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MARKET FORECAST

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Worldwide Information  
Services Forecast

1993-1998

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U.S. Market Analysis Program



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# Worldwide Information Services Forecast 1993-1998

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# Abstract

This report provides a comprehensive look at the worldwide information services industry with growth rate projections for the period 1993 through 1998. Market size and opportunities are analyzed for the eight delivery modes used by INPUT: Professional services, systems integration, systems operations, processing services, network services, systems software products, applications software products and turnkey systems.

The report provides forecasts of user expenditures for information services in 30 countries or geographic areas in North America, Europe (Western and Eastern), Asia and the Pacific, Latin America and the Middle East and Africa. Leading information services vendors are identified in many of the countries.

For each country or geographic area, the report analyzes user expenditures for each of the eight delivery modes that INPUT uses in all information services market forecasts and analyses.

The report provides an overview of each market (regional or national) including the driving forces and inhibiting factors impacting the local information services industry. The report provides a number of considerations for market entry or expansion in each country or area, as well as a number of recommendations for increasing the market effectiveness of companies in foreign countries.

This report contains 394 pages, including 253 exhibits.

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**U.S. Information Services Market  
Analysis Program**

***Worldwide Information Services  
Forecast, 1993-1998***

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# Table of Contents

---

<b>I</b>	Introduction	I-1
	A. Purpose and Scope	I-1
	B. Methodology	I-3
	1. Research/Analysis Methodology	I-3
	2. Forecasts and Inflation	I-4
	C. Report Structure	I-5
	D. Related Reports	I-7

---

<b>II</b>	Worldwide Summary	II-1
	A. Global Business Environment	II-1
	B. Driving Forces	II-2
	C. Information Services Market Forecast	II-5
	1. Worldwide Summary	II-5
	2. Delivery Mode Forecast	II-7
	3. Geographic Distribution	II-8
	4. Regional Area Comparison	II-10

---

<b>III</b>	Regional Summary—Asia/Pacific	III-1
	A. Regional Overview	III-1
	1. Driving Forces	III-2
	2. Inhibiting Factors	III-3
	B. Information Services Market Forecast	III-4
	C. Market Considerations	III-12
	D. IT Spending	III-13

## IV

Regional Summary—Europe	IV-1
A. Regional Overview	IV-1
1. Return To Modest Growth Predicted	IV-1
2. Industry Driving Forces	IV-2
a. Open Systems Client/Server	IV-2
b. Systems Consolidation	IV-2
c. Outsourcing	IV-4
B. Information Services Market Forecast	IV-4
C. Market Considerations	IV-7
D. IT Spending	IV-9

## V

Regional Summary—Latin America	V-1
A. Regional Overview	V-1
1. Driving Forces	V-4
2. Inhibiting Factors	V-5
B. Information Services Market Forecast	V-5
C. Market Considerations	V-9
D. IT Spending	V-11

## VI

Regional Summary—Middle East/Africa	VI-1
A. Regional Overview	VI-1
1. Africa	VI-1
a. Driving Forces	VI-4
b. Inhibiting Factors	VI-5
2. Middle East	VI-6
a. Driving Forces	VI-9
b. Inhibiting Factors	VI-10
B. Information Services Market Forecast	VI-11
C. Market Considerations	VI-15
D. IT Spending	VI-15

## VII

Regional Summary—North America	VII-1
A. Regional Overview	VII-1
B. Information Services Market Forecast	VII-3
C. Market Considerations	VII-7
D. IT Spending	VII-8

## VIII

<b>National Profiles</b>	VIII-1
<b>A. Introduction</b>	VIII-1
<b>B. Argentina</b>	VIII-2
1. National Overview	VIII-2
a. Driving Forces	VIII-5
b. Inhibiting Factors	VIII-6
2. Information Services Market Forecast	VIII-6
3. Market Considerations	VIII-11
4. IT Spending	VIII-12
<b>C. Australia</b>	VIII-15
1. National Overview	VIII-15
a. Driving Forces	VIII-16
b. Inhibiting Factors	VIII-17
2. Information Services Market Forecast	VIII-17
3. Market Considerations	VIII-21
4. IT Spending	VIII-23
<b>D. Austria</b>	VIII-25
1. National Overview	VIII-25
2. Information Services Market Forecast	VIII-25
3. Market Considerations	VIII-27
4. IT Spending	VIII-29
<b>E. Belgium</b>	VIII-32
1. National Overview	VIII-32
2. Information Services Market Forecast	VIII-33
3. Market Considerations	VIII-34
4. IT Spending	VIII-35
<b>F. Brazil</b>	VIII-38
1. National Overview	VIII-38
a. Driving Forces	VIII-40
b. Inhibiting Factors	VIII-41
2. Information Services Market Forecast	VIII-42
3. Market Considerations	VIII-47
4. IT Spending	VIII-49
<b>G. Canada</b>	VIII-52
1. National Overview	VIII-52
a. Driving Forces	VIII-53
b. Inhibiting Factors	VIII-54
2. Information Services Market Forecast	VIII-54
3. Market Considerations	VIII-57
4. IT Spending	VIII-57

## VIII

<b>H. Denmark</b>	VIII-60
1. National Overview	VIII-60
2. Information Services Market Forecast	VIII-60
3. Market Considerations	VIII-63
4. IT Spending	VIII-64
<b>I. Eastern Europe</b>	VIII-67
1. National Overview	VIII-67
2. Information Services Market Forecast	VIII-68
3. Market Considerations	VIII-71
4. IT Spending	VIII-72
<b>J. Finland</b>	VIII-74
1. National Overview	VIII-74
2. Information Services Market Forecast	VIII-74
3. Market Considerations	VIII-77
4. IT Spending	VIII-78
<b>K. France</b>	VIII-81
1. National Overview	VIII-81
2. Information Services Market Forecast	VIII-82
3. Market Considerations	VIII-84
4. IT Spending	VIII-86
<b>L. Germany</b>	VIII-89
1. National Overview	VIII-89
2. Information Services Market Forecast	VIII-90
3. Market Considerations	VIII-93
4. IT Spending	VIII-95
<b>M. Hong Kong</b>	VIII-97
1. National Overview	VIII-97
a. Driving Forces	VIII-98
b. Inhibiting Factors	VIII-99
2. Information Services Market Forecast	VIII-100
3. Market Considerations	VIII-105
4. IT Spending	VIII-106
<b>N. India</b>	VIII-109
1. National Overview	VIII-109
a. Driving Forces	VIII-110
b. Inhibiting Factors	VIII-111
2. Information Services Market Forecast	VIII-112
3. Market Considerations	VIII-116
4. IT Spending	VIII-117

## VIII

<b>O.</b>	Italy	VIII-120
	1. National Overview	VIII-120
	2. Information Services Market Forecast	VIII-121
	3. Market Considerations	VIII-123
	4. IT Spending	VIII-124
<b>P.</b>	Japan	VIII-127
	1. National Overview	VIII-127
	a. Driving Forces	VIII-128
	b. Inhibiting Factors	VIII-129
	2. Information Services Market Forecast	VIII-130
	3. Market Considerations	VIII-135
	4. IT Spending	VIII-137
<b>Q.</b>	Mexico	VIII-139
	1. National Overview	VIII-139
	a. Driving Forces	VIII-142
	b. Inhibiting Factors	VIII-144
	2. Information Services Market Forecast	VIII-145
	3. Market Considerations	VIII-150
	4. IT Spending	VIII-152
<b>R.</b>	The Netherlands	VIII-155
	1. National Overview	VIII-155
	2. Information Services Market Forecast	VIII-155
	3. Market Considerations	VIII-157
	4. IT Spending	VIII-159
<b>S.</b>	New Zealand	VIII-162
	C National Overview	VIII-162
	a. Driving Forces	VIII-163
	b. Inhibiting Factors	VIII-164
	2. Information Services Market Forecast	VIII-165
	3. Market Considerations	VIII-168
	4. IT Spending	VIII-169
<b>T.</b>	Norway	VIII-172
	1. National Overview	VIII-172
	2. Information Services Market Forecast	VIII-172
	3. Market Considerations	VIII-175
	4. IT Spending	VIII-176

## VIII

U. Other Asia/Pacific	VIII-179
1. Overview	VIII-179
a. Driving Forces	VIII-180
b. Inhibiting Factors	VIII-181
2. Information Services Market Forecast	VIII-182
3. Market Considerations	VIII-186
4. IT Spending	VIII-186
V. Other Europe	VIII-188
1. Overview	VIII-188
2. Information Services Market Forecast	VIII-189
W. Other Latin America	VIII-201
1. Overview	VIII-201
2. Information Services Market Forecast	VIII-204
4. IT Spending	VIII-207
X. Singapore	VIII-210
1. National Overview	VIII-210
a. Driving Forces	VIII-211
b. Inhibiting Factors	VIII-212
2. Information Services Forecast	VIII-212
3. Market Considerations	VIII-215
4. IT Spending	VIII-217
Y. South Korea	VIII-219
1. National Overview	VIII-219
a. Driving Forces	VIII-219
b. Inhibiting Forces	VIII-220
2. Information Services Market Forecast	VIII-221
3. Market Considerations	VIII-225
4. IT Spending	VIII-226
Z. Spain	VIII-229
1. National Overview	VIII-229
2. Information Services Market Forecast	VIII-229
3. Market Considerations	VIII-232
4. IT Spending	VIII-234
AA. Sweden	VIII-236
1. National Overview	VIII-236
2. Information Services Market Forecast	VIII-236
3. Market Considerations	VIII-239
4. IT Spending	VIII-240

## VIII

<b>BB.</b>	Switzerland	VIII-243
	1. National Overview	VIII-243
	2. Information Services Market Forecast	VIII-243
	3. Market Considerations	VIII-245
	4. IT Spending	VIII-246
<b>CC.</b>	Taiwan	VIII-249
	1. National Overview	VIII-249
	a. Driving Forces	VIII-250
	b. Inhibiting Factors	VIII-250
	2. Information Services Market Forecast	VIII-251
	3. Market Considerations	VIII-254
	4. IT Spending	VIII-256
<b>DD.</b>	United Kingdom	VIII-258
	1. National Overview	VIII-258
	2. Information Services Market Forecast	VIII-259
	3. Market Considerations	VIII-261
	4. IT Spending	VIII-263
<b>EE.</b>	United States	VIII-266
	1. National Overview	VIII-266
	a. Driving Forces	VIII-267
	b. Inhibiting Factors	VIII-267
	2. Information Services Market Forecast	VIII-267
	3. Market Considerations	VIII-271
	4. IT Spending	VIII-273
<b>FF.</b>	Venezuela	VIII-276
	1. National Overview	VIII-276
	a. Driving Forces	VIII-279
	b. Inhibiting Factors	VIII-279
	2. Information Services Market Forecast	VIII-280
	3. Market Considerations	VIII-283
	4. IT Spending	VIII-284

## IX

	Conclusions and Recommendations	IX-1
<b>A.</b>	Conclusions	IX-1
	1. Client/Server and Personal Computing	IX-1
	2. Outsourcing	IX-2
	3. Relationships and Organization	IX-2
	4. International Markets	IX-3

---

IX
----

<b>B. Recommendations</b>	IX-4
1. Know the Real Buyer	IX-4
2. Relationships	IX-4
3. Commitment	IX-4
4. Flexibility	IX-5
5. International and Country Focus	IX-5

---

Appendixes
------------

<b>A. Market Forecast Database</b>	A-1
<b>B. Currency Conversion Factors</b>	B-1

# Exhibits

I
---

- 
- |    |  |     |
|----|--|-----|
| -1 | Information Services Industry Structure—1993 | I-2 |
|----|--|-----|
- 

II
----

- |     |   |       |
|-----|---|-------|
| -1  | Worldwide Information Services Market—Driving Forces                            | II-3  |
| -2  | Market Forecast—Worldwide, 1993-1998  | II-5  |
| -3  | Total 1993 IT Spending—Worldwide  | II-6  |
| -4  | 1993 IT Spending Percentages—Worldwide  | II-7  |
| -5  | Compound Growth Rate Comparison by Delivery Mode                                | II-8  |
| -6  | Worldwide Market Distribution, 1993 and 1998                                    | II-9  |
| -7  | Worldwide Market Forecast—Leading Countries                                     | II-9  |
| -8  | Leading Information Services Vendors—Worldwide, 1993                            | II-10 |
| -9  | Worldwide Market Forecast by Regional Area, 1993-1998                           | II-11 |
| -10 | Compound Growth Rate Comparison by Region and Worldwide                         | II-11 |
| -11 | Worldwide Market Forecast by Regional Area—Professional Services, 1993-1998     | II-12 |
| -12 | Worldwide Market Forecast by Regional Area—Systems Integration, 1993-1998       | II-12 |
| -13 | Worldwide Market Forecast by Regional Area—Systems Operations, 1993-1998        | II-13 |
| -14 | Worldwide Market Forecast by Regional Area—Processing Services, 1993-1998       | II-13 |
| -15 | Worldwide Market Forecast by Regional Area—Network Services, 1993-1998          | II-14 |
| -16 | Worldwide Market Forecast by Regional Area—Systems Software Products, 1993-1998 | II-14 |

## II

- 
- 17 Worldwide Market Forecast by Regional Area—  
Applications Software Products, 1993-1998 II-15
  - 18 Worldwide Market Forecast by Regional Area—  
Turnkey Systems, 1993-1998 II-15
- 

## III

- 1 Market Forecast—Asia/Pacific, 1993-1998 III-5
  - 2 Market Distribution—Asia/Pacific, 1993 and 1998 III-6
  - 3 Market Forecast by Delivery Mode—Asia/Pacific,  
1993-1998 III-8
  - 4 Delivery Mode Analysis Information Services  
Market—Asia/Pacific, 1993 and 1998 III-11
  - 5 Total 1993 IT Spending—Asia/Pacific III-14
  - 6 1993 IT Spending Percentages—Asia/Pacific III-14
- 

## IV

- 1 Market Forecast—Europe, 1993-1998 IV-5
  - 2 Market Forecast by Delivery Mode—Europe, 1993-1998 IV-6
  - 3 Leading Vendors, Software and Services—Europe, 1993 IV-8
  - 4 Total 1993 IT Spending—Europe IV-9
  - 5 1993 IT Spending Percentages—Europe IV-10
- 

## V

- 1 Market Forecast—Latin America, 1993-1998 V-6
- 2 Market Distribution—Latin America, 1993 and 1998 V-7
- 3 International Vendors Active in Latin America, 1993 V-10
- 4 Total 1993 IT Spending—Latin America V-11
- 5 1993 IT Spending Percentages—Latin America V-12

## VI

- |    |  |       |
|----|--|-------|
| -1 | Market Forecast—Middle East/Africa, 1993-1998  | VI-11 |
| -2 | Market Forecast by Delivery Mode—Middle East/<br>Africa, 1993-1998                       | VI-13 |
| -3 | Delivery Mode Analysis Information Services Market—<br>Middle East/Africa, 1993 and 1998 | VI-14 |
| -4 | Total 1993 IT Spending—Middle East/Africa  | VI-16 |
| -5 | 1993 IT Spending Percentages—Middle East/Africa  | VI-16 |

## VII

- |    |   |       |
|----|---|-------|
| -1 | Market Forecast—North America, 1993-1998  | VII-3 |
| -2 | Market Distribution—North America, 1993 and 1998                                    | VII-4 |
| -3 | Market Forecast by Delivery Mode—North<br>America, 1993-1998                        | VII-5 |
| -4 | Delivery Mode Analysis Information Services Market—<br>North America, 1993 and 1998 | VII-6 |
| -5 | Total 1993 IT Spending—North America  | VII-8 |
| -6 | 1993 IT Spending Percentages—North America  | VII-9 |

## VIII

- |     |  |         |
|-----|--|---------|
| -1  | Market Forecast—Argentina, 1993-1998   | VIII-7  |
| -2  | Market Forecast by Delivery Mode—Argentina,<br>1993-1998                               | VIII-8  |
| -3  | Selected Vendors by Delivery Mode—<br>Argentina, 1993                                  | VIII-11 |
| -4  | Total 1993 IT Spending—Argentina   | VIII-13 |
| -5  | 1993 IT Spending Percentages—Argentina   | VIII-13 |
| -6  | Information Services Industry Market Forecast by<br>Delivery Mode—Argentina, 1993-1998 | VIII-14 |
| -7  | Market Forecast—Australia, 1993-1998   | VIII-18 |
| -8  | Market Forecast by Delivery Mode—Australia,<br>1993-1998                               | VIII-19 |
| -9  | Selected Vendors by Delivery Mode—Australia  | VIII-22 |
| -10 | Total 1993 IT Spending—Australia   | VIII-23 |
| -11 | 1993 IT Spending Percentages—Australia   | VIII-23 |
| -12 | Information Services Industry Market Forecast by<br>Delivery Mode—Australia, 1993-1998 | VIII-24 |

## VIII

-13	Market Forecast—Austria, 1993-1998	VIII-26
-14	Market Forecast by Delivery Mode—Austria, 1993-1998	VIII-27
-15	Leading Information Services Vendors— Austria, 1993	VIII-28
-16	Total 1993 IT Spending—Austria	VIII-29
-17	1993 IT Spending Percentages—Austria	VIII-30
-18	Information Services Industry Market Forecast by Delivery Mode—Austria, 1993-1998	VIII-31
-19	Market Forecast—Belgium, 1993-1998	VIII-33
-20	Market Forecast by Delivery Mode—Belgium, 1993-1998	VIII-34
-21	Leading Information Services Vendors— Belgium, 1993	VIII-35
-22	Total 1993 IT Spending—Belgium	VIII-36
-23	1993 IT Spending Percentages—Belgium	VIII-36
-24	Information Services Industry Market Forecast by Delivery Mode—Belgium, 1993-1998	VIII-37
-25	Market Forecast—Brazil, 1993-1998	VIII-43
-26	Market Forecast by Delivery Mode—Brazil, 1993-1998	VIII-45
-27	Selected Vendors by Delivery Mode—Brazil, 1993	VIII-48
-28	Total 1993 IT Spending—Brazil	VIII-49
-29	1993 IT Spending Percentages—Brazil	VIII-50
-30	Information Services Industry Market Forecast by Delivery Mode—Brazil, 1993-1998	VIII-51
-31	Market Forecast—Canada, 1993-1998	VIII-55
-32	Market Forecast by Delivery Mode—Canada, 1993-1998	VIII-56
-33	Leading Information Services Vendors— Canada, 1993	VIII-57
-34	Total 1993 IT Spending—Canada	VIII-58
-35	1993 IT Spending Percentages—Canada	VIII-58
-36	Information Services Industry Market Forecast by Delivery Mode—Canada, 1993-1998	VIII-59
-37	Market Forecast—Denmark, 1993-1998	VIII-61
-38	Market Forecast by Delivery Mode—Denmark, 1993-1998	VIII-62

## VIII

-39	Leading Information Services Vendors— Denmark, 1993	VIII-64
-40	Total 1993 IT Spending—Denmark	VIII-64
-41	1993 IT Spending Percentages—Denmark	VIII-65
-42	Information Services Industry Market Forecast by Delivery Mode—Denmark, 1993-1998	VIII-66
-43	Population by Region—Eastern Europe, 1993	VIII-67
-44	Market Forecast—Eastern Europe, 1993-1998	VIII-69
-45	Market Forecast by Delivery Mode—Eastern Europe, 1993-1998	VIII-70
-46	Total 1993 IT Spending—Eastern Europe	VIII-72
-47	1993 IT Spending Percentages—Eastern Europe	VIII-72
-48	Information Services Industry Market Forecast by Delivery Mode—Eastern Europe, 1993-1998	VIII-73
-49	Market Forecast—Finland, 1993-1998	VIII-75
-50	Market Forecast by Delivery Mode—Finland, 1993-1998	VIII-76
-51	Leading Information Services Vendors— Finland, 1993	VIII-77
-52	Total 1993 IT Spending—Finland	VIII-78
-53	1993 IT Spending Percentages—Finland	VIII-79
-54	Information Services Industry Market Forecast by Delivery Mode—Finland, 1993-1998	VIII-80
-55	Market Forecast—France, 1993-1998	VIII-82
-56	Market Forecast by Delivery Mode—France, 1993-1998	VIII-83
-57	Leading Information Services Vendors— France, 1993	VIII-85
-58	Total 1993 IT Spending—France	VIII-86
-59	1993 IT Spending Percentages—France	VIII-87
-60	Information Services Industry Market Forecast by Delivery Mode—France, 1993-1998	VIII-88
-61	Market Forecast—Germany, 1993-1998	VIII-91
-62	Market Forecast by Delivery Mode—Germany, 1993-1998	VIII-92
-63	Leading Information Services Vendors— Germany, 1993	VIII-93
-64	Total 1993 IT Spending—Germany	VIII-95
-65	1993 IT Spending Percentages—Germany	VIII-95

## VIII

- |     |   |          |
|-----|---|----------|
| -66 | Information Services Industry Market Forecast by Delivery Mode—Germany, 1993-1998   | VIII-96  |
| -67 | Market Forecast—Hong Kong, 1993-1993  | VIII-101 |
| -68 | Market Forecast by Delivery Mode—Hong Kong, 1993-1998                               | VIII-103 |
| -69 | Total 1993 IT Spending—Hong Kong  | VIII-106 |
| -70 | 1993 IT Spending Percentages—Hong Kong  | VIII-107 |
| -71 | Information Services Industry Market Forecast by Delivery Mode—Hong Kong, 1993-1998 | VIII-108 |
| -72 | Market Forecast—India, 1993-1998  | VIII-113 |
| -73 | Market Forecast by Delivery Mode—India, 1993-1998                                   | VIII-114 |
| -74 | Selected Vendors by Delivery Mode—India, 1993                                       | VIII-117 |
| -75 | Total 1993 IT Spending—India  | VIII-118 |
| -76 | 1993 IT Spending Percentages—India  | VIII-118 |
| -77 | Information Services Industry Market Forecast by Delivery Mode—India, 1993-1998     | VIII-119 |
| -78 | Market Forecast—Italy, 1993-1998  | VIII-121 |
| -79 | Market Forecast by Delivery Mode—Italy, 1993-1998                                   | VIII-122 |
| -80 | Leading Information Services Vendors—Italy, 1993                                    | VIII-124 |
| -81 | Total 1993 IT Spending—Italy  | VIII-125 |
| -82 | 1993 IT Spending Percentages—Italy  | VIII-125 |
| -83 | Information Services Industry Market Forecast by Delivery Mode—Italy, 1993-1998     | VIII-126 |
| -84 | Market Forecast—Japan, 1993-1998  | VIII-130 |
| -85 | Market Forecast by Delivery Mode—Japan, 1993-1998                                   | VIII-132 |
| -86 | Leading Vendors by Delivery Mode—Japan, 1993  | VIII-136 |
| -87 | Total 1993 IT Spending—Japan  | VIII-137 |
| 88  | 1993 IT Spending Percentages—Japan  | VIII-137 |
| -89 | Information Services Industry Market Forecast by Delivery Mode—Japan, 1993-1998     | VIII-138 |
| -90 | Market Forecast—Mexico, 1993-1998   | VIII-146 |
| -91 | Market Forecast by Delivery Mode—Mexico, 1993-1998                                  | VIII-147 |
| -92 | Selected Vendors by Delivery Mode—Mexico, 1993                                      | VIII-151 |
| -93 | Total 1993 IT Spending—Mexico   | VIII-152 |
| -94 | 1993 IT Spending Percentages—Mexico   | VIII-153 |
| -95 | Information Services Industry Market Forecast by Delivery Mode—Mexico, 1993-1998    | VIII-154 |

## VIII

<b>-96</b>	Market Forecast—The Netherlands, 1993-1998	VIII-156
<b>-97</b>	Market Forecast by Delivery Mode—The Netherlands, 1993-1998	VIII-157
<b>-98</b>	Leading Information Services Vendors—The Netherlands, 1993	VIII-158
<b>-99</b>	Total 1993 IT Spending—The Netherlands	VIII-159
<b>-100</b>	1993 IT Spending Percentages—The Netherlands	VIII-160
<b>-101</b>	Information Services Industry Market Forecast by Delivery Mode—The Netherlands, 1993-1998	VIII-161
<b>-102</b>	Market Forecast—New Zealand, 1993-1998	VIII-165
<b>-103</b>	Market Forecast by Delivery Mode—New Zealand, 1993-1998	VIII-166
<b>-104</b>	Selected Vendors by Delivery Mode—New Zealand, 1993-1998	VIII-169
<b>-105</b>	Total 1993 IT Spending—New Zealand	VIII-170
<b>-106</b>	1993 IT Spending Percentages—New Zealand	VIII-170
<b>-107</b>	Information Services Industry Market Forecast by Delivery Mode—New Zealand, 1993-1998	VIII-171
<b>-108</b>	Market Forecast—Norway, 1993-1998	VIII-173
<b>-109</b>	Market Forecast by Delivery Mode—Norway, 1993-1998	VIII-174
<b>-110</b>	Leading Information Services Vendors—Norway, 1993	VIII-175
<b>-111</b>	Total 1993 IT Spending—Norway	VIII-176
<b>-112</b>	1993 IT Spending Percentages—Norway	VIII-177
<b>-113</b>	Information Services Industry Market Forecast by Delivery Mode—Norway, 1993-1998	VIII-178
<b>-114</b>	Market Forecast—Other Asia/Pacific, 1993-1998	VIII-183
<b>-115</b>	Market Forecast by Delivery Mode—Other Asia/Pacific, 1993-1998	VIII-184
<b>-116</b>	Total 1993 IT Spending—Other Asia/Pacific	VIII-186
<b>-117</b>	1993 IT Spending Percentages—Other Asia/Pacific	VIII-187
<b>-118</b>	Information Services Industry Market Forecast by Delivery Mode—Other Asia/Pacific, 1993-1998	VIII-187
<b>-119</b>	Market Forecast—Portugal, 1993-1998	VIII-189
<b>-120</b>	Market Forecast by Delivery Mode—Portugal, 1993-1998	VIII-190
<b>-121</b>	Total 1993 IT Spending—Portugal	VIII-191
<b>-122</b>	1993 IT Spending Percentages—Portugal	VIII-191

## VIII

-123	Market Forecast—Greece, 1993-1998	VIII-192
-124	Market Forecast by Delivery Mode—Greece, 1993-1998	VIII-193
-125	Total 1993 IT Spending—Greece	VIII-194
-126	1993 IT Spending Percentages—Greece	VIII-194
-127	Market Forecast—Ireland, 1993-1998	VIII-195
-128	Market Forecast by Delivery Mode—Ireland, 1993-1998	VIII-196
-129	Total 1993 IT Spending—Ireland	VIII-197
-130	1993 IT Spending Percentages—Ireland	VIII-197
-131	Information Services Industry Market Forecast by Delivery Mode—Portugal, 1993-1998	VIII-198
-132	Information Services Industry Market Forecast by Delivery Mode—Greece, 1993-1998	VIII-199
-133	Information Services Industry Market Forecast by Delivery Mode—Ireland, 1993-1998	VIII-200
-134	Market Forecast—Other Latin America, 1992-1993	VIII-205
-135	Market Forecast by Delivery Mode—Other Latin America, 1993-1998	VIII-206
-136	Selected Vendors by Delivery Mode—Other Latin America, 1993-1998	VIII-207
-137	Total 1993 IT Spending—Other Latin America	VIII-208
-138	1993 IT Spending Percentages—Other Latin America	VIII-208
-139	Information Services Industry Market Forecast by Delivery Mode—Other Latin America, 1993-1998	VIII-209
-140	Market Forecast—Singapore, 1993-1998	VIII-213
-141	Market Forecast by Delivery Mode—Singapore, 1993-1998	VIII-214
-142	Selected Vendors by Delivery Mode—Singapore, 1993	VIII-216
-143	Total 1993 IT Spending—Singapore	VIII-217
-144	1993 IT Spending Percentages—Singapore	VIII-218
-145	Information Services Industry Market Forecast by Delivery Mode—Singapore, 1993-1998	VIII-218
-146	Market Forecast—South Korea, 1993-1998	VIII-222
-147	Market Forecast by Delivery Mode—South Korea, 1993-1998	VIII-223
-148	Leading Information Services Vendors—South Korea, 1993-1998	VIII-225

## VIII

- |      |  |          |
|------|--|----------|
| -149 | Total 1993 IT Spending—South Korea, 1993   | VIII-226 |
| -150 | 1993 IT Spending Percentages—South Korea   | VIII-227 |
| -151 | Information Services Industry Market Forecast by<br>Delivery Mode—South Korea, 1993-1998 | VIII-228 |
| -152 | Market Forecast—Spain, 1993-1998   | VIII-230 |
| -153 | Market Forecast by Delivery Mode—Spain, 1993-1998  | VIII-231 |
| -154 | Leading Information Services Vendors—<br>Spain, 1993                                     | VIII-233 |
| -155 | Total 1993 IT Spending—Spain   | VIII-234 |
| -156 | 1993 IT Spending Percentages—Spain   | VIII-234 |
| -157 | Information Services Industry Market Forecast by<br>Delivery Mode—Spain, 1993-1998       | VIII-235 |
| -158 | Market Forecast—Sweden, 1993-1998  | VIII-237 |
| -159 | Market Forecast by Delivery Mode—Sweden,<br>1993-1998                                    | VIII-238 |
| -160 | Leading Information Services Vendors—<br>Sweden, 1993                                    | VIII-239 |
| -161 | Total 1993 IT Spending—Sweden  | VIII-240 |
| -162 | 1993 IT Spending Percentages—Sweden  | VIII-241 |
| -163 | Information Services Industry Market Forecast by<br>Delivery Mode—Sweden, 1993-1998      | VIII-242 |
| -164 | Market Forecast—Switzerland, 1993-1998   | VIII-244 |
| -165 | Market Forecast by Delivery Mode—Switzerland,<br>1993-1998                               | VIII-245 |
| -166 | Leading Information Services Vendors—<br>Switzerland, 1993                               | VIII-246 |
| -167 | Total 1993 IT Spending—Switzerland   | VIII-247 |
| -168 | 1993 IT Spending Percentages—Switzerland   | VIII-247 |
| -169 | Information Services Industry Market Forecast by<br>Delivery Mode—Switzerland, 1993-1998 | VIII-248 |
| -170 | Market Forecast—Taiwan, 1993-1998  | VIII-252 |
| -171 | Market Forecast by Delivery Mode—Taiwan,<br>1993-1998                                    | VIII-253 |
| -172 | Selected Vendors by Delivery Mode—Taiwan, 1993   | VIII-255 |
| -173 | Total 1993 IT Spending—Taiwan  | VIII-256 |
| -174 | 1993 IT Spending Percentages—Taiwan  | VIII-256 |
| -175 | Information Services Industry Market Forecast by<br>Delivery Mode—Taiwan, 1993-1998      | VIII-257 |
| -176 | Market Forecast—United Kingdom, 1993-1998  | VIII-259 |

## VIII

-177	Market Forecast by Delivery Mode—United Kingdom, 1993-1998	VIII-261
-178	Leading Information Services Vendors—United Kingdom, 1993	VIII-262
-179	Total 1993 IT Spending—United Kingdom	VIII-263
-180	1993 IT Spending Percentages—United Kingdom	VIII-264
-181	Information Services Industry Market Forecast by Delivery Mode—United Kingdom, 1993-1998	VIII-265
-182	Market Forecast—United States, 1993-1998	VIII-268
-183	Market Forecast by Delivery Mode—United States, 1993-1998	VIII-269
-184	Leading United States Vertical Markets	VIII-270
-185	Leading Information Services Vendors—United States	VIII-272
-186	Total 1993 IT Spending—United States	VIII-273
-187	1993 IT Spending Percentages—United States	VIII-274
-188	Information Services Industry Market Forecast by Delivery Mode—United States, 1993-1998	VIII-275
-189	Market Forecast—Venezuela, 1993-1998	VIII-281
-190	Market Forecast by Delivery Mode—Venezuela, 1993-1998	VIII-282
-191	Selected Vendors by Delivery Mode—Venezuela, 1993	VIII-284
-192	Total 1993 IT Spending—Venezuela	VIII-285
-193	1993 IT Spending Percentages—Venezuela	VIII-285
-194	Information Services Industry Market Forecast by Delivery Mode—Venezuela, 1993-1998	VIII-286

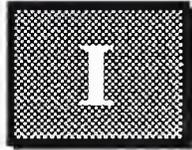
## Appendix

A		
-1	Information Services Industry Market Forecast by Delivery Mode—Worldwide, 1993-1998	A-1
-2	Information Services Industry Market Forecast by Region—Worldwide, 1993-1998	A-2
-3	Information Services Industry Market Forecast—Professional Services, 1993-1998	A-2
-4	Information Services Industry Market Forecast—Systems Integration, 1993-1998	A-3

Appendix
----------

- |     |   |      |
|-----|---|------|
| -5  | Information Services Industry Market Forecast—<br>Systems Operations, 1993-1998                 | A-3  |
| -6  | Information Services Industry Market Forecast—<br>Processing Services, 1993-1998                | A-4  |
| -7  | Information Services Industry Market Forecast—<br>Network Services, 1993-1998                   | A-4  |
| -8  | Information Services Industry Market Forecast—<br>Systems Software Products, 1993-1998          | A-5  |
| -9  | Information Services Industry Market Forecast—<br>Applications Software Products, 1993-1998     | A-5  |
| -10 | Information Services Industry Market Forecast—<br>Turnkey Systems, 1993-1998                    | A-6  |
| -11 | Information Services Industry Market Forecast by<br>Delivery Mode—Asia/Pacific, 1993-1998       | A-7  |
| -12 | Information Services Industry Market Forecast by<br>Delivery Mode—Europe, 1993-1998             | A-8  |
| -13 | Information Services Industry Market Forecast by<br>Delivery Mode—Latin America, 1993-1998      | A-9  |
| -14 | Information Services Industry Market Forecast by<br>Delivery Mode—Middle East/Africa, 1993-1998 | A-10 |
| -15 | Information Services Industry Market Forecast by<br>Delivery Mode—North America, 1993-1998      | A-11 |

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# Introduction

This is the fifth worldwide information services forecast published by INPUT. The first covered the period 1989-1994; this fifth version covers 1993-1998.

In 1993, the worldwide information services and software products market approached the \$277 billion (U.S. dollars) level. This market continues to outgrow the rate of economic growth in essentially all geographic areas covered by this report. Strong growth and an increasingly international orientation to the information services market suggest that all vendors, large and small, need an appreciation for the worldwide market as well as for their current geographic areas of emphasis.

As in 1992, 1993 performance was impacted by the general recessionary economic environment. It continued to suppress expenditures in North America and Europe and had a significant impact in Japan as well.

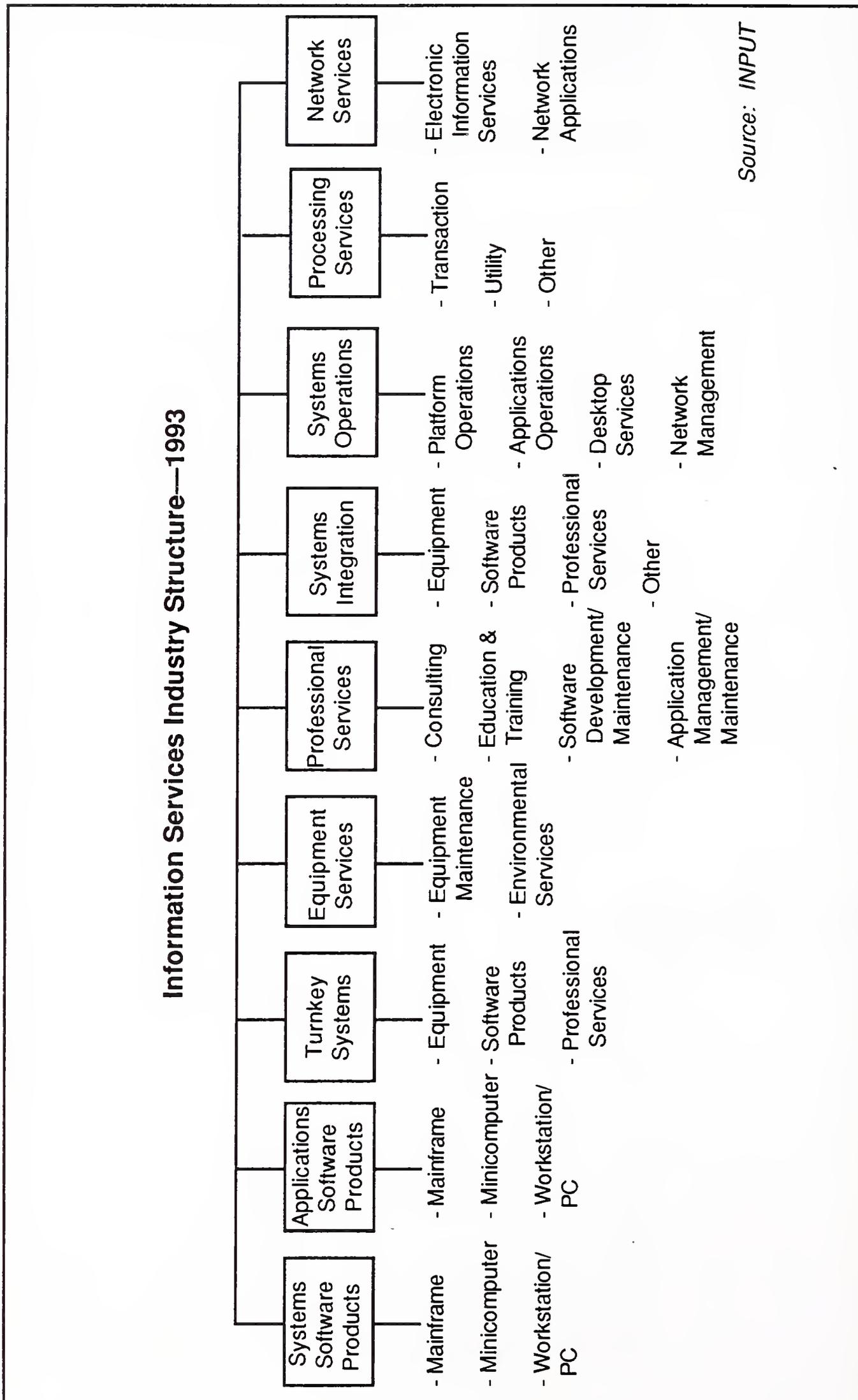
## A

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### Purpose and Scope

The purpose of this report is to identify the global market for information services, key trends that are causing the market to grow, key national developments and major obstacles to entry or expansion into a foreign market.

The research conducted for this report included extensive primary and secondary research. It draws upon INPUT's 17-year tradition of forecasting the U.S. and European information services markets and its new focus on, and ever-expanding coverage of, worldwide information services market opportunities. The forecast and analysis contained in this report are based on INPUT's standard information services industry structure as presented in Exhibit I-1.



**B****Methodology**

Primary and secondary research was conducted for 30 countries and geographic areas of the world, including those in the following list:

- Africa
- Australia
- Argentina
- Belgium
- Brazil
- Canada
- Denmark
- Eastern Europe
- Finland
- France
- Germany
- Greece
- Hong Kong
- Ireland
- Italy
- Japan
- Mexico
- Middle East
- Netherlands
- New Zealand
- Norway
- Other Asia
- Other Latin America
- Portugal
- Singapore
- South Korea
- Spain
- Sweden
- Switzerland
- Taiwan
- United Kingdom
- United States
- Venezuela

**1. Research/Analysis Methodology**

Research for the report included a review of published data to identify key national and regional activities and trends. The

research process also included extensive primary research. Key elements of the research included the following:

- Research drawn from INPUT's U.S. and European market analysis programs.
- An in-depth assessment of the Canadian market conducted in 1993.
- New primary research from INPUT's affiliates in Japan and South Korea and India.
- Direct interviews with active information services vendors in one or more countries outside Europe and North America.
- An extensive review of background data about the economic and service environment in countries throughout the world.
- Review and assessment of economic and business trends that could affect the growth of the information services business.
- In addition to the primary research, the International Trade Administration (ITA) of the U.S. Department of Commerce was contacted to obtain available information about information services markets in countries throughout the world. Data from the ITA was used as a cross-reference for data derived from INPUT's research. ITA information was also used as a means of identifying patterns in development or difficulties in market entry.

## **2. Forecasts and Inflation**

In recognition of the volatility of inflation rates in many areas of the world, and to provide a basis for comparing market share and growth, forecasts have been prepared using current U.S. dollars.

To obtain specific data for local (non-U.S.) markets, currency conversion rates from Appendix B can be applied. Using local currency, information about projected growth in GDP, and changes in consumer prices, local market forecasts can be made.

Instead of using the absolute values generated by INPUT economic and industry models, primary research or secondary sources, INPUT has traditionally rounded its forecast values in exhibits showing expenditures for the United States and Europe information

services markets to clearly identify them as estimates. In the past, this same rounding philosophy has also been applied to values in the *Worldwide Information Services Forecast*. Because of the small size of so many country markets presented in the 1993 worldwide edition, however, INPUT has presented market size forecasts, in exhibits, as absolute values, so that smaller changes in the growth of country information services expenditures can be more clearly identified. For larger markets, and worldwide and regional summaries, rounding was applied at the units level of the scale appropriate to the market size, so that such forecasts represent accurate estimates of expenditures and growth. As a result, calculation of a compound annual growth rate (CAGR) based solely on exhibit revenue data could vary slightly from the market databases provided for the worldwide, regional and country or area markets. In addition, the numbers in the detailed forecast tables may not add due to rounding.

## C

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### Report Structure

Following the Introduction, the report is organized into seven major parts.

- Chapter II is a worldwide summary.
- Chapter III is a regional summary for the Asia/Pacific area. For the purpose of the report, Asia/Pacific includes the geographic area from Japan to New Zealand, and from the Pacific Rim to Pakistan.
- Chapter IV is a regional summary for Europe. The European summary includes information derived from INPUT's annual research into the European information services market. This is supplemented by research into other Western and Eastern European countries. For the purpose of this report, Eastern Europe includes the former countries of the USSR and countries considered part of the "Eastern Bloc."
- Chapter V is a regional summary for Latin America. For the purpose of this report, Latin America includes Mexico and the countries of Central America, South America, and the Caribbean.

