	2,761	2,693	-2%
<b>Wireless</b>							
<b>Total IT</b>	3,054	3,559	4,147	4,833	5,632	6,563	17%
External Spending	2,285	2,742	3,283	3,912	4,663	5,547	19%
Hardware	811	921	1,041	1,170	1,314	1,469	13%
Software	639	779	946	1,141	1,374	1,650	21%
External Services	835	1,042	1,296	1,601	1,974	2,427	24%
Internal Services	769	817	865	920	969	1,016	6%
<b>Media Distribution</b>							
<b>Total IT</b>	2,960	3,358	3,788	4,251	4,744	5,267	12%
External Spending	2,215	2,587	2,998	3,441	3,928	4,451	15%
Hardware	786	869	951	1,029	1,107	1,179	8%
Software	619	735	864	1,004	1,158	1,324	16%
External Services	809	983	1,184	1,408	1,663	1,948	19%
Internal Services	745	771	790	809	816	816	2%

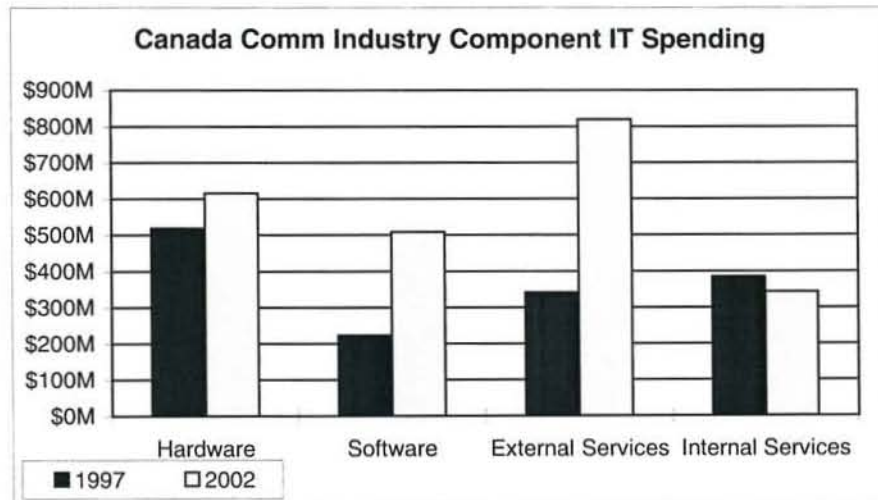
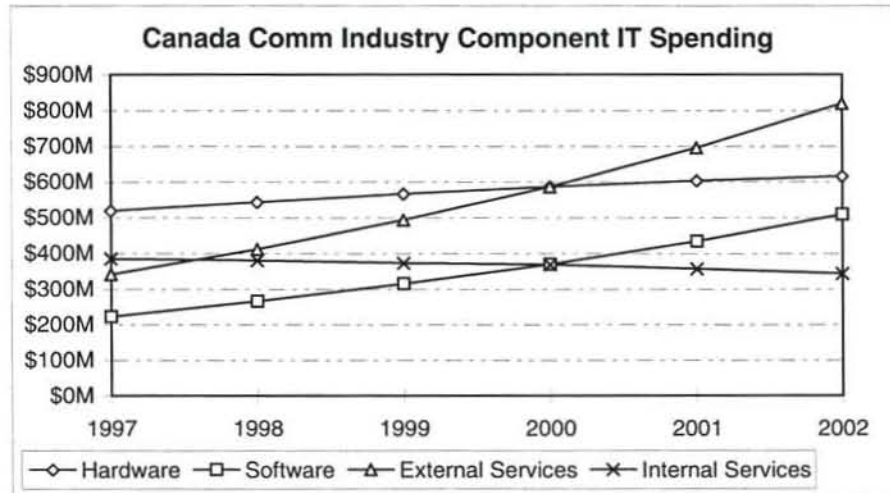
## United States Communications IT Spending (in \$ millions) by Component



**Canada**  
**Communications IT Spending (in \$ millions)**  
**by Component**

<b>Canada</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>AAGR</b>
<b>Communications</b>							
Total IT	1,468	1,601	1,748	1,910	2,089	2,287	9%
External Spending	1,083	1,221	1,374	1,542	1,732	1,944	12%
Hardware	519	543	566	586	603	616	3%
Software	223	266	315	369	434	509	18%
External Services	341	412	493	586	695	819	19%
Internal Services	385	380	373	368	357	343	-2%
<b>Wireline</b>							
Total IT	935	996	1,061	1,130	1,204	1,283	7%
External Spending	680	750	824	903	985	1,072	10%
Hardware	348	357	364	368	384	399	3%
Software	129	152	177	204	226	249	14%
External Services	203	241	283	331	375	424	16%
Internal Services	255	246	237	227	220	211	-4%
<b>Wireless</b>							
Total IT	237	271	309	354	404	462	14%
External Spending	180	212	249	290	341	401	17%
Hardware	64	71	79	86	89	90	7%
Software	49	59	70	83	103	127	21%
External Services	67	82	100	121	150	184	22%
Internal Services	57	59	61	63	63	61	2%
<b>Media Distribution</b>							
Total IT	296	334	377	426	481	543	13%
External Spending	223	259	302	349	406	472	16%
Hardware	106	115	123	131	131	128	4%
Software	45	55	68	82	105	132	24%
External Services	71	89	110	135	170	212	24%
Internal Services	73	75	76	77	75	71	-1%

## Canada Communications IT Spending (in \$ millions) by Component

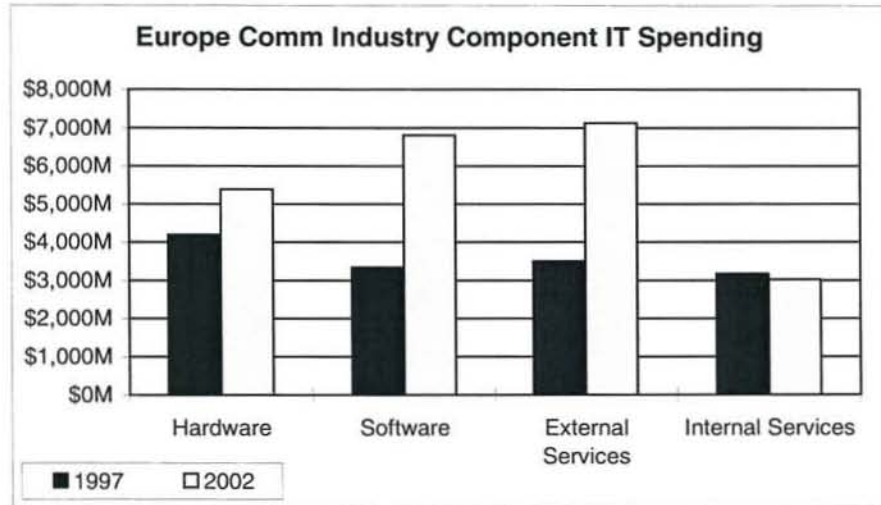
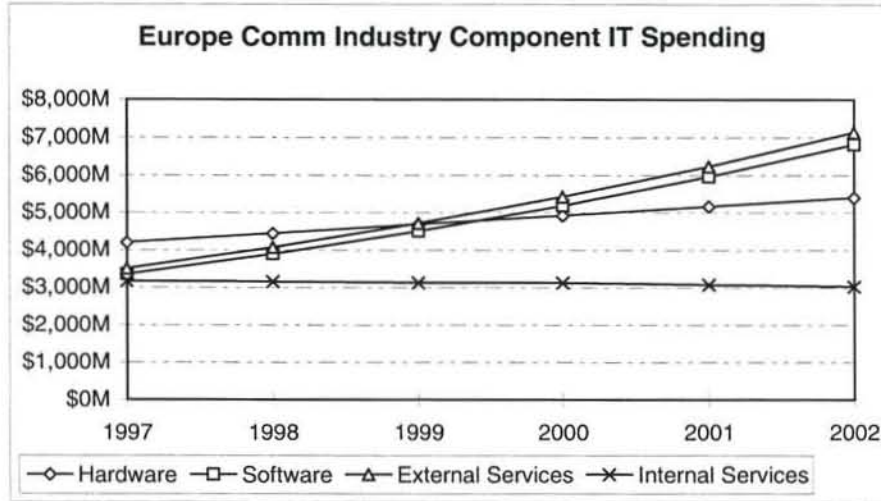


**Europe**  
**Communications IT Spending (in \$ millions)**  
**by Component**

<b>Europe</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>AAGR</b>
<b>Communications</b>							
Total IT	14,198	15,548	17,027	18,646	20,419	22,361	10%
External Spending	11,031	12,394	13,898	15,525	17,343	19,338	12%
Hardware	4,192	4,440	4,687	4,921	5,164	5,392	5%
Software	3,342	3,887	4,502	5,181	5,951	6,814	15%
External Services	3,497	4,067	4,710	5,422	6,228	7,132	15%
Internal Services	3,167	3,154	3,129	3,121	3,076	3,023	-1%
<b>Wireline</b>							
Total IT	9,302	9,988	10,724	11,515	12,364	13,276	7%
External Spending	7,232	7,967	8,758	9,592	10,505	11,484	10%
Hardware	2,752	2,857	2,956	3,043	3,131	3,205	3%
Software	2,191	2,499	2,837	3,201	3,604	4,046	13%
External Services	2,290	2,611	2,965	3,347	3,770	4,234	13%
Internal Services	2,070	2,022	1,966	1,924	1,859	1,791	-3%
<b>Wireless</b>							
Total IT	2,087	2,383	2,720	3,105	3,545	4,046	14%
External Spending	1,616	1,894	2,215	2,581	3,006	3,496	17%
Hardware	611	675	744	815	892	972	10%
Software	490	594	718	862	1,032	1,232	20%
External Services	516	625	754	904	1,082	1,291	20%
Internal Services	471	489	505	524	538	551	3%
<b>Media Distribution</b>							
Total IT	2,809	3,177	3,582	4,026	4,511	5,039	12%
External Spending	2,183	2,533	2,925	3,352	3,832	4,358	15%
Hardware	830	908	987	1,063	1,141	1,216	8%
Software	661	795	947	1,119	1,315	1,536	18%
External Services	692	831	991	1,171	1,376	1,607	18%
Internal Services	626	644	658	673	679	681	2%



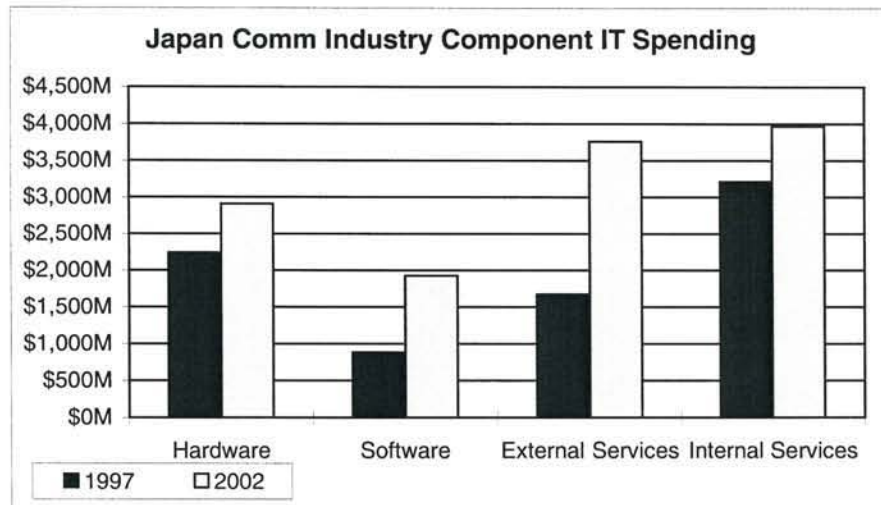
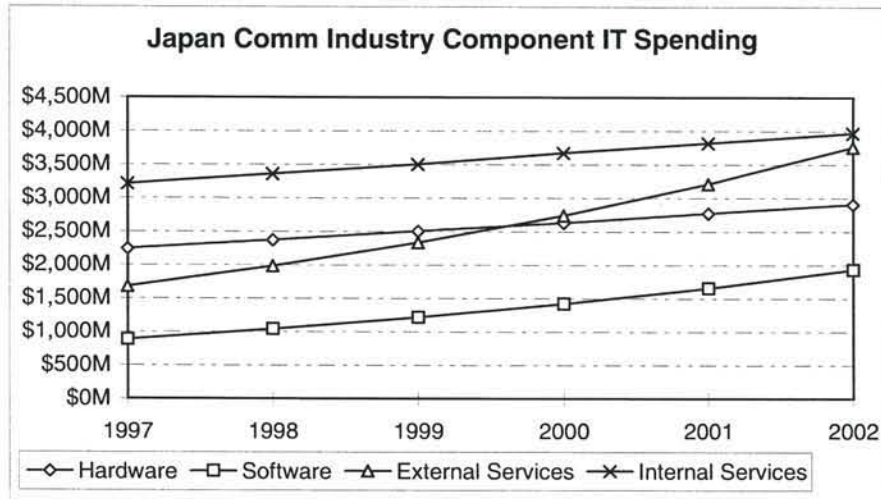
## Europe Communications IT Spending (in \$ millions) by Component



**Japan**  
**Communications IT Spending (in \$ millions)**  
**by Component**

Japan	1997	1998	1999	2000	2001	2002	AAGR
<b>Communications</b>							
Total IT	8,009	8,744	9,557	10,456	11,454	12,561	9%
External Spending	4,799	5,389	6,057	6,784	7,633	8,593	12%
Hardware	2,241	2,372	2,506	2,630	2,769	2,907	5%
Software	882	1,037	1,216	1,418	1,654	1,928	17%
External Services	1,676	1,980	2,335	2,736	3,210	3,759	18%
Internal Services	3,211	3,355	3,500	3,672	3,820	3,968	4%
<b>Wireline</b>							
Total IT	5,083	5,410	5,758	6,128	6,522	6,942	6%
External Spending	3,045	3,334	3,649	3,976	4,347	4,749	9%
Hardware	1,422	1,468	1,510	1,542	1,577	1,606	2%
Software	560	641	733	831	942	1,065	14%
External Services	1,064	1,225	1,407	1,604	1,828	2,077	14%
Internal Services	2,037	2,075	2,109	2,152	2,175	2,193	1%
<b>Wireless</b>							
Total IT	1,231	1,411	1,618	1,855	2,127	2,439	15%
External Spending	738	870	1,026	1,204	1,418	1,669	18%
Hardware	344	383	424	467	514	564	10%
Software	136	167	206	252	307	374	23%
External Services	258	320	395	486	596	730	23%
Internal Services	493	542	593	652	710	771	9%
<b>Media Distribution</b>							
Total IT	1,696	1,923	2,181	2,473	2,804	3,180	13%
External Spending	1,016	1,185	1,382	1,604	1,869	2,175	16%
Hardware	474	522	572	622	678	736	9%
Software	187	228	277	335	405	488	21%
External Services	355	435	533	647	786	952	22%
Internal Services	680	738	799	868	935	1,005	8%

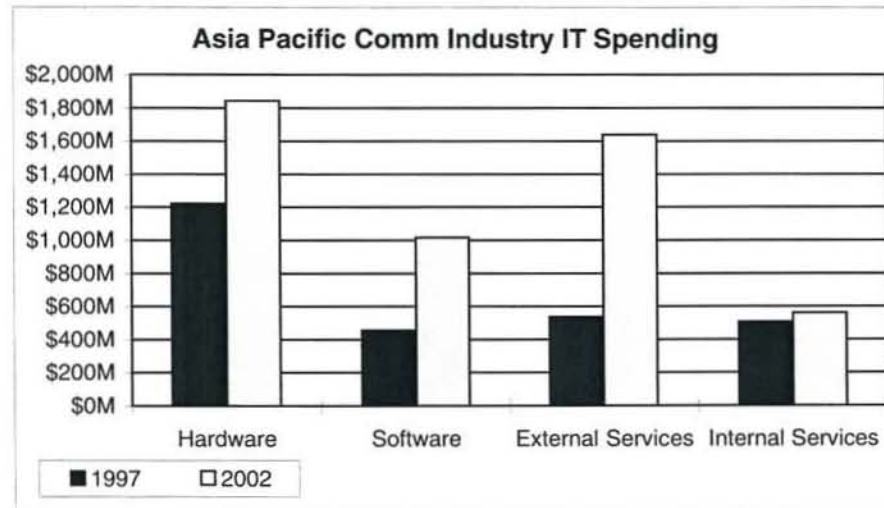
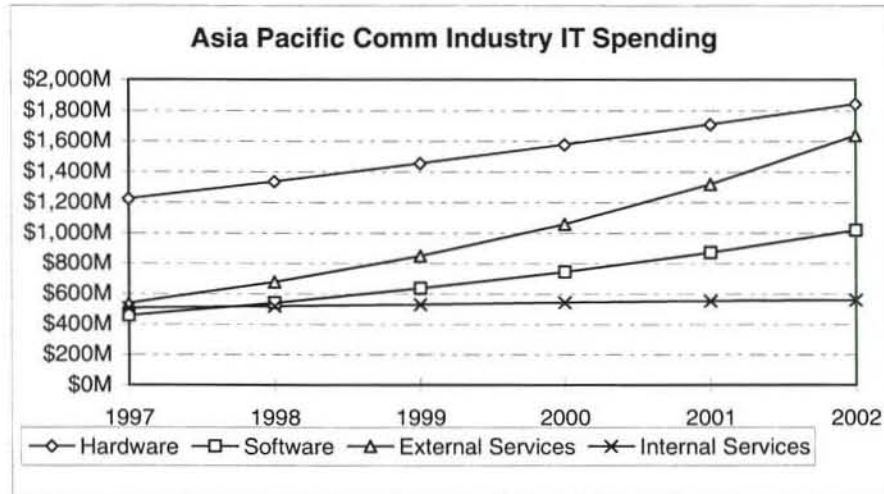
## Japan Communications IT Spending (in \$ millions) by Component