- Chapter VI is a regional summary for the Middle East and Africa. The Middle East/Africa region includes all the countries of Africa and countries generally considered part of the Middle East. For the purpose of this report, Turkey is considered part of the Middle East, and Greece is considered part of Europe. No individual country profiles have been developed to date for this region, which represents less than 1% of the worldwide information services market.
- Chapter VII is a regional summary for North America. The North American summary includes information derived from INPUT's annual research into the U.S. information services industry, combined with research on the Canadian market.
- Chapter VIII comprises brief introductions followed by 31 sections. Each section represents a country or geographic area covered in the research.

The country/geographic area sections generally include the following information:

- Introduction
- Key technology trends
- Driving and inhibiting forces
- Leading vendors
- Services forecast
- Market entry/expansion considerations
- Chapter IX provides conclusions about the international market for information services and recommendations for being successful in the international marketplace.
- Appendix A contains the market forecast database tables for the worldwide and regional forecasts. The country tables are in Chapter VIII with each country profile.
- Appendix B contains currency conversion factors.

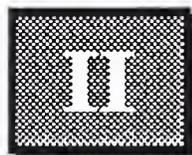
**D****Related Reports**

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Other INPUT reports related to the Worldwide Market Forecast include:

- *U.S. Application Solutions Market, 1993-1998*
- *U.S. Processing Services Market, 1993-1998*
- *U.S. Professional Services Market, 1993-1998*
- *U.S. Network Services Market, 1993-1998*
- *U.S. Systems Operations Market, 1993-1998*
- *U.S. Systems Integration Market, 1993-1998*
- *U.S. Systems Software Products Market, 1993-1998*
- *Canadian Services Market, 1993-1998*
- *Western European Application Solutions Market, 1993-1998*
- *Western European Processing Services Market, 1993-1998*
- *Western European Professional Services Market, 1993-1998*
- *Western European Network Services Market, 1993-1998*
- *Western European Systems Operations Market, 1993-1998*
- *Western European Systems Integration Market, 1993-1998*
- *Western European Systems Software Products Market, 1993-1998*

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# Worldwide Summary

## A

### Global Business Environment

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The global business environment in general, and the information services industry in particular, are still encountering the persistent effects of the global recession that took place earlier this decade.

- The North American economy, specifically the U.S., showed signs of recovery and slowly began rebuilding strength during late 1993. The Clinton Administration made some positive overtures, in word and action, that stimulated the weary U.S. economy. Of notable importance is the North American Free Trade Agreement (NAFTA) with Canada and Mexico, which is expected to encourage free market activity despite early criticisms.
- Europe still experienced recessionary sluggishness during 1993. In France, talks with the U.S. on the General Agreement on Trade and Tariffs (GATT) proved difficult, as the French position on several trade points generated tensions and possible trade sanctions. The German economy in 1993 still suffered from growing pains due to reunification. With Europe's second-largest information services market, Germany must cope with diluted resources and a technological lag among former East German industries.
- The Japanese economy comparatively suffered the most in 1993. Representing more than 80% of the Asia/Pacific market, the Japanese information services market actually decreased 6% in 1993. This reflects the effects of a full-blown recession that damaged the stability of some of Japan's largest market sectors, including banking, real estate and discrete manufacturing.

The economic difficulties in Japan stimulated growth in other countries within the Asia/Pacific region. The high price of native labor paired with a desire to curtail costs led the Japanese to look elsewhere in their region for needed manpower and manufacturing space. South Korea and Taiwan remain targets of Japanese foreign investment, with the People's Republic of China emerging as a market with perhaps the greatest potential in the region. China's southern regions, from Shanghai down the coast, became targets for Japanese, Korean and Taiwanese investment in light and heavy manufacturing facilities and labor. In Taiwan, local pollution, an ailing municipal infrastructure and proximity to the mainland, made China ironically appealing.

In 1993, the North American information services market made up 51% of the worldwide total, an increase of 3% over 1992. The U.S. represents 96% of the market and, therefore, the direction of the American market heavily impacts the region overall. U.S. market growth is still confined somewhat by the recession—it grew only 10% in 1993.

However, in the last two quarters of 1993, the U.S. overall economy demonstrated signs of recovery which carried over into the early months of 1994. Unfortunately, this improvement remains offset by economic woes in Europe and Japan, and is reflected in flat global growth for the forecast period.

## **B**

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### **Driving Forces**

The 1992 worldwide report from INPUT identified a number of driving forces within the information services industry that are affecting the market on a worldwide basis, shown in Exhibit II-1. Due to their importance and magnitude, most of these forces persisted in 1993.

## EXHIBIT II-1

**Worldwide Information Services Market—Driving Forces**

- Global recession continues
- Information a competitive commodity
- New technologies offer new opportunities
- Technology must aid business goals
- Integrated solutions
- Industry-specific solutions
- Telecommunications and networking
- International standards
- Information services vendor capabilities

- *Global recession continues*—As discussed in the prior section, economies of larger, leading users of information technology and services remain in a lingering recession. Consequently, investment has slowed considerably.
- *Information a competitive commodity*—In developed and developing nations, information is a virtual commodity obtained and used to increase or establish a competitive edge. Technology alone has become the tool or facilitator for communicating and conducting business at the local, regional and global level.
- *New technologies offer new opportunities*—The personal computer is a perfect example of a technology which, when new, offered a low-cost yet powerful means of improving productivity and increasing capabilities for users. More recent technological opportunities include client/server computing, wireless networks, cellular telecommunications and personal digital computing. However, users are still not likely to acquire or enthusiastically embrace new technologies until they prove useful and reliable. The lingering global recession also hampered new technological investment.

- *Technology must aid business goals*—In the U.S. and in Europe, corporate users no longer assume investing in information systems and services will improve their business. Instead, they demand that information technology improve business. Overall, companies carefully examine and formulate fundamental business objectives and use these as a basis for systems and services needs.
- *Integrated solutions*—Disparate software and systems in developed and emerging nations still exist. There is, therefore, still a great need for vendors with the expertise necessary to integrate different technologies into manageable, efficient systems.
- *Industry-specific solutions*—Although packaged software such as word processors and spreadsheets are gaining global market share for some vendors, tailored software solutions are still crucial. Vendors with industry-focused solutions or applications development skills will find significant opportunities.
- *Telecommunications and networking*—Locally, computer networks are vital to the development of corporations and industrial groups within a country. On a regional level, trading communities develop with the aid of expanding telecommunications infrastructures, often fueled by foreign investment and government privatization.
- *International standards*—Progress creating and adopting worldwide information technology standards gained speed at the end of the 1980s. This will continue and standards will become an even greater factor in the worldwide information services industry throughout the 1990s. Standards greatly assist the user to gain a return on information technology investment. Vendors who help implement standards will be in significant demand.
- *Information services vendor capabilities*—Users in Asia, Europe and North America already established the need for information services vendors who can successfully support a given company's global activities. Global capabilities are of crucial importance as technology enables users to conduct business on a global level.

With economic concern of the current period and the pressure on information systems to improve performance, the outsourcing trend

was born. Over the next five years this will be the primary factor in growth in the overall size of the information services market as a greater proportion of the total information systems spending of organizations shifts from internal to external expenditures.

## C

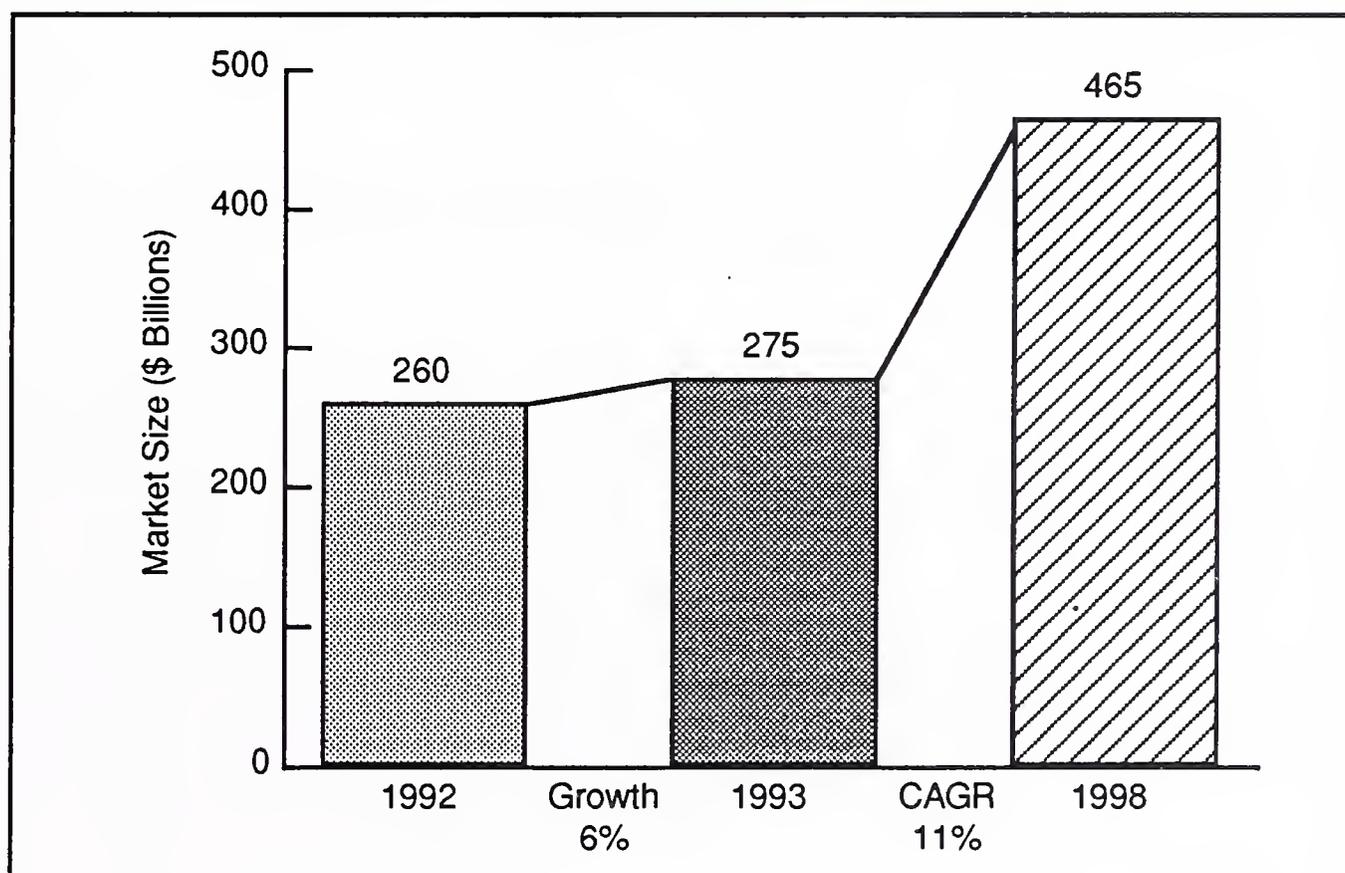
### Information Services Market Forecast

#### 1. Worldwide Summary

The worldwide market for information services and software products grew to \$244 billion in 1991, reached \$260 billion for 1992 and \$277 billion in 1993. By 1998, the market will reach approximately \$465 billion, as shown in Exhibit II-2.

EXHIBIT II-2

Market Forecast—Worldwide, 1993-1998



*Numbers are rounded*

With the growing trend to outsource major portions of the information systems function, the market opportunity for information services vendors broadened to the entire information systems budget. That includes budgets directly controlled by the internal information systems function and budgets under the control of operational departments or business units.

The true market potential is many times larger than the current \$260 billion market for 1993. The continuing success of the outsourcing trend has the potential to increase the growth rate for information services or at least assure that the 11% CAGR is achieved overall. Exhibit II-3 provides INPUT's overall estimate of IT spending for internal and external products and services. It excludes the investment required by information services vendors to provide their services.

Exhibit II-3 provides an estimate of the global total IT spending for 1993.

## EXHIBIT II-3

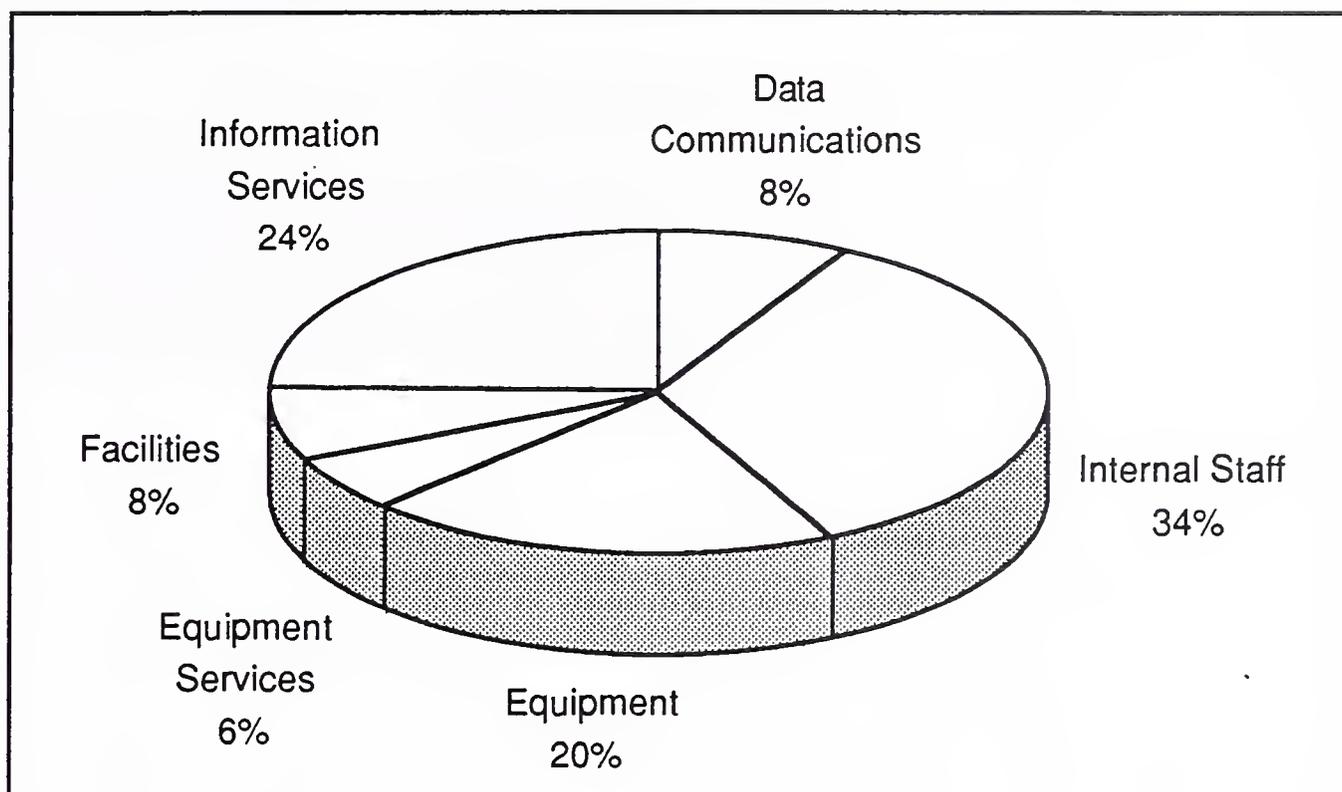
**Total 1993 IT Spending—Worldwide**

<b>Budget Category</b>	<b>Estimated Spending (\$ Billions)</b>
Data Communications	91,000
Internal Staff	390,000
Equipment	225,000
Equipment Services	63,000
Facilities	89,000
Information Services	277,000
<b>Total IT Spending</b>	<b>1,130,000</b>

Information services, which includes software products, represents approximately 24% of the total worldwide IT budget, as noted in Exhibit II-4. The largest expenditure is for internal staff (34%). Equipment services represents the smallest portion of the IT budget at \$69 billion and 6% of the total.

## EXHIBIT II-4

## 1993 IT Spending Percentages—Worldwide



On a worldwide basis, the information services market category is approximately 27% of the total estimated IT spending.

## 2. Delivery Mode Forecast

Exhibit II-5 provides the worldwide forecast by eight delivery modes used by INPUT to analyze the information services industry on a worldwide basis. This information differs from last year's worldwide forecast report in that:

- With no exception, growth rates projected for each delivery mode is smaller than or equal to the 1992-1997 forecast, leading to the overall forecast of 11% CAGR. Exhibit II-5 provides a comparison.
- Systems integration, systems operations and network services remain the strongest delivery modes. They are also smaller in market size.
- The growth rate for systems software declined the most from 12% CAGR to 8% CAGR. It suffered the greatest impact from the recession in larger information services markets, and in this case is heavily impacted by a major turn in the Japanese market.

- The decline in software products growth rates is tied, in part, to the shifting technology foundation and deferred expenditures.

## EXHIBIT II-5

**Compound Growth Rate Comparison by Delivery Mode**

<b>Delivery Mode</b>	<b>1992-1997 CAGR (Percent)</b>	<b>1993-1998 CAGR (Percent)</b>
Professional Services	10	7
Systems Integration	17	16
Systems Operations	18	17
Processing Services	8	8
Network Services	17	17
Systems Software Products	12	8
Applications Software Products	15	14
Turnkey Systems	10	9
<b>Total</b>	<b>12</b>	<b>11</b>

**3. Geographic Distribution**

During 1993-1998, the market share for major geographic areas will shift somewhat, as shown in Exhibit II-6. North America is by far the largest, but is now more than 50% of the total reported last year and will grow to 53% by 1998. Growth rates in the Asia/Pacific region will drive the shift.

The European market will decrease its proportion of the total modestly. Should the Eastern European market explode, the direction could shift for Europe in total.

EXHIBIT II-6

**Worldwide Market Distribution, 1993 and 1998**

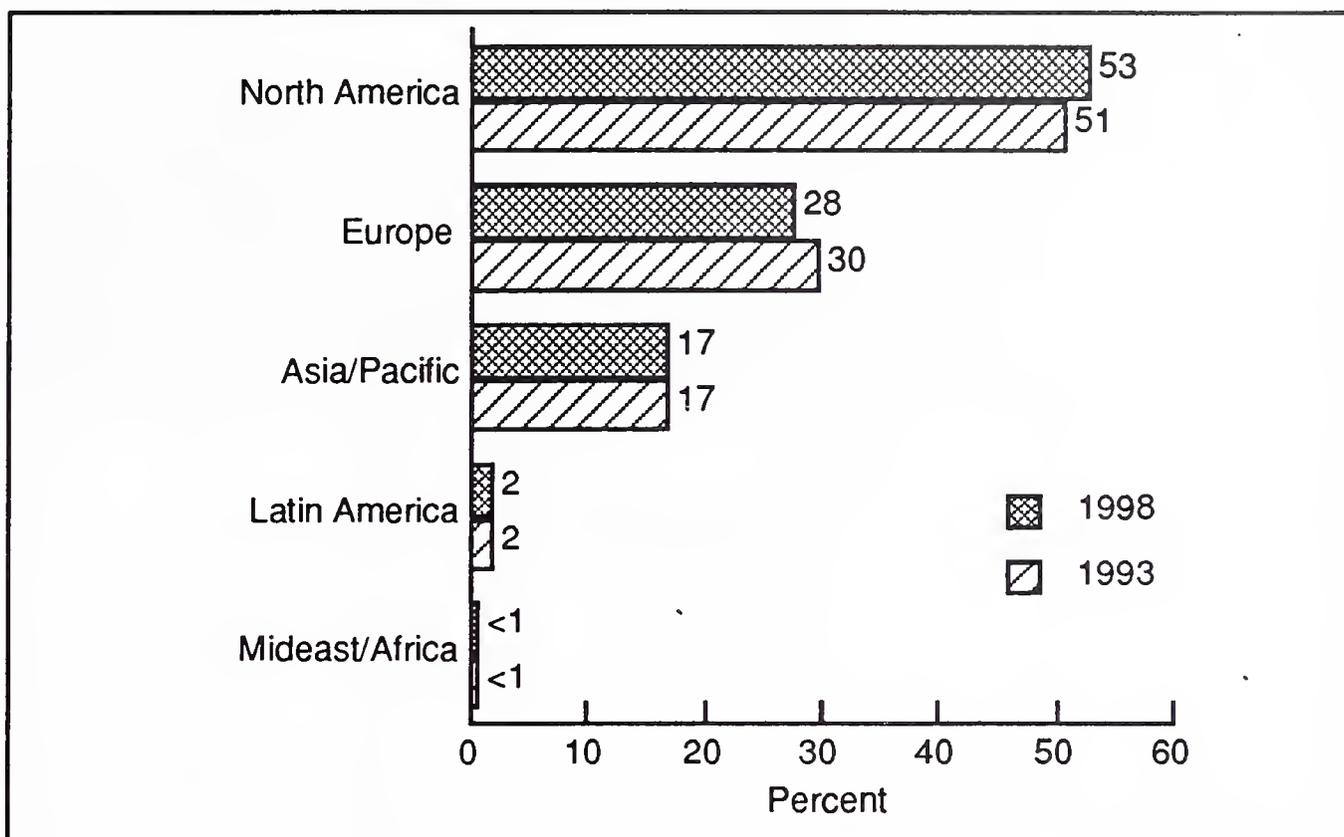


Exhibit II-7 identifies the five largest countries and their market sizes. Together they represent 82% of the worldwide market and will hold steady through 1998.

EXHIBIT II-7

**Worldwide Market Forecast—Leading Countries**

Country	1993		1998	
	\$ Billions	Total (Percent)	\$ Billions	Total (Percent)
United States	136	51	236	53
Japan	39	14	61	13
France	20	7	28	6
Germany	17	6	27	6
United Kingdom	12	4	20	4
Other Countries	53	19	84	18
<b>Total</b>	<b>277</b>	<b>100</b>	<b>456</b>	<b>100</b>

*Note: Percent totals may not equal 100 due to rounding*

Exhibit II-8 presents the top worldwide information services vendors and their total 1993 IS revenues.

## EXHIBIT II-8

### Leading Information Services Vendors—Worldwide, 1993

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Billions)	Market Share (Percent)
1	IBM	U.S.	20.7	7.5
2	EDS (non-GM)	U.S.	5.2	1.9
3	NTT Data	Japan	3.8	1.4
4	Microsoft	U.S.	3.4	1.2
5	Fujitsu	Japan	3.2	1.2
6	Digital	U.S.	3.1	1.1
7	Andersen	U.S.	2.9	1.0
8	Reuters	U.K.	2.7	1.0
9	CSC	U.S.	2.5	0.9
10	Unisys	U.S.	2.4	0.9
	Total Listed		49.9	18.1
	Total Market		277.0	100.0

Once again, IBM leads at the global level despite its own internal difficulties and recessions in many overseas markets. In second place, EDS now shares the top five with software giant Microsoft, NTT and Fujitsu. The Japanese companies' own country is in the icy grip of both recession and political turmoil, yet NTT and Fujitsu have fared well in non-Japanese markets.

#### 4. Regional Area Comparison

This section provides a comparison of the worldwide market by the five regional areas, first in total and then for each of the delivery modes. All of the charts are in U.S. \$ billions.

- Exhibit II-9 provides the forecasts by regional area while Exhibit II-10 presents a comparison of compound growth rate projections for 1992-1997 and 1993-1998 by region.

- Exhibits II-11 through II-18 provide the regional area comparisons by delivery mode.

EXHIBIT II-9

**Worldwide Market Forecast by Regional Area, 1993-1998**

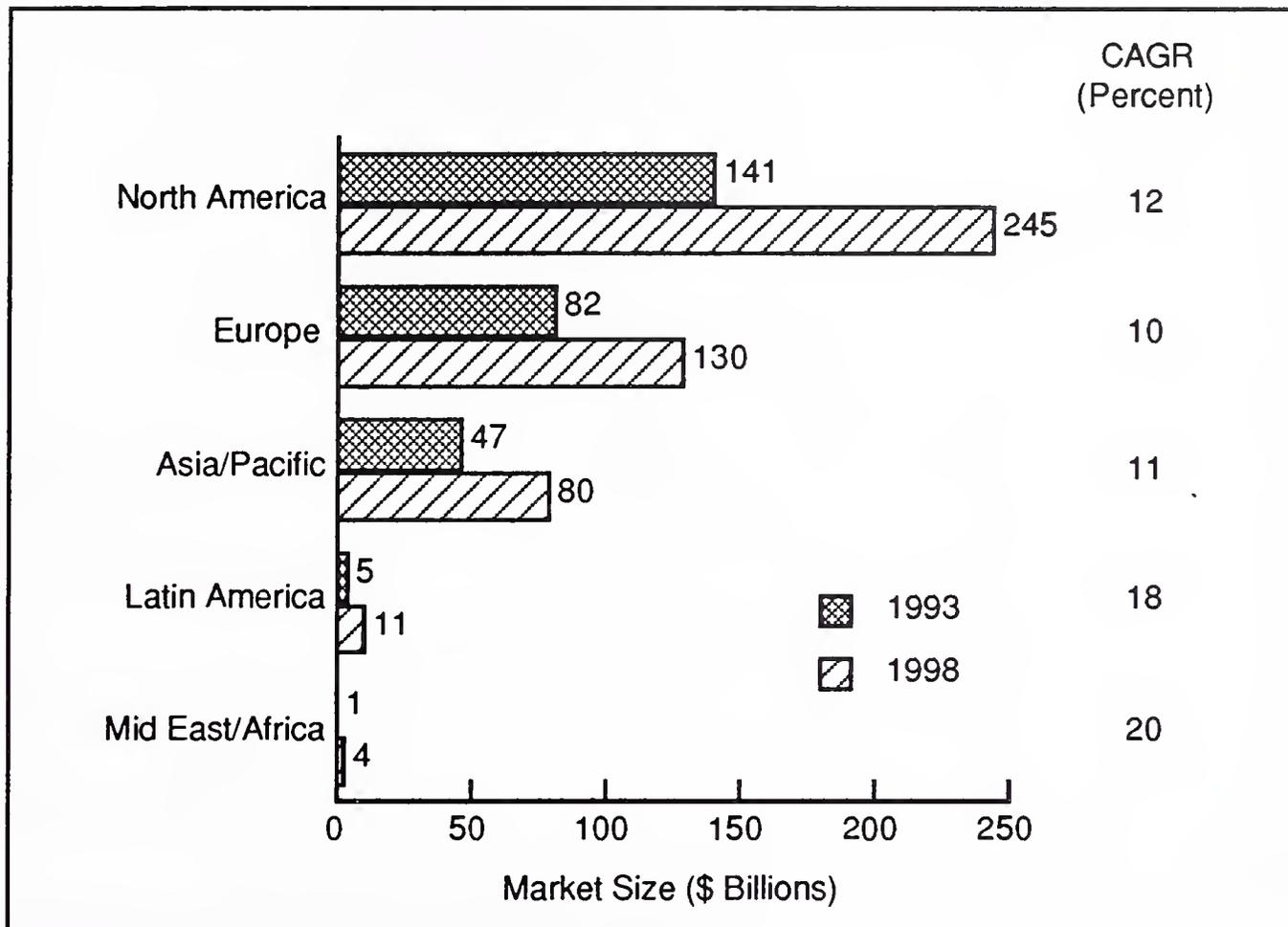


EXHIBIT II-10

**Compound Growth Rate Comparison by Region and Worldwide**

Region	1992-1997 CAGR (Percent)	1993-1998 CAGR (Percent)
Asia/Pacific	14	11
Europe	11	10
Latin America	19	18
Middle East/Africa	22	20
North America	12	12
Worldwide	12	11

EXHIBIT II-11

**Worldwide Market Forecast by Regional Area  
Professional Services, 1993-1998**

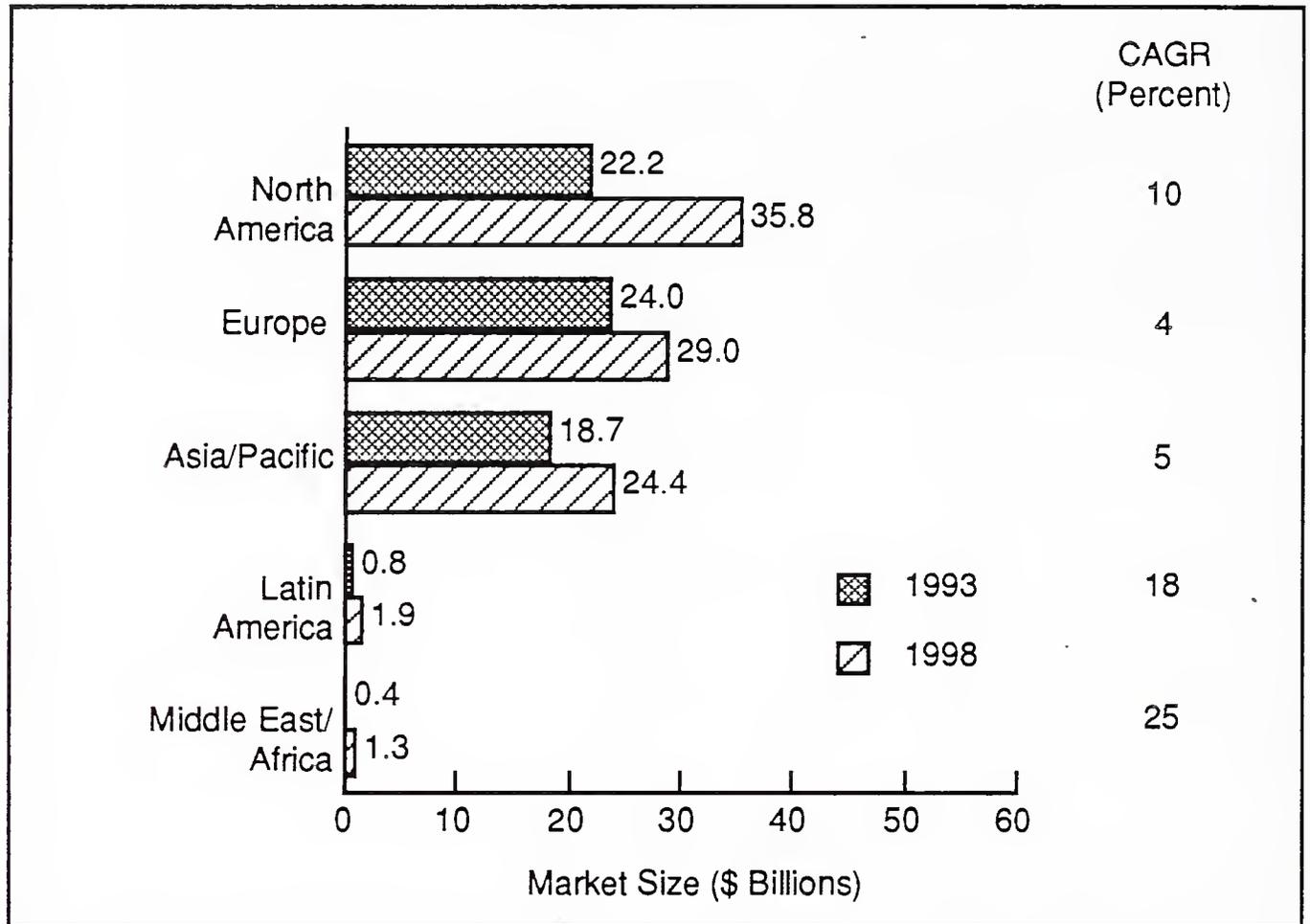


EXHIBIT II-12

**Worldwide Market Forecast by Regional Area  
Systems Integration, 1993-1998**

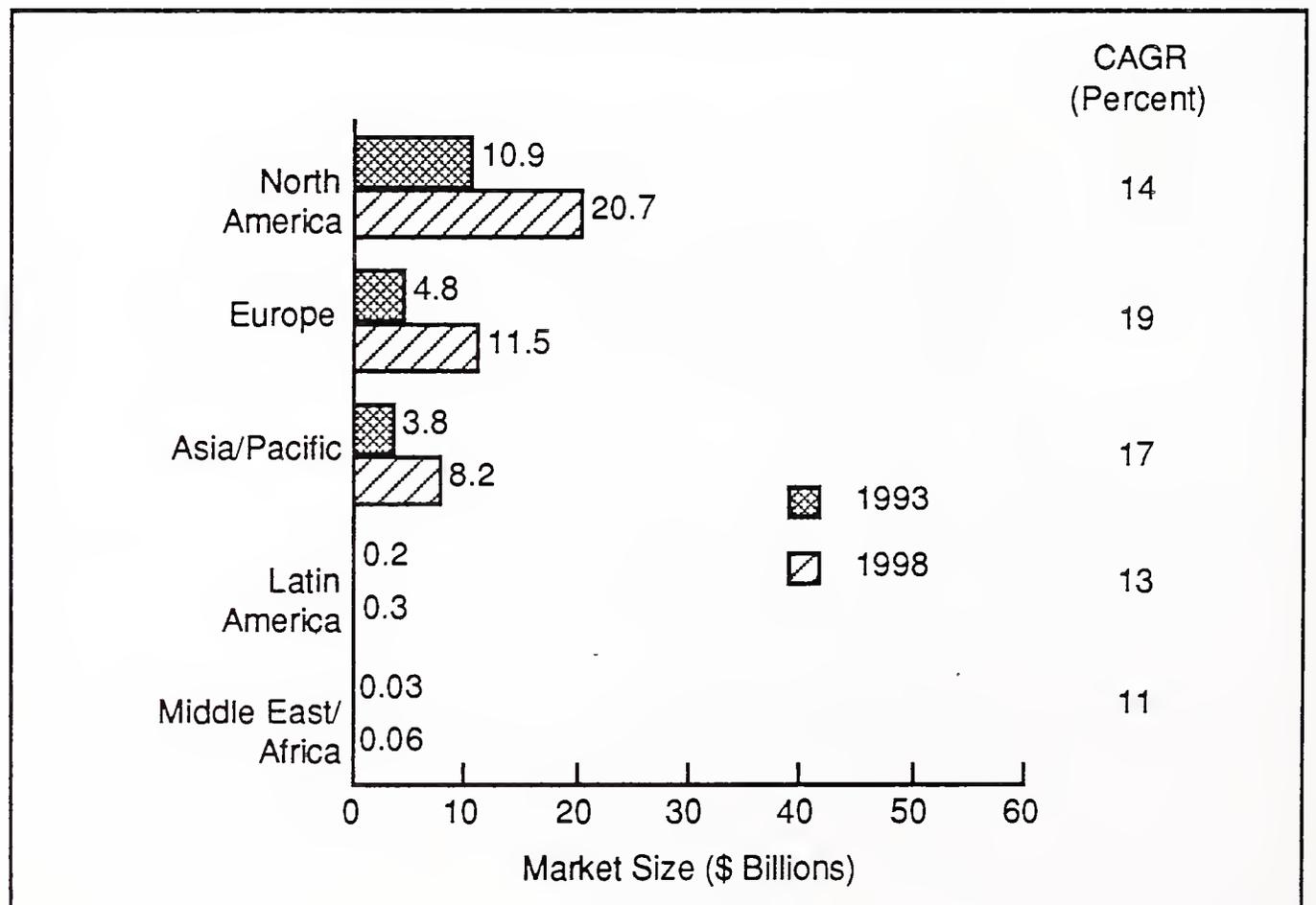


EXHIBIT II-13

**Worldwide Market Forecast by Regional Area  
Systems Operations, 1993-1998**

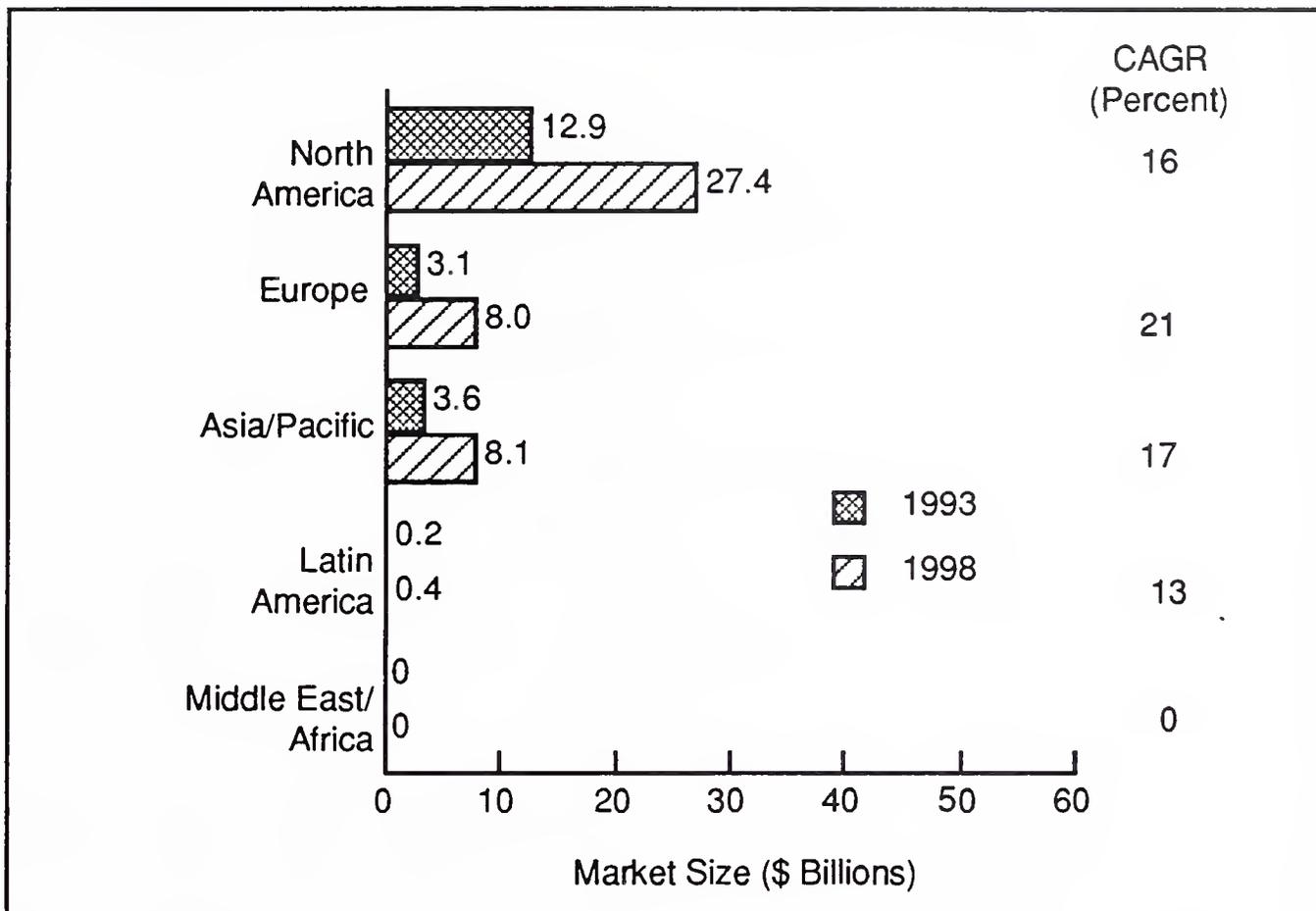


EXHIBIT II-14

**Worldwide Market Forecast by Regional Area  
Processing Services, 1993-1998**

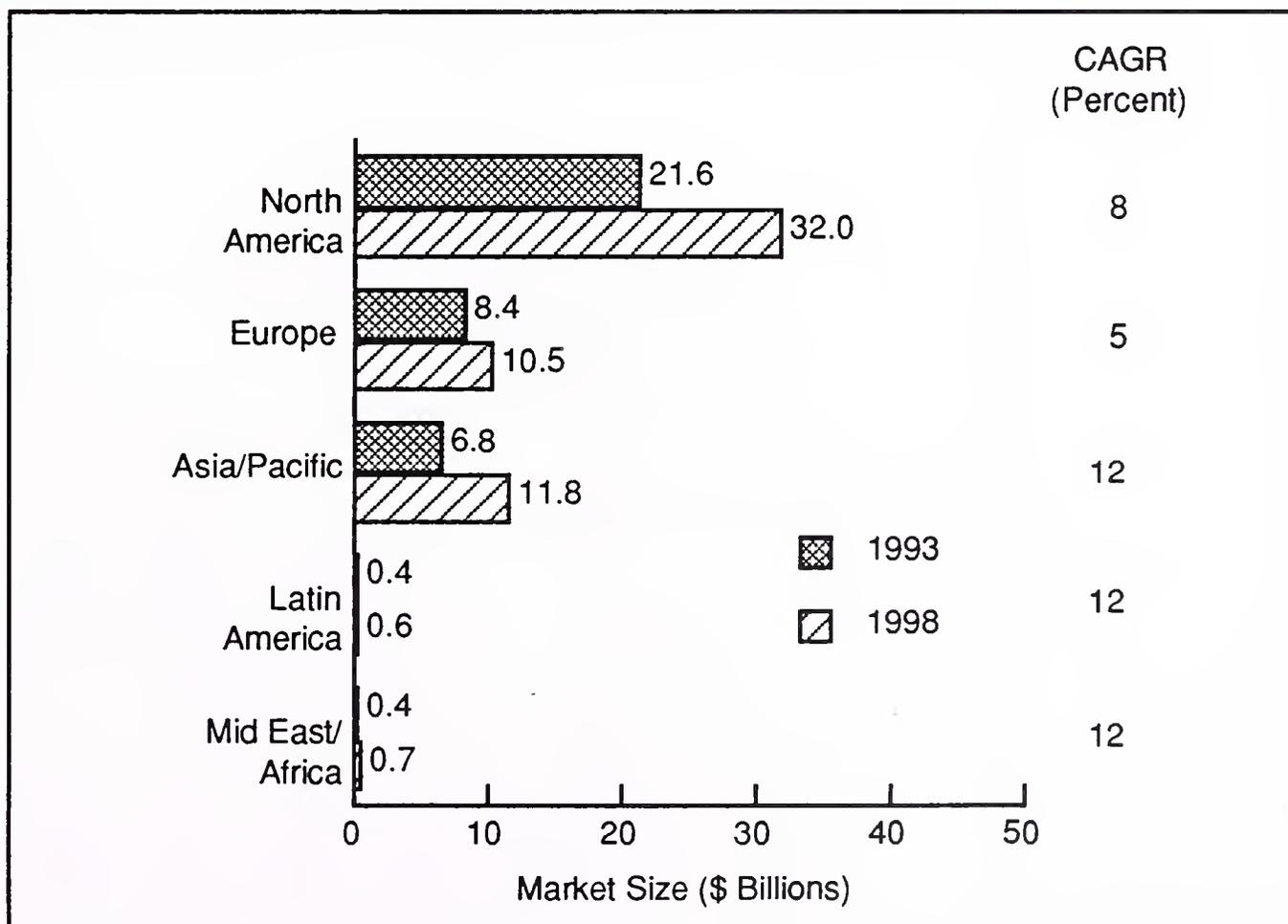


EXHIBIT II-15

**Worldwide Market Forecast by Regional Area  
Network Services, 1993-1998**

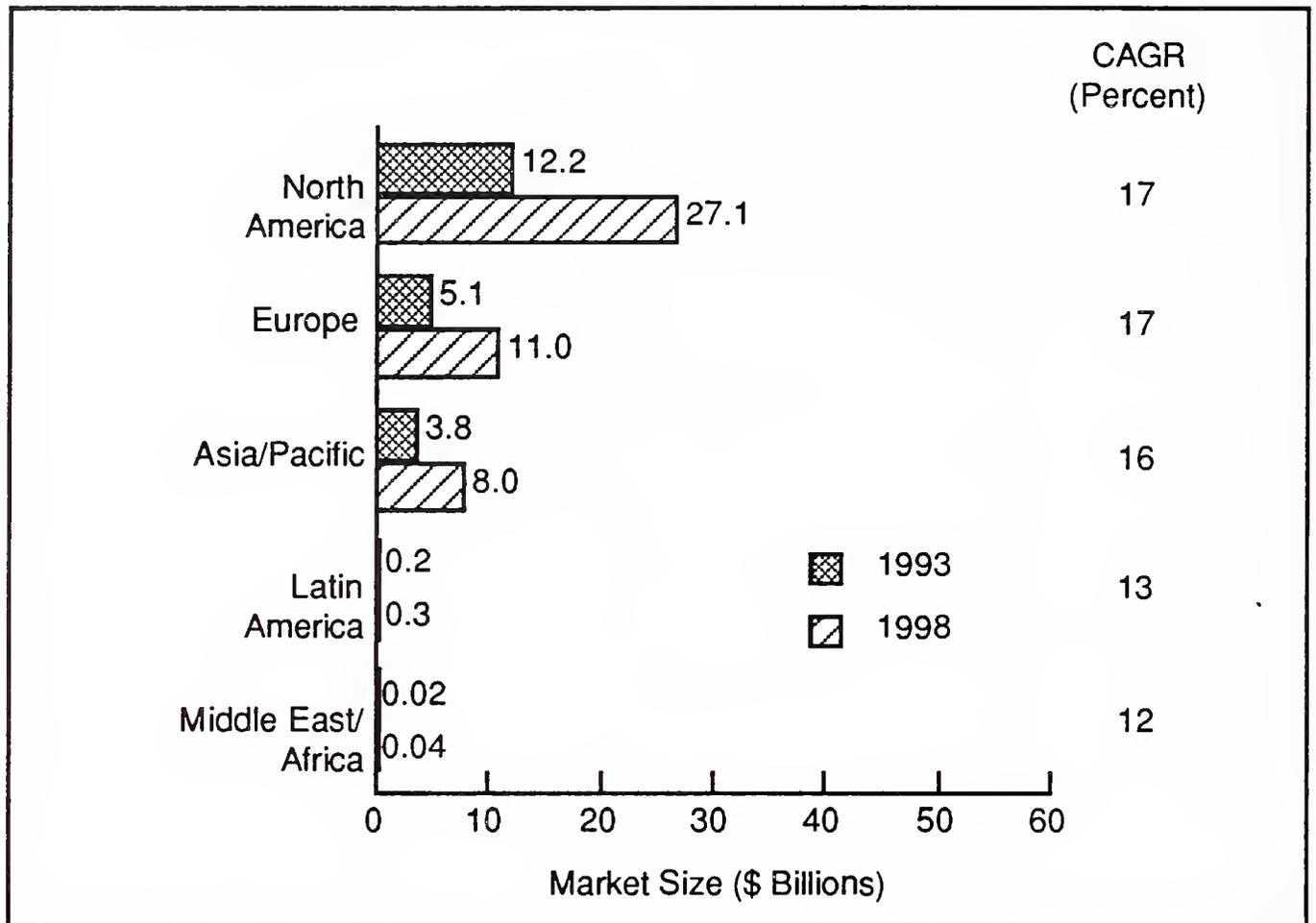


EXHIBIT II-16

**Worldwide Market Forecast by Regional Area  
Systems Software Products, 1993-1998**

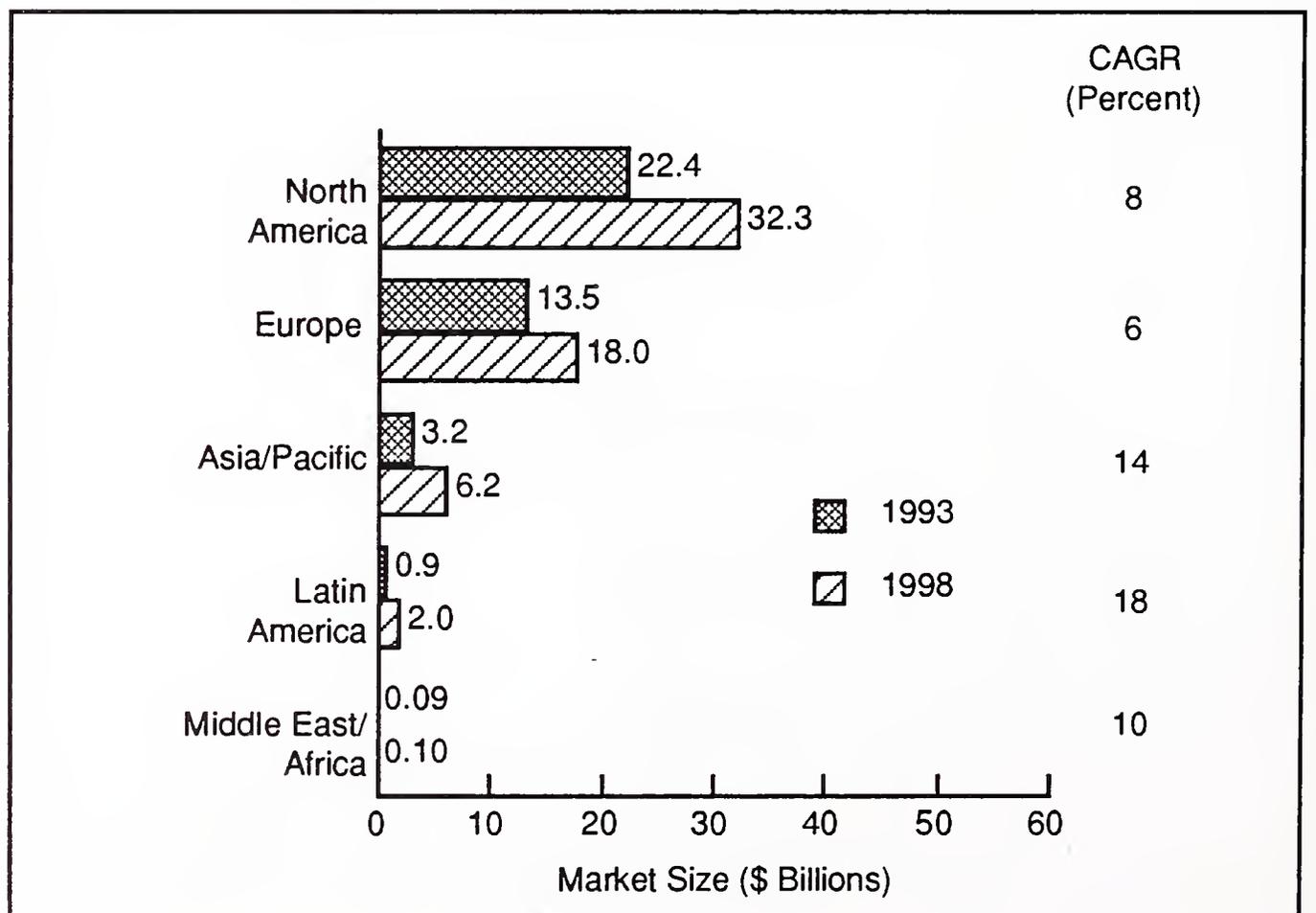


EXHIBIT II-17

**Worldwide Market Forecast by Regional Area  
Applications Software Products, 1993-1998**

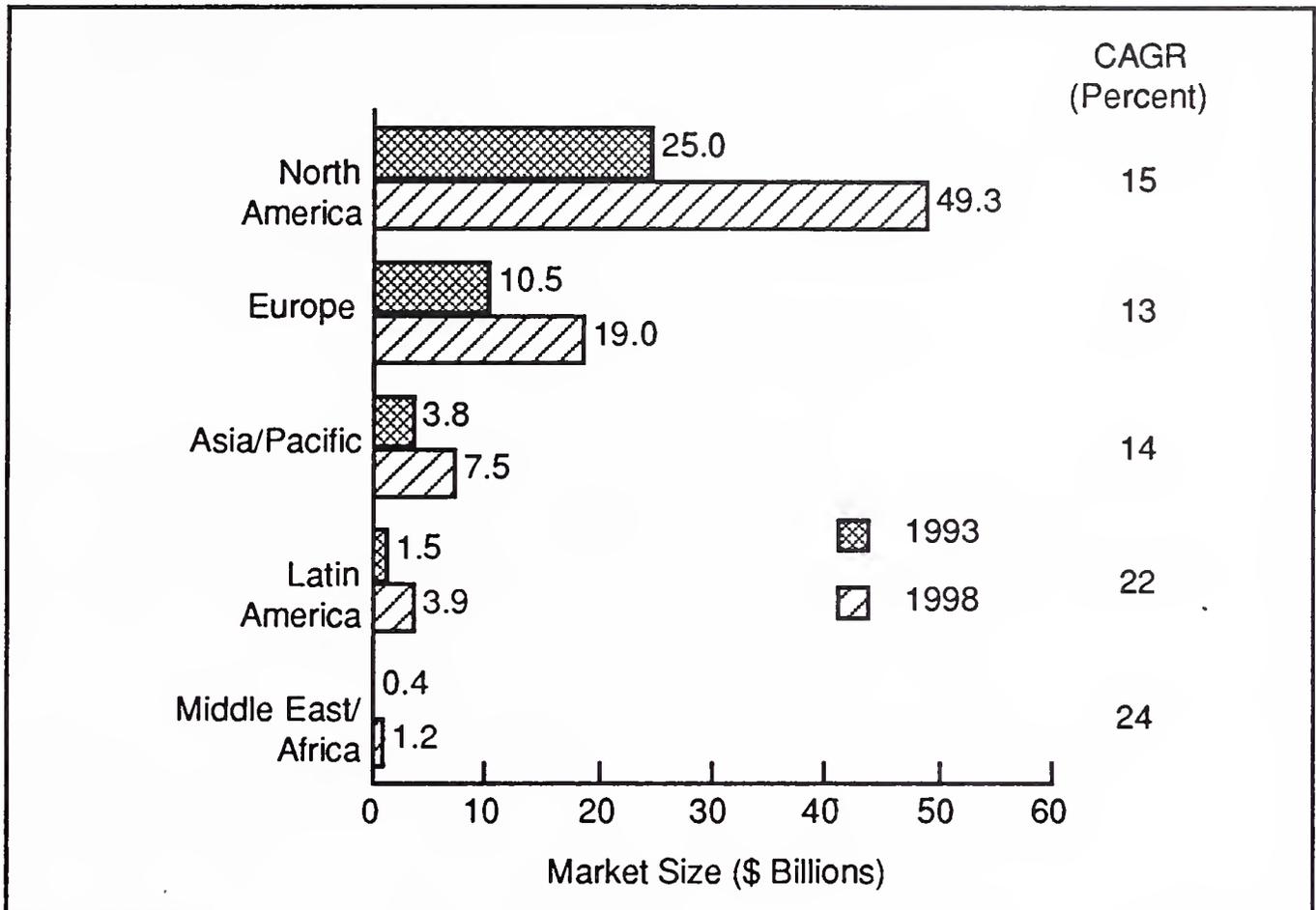
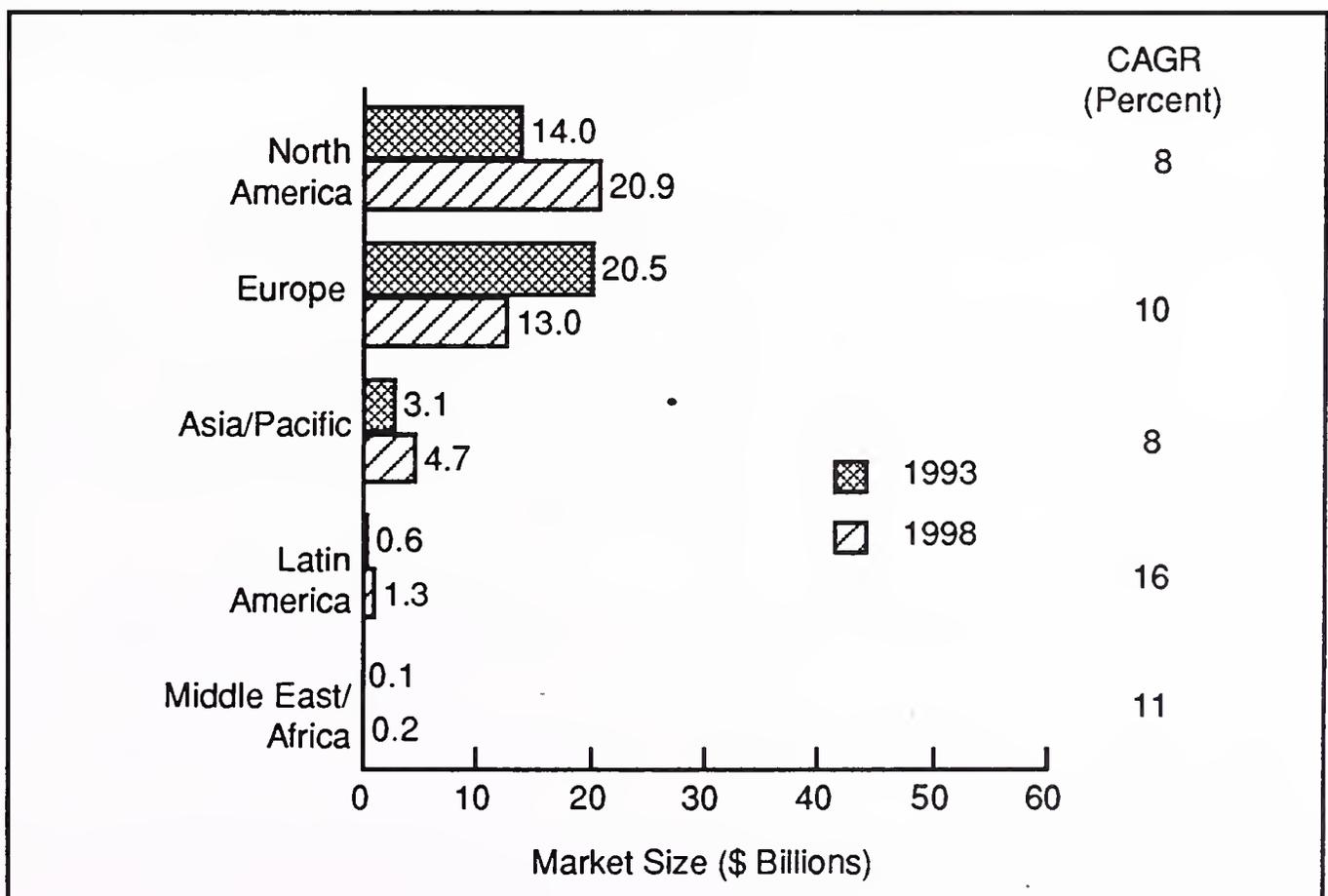


EXHIBIT II-18

**Worldwide Market Forecast by Regional Area  
Turnkey Systems, 1993-1998**



Forecasts for each region, except Latin America, are lower or equal to previous projections. Largest declines are in Europe and Asia, with Europe dropping from a projected CAGR of 15% to 10% for 1993-1998 and Asia from 18% to 11%. The recession spread from the U.K. to the continent, causing the European decline, while problems in the Japanese economy are the primary reason for the reduction in the Asia/Pacific area, where Japan represents more than 80% of the market.

*Processing services* (Exhibit II-10)—Although one of the largest segments, processing services, will grow at or below the industry overall average in each of the five regional areas. Though opportunities exist in processing services, greater opportunities for these vendors are in systems operations and the outsourcing concept of the entire data center.

*Turnkey systems* (Exhibit II-11)—Turnkey systems, though currently a market of modest growth in North America, remains a strong opportunity in the rest of the world. Client/server technology and more powerful personal computers will drive this delivery mode into the 1990s.

*Applications software products* (Exhibit II-12)—On balance across the regions, this is one of the strongest delivery modes and offers significant opportunities.

- Only North America reached a penetration greater than 50%. Significant growth opportunities remain in Europe and Asia. Assuming more rapid product and support development that functions in native languages, the Middle East and Latin America offer significant potential for the future.
- The movement to client/server technology will favor this delivery mode by the mid-1990s.

*Systems operations* (Exhibit II-13)—As an established market in North America and, to some degree, Japan, the systems operations concept remains relatively new and underused in the rest of the world.

- A few worldwide vendors will pursue this market in North America, Europe and Japan over the next five years and beyond.

- The opportunity in Europe, where the current market size is 28% of North America's, is quite large. The total information services market in Europe is close to 70% of that in North America.

*Systems integration* (Exhibit II-14)—Systems integration is the strongest delivery mode, in terms of growth, in the three major regions—North America, Europe and Japan.

- Interest in totally implemented information technology solutions is expected to grow throughout the 1990s.
- As general managers assume almost full control of information systems spending for development, they will turn to proven information services vendors for deployment of total solutions, expecting high-quality services at an affordable price.

*Professional services* (Exhibit II-15)—The largest sector overall, professional services had the most significant impacts from current economic conditions.

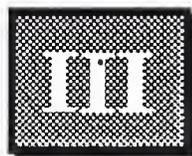
- North America growth was 10% in 1993, while the outlook in Europe dropped for the second year in a row from 11% CAGR in 1992 to just 4%.
- These vendors benefit from the shift to systems integration-type purchases of services, but not without some cost and disruption. For the smaller vendor, the near-term outlook is uncertain.
- Long term, this industry segment remains critical, a bellwether indicator of the industry's health as a whole.

*Network services* (Exhibit II-16)—This sector has the most worldwide aspect in the information services industry. All established markets require network access on a worldwide basis.

- Network applications and electronic information services will see strong growth over the next five years, although at a slower rate than previously predicted.
- It takes time for Europe to develop Europe-wide networks, and the same is true in the Far East. However, by the middle of the decade significant progress will have been made, international standards will have progressed and worldwide network services offerings will become common.

*Systems software products* (Exhibit II-17)—The growth of systems software products by region is primarily tied to hardware sales and the need to interconnect processing facilities.

- It remains a market of strong potential with relative ease of international product sales, regardless of where the product originates. If the product complies with international standards and functions with measurable value, a market for it will eventually exist in all regions.
- In the near term, the major market outlook is for somewhat slower growth due to declining hardware sales and software product costs. As demand for client/server and more integrated networks increases, growth will improve.



## Regional Summary—Asia/Pacific

### A

#### Regional Overview

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Amid the economic and political turmoil that has besieged most global regions, Asia and the Pacific Rim enjoy robust growth and increased opportunity. Of course, there remain exceptions. The negative effects of recession that plagued Japan in 1992 followed that nation's economy into 1993. Hong Kong's economy is still vibrant, but conflicts between Prime Minister Chris Patten and the Chinese government have increased the island's anxiety as 1997 draws ever closer. Taiwan faces labor competition from Southern China in the face of an ailing infrastructure, while South Korea turns a fearful eye toward the angry face of North Korean dictator Kim Jong Il.

Yet with these difficulties, the economic outlook for the Asia/Pacific region is quite optimistic. The region is fast becoming a force to be reckoned with in terms of the amount of wealth its industries and resources can generate. In aggregate, the governments of East Asia, excluding Japan, possess foreign reserves of roughly \$250 billion, while the region's corporations maintain more than \$600 billion in cash reserves. By 1996, the number of non-Japanese multimillionaires in the region is expected to double the current figure of 400,000. Within the next 15 to 25 years, the Asia/Pacific region will grow into an economic superpower, rivaling or surpassing Europe and North America.

For purposes of this overview, the Asia/Pacific region can be broken down into the following economic sectors:

- Japan, which overpowers the rest of the region economically, despite the ripples that spread from the burst bubble. Its impact on the total information services market of the region is discussed later.

- The “Four Dragons”—South Korea, Singapore, Taiwan and Hong Kong. The economies of these countries demonstrate some of the highest growth rates in the world. Along with Australia and New Zealand, the Four Dragons represent the second major economic tier in the region.
- The rest of the region, which includes Brunei, Cambodia, China, Indonesia, Laos, Malaysia, Myanmar (Burma), North Korea, the Philippines and Vietnam. Economically, China’s 1993 GDP of \$435 billion surpasses those of the Four Dragons, yet the country remains substantially behind in the information services and technology area.

Most of these countries have strong national governments that invest significant funds and energy into developing services that favor local industry in general, as well as the local information services industry. This internal development will continue. However, there are strong indications that privatization of government services, including telecommunications, banking and airlines, will yield significant opportunities in the area of information services. As more countries privatize key industries and further open their economies, there will be greater opportunities in Asia. European and North American information services companies will find themselves increasingly competing with Asians as more local firms emerge and grow with marketplace demand.

There are many forces driving the development of information services in the Asia/Pacific area. There are also several factors that could inhibit their growth over the next several years.

### **1. Driving Forces**

The forces driving continuing development of information services are significant and long-term. They represent the level of emphasis placed by government and industry in these countries on developing a strong information technology industry.

- *Technology value*—Recognizing the value of technology is a strength in this region. South Korea and Taiwan, for example, are manufacturing centers for technology products and have long realized the valuable relationship between technology investment and national development, making technology a national priority. Singapore has taken this a step further with its IT 2000 “Intelligent Island” concept, which will remake the city-state into a network focal point for the region.
- *Skilled labor*—India, Singapore and South Korea are at the forefront of a regionwide trend to better educate their populations in technological areas. Economically smaller countries have also seized upon this goal. Vietnam, for example, has more than 2,000 highly educated computer scientists, while its universities train and graduate roughly 300 more each year.
- *National development*—Asian countries have implemented extensive plans to develop their national infrastructures. Taiwan is an excellent example. This country’s six-year, multibillion dollar development program is among the most ambitious in the region and calls for improvements to highways, telecommunications systems and high-speed rail transportation. In China, plans exist to revitalize Shanghai and other southern cities to encourage more and better trade with the West through Hong Kong and Taiwan.

## 2. Inhibiting Factors

Although the forces causing the growth of information services are great, there are many factors that could significantly impact these countries’ continued development.

- *Political stability*—Long-term political stability remains a concern in many stronger Asian countries.
  - In the wake of Tianenmen Square, China continues to come under attack for its policies on trade and human rights. Internally, tension runs high as economic policy chief Zhu Rongji begins his economic reforms. Externally, the country suffered bitter criticism and defeat when its bid to host the 2000 Olympic Games was rejected by the International Olympic Committee on the basis of China’s unsavory imprisonment practices.

- A squabble has turned into a virtual feud between Hong Kong Governor Chris Patten and the mainland Chinese government. At issue are pro-democratic political reforms Patten announced in October 1992 that are not supported by China. In fact, the Chinese government threatened to put its own administration in place when it takes control of the island in 1997.
- Even in Japan, where the Liberal Democratic Party government was stable, albeit corrupt, for nearly 40 years, there is speculation whether the coalition government of Prime Minister Hosokawa will survive through the end of 1994.
- *Inflation*—The economies of most Asian countries heavily depend on the economic health of the West. The recession in North America and Europe may impede development in Asia/Pacific as it already has in Japan. As the West struggles toward recovery, the Japanese automobile, banking, construction, electronics, machinery and retail industries weaken. The slowdown is reflected in the 1993 INPUT forecast.
- *Domestic economic base*—Although this is changing as Asia's economic growth charges on, most Asian countries have a small economic base from which to derive investment resources. This small base restricts the speed at which they can grow. As a result, a high priority exists in the region to attract foreign investment, particularly if it involves automotive or computer-related manufacturing. Ironically, Japan and South Korea are regional leaders in this respect as large companies in their respective automobile and computer industries have exported jobs to other Asian countries.

## B

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### Information Services Market Forecast

In terms of country percentage of the total Asia/Pacific market, INPUT's 1993 analysis finds the conditions generally unchanged, with the exception of Japan, which has declined slightly from an 85% 1992 market share to 83% of the 1993 Asian market. The information services industry exhibits growth in some of the smaller markets, including India (five-year CAGR of 26%), Singapore (15%) and Taiwan (15%). Overall growth rates are

somewhat below those projected in the 1992 INPUT worldwide forecast, except for Singapore and South Korea, whose five-year CAGRs both exceed last year's estimates by 3%.

The information services market in the Asia/Pacific area decreased in size by 3% to approximately \$47 billion in 1993, primarily due to the 6% decline in the Japanese market as a result of that country's current economic difficulties. Between 1993 and 1998, the market is expected to grow to almost \$79 billion, as Exhibit III-1 shows, with an annual growth rate of 11%. This compares with 1992's 14% CAGR projection for the 1992-1997 period.

## EXHIBIT III-1

Market Forecast—Asia/Pacific, 1993-1998

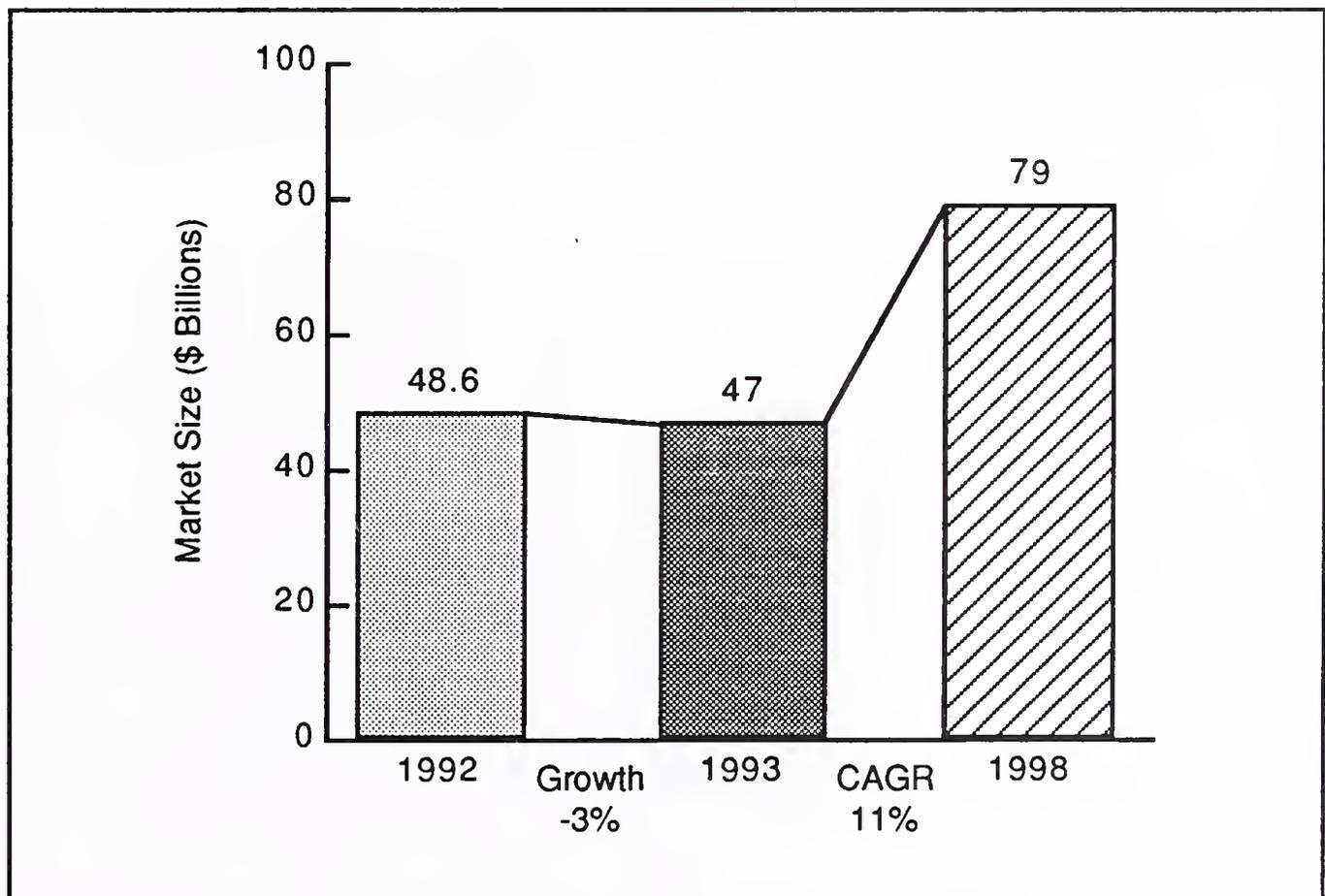


Exhibit III-2 provides the distribution of the market by country. Japan dominates the market with 83% of the expenditures and is the second largest market for information services in the world behind the United States. Its market is measurably larger than those of France and Germany. However, the severe impacts of the global recession and Japan's own internal economic problems resulted in a 6% reduction in information services expenditures in 1993. Growth in 1994 is expected to be a very modest 1%.

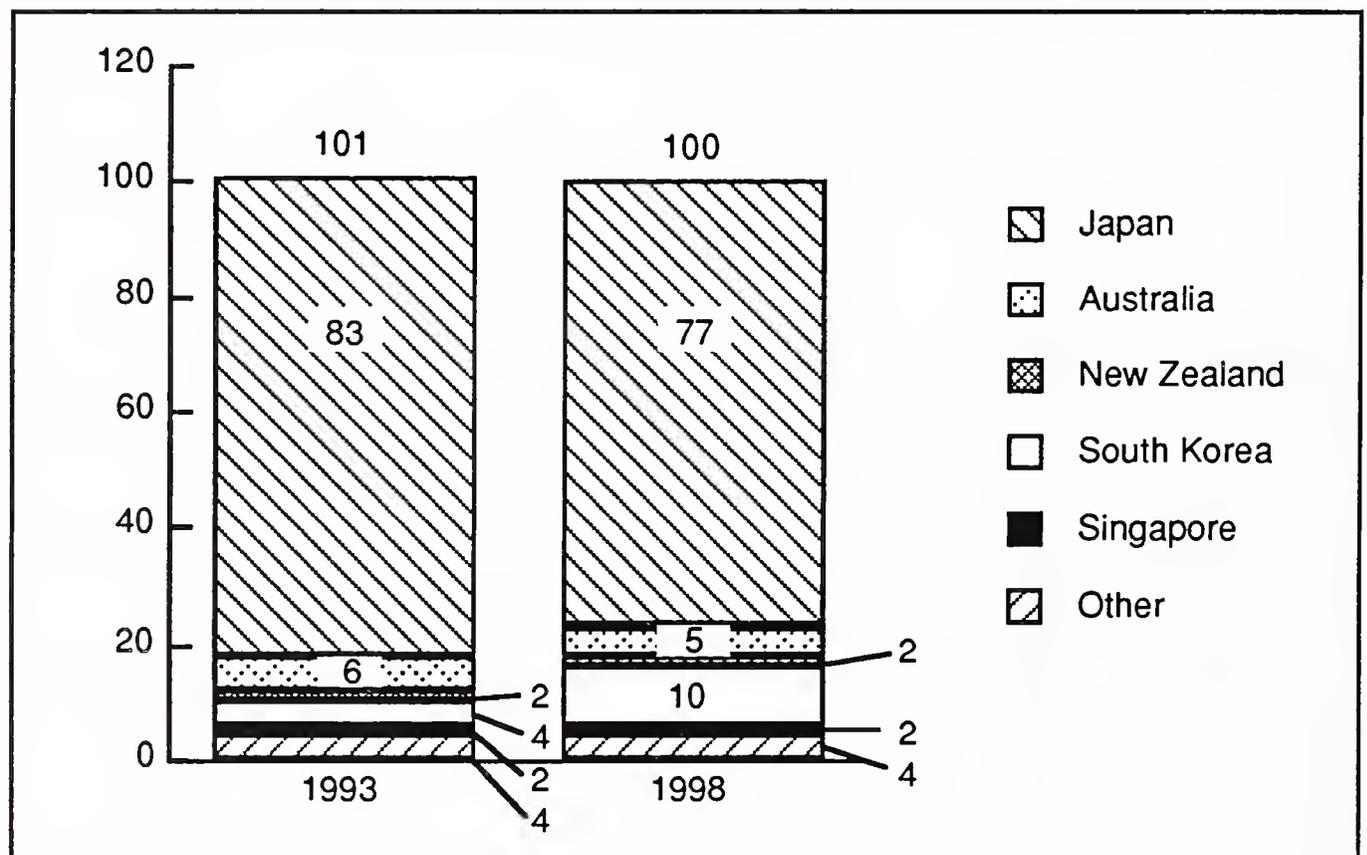
Stronger growth is anticipated in 1995 through 1998, resulting in a five-year CAGR of 9%.

Another significant change projected over the next five years is slower growth rates for Australia, New Zealand and Hong Kong. The Hong Kong information services market is forecast only through 1996, because the island reverts to China in 1997. INPUT believes that any estimate of expenditures beyond 1996 would be highly speculative.

As noted above, bright spots in the Asia/Pacific region include South Korea, whose five-year growth projection improved from 33% in 1992 to 36% in 1993; and Singapore, whose long-range forecast is upgraded from 12% to 15%.

EXHIBIT III-2

Market Distribution—Asia/Pacific, 1993 and 1998



Note: May not add to 100% due to rounding

As shown in Exhibit III-3, growth rates in most of the delivery modes are expected to be healthy for the next several years.

Specifically:

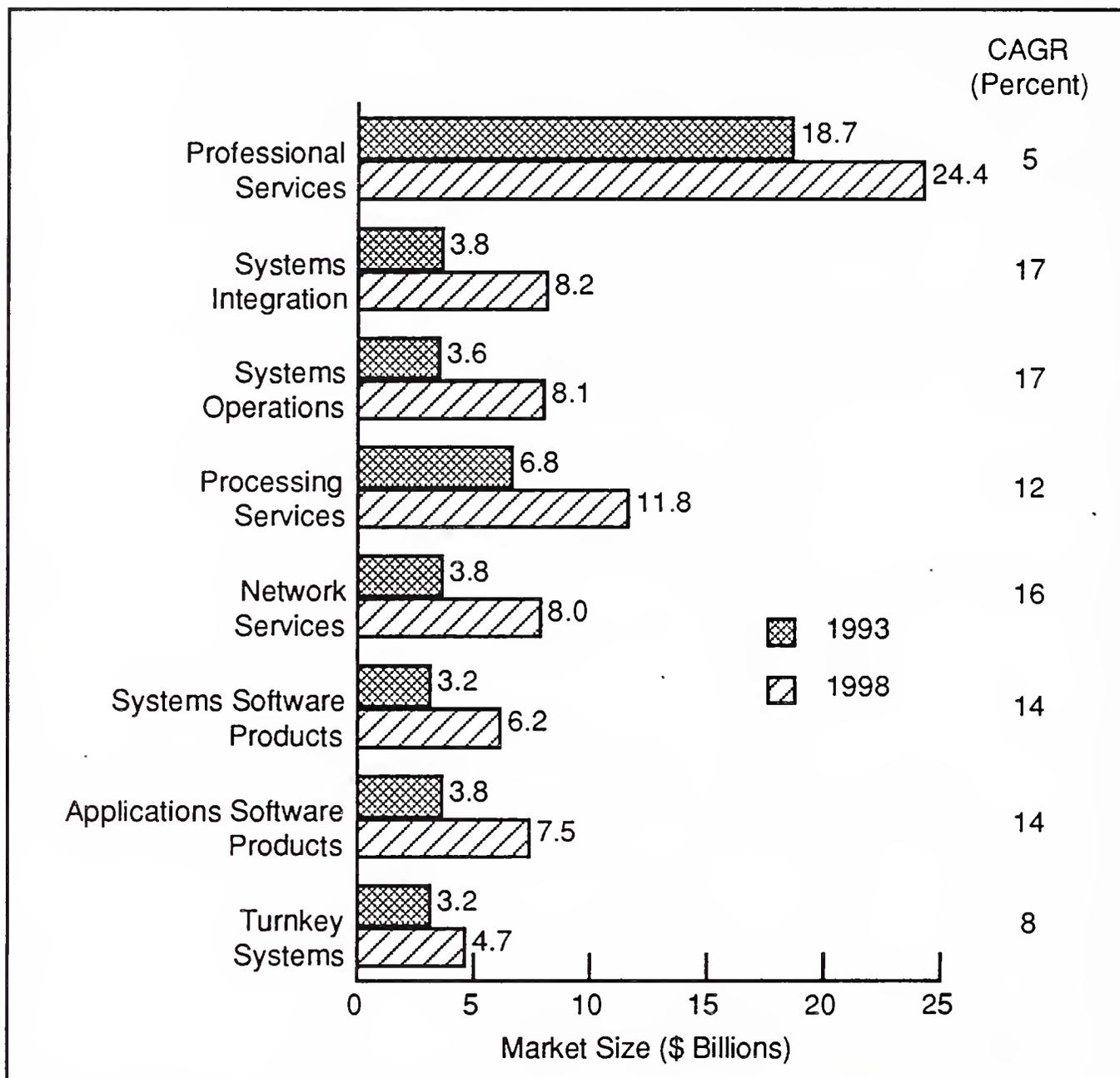
- *Processing services*—The 12% annual growth rate will bring this market to \$11.8 billion by the end of the forecast period. This forecast is somewhat lower than 1992's 15% CAGR. Strongest growth opportunities will be in South Korea (five-year CAGR of 26%), Taiwan (13%), Japan (12%) and Australia (12%). Japan, with a 2% decline in revenues from 1992 to 1993, will show enough improvement over the next five years to raise its performance to the 12% level.
- *Turnkey systems*—In the Asia/Pacific region, even Japan's 1992-1993 10% decline in turnkey systems expenditures doesn't prevent that market from growing at the same (but modest) 8% rate as the U.S. market. The growth reflects the continuing requirement for short-term solutions to meet growing needs, especially in South Korea and India.

The majority of turnkey systems opportunities will be in the lower end mini- and micro-based systems, rather than in large systems. Overall, the market is expected to grow from almost \$3.2 billion in 1993 to \$4.7 billion by 1998.

- *Applications software products*—The need for applications software products will make this a strong delivery mode in the Asia/Pacific area, growing from \$3.8 billion in 1993 to almost \$7.5 billion in 1998—a 14% CAGR.
  - Continued demand for industry/application-specific microcomputer software is expected to be the major driver.
  - The use of purchased applications software products in this region lags behind the Western market due to language barriers and pirated products, but these inhibitors are now being overcome so opportunities are significant, especially in South Korea and India.

EXHIBIT III-3

**Market Forecast by Delivery Mode  
Asia/Pacific, 1993-1998**



- *Systems operations*—As a market, systems operations is well established only in Japan, but is becoming a recognized processing alternative in most of the other major region markets.
  - The growth of this market, at 17% for 1993-1998, will parallel the equivalent growth of the Japanese market. The only other markets of current significance are Australia and South Korea, at 1993 sizes of \$116 million and \$196 million, respectively.