**Asia Pacific  
Communications IT Spending (in \$ millions)  
by Component**

<b>Asia Pacific Communications</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>AAGR</b>
<b>Total IT</b>	2,721	3,068	3,467	3,924	4,452	5,060	13%
External Spending	2,216	2,551	2,938	3,380	3,898	4,499	15%
Hardware	1,223	1,336	1,455	1,578	1,709	1,844	9%
Software	456	538	635	745	872	1,017	17%
External Services	537	676	848	1,058	1,318	1,639	25%
Internal Services	505	517	529	544	553	561	2%
 <b>Wireline</b>							
<b>Total IT</b>	1,660	1,811	1,976	2,156	2,353	2,568	9%
External Spending	1,351	1,506	1,675	1,857	2,060	2,282	11%
Hardware	746	789	830	867	904	936	5%
Software	278	318	362	409	461	516	13%
External Services	327	399	483	581	696	830	20%
Internal Services	308	305	302	299	293	285	-2%
 <b>Wireless</b>							
<b>Total IT</b>	640	774	937	1,133	1,371	1,659	21%
External Spending	521	644	795	977	1,202	1,477	23%
Hardware	287	336	392	454	525	602	16%
Software	107	136	171	215	269	334	26%
External Services	127	172	231	308	409	542	34%
Internal Services	119	130	142	156	169	182	9%
 <b>Media Distribution</b>							
<b>Total IT</b>	422	483	554	635	727	833	15%
External Spending	343	401	469	546	636	740	17%
Hardware	190	211	233	256	281	306	10%
Software	71	85	101	120	142	167	19%
External Services	83	106	134	169	213	267	26%
Internal Services	78	82	85	89	91	94	4%

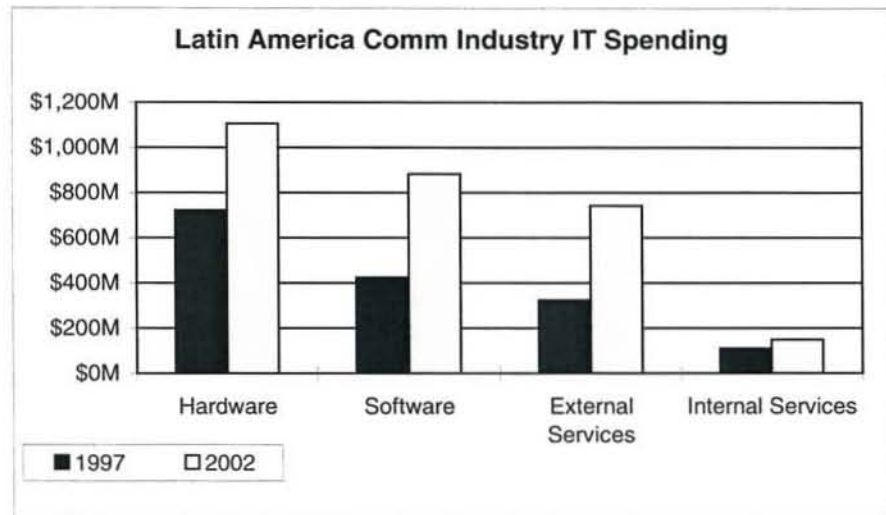
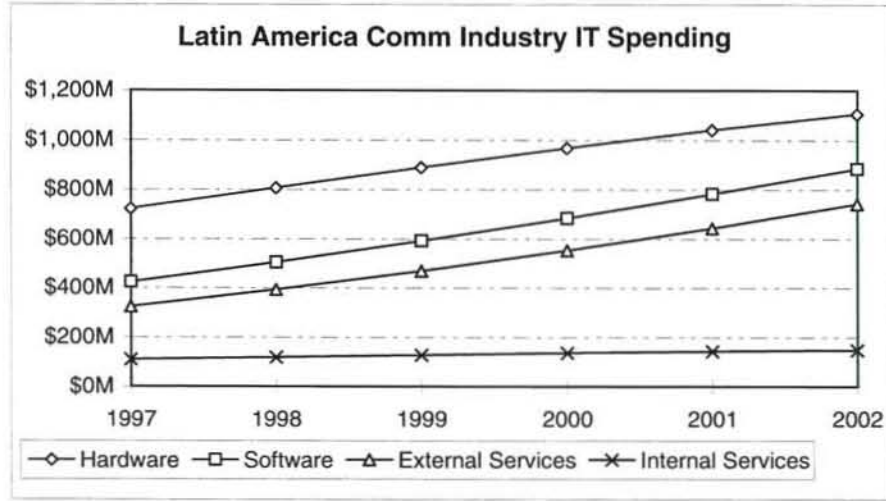
## Asia Pacific Communications IT Spending (in \$ millions) by Component



**Latin America  
Communications IT Spending (in \$ millions)  
by Component**

<b>Latin America Communications</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>AAGR</b>
<b>Total IT</b>	1,581	1,822	2,077	2,340	2,610	2,879	13%
External Spending	1,471	1,703	1,949	2,203	2,466	2,730	13%
Hardware	722	807	889	967	1,041	1,106	9%
Software	424	504	591	684	782	883	16%
External Services	325	393	469	552	644	741	18%
Internal Services	110	119	128	137	144	149	6%
<b>Wireline</b>							
<b>Total IT</b>	1,032	1,107	1,187	1,273	1,366	1,465	7%
External Spending	961	1,035	1,114	1,199	1,291	1,389	8%
Hardware	472	490	508	526	545	563	4%
Software	277	306	338	372	409	449	10%
External Services	212	239	268	301	337	377	12%
Internal Services	72	72	73	74	75	76	1%
<b>Wireless</b>							
<b>Total IT</b>	402	494	605	743	911	1,117	23%
External Spending	375	461	568	699	861	1,059	23%
Hardware	184	219	259	307	363	429	18%
Software	108	137	172	217	273	343	26%
External Services	83	106	137	175	225	287	28%
Internal Services	28	32	37	43	50	58	16%
<b>Media Distribution</b>							
<b>Total IT</b>	146	222	284	324	333	297	15%
External Spending	136	207	266	305	315	282	16%
Hardware	67	98	121	134	133	114	11%
Software	39	61	81	95	100	91	18%
External Services	30	48	64	77	82	77	21%
Internal Services	10	15	17	19	18	15	9%

## Latin America Communications IT Spending (in \$ millions) by Component

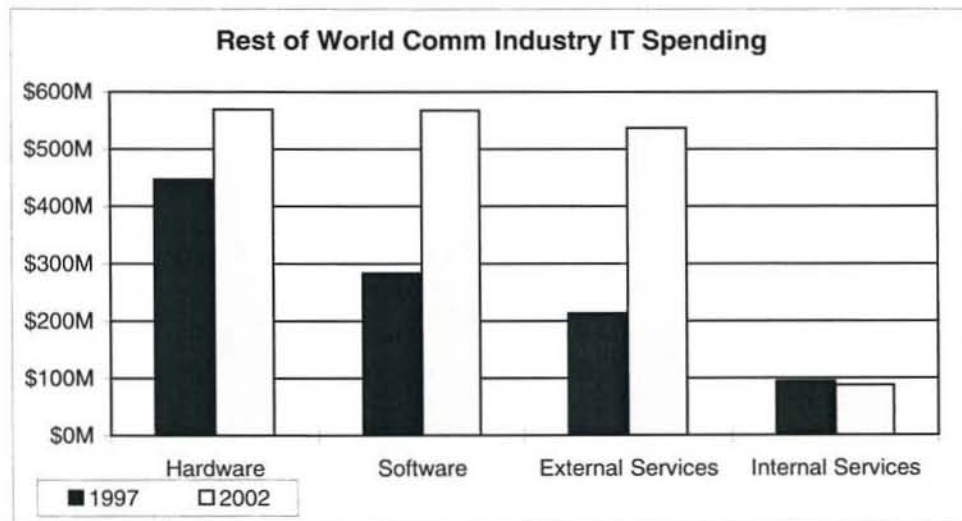
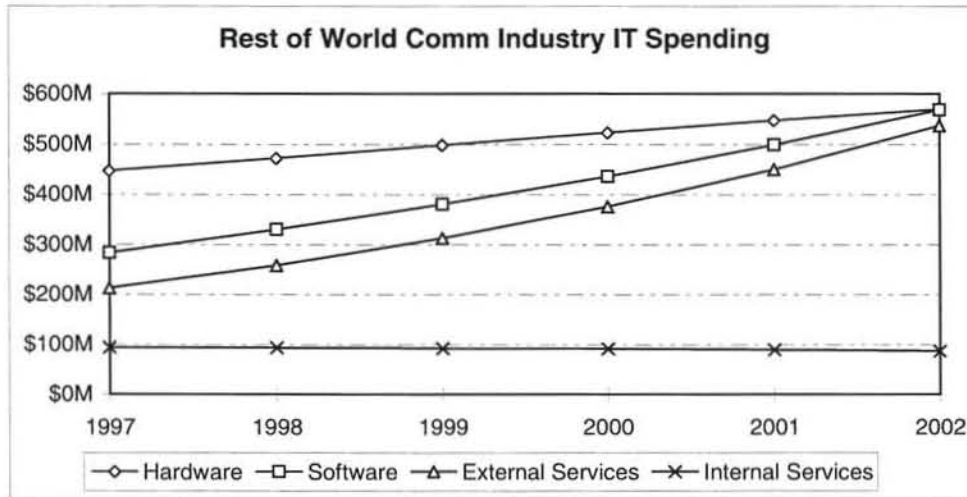


**Rest of World  
Communications IT Spending (in \$ millions)  
by Component**

<b>Rest of World</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>AAGR</b>
<b>Communications</b>							
Total IT	1,038	1,154	1,283	1,426	1,585	1,761	11%
External Spending	944	1,060	1,190	1,334	1,495	1,674	12%
Hardware	447	472	498	523	547	569	5%
Software	283	330	380	436	498	568	15%
External Services	213	258	313	375	450	537	20%
Internal Services	95	94	92	92	90	87	-2%
<b>Wireline</b>							
Total IT	722	784	850	922	1,000	1,085	8%
External Spending	656	720	789	863	944	1,031	9%
Hardware	311	320	330	338	345	351	2%
Software	197	224	252	282	315	350	12%
External Services	148	175	207	243	284	331	17%
Internal Services	66	64	61	59	57	54	-4%
<b>Wireless</b>							
Total IT	105	126	153	184	222	269	21%
External Spending	95	116	142	172	210	255	22%
Hardware	45	52	59	68	77	87	14%
Software	29	36	45	56	70	87	25%
External Services	22	28	37	49	63	82	31%
Internal Services	10	10	11	12	13	13	7%
<b>Media Distribution</b>							
Total IT	211	244	280	319	362	408	14%
External Spending	192	224	260	299	341	387	15%
Hardware	91	100	109	117	125	132	8%
Software	58	70	83	98	114	131	18%
External Services	43	55	68	84	103	124	23%
Internal Services	19	20	20	21	20	20	1%



## Rest of World Communications IT Spending (in \$ millions) by Component

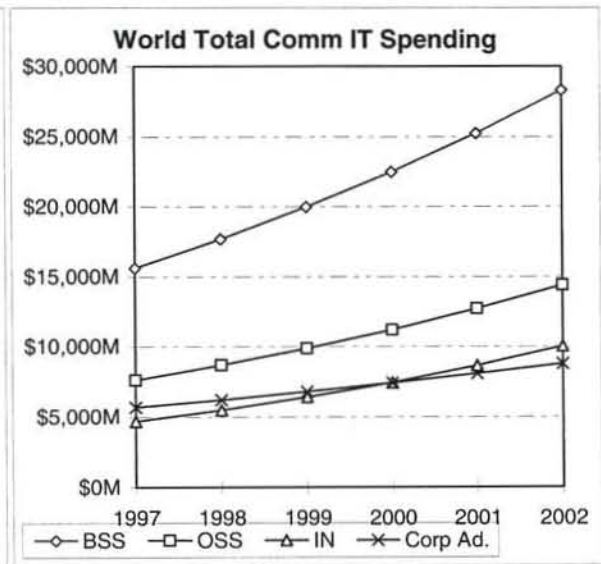
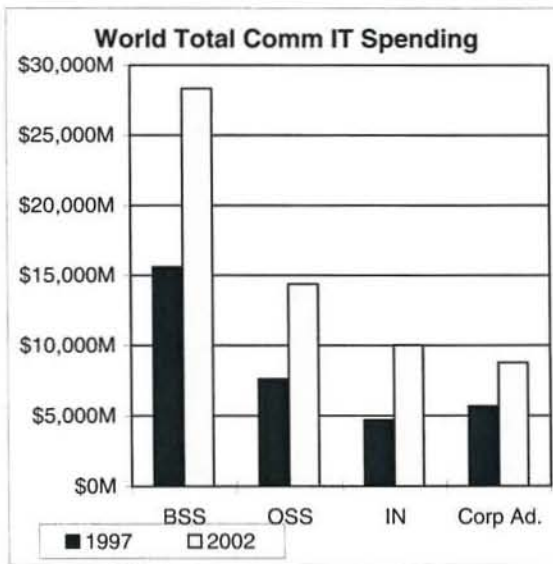


# **III. Total Communications Industry - Process/ Application Level**



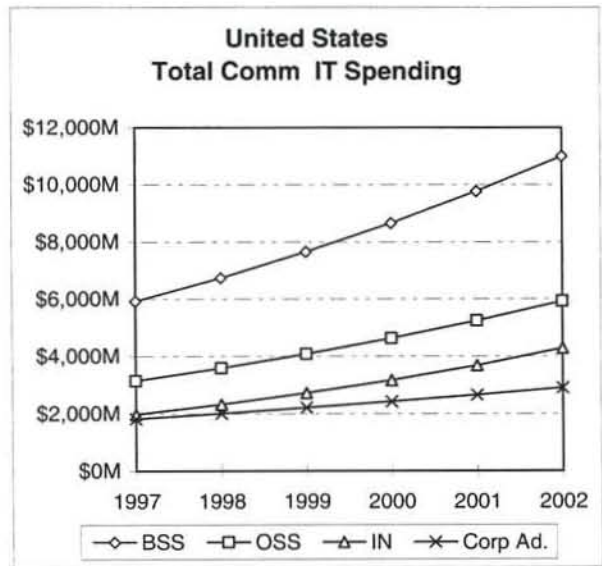
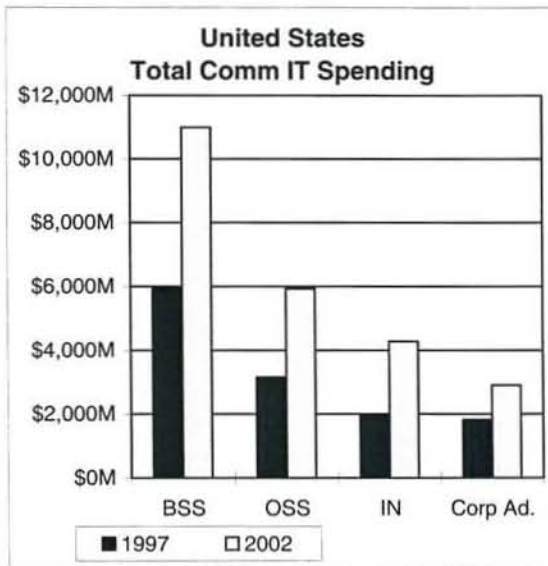
## World Total Communications IT Spending (in \$ millions)

World	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	46,686	51,482	56,772	62,605	69,037	76,130	10.3%
External IT Spending	34,766	39,376	44,515	50,119	56,452	63,474	12.8%
Business Support Systems	15,603	17,682	19,976	22,462	25,253	28,325	12.7%
Fraud Management (WIs)	250	298	355	420	498	590	18.7%
Directory/Publications	575	610	645	680	716	753	5.5%
Billing & Records	6,587	7,493	8,476	9,541	10,734	12,045	12.8%
Customer Assistance	4,642	5,276	5,986	6,758	7,626	8,584	13.1%
Marketing & Sales	3,548	4,005	4,514	5,063	5,678	6,353	12.4%
Operations Support Systems	7,616	8,683	9,881	11,201	12,705	14,390	13.6%
Planning & Engineering	963	1,108	1,272	1,455	1,664	1,901	14.6%
Provisioning	1,681	1,927	2,206	2,516	2,871	3,271	14.2%
Inventory Management	1,275	1,438	1,618	1,813	2,031	2,272	12.3%
Workforce Management	832	945	1,070	1,206	1,358	1,527	12.9%
Message Collection	1,446	1,662	1,909	2,186	2,506	2,871	14.7%
Network Management	1,420	1,603	1,806	2,027	2,274	2,547	12.4%
Intelligent Network Automation	4,693	5,489	6,406	7,443	8,649	10,031	16.4%
Corporate Administration	5,684	6,220	6,808	7,417	8,080	8,781	9.1%
Other Total Comm Spending	1,170	1,301	1,444	1,596	1,765	1,947	10.7%



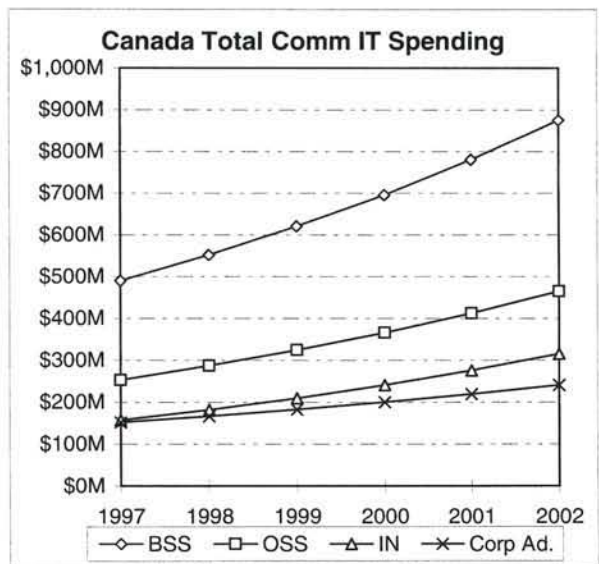
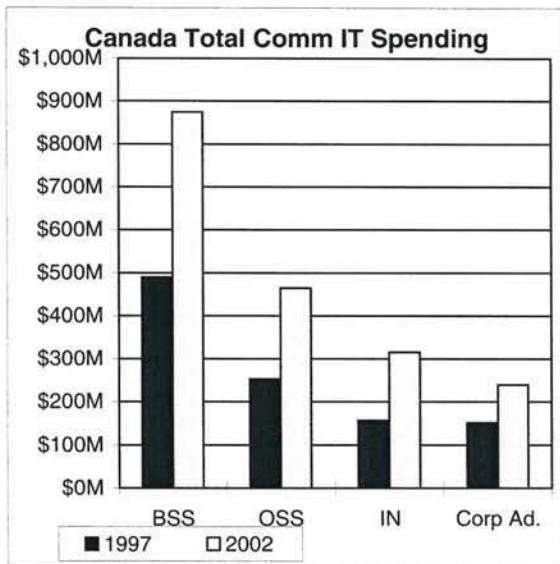
## United States Total Communications IT Spending (in \$ millions)