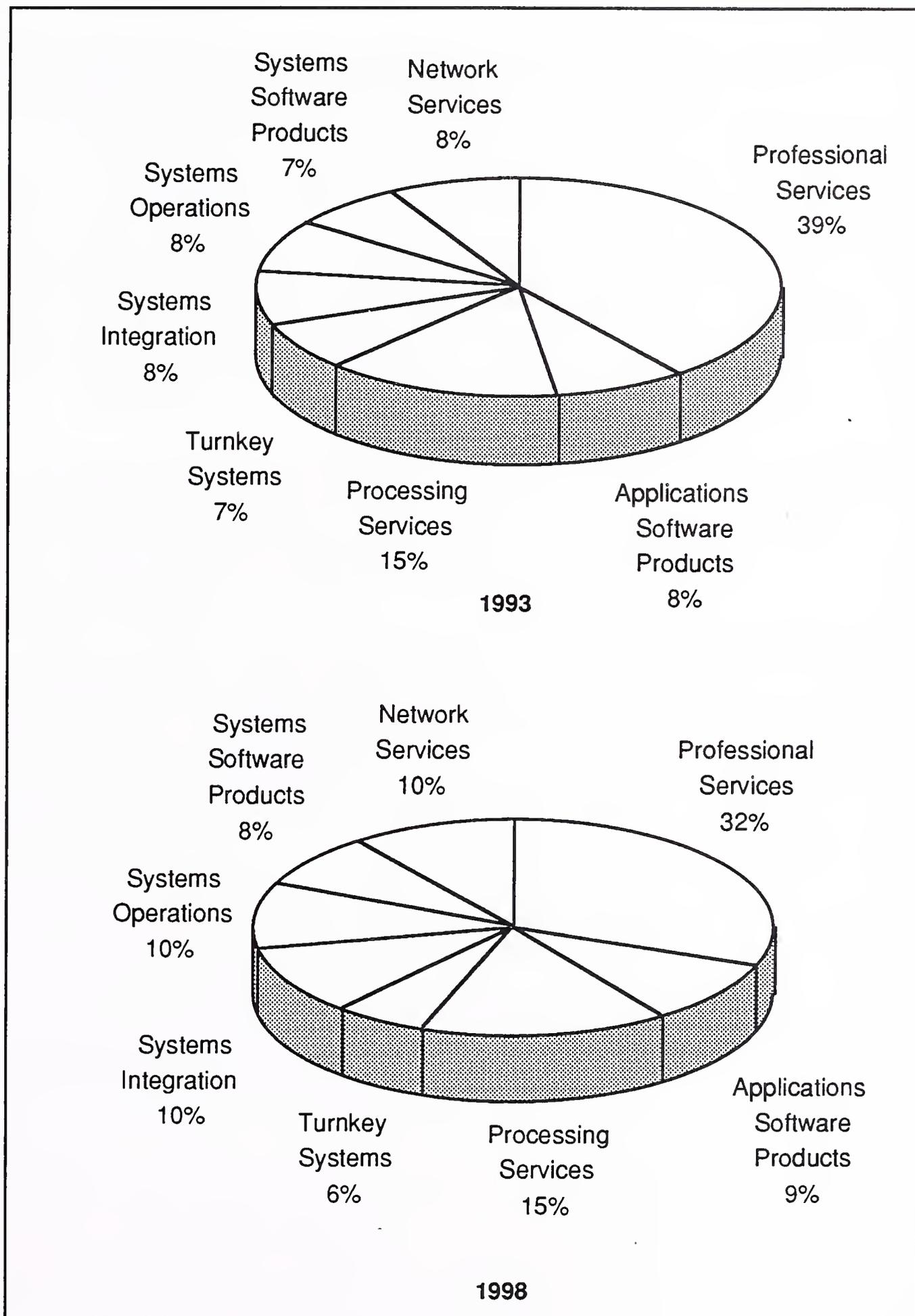
- In terms of long-range growth, South Korea's 31% increase to more than \$1 billion in 1998 and Japan's \$3.7 billion growth during the same period, offer the best vendor opportunities.
- *Systems integration*—Requirements for systems integration are expected to parallel those for systems operations in both market size and growth rates. The key market for integration services is Japan, although another market area, South Korea, showed extremely strong growth in 1993 (47%) and for the future (50%). The total Asia/Pacific market for systems integration services will grow from \$3.8 billion in 1993 to \$8.2 billion in 1998, at a 17% CAGR.
  - Identifying a systems integration market in less developed and developing countries is difficult. There are few projects that would qualify as systems integration projects if high value is considered an identifying factor.
  - In the smaller developing countries, the separation between turnkey systems and systems integration is less clear than in countries such as Japan and South Korea.
- *Professional services*—Professional services is by far the largest of the delivery modes; at \$18.7 billion in 1993 and \$24.3 billion in 1998, it is more than twice the size of the next largest mode, processing services. At only 5%, however, its five-year growth rate is the lowest of all delivery modes.
  - This is a direct result of the 8% drop in the Japanese professional services market and the only 4% five-year growth rate forecast for that country.
  - The slowed growth of the Japanese market is due in part to the growing acceptance of both applications and systems software products, decreasing dependence upon professional services programming activities.
  - The requirement for professional services will be strong in other countries where professional services skills remain somewhat scarce. This demand will be especially applicable to the medium-sized and smaller companies in countries such as South Korea, India and Singapore.

- Most importantly, in the smaller markets, professional services offers an excellent opportunity to establish market presence, whether as an international vendor or a local firm.
- *Network services*—Starting from a small base of \$3.8 billion in 1993, the market for network services is expected to show substantial growth, to \$8 billion in 1998, at a CAGR of 16%. This growth will be driven by increasing need for network-related services such as electronic mail and EDI.
  - Growth in some countries will be greater—e.g., South Korea, (a five-year CAGR of 35%), Singapore (22%) and Taiwan and India (19%).
  - Depending on national development priorities in the related telecommunications area over the forecast period, the growth rates could be even larger. As these countries expand their roles in the world markets, network services will become essential and offer significant opportunities to networking firms.
- *Systems software products*—The market for systems software products is strong, paralleling applications software products and driven by the aggressive adoption of PCs/workstations and minicomputers in this geography.
  - In addition, interest in CASE and other applications development tools creates significant opportunities for software product developers from Western countries.
  - INPUT forecasts this market to grow from \$3.2 billion in 1993 to more than \$6.2 billion in 1998—a CAGR of 14%.

Exhibit III-4 provides a comparison of the Asia/Pacific market by delivery mode for 1993 and 1998. Professional services will lose share in the overall market during the next five years while applications and systems software products and network services will gain share. This analysis, however, is heavily biased by the trends in Japan that represent 83% and 77% of the Asia/Pacific market for information services for the years noted.

EXHIBIT III-4

### Delivery Mode Analysis Information Services Market—Asia/Pacific, 1993-1998



## C

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**Market Considerations**

Many significant considerations related to entering the market for information services in the Asia/Pacific area were identified in the 1990 and 1991 reports. They generally remain unchanged.

- *National infrastructure*—In many Asian countries, the national infrastructure is extremely limited, indicating significant effort will be required before extensive use can be made of many technological advances, particularly relative to telecommunications. However, on a positive note, many national initiatives to improve this situation have gotten underway in 1992.
- *Size of market*—Outside the Japanese market, each country's market for information services is modest compared to Western markets. This suggests the costs of entry must be weighed carefully. The use of local agents is the most common approach to market entry everywhere but Japan and Korea.
- *Investment term*—Organizations interested in entering or expanding into the Asia/Pacific area should realize that a long wait may be required before there is a return on investment. All investments must be made with the long term in mind, yet growth opportunities suggest careful examination.
- *Organizational stability*—Organizations entering the Asian market must be able to demonstrate long-term stability. Experience with western companies indicates these companies are not prepared to continue as committed players for an extended period. This is particularly true in the area of software-related services, where numerous organizations have entered the market, then failed to provide ongoing support.
- *Cultural diversity*—Organizations must recognize there is great cultural diversity in the Far East. Individuals representing products and services must be able to deal successfully with a wide range of business styles, practices and customs. There is no "one Asia" any more than there is a single road to success in Europe.

- *Dynamic markets*—Asian markets are dynamic and will grow for a long time. Organizations willing to make long-term investments could realize significant rewards.
- *Technology transfer*—Asian countries are keenly interested in opportunities to develop skills of their indigenous population. Organizations willing to transfer some portion of their technology (i.e., software support) through training programs will be better received than those that are not.
- *Competition*—There is a high degree of competition from other countries and from those Asian countries that have already begun to develop their own information services capabilities. These countries tend to favor local vendors; thus, keen competition should be expected.
- *Nationalism*—Although all markets are open to international companies, there remains a strong sense of nationalism in most, if not all, countries in the Asia/Pacific region. This tendency also favors the local agent.

Local vendors tend to be native to each country and generally do not have a presence in more than their own country. The major U.S.-based firms are active in most of these markets and others use local representatives. European vendors are also active on a country-by-country basis.

For leading vendor information, please refer to the country profiles.

## D

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### IT Spending

Exhibit III-5 provides an estimate of Asia/Pacific's total IT spending for 1993.

EXHIBIT III-5

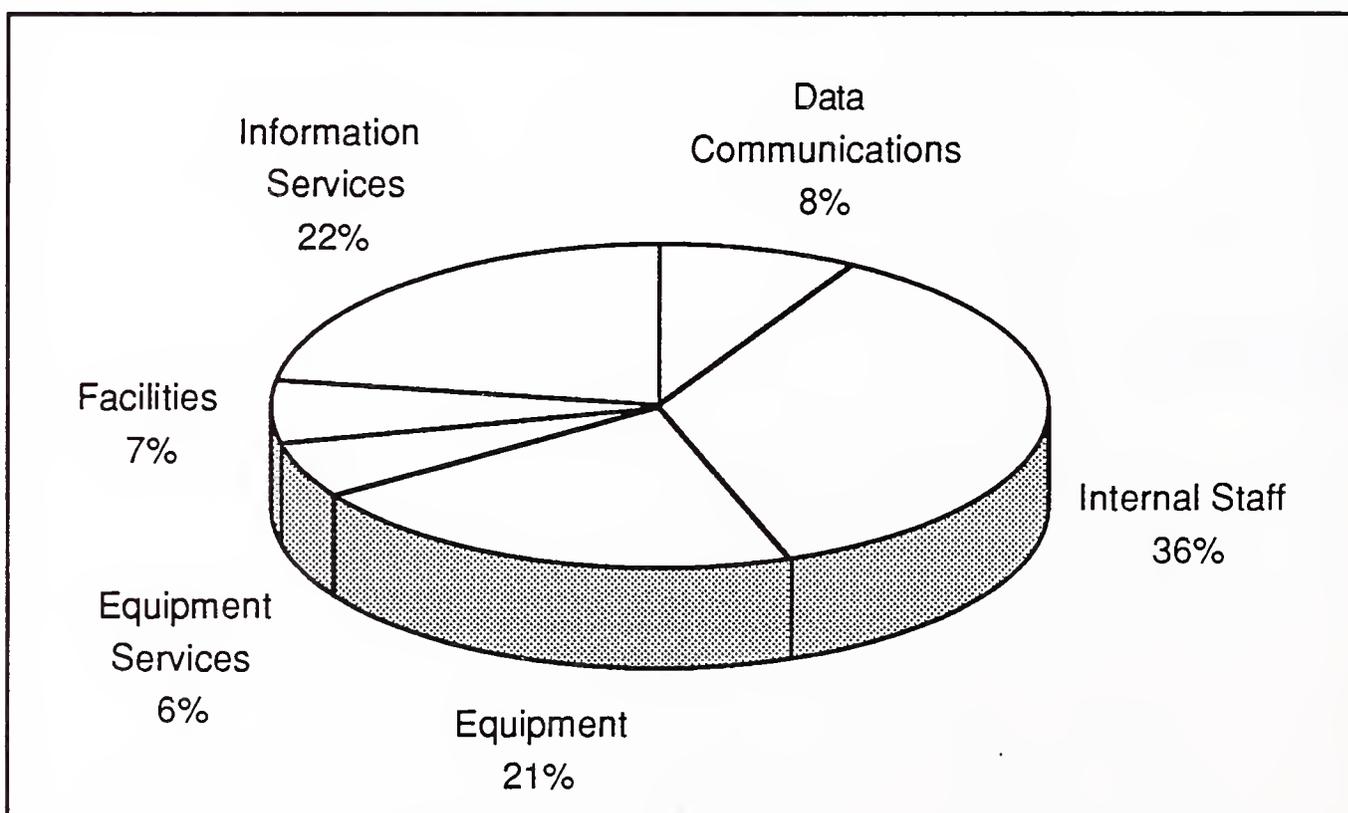
**Total 1993 IT Spending—Asia/Pacific**

Budget Category	Estimated Spending (\$ Billions)
Data Communications	19.6
Internal Staff	88.0
Equipment	52.0
Equipment Services	22.6
Facilities	27.6
Information Services	75.0
<b>Total IT Spending</b>	<b>284.8</b>

Information services, which includes software products, represents approximately 22% of the total IT budget, as noted in Exhibit III-6. The largest expenditure is for internal staff (36%). Equipment services represents the smallest portion of the IT budget at \$19.6 billion and 7% of the total.

EXHIBIT III-6

**1993 IT Spending Percentages—Asia/Pacific**





## Regional Summary—Europe

### A

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#### Regional Overview

##### 1. Return To Modest Growth Predicted

Information services investment is now 40% of European spending on capital goods. Because of this, the IS industry growth is closely tied to overall economic conditions. Weak growth prospects for nearly all European countries overshadow the market stimulus created by rapid advances in computer technology.

Software and services vendors will squeeze more from Europe's static IS budgets at the expense of reduced spending elsewhere. In Europe, only 16 of the Top 30 vendors made a profit in 1993.

In the latest forecasts for European software and services markets, INPUT reports an all-time low growth of 5% during 1993. As recession eases, average growth will rise to 10% per year over the next five years.

For this market growth to happen, Europe must spend less on hardware, computer facilities and internal IS staff. In other words, the trends to downsize, consolidate data centers, implement software solutions and outsource computer operations and support must continue or accelerate.

The challenge for the IS industry is to regain its profitability in a fiercely competitive market by moving rapidly to client/server architectures.

The Top 50 software and services vendors in Europe increased their collective market share in 1993 by 3% to 43% through a combination of business acquisitions and organic growth. The

bulk of professional services growth was accounted for by acquisition. In contrast, software product vendors achieved their growth mostly organically. Four major vendor groups vie for market share in software and services:

- Equipment vendors such as Digital
- Professional services vendors such as Sema
- Software product vendors such as Oracle
- Network service vendors such as AT&T

As a group, equipment vendors in the Top 50 only expanded software and services revenues by 8%. They lost ground to professional services companies and software products vendors. Network services vendors held their own against the rest.

## **2. Industry Driving Forces**

Three topics stand out as major driving forces for change in the software and services sector in Europe—open systems client/server, systems consolidation and outsourcing.

### **a. Open Systems Client/Server**

The need to exploit as well as control desktop computing has brought about the adoption of client-server principles and technology, where computing applications work is shared between the desktop computer and specialist servers on networks. The timing of this new wave of technology coincides with the availability of many open systems standards and low-cost products. Developing and implementing client/server-based application solutions will undoubtedly provide the majority of opportunities for software and service vendors over the next decade.

### **b. Systems Consolidation**

The underlying trend of systems consolidation could restore confidence in centralized IS products and services on open system platforms. For example, strategists at Amdahl, the mainframe systems vendor, believe UNIX will become well established in all large data centers during the 1990s. Such a conclusion would ensure that IS departments remain major purchasers of software

and services in spite of recent losses of purchasing authority to user management.

One of the best documented IS trends recently is the downsizing phenomenon, which implements new or replacement applications on smaller, cheaper systems. The economic pressure to reduce IS spending and get better value for money also resulted in significant downsizing among vendors themselves.

Less obvious, but just as important as downsizing, is the trend to consolidate systems and resources. In contrast to downsizing, which usually leads to fragmented IS resources over many different systems, consolidation leads to rationalized resources. Dispersed resources such as staff, systems or software are concentrated in fewer centers. Savings, for example, come from economies of scale, improved control of expenditures, and fewer boxes and licenses.

Outsourcing of systems operations is also a form of consolidation. The vendor takes advantage of critical mass to offer a cost reduction to the customer when running the data center or network.

These two processes, downsizing and consolidation, directly parallel the behavior of organizations. Businesses continually improve either their effectiveness or their efficiency. Downsizing—often motivated by user frustration and the need for flexibility—is the normal outcome of a desire to improve effectiveness. The opposite swing of the pendulum is consolidation—the need to improve efficiency and productivity. In general, these phases alternate with each other.

Recent research by INPUT in Europe revealed that UNIX is the most preferred software environment—despite continuous ebb and flow of the political and technical power struggle between Novell, COSE and Microsoft. Software environments implemented at the department server today and for the next few years will gradually consolidate into data centers or their equivalent.

The result of this downsizing and consolidation is that the IS infrastructure (networked open system servers), built up to support clients, will inevitably support UNIX.

Consolidation also means that IS management will retain the role of specialist purchaser for their organizations' IS infrastructure. This is good news for software and service vendors who have found their sales costs rising as IS purchasing power moves steadily away from IS to user management. However, IS professionals are now targets of desktop vendors as well as data center vendors.

### **c. Outsourcing**

As industry and commerce become increasingly competitive and markets become more global, many companies question their need to employ staff for noncore functions. The alternative is to outsource such functions to other businesses, preferably for a reduction in overall cost or improved service.

The most significant outsourcing trend to occur within the information services sector recently is in systems operations—passing on responsibility for (facility) management of previously in-house computer operations and/or applications to a third-party vendor. The major advantage for vendors and users is that contracts for such services imply a long-term relationship during which both parties financially benefit through economies of scale and forward planning.

The next major trend is outsourcing desktop services. Several contracts were recently placed for the support and maintenance of the whole variety of desktop systems, such as PCs, workstations, printers and office servers, plus the systems and applications software being used. As business-critical systems become more distributed, purchasing decisions move away from the central IS function and become distributed. Comprehensive desktop services vendors may become very influential in future system decisions compared with vendors who support only central IS systems.

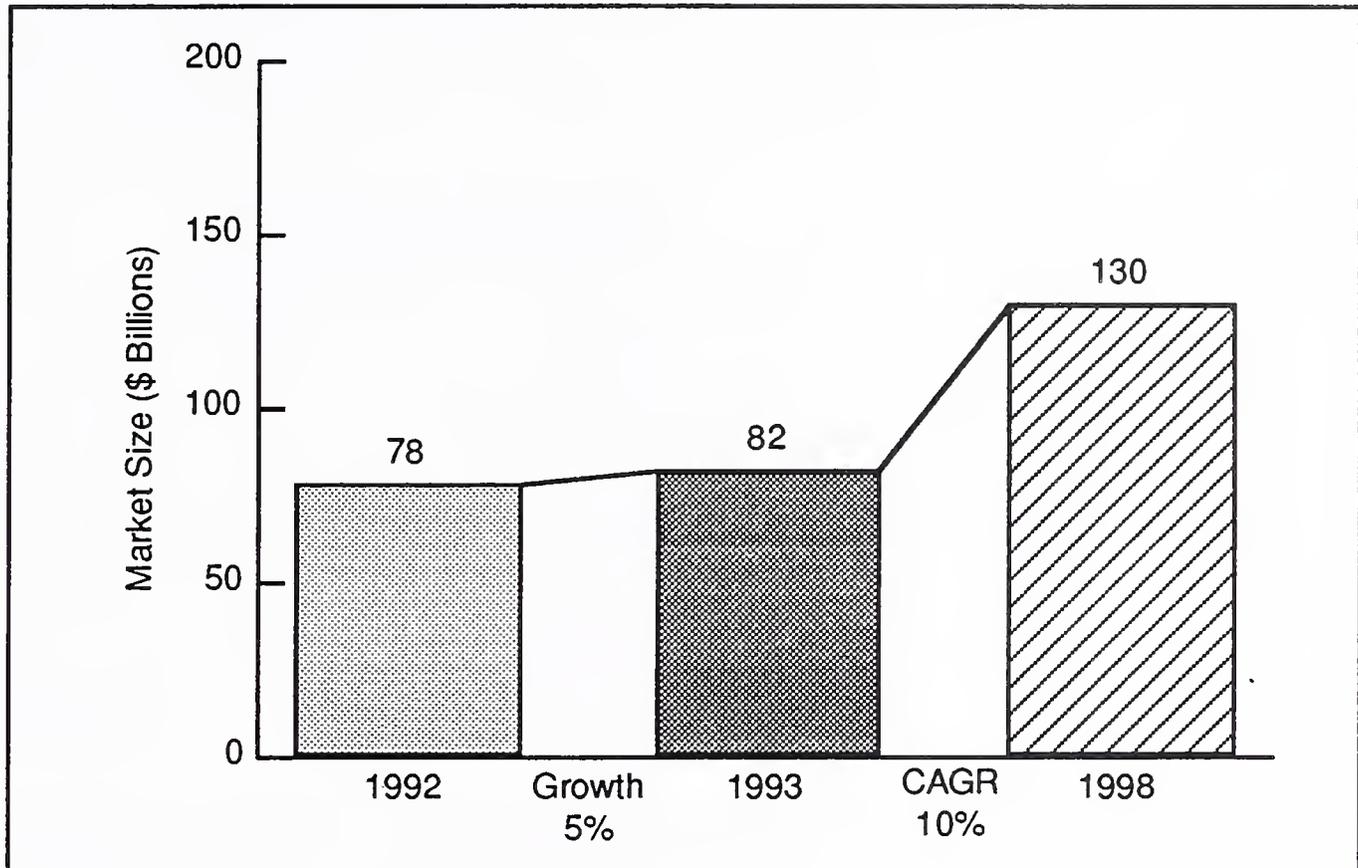
## **B**

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### **Information Services Market Forecast**

Exhibit IV-1 shows INPUT's forecast for the total European information services market, which includes equipment services. It is expected to grow from \$82 billion in 1993 to \$130 billion by 1998, at a CAGR of 10%.

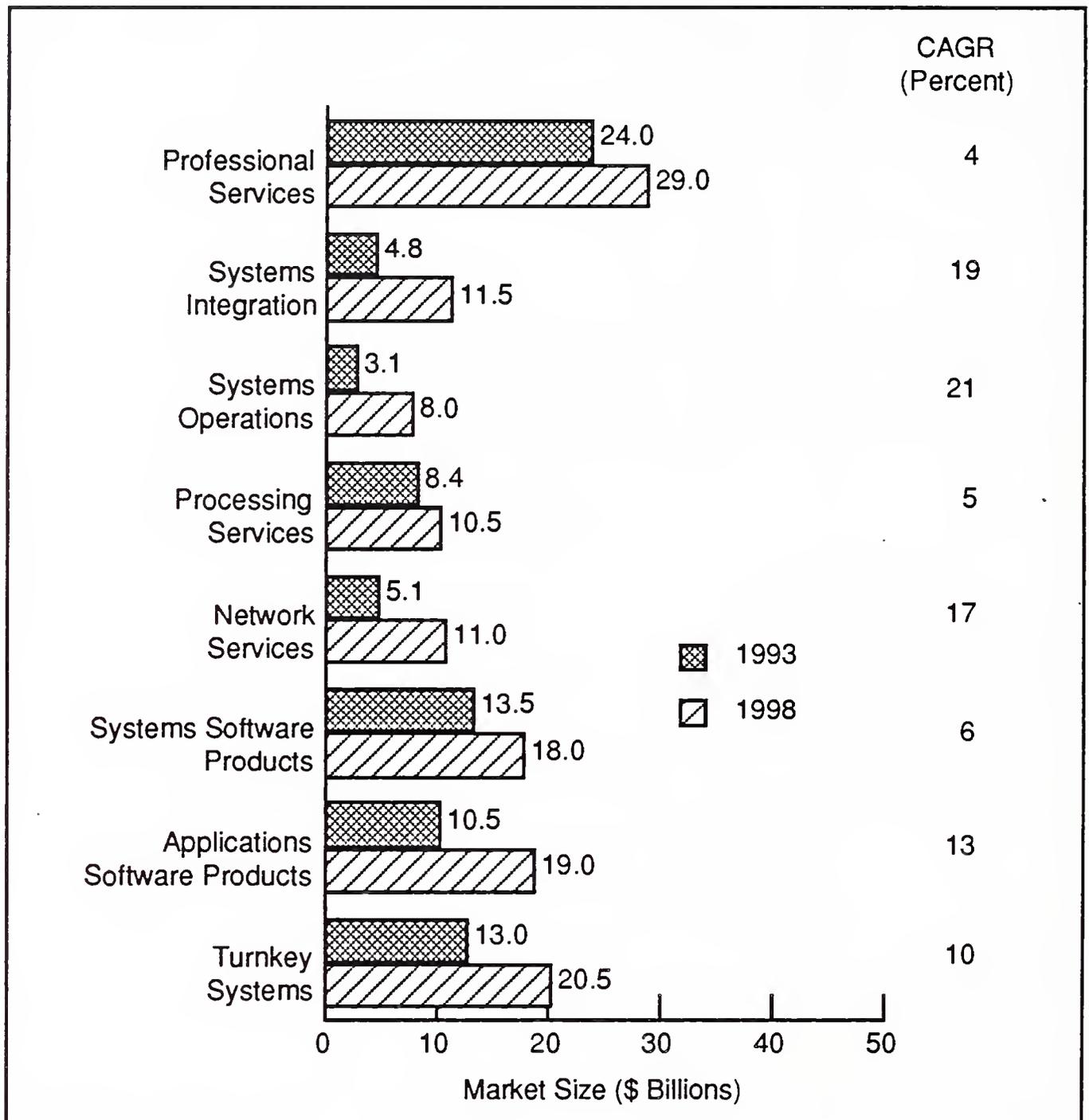
Exhibit IV-1

**Market Forecast—Europe, 1993-1998**

The development of nine delivery modes as defined by INPUT is shown in Exhibit IV-2. Professional services joins the processing services sector as the slowest growing sectors, at an average of 4% annually over the five-year period. Outsourcing has the highest predicted growth at 21% yearly during the same period.

EXHIBIT IV-2

**Market Forecast by Delivery Mode  
Europe, 1993-1998**



Software products are not gaining market share over services as predicted in previous reports. Price competition is expected to counter the increase in product volumes, resulting in overall growth just below the whole market average. Systems software is expected to perform particularly badly, even though there are many innovative product areas in this sector. Applications software products and turnkey systems are expected to experience difficult growth as the market continues to downsize. Volumes will grow rapidly, but revenues will be held back by pricing pressures.

Professional services continue to represent about one-third of the whole market, with consulting and training suffering from financial cuts in times of recession. The fall in demand for contract staff (body-shopping) has significantly lowered growth expectations in professional services.

In terms of market size, the leading country is clearly France, but it is now expected to lose some ground to Germany and the U.K. over the next five years. At 8% growth, Germany fell behind Spain, which is now the fastest growing of the larger markets in Europe. The small market in Central and Eastern Europe promises to grow at 20% to 30%. Scandinavia and France can expect some of the slowest growth rates over the next five years.

## C

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### Market Considerations

INPUT's analysis of the 10 leading vendors in software and services across Europe is shown in Exhibit IV-3. The nationality of the parent company is shown with the estimated revenues attributable to the vendor from free-market business within Europe.

All major equipment vendors have reorganized in Europe through 1992-1993 to emphasize their capabilities as software and services providers and increase the profit contribution from these activities. Hardware prices and revenues generally fell faster than vendors could reduce their overhead costs. Restructuring of these businesses is still a high priority for equipment vendors.

Exhibit IV-3

## Leading Vendors, Software and Services—Europe, 1993

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	6,640	8.0
2	Cap Gemini Sogeti	France	2,080	2.5
3	Digital	U.S.	2,010	2.5
4	Siemens-Nixdorf	Germany	1,890	2.3
5	Reuters	U.K.	1,350	1.6
6	Microsoft	U.S.	1,280	1.6
7	Andersen Consulting	U.S.	1,050	1.3
8	Olivetti	Italy	1,020	1.2
9	ICL (Fujitsu)	U.K. (J)	950	1.2
10	Bull	France	895	1.1
	Total Listed		19,165	23.3
	Total Market		82,000	100.0

IBM is the largest computer vendor in Europe by far, so subsequently is also the largest vendor of software and services. In most countries, IBM retrain staff to move them from back-office jobs into front-line service roles. Its systems integration business in Europe has been centrally coordinated for five years, and has grown extremely rapidly winning multinational bids. Across all its businesses, IBM invests in partnerships, particularly small equity holdings, with other vendors who are key either to future industry sector business, product development or new technology.

As it offers a range of professional services, IBM is increasingly seen by independent vendors as a potential competitor as well as a partner. IBM is seen as a considerable threat to the traditional independent service vendors in terms of market share.

Cap Gemini Sogeti has a clear size and geographic advantage over its European rivals now, but finds the market tough throughout Europe. Its market share in France fell in 1992. Recent acquisitions in Sweden, Netherlands and Germany have all downsized somewhat in the restructuring. A new top

management team and fresh policies, such as signing up software product marketing agreements, should limit the damage caused by continued recession and reduced demand for custom development projects in Europe.

**D****IT Spending**

Exhibit IV-4 provides an estimate of Europe's total IT spending for 1993.

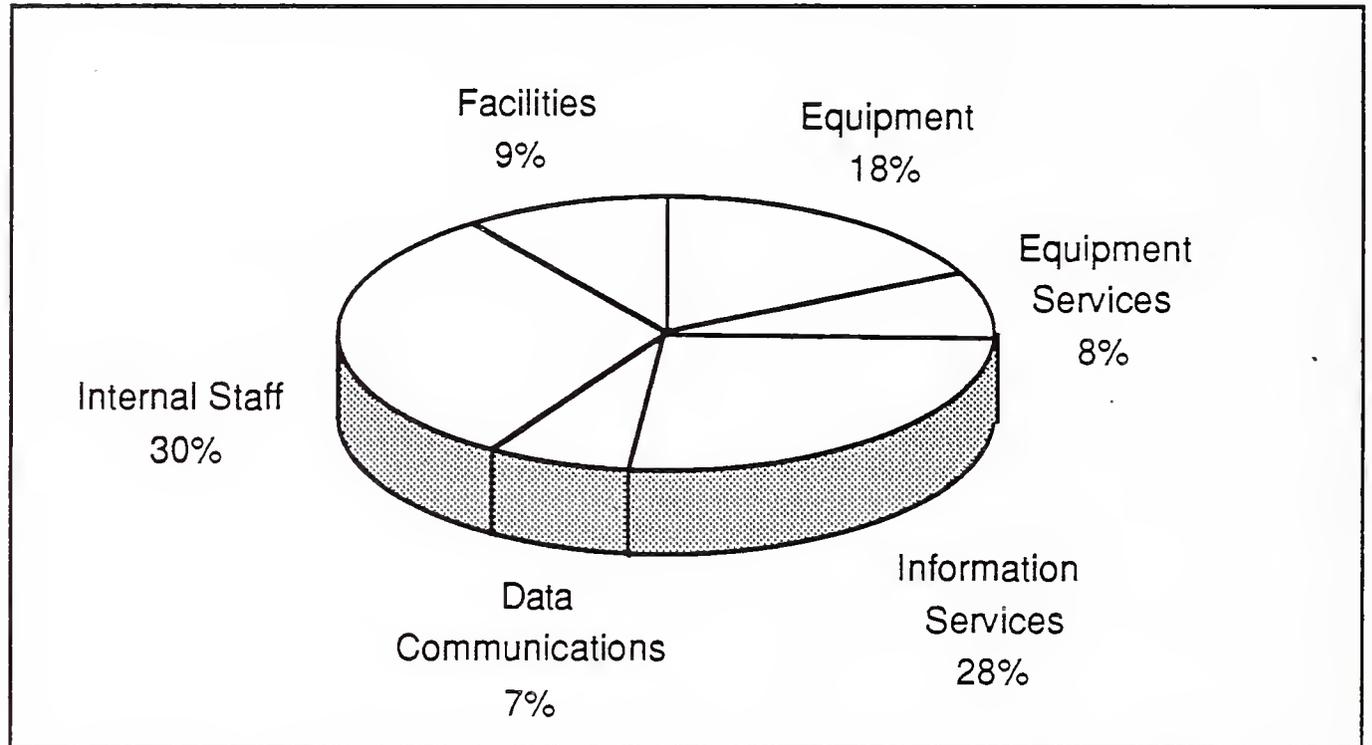
## EXHIBIT IV-4

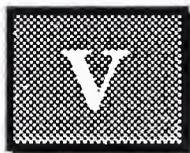
**Total 1993 IT Spending—Europe**

<b>Budget Category</b>	<b>Estimated Spending (\$ Billions)</b>
Data Communications	19.6
Internal Staff	88.0
Equipment	52.0
Equipment Services	22.6
Facilities	27.6
Information Services	82.0
<b>Total IT Spending</b>	<b>292.3</b>

Information services, which includes software products, represents approximately 26% of the total IT budget, as noted in Exhibit IV-5. The largest expenditure is for internal staff (31% of the IT budget). Data communications represents the smallest portion of the IT budget at \$19.6 billion and 7% of the total.

EXHIBIT IV-5

**1993 IT Spending Percentages—Europe**



## Regional Summary— Latin America

### A

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#### Regional Overview

After spending the 1980s largely underdeveloped and deeply in debt, Latin America is finally modernizing and positioning itself as a desirable trading partner for North America and Europe. Through a series of austerity or “shock” programs and privatization initiatives, many Latin American governments are trimming the fat from their infrastructures, better managing finance and debt issues and providing appealing inroads for foreign capital investment and technology.

Since the late 1980s, a number of Latin American countries have elected free market-oriented leaders who promote privatization of state-owned industries, which greatly expanded the amount of foreign private capital invested in the region.

Significant progress in recent years brought down soaring inflation rates of the 1980s in many Latin American countries. This caused some slowing in economic growth over the past two years, which has also been exacerbated by the worldwide recessionary environment. However, progress in 1993 toward establishing a number of regional free-trade zones, including substantially reduced tariffs with the United States, should lead to accelerated GDP growth rates in the 1995+ time frame, as individual countries learn to maximize their economic competitive advantage. Also, the strengthening U.S. economy should be a significant positive for a resurgence in growth, particular for Mexico.

However, many countries are still burdened by high debt and a low economic base, so prospects for certain regions over the next

several years are cautiously optimistic. Many countries continue to address their debt problems with austerity programs, and many now structure policies intended to stimulate investment.

Most Latin American governments are investing heavily in telecommunications and other infrastructure programs. This bodes well for United States telecommunications equipment and services companies, many of which have already signed significant contracts in the area.

However, telecommunications privatization programs differ in degree among Latin American countries, which impacts the level of opportunities for foreign telecommunications equipment and services companies as well as the sophistication level of telecommunication services for multinational corporations. The Mexican government implemented one of the most liberal and extensive privatization programs for telecommunication services, which produced one of the most modern telecommunications infrastructures in the region.

More recent free market reform programs are also very positive for the United States computer and information services industry. With stiff tariffs in the past, often in the range of 20% to 25%, U.S. computer and software products companies have had difficulty competing with local companies. Penetration of computer technology in Latin America is also significantly less than in other global regions, such as Europe and Asia, which provides the potential for significantly higher market growth rates for such products in Latin America.

In the 1990s, Latin American countries renegotiated with their creditors to spread payments on their nearly \$400 billion debt into easier terms. With this breathing room, Latin America is the United State's fastest-growing export market. In 1991, 400 million Latin Americans bought \$58 billion worth of American-made goods and services, an 18% increase over 1990. In 1992, this figure reached approximately \$68 billion.

These figures represent how effectively Latin American leaders have loosened protective import regulations and lowered restrictive tariffs. American companies now have more freedom, so ship capital goods to Latin Americans ranging from heavy equipment, like bulldozers, to personal computers.

Latin American countries can be divided into two groups:

- Argentina, Brazil, Mexico, Panama and Uruguay, which have been plagued by the worldwide recessionary environment. Progress in 1993 toward establishing a number of regional free-trade zones including substantially reduced tariffs with the United States, should lead to accelerated GDP growth rates in the 1995+ time frame, as individual countries learn to maximize their economic development and growth.
- The remaining Latin American countries, which have low income per capita and generally unstable governmental and political environments.

The information services market can also be divided into these groups. Each of the five developing countries have established information services industries with locally-based companies and are represented by leading computer manufacturers. They offer real market opportunities, although not without significant challenge—the second category offers less opportunity.

Even though positive changes are expected in Latin America, they will come slowly throughout the decade. A number of countries will achieve modest growth if the world economy remains stable. This is hampered by general recessionary economies of major industrialized countries in Europe, North America and Japan.

Severe downturns in the world economy will adversely affect many Latin American countries and slow their development of successful information services markets. If Latin America backslides, the economic superpowers can expect the migration, political upheaval, debt default and ecological devastation these countries have suffered in the past to return with a vengeance.

As occurs in more developed countries, the IS market outgrows the local economy. Long term, there could be major opportunities in larger Latin America countries, given their populations and potential industrialization. These will primarily be software and professional services.

## 1. Driving Forces

Although the technological base is relatively small in the majority of the countries, there are a number of forces causing change. Many of them represent opportunities for information services vendors.

- *Training/Education*—The low level of education has been identified in most countries as a key contributor to lack of industrial development. As a result, many countries instituted national education and training programs, with emphasis on technology. This is a significant and long-term opportunity for professional services companies to provide information technology training.
- *Public sector spending*—As economic stability develops, public sector spending should increase, providing opportunity to local and international vendors. Most information technology spending comes from the public sector, so increased government spending for development will have a stimulating effect. These countries have high-growth populations and a number of government-run social programs that benefit from systems integration services.
- *Technology incentives*—Many countries instituted incentives to stimulate computer use. This should result in more acquisitions of mini- and microcomputers. Many countries are working to place computers in schools at all levels.
- *Economic stability/privatization*—Although economic progress is slow, each year of increasing stability suggests a better market for investment by international information services companies. If the trend continues, larger markets could experience growth rates well above those in Europe and the U.S. Also, as Latin Americans privatize more institutions, including banks and telecommunications companies, foreign capital and technology will find warm and profitable homes.

## 2. Inhibiting Factors

There are also a number of significant inhibiting factors in the Latin American information services markets.

- *Stalled economies*—Many smaller economies in Latin America are stalled, showing limited growth. There has been only minor growth stimulus. Without some level of economic stability and controlled inflation, these markets will remain unattractive.
- *High duties/protectionism*—Many countries impose high duties on imported technology products and services. Some countries have made progress with new “informatic” laws that provide copyright protection and other laws that reduce tariffs. In general, information technology will benefit from a general trend toward freer trade, but more progress is required.
- *Far East competition*—Though the U.S. dominates the high end of the equipment business, competition from Taiwan and Japan is increasing. Some countries have closer ties with Japan (Brazil and Chile) and Europe (Argentina) than the U.S. (Mexico), relative to information technology products and services.
- *Software piracy*—Few countries in Latin America have passed laws related to software protection, which allows the rampant practice of copying. Changes in Brazil and elsewhere are bringing local copyright practices in line with international practice. If effective, these changes will greatly attract software products vendors to Latin America.

## B

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### Information Services Market Forecast

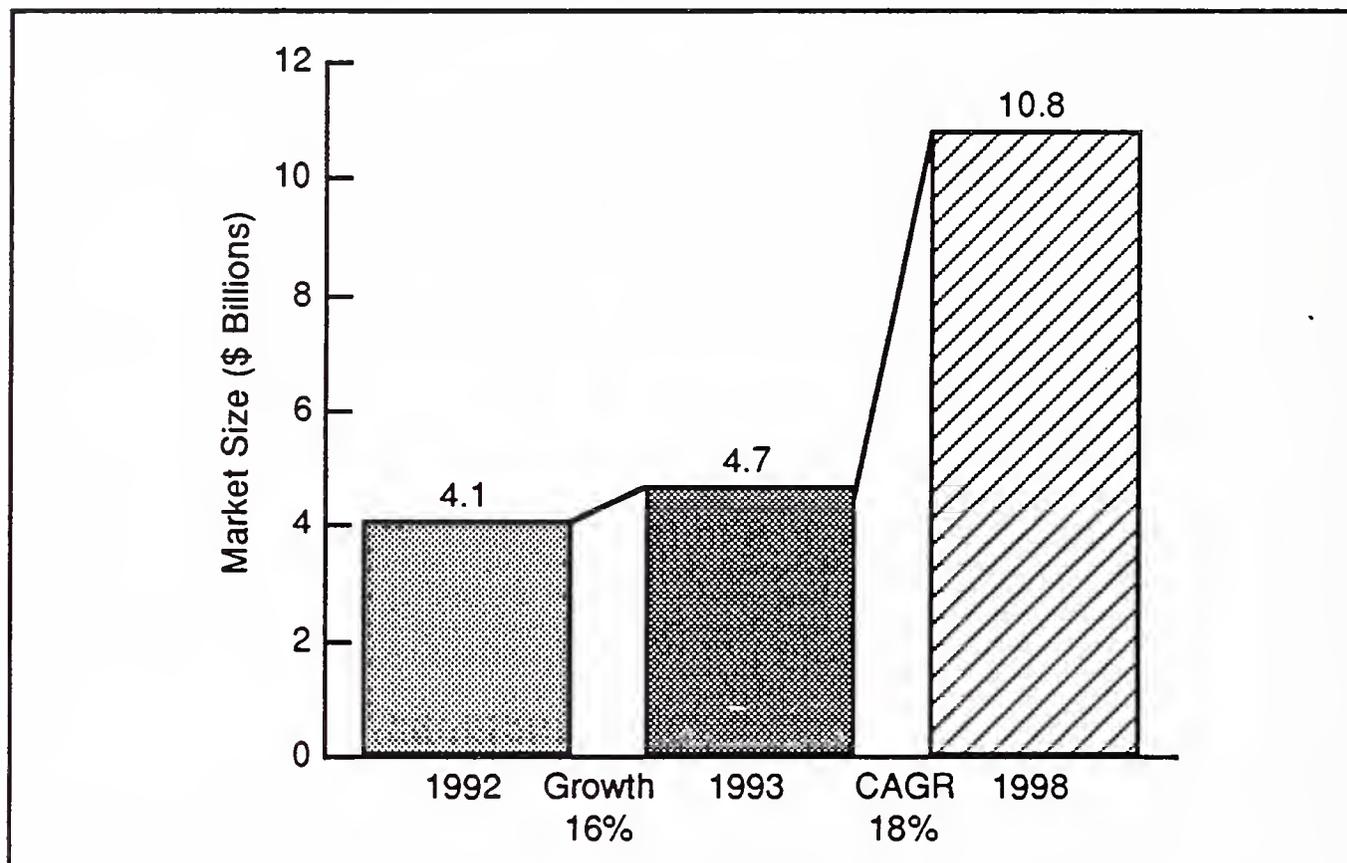
When compared to the world total, the Latin American information services market remains small. As noted in the worldwide summary, it represents less than 2% of the worldwide market of close to \$295 billion. The information services expenditure relative to the gross national product is many times lower than in the U.S. or in European countries.

The total market is expected to grow at an compounded annual growth rate (CAGR) of 18%, from \$4.7 billion in 1993 to \$10.8 billion in 1998, as shown in Exhibit V-1. This growth rate

compares to 19% projected for 1992-1997. This modest decrease in the five-year CAGR forecast assumes the recovery from the worldwide recession will be slightly less robust than previously thought. The positive trends favoring increased information technology should continue in the major Latin American countries.

## EXHIBIT V-1

Market Forecast—Latin America, 1993-1998



This growth rate, however, is approximately one-and-a-half times that of the U.S. as well as other major developing economic regions. Although the market is small, economic stabilization should generate a market of adequate size and real interest throughout the 1990s.

Latin America could become a significant fast-growth market by the middle of the decade if the economic situation is finally brought into reasonable balance.

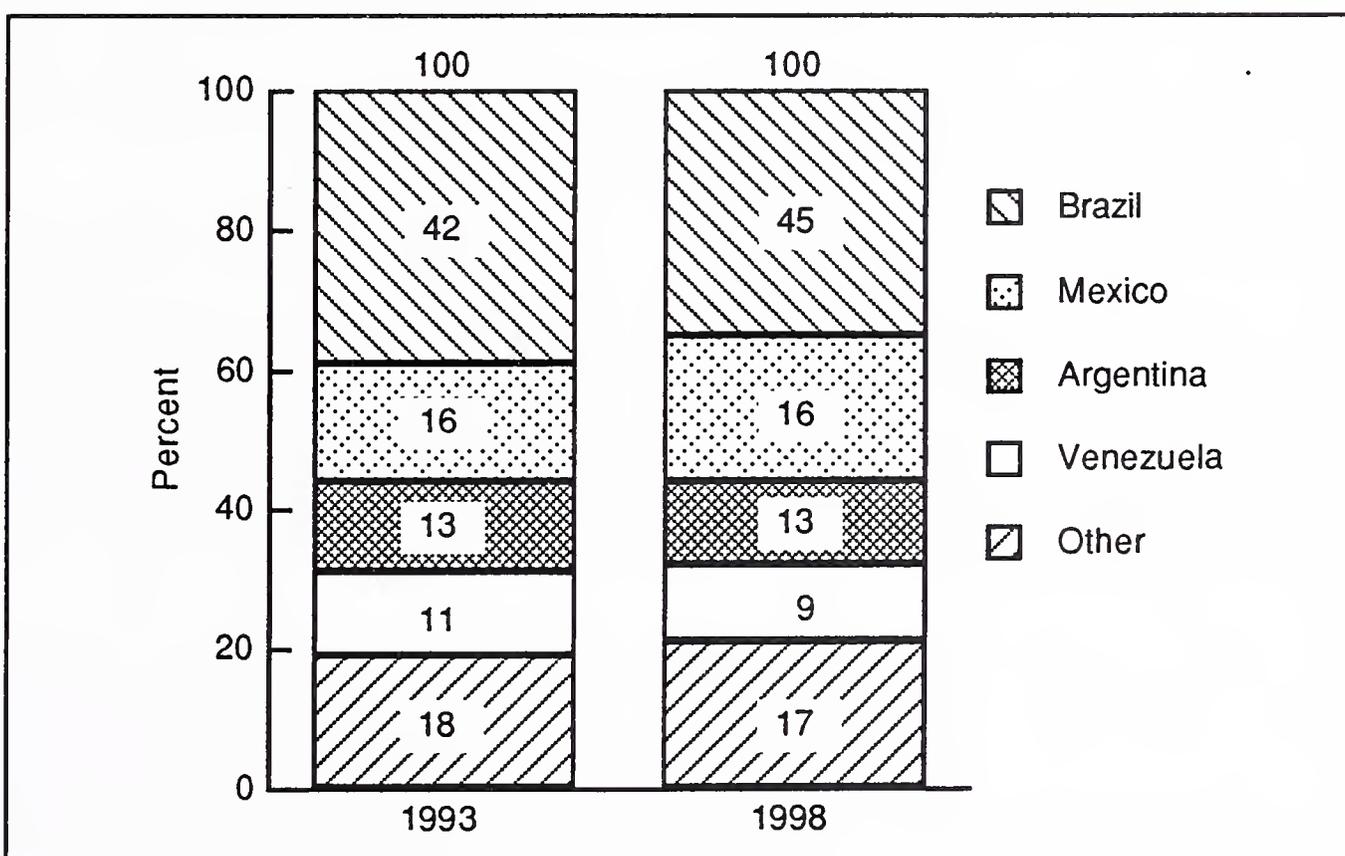
Governments in key countries (Argentina, Brazil, Mexico, Venezuela and Chile) recognize the value of technology, but have been burdened with conflicting financial priorities and have been unable to make necessary investments. Efforts to stabilize the economy are paying dividends and permitting governments of

economy are paying dividends and permitting governments of larger countries to remove regulation and tariffs. INPUT expects this positive direction to continue.

Within the region, market distribution is expected to change modestly over the five-year period. Brazil, with an estimated 39% of the market (shown in Exhibit V-2), will maintain its leadership. However, the Mexican information services market should show the strongest growth, at 21%, compounded annually over the next five years, and thus will pick up market share versus the other larger Latin American countries.

EXHIBIT V-2

Market Distribution—Latin America, 1993 and 1998



The distribution figures for the “other” category represents less than 20% of the market, but nearly 90% of the countries (including the Caribbean). The market share for this segment is expected to increase by 2% over the next five years. The only other market that is or will become an attractive size is Chile. However, certain Central American economies show considerable promise, particularly Panama, Costa Rica and Honduras.

An outlook review for individual delivery modes in the Latin American market reflects a somewhat different picture than is found in the U.S. or other regions.

- *Processing services*—Processing services are less than 8% of the market, and should grow just slightly more than half as fast as the total market. Given the economic attractiveness of processing services for specialized applications, there could be some improvement in this situation as general computer use increases, if telecommunications facilities improve to the point where reliable on-line transaction processing services become more viable.
- *Turnkey systems*—Although a small market, turnkey systems is expected to grow at a rate below the general information services industry. However, the increasing availability of powerful personal computers and full-feature PC-and LAN-based applications provide the tools to grow this market at an even greater rate. In the underdeveloped markets, turnkey solutions in native languages should become very affordable as the economies improve.
- *Applications software products*—The market for applications software products is a bright spot in Latin America. It represents the largest and one of the fastest growing delivery modes. With an inadequate base of computer professionals, the easiest alternative is to turn to packaged solutions. Of course, they must operate in the language of the country, not English.
- *Systems operations*—Systems operations represents a modest market and opportunity, although it is almost as large as processing services. There are not enough large companies that require the broad, full-service approach represented by systems operations. In general, the same vendors provide processing and systems operations services, which are less clearly differentiated than in the larger European and North American markets.
- *Systems integration*—The systems integration services market should remain small for some time. Most countries do not have a large enough industrial base to support a systems integration market, and buyers and vendors may lack the sophistication required to manage the systems integration relationship. The preference for traditional professional services will remain for some time.

- *Professional services*—Growth in professional services should be the fastest-growing delivery mode. Lack of adequately skilled computer professionals places a premium on the services of locally based and internationally affiliated professional services firms. If they continue to develop qualified staff, there is reason to believe their current growth rates can accelerate. In many ways, professional services firms offer the best opportunity for these economies to gain through information technology. Presently, there is inadequate time and resources to develop skills internally, suggesting that government and major industrial firms must turn to local or international firms.
- *Network services*—The market for network services is small and should remain so. The region suffers a significant lack of telecommunications infrastructure, a problem that will not be rectified for many years, even though some countries have launched major improvement programs or other initiatives (e.g., Argentina, Brazil).
- *Systems software products*—The market for systems software products is another bright spot in Latin America, but will see somewhat slower growth than applications software products. However, systems software pricing could become a significant issue, with a more competitive market shaping up for enterprise operating systems solutions.

## C

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### Market Considerations

Each of the five established information services markets have well-developed communities of information services vendors. These communities include numerous local companies as well as leading international firms. National profiles identify these vendors and their delivery modes. Many local companies have relationships with one or more international firms, particularly in the professional services and software products areas.

For organizations considering entering or expanding into the Latin American market, cautious optimism is advised. There are indications that many countries are beginning to successfully address their financial problems, but will need time to assess effects of their new policies. They have made significant progress in 1993 addressing trade and software protection.

Primary opportunities are in the desktop and minicomputer software product sectors for education and office productivity, and in certain vertical market areas such as manufacturing and financial services applications.

As a rule, the professional services segments of larger markets are growing strong. Where the economy and specific company situations support investment, vendors must move quickly. The professional services firms control many skilled computer professionals and thus are equipped to respond more quickly than new market entrants.

In Latin America, a distributor or representative is necessary, mainly because accomplishing tasks depends greatly on the representative's knowledge and contacts within the government. The region should be considered on a country-by-country basis, although some larger Latin American vendors are developing operations in more than one country.

Exhibit V-3 identifies major international information services vendors active in multiple Latin America countries.

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**EXHIBIT V-3**
**International Vendors Active in Latin America, 1993**

- |                         |                     |
|-------------------------|---------------------|
| • ADP                   | • Lotus Development |
| • Andersen Consulting   | • Microsoft         |
| • Borland International | • NCR               |
| • Computer Associates   | • Oracle            |
| • Coopers & Lybrand     | • Pansophic         |
| • DEC                   | • Peat Marwick      |
| • Deloitte Touche       | • Price Waterhouse  |
| • EDS                   | • Software AG       |
| • HP                    | • Unisys            |
| • IBM                   |                     |

**D****IT Spending**

Exhibit V-4 estimates Latin America's total information technology (IT) spending for 1993.

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 EXHIBIT V-4

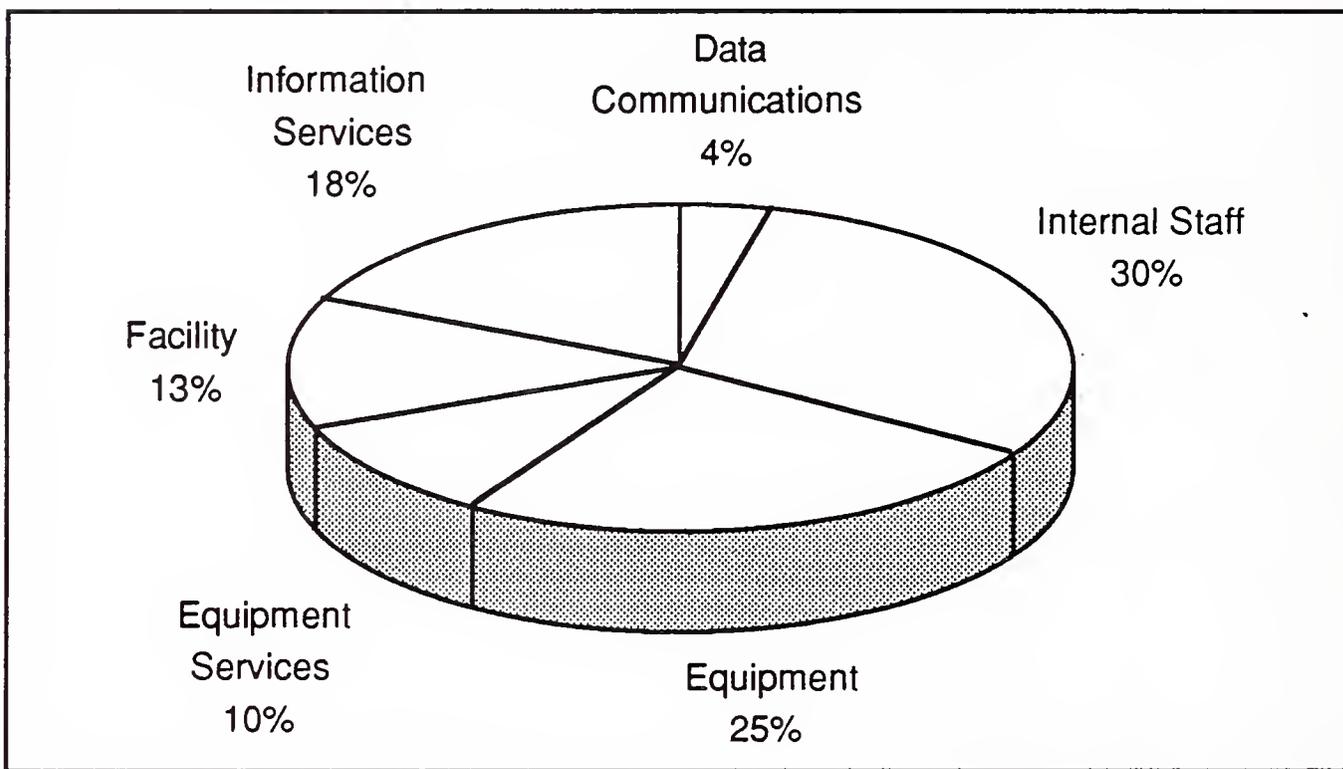
**Total 1993 IT Spending—Latin America**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	1,046
Internal Staff	7,843
Equipment	6,536
Equipment Services	2,614
Facilities	3,399
Information Services	4,706
<b>Total IT Spending</b>	<b>26,144</b>

At almost \$5 billion, information services spending (including software products) accounts for approximately 18% of the total IT budget, as noted in Exhibit V-5. The largest expenditures are for internal staff (30% of the IT budget) and equipment (25%). As with most national IT spending profiles, data communications represents the smallest portion at \$1 billion, and 4% of the total.

EXHIBIT V-5

**1993 IT Spending Percentages—Latin America**





## Regional Summary— Middle East/Africa

### A

#### Regional Overview

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Since INPUT last profiled Africa and the Middle East, South Africa's apartheid policy is being replaced by a political structure based more on proportional representation. The Middle East is slowly recovering in the aftermath of the Persian Gulf War, with prospects for greater stability in the region based on a proposed settlement of the political status of Palestinians in Israel.

Although grouped together in this report, Africa and the Middle East are quite distinct and possess considerably different demographics, resources and business requirements. For these reasons, background data is provided separately for each region, although due to factors such as religion, culture and geographic location, Egypt is considered part of the Middle East. The Middle Eastern information services market is larger than Africa's, but on a comparative global scale the markets are small. Forecasts are limited to the most relevant delivery modes; modes not shown are considered negligible.

When comparing this regional market to others in this report, it is important to note that market expenditures are for one continent, many nations and a good portion of the Middle East. It is not rational to directly compare them to another country (or even regional) spending profile.

#### 1. Africa

This continental region consists of more than 35 countries that are home to more than 600 million people, roughly 12% of the world's total. The lion's share of Africa's immense 11.7 million

miles is arid, virtually uninhabitable desert land. The continent is also blessed with vast amounts of non- or underdeveloped resources. Unfortunately, many African countries are plagued with internal political turmoil and leaders who have not effectively harnessed available natural wealth.

For the purpose of this report, Africa is divided into two distinct areas: South Africa and the remainder of the continent. South Africa is considered one of the more developed areas of the industrial world, and as such, has a developed, although modest, information services industry.

Aside from South Africa, the continent is generally fragmented. Only a handful of countries have more than a subsistence economy, and many are plagued with famine and intertribal violence. Few significant opportunities exist for information technology and services companies in the other African countries. One notable exception is Morocco, where American companies have succeeded at marketing and implementing information services. Moroccans use LANs and are improving their telecommunications infrastructure. Digital Equipment Corporation (DEC) recently opened its first African office in Casablanca, where the company has distributed its products and services through a local vendor for more than six years.

### *Egypt*

Longer-term, Egypt could possibly become more of an important market. The country benefits from its political importance in aiding political stability between Israel and the Arab states. As such, Egypt received significant economic and military aid from the United States and other Western nations.

Traditionally, government economic policy provided heavy consumer subsidies to help mitigate the impact of a high poverty level with stagnant economic growth. This resulted in a major trade imbalance, with imports far exceeding exports. U.S. exports to Egypt in 1992 were approximately \$3 billion, which included primarily agricultural commodity and industrial machinery products.

The Egyptian government implemented measures to address the country's serious economic issues. This reflects in part an International Monetary Fund (IMF) agreement signed in 1991,

which will substantially reduce the country's debt burden over a three-year period. The country's huge debt burden primarily determined its inflation rate. Resultant government economic policy has been to reduce consumer good subsidies, liberalize trade and encourage investment through the privatization of many public companies. In addition, the government attempted to reduce bureaucratic red tape that deterred past investments in this highly controlled economy.

Egypt has a skilled labor force compared to much of the region, and also represents a large domestic market. Potentially lucrative export markets include telecommunications and computer systems equipment.

As a result of macroeconomic policies designed to reduce high debt levels, the Egyptian economy showed little growth in recent years. In addition, strong opposition domestic political forces reflect a high unemployment environment, which threatens government stability. These will slow longer-term government plans for increased privatization.

The Egyptian GDP growth rate for 1994 should be in the range of 1.0 to 1.5%, a modest improvement over the 0.5% GDP growth rate expectations for 1993. Much of the incremental growth will come from the increasing rate of private investment combined with the liberalized trading environment.

### *South Africa*

With official apartheid policies abolished in South Africa, U.S. technology companies are returning. Lotus Development has resumed business dealings in South Africa, and Digital Equipment opened a subsidiary there in July 1993. South Africa suffered from a major disinvestment of capital resources over the past several years.

However, an end to the country's ostracism is in sight and the day will come when this rich and well-developed country is accepted back into the world trade community. When this finally happens, it will reopen a modest but important information services market equal in size to those of the more developed countries in Latin America.

However, the political and social environments remain very tense. Continued violence threatens to disrupt economic growth, at least for the intermediate term.

By the year 2020, the South African population is expected to double to 71 million, with a marked decline in average. AIDS will be a major health problem in South Africa, as it is in many other African countries. This is expected to reduce the population growth rate to less than 2% per year over the next 10 years.

Much of the country's economic resources over the next several years must focus on basic human needs such as housing, education and health care.

If political reform succeeds, with progress measured in the near-term by the first multiparty elections in April 1994, there is hope for the beginnings of economic recovery from a prolonged recession. Renewed foreign capital inflows, along with a more expansionary fiscal policy, should help provide investment capital for a modest GDP growth of 0.5 to 1.0% in 1994, after a period of no growth in 1993. However, the major rise in government deficit spending in recent years on human services will limit the government's ability to provide higher levels of fiscal stimulus.

The 1993 inflation rate is expected to be around 10%, held down by weak economic growth and lower food costs.

The country's near-term growth recovery will be tied to exports of minerals and agricultural products. The recovery in the growth rate of GDP over the next few years is expected to be very modest, with a GDP growth of 1.0 to 1.5% projected for the 1995-1996 time frame.

#### **a. Driving Forces**

In South Africa, the information technology driving forces are generally unchanged from the 1992 worldwide report.

- *Mini/personal computer availability*—Considering the relative size of businesses in South Africa, increasing emphasis is placed on developing mini- and micro-based applications. Many needs are satisfied with mini and PC equipment, and its associated software, as functionality increases.

- *Fourth-generation languages*—For larger firms, increased emphasis is on systems development based on 4GL and database systems.
- *Economic expansion*—The recognized need for up-to-date capabilities in mini/micro systems and database systems drives their development, allowing South Africa to compete in the international market. The government stimulates investment in national development projects.
- *Network development*—Emphasis on systems development increases focus on networking, particularly for minis and micros. The majority of networking tools are imported from either the U.S. or the U.K. LAN technology should spread throughout the next five years.
- *Education*—There is national recognition of the need to provide education to the black communities if they are to share in the governing and business process. The government places increased emphasis on providing technology-based tools for the educational system.

For areas outside South Africa, the driving forces are essentially the same. However, the level of emphasis is considerably less; and, as noted before, the information services market in some African countries is nonexistent.

#### **b. Inhibiting Factors**

As well as driving forces in South Africa, there are many inhibiting forces that, to date, have had a negative impact on the information services market in that country. In addition, many other countries in the region are also burdened by high debt and a low economic base, so prospects for the region over the next several years are cautiously optimistic.

Many countries address their debt problems with austerity programs, and many are structuring policies intended to stimulate investment. In addition, a general trend toward more open trade regulation makes importing information technology products somewhat easier. Several of the more developed countries are proceeding with much-needed improvements to their aged and ailing telecommunications infrastructures.

- *Divestment*—Requirements that U.S. firms reduce or completely divest their financial holdings in South Africa has significantly impacted the country's development. Many firms withdrew and others had difficulty establishing relationships with black-owned firms. However, once a multiparty interim government, or Transitional Executive Council (TEC), is established in 1994, many countries probably will rescind their remaining financial sanctions against the country.
- *Labor skill level*—The skill level of local labor outside the small white community is generally considered to be low. Although effort is directed to providing increased educational opportunities, a labor shortage could exist for some time.
- *Political policies*—National apartheid policies are declining quickly and hopefully soon will be removed as a philosophical and commercial obstacle for the information services industry in South Africa.
- *Social unrest*—In addition to the inhibiting effect of apartheid policies, the continuing social unrest, though diminishing, still hinders the country's focus on growth, education and general improvement in industrial and individual quality of life.

## 2. Middle East

Comprised of 16 countries covering an area stretching from Turkey to Yemen and from Egypt to Iran, the Middle East represents one of the most politically complex and turbulent areas of the world. Political conflicts continue between Iran and Iraq, Iraq and the United Nations and the Arabs and Israel.

The region's population represents approximately 4% of the world total and grows at roughly 2.5% per year. However, area development and any potential industry segment is dominated by two factors—oil and religion. Religion is at the very heart of ongoing political and territorial disputes with Israel, even though the restraint that country practiced during the Persian Gulf War eased some tensions.

Though successful, the conflict with Iraq had lingering fiscal and philosophical consequences. Rebuilding the damage in Kuwait continues at a high cost for the country itself and Saudi Arabia,

Kuwait's biggest source of aid. And as a result of U.S. involvement, Saudi Arabia learned its old policies and Middle Eastern loyalties are inadequate in dealing with the modern world it has grudgingly become a part of.

With few natural resources, the Middle East heavily depends on its natural oil reserves to generate wealth in the world market. However, because of the decline of prices in the oil industry, many countries have consolidated their economic positions and are experiencing only moderate growth.

In general, economies of this area see little inflation and are highly controlled by the government and wealth from oil.

With basically a fractious political environment, a single-product economy and an isolationist perspective, opportunities in the near term (one to three years) will be limited and difficult to realize, and for the most part will be driven by government spending.

A great deal of the information services activity is tied to government-sponsored programs, particularly in the Arab countries. Thus, government stability is key to spending for professional services and software products.

### *Israel*

In contrast, Israel has a broader industrial economy affected by inflation, defense costs and the *aliyah*, an Israeli term for the huge immigration of former Soviet Jews. Already the *aliyah* has brought more than 600,000 Jews to the country and it cost roughly \$40 billion to house and employ the newcomers in 1993.

A key determinant of economic growth in the area is the political environment. To date, focus on religious and territorial differences has diverted a significant portion of national revenues from growth opportunities to defense. There is reason for some optimism that tensions in the area may subside now that one of the major political issues of the region, the status of the Palestinians, now is addressed through direct Israeli-Palestinian dialogue.

Israel probably represents the best opportunity for U.S. Information Services vendors. EDS, for example, indicated it is studying potential systems integration business opportunities in

Israel. EMC recently opened a research and development center in Tel Aviv to develop storage products for midrange computer systems sold in the Middle East. Other U.S. information technology companies that have established locations in Israel include IBM, Digital Equipment, Intel and Motorola.

Many Israeli software products companies compete very effectively in worldwide markets. These include companies such as 4th Dimension Software, Inc., Magic Software Enterprises, Inc. and Mercury Interactive Corp., an American firm with R&D operations based in Israel. Targeted applications market segments include client/server computing, open systems and database usage. Industry sources estimate there are at least 150 software products companies in Israel. Several have successfully accessed U.S. capital markets.

Partnerships with such firms would be a way for U.S. vendors to augment their marketing presence in the region as well as in Europe, where many of these companies have also been quite successful. The Israeli government also offers funding and other incentive packages to U.S. companies.

Israel has a large population base of highly skilled scientific and engineering professionals. A major new contribution to the scientific community has come from Russian scientists who have emigrated to Israel. The increase in immigration from Russia to Israel in the early 1990s expanded economic growth, although it also led to increased unemployment.

The Israeli economy, although burdened with a high level of foreign debt, is expected to show relatively strong GDP growth over the foreseeable future. U.S. loan guarantees would also allow Israel to meet its external financing obligations.

The Israeli government is instituting an economic reform program that targets restructuring and privatizing its large public economic sector; the government is also implementing a budget deficit reduction plan. It is committed to trade liberalization along with encouraging foreign investment.

GDP growth in 1994 should be in the range of 4.0 to 4.5%, with a further increase in 1995. GDP growth for 1993 was 4.5%.

The rate of inflation has increased moderately since the 1980s. The current inflation rate is around 12%, but is expected to exhibit a modest increase in 1994.

**a. Driving Forces**

Driving forces for the Middle East include:

- *Oil field development*—As a result of a single-product economy, there is considerable emphasis on methods to identify and develop new sources of oil.
- *Production control development*—With the world oil market decline, emphasis has increased on obtaining greater benefits from existing production facilities and processes. Many companies are streamlining their operations to achieve greater efficiency.
- *Industrial development*—Recognizing the need to diversify, many countries search for other forms of industry. Though progress has been slow, focus on alternative revenue sources should continue. However, to date there are virtually no facilities that manufacture computer or information technology products in the region.
- *Education / Training*—Many countries recognize greater efforts are needed to provide educational opportunities. The region, particularly Saudi Arabia, possesses good universities, but frequently sends individuals abroad for technical and business training. Countries in the region have also increased investments in educational processes, including automated tools.

## b. Inhibiting Factors

In the Middle East, driving forces contribute to growth of the information services industry, but inhibiting forces have had more impact.

- *Political environment*—The political environment has a major negative impact on the development of industry. The Iraq/Kuwait conflict still aggravates the political climate, further delaying possible stability and slowing development in many countries. Also, dictatorial countries like Jordan put severe limits on information technology due to government distrust of foreign, non-Islamic ideas and influences. In some countries, international telecommunications and fax machines are banned. Recently, tensions have severely heightened between Israel and the Palestinians due to a series of shootings.
- *Total solution requirement*—There is increasing emphasis on ability to provide a total solution. This puts single-product vendors at a disadvantage. The market is primarily driven by government spending, which dictates a full-service or solution approach.
- *Local representation*—In many countries, local representation is mandatory. Combined with the custom of noncontracted gratuities, many companies find operating in the Middle East extremely expensive and the margins small.
- *Software piracy*—Software piracy is rampant in the Middle East. Because copyright protection is not generally recognized, all packages and applications are subject to extensive copying. However, Saudi and other leaders are beginning to respect and recognize the value of intellectual property in an effort to join the legitimate international software community.
- *Arabization of software*—Arabic is a complex written language; Arab software engineers have difficulty adapting word processing and other software to their unique requirements. Should this problem be solved, the Arabian software market would open significantly.

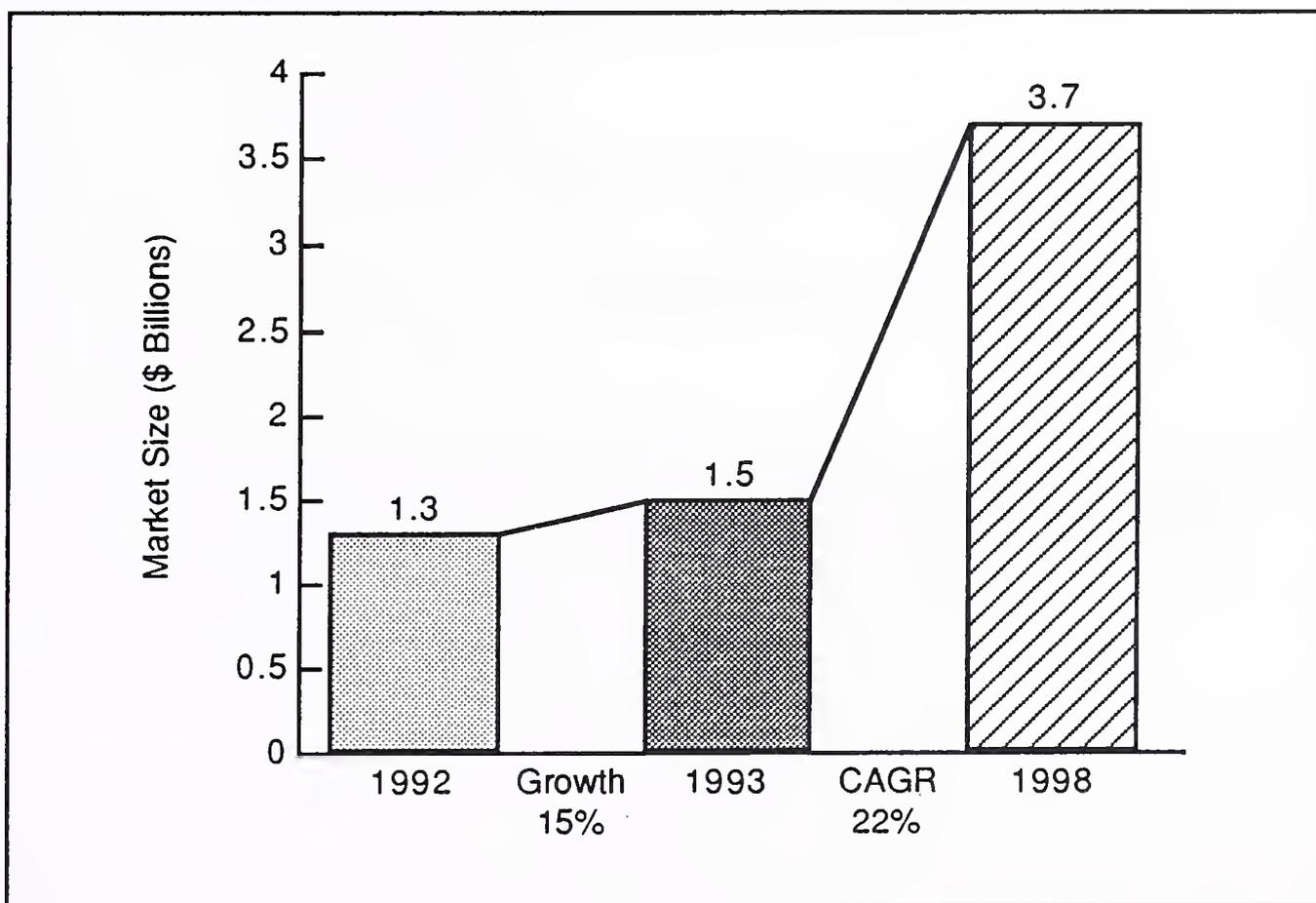
**B**  
**Information Services Market Forecast**

As a region, the Middle East/Africa area, comprised of more than 40 countries, offers one of the least significant opportunities for information services. The most technologically sophisticated economies in this region are Israel, South Africa, Saudi Arabia and Egypt. Countries such as Syria, Iraq and Iran are essentially dictatorships, with most technology expenditures made by the military, which offer large opportunities to systems integrators and professional services firms, with particular focus on the upstream end of the petroleum business.

From 1993 to 1998, the region's total information services market is estimated to grow from approximately \$1.5 billion to \$3.7 billion, as shown in Exhibit VI-1. The growth rate is expected to be approximately 20%, as the primary countries focus on building technological infrastructures. This is down slightly from the 1992 forecast due to the recessionary environment and political disruption in the region.

Exhibit VI-1

**Market Forecast—Middle East/Africa, 1993-1998**



Of the total market, processing services, applications software products and professional services delivery modes hold the greatest opportunities, as depicted in Exhibit VI-2.

- Processing services represent a solid and sizable market, due to processing requirements of various governments that do not have the internal capabilities to operate their own processing facilities or develop and maintain key applications.
- Applications software products represents the second-largest area of growth, based on increased interest in mini and personal computer systems, particularly for government requirements. Much of the growth will result from the need for industry-specific applications. The applications software products sector is expected to grow an estimated 24%, to approximately \$1.2 billion in 1998.
- Professional services also should grow significantly. Driven by the need to develop technology-based systems and industry-specific applications and by governmental program administration requirements, professional services are expected to grow from approximately \$425 million in 1993 to \$1.3 billion during the forecast period, at a rate of 25%.

Exhibit VI-2

**Market Forecast by Delivery Mode  
Middle East/Africa, 1993-1998**

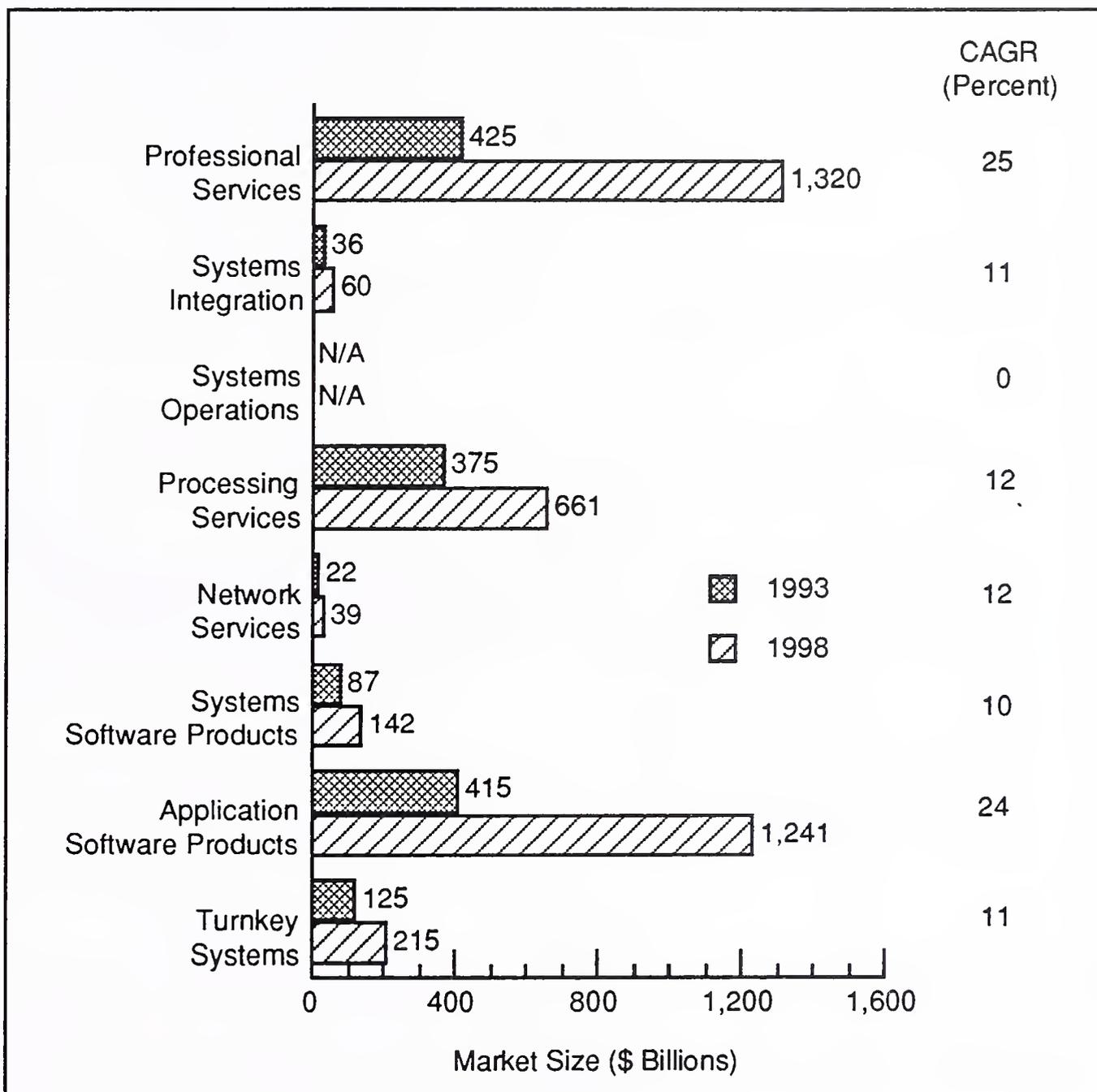
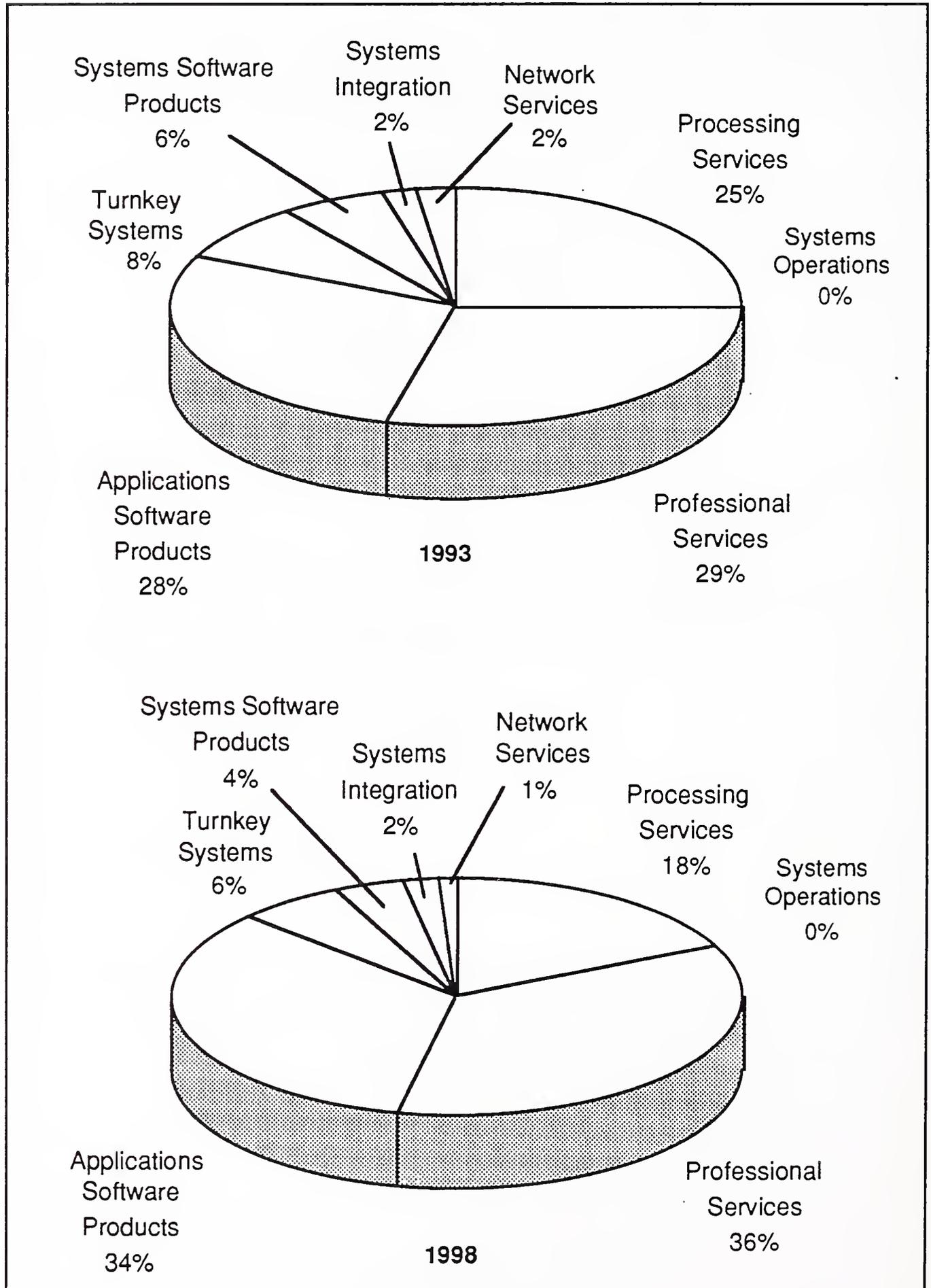


Exhibit VI-3 compares the Middle East/Africa market by delivery mode for 1993 and 1998. Professional services and applications software products will gain a 70% share of the overall market during the next five years.

EXHIBIT VI-3

### Delivery Mode Analysis Information Services Market—Middle East/Africa 1993 and 1998



**C**

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**Market Considerations**

This market is controlled by the government program of the two major countries, Israel and South Africa. In total, these two countries represent more than half of the information services market.

Delivery modes other than applications software and professional services are expected to grow at respectable rates, but represent such a small portion of the overall market that their contribution is minimal.

The concepts of systems integration and systems operations remain beyond the needs of this region in general.

In South Africa, there are many opportunities, and they are expected to grow. However, companies must make long-term investments with local firms familiar with the economy and social and political customs.

For companies considering entering or expanding into South Africa, investment in local firms is recommended, along with methods of providing education and training for local representatives.

In the Middle East, local representatives are mandatory. In addition, know that sales cycles are long and personal rebates are part of the business process. Also, it may be many years before the negative impact of the Iraq/Kuwait confrontation is completely eliminated.

**D**

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**IT Spending**

Exhibit VI-4 provides an estimate of Middle East/Africa's total IT spending for 1993.

Exhibit VI-4

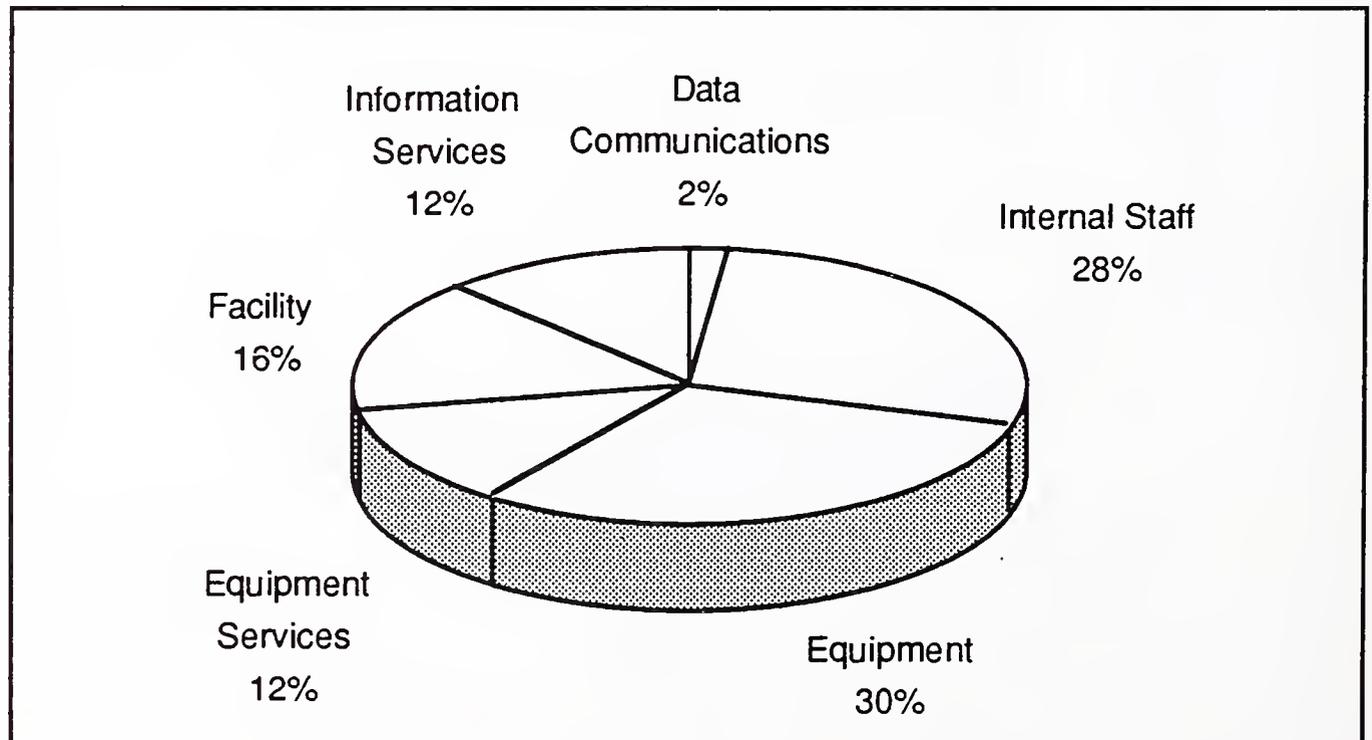
**Total 1993 IT Spending—Middle East/Africa**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	248
Internal Staff	3,465
Equipment	3,713
Equipment Services	1,485
Facilities	1,980
Information Services	1,485
<b>Total IT Spending</b>	<b>12,376</b>

Information services spending (which includes software products), at almost \$1.5 billion, accounts for approximately 12% of the total IT budget, as noted in Exhibit VI-5. The largest expenditures are for equipment (30% of the IT budget) and internal staff (28%). As with most of the less-developed national IT spending profiles, data communications represents the smallest portion of the IT budget at \$248 million and 2% of the total.