United States	1997	1998	1999	2000	2001	2002	AAGR %
Communications IT Spending	17,670	19,544	21,615	23,902	26,429	29,219	10.6%
External IT Spending	13,223	15,057	17,109	19,351	21,883	24,695	13.3%
Business Support Systems	5,921	6,742	7,655	8,649	9,766	11,000	13.2%
Fraud Management (WIs)	129	154	183	217	257	303	18.7%
Directory/Publications	179	191	204	216	228	241	6.1%
Billing & Records	2,328	2,660	3,030	3,431	3,882	4,378	13.5%
Customer Assistance	1,864	2,127	2,422	2,744	3,106	3,507	13.5%
Marketing & Sales	1,421	1,609	1,817	2,042	2,294	2,571	12.6%
Operations Support Systems	3,149	3,591	4,086	4,629	5,243	5,926	13.5%
Planning & Engineering	387	445	509	581	662	753	14.2%
Provisioning	680	779	891	1,014	1,154	1,311	14.0%
Inventory Management	536	605	682	764	856	957	12.3%
Workforce Management	349	397	449	506	570	639	12.8%
Message Collection	611	704	809	926	1,060	1,213	14.7%
Network Management	585	662	747	838	941	1,054	12.5%
Intelligent Network Automation	1,976	2,320	2,716	3,163	3,683	4,278	16.7%
Corporate Administration	1,814	2,003	2,208	2,421	2,655	2,904	9.9%
Other Spending	363	402	444	488	536	587	10.1%



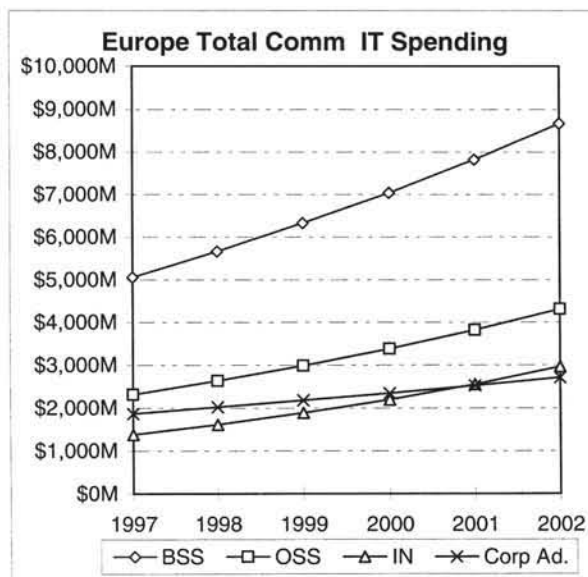
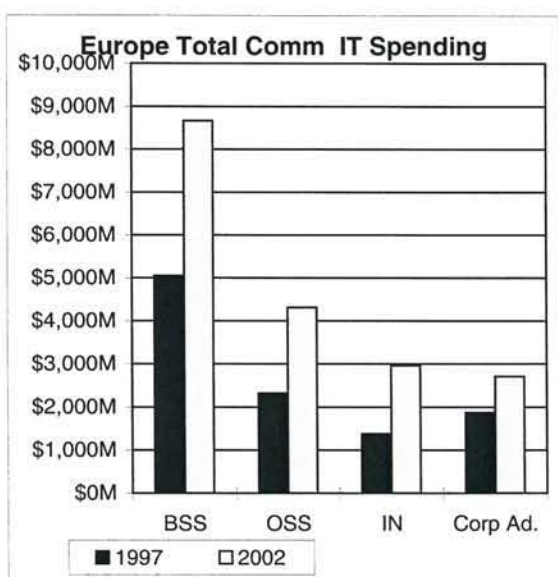
## Canada Total Communications IT Spending (in \$ millions)

Canada	1997	1998	1999	2000	2001	2002	AAGR %
Communications IT Spending	1,468	1,601	1,748	1,910	2,089	2,287	9.3%
External IT Spending	1,083	1,221	1,374	1,542	1,732	1,944	12.4%
Business Support Systems	490	552	621	695	780	875	12.3%
Fraud Management (WIs)	10	12	14	16	19	22	17.5%
Directory/Publications	16	18	19	21	22	24	8.0%
Billing & Records	191	214	239	265	296	329	11.5%
Customer Assistance	154	174	197	222	251	282	12.9%
Marketing & Sales	119	135	152	171	193	217	12.8%
Operations Support Systems	253	287	324	366	412	465	12.9%
Planning & Engineering	32	36	41	47	53	61	13.8%
Provisioning	54	61	69	77	87	97	12.6%
Inventory Management	43	48	54	60	67	75	11.7%
Workforce Management	29	32	36	41	46	52	12.7%
Message Collection	48	55	63	72	82	94	14.4%
Network Management	48	54	61	68	77	86	12.3%
Intelligent Network Automation	157	182	210	240	276	315	14.9%
Corporate Administration	152	167	183	200	219	240	9.6%
Other Spending	31	34	37	41	45	49	9.8%



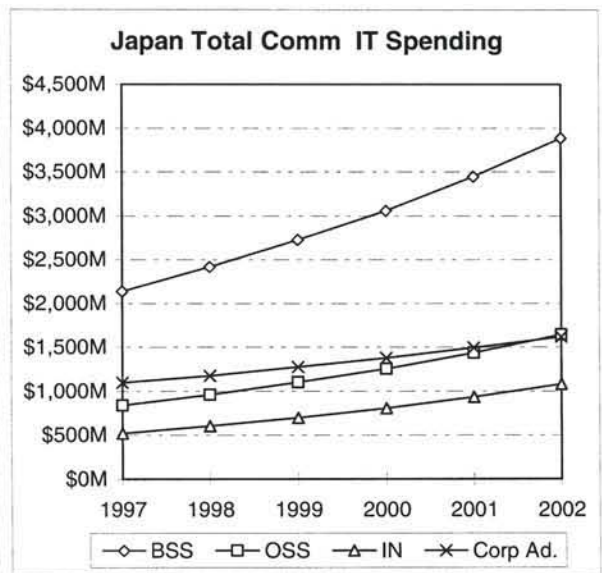
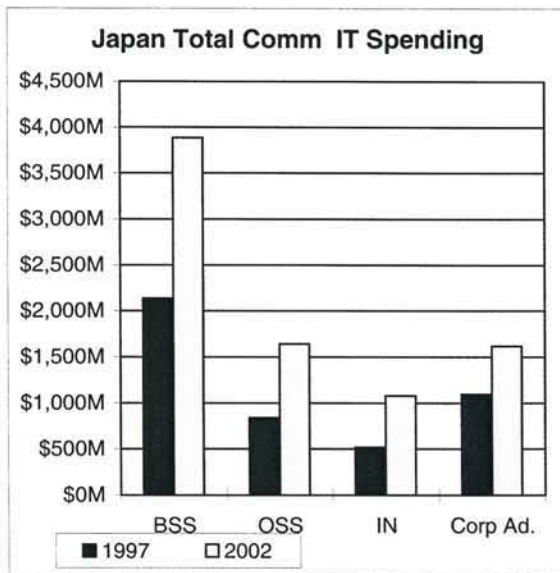
## Europe Total Communications IT Spending (in \$ millions)

Europe	1997	1998	1999	2000	2001	2002	AAGR %
Communications IT Spending	14,198	15,548	17,027	18,646	20,419	22,361	9.5%
External IT Spending	11,031	12,394	13,898	15,525	17,343	19,338	11.9%
Business Support Systems	5,055	5,663	6,327	7,036	7,818	8,664	11.4%
Fraud Management (WIs)	41	46	53	60	68	76	13.4%
Directory/Publications	203	213	223	233	243	252	4.4%
Billing & Records	2,179	2,449	2,729	3,026	3,353	3,706	11.2%
Customer Assistance	1,495	1,688	1,909	2,148	2,415	2,706	12.6%
Marketing & Sales	1,137	1,267	1,413	1,569	1,740	1,924	11.1%
Operations Support Systems	2,316	2,635	2,991	3,381	3,822	4,311	13.2%
Planning & Engineering	295	337	384	436	496	563	13.8%
Provisioning	516	593	681	777	888	1,011	14.4%
Inventory Management	399	452	510	573	643	720	12.5%
Workforce Management	262	300	341	387	439	497	13.6%
Message Collection	408	464	527	596	673	760	13.3%
Network Management	436	489	548	612	683	760	11.8%
Intelligent Network Automation	1,379	1,617	1,890	2,199	2,557	2,966	16.5%
Corporate Administration	1,867	2,021	2,182	2,347	2,525	2,710	7.7%
Other Spending	414	459	508	562	621	687	10.7%



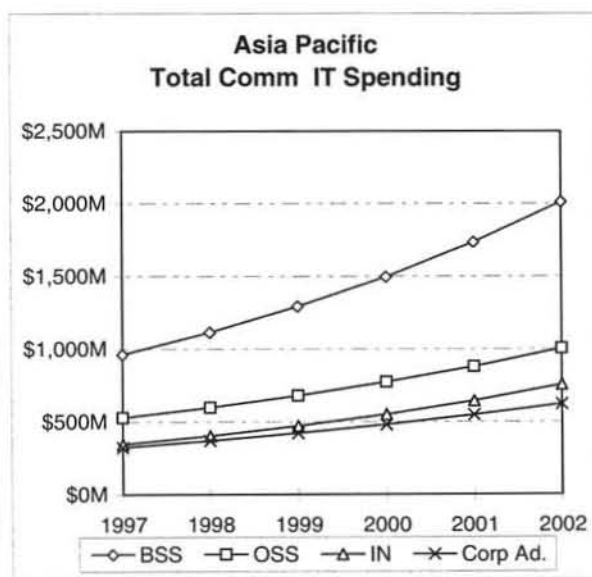
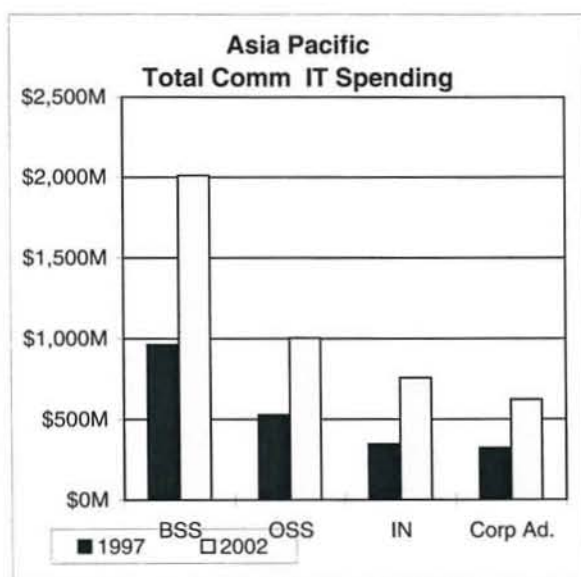
## Japan Total Communications IT Spending (in \$ millions)

Japan	1997	1998	1999	2000	2001	2002	AAGR %
Communications IT Spending	8,009	8,744	9,557	10,456	11,454	12,561	9.4%
External IT Spending	4,799	5,389	6,057	6,784	7,633	8,593	12.4%
Business Support Systems	2,137	2,419	2,725	3,059	3,447	3,884	12.7%
Fraud Management (WIs)	21	24	28	33	38	44	16.4%
Directory/Publications	98	103	108	112	116	121	4.2%
Billing & Records	944	1,067	1,200	1,345	1,513	1,702	12.5%
Customer Assistance	614	700	792	893	1,011	1,144	13.2%
Marketing & Sales	459	525	597	676	768	873	13.7%
Operations Support Systems	839	961	1,100	1,254	1,436	1,644	14.4%
Planning & Engineering	111	129	150	173	201	234	16.1%
Provisioning	178	206	237	273	314	362	15.2%
Inventory Management	147	166	187	210	237	268	12.7%
Workforce Management	99	113	128	145	166	189	13.7%
Message Collection	158	181	208	238	274	315	14.8%
Network Management	145	166	188	214	243	277	13.8%
Intelligent Network Automation	520	603	699	806	933	1,079	15.7%
Corporate Administration	1,097	1,175	1,274	1,377	1,493	1,618	8.1%
Other Spending	205	231	259	289	326	367	12.3%



## Asia Pacific Total Communications IT Spending (in \$ millions)

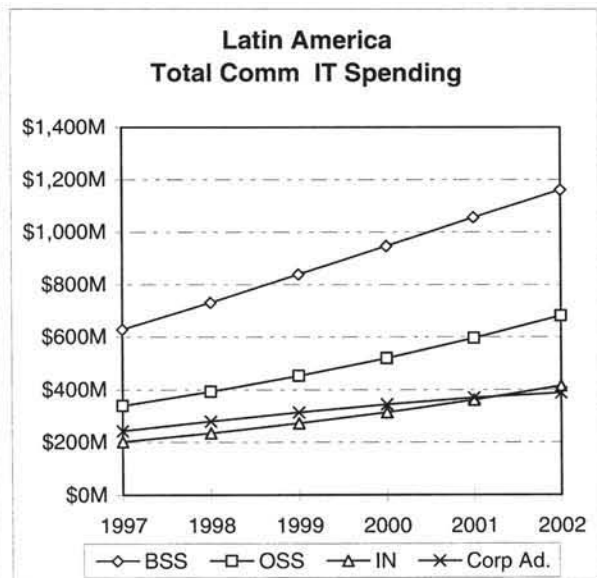
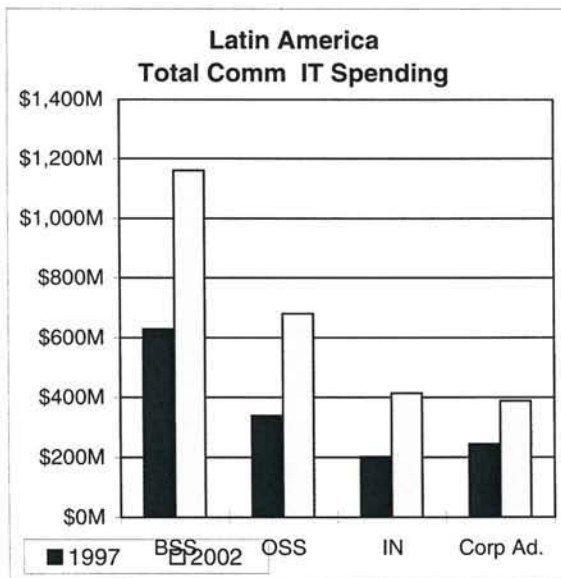
Asia Pacific	1997	1998	1999	2000	2001	2002	AAGR %
Communications IT Spending	2,721	3,068	3,467	3,924	4,452	5,060	13.2%
External IT Spending	2,216	2,551	2,938	3,380	3,898	4,499	15.2%
Business Support Systems	962	1,115	1,292	1,495	1,734	2,013	15.9%
Fraud Management (WIs)	22	27	33	40	48	58	21.4%
Directory/Publications	34	37	41	46	51	56	10.6%
Billing & Records	452	529	619	723	846	990	17.0%
Customer Assistance	253	289	331	379	434	499	14.6%
Marketing & Sales	202	233	268	308	355	410	15.2%
Operations Support Systems	528	599	680	773	880	1,004	13.7%
Planning & Engineering	71	83	96	111	129	151	16.1%
Provisioning	124	141	160	182	207	236	13.7%
Inventory Management	76	85	94	105	117	130	11.3%
Workforce Management	48	52	58	63	70	77	9.9%
Message Collection	106	123	143	166	193	225	16.2%
Network Management	102	115	129	146	164	186	12.8%
Intelligent Network Automation	345	403	471	551	645	757	17.0%
Corporate Administration	323	369	421	480	547	622	14.0%
Other Spending	58	65	73	82	92	103	12.3%





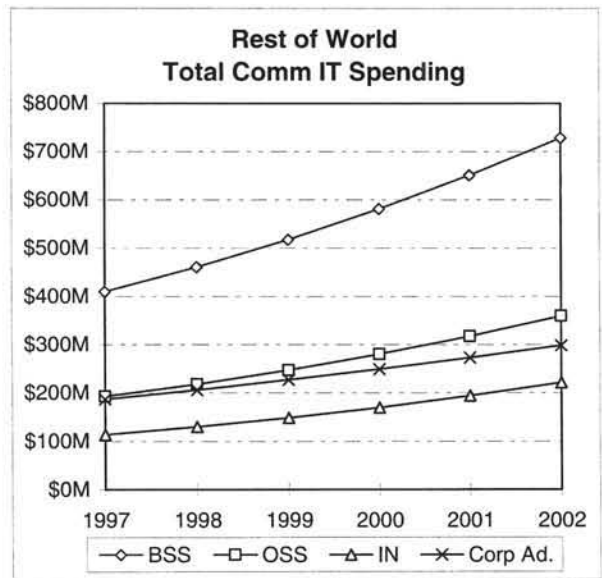
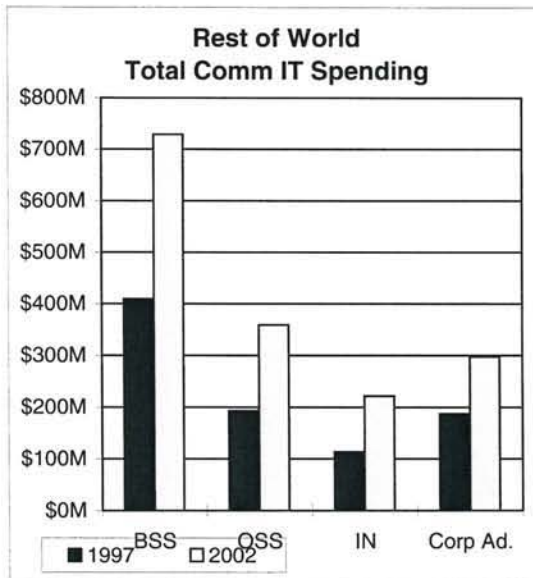
## Latin America Total Communications IT Spending (in \$ millions)

Latin America	1997	1998	1999	2000	2001	2002	AAGR %
Communications IT Spending	1,581	1,822	2,077	2,340	2,610	2,879	12.7%
External IT Spending	1,471	1,703	1,949	2,203	2,466	2,730	13.2%
Business Support Systems	628	731	838	947	1,056	1,161	13.1%
Fraud Management (WIs)	23	28	35	44	56	69	25.2%
Directory/Publications	26	27	29	30	32	33	5.1%
Billing & Records	295	348	404	460	516	569	14.1%
Customer Assistance	159	182	206	230	252	271	11.3%
Marketing & Sales	126	145	164	183	201	218	11.6%
Operations Support Systems	339	392	452	519	595	680	14.9%
Planning & Engineering	42	50	58	68	78	89	16.4%
Provisioning	81	94	108	125	143	165	15.2%
Inventory Management	45	51	56	63	69	76	11.0%
Workforce Management	27	31	34	38	41	43	10.0%
Message Collection	80	94	112	133	159	192	19.1%
Network Management	64	73	83	93	104	115	12.4%
Intelligent Network Automation	202	235	272	314	361	414	15.5%
Corporate Administration	243	280	314	344	369	388	9.8%
Other Spending	59	66	74	80	85	87	8.3%