Exhibit VI-5

**1993 IT Spending Percentages—Middle East/Africa**





## Regional Summary— North America

### A

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#### Regional Overview

The North American market, consisting of Canada and the United States, is the largest region in the worldwide information services market. The 1993 North American market of \$141 billion represents 51% of the worldwide total. Slower growth in Europe and Japan, as well as in the rest of the world in general, is slowly increasing the North American share. Growth improved over the last year due to reviving economies and the increasing need to deploy information technology.

The U.S., with its sheer size (\$136 billion in 1993), dominates this region and impacts the entire worldwide market. The U.S. information services industry is headquarters for many of the largest vendors active on a global basis. In the immediate period (1993 to 1994), the North American market experienced about 11% growth in 1993, but it still does not equal the 20% annual growth rate of the 1980s. However, on a regional level, U.S. information services growth is gaining strength while it weakens in other regions, notably Asia and Europe.

The Canadian information services market was \$5.3 billion in 1992. Canada makes up 3.8% of the North American information services market. The Canadian market, though small, remains a viable market known for aggressive programs by leading vendors and a number of larger industrial information systems programs that offer excellent opportunities to vendors willing to have a presence in Canada.

Canada maintains its sensitivity to the presence and size of the U.S., and staunchly preserves its independence while entering

American markets. The ratification of the North American Free Trade Agreement (NAFTA) created nationalist furor in Canada and the U.S. During 1993, however, prospects for improved investment and competitive opportunities became more apparent, thus mollifying some Canadian apprehensions.

Canadian information systems users historically preferred Canadian applications vendors where possible, but this has not prevented U.S. vendors with well-targeted solutions from gaining market share. NAFTA may provide further international opportunities for Canadian information services vendors, who will look to the U.S. as their first target for international expansion. Traditionally, U.S. vendors use Canada as a test base for international marketing of their products.

Driving and inhibiting forces for the U.S. and Canadian markets are described in detail in the respective country profiles. There are some common inhibitors present in both markets.

- *Shift to client/server*—In general, client/server technology is gaining popularity and support with vendors such as Andersen, Gupta, Powersoft and others, providing solid applications development solutions. In the long term, client/server technology will be a strong force in bolstering the market.
- *Slow economic recovery*—Both economies improved in 1993, particularly during the fourth quarter. However, weak signs remain. It is likely to be midyear 1994 before sufficient confidence builds to motivate a more liberal allocation of dollars for major information systems.
- *Outsourcing*—Due in part to recession and resulting tight corporate purse strings, both countries lead the growing trend to outsource major portions of their IS function. Vendors are better equipped to take the risk and serve on an international basis. Canadian and U.S. vendors can deal with outsourcing agreements on an international scale.

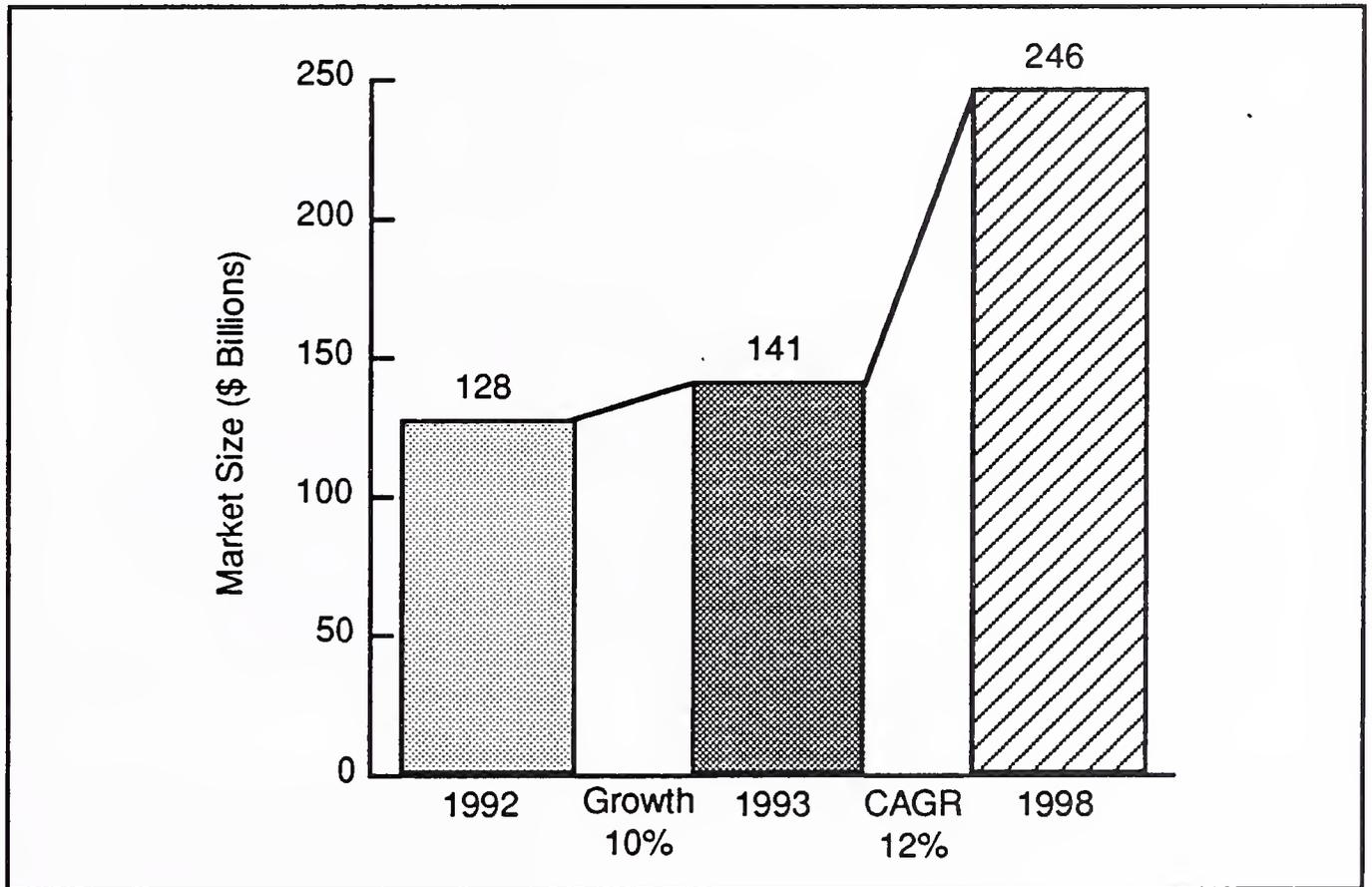
**B**

**Information Services Market Forecast**

The overall information services market, shown in Exhibit VII-1, will grow from \$141 billion in 1993 to more than \$286 billion by 1998, at a 12% CAGR. The sheer size of this market makes it very attractive to vendors in many countries.

EXHIBIT VII-1

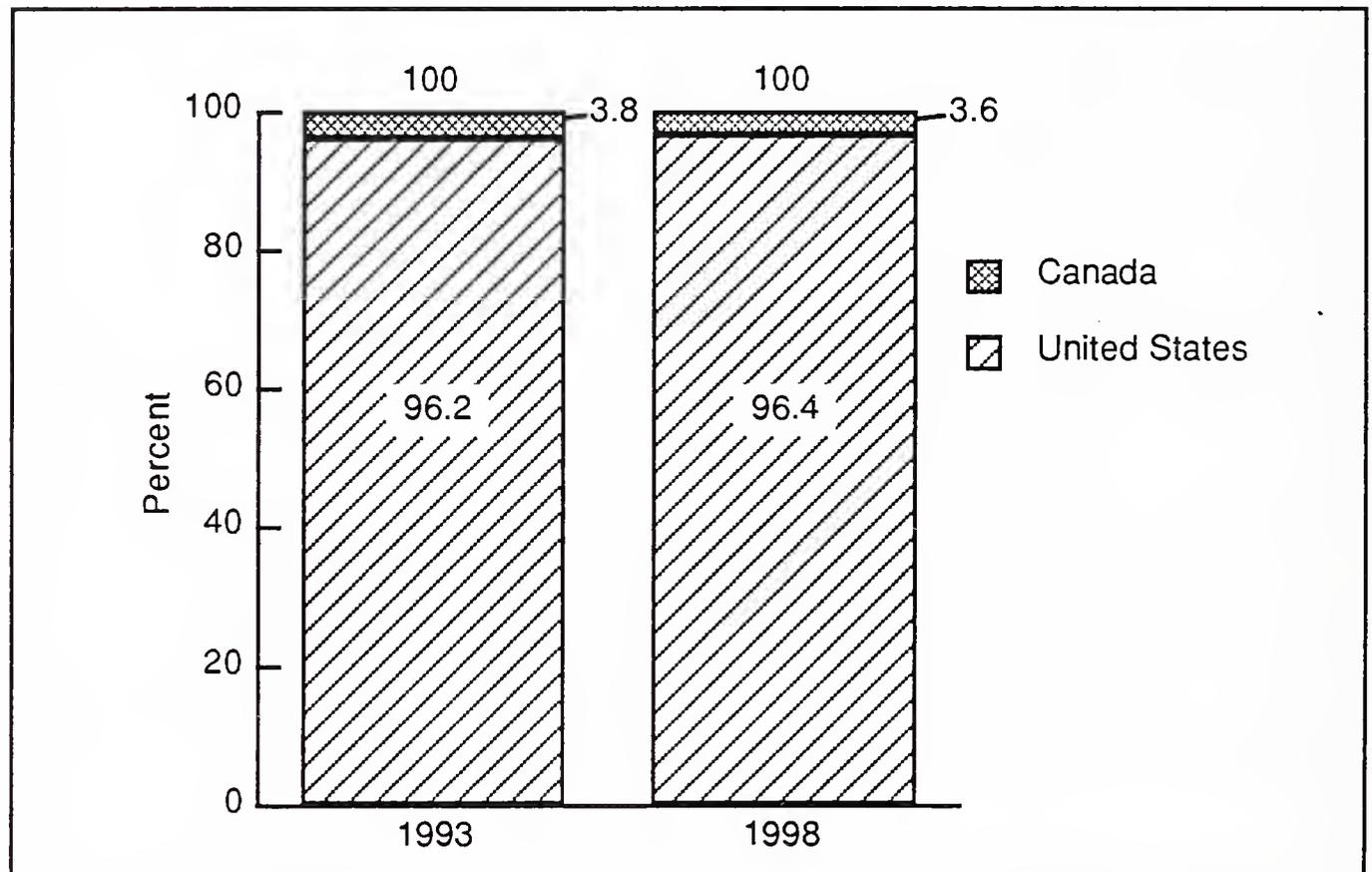
**Market Forecast—North America, 1993-1998**



As Exhibit VII-2 shows, the Canadian market size is modest compared to that of the U.S., yet Canada's market increased 0.5% over the 3.3% it represented in 1992. Distribution of the North American market is expected to change little over the five-year period; Canada will experience essentially the same rate of growth as the U.S. market.

EXHIBIT VII-2

### Market Distribution—North America, 1993 and 1998



The Canadian market, though a small portion of the North American market, is one of the larger national markets (it exceeds \$5 billion), surpassing many European country markets, and \$600 million larger than the total Latin American region. It is a market of real opportunity, and has developed a growing number of international information services vendors.

Exhibit VII-3 shows the size and growth rate of eight product/service segments tracked by INPUT. Growth rates and market size parallel those presented for the U.S. in the national profile.

Because the delivery mode forecasts are very similar to those for the U.S., the reader is referred to the national profiles for Canada and the U.S.

EXHIBIT VII-3

**Market Forecast by Delivery Mode—North America, 1993-1998**

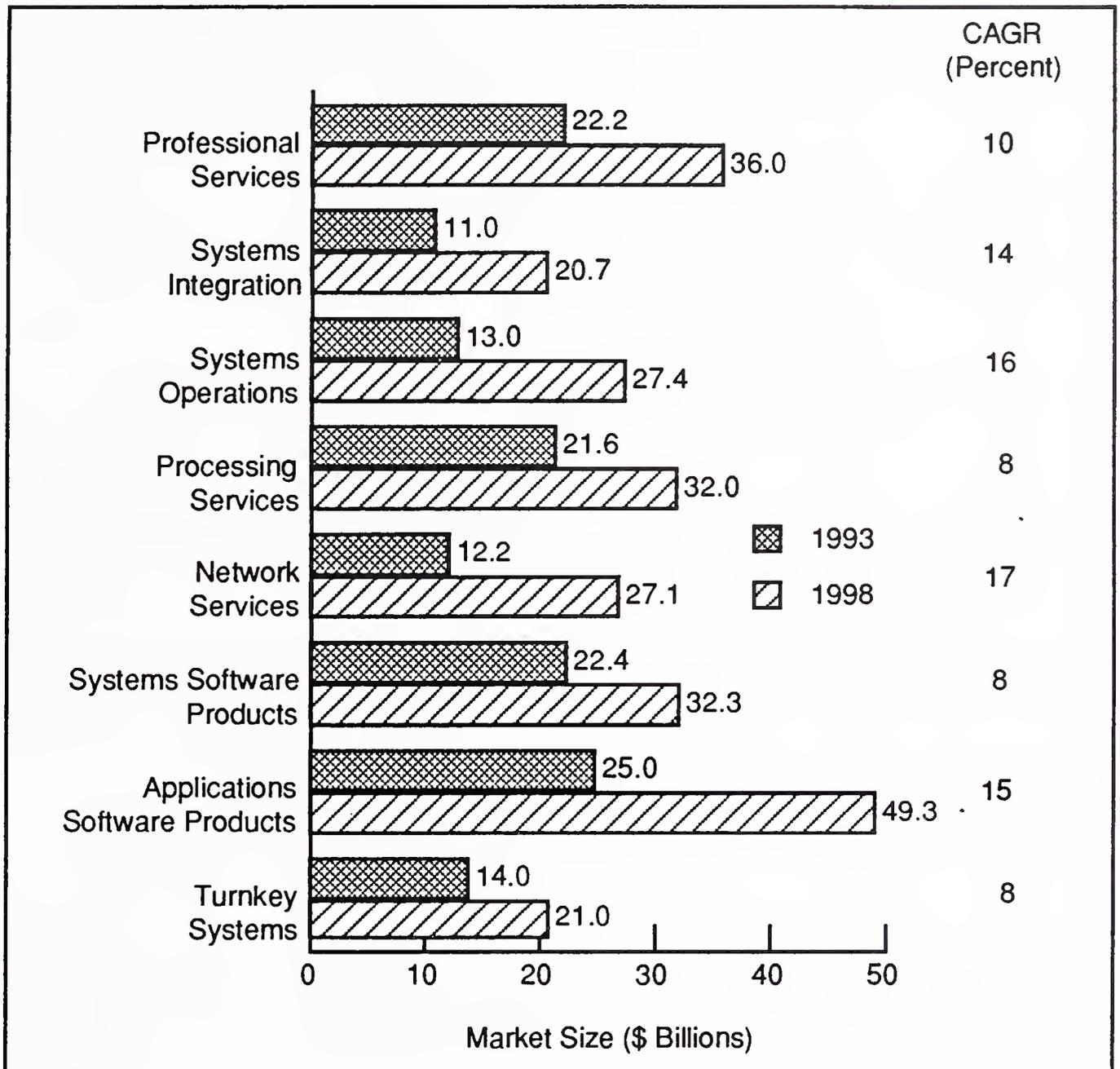
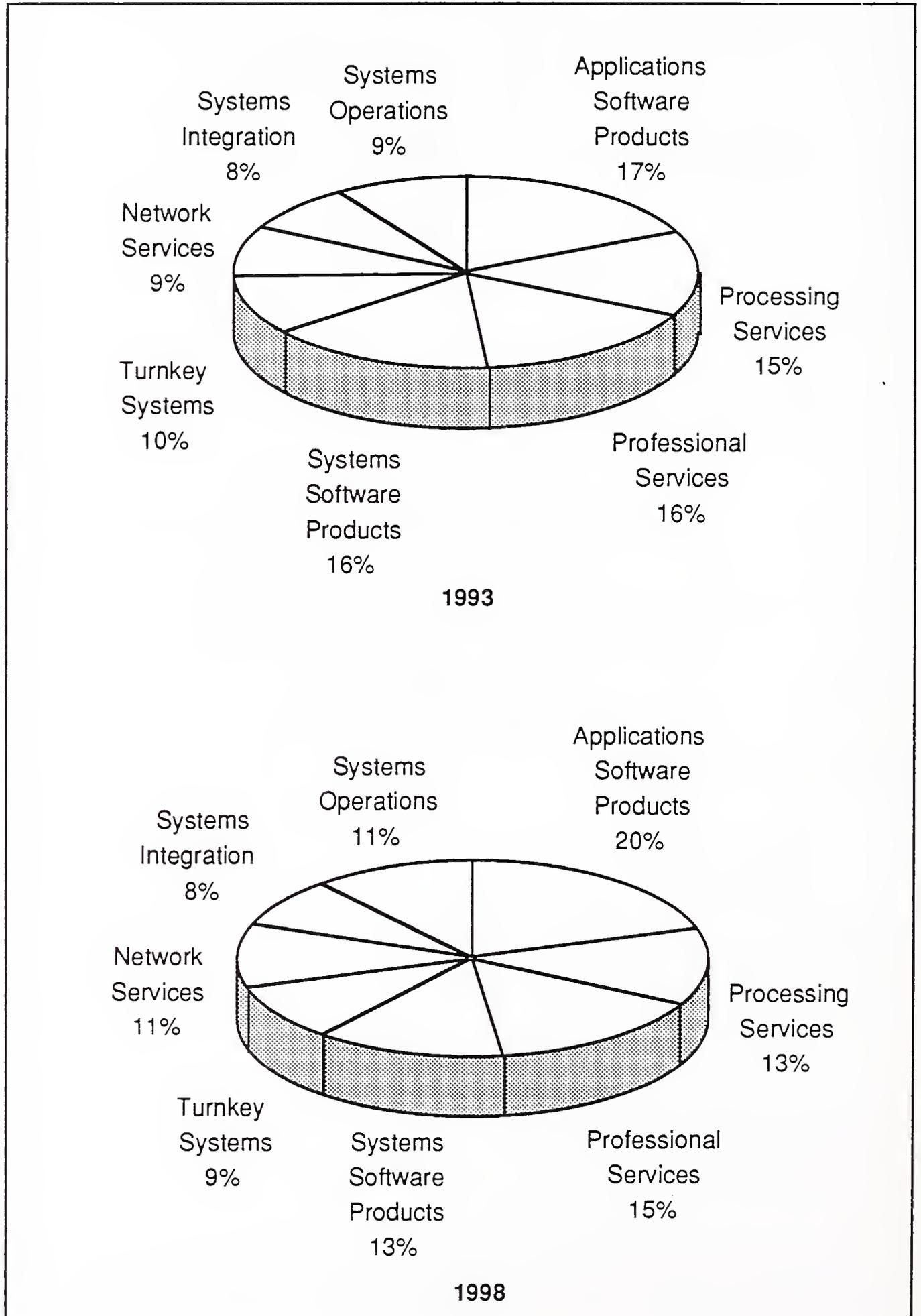


Exhibit VII-4 provides a comparison of the North American IS market by delivery mode for 1993 and 1998. Processing services will lose some share of the overall market to systems operations, systems integration and network services.

EXHIBIT VII-4

### Delivery Mode Analysis Information Services Market—North America 1993 and 1998



**C****Market Considerations**

On a worldwide basis, North America leads the industry in establishing systems operations and network services as the sectors with the greatest growth rates.

- Larger U.S. vendors moved quickly to implement full-service strategies and assume the risk required by these types of services with their fixed pricing and long-term agreements.
- A number of vendors in Canada (ISM, DMR and SHL Systemhouse) established, or are establishing, themselves as worldwide players in the outsourcing market.

Sheer size offers significant opportunities, even in an economic recovery. As the largest geographic market available, North America presents significant potential to vendors with new products and the ability to penetrate a very established market. There are, however, some factors that make the North American market a challenge.

- Most market niches are well populated—even saturated—at this time, and a vendor shake-out in many sectors is underway.
- Geographic market size makes market entry challenging. U.S. customers increasingly expect a vendor to provide support on a national basis from the start.
- Vertical market focus is a strategy implemented by many software and services vendors. Increasingly, sophisticated users are requiring more complex solutions specifically tailored to their business needs.
- Vendors must be prepared to offer, as nearly as practical, a total solution with a wide range of supporting services. U.S. vendors are moving in this direction and achieving greater account control and revenues.

The key to entry in the future may be through an alliance with a larger U.S.-based firm or in partnership with other firms from the same country that wish to enter North America.

Please refer to the national profiles for these two countries for information on leading vendors. All U.S.-based firms continue their strong commitment to the Canadian market. Many of their Canadian subsidiaries operate with significant independence from the parent.

**D****IT Spending**

Exhibit VII-5 provides an estimate of North America's total IT spending for 1993.

## EXHIBIT VII-5

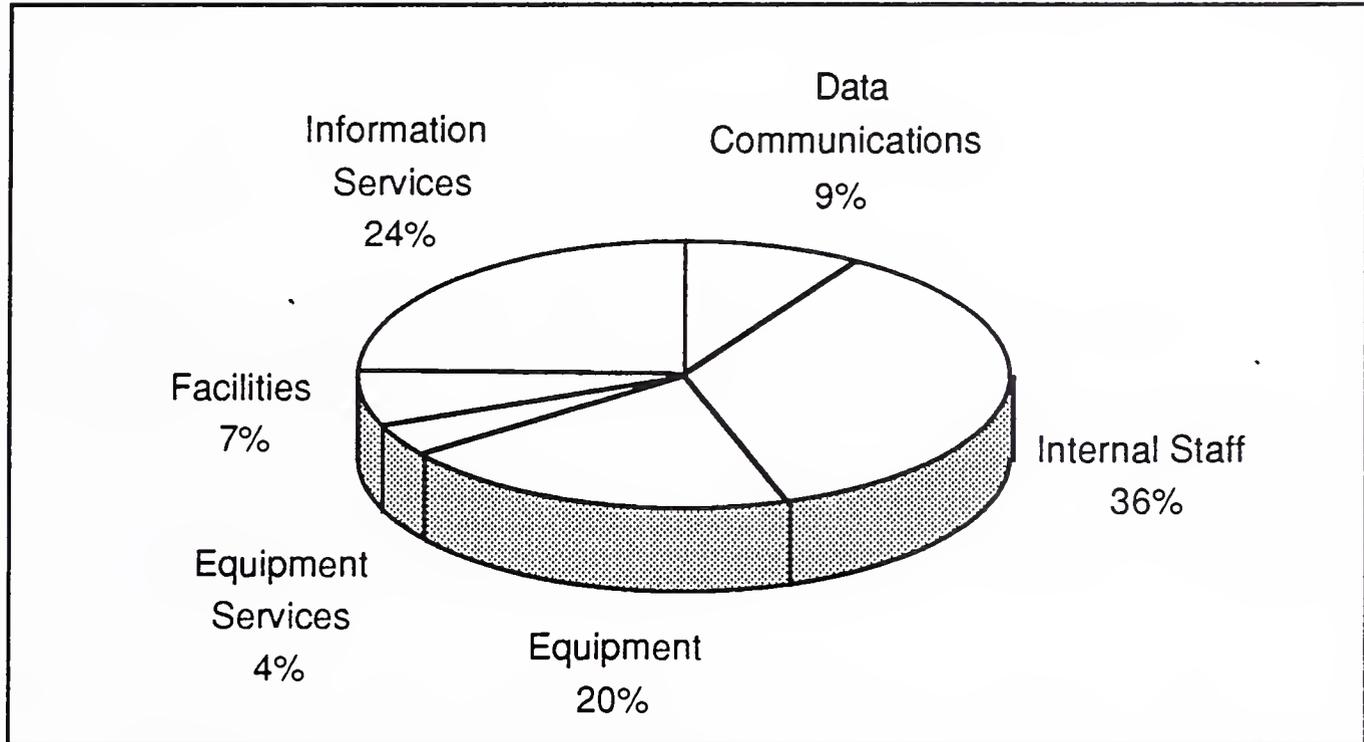
**Total 1993 IT Spending—North America**

<b>Budget Category</b>	<b>Estimated Spending (\$ Billions)</b>
Data Communications	52.2
Internal Staff	210.6
Equipment	117.5
Equipment Services	24.1
Facilities	41.8
Information Services	141.2
<b>Total IT Spending</b>	<b>587.4</b>

Information services, which includes software products, represents approximately 24% of the total IT budget, as noted in Exhibit VII-6. The largest expenditure is for internal staff (36% of the IT budget). Equipment services represents the smallest portion of the IT budget at \$24.1 billion and 4% of the total.

EXHIBIT VII-6

**1993 IT Spending Percentages—North America**



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# National Profiles

## A

### Introduction

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Chapter VIII of the 1993-1998 worldwide forecast provides individual profiles of the information services market for 31 countries or areas of the world. Each national profile includes:

- An introduction to the country or area, including a discussion of the general business climate for information services and products.
- A summary of key technology trends, driving forces and inhibiting factors impacting the information services market in the country or area.
- The current size and forecast of the information services market for the country or area. (Note that the forecast database table for each country or area is included in this chapter with the national profiles, rather than in Appendix B, for ease of reference.)
- A discussion of the competitive environment and leading vendors, where appropriate.
- A brief summary of considerations regarding entering the market or expanding market presence. Areas of opportunity that appear to be particularly significant have been identified.

Most national profiles include the following exhibits:

- Market Forecast, 1993-1998
- Market Forecast by Delivery Mode, 1993-1998

- Market Forecast Database by Delivery Mode and Submode by Year, 1992 through 1998

The forecast charts are in \$U.S. billions unless the market is extremely small, in which case they are in \$U.S. millions. The market forecast database tables are all in \$U.S. millions.

## B

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### Argentina

#### 1. National Overview

Before the mid-1930s, Argentina was one of the 10 richest countries in the world. It suffered a series of economic and political shocks over the last 50 years that have resulted in an unstable environment for the business community prior to a change in economic policy in the early 1990s.

Argentina is a land of more than one million square miles and has a population of more than 34 million, with a strong European heritage. The country has some of the richest farming and grazing land in the world, as well as major energy reserves. The country is self-sufficient in petroleum, but has suffered from vast inefficiencies in using this natural resource as well as others under state-run monopolies. Until recently, approximately 75% of the country's export earnings have been from the sale of commodities. The potential for development of such resources into value-added products is huge.

Argentina has suffered from major political upheavals, a bloated public-sector economy, hyperinflation and low industrial productivity with high tariff barriers.

Under new, national leadership since 1989, Argentina is significantly progressing with controlling its excessive inflation and promoting industrial growth.

The initial signs of economic turnaround include:

- Increase in the annual rate of growth in consumer demand since 1991, fueled by an increase in real wages (with declining inflation)
- Reversal in the trend of capital flight, which also helped finance the privatization of many sectors

- Increase in the annual rate of growth in consumer demand since 1991, fueled by an increase in real wages (with declining inflation)
- Reversal in the trend of capital flight, which also helped finance the privatization of many sectors

During the 1980s, an estimated \$50 to \$60 billion was transferred out of the country to protect it from raging inflation.

The rate of inflation for 1993 declined to the 9.5% level, down from 25% in 1992. The inflation rate was as high as 4,425% in 1989.

Growth in real GDP leveled in 1993 to approximately 5% from annual average rate increases of 9% in 1991 and 1992. The higher growth rates in these latter two years reflected increased consumer spending in the consumer durables and services sectors of the Argentine economy with the increase in real wages from a lower inflationary rate. However, declines in real wage rate increases and high interest rates have led to some softening in the growth rate of consumer spending.

In 1993, with an acceleration in the rate of privatization, there was a shift away from consumption growth toward increased investment spending. Investment spending is expanding at a strong estimated annual rate of 25% to 30%.

Argentina's manufacturing sector in recent years suffered from a lack of competitiveness with other economies due to the overvalued Argentine peso, the country's excessively high inflation rate and its relatively restrictive tariff regulations.

A major change in Argentine economic policy began in the early 1990s, following a change in leadership in 1989 with the election of current president Carlos Saul Menem. Policy changes included more private ownership of business, decreased government regulation of business, a balanced budget policy, lower taxes and the full convertibility of Argentina's currency. A tight monetary policy has improved the competitiveness of Argentine manufactured goods.

Such governmental policy is expected to continue in 1994. Some further decline from 1993's projected 9.5% inflation rate is expected in 1994.

inflation, the inflation rate is expected to show further decline to the 8.5% to 9.0% level in 1994.

The long-term success of the current economic policies are still somewhat in doubt because such free-market policies have been attempted in the past and have failed. The two traditional political parties throughout the past many decades continue to be the current Peronists and the opposition party (which represents more of the traditional labor interests). They are somewhat united on current economic policies, which would suggest a somewhat higher percentage of success than in the past.

The unemployment rate increased from the 6.9% level in 1992 to nearly 10% in 1993. Labor laws have been changed to allow more flexible employment staffing to help make Argentine businesses more competitive. Acceleration in the GDP growth depends on increasing labor productivity through continued company structurings and increased spending on capital goods, such as information technology, along with keeping the Argentine peso competitive with other currencies.

The privatization of Yacimientos Petroliferos Fiscales (YPF), the country's large state oil company, began in 1993. In preparation for this sale, the employment level of YPF was reduced from 50,000 to 12,000 over a three-year period as part of a restructuring plan.

Exports are expected to show resumed growth in 1994, following a period of a relatively flat growth in recent years, and the rate of import growth is expected to flatten. Lower international interest rates have also allowed restructuring of commercial bank debt in Argentina. All of these factors will help the current account deficit remain relatively stable.

U.S. exports to Argentina have increased significantly since 1991, the year that reflected lower tariff barriers and a healthier domestic economy. U.S. exports to Argentina have been more heavily weighted toward capital goods and reached approximately the \$2.5 to \$3.0 billion level in 1993, which will continue to represent approximately 23% of the Argentine market.

There has been a major effort by the current Argentine government to portray Argentina as a business-friendly country. Several international trade development programs, many of them

the \$2.5 to \$3.0 billion level in 1993, which will continue to represent approximately 23% of the Argentine market.

There has been a major effort by the current Argentine government to portray Argentina as a business-friendly country. Several international trade development programs, many of them led by the U.S., have had substantial contributions to various Argentine industrial development programs, which also helps U.S. firms to do business in the country.

One of Argentina's major trading partners is Brazil, which is suffering from a severe recession. Over the past year, this has resulted in a trade imbalance in favor of Brazil and some disruption to a proposed regional trading pact, known as the Mercado Del Sur (MERCOSUR), which would include Argentina, Brazil, Paraguay and Uruguay. The Argentine government suggested the timetable for completing this agreement be delayed until after January 1995, in light of Brazil's current economic problems.

Forces driving and inhibiting the information services market are primarily related to the fundamental elements of the economic environment.

#### **a. Driving Forces**

- *Improved communications systems*—The government invests in the telecommunications infrastructure and business to develop information networks. Privatization of telecommunications has reduced corruption and created a more stable environment.
- *Industrial investment and general business climate*—The government is encouraging investment in the industrial sector to stimulate the economic growth of the country. However, this must be balanced against the inflationary pressure and a recessionary climate.
- *Reduced tariffs*—Significant tariffs on manufactured products have traditionally proved to be a barrier. However, tariff reductions initiated under the new government are expected to contribute to increased imports of hardware and software.
- *Economic stabilization*—There have been significant efforts to establish a stable economic base from which to grow.

## b. Inhibiting Factors

- *Inflation*—Inflationary pressures that inhibit long-term investment in industry and technology remain a challenge. The solution is long term and the direction is positive, but in the short term, inflationary pressures hamper investment from outside the country.
- *Political instability*—The ability of the country to develop a stable political environment remains in question. Many foreign firms are reluctant to make investment commitments without a stable government. Many are waiting to see the outcome of early initiatives. Nevertheless, if President Menem can garner enough support in Argentina's Congress, and if the economy continues to stabilize, he could have another opportunity to change the law to allow him to run again for president in 1995.
- *Limited infrastructure*—With a limited technological base, significant short-term growth prospects are limited. However, significant investment must be made before IS technology will be of benefit.
- *Cost of technology*—Because much information technology (hardware and software products) is imported, internal inflation often makes such products too expensive, thus slowing investment. High import tariffs are also a problem.
- *Limits on available credit*—High cost of credit and limited access in smaller cities can complicate and/or delay purchase of new technology.
- *Work ethic issues*—In certain areas of Latin America, such as Argentina, there appears to be less of an appreciation for the work ethic than in Mexico, possibly related historically to the presence of a leisure class associated with a particular class structure.

## 2. Information Services Market Forecast

The market for information services in Argentina is small, but with continued stabilization of the economy and the political environment, it can grow at an estimated 17% rate, from \$607 million in 1993 to approximately \$1.3 billion by 1998, as shown in Exhibit VIII-1. This represents a modest downward revision in

INPUT's five-year compound annual growth rate (CAGR) forecast, which represents:

- Expectations for moderating GDP growth over the next two years
- Continuing tight fiscal and monetary policies
- Weakness in the Brazilian economy, Argentina's largest trading partner

EXHIBIT VIII-1

Market Forecast—Argentina, 1993-1998

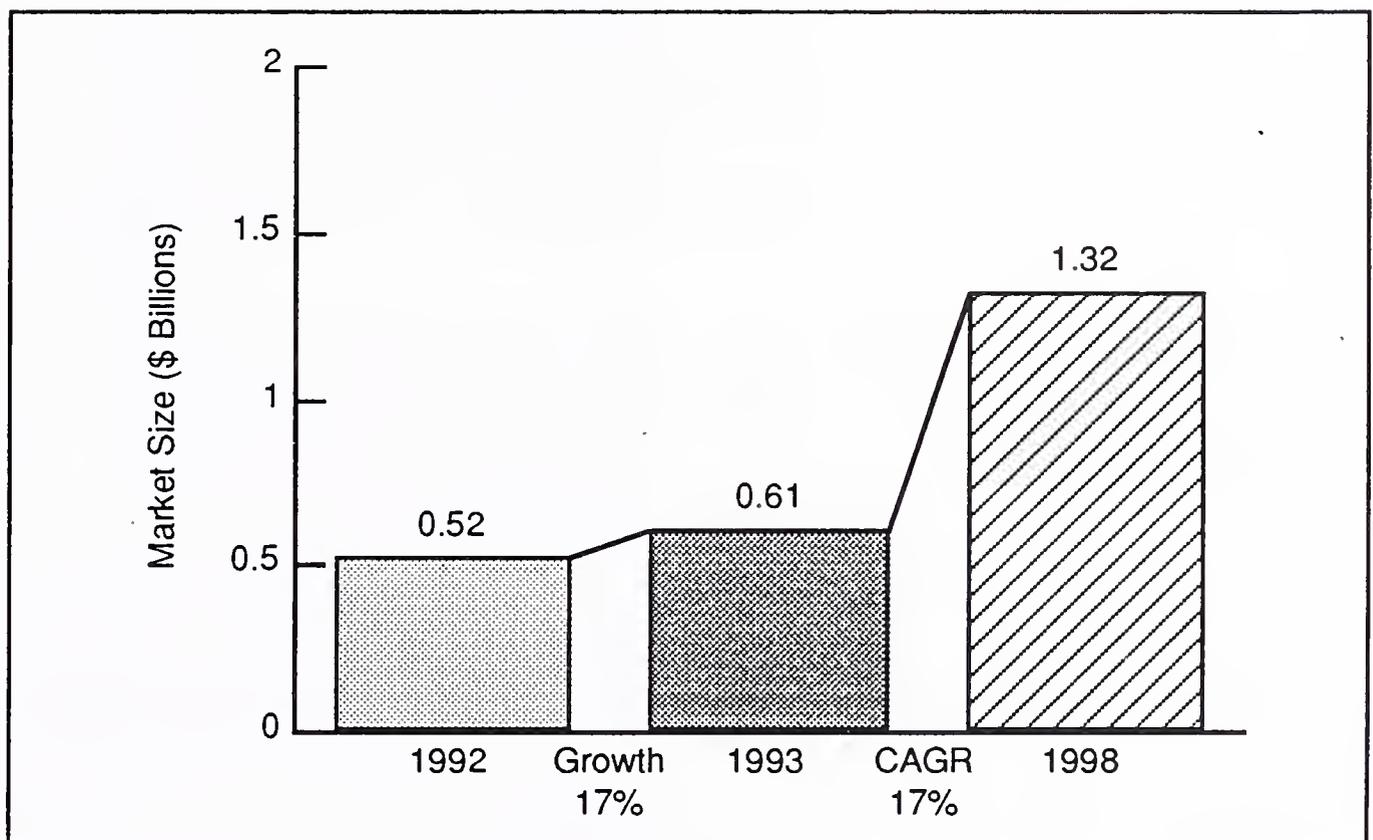
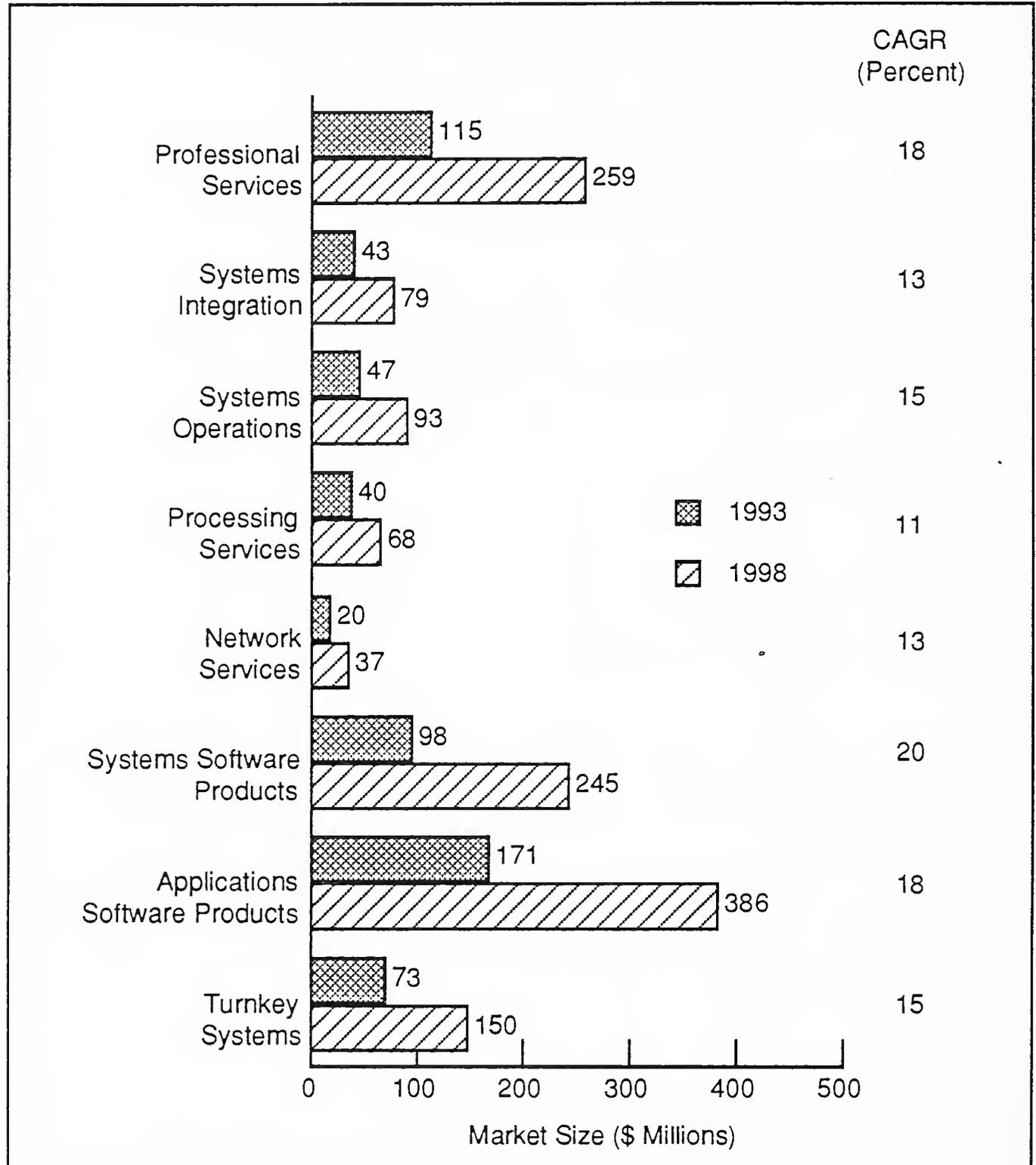


Exhibit VIII-2 provides the forecast by delivery mode. Exhibit VIII-6, found at the end of this profile, provides the forecast in greater detail.

EXHIBIT VIII-2

### Market Forecast by Delivery Mode Argentina, 1993-1998



Although revised downward slightly from 12% in the 1992 forecast to a 11% CAGR in the current forecast, Argentina processing services is expected to show steady growth as companies expand their processing capabilities or seek short-term solutions to meet growth demands. It is a good alternative to in-house processing, given the tariff situation on computer equipment. A somewhat higher growth rate (15%) is projected for systems operations. Because of the cost of larger computers, there is a growing

opportunity for processing services companies to offer full systems operations services economically, compared to internal data centers.

As in other developing economies, turnkey systems are expected to grow at a higher rate (15%) than the U.S. average (8%), due to the need to implement solutions immediately. The focus will be on personal computer- and LAN-based turnkey systems.

The network services sector in Argentina is modest and will remain small for several years at well under 5% of the total market.

- Although significant progress is being made in telecommunications investments, the country has a very poor telecommunications infrastructure today and it will take several years of investment before much growth can be expected.
- Although Argentina has begun major efforts to upgrade its telecommunications infrastructure, the emphasis is on increased quality and quantity of basic services (telephone, telex, etc.), not enhanced services.

The fastest-growing area of the industry remains software products—applications and systems software. There is a sufficiently large installed base to support a growing software market, in particular at the PC/workstation level.

- The market for software products represents about 44% of the total information services market.
- The systems software products sector will remain quite strong with a 20% CAGR, driven by increasing dependence on PCs, workstations and LANs, as well as a growing interest in UNIX.
- Applications software products will grow slower (18% CAGR). Investment costs are prohibitive and there is a desire to wait for UNIX and newer client/server products.

- If the planned lowering of duties and tariffs is accomplished, residual demand should result in high growth rates for applications, systems control and application development software. With a lowering of import duties (which has been in the 15-20% range), there should be excellent opportunities for U.S. software companies to expand their presence. The U.S. currently dominates the local software market, particularly for business applications.
- Systems urgently need to be updated. This year's interview data from Argentina indicated this was one of the strongest motivators for systems investments.

The market for systems integration is expected to expand from \$43 million to approximately \$79 million by 1998, a growth rate of about 13%. This is down 15% from last year's interview data. The downward revision is a more moderate outlook for general growth in the economy.

As industry addresses lingering productivity problems, the professional services sector is expected to benefit, primarily from the need for consulting to identify solutions and alternatives. The professional services sector is expected to grow from about \$115 million in 1993 to \$259 million by 1998. Professional services will continue to outpace systems integration over the next five years, because buyers and vendors are more comfortable with the traditional professional services relationship rather than the more inclusive, higher-risk systems integration relationship.

- While the need for consulting services is expected to be the greatest in the near term, software development should increase steadily over the five-year period, as work progresses from analysis and definition to the development stage of the growth process.
- Education and training is also a growing need. With a limited base of trained personnel, significant effort will be required to improve staff skills if internal staffs are to handle new systems.

These projections for Argentina are somewhat fragile. They assume a moderately improved economic base and a political environment that will continue to stabilize. Indications are generally positive, but not conclusive.

### 3. Market Considerations

Exhibit VIII-3 lists leading Argentina-based vendors and the delivery modes in which they primarily operate.

EXHIBIT VIII-3

#### Selected Vendors by Delivery Mode—Argentina, 1993

Vendor	Processing/ Network Services/ Systems Operations	Professional Services/ Systems Integration	Software Products	Turnkey Systems
Bairesco	✓			
Baiwo	✓			
Bergerman		✓	✓	
Dataproceso	✓			
Haltener & Lopez		✓		
Logica			✓	
Pistelly, Lia & Accox		✓		
Proceda	✓	✓	✓	
Sacoma	✓			
Sisercom		✓		
Sisteco	✓		✓	
Sistemática		✓		
S&M Consultores		✓		✓

As a general guideline, mainframes and minicomputers, as well as programming languages and operating systems, are imported from the U.S. Applications software is designed by foreign and Argentine firms. An increasing number of microsystems come from the Far East.

There is a local information services infrastructure, which includes:

- Local professional services firms that include the international accounting and consulting companies such as Andersen Consulting, Deloitte Touche and IBM (relationships tend to be with the European [Spanish] rather than the U.S. branches of these firms)
- Local processing services firms
- Marketing arms of U.S. computer manufacturers and some software companies

Leading vendors of hardware and software include IBM, Unisys, Computer Associates, Software AG, Microsoft, Borland and Oracle.

In general the local vendors look to the U.S. for technology-based product and services relationships.

Whether this is a good time for entering or expanding into the Argentine market is speculative. There are signs the country will continue to stabilize and investment opportunities will be attractive. However, previous initiatives have met with limited success.

Many providers who are knowledgeable in this area suggest distribution arrangements as the best method of entry or expansion for the near term. Establishing an equity participation arrangement can stimulate growth without significant up-front investment.

#### **4. IT Spending**

Exhibit VIII-4 provides an estimate of Argentina's total IT spending for 1993.

EXHIBIT VIII-4

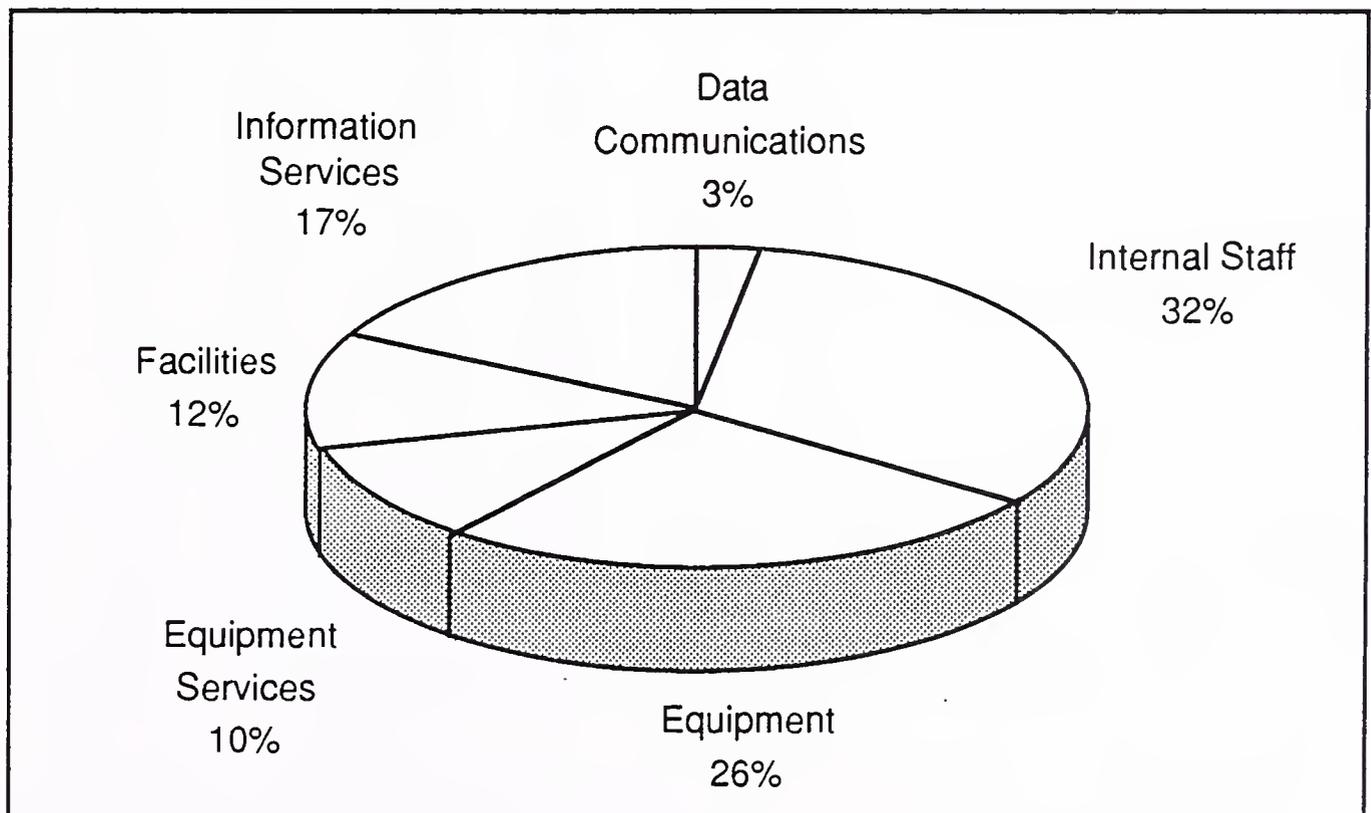
**Total 1993 IT Spending—Argentina**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	107
Internal Staff	1,143
Equipment	928
Equipment Services	357
Facilities	428
Information Services	607
<b>Total IT Spending</b>	<b>3,570</b>

Information services, which includes software products, represents approximately 17% of the total IT budget, as noted in Exhibit VIII-5. The largest expenditures are for internal staff (32% of the IT budget) and equipment (26%). Data communications represents the smallest portion of the IT budget at \$107 million and 3% of the total.

EXHIBIT VIII-5

**1993 IT Spending Percentages—Argentina**



## EXHIBIT VIII-6

**Information Services Industry Market Forecast by Delivery Mode  
Argentina, 1993-1998**

Delivery Modes	1992 (\$M)	Growth 92-93 (%)	1993 (\$M)	1994 (\$M)	1995 (\$M)	1996 (\$M)	1997 (\$M)	1998 (\$M)	CAGR 93-98 (%)
Total Argentina Information Services Mkt.	519	17	607	705	822	963	1,130	1,317	17
<i>Professional Services</i>	98	17	115	135	159	187	221	259	18
- IS Consulting	26	15	30	35	41	48	57	66	17
- Education & Training	14	14	16	18	21	24	27	31	14
- Custom Software	58	19	69	82	97	115	137	162	19
<i>Systems Integration</i>	38	13	43	48	54	62	71	79	13
- Equipment	11	9	12	13	14	16	18	20	11
- Software Products	15	13	17	19	21	24	27	30	12
- Professional Services	11	18	13	15	18	21	24	27	16
- Other	1	0	1	1	1	1	2	2	15
<i>Systems Operations</i>	41	15	47	53	61	70	82	93	15
- Platform Operations	24	17	28	32	37	42	48	54	14
- Application Operations	17	12	19	21	24	28	34	39	15
<i>Processing Services</i>	36	11	40	45	49	55	61	68	11
- Transaction Processing	16	13	18	21	24	27	31	35	14
- Utility Processing	12	8	13	14	15	17	18	20	9
- Disaster Recovery	8	13	9	10	10	11	12	13	8
<i>Network Services</i>	18	11	20	22	25	29	33	37	13
- Electronic Info Services	15	13	17	19	21	24	28	32	13
- Network Applications	3	0	3	3	4	5	5	5	11
<i>System SW Products</i>	82	20	98	116	138	166	203	245	20
- System Control	50	22	61	73	87	104	125	150	20
- Data Center Management	6	17	7	8	9	10	11	12	11
- Applications Development	26	15	30	35	42	52	67	83	23
<i>Application SW Products</i>	146	17	171	200	236	279	328	386	18
<i>Turnkey Systems</i>	60	22	73	86	100	115	131	150	15
- Equipment	31	19	37	44	50	56	62	68	13
- Software Products	17	29	22	26	31	36	43	51	18
- Professional Services	12	17	14	16	19	23	26	31	17

**C****Australia****1. National Overview**

"The Lucky Country" spent much of the 1990s in the throes of a recession that weakened business investment, slowed export growth and caused a prolonged period of unusually high unemployment. Since his re-election in March 1993, Prime Minister Paul Keating has focused on reducing Australia's budget deficit and enacting reforms in the labor market. Unfortunately, Keating and the Labor party promised reductions in income taxes prior to the election that, when implemented, will diminish the government's incoming cash flow.

Nevertheless, overall Australian business activity grew from 2% in 1992 to 2.5% in 1993. This growth was largely due to individual consumers who took advantage of lower interest rates, courtesy of the Reserve Bank of Australia, and spent more on consumer goods and housing. This led to a revival, of sorts, for the Australian economy that is expected to increase its GDP growth rate to 2.8% in 1994, reaching 3.0% in 1995. However, the country's inflation rate reached 1.8% in 1993, and is expected to increase to 3.2% in 1994.

Although the increased mining and exporting of mineral resources in the 1990s helped the economy, only 25% of Australia's work force is employed in the manufacturing sector which includes light and heavy machinery, apparel, automobiles and information technology. Australia's 18.1 million people are also buying more imported goods, resulting in an accumulated foreign debt in 1993 of \$140 billion. This debt is expected to increase to \$148 billion in 1994.

As Australia's competitiveness with its Asian neighbors has weakened, the country has rethought its long-held conviction that it is more a southern extension of Europe than a part of Asia. Economic difficulties led Australians and their leaders to seek inclusion in Asia's growing prosperity. The country welcomed Japanese investment, which accounts for more than 20% of total trade, and made friendly overtures to South Korea, Hong Kong and other Asian neighbors in recent years. In fact, Australia currently exports more than 65% of its products within Asia,

compared to 52% in 1986. Japan alone accounts for 29% of Australia's export market.

The forces driving and inhibiting growth in the information services market in Australia are summarized. They are consistent with those reported in INPUT's 1992 report.

#### a. Driving Forces

- *Trade liberalization*—Since becoming Prime Minister in December 1991, Paul Keating has made promising headway toward restructuring Australia's centralized wage determination system. The goal is to completely shift to a system that encourages plant-level bargaining and provides rewards for improved productivity.
- *Privatization*—Privatization of industry provides a stimulus for investment, modernization and expansion. In the past several years, the government has sold off shares in its airline and telecommunications industries. These moves attracted substantial private capital investments.
- *Industrial expansion*—The government is expanding the country's industrial base by streamlining national and regional industry regulations and creating country-wide industrial standards.
- *Mini-based applications*—With the availability of high-performance mini and microcomputers, companies seek industry-specific applications to meet current and future needs.
- *Network development*—Networking capability is an increasingly important aspect of the information services industry. With a widely dispersed population, network technology is a key development and operational tool. Current network users include regional railway companies, municipal law enforcement agencies, the financial services sector and Australia's software industry.

## b. Inhibiting Factors

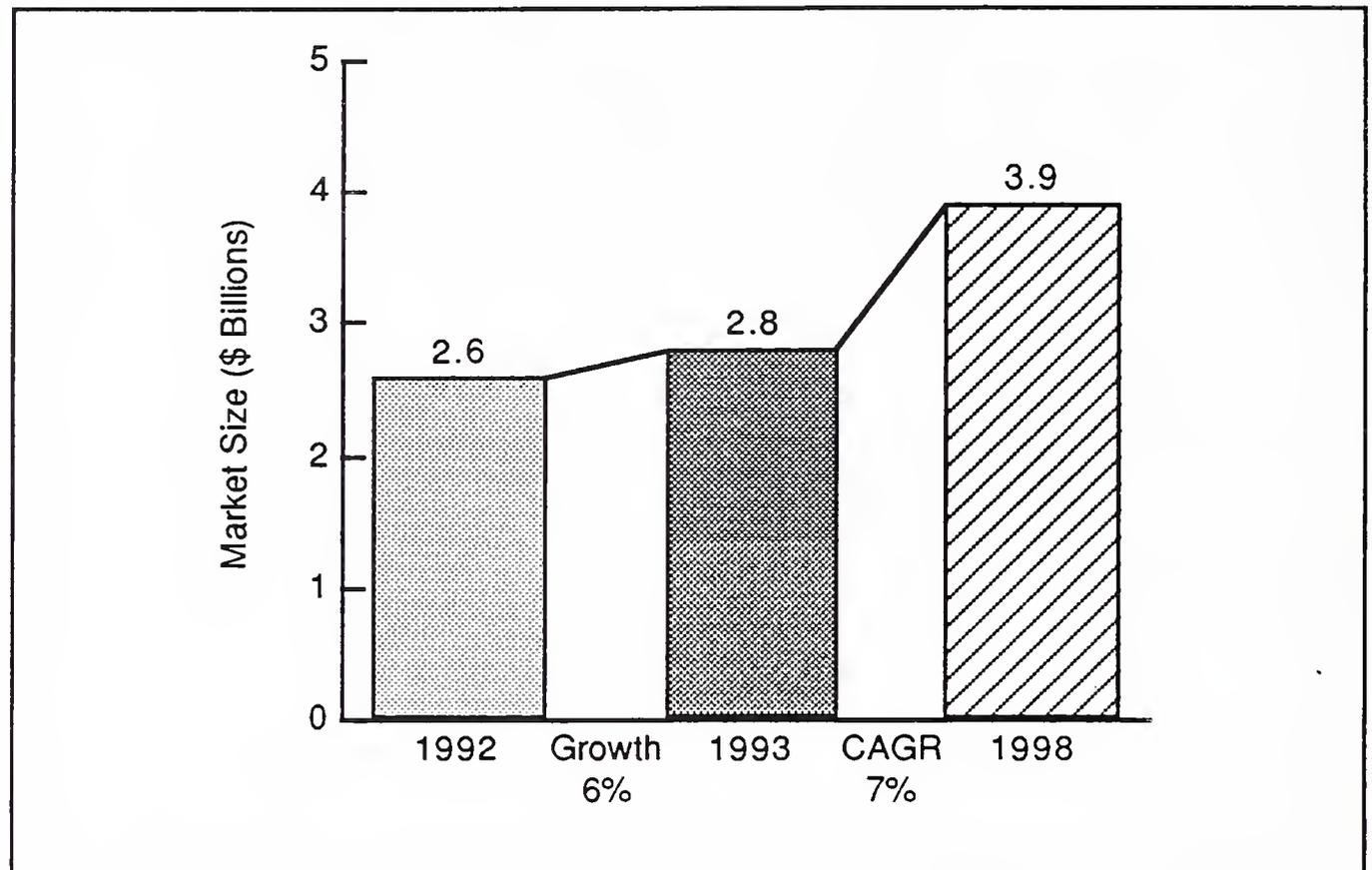
- *Unionism*—Unions traditionally have a strong voice in industrial and political developments. More than 55% of all Australian wage and salary earners are unionized. Seeing the potential for job loss, unions generally resist technology application. The strength of unions has declined somewhat, but they still have a strong voice, so progress toward information technology must be made slowly.
- *Skilled labor shortage*—There is a significant shortage of skilled labor in the information services industry, which requires increased education and practical experience. The recent influx of Chinese and other Asians from neighboring countries will boost the overall labor pool and may contribute information technology skills.
- *Software piracy* — American software companies, such as Microsoft and Gupta, have succeeded at selling their products in various niches of Australian business and industry. However, the Business Software Association of Australia found the problem of software piracy so significant that it established a hotline in mid-1993 for users to report cases of illegal software copying and use. The problem includes the sale of pirated disks, as well as the legitimate sale of hardware systems equipped with pirated software.

## 2. Information Services Market Forecast

The market for information services in Australia is expected to grow from an estimated \$2.8 billion in 1993 to \$3.9 billion by 1998, as shown in Exhibit VIII-7. The annual growth rate of 7% is down significantly from last year's forecast. This conservative growth estimate reflects the lingering effects of global economic slowdown, a slow growth rate for the Australian economy and the more than 75% increase in the rate of inflation—all factors that affect business spending for outside services. As the overall economic environment improves in Australia, information services expenditures are expected to return to double-digit growth levels.

## EXHIBIT VIII-7

## Market Forecast—Australia, 1993-1998

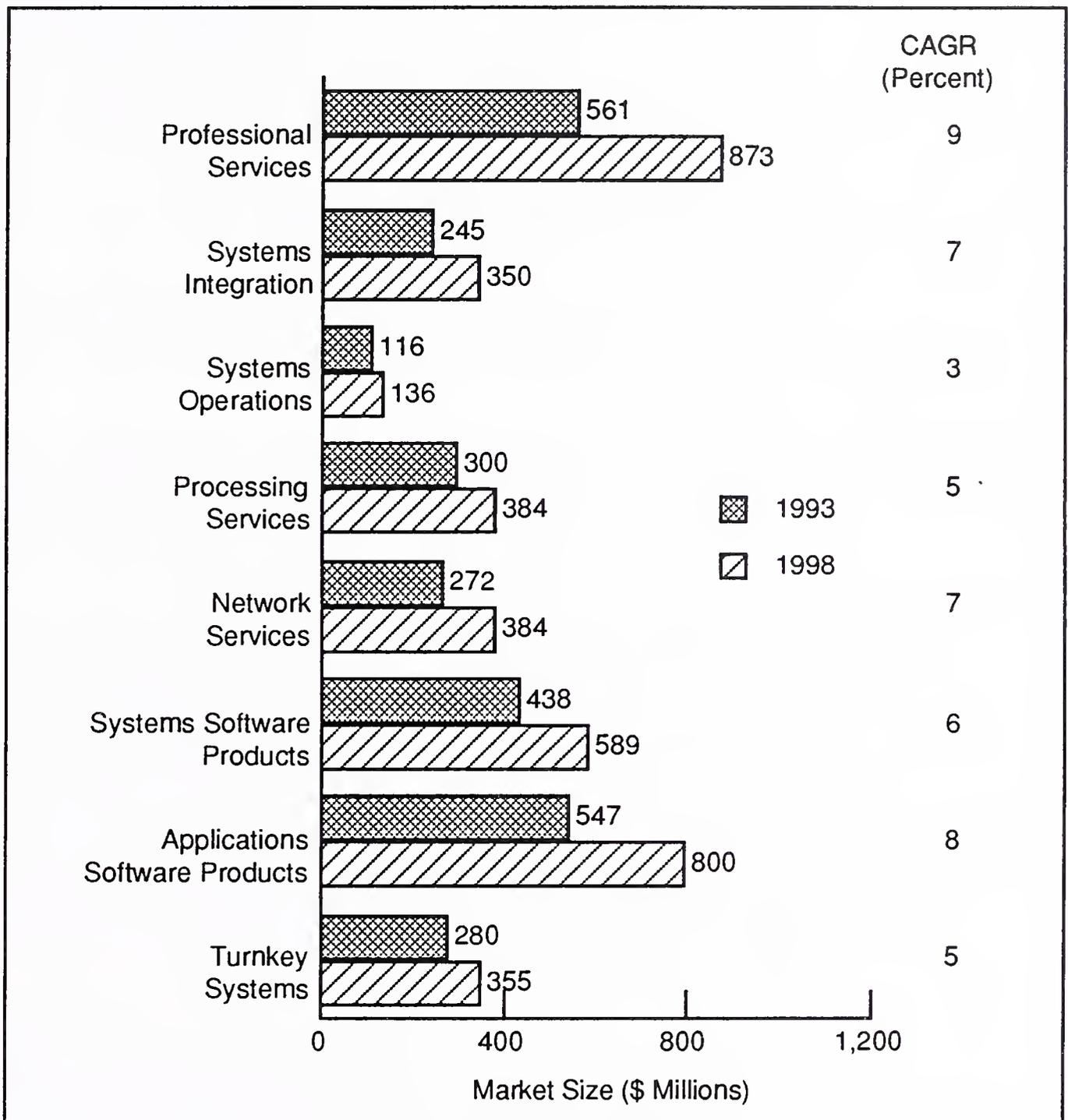


The specific trends by market segment are generally reduced by almost half, when compared to the 1992 forecast, and reflect the economic and business trends noted above. As Australia shifts its emphasis from compatibility with European economies to stronger participation in the actively growing Pacific Rim market, and tax reductions start to take effect and allow businesses to invest more in new markets and expand production resources, information services spending should return to higher levels.

Exhibit VIII-8 provides the forecast by delivery mode and Exhibit VIII-12, at the end of this profile, provides the detail behind this forecast.

EXHIBIT VIII-8

**Market Forecast by Delivery Mode  
Australia, 1993-1998**



The largest growth rates are projected for network services, systems integration, applications software products and professional services.

The market for processing services is expected to grow from approximately \$300 million in 1993 to about \$384 million by 1998, an average growth rate of approximately 5%, as shown in Exhibit VIII-8.

The demand for turnkey systems in Australia is expected to be at the same level as processing services, with a 5% compound annual growth rate (CAGR). There continues to be strength in the PC/workstation sector for small firms, supported by the availability of packaged software products and a steady demand for professional services associated with turnkey systems.

Software products will grow at a rate of 8% for applications and 6% for systems software products.

- Applications software will be needed in all segments of the economy, ensuring increasing growth for the next several years.
- The need for systems control and application development tools is also expected to grow at a steady pace, as more organizations develop or improve internal processing capabilities — especially with workstations and PCs.

The \$116 million systems operations market will grow at a very modest rate of 3%. The concept of shifting full data center operations to an outside provider is receiving slow acceptance in Australia, as it is in most smaller information services markets.

The demand for systems integration and professional services is expected to grow at 7% and 9% respectively. This level of growth reflects an industry that has slowed down investments in systems projects due to reduced budgets.

- Systems integration services are expected to be driven by the government's need to modernize and expand federal and statewide services. Commercial systems integration will lag behind the government sector.
- For professional services, consulting is expected to grow at a 10% rate, as companies consider and implement alternatives that will modernize and leverage the newer, integrated information technologies.
- Education and training will expand at a modest 4% as the country moves toward developing a broader range of information technology skills. Although the quality of trained staff is high, Australia has been generally slow in educating and training sufficient staff to meet growing needs.

The demand for network services is expected to increase due to the ongoing need for the government to provide more service to remote areas of the country, and for on-line services to link financial service centers.

- Overall, network services will grow at 7% per year, from \$272 million in 1993 to approximately \$384 million in 1998.
- The strongest growth is expected in network applications, which, at a 13% CAGR, has the highest growth rate of any delivery mode or submode. Australian businesses recognize the generic value of information and have been developing an on-line database industry with worldwide accessibility.
- Database and information exchange services, such as those related to medical and health care services, stimulate growth of network applications.
- As in many countries, there is continuing interest in EDI and E-mail services in Australia. This interest has become a primary driver for the growth of network applications.

The Australian market was around \$2.8 billion in 1993 and is experiencing reasonable growth in a difficult economy. Opportunities for continued growth are real, and over the forecast period the rate of growth will steadily increase. As Australia becomes a more active partner in the Pacific Rim economy, higher growth rates will almost certainly be realized.

### **3. Market Considerations**

Prospects for entry into, or expansion of, the Australian market are good. However, vendors should consider the market immature and should expect an extended growth period.

Distribution channels are similar to those in the U.S. Processing and professional services are generally sold directly to the prospect. Systems software generally accompanies hardware sales.

There are many distributors of software, and vendors entering the market are encouraged to establish relationships with them as the preferred method of gaining entry.

There are few inhibitors to entering the Australian market, and a number of well-established firms that have a presence beyond the country of Australia.

Outsourcing and downsizing are active trends in the Australian market. Thus, the activities of vendors in the U.S. market are directly applicable in Australia.

Exhibit VIII-9 lists local vendors by delivery mode identified during INPUT's 1993 research. In addition, all major computer manufacturers and leading U.S. vendors, such as EDS, Oracle, Computer Associates and Andersen Consulting, are active in this market. There is no English language barrier, making entry very easy for U.S.- and U.K.-based firms.

## EXHIBIT VIII-9

## Selected Vendors by Delivery Mode—Australia

Vendor	Processing/ Network Services/ Systems Operations	Professional Services/ Systems Integration	Software Products	Turnkey Systems
Aspect		✓		
BHP-IT		✓		
COCAM				✓
Computer Science of Australia	✓	✓		
Computer Power Group		✓		
DMR	✓	✓		
Ferntree	✓	✓		
MLC	✓			
PAXUS	✓			
Telecom Plus	✓			

### 4. IT Spending

Exhibit VIII-10 provides INPUT's estimate of Australia's IT spending for 1993.

EXHIBIT VIII-10

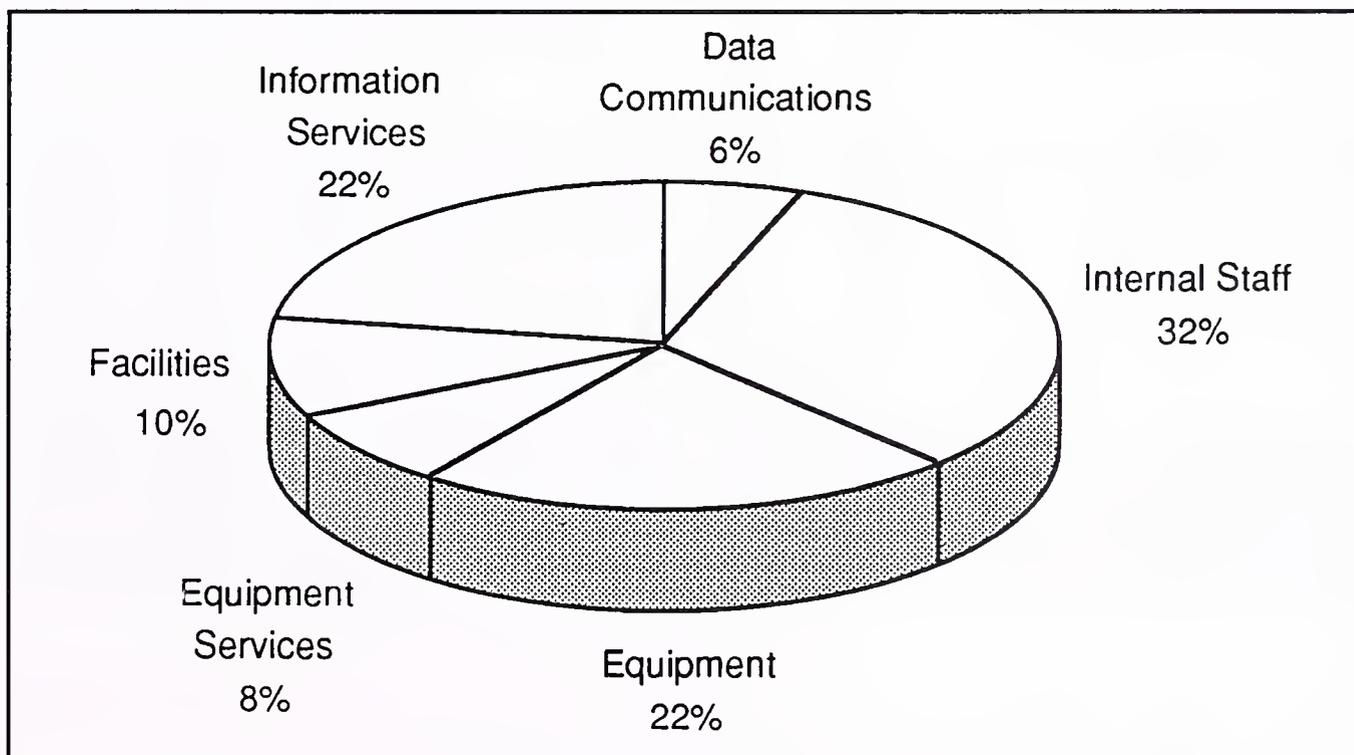
**Total 1993 IT Spending—Australia**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	753
Internal Staff	4,015
Equipment	2,760
Equipment Services	1,004
Facilities	1,255
Information Services	2,760
<b>Total IT Spending</b>	<b>12,547</b>

Information services spending, at \$2.7 billion, represents 22% of the total IT budget, as noted in Exhibit VIII-11. The largest expenditures are for internal staff (32%) and information services and equipment (22% each). Data communications represents the smallest portion of the IT budget at \$753 million or 6% of the total.

EXHIBIT VIII-11

**1993 IT Spending Percentages—Australia**



## EXHIBIT VIII-12

**Information Services Industry Market Forecast by Delivery Mode  
Australia, 1993-1998**

Delivery Modes	1992	Growth	1993	1994	1995	1996	1997	1998	CAGR
	(\$)	92-93 (%)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	93-98 (%)
Total Australia Information Services Mkt.	2,612	6	2,760	2,925	3,130	3,349	3,585	3,870	7
<i>Professional Services</i>	520	8	561	607	665	725	791	873	9
- IS Consulting	121	9	132	145	161	178	196	216	10
- Education & Training	63	3	65	66	69	71	73	80	4
- Software Development	336	8	364	396	435	476	522	577	10
<i>Systems Integration</i>	230	7	245	262	281	304	326	348	7
- Equipment	97	6	103	108	116	124	132	141	6
- Software Products	23	9	25	27	29	31	33	35	7
- Professional Services	99	7	106	115	124	136	148	158	8
- Other	11	0	11	12	12	13	13	14	5
<i>Systems Operations</i>	114	2	116	119	122	126	131	136	3
- Platform Operations	67	1	68	70	72	74	77	80	3
- Applications Operations	47	2	48	49	50	52	54	56	3
<i>Processing Services</i>	291	3	301	312	328	344	361	384	5
- Transaction Processing	243	4	252	262	275	289	303	323	5
- Utility Processing	15	0	15	15	16	16	17	18	4
- Other Processing	33	3	34	35	37	39	41	43	5
<i>Network Services</i>	259	5	272	289	309	331	356	384	7
- Electronic Info Svcs	210	4	218	227	238	250	263	284	5
- Network Applications	49	10	54	62	71	81	93	100	13
<i>Systems Software</i>	417	5	438	460	490	520	552	589	6
- System Control	179	7	191	204	220	237	255	275	8
- Data Center Mgt	86	3	89	92	97	102	107	113	5
- Applications Dvlpmt	152	4	158	164	173	181	190	201	5
<i>Applications Software</i>	513	7	547	586	631	679	732	801	8
<i>Turnkey Systems</i>	268	4	280	290	304	320	336	355	5
- Equipment	124	3	128	132	137	143	148	156	4
- Software Products	65	3	67	68	70	72	75	79	3
- Professional Services	79	8	85	90	97	105	113	120	7

**D****Austria****1. National Overview**

Austria's gentle image of mountains and *gemütlichkeit* contrasts sharply with its strong industrial base and skilled labor force of the nation's 7.8 million population.

Manufacturing accounts for 26% of GDP, which, in 1992 at current prices and current exchange rates, is estimated by OECD (Organization for Economic Cooperation and Development) at \$185 billion, about 2.4% of OECD European members' total GDP.

Austria is a member of the European Free Trade Association (EFTA) and will, therefore, be part of the EEA (European Economic Area) when this is inaugurated sometime in 1994. Under EEA, restrictions on trade and the movement of capital between European Community (EC) and EFTA countries will be largely removed.

Meanwhile, Austria has applied individually for EC membership, which will probably be negotiated in time for it to join in 1995.

GDP growth, among other things, has led to Austria being dubbed "one of OECD's stars" in recent years. In 1991, it bucked the European trend with a 3.0% expansion. Growth occurred at a lower level (1.5%) in 1992, with a very slight increase in inflation to 3.7%, about average for the OECD. There was a small current account deficit (0.2% of GDP).

For the future, 1993 is expected to be a year of zero growth, with 1994 showing a small growth at 1.5%. Inflation should fall below the OECD average by 1994 at 2.8%.

**2. Information Services Market Forecast**

Exhibit VIII-13 shows the overall information services industry market for Austria. Steady, significant growth at 9% CAGR is expected, from \$1.5 billion in 1993 to \$2.2 billion over the next five years.

EXHIBIT VIII-13

Market Forecast—Austria, 1993-1998

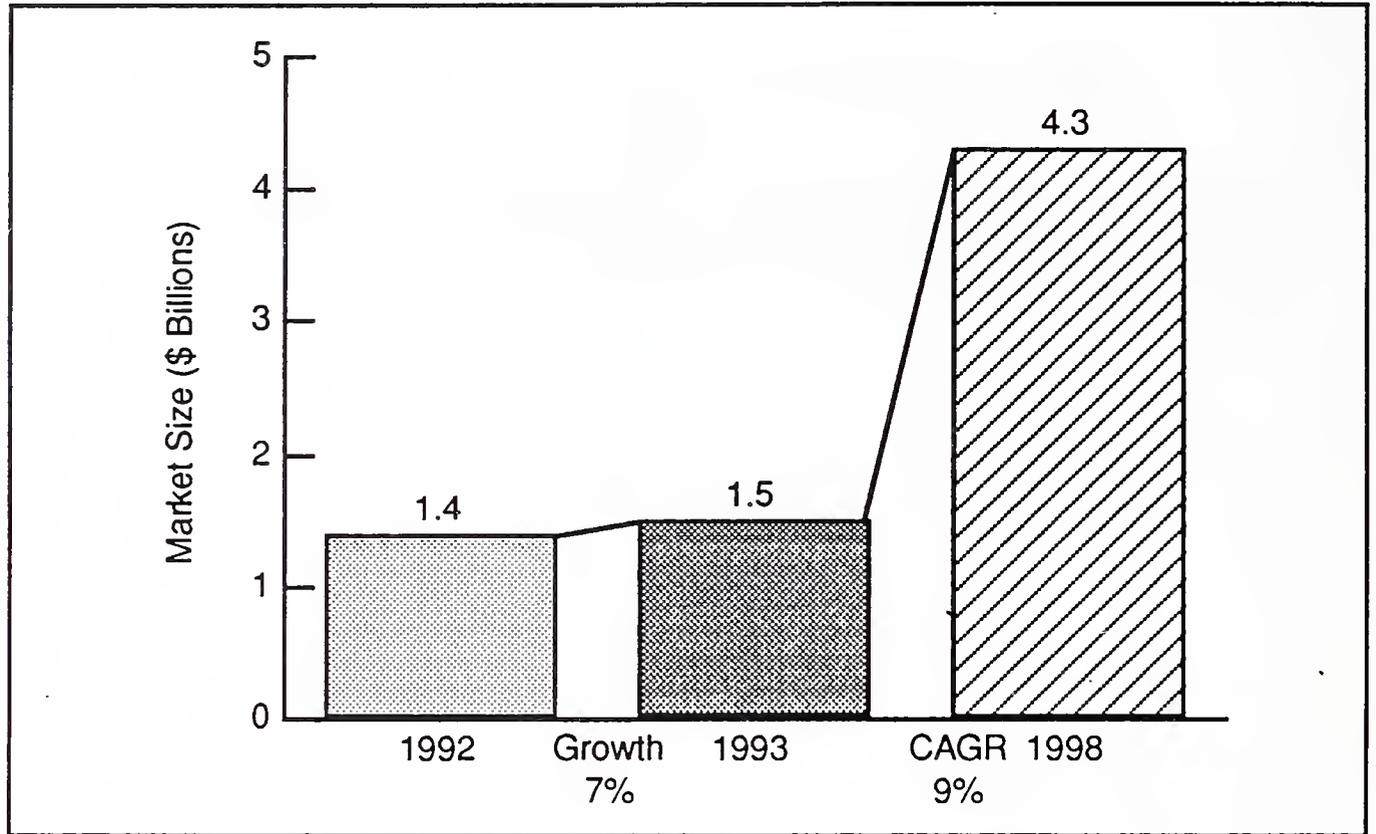
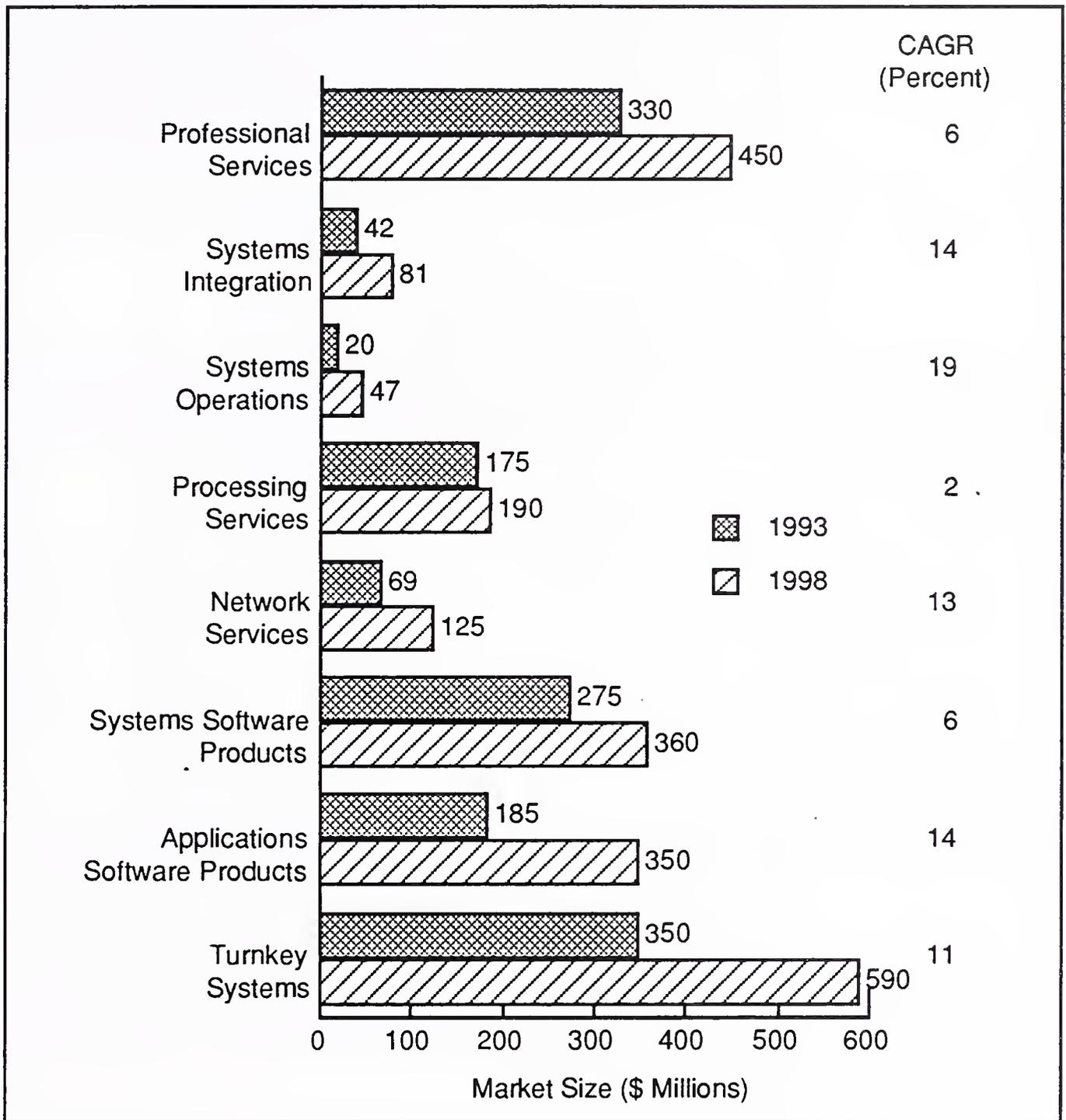


Exhibit VIII-14 provides the Austrian market forecast by delivery mode. Exhibit VIII-18, at the end of this profile, provides the forecast in greater detail.