## Rest of World Total Communications IT Spending (in \$ millions)

Rest of World	1997	1998	1999	2000	2001	2002	AAGR %
Communications IT Spending	1,038	1,154	1,283	1,426	1,585	1,761	11.1%
External IT Spending	944	1,060	1,190	1,334	1,495	1,674	12.1%
Business Support Systems	409	460	517	580	651	729	12.2%
Fraud Management (WIs)	6	7	9	11	14	17	23.9%
Directory/Publications	19	20	21	23	24	26	6.8%
Billing & Records	198	225	256	290	328	371	13.4%
Customer Assistance	104	116	129	143	158	174	10.8%
Marketing & Sales	83	92	102	114	126	140	11.1%
Operations Support Systems	193	218	247	280	317	359	13.2%
Planning & Engineering	25	29	33	38	44	50	15.1%
Provisioning	47	53	60	69	78	89	13.9%
Inventory Management	28	31	34	38	42	46	10.5%
Workforce Management	18	20	23	25	28	31	10.8%
Message Collection	35	41	47	54	63	73	15.6%
Network Management	40	45	50	56	63	70	11.9%
Intelligent Network Automation	114	130	149	170	194	222	14.3%
Corporate Administration	187	206	227	249	273	298	9.7%
Other Spending	41	45	50	55	61	67	10.5%

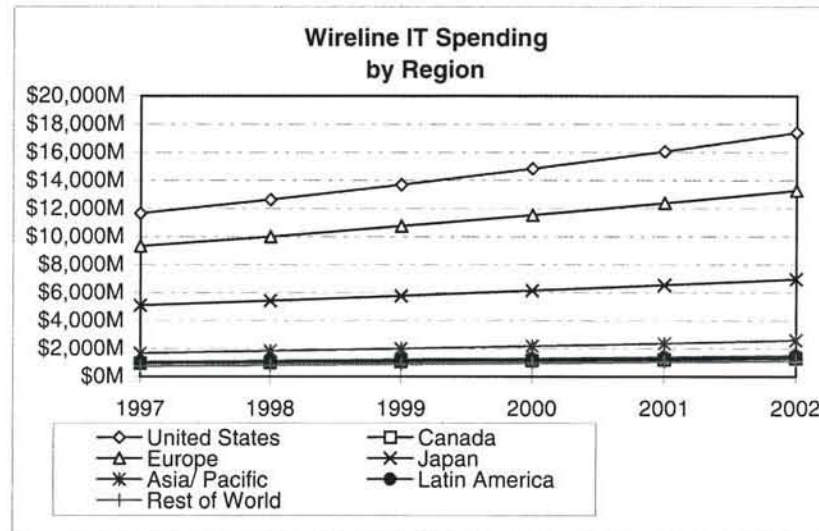
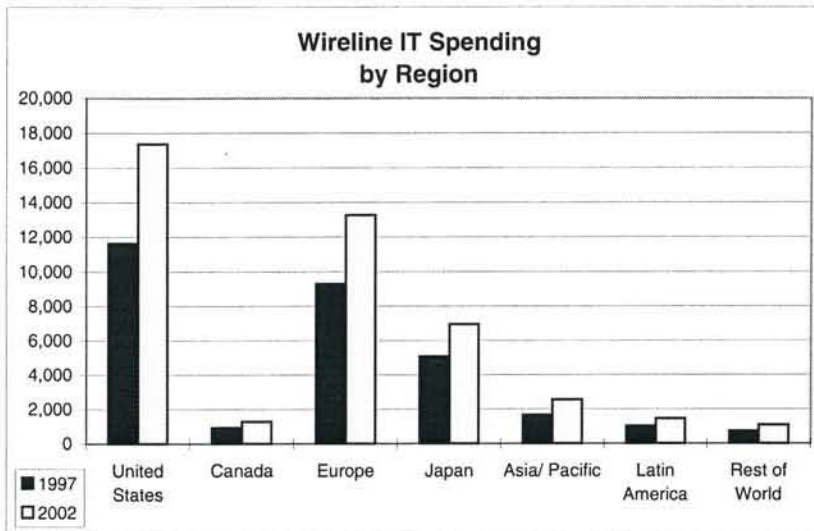


# **IV. Wireline Segment - Process/ Application Level**



### Wireline Industry IT Spending Regional Analysis (in \$ millions)

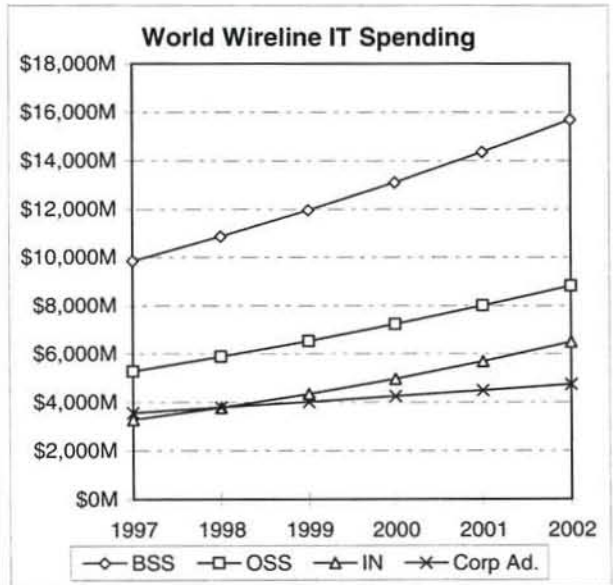
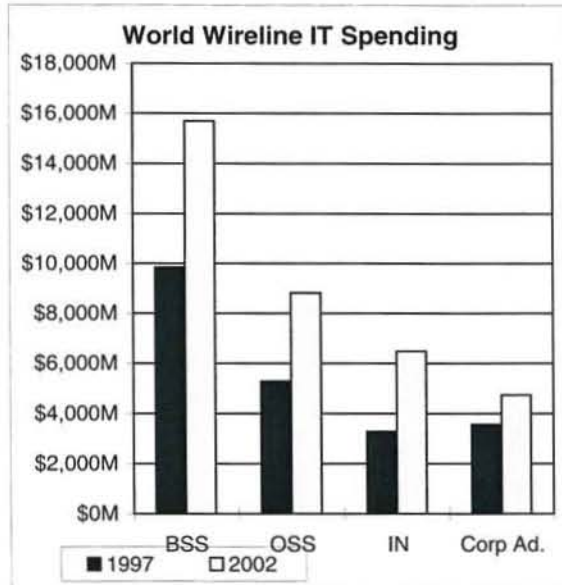
Total IT Wireline Industry*	1997	1998	1999	2000	2001	2002	AAGR
World	30,391	32,723	35,236	37,944	40,862	44,007	7.7%
United States	11,657	12,628	13,679	14,819	16,053	17,390	8.3%
Canada	935	996	1,061	1,130	1,204	1,283	6.5%
Europe	9,302	9,988	10,724	11,515	12,364	13,276	7.4%
Japan	5,083	5,410	5,758	6,128	6,522	6,942	6.4%
Asia/ Pacific	1,660	1,811	1,976	2,156	2,353	2,568	9.1%
Latin America	1,032	1,107	1,187	1,273	1,366	1,465	7.2%
Rest of World	722	784	850	922	1,000	1,085	8.5%



\* IT Spending includes hardware, software, external services and internal services.

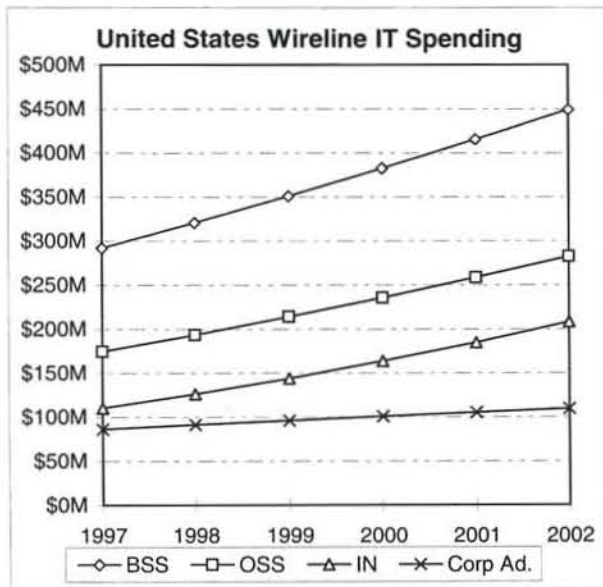
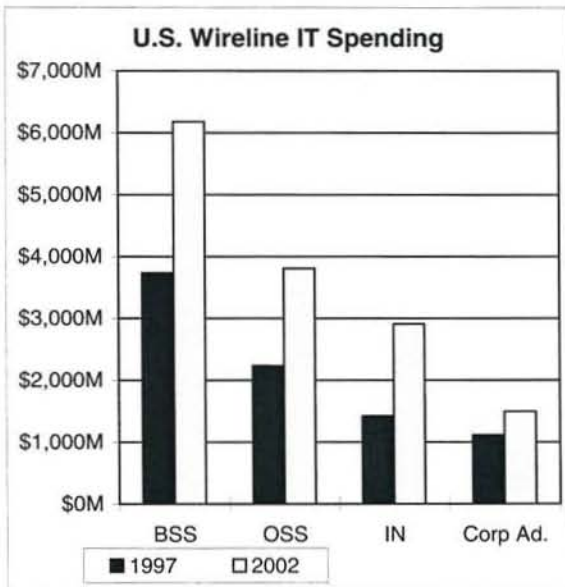
## World Wireline IT Spending (in \$ millions)

World	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	46,686	51,482	56,772	62,605	69,037	76,130	10.3%
Wireline IT Spending	30,391	32,723	35,236	37,944	40,862	44,007	7.7%
External Wireline IT Spending	22,649	25,039	27,637	30,386	33,423	36,705	10.1%
Business Support Systems	9,841	10,857	11,952	13,099	14,353	15,694	9.8%
Directory/Publications	575	610	645	680	716	753	5.5%
Billing & Records	4,047	4,476	4,939	5,426	5,960	6,534	10.1%
Customer Assistance	2,845	3,150	3,481	3,829	4,210	4,618	10.2%
Marketing & Sales	2,375	2,621	2,886	3,164	3,467	3,789	9.8%
Operations Support Systems	5,282	5,882	6,535	7,229	7,994	8,821	10.8%
Planning & Engineering	587	651	719	791	871	955	10.2%
Provisioning	1,269	1,428	1,604	1,794	2,006	2,237	12.0%
Inventory Management	1,004	1,115	1,234	1,361	1,500	1,650	10.4%
Workforce Management	601	668	740	817	902	994	10.6%
Message Collection	883	988	1,102	1,223	1,358	1,504	11.2%
Network Management	938	1,033	1,135	1,242	1,358	1,481	9.6%
Intelligent Network Automation	3,280	3,778	4,342	4,968	5,683	6,488	14.6%
Corporate Administration	3,563	3,787	4,017	4,244	4,485	4,733	5.8%
Other Wireline Spending	681	735	790	847	907	970	7.3%



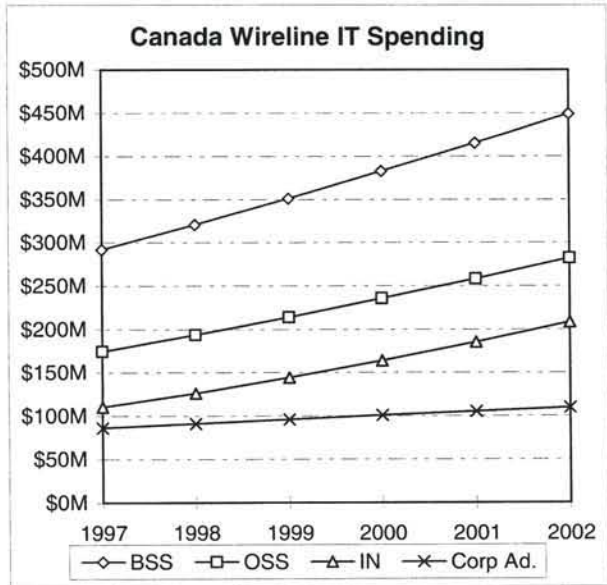
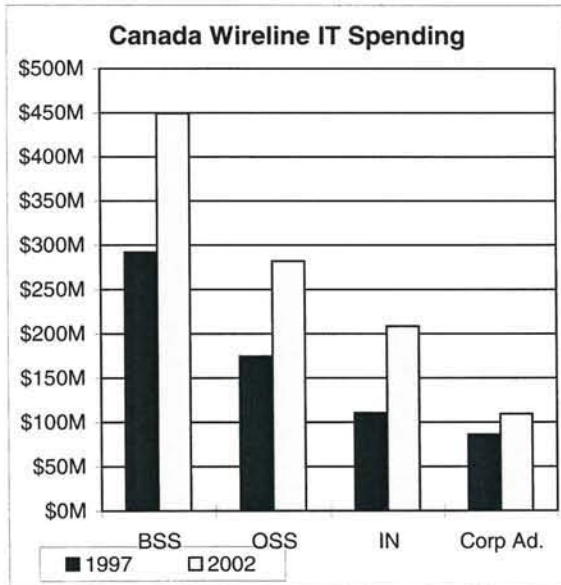
## United States Wireline IT Spending (in \$ millions)

United States	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	17,670	19,544	21,615	23,902	26,429	29,219	10.6%
Wireline IT Spending	11,657	12,628	13,679	14,819	16,053	17,390	8.3%
External Wireline IT Spending	8,723	9,729	10,828	11,997	13,292	14,697	11.0%
Business Support Systems	3,737	4,156	4,610	5,088	5,613	6,175	10.6%
Directory/Publications	179	191	204	216	228	241	6.1%
Billing & Records	1,441	1,617	1,810	2,016	2,243	2,490	11.6%
Customer Assistance	1,154	1,283	1,422	1,568	1,728	1,899	10.5%
Marketing & Sales	963	1,065	1,175	1,289	1,413	1,546	9.9%
Operations Support Systems	2,236	2,502	2,792	3,099	3,439	3,807	11.2%
Planning & Engineering	248	277	308	341	377	416	10.8%
Provisioning	534	603	678	760	850	949	12.2%
Inventory Management	433	483	537	595	658	726	10.9%
Workforce Management	256	287	320	354	393	434	11.1%
Message Collection	374	421	472	526	586	652	11.7%
Network Management	389	431	477	524	575	630	10.1%
Intelligent Network Automation	1,421	1,650	1,910	2,201	2,535	2,911	15.4%
Corporate Administration	1,114	1,188	1,264	1,338	1,415	1,493	6.0%
Other Spending	215	233	252	270	291	311	7.7%



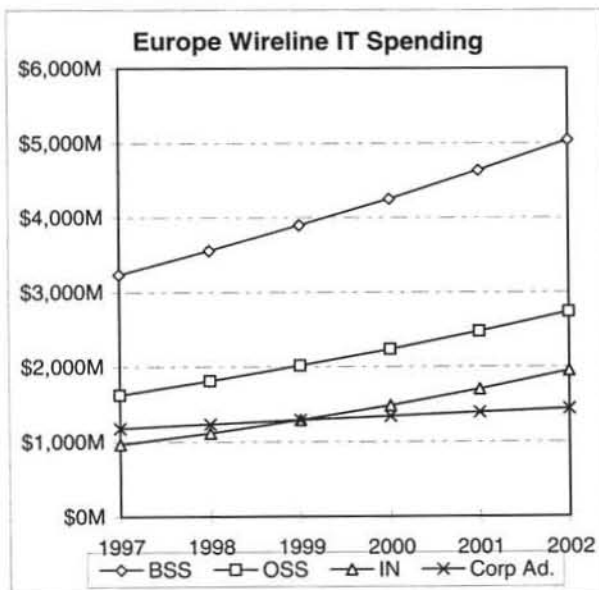
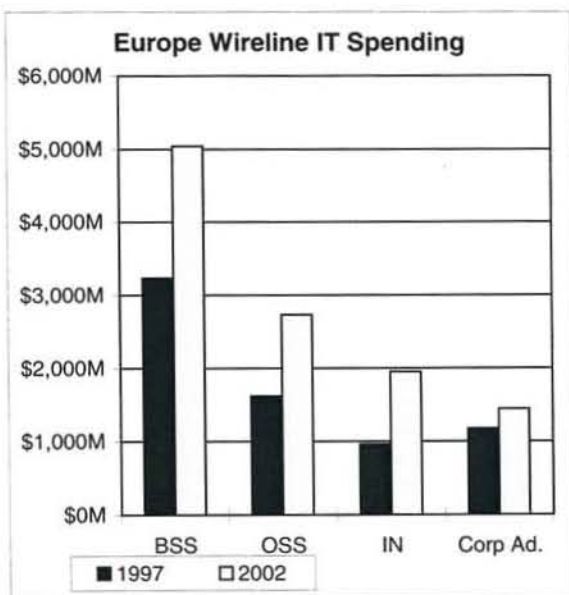
## Canada Wireline IT Spending (in \$ millions)

Canada	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	1,468	1,601	1,748	1,910	2,089	2,287	9.3%
Wireline IT Spending	935	996	1,061	1,130	1,204	1,283	6.5%
External Wireline IT Spending	680	750	824	903	985	1,072	9.5%
Business Support Systems	292	321	351	383	415	449	9.0%
Directory/Publications	16	18	19	21	22	24	8.0%
Billing & Records	110	120	130	141	151	162	8.1%
Customer Assistance	89	98	108	118	128	139	9.3%
Marketing & Sales	77	85	94	104	114	124	10.1%
Operations Support Systems	174	194	214	236	258	282	10.1%
Planning & Engineering	19	21	23	26	28	30	9.8%
Provisioning	42	46	51	57	62	68	10.4%
Inventory Management	34	37	41	45	50	54	9.8%
Workforce Management	20	22	24	27	29	32	10.0%
Message Collection	29	33	37	41	45	50	11.1%
Network Management	31	34	37	40	44	47	9.1%
Intelligent Network Automation	110	126	144	164	185	209	13.6%
Corporate Administration	86	91	96	101	105	109	4.8%
Other Spending	17	18	19	20	21	22	5.9%



## Europe Wireline IT Spending (in \$ millions)

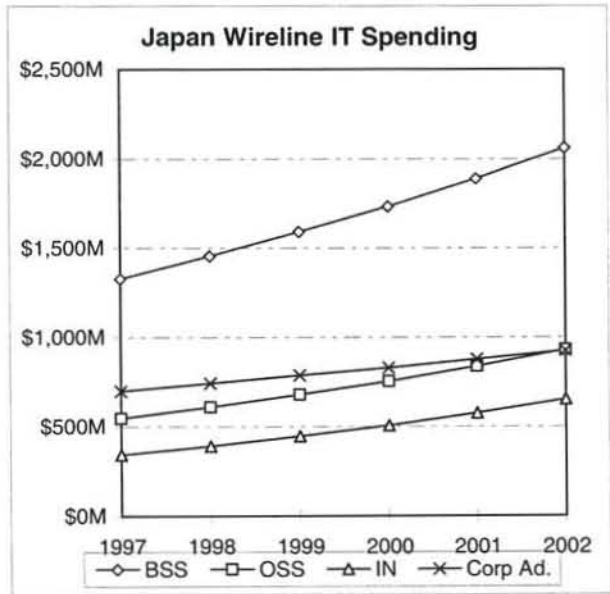
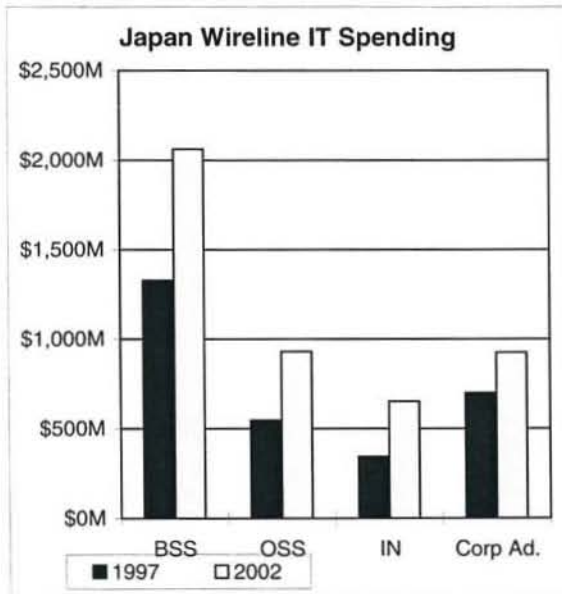
Europe	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	14,198	15,548	17,027	18,646	20,419	22,361	9.5%
Wireline IT Spending	9,302	9,988	10,724	11,515	12,364	13,276	7.4%
External Wireline IT Spending	7,232	7,967	8,758	9,592	10,505	11,484	9.7%
Business Support Systems	3,237	3,557	3,899	4,253	4,636	5,041	9.3%
Directory/Publications	203	213	223	233	243	252	4.4%
Billing & Records	1,342	1,466	1,597	1,731	1,875	2,024	8.6%
Customer Assistance	925	1,032	1,147	1,270	1,404	1,548	10.9%
Marketing & Sales	767	846	931	1,019	1,115	1,216	9.7%
Operations Support Systems	1,623	1,812	2,018	2,236	2,475	2,734	11.0%
Planning & Engineering	177	195	214	234	256	279	9.5%
Provisioning	389	440	498	560	629	704	12.6%
Inventory Management	314	351	391	434	481	532	11.1%
Workforce Management	185	207	232	258	286	317	11.4%
Message Collection	269	301	335	371	411	454	11.0%
Network Management	289	318	348	379	412	448	9.1%
Intelligent Network Automation	964	1,116	1,289	1,482	1,702	1,949	15.1%
Corporate Administration	1,178	1,234	1,289	1,340	1,392	1,442	4.1%
Other Spending	230	247	264	281	300	318	6.7%





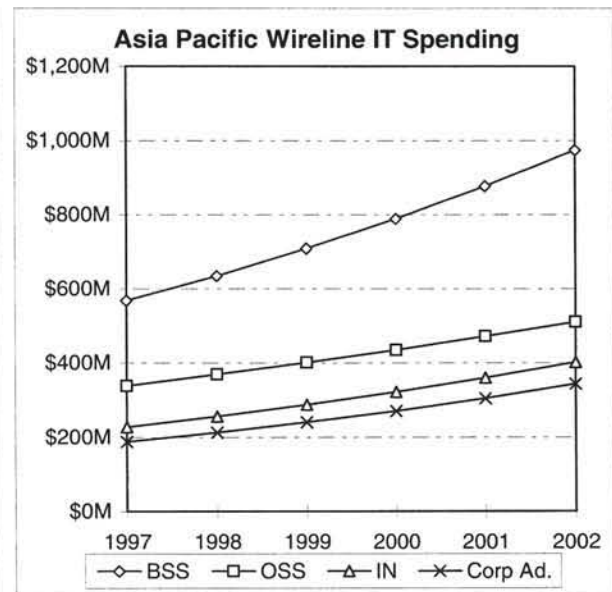
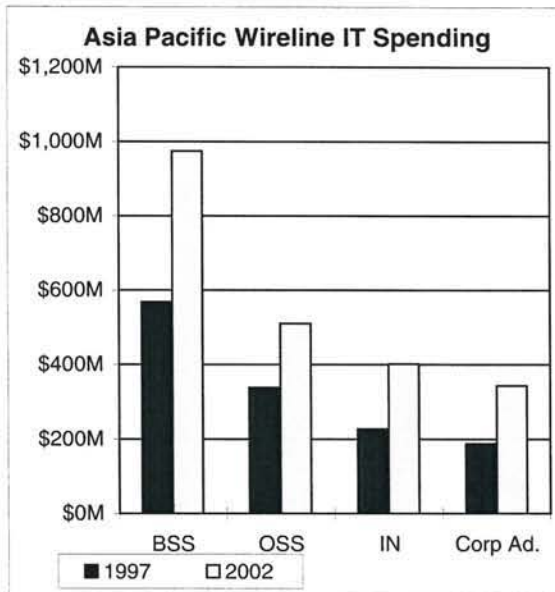
## Japan Wireline IT Spending (in \$ millions)

Japan	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	8,009	8,744	9,557	10,456	11,454	12,561	9.4%
Wireline IT Spending	5,083	5,410	5,758	6,128	6,522	6,942	6.4%
External Wireline IT Spending	3,045	3,334	3,649	3,976	4,347	4,749	9.3%
Business Support Systems	1,329	1,455	1,592	1,732	1,891	2,061	9.2%
Directory/Publications	98	103	108	112	116	121	4.2%
Billing & Records	561	613	669	726	791	860	8.9%
Customer Assistance	370	407	447	489	536	587	9.7%
Marketing & Sales	300	333	368	405	448	493	10.4%
Operations Support Systems	547	610	679	753	837	929	11.2%
Planning & Engineering	62	69	77	85	95	105	10.9%
Provisioning	121	136	154	172	194	218	12.5%
Inventory Management	110	122	134	148	163	179	10.2%
Workforce Management	71	78	86	95	104	114	10.1%
Message Collection	96	108	122	137	153	172	12.3%
Network Management	87	96	106	117	129	142	10.4%
Intelligent Network Automation	344	392	447	506	575	653	13.7%
Corporate Administration	700	742	786	829	876	925	5.7%
Other Spending	125	135	145	156	168	180	7.6%



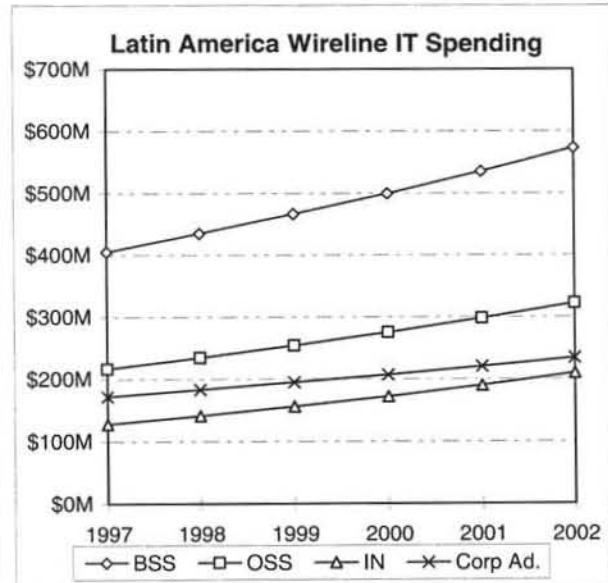
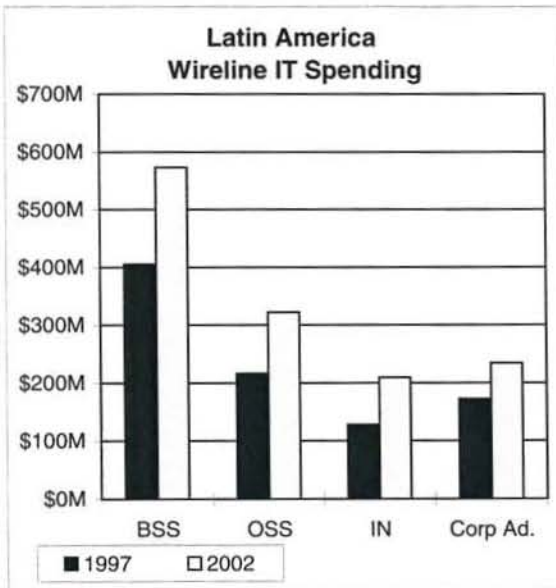
## Asia Pacific Wireline IT Spending (in \$ millions)

Asia Pacific	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	2,721	3,068	3,467	3,924	4,452	5,060	13.2%
Wireline IT Spending	1,660	1,811	1,976	2,156	2,353	2,568	9.1%
External Wireline IT Spending	1,351	1,506	1,675	1,857	2,060	2,282	11.1%
Business Support Systems	568	635	709	788	877	975	11.4%
Directory/Publications	34	37	41	46	51	56	10.6%
Billing & Records	270	306	346	391	440	495	12.9%
Customer Assistance	139	152	166	181	197	215	9.1%
Marketing & Sales	125	139	155	171	189	209	10.8%
Operations Support Systems	339	369	401	435	472	511	8.6%
Planning & Engineering	40	44	49	53	58	64	9.9%
Provisioning	89	98	108	118	130	142	9.8%
Inventory Management	56	60	64	69	74	78	7.0%
Workforce Management	34	36	39	41	43	46	6.0%
Message Collection	55	60	65	71	77	84	9.0%
Network Management	65	71	77	83	89	96	8.2%
Intelligent Network Automation	228	256	287	322	360	402	12.1%
Corporate Administration	188	212	240	271	305	343	12.8%
Other Spending	30	33	37	41	46	51	11.4%



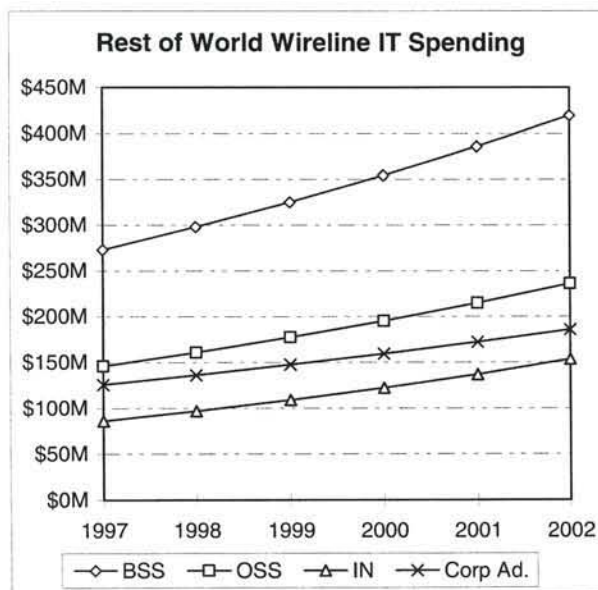
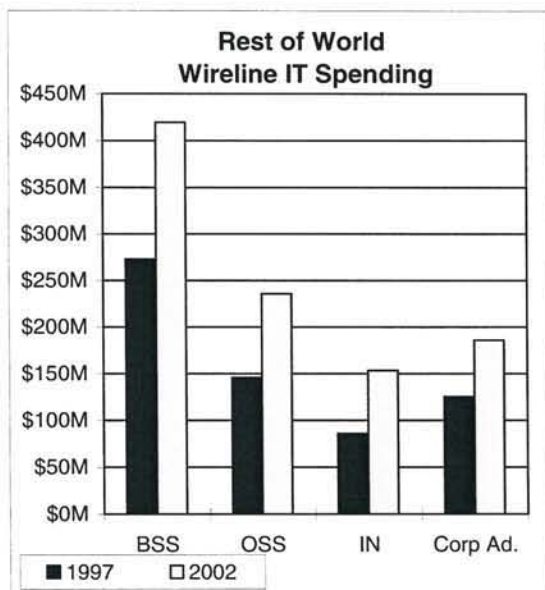
## Latin America Wireline IT Spending (in \$ millions)

Latin America	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	1,581	1,822	2,077	2,340	2,610	2,879	12.7%
Wireline IT Spending	1,032	1,107	1,187	1,273	1,366	1,465	7.2%
External Wireline IT Spending	961	1,035	1,114	1,199	1,291	1,389	7.6%
Business Support Systems	405	435	466	499	535	573	7.2%
Directory/Publications	26	27	29	30	32	33	5.1%
Billing & Records	194	210	228	247	268	290	8.4%
Customer Assistance	100	106	113	119	126	133	5.8%
Marketing & Sales	85	91	97	103	109	116	6.4%
Operations Support Systems	217	235	254	275	298	322	8.2%
Planning & Engineering	24	26	29	31	33	36	8.2%
Provisioning	56	62	68	75	82	90	9.8%
Inventory Management	34	36	38	41	43	46	6.3%
Workforce Management	21	22	24	25	27	29	6.9%
Message Collection	35	39	42	46	49	54	8.7%
Network Management	46	50	54	58	63	68	7.9%
Intelligent Network Automation	128	141	156	172	190	210	10.4%
Corporate Administration	172	183	195	207	220	234	6.4%
Other Spending	39	41	43	45	48	50	5.0%



## Rest of World Wireline IT Spending (in \$ millions)

Rest of World	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	1,038	1,154	1,283	1,426	1,585	1,761	11.1%
Wireline IT Spending	722	784	850	922	1,000	1,085	8.5%
External Wireline IT Spending	656	720	789	863	944	1,031	9.5%
Business Support Systems	273	298	325	354	386	420	9.0%
Directory/Publications	19	20	21	23	24	26	6.8%
Billing & Records	130	143	158	175	192	212	10.3%
Customer Assistance	67	73	78	84	90	97	7.6%
Marketing & Sales	57	62	67	73	79	85	8.2%
Operations Support Systems	146	161	177	195	215	236	10.1%
Planning & Engineering	16	18	19	21	23	26	10.1%
Provisioning	38	43	48	53	59	66	11.6%
Inventory Management	23	25	27	29	32	34	8.1%
Workforce Management	14	15	16	18	19	21	8.7%
Message Collection	24	27	29	32	36	40	10.5%
Network Management	31	34	38	41	45	50	9.8%
Intelligent Network Automation	86	97	109	122	137	153	12.3%
Corporate Administration	126	136	147	159	172	186	8.2%
Other Spending	26	28	30	32	34	37	6.8%



# **V. Wireless Segment - Process/ Application Level**





## **Adjustment of Wireless IT Spending Forecasts**

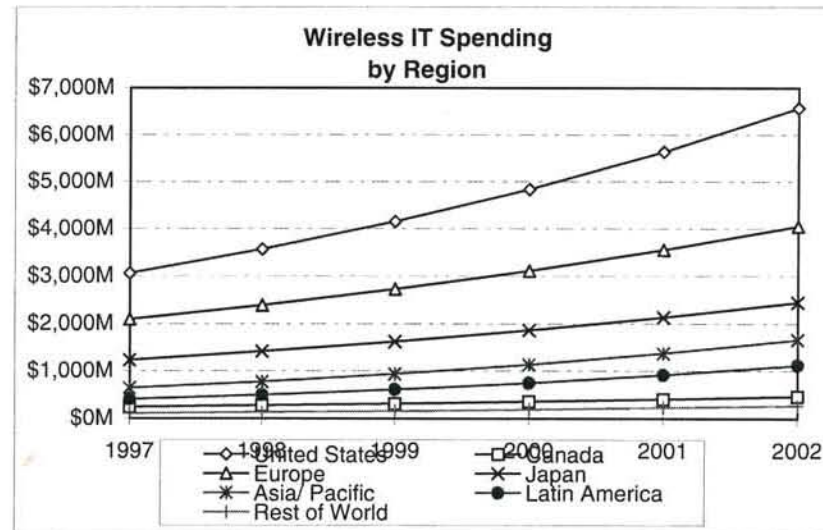
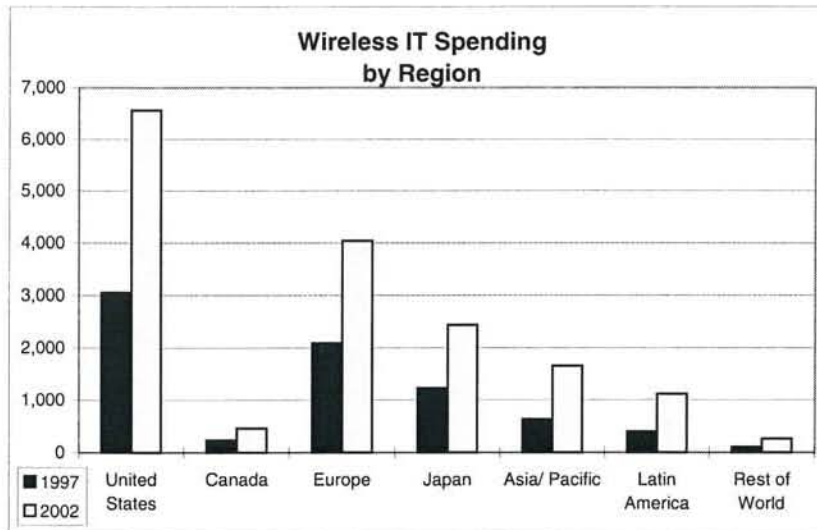
As G2R indicated in its Global Wireless report, IT spending as a percentage of revenue in the wireless industry is a lower ratio (4 to 6.5% of revenue) than that of wireline (8% to 10% of revenue). There are two main reasons: 1) Wireless carriers generally exhibit higher revenues per customer and IT dollar than wireline carriers do. 2) What would typically be IT spending on processes like billing systems tends to go to outside vendors through Business Process Outsourcing contracts.

G2R has changed the way we track spending on business process outsourcing services to reflect changes in market dynamics. G2R defines business process outsourcing as the delegation of one or more IT-intensive business processes to an external provider to improve overall business performance in a particular area. For vendors, BPO entails the ownership, administration, operations, and management of a customer's business process(es). As such, when a carrier elects to outsource a process the expenditures typically comes out of the operating budget rather than IT budget.

Since carriers treat BPO expenditures differently, much of BPO spending was included in our IT forecasts. In the past, we also decided to include billing process outsourcing in the billing IT spending numbers. Removing BPO spending from IT spending on wireless billing had a misleading affect on those numbers by deflating the real size of that solution space. Our new IT spending numbers focus squarely on IT spending expenditures and remove the BPO portion. This change was made because there is increasing traditional IT spending on billing systems and since BPO is becoming easier to separate from IT spending.

### Wireless Industry IT Spending Regional Analysis (in \$ millions)

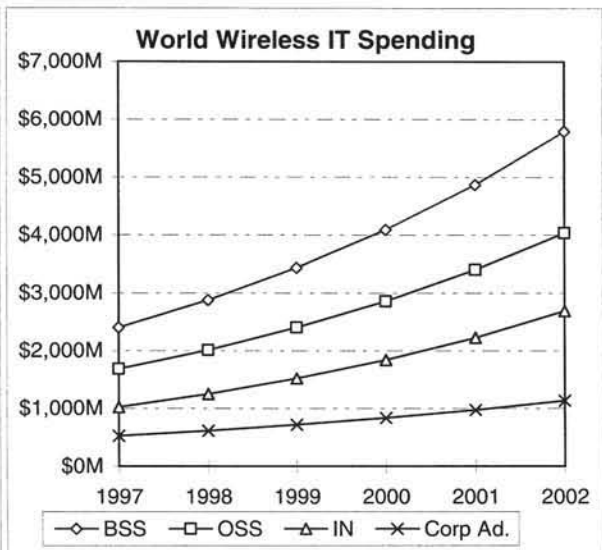
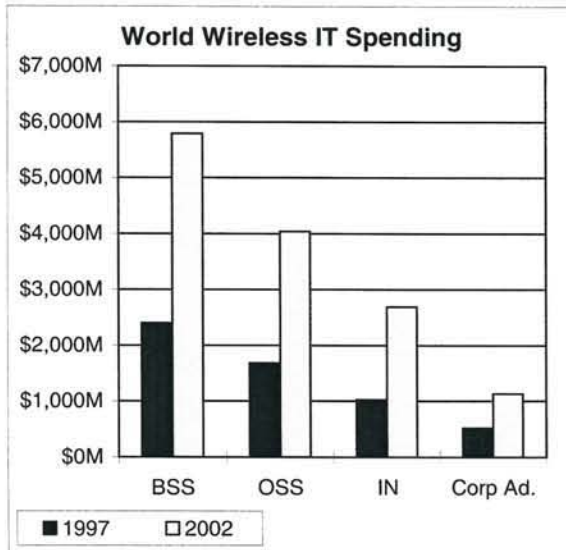
Total IT Wireless Industry*	1997	1998	1999	2000	2001	2002	AAGR
World	7,756	9,018	10,490	12,207	14,212	16,555	16.4%
United States	3,054	3,559	4,147	4,833	5,632	6,563	16.5%
Canada	237	271	309	354	404	462	14.3%
Europe	2,087	2,383	2,720	3,105	3,545	4,046	14.2%
Japan	1,231	1,411	1,618	1,855	2,127	2,439	14.7%
Asia/ Pacific	640	774	937	1,133	1,371	1,659	21.0%
Latin America	402	494	605	743	911	1,117	22.7%
Rest of World	105	126	153	184	222	269	20.7%



\* IT Spending includes hardware, software, external services and internal services.

## World Wireless IT Spending (in \$ millions)

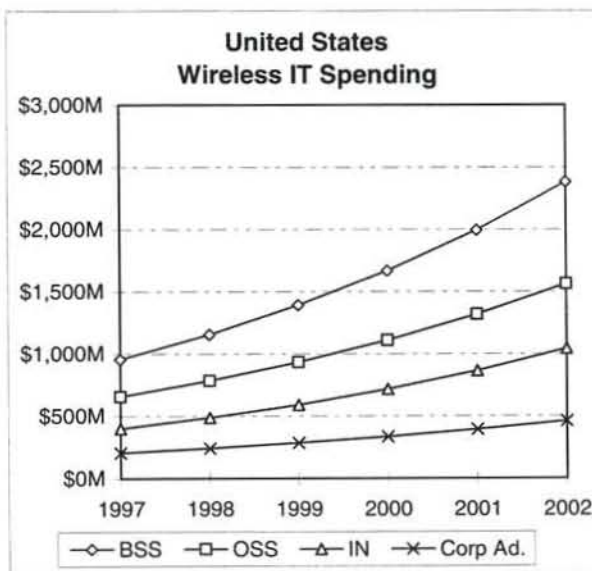
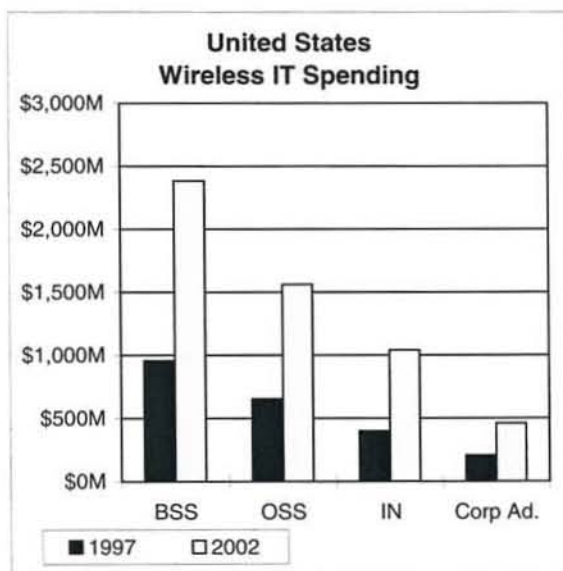
World	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	46,686	51,482	56,772	62,605	69,037	76,130	10.3%
Wireless IT Spending	7,756	9,018	10,490	12,207	14,212	16,555	16.4%
External Wireless IT Spending	5,810	6,939	8,277	9,836	11,702	13,904	19.1%
Business Support Systems	2,402	2,875	3,435	4,088	4,869	5,791	19.2%
Fraud Management	250	298	355	420	498	590	18.7%
Billing & Records	992	1,186	1,416	1,684	2,006	2,386	19.2%
Customer Assistance	713	854	1,020	1,213	1,443	1,715	19.2%
Marketing & Sales	447	537	645	771	922	1,101	19.8%
Operations Support Systems	1,682	2,012	2,402	2,856	3,398	4,036	19.1%
Planning & Engineering	216	261	314	376	451	540	20.1%
Provisioning	340	412	498	599	721	866	20.5%
Inventory Management	163	194	230	272	321	379	18.4%
Workforce Management	74	87	102	120	140	164	17.4%
Message Collection	562	674	807	962	1,148	1,367	19.4%
Network Management	326	384	451	528	617	721	17.2%
Intelligent Network Automation	1,024	1,247	1,516	1,836	2,225	2,690	21.3%
Corporate Administration	523	613	717	835	974	1,134	16.7%
Other Wireless Spending	180	193	207	221	236	252	7.0%





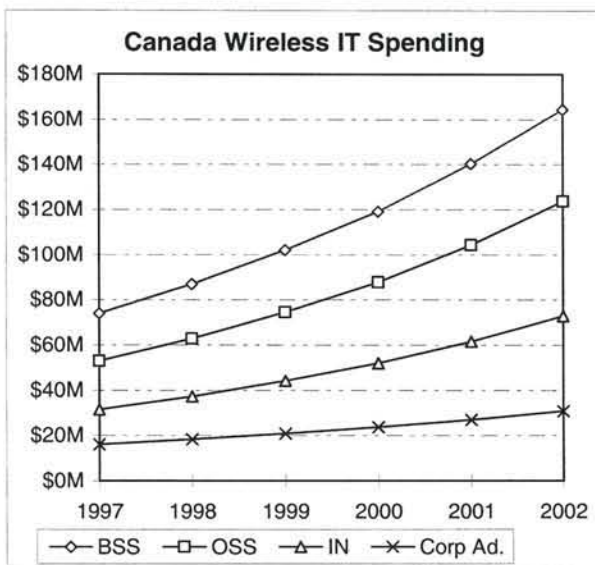
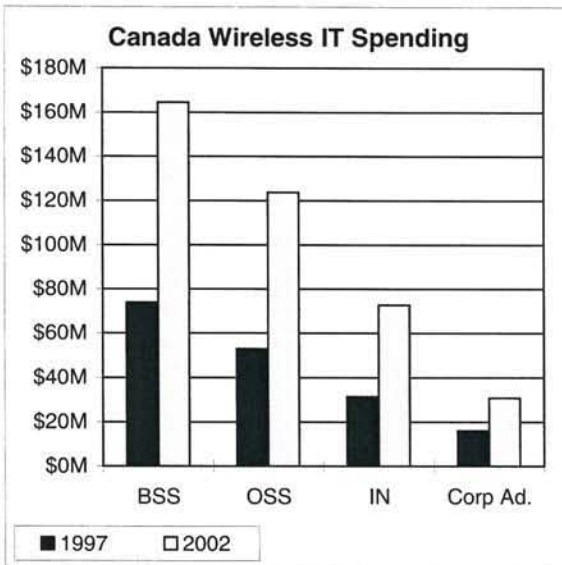
## United States Wireless IT Spending (in \$ millions)

United States	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	17,670	19,544	21,615	23,902	26,429	29,219	10.6%
Wireless IT Spending	3,054	3,559	4,147	4,833	5,632	6,563	16.5%
External Wireless IT Spending	2,285	2,742	3,283	3,912	4,663	5,547	19.4%
Business Support Systems	958	1,155	1,390	1,665	1,994	2,382	20.0%
Fraud Management	129	154	183	217	257	303	18.7%
Billing & Records	363	436	524	625	746	888	19.6%
Customer Assistance	290	351	424	510	613	735	20.4%
Marketing & Sales	176	214	260	313	378	455	20.9%
Operations Support Systems	656	784	935	1,110	1,317	1,559	18.9%
Planning & Engineering	77	94	113	136	163	196	20.4%
Provisioning	118	144	174	209	252	302	20.6%
Inventory Management	60	72	85	101	119	141	18.6%
Workforce Management	28	33	39	46	54	63	17.3%
Message Collection	237	283	337	400	474	561	18.8%
Network Management	135	159	186	218	254	296	17.1%
Intelligent Network Automation	399	486	591	715	864	1,043	21.2%
Corporate Administration	205	242	286	335	393	459	17.5%
Other Spending	67	74	81	88	96	104	9.1%



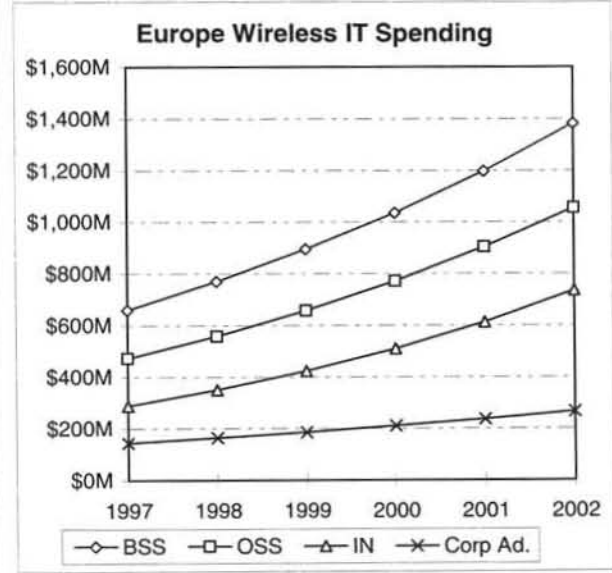
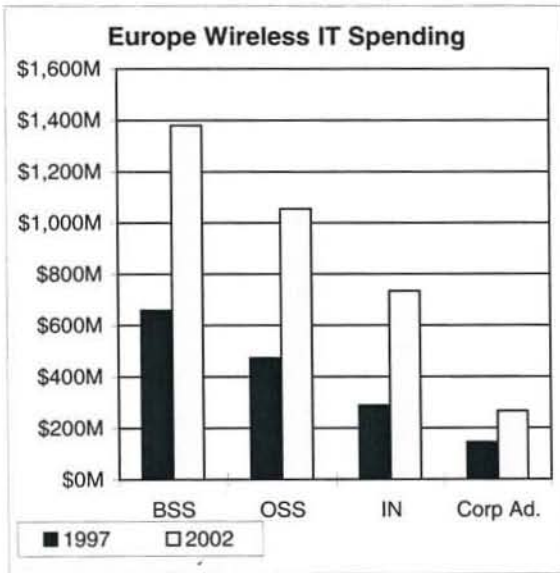
## Canada Wireless IT Spending (in \$ millions)

Canada	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	1,468	1,601	1,748	1,910	2,089	2,287	9.3%
Wireless IT Spending	237	271	309	354	404	462	14.3%
External Wireless IT Spending	180	212	249	290	341	401	17.3%
Business Support Systems	74	87	102	119	140	165	17.3%
Fraud Management	10	12	14	16	19	22	17.5%
Billing & Records	28	33	38	44	52	60	16.5%
Customer Assistance	22	26	31	36	43	50	17.6%
Marketing & Sales	14	16	19	23	27	32	18.5%
Operations Support Systems	53	63	75	88	104	124	18.5%
Planning & Engineering	7	8	9	11	13	15	18.2%
Provisioning	9	11	13	16	19	23	19.3%
Inventory Management	5	6	7	8	10	11	18.6%
Workforce Management	2	3	3	4	4	5	18.3%
Message Collection	19	22	27	31	37	44	18.8%
Network Management	11	13	15	18	21	25	17.5%
Intelligent Network Automation	31	37	44	52	62	73	18.3%
Corporate Administration	16	18	21	24	27	31	13.9%
Other Spending	6	6	7	8	8	9	8.0%



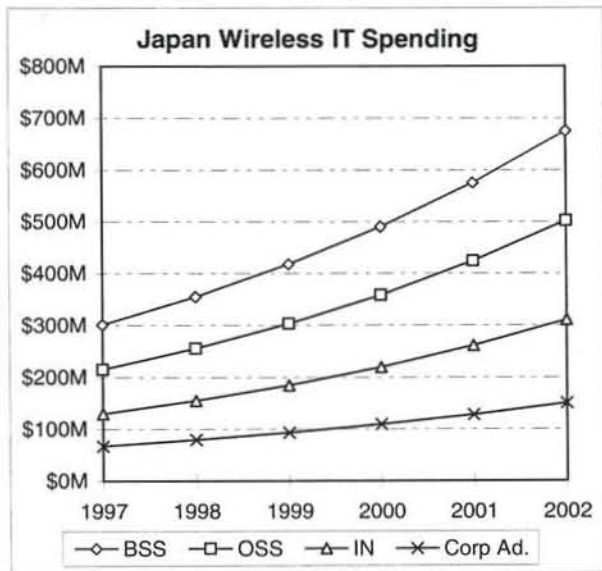
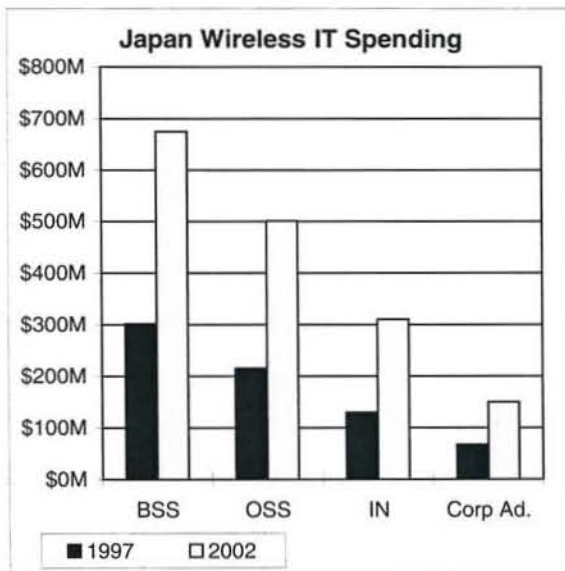
## Europe Wireless IT Spending (in \$ millions)

Europe	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	14,198	15,548	17,027	18,646	20,419	22,361	9.5%
Wireless IT Spending	2,087	2,383	2,720	3,105	3,545	4,046	14.2%
External Wireless IT Spending	1,616	1,894	2,215	2,581	3,006	3,496	16.7%
Business Support Systems	660	769	894	1,035	1,197	1,381	15.9%
Fraud Management	41	46	53	60	68	76	13.4%
Billing & Records	297	346	401	464	535	616	15.7%
Customer Assistance	198	233	272	317	368	427	16.6%
Marketing & Sales	123	144	168	195	226	261	16.2%
Operations Support Systems	472	558	657	770	903	1,055	17.4%
Planning & Engineering	65	78	92	108	127	149	18.0%
Provisioning	104	125	149	178	212	252	19.3%
Inventory Management	49	57	67	78	91	106	16.6%
Workforce Management	23	27	32	37	43	50	16.5%
Message Collection	138	163	192	224	263	306	17.3%
Network Management	93	108	125	145	167	192	15.7%
Intelligent Network Automation	288	350	423	509	612	734	20.5%
Corporate Administration	144	164	186	210	237	266	13.0%
Other Spending	52	53	55	57	58	60	3.0%



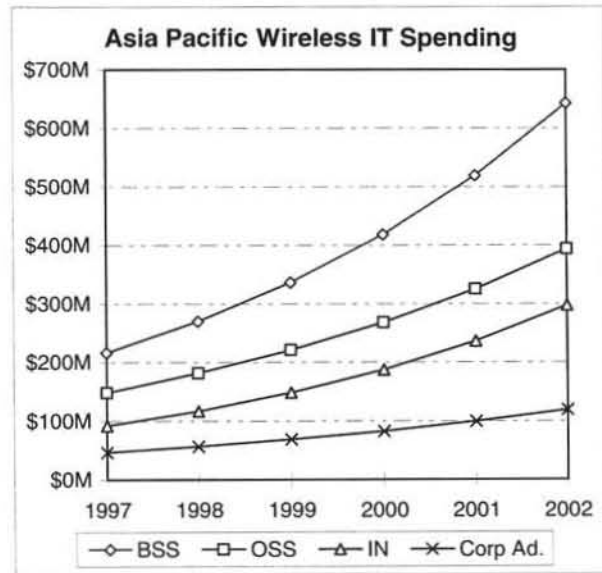
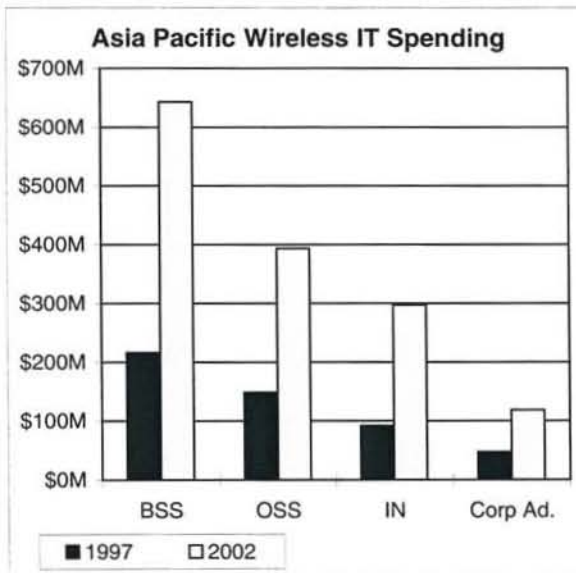
## Japan Wireless IT Spending (in \$ millions)

Japan	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	8,009	8,744	9,557	10,456	11,454	12,561	9.4%
Wireless IT Spending	1,231	1,411	1,618	1,855	2,127	2,439	14.7%
External Wireless IT Spending	738	870	1,026	1,204	1,418	1,669	17.7%
Business Support Systems	302	355	418	490	575	675	17.5%
Fraud Management	21	24	28	33	38	44	16.4%
Billing & Records	137	161	190	222	260	305	17.3%
Customer Assistance	87	103	121	142	166	195	17.4%
Marketing & Sales	56	67	79	93	111	131	18.5%
Operations Support Systems	215	256	303	358	424	502	18.4%
Planning & Engineering	30	35	42	50	60	71	19.1%
Provisioning	49	59	70	84	101	120	19.7%
Inventory Management	23	28	33	38	45	53	17.8%
Workforce Management	10	12	14	16	19	23	17.6%
Message Collection	61	73	86	102	121	143	18.4%
Network Management	42	49	58	67	78	91	16.8%
Intelligent Network Automation	130	155	185	219	261	311	19.1%
Corporate Administration	67	79	93	109	128	150	17.3%
Other Spending	24	25	27	28	30	32	5.9%



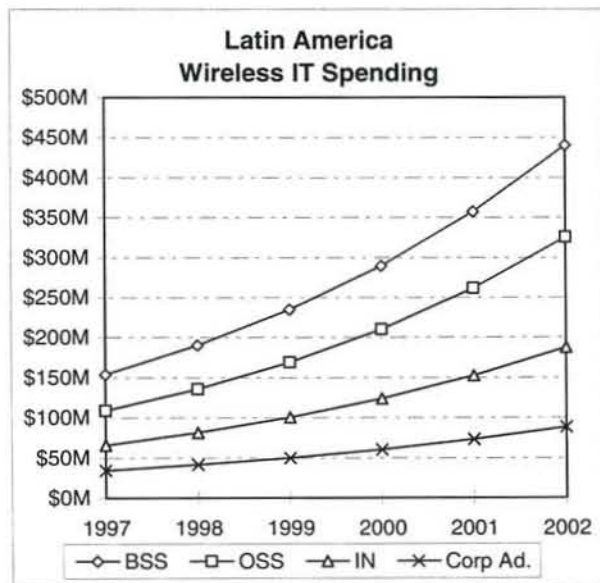
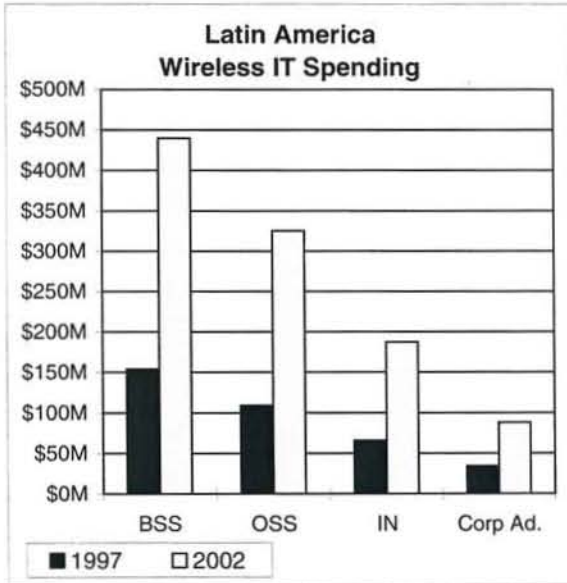
## Asia Pacific Wireless IT Spending (in \$ millions)

Asia Pacific	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	2,721	3,068	3,467	3,924	4,452	5,060	13.2%
Wireless IT Spending	640	774	937	1,133	1,371	1,659	21.0%
External Wireless IT Spending	521	644	795	977	1,202	1,477	23.2%
Business Support Systems	216	270	337	418	519	643	24.3%
Fraud Management	22	27	33	40	48	58	21.4%
Billing & Records	87	110	138	174	219	275	26.0%
Customer Assistance	65	81	99	122	149	183	22.8%
Marketing & Sales	42	53	66	83	103	127	24.6%
Operations Support Systems	149	181	221	268	325	394	21.5%
Planning & Engineering	20	25	31	37	46	56	22.3%
Provisioning	30	37	45	55	67	81	21.9%
Inventory Management	14	17	21	25	31	37	20.8%
Workforce Management	5	6	7	9	10	12	18.7%
Message Collection	52	64	78	95	116	141	22.3%
Network Management	27	32	39	47	56	66	19.9%
Intelligent Network Automation	92	117	148	187	236	297	26.4%
Corporate Administration	47	57	69	82	99	119	20.3%
Other Spending	17	18	20	22	23	25	8.4%



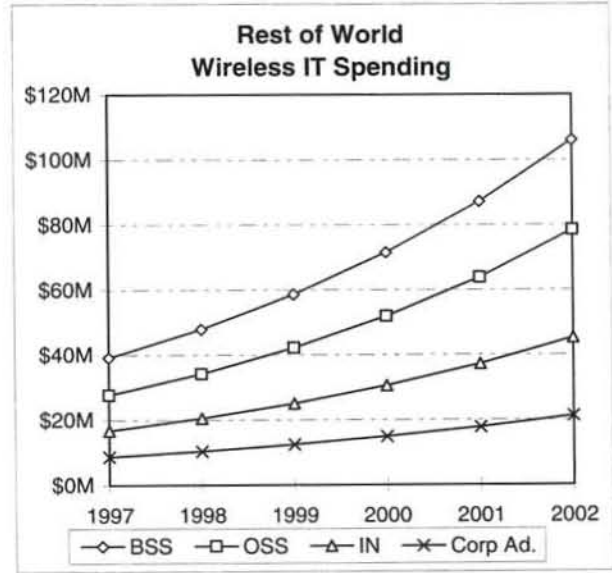
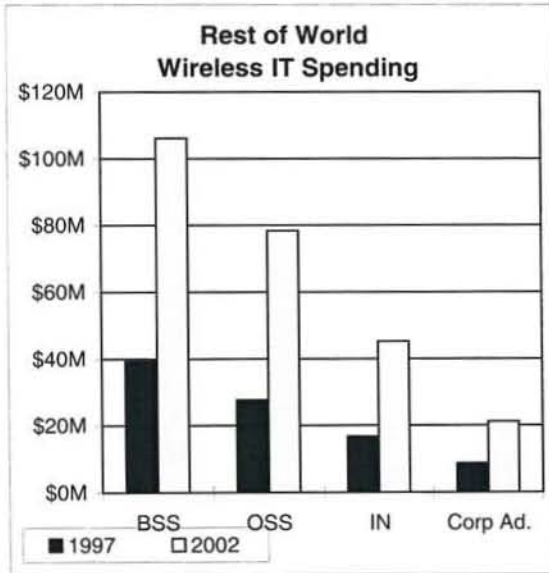
## Latin America Wireless IT Spending (in \$ millions)

Latin America	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	1,581	1,822	2,077	2,340	2,610	2,879	12.7%
Wireless IT Spending	402	494	605	743	911	1,117	22.7%
External Wireless IT Spending	375	461	568	699	861	1,059	23.1%
Business Support Systems	154	190	235	290	357	440	23.4%
Fraud Management	23	28	35	44	56	69	25.2%
Billing & Records	64	80	100	126	157	196	25.0%
Customer Assistance	39	47	57	69	83	100	20.6%
Marketing & Sales	28	34	42	51	62	76	21.8%
Operations Support Systems	109	136	169	210	262	325	24.5%
Planning & Engineering	14	17	21	27	34	43	25.8%
Provisioning	23	29	37	46	57	71	24.8%
Inventory Management	9	11	14	17	21	25	22.3%
Workforce Management	4	4	5	6	7	9	19.6%
Message Collection	44	56	70	88	110	138	25.4%
Network Management	15	18	22	27	33	40	22.1%
Intelligent Network Automation	66	81	100	124	152	188	23.3%
Corporate Administration	34	41	50	60	73	88	20.8%
Other Spending	12	13	14	15	17	18	9.8%



## Rest of World Wireless IT Spending (in \$ millions)

Rest of World	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	1,038	1,154	1,283	1,426	1,585	1,761	11.1%
Wireless IT Spending	105	126	153	184	222	269	20.7%
External Wireless IT Spending	95	116	142	172	210	255	21.8%
Business Support Systems	39	48	59	71	87	106	22.0%
Fraud Management	6	7	9	11	14	17	23.9%
Billing & Records	16	19	24	30	37	45	23.7%
Customer Assistance	10	12	15	17	21	25	19.3%
Marketing & Sales	7	9	11	13	16	19	20.5%
Operations Support Systems	28	34	42	52	64	78	23.1%
Planning & Engineering	3	4	5	7	8	10	24.4%
Provisioning	6	7	9	11	14	17	23.5%
Inventory Management	2	3	3	4	5	6	21.0%
Workforce Management	1	1	1	2	2	2	18.3%
Message Collection	11	14	18	22	27	33	24.1%
Network Management	4	5	6	7	8	10	20.8%
Intelligent Network Automation	17	20	25	31	37	45	21.9%
Corporate Administration	9	10	12	15	18	21	19.5%
Other Spending	3	3	3	4	4	4	8.6%



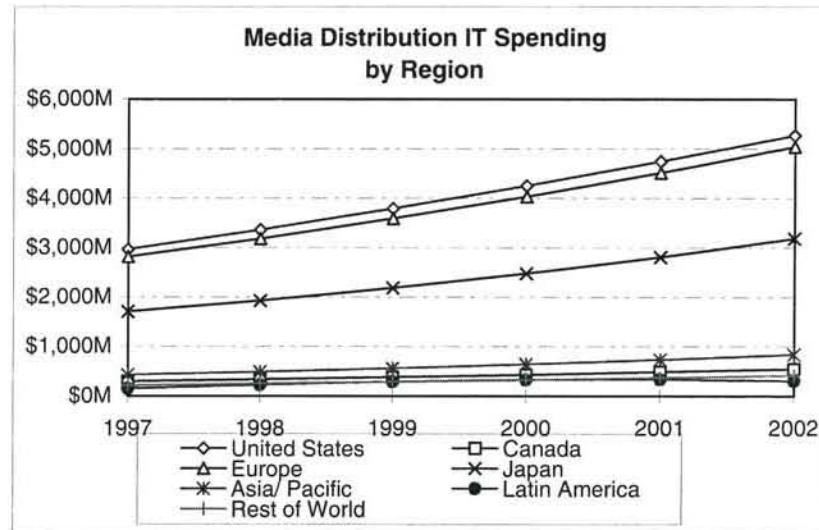
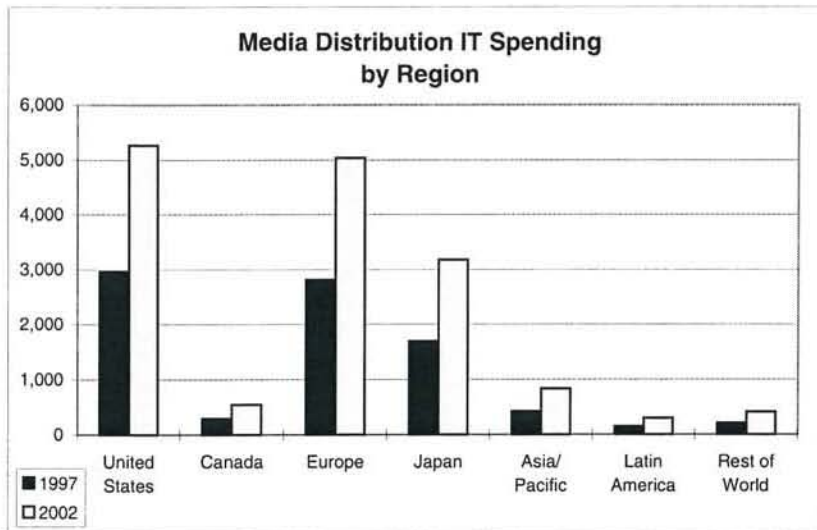
# **VI. Media Distribution Segment - Process/ Application Level**





### Media Distribution Industry IT Spending Regional Analysis (in \$ millions)

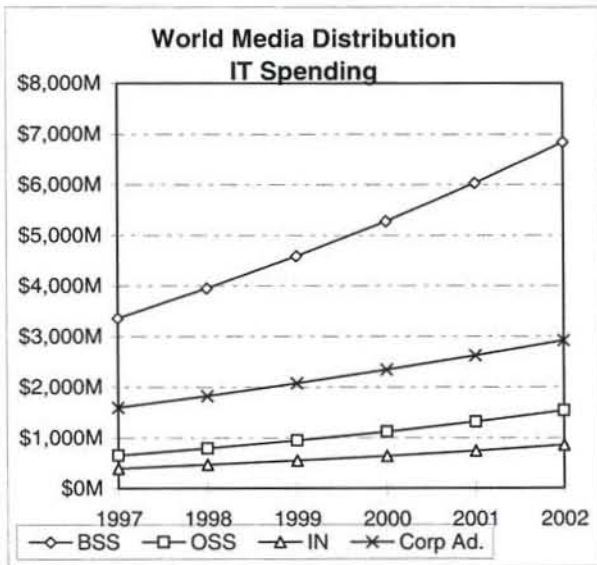
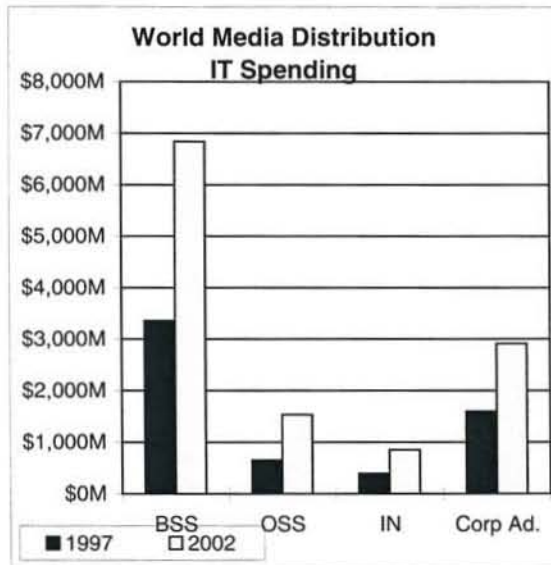
Total IT Media Dist. Industry*	1997	1998	1999	2000	2001	2002	AAGR
World	8,538	9,741	11,046	12,454	13,962	15,568	12.8%
United States	2,960	3,358	3,788	4,251	4,744	5,267	12.2%
Canada	296	334	377	426	481	543	12.9%
Europe	2,809	3,177	3,582	4,026	4,511	5,039	12.4%
Japan	1,696	1,923	2,181	2,473	2,804	3,180	13.4%
Asia/ Pacific	422	483	554	635	727	833	14.6%
Latin America	146	222	284	324	333	297	15.3%
Rest of World	211	244	280	319	362	408	14.0%



\* IT Spending includes hardware, software, external services and internal services.

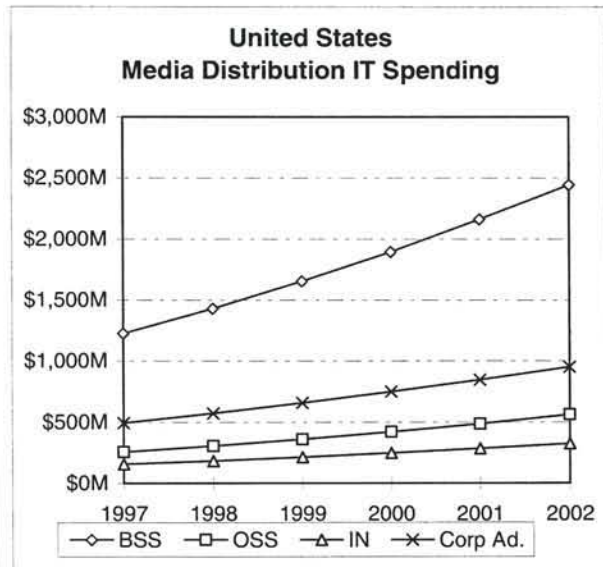
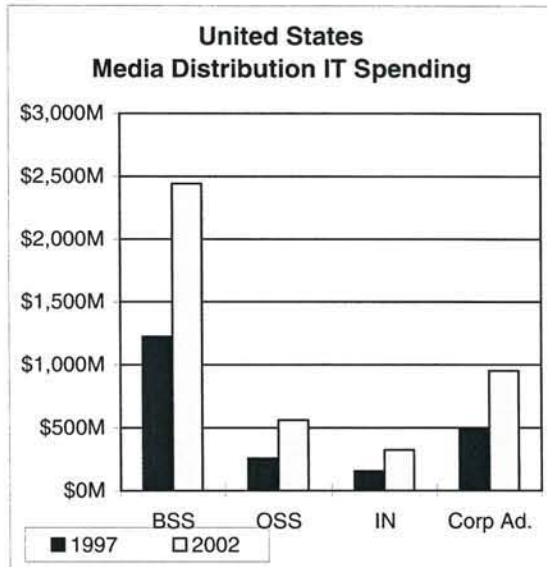
## World Media Distribution IT Spending (in \$ millions)

World	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	46,686	51,482	56,772	62,605	69,037	76,130	10.3%
Media Distribution IT Spending	8,538	9,741	11,046	12,454	13,962	15,568	12.8%
External IT Spending	6,307	7,398	8,602	9,897	11,327	12,866	15.3%
Business Support Systems	3,359	3,950	4,589	5,275	6,030	6,840	15.3%
Billing & Records	1,548	1,831	2,121	2,430	2,768	3,125	15.1%
Customer Assistance	1,085	1,272	1,486	1,717	1,973	2,252	15.7%
Marketing & Sales	727	847	982	1,128	1,289	1,463	15.0%
Operations Support Systems	652	789	943	1,116	1,313	1,533	18.6%
Planning & Engineering	160	196	239	287	343	406	20.6%
Provisioning	72	87	104	123	145	169	18.6%
Inventory Management	107	129	153	180	210	243	17.8%
Workforce Management	158	191	228	269	316	369	18.5%
Network Management	155	186	220	257	299	345	17.3%
Intelligent Network Automation	389	464	548	639	741	853	17.0%
Corporate Administration	1,597	1,821	2,075	2,338	2,621	2,914	12.8%
Other Spending	308	374	447	529	622	726	18.7%



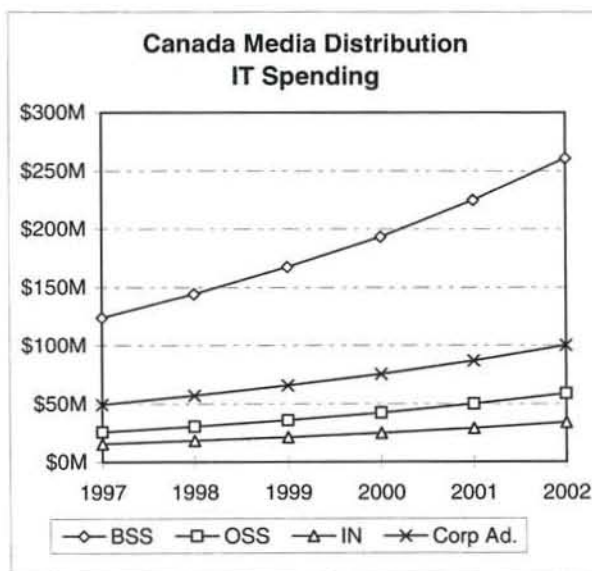
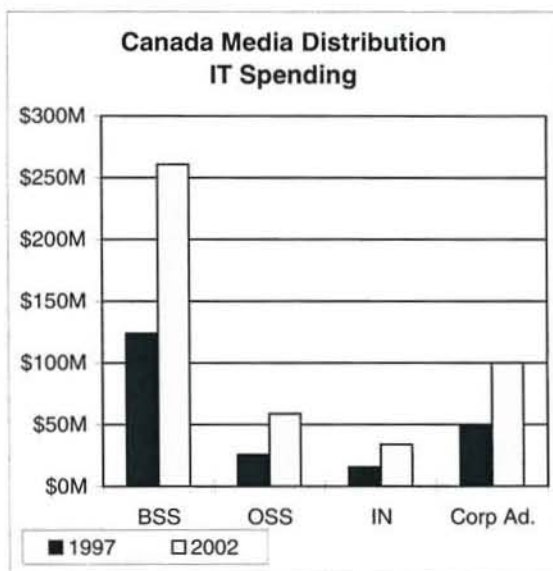
## United States Media Distribution IT Spending (in \$ millions)

United States	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	17,670	19,544	21,615	23,902	26,429	29,219	10.6%
Media Distribution IT Spending	2,960	3,358	3,788	4,251	4,744	5,267	12.2%
External IT Spending	2,215	2,587	2,998	3,441	3,928	4,451	15.0%
Business Support Systems	1,226	1,430	1,654	1,896	2,160	2,443	14.8%
Billing & Records	525	607	696	790	892	1,000	13.8%
Customer Assistance	419	493	576	666	765	873	15.8%
Marketing & Sales	282	330	383	440	502	570	15.1%
Operations Support Systems	257	305	360	420	487	561	16.9%
Planning & Engineering	62	74	88	104	122	142	18.3%
Provisioning	28	33	38	45	52	60	16.7%
Inventory Management	43	50	59	68	79	90	16.0%
Workforce Management	64	77	90	106	123	142	17.1%
Network Management	61	72	84	97	111	127	15.8%
Intelligent Network Automation	156	184	214	248	284	324	15.7%
Corporate Administration	495	573	658	749	847	952	14.0%
Other Spending	81	95	112	130	150	171	16.3%



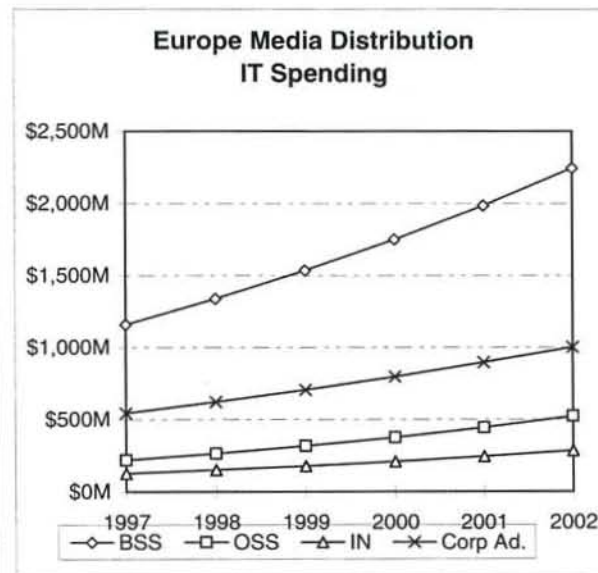
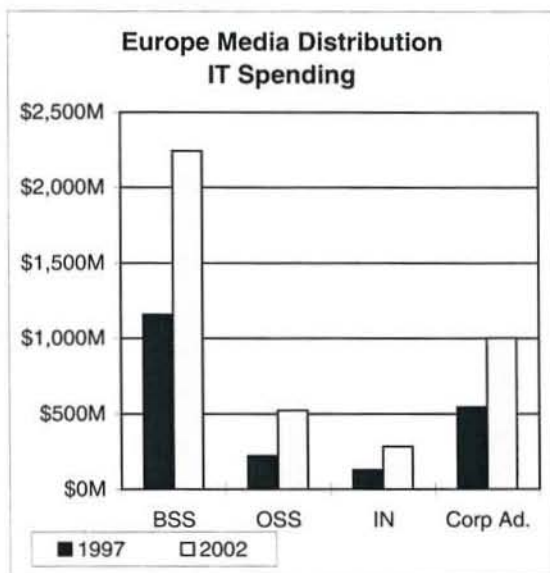
## Canada Media Distribution IT Spending (in \$ millions)

Canada	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	1,468	1,601	1,748	1,910	2,089	2,287	9.3%
Media Distribution IT Spending	296	334	377	426	481	543	12.9%
External IT Spending	223	259	302	349	406	472	16.2%
Business Support Systems	124	144	167	193	225	261	16.1%
Billing & Records	53	61	70	80	93	106	15.0%
Customer Assistance	42	49	58	68	79	93	17.2%
Marketing & Sales	29	34	39	45	53	61	16.5%
Operations Support Systems	26	30	36	42	50	59	18.0%
Planning & Engineering	6	7	9	10	13	15	19.9%
Provisioning	3	3	4	4	5	6	17.8%
Inventory Management	4	5	6	7	8	9	17.1%
Workforce Management	6	8	9	10	12	15	18.1%
Network Management	6	7	8	10	11	13	16.8%
Intelligent Network Automation	16	18	21	25	29	34	16.9%
Corporate Administration	49	57	66	75	87	100	15.1%
Other Spending	8	10	11	13	15	18	17.5%



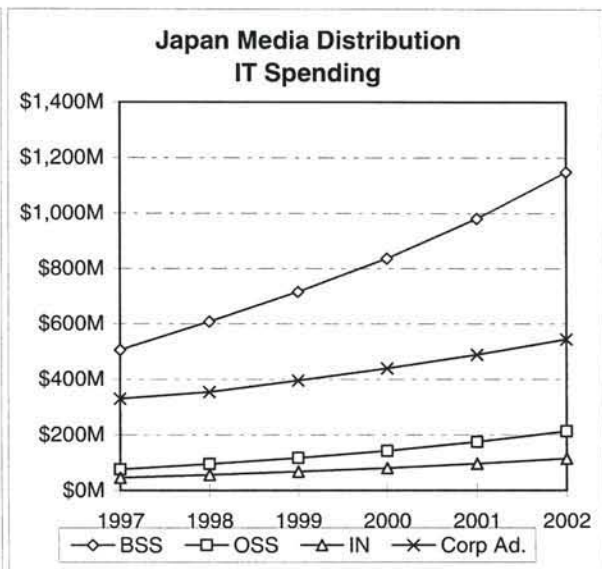
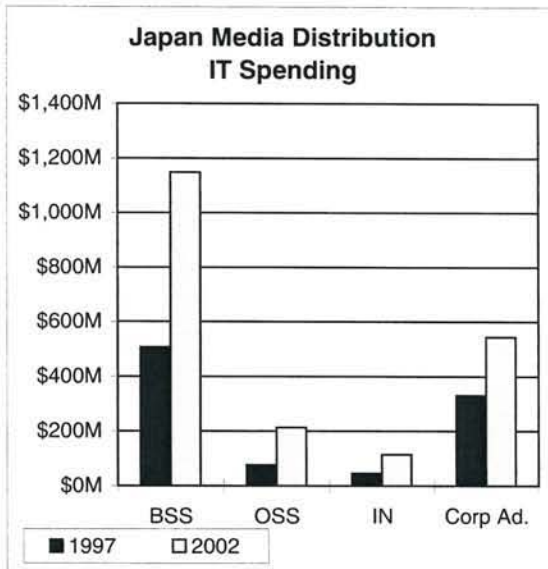
## Europe Media Distribution IT Spending (in \$ millions)

Europe	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	14,198	15,548	17,027	18,646	20,419	22,361	9.5%
Media Distribution IT Spending	2,809	3,177	3,582	4,026	4,511	5,039	12.4%
External IT Spending	2,183	2,533	2,925	3,352	3,832	4,358	14.8%
Business Support Systems	1,158	1,337	1,535	1,748	1,985	2,243	14.1%
Billing & Records	540	637	730	831	943	1,065	14.6%
Customer Assistance	372	424	490	562	643	731	14.5%
Marketing & Sales	247	277	315	355	399	446	12.6%
Operations Support Systems	220	264	316	375	444	522	18.9%
Planning & Engineering	52	64	78	94	113	135	20.9%
Provisioning	23	28	34	40	47	55	18.7%
Inventory Management	36	43	51	60	71	82	17.8%
Workforce Management	54	65	78	93	110	130	19.0%
Network Management	54	64	75	88	103	120	17.5%
Intelligent Network Automation	127	151	178	208	243	283	17.4%
Corporate Administration	545	622	707	797	896	1,002	13.0%
Other Spending	133	159	189	224	264	309	18.4%



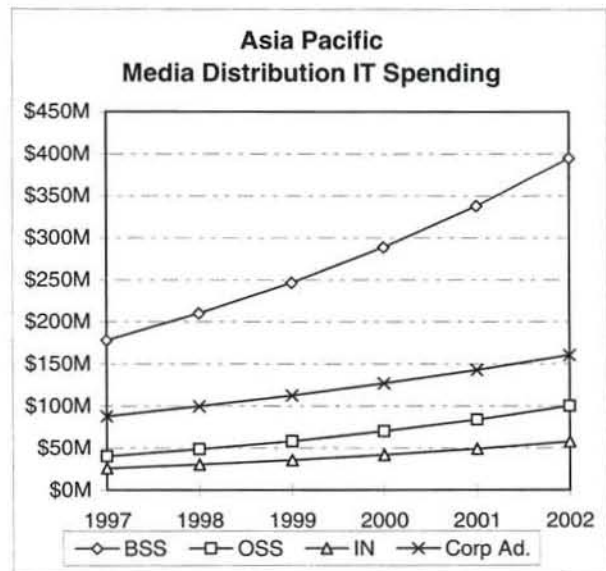
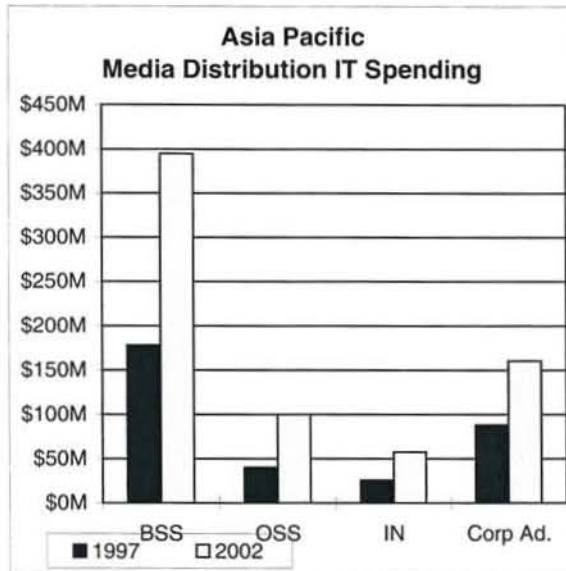
## Japan Media Distribution IT Spending (in \$ millions)

Japan	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	8,009	8,744	9,557	10,456	11,454	12,561	9.4%
Media Distribution IT Spending	1,696	1,923	2,181	2,473	2,804	3,180	13.4%
External IT Spending	1,016	1,185	1,382	1,604	1,869	2,175	16.4%
Business Support Systems	506	608	715	836	981	1,148	17.8%
Billing & Records	246	293	342	397	462	537	16.9%
Customer Assistance	157	190	224	262	308	362	18.2%
Marketing & Sales	103	126	150	177	210	249	19.3%
Operations Support Systems	76	95	117	143	175	213	22.8%
Planning & Engineering	19	24	30	38	47	58	24.9%
Provisioning	9	11	13	16	20	24	22.6%
Inventory Management	13	17	20	24	30	36	21.6%
Workforce Management	18	23	28	34	42	51	22.9%
Network Management	17	21	25	30	36	44	21.3%
Intelligent Network Automation	46	56	68	81	96	115	20.1%
Corporate Administration	330	354	395	439	489	544	10.5%
Other Spending	57	71	87	105	128	156	22.3%



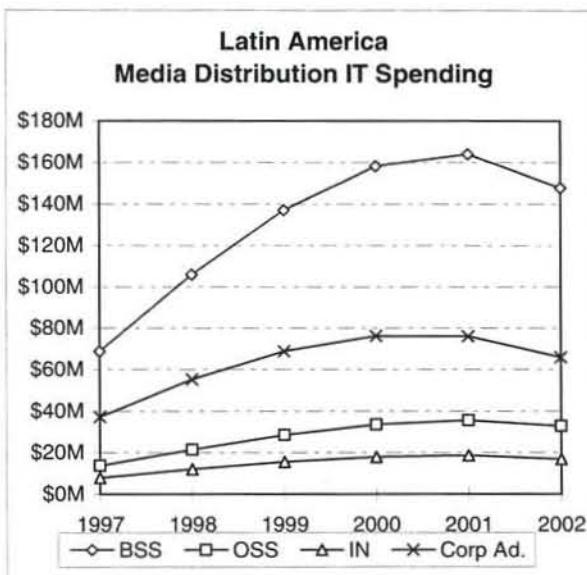
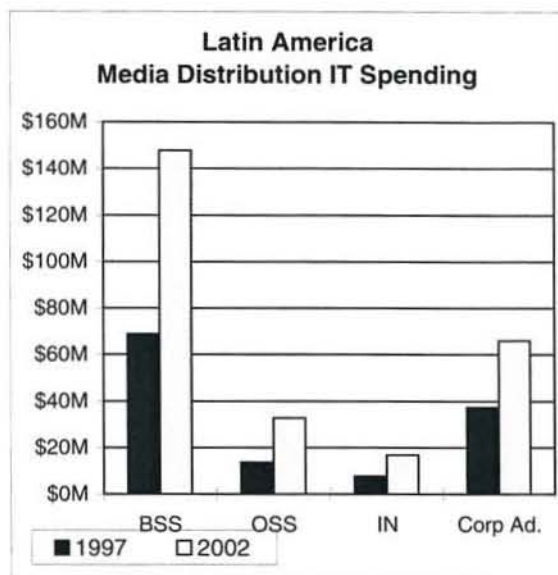
## Asia Pacific Media Distribution IT Spending (in \$ millions)

Asia Pacific	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	2,721	3,068	3,467	3,924	4,452	5,060	13.2%
Media Distribution IT Spending	422	483	554	635	727	833	14.6%
External IT Spending	343	401	469	546	636	740	16.6%
Business Support Systems	178	210	247	289	338	395	17.3%
Billing & Records	95	113	134	158	187	220	18.3%
Customer Assistance	48	56	65	76	88	102	16.0%
Marketing & Sales	35	40	47	55	64	74	16.2%
Operations Support Systems	40	48	58	70	84	100	20.0%
Planning & Engineering	11	14	17	21	25	31	22.7%
Provisioning	5	6	7	9	11	13	20.7%
Inventory Management	6	7	9	10	12	15	19.9%
Workforce Management	8	10	11	13	16	18	17.3%
Network Management	10	12	14	16	19	23	18.4%
Intelligent Network Automation	26	30	36	42	49	58	17.4%
Corporate Administration	88	100	112	127	143	160	12.8%
Other Spending	11	13	16	19	22	27	19.5%



## Latin America Media Distribution IT Spending (in \$ millions)

Latin America	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	1,581	1,822	2,077	2,340	2,610	2,879	12.7%
Media Distribution IT Spending	146	222	284	324	333	297	15.3%
External IT Spending	136	207	266	305	315	282	15.8%
Business Support Systems	69	106	137	158	164	148	16.5%
Billing & Records	37	58	75	87	91	83	17.5%
Customer Assistance	19	29	37	42	43	38	15.2%
Marketing & Sales	13	20	25	29	30	26	15.4%
Operations Support Systems	14	21	28	34	36	33	19.2%
Planning & Engineering	4	6	8	10	11	10	21.9%
Provisioning	2	3	4	4	5	4	19.8%
Inventory Management	2	3	4	5	5	5	19.1%
Workforce Management	3	4	5	6	6	6	16.5%
Network Management	3	5	7	8	8	8	17.6%
Intelligent Network Automation	8	12	16	18	19	17	16.6%
Corporate Administration	37	55	69	76	76	66	12.0%
Other Spending	8	13	17	19	21	19	18.7%





## Rest of World Media Distribution IT Spending (in \$ millions)

Rest of World	1997	1998	1999	2000	2001	2002	AAGR%
Communications IT Spending	1,038	1,154	1,283	1,426	1,585	1,761	11.1%
Media Distribution IT Spending	211	244	280	319	362	408	14.0%
External IT Spending	192	224	260	299	341	387	15.1%
Business Support Systems	98	115	134	155	178	203	15.8%
Billing & Records	52	62	73	86	99	114	16.8%
Customer Assistance	27	31	36	41	47	53	14.5%
Marketing & Sales	18	21	25	28	32	36	14.7%
Operations Support Systems	19	23	28	33	39	45	18.4%
Planning & Engineering	5	7	8	10	12	14	21.1%
Provisioning	2	3	4	4	5	6	19.1%
Inventory Management	3	3	4	5	6	6	18.4%
Workforce Management	4	4	5	6	7	8	15.8%
Network Management	5	6	7	8	9	11	16.9%
Intelligent Network Automation	11	13	15	18	20	23	15.9%
Corporate Administration	53	60	67	75	83	91	11.4%
Other Spending	11	14	16	19	22	26	18.0%