EXHIBIT VIII-14

**Market Forecast by Delivery Mode  
Austria, 1993-1998**



In comparison to the overall European market, Austria shows similar characteristics to Germany with packaged application solutions—applications software products and turnkey systems—that are more dominant in the business mix than is usual.

**3. Market Considerations**

Exhibit VIII-15 lists the top vendors in the Austrian market for 1992.

EXHIBIT VIII-15

## Leading Information Services Vendors—Austria, 1993

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	140	9.7
2	Siemens-Nixdorf	Germany	64	4.4
3	Digital Equipment	U.S.	42	2.9
4	Management Data	Austria	37	2.6
5	EDV	Austria	34	2.3
6	Beko	Austria	32	2.2
7	Data-Service	Austria	32	2.2
8	Unisys	U.S.	25	1.7
9	GRZ Linz	Austria	23	1.6
10	Microsoft	U.S.	22	1.5
	Total Listed		451	31.1
	Total Market		1,450	100.0

IBM is the largest information services vendor in Austria with the merged Siemens-Nixdorf (SNI) still generating attributable revenues of less than half those of the market leader. Neither company has grown as significantly as its major Austrian competitors in the past three years. In fact, SNI probably suffered some loss of client base to competitors during the uncertain period after the takeover.

Digital Equipment moved rapidly up the rankings when it acquired the Mannesmann Kienzle business. The initiative to sell to small and medium enterprises has not been as successful as was hoped.

Management Data is a 21-year-old company operating out of Vienna, Innsbruck, Salzburg, Germany, Hungary, the U.K. and Singapore. It has a network of agents across the rest of Europe, Japan and South Africa. Its main specialization is International Banking software primarily selling this as turnkey systems.

Dataservice is a wholly-owned subsidiary of an Austrian bank. It has a strong PC orientation, as well as a wide range of processing

services, and specializes in banking, insurance and manufacturing systems. Beko has an engineering bias across a wide range of platforms and specializes in manufacturing, laboratory and general business administration systems.

#### 4. IT Spending

Exhibit VIII-16 provides an estimate of Austria's total IT spending for 1993.

EXHIBIT VIII-16

#### Total 1993 IT Spending—Austria

Budget Category	Estimated Spending (\$ Millions)
Data Communications	480
Internal Staff	1,800
Equipment	1,350
Equipment Services	435
Facilities	610
Information Services	1,250
<b>Total IT Spending</b>	<b>5,925</b>

Information services, which includes software products, represents 21% of the total IT budget, as noted in Exhibit VIII-17. The largest expenditures are for internal staff (30%) and equipment (23%). Equipment services represents the smallest portion of the IT budget at \$435 million and 7% of the total.

## EXHIBIT VIII-17

1993 IT Spending Percentages—Austria

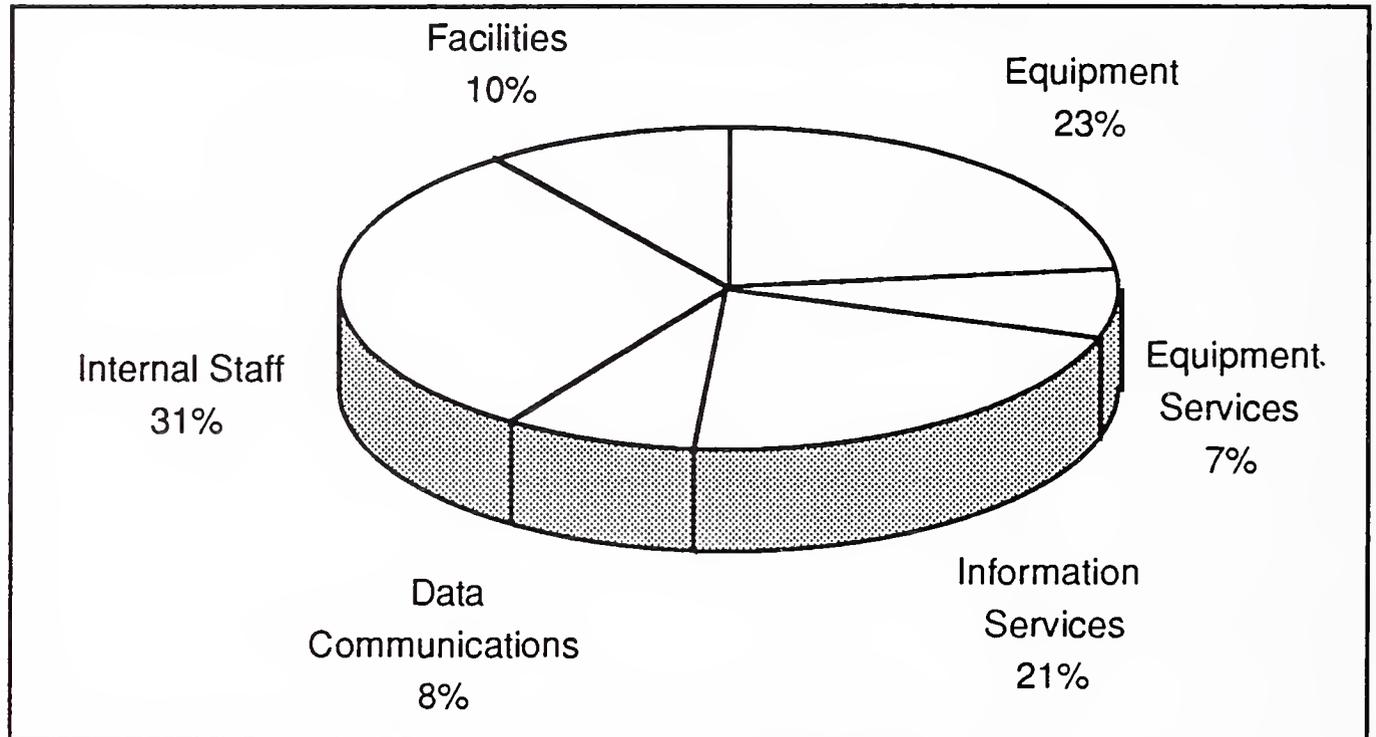


EXHIBIT VIII-18

**Information Services Industry Market Forecast by Delivery Mode  
Austria, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$M)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$M)</b>	<b>1994 (\$M)</b>	<b>1995 (\$M)</b>	<b>1996 (\$M)</b>	<b>1997 (\$M)</b>	<b>1998 (\$M)</b>	<b>CAGR 93-98 (%)</b>
Total Austria Information Services Mkt.	1,350	7	1,450	1,600	1,700	1,850	2,050	2,200	9
<i>Professional Services</i>	310	6	330	360	380	400	430	450	6
- IS Consulting	40	9	43	48	53	58	64	69	10
- Education & Training	37	4	39	41	42	44	46	48	5
- Custom Software	235	6	250	265	280	300	315	330	6
<i>Systems Integration</i>	37	14	42	47	54	62	71	81	14
- Equipment	10	15	12	13	14	15	16	17	8
- Software Products	9	20	11	14	18	22	28	35	26
- Professional Services	17	15	19	20	22	24	26	27	7
- Other	1	0	1	1	1	2	2	2	21
<i>Systems Operations</i>	18	11	20	24	28	33	40	47	19
- Platform Operations	6	17	7	8	9	10	12	13	13
- Application Operations	6	9	6	7	8	9	10	11	13
- Desktop Services	3	16	3	4	5	6	8	9	24
- Network Management	3	17	4	5	6	8	11	14	32
<i>Processing Services</i>	175	0	175	180	185	190	195	190	2
- Transaction Processing	154	2	156	159	164	168	175	171	2
- Utility Processing	7	0	7	6	6	6	6	6	-3
- Other Processing	14	0	14	14	15	15	16	15	1
<i>Network Services</i>	62	11	69	77	87	98	110	125	13
- Electronic Info Services	53	7	56	61	67	71	77	83	8
- Network Applications	10	32	13	16	21	27	35	44	29
<i>System SW Products</i>	260	6	275	290	310	330	350	360	6
- Mainframe	120	0	120	120	120	120	119	113	-1
- Minicomputer	84	7	89	96	102	110	117	120	6
- Workstation/PC	56	16	65	76	87	101	117	130	15
<i>Application SW Products</i>	160	16	185	210	240	270	310	350	14
- Mainframe	16	0	16	16	16	16	16	15	-1
- Minicomputer	49	10	54	59	65	71	77	81	9
- Workstation/PC	95	21	115	135	160	185	220	250	17
<i>Turnkey Systems</i>	310	13	350	400	440	490	550	590	11
- Equipment	159	10	175	192	209	228	248	258	8
- Software Products	76	16	88	100	115	130	150	165	13
- Professional Services	79	15	91	105	120	136	155	168	13

## E

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### Belgium

#### 1. National Overview

The population of Belgium is 9.8 million and the labor force numbers approximately 4.2 million (35% female), with a major presence in metallurgy industries. The population is divided into two groups: the Walloons (33%), who speak French; and the Flemish (67%), who speak Dutch. Cultural coexistence is currently not a problem.

The 1993 GDP at current prices and current exchange rates is estimated by OECD at \$219 billion, about 3% of OECD European members' total GDP.

A founding member of the European Community (EC), Belgium has long-established links with the Netherlands and Luxembourg, in the customs union, Benelux, that dates from the 1920s.

The information services market is estimated to be the ninth-largest in Europe at \$3.2 billion in 1992.

In Belgium and Luxembourg, GDP growth rate dropped in 1992 from 2.0% to 0.9% as a result of general economic circumstances in international trade—a major export market for Belgium, particularly as the recession bit into Germany. Inflation declined from 3.2% to 2.5%. The current account is in surplus to the tune of 2.3% of GDP. Unemployment increased by one percentage point, to 10.3%, which is close to average for the EC.

The GDP growth rate was flat in 1993 and should be 1.2% in 1994, with small increases in inflation in 1993 (2.7%) and 1994 (3.0%). The current account will continue in surplus, while unemployment will decrease slightly over the longer term.

Wealth in the country centers on Brussels—main seat of the EC administration—and on the northern (Flemish) border. Rapid decline of steel, coal, textiles and ship-building industries left the Belgium's government with heavy debts that are gradually being passed to the regional governments.

Luxembourg, once a beneficiary of the steel industry, now prospers as a kind of fiscal paradise, with low tax, banking

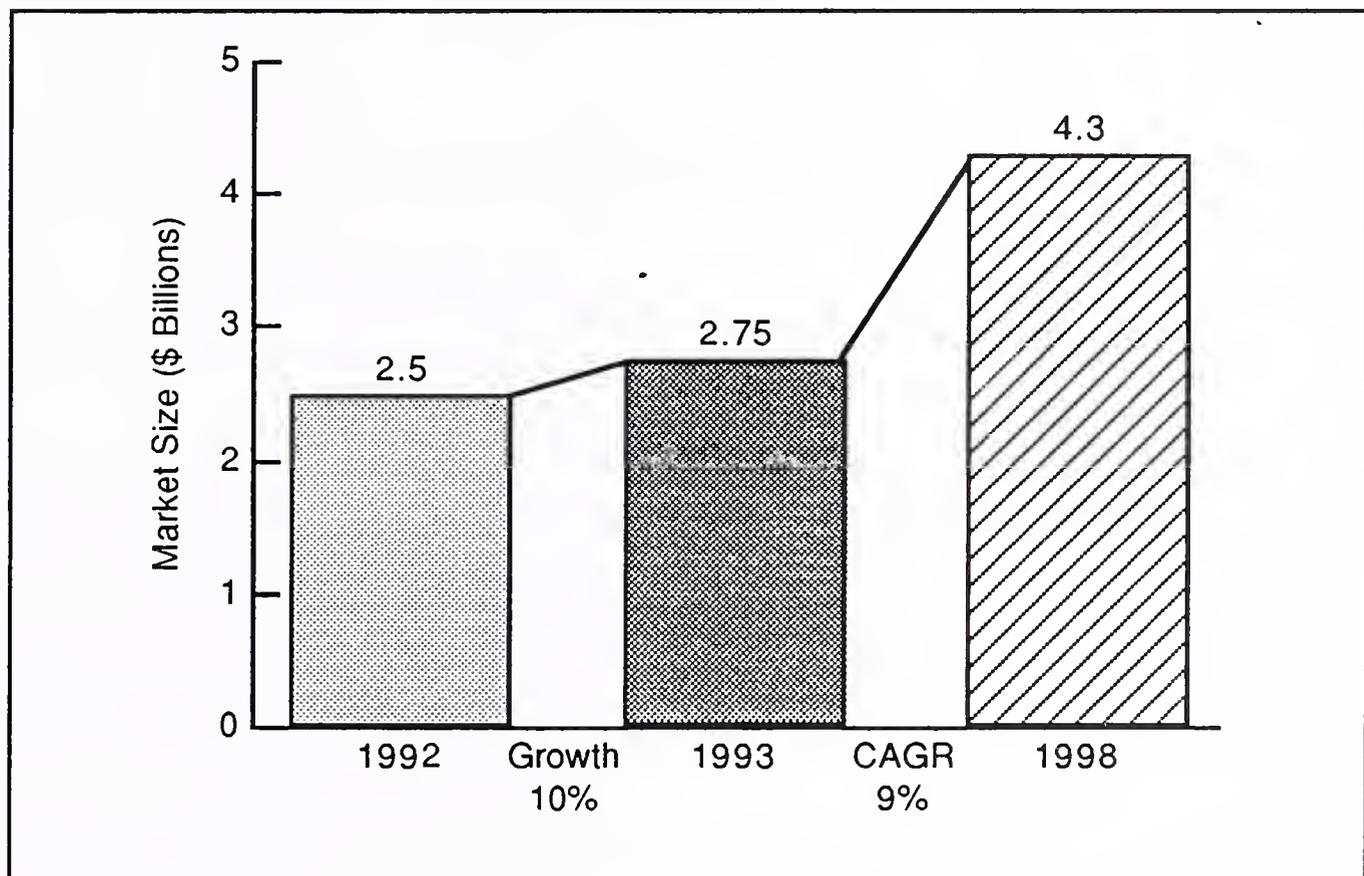
secrecy and duty-free shopping. New Swiss banking laws regarding disclosure have caused substantial funds to be diverted to Luxembourg. This increase in Luxembourg's competitive advantage is threatened only by the possibility that other EC members may push for new banking legislation across the community.

## 2. Information Services Market Forecast

INPUT forecasts that the Belgian market for information services will be \$2.6 billion in 1993, growing at an average CAGR of 11% to \$4.5 billion by 1998, as shown in Exhibit VIII-19.

EXHIBIT VIII-19

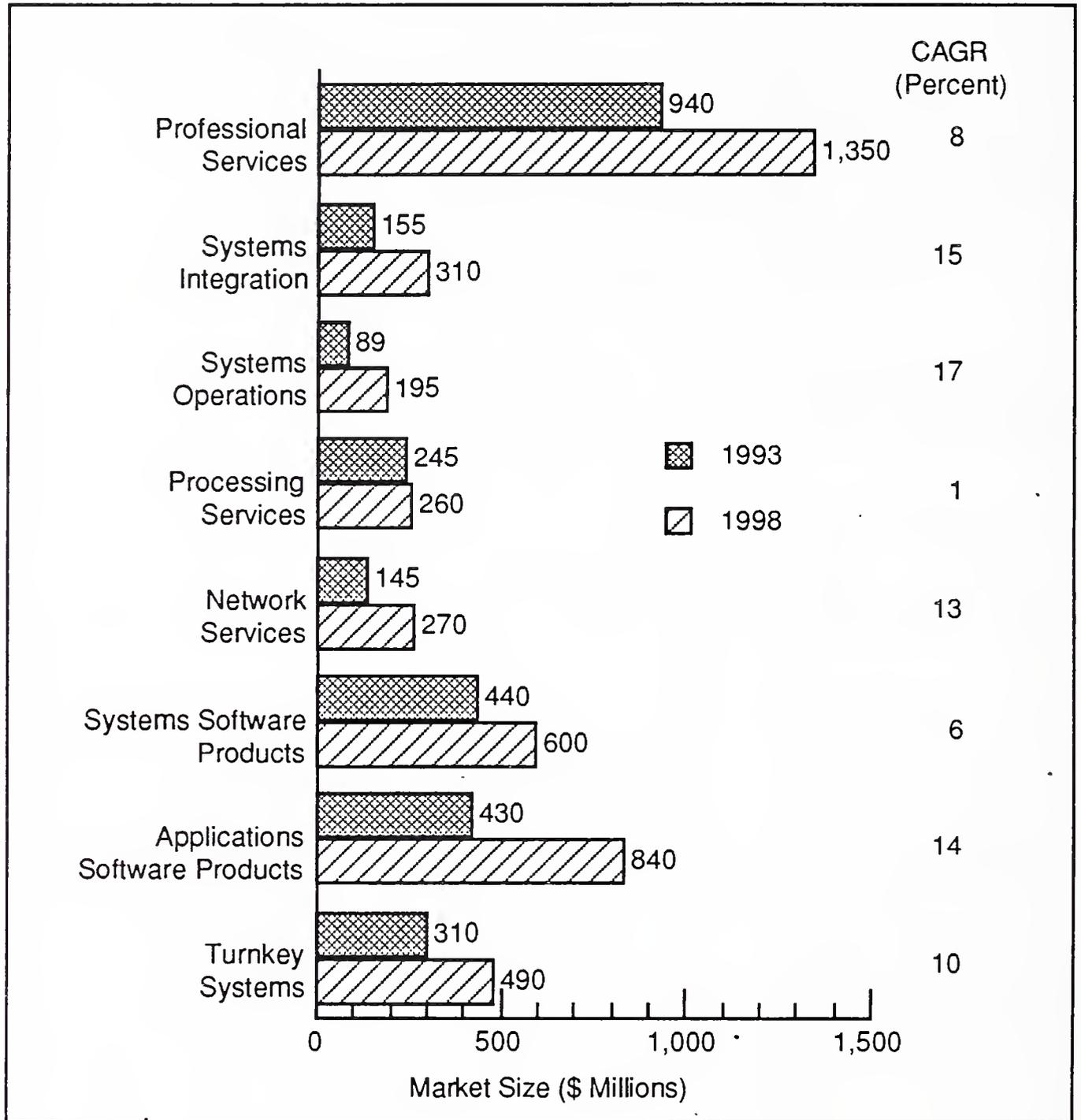
Market Forecast—Belgium, 1993-1998



The primary high growth opportunities lie in the area of application solutions, especially application software products, network services, systems operations and systems integration. Exhibit VIII-20 shows the market forecast by delivery mode. Exhibit VIII-24, found at the end of this profile, provides the forecast in greater detail.

EXHIBIT VIII-20

**Market Forecast by Delivery Mode  
Belgium, 1993-1998**



**3. Market Considerations**

Exhibit VIII-21 lists the top 10 vendors in the Belgian market during 1992. It is compiled using only the software and service revenues attributable to the domestic market within Belgium, excluding exports and revenues from within any parent group companies.

EXHIBIT VIII-21

**Leading Information Services Vendors—Belgium, 1993**

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	173	6.3
2	Digital	U.S.	74	2.7
3	Computer Sciences Corp.	U.S.	66	2.4
4	Dolmen	Belgium	66	2.4
5	Siemens-Nixdorf	Germany	61	2.2
6	Cap Gemini Sogeti	France	54	2.0
7	TIS Group	Belgium	45	1.6
8	Andersen Consulting	U.S.	40	1.5
9	Microsoft	U.S.	38	1.4
10	Administra Computing	Belgium	36	1.3
	Total Listed		653	23.8
	Total Market		2,750	100.0

As in nearly every European country, IBM leads in information services revenues. It has vigorously pursued additional business in software and services in order to counter falling income and margins from its equipment supply and maintenance businesses. It has been particularly successful in establishing a European-wide systems integration business.

#### 4. IT Spending

Exhibit VIII-22 provides an estimate of Belgium's total IT spending for 1993.

EXHIBIT VIII-22

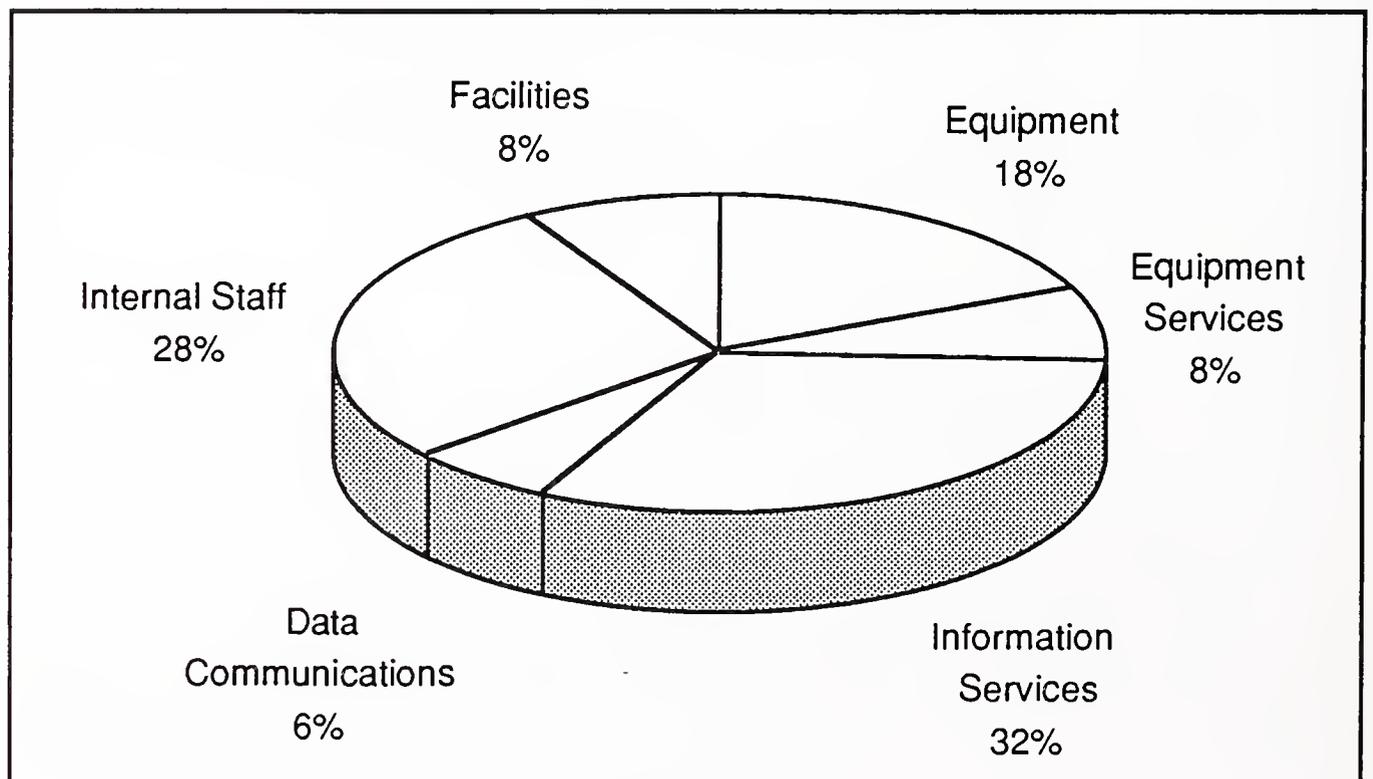
**Total 1993 IT Spending—Belgium**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	550
Internal Staff	2,250
Equipment	1,450
Equipment Services	660
Facilities	640
Information Services	2,550
<b>Total IT Spending</b>	<b>8100</b>

Information services, which includes software products, represents the largest expenditure, at approximately 32% of the total IT budget, as noted in Exhibit VIII-23. The next largest expenditures are for internal staff (28% of the IT budget) and equipment (18%). Data communications represents the smallest portion of the IT budget at \$550 million and 6% of the total.

EXHIBIT VIII-23

**1993 IT Spending Percentages—Belgium**



## EXHIBIT VIII-24

**Information Services Industry Market Forecast by Delivery Mode  
Belgium, 1993-1998**

Delivery Modes	1992	Growth	1993	1994	1995	1996	1997	1998	CAGR
	(\$M)	92-93 (%)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	93-98 (%)
Total Belgium Information Services Mkt.	2,500	10	2,750	3,000	3,300	3,600	4,000	4,300	9
<i>Professional Services</i>	870	8	940	1,000	1,050	1,150	1,250	1,350	8
- IS Consulting	127	12	143	160	177	199	223	247	12
- Education & Training	71	6	75	76	78	80	84	90	4
- Custom Software	670	7	720	770	815	870	935	990	7
<i>Systems Integration</i>	135	15	155	180	205	235	270	310	15
- Equipment	36	18	43	47	52	57	61	66	9
- Software Products	34	21	41	52	66	84	105	135	27
- Professional Services	60	18	71	77	84	91	98	104	8
- Other	3	26	3	4	5	6	8	10	25
<i>Systems Operations</i>	77	16	89	105	120	140	165	195	17
- Platform Operations	47	14	54	61	71	82	96	113	16
- Application Operations	26	18	30	35	41	48	57	68	18
- Desktop Services	1	32	1	2	2	3	4	5	30
- Network Management	4	14	4	5	7	8	10	11	22
<i>Processing Services</i>	245	0	245	250	250	255	260	260	1
- Transaction Processing	219	0	219	220	222	224	229	227	1
- Utility Processing	7	0	7	7	7	7	7	7	0
- Other Processing	20	5	21	22	23	25	27	28	6
<i>Network Services</i>	130	12	145	165	185	210	245	270	13
- Electronic Info Services	83	8	90	97	105	112	122	129	8
- Network Applications	47	20	56	68	83	99	121	143	21
<i>System SW Products</i>	410	7	440	470	500	530	570	600	6
- Mainframe	203	2	207	209	211	213	216	214	1
- Minicomputer	126	10	138	151	165	180	196	210	9
- Workstation/PC	81	15	93	106	122	139	158	177	14
<i>Application SW Products</i>	370	16	430	490	560	640	740	840	14
- Mainframe	33	0	33	33	33	33	32	31	-1
- Minicomputer	112	11	124	136	150	165	182	196	10
- Workstation/PC	225	20	270	320	380	445	525	610	18
<i>Turnkey Systems</i>	285	9	310	350	380	420	460	490	10
- Equipment	141	7	151	160	168	177	186	191	5
- Software Products	71	14	81	93	105	120	135	150	13
- Professional Services	71	15	82	93	106	119	135	150	13

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**F****Brazil**

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**1. National Overview**

After spending most of the 1960s and all of the 1970s under military rule, Brazilians had high hopes for the democratic administration that achieved power in the mid-1980s. The several years of democratic rule proved to be somewhat of a disappointment. Brazil's democratic leadership stimulated the economy through increased government spending and a loosening of monetary policy. Although this stimulated economic growth, it came at the expense of huge government budget deficits that increased to 45% of GDP in 1993, and a major acceleration in the annual rate of inflation.

The fiscal and monetary policies of the Brazilian government in recent years have been in contrast with those of many other countries in Latin America during the same period.

To address the problems of economic stagnation that have troubled the country for many years, government economic policy became highly stimulated following the election of President Fernando Collor de Mello in 1989. After three relatively stable years in office, Collor was impeached on corruption charges in September 1992. Collor's vice-president, Itamar Franco, is now president, but so far has not inspired great confidence.

Brazil has the largest population in Latin America at more than 157 million, with one of the lowest per capita incomes at less than \$3,000 per year.

The stimulus programs have increased economic growth, primarily in nominal terms, with a negative 4.4% growth rate in 1990, a positive 0.9% rate of growth in 1991 and a negative 1.0% growth rate in 1992.

Brazil's exports in Latin America over the past two years have shown strong growth due, in part, to the price competitiveness of Brazilian goods with the depreciation of the cruzeiro against other Latin currencies. In 1993, a rise in the rate of consumer spending along with tariff reductions resulted in a surge in imports.

In 1993, capital inflows remained relatively strong, and along with continued high levels of exports, led to an account surplus. In addition, government encouragement of privatization brought substantial sums from portfolio capital sources.

Although real GDP reached nearly 4.0% (one of the highest in Latin America) in 1993, inflation climbed to nearly 2,500% compared with 1,156% in 1992. The return to very high levels of inflation continued into 1994. Last year, wages and prices were raised to adjust to the higher cost of living, reacting to a possible change in government policy that would impose wage and price controls. With congressional and presidential elections approaching in October 1994, however, it appears the government will pursue a less controversial policy of high interest rates to contain inflation.

The industrial sector is highly successful in exporting natural and manufactured resources that include iron ore, gold, tin, soybeans, coffee, sugar, rubber, automobiles and industrial hardware. The principal industry sectors benefiting from the recovery in domestic growth in 1993 have produced consumer durables, capital goods and related intermediate goods. Financial institutions also benefited from an increasing positive spread between loan rates and deposit rates.

But with a foreign debt in excess of \$115 billion annually and the recent return of an upward inflationary spiral, the substantial foreign exchange trade will be sucked away, leaving less and less for the country's coffers. However, Brazil is close to completing an agreement to restructure approximately \$34 billion due to foreign commercial banks. However, the Brazilian government still has to conclude an economic policy agreement with the IMF to access any significant sources of new foreign borrowings. At this time, with the current fiscal stimulant programs in place, it may be difficult to reach an agreement with the IMF.

The GDP growth rate began to plateau in the first three months of 1993, and expectations of accelerating inflation and possible wage and price controls could put a significant damper on growth in 1994. There will likely be slower capital inflows into Brazil. Real GDP growth could slow to a projected rate of 1.5% to 2.0%, with a further decline anticipated for 1995.

Brazil's information technology market, however, suffered along with other segments in the economy. Until Fernando Collor de Mello ascended to the Brazilian presidency in late 1989, the country's markets were highly controlled and protected by price controls and import tariffs. Various Brazilian administrations have enacted policies since the late 1970s to create an indigenous computer industry.

In 1984, the Brazilian information technology market virtually closed to foreign trade with the enactment of the National Informatics Law. Under this law, all applications for information technology import licenses were considered, and largely rejected, by the Brazilian Science and Technology Secretary. While this did supply the stimulus for native PC, midrange and high-end systems development, it also made Brazilian technology twice as expensive and a generation behind foreign technology.

Since 1989, the Informatics Law gradually phased out to eliminate market reserve. In April 1992, Fernando Collor effectively nullified the law with a new one that diminishes Brazilian information technology market reserve and raises the limit on foreign investment in the market from 30% to 49%. Collor also pushed through market reforms that deregulated and privatized Brazil's \$3.2 billion telecommunications market. The government estimates between \$5 and \$6 billion in investment will be needed to bring the country's communications infrastructure up to date. The hope is that American and other foreign firms will take advantage of these new opportunities to own as much as 49% of nonvoting stock in Brazilian information technology and telecommunications companies.

The forces driving and inhibiting growth in the information services/technology market have shifted somewhat from the previous report, and include the following:

**a. Driving Forces**

- *Copyright law enforcement*—The government is enforcing international copyright protection laws. Software piracy has somewhat lessened, causing some companies to consider increasing their efforts in the Brazilian market.

- *End of National Informatics Law*—As detailed above, the Informatics Law has been phased out and the way is clearer than ever for foreign entry into the Brazilian information technology market.
- *Initial stage of privatization*—There was the sale of government holdings in the steel and petrochemical industries in 1993. Continuing government encouragement of the privatization program led to public offerings of more than 100 issues in 1993.
- *Relaxed investment policies/procedures*—Government policy has improved in favor of R&D investments. Easing of registration times and product ownership rules is in process and a better information technology industry is expected to develop, particularly if foreign firms take advantage of Brazil's recently relaxed foreign investment quotas.
- *Economic climate*—In spite of continued inflation and recessionary pressures, many industries show growth and sponsor new investments, including information technology.

#### **b. Inhibiting Factors**

- *Political volatility*—Ongoing government corruption scandals will likely distract Brazilian leaders from pursuing needed economic change.
  - It is likely the current Franco administration will be replaced in this year's presidential election. In particular, political observers think it unlikely the president will be able to change governmental political direction toward a policy of fiscal restraint.
  - If economic conditions rapidly decline, even greater political instability is possible, which could be triggered by greater conflict between Congress and the President. At this time, a leading contender for President is Ignacio Lula da Silva, leader of the left-wing Workers Party.
- *Constitutional reform issues*—The constitution prevents fiscal economic reforms, such as changes in general state subsidies, and the complex political situation is unlikely to lead to any constitutional changes that would allow change in current general fiscal programs.

- *Complex entry procedures*—Bureaucratic entry procedures are expected to remain. Estimates are that up to 18 months may be required to obtain necessary approval to conduct business in the country.
- *Entry restriction*—Although the general trend is toward easing permission to enter the market, the market is expected to remain restricted. The Law of Similars, which forbids importing goods similar to those produced in Brazil, still exists.
- *Economic stability*—Overall economic stability of the country remains a significant question for many firms considering entering or expanding in Brazil.

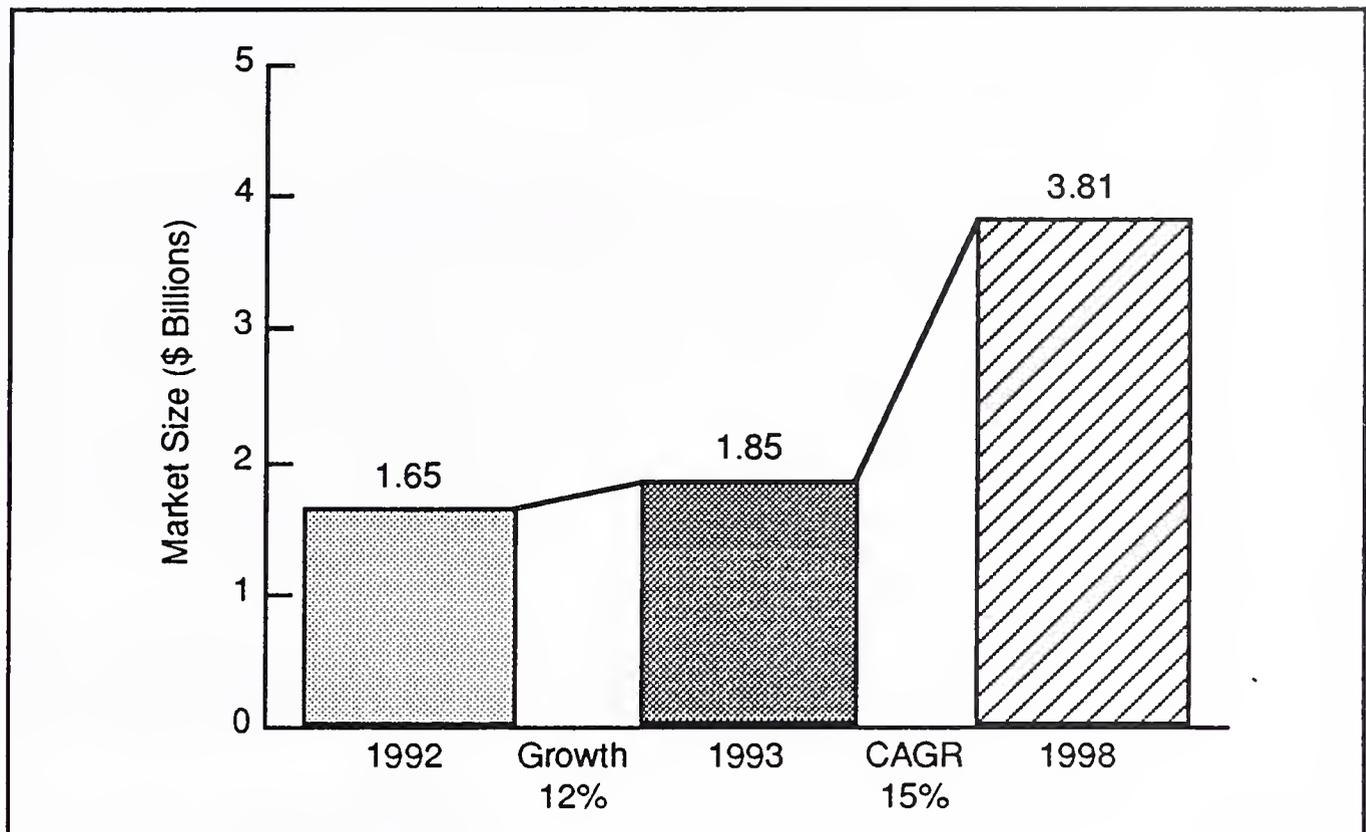
## 2. Information Services Market Forecast

The market for information services in Brazil is still growing. Although its economy is five times larger than Argentina's, Brazil's information services market is only three times as large. It languishes as a result of technological isolationism, extreme bureaucracy and a weak economic infrastructure.

The 1993 market for information services was approximately \$1.9 billion. It is expected to grow at a compound annual growth rate (CAGR) of 15% to approximately \$3.8 billion by 1998, as shown in Exhibit VIII-25. The five-year CAGR for 1992-1997 was 20% and the downward revision in the forecast and growth rate reflect INPUT's concern for Brazil's low GDP growth and very high inflation rates anticipated over the next few years.

## EXHIBIT VIII-25

## Market Forecast—Brazil, 1993-1998



Liberal local content laws and other attempts at (partial) deregulation of the Brazilian information services market helps stimulate growth by increasing marketing participation (primarily through distributors) of foreign companies. Currently, foreign companies have an estimated 40% of the total Brazilian information services market, with U.S. companies representing much of the foreign company market share.

In 1993, AT&T established a joint venture company with SID Telecom to manufacture and sell AT&T telecommunications network equipment in Brazil. The joint venture concentrated initially on manufacturing and marketing the AT&T 5ESS Switch in Brazil. In addition, the joint venture engaged in development; systems and equipment engineering; software and application development; installation; training; and customer support.

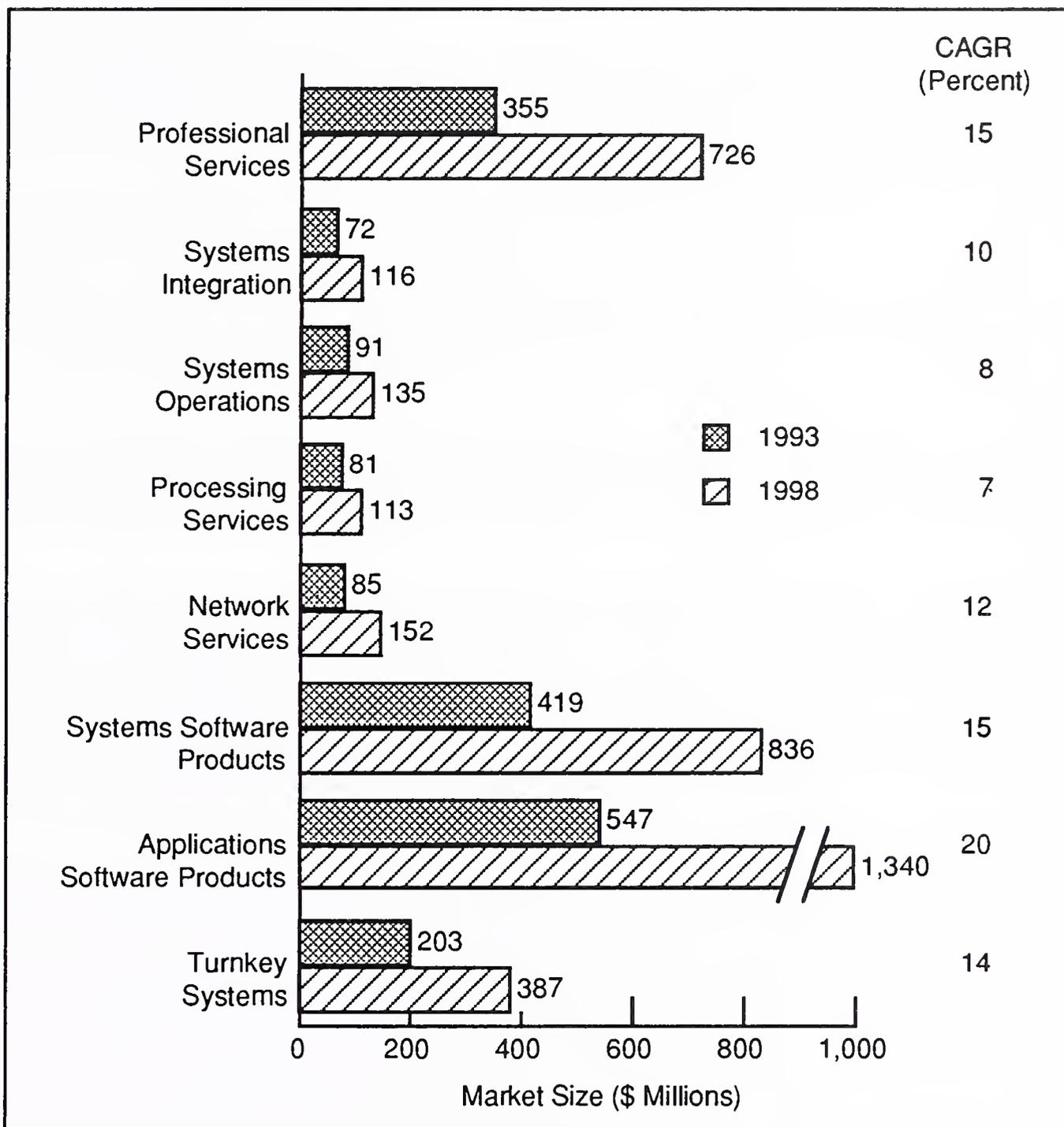
Tariffs on foreign company computer equipment have fallen dramatically since 1990, and the Brazilian software market has very low tariffs that are expected to decline even further in the near future. A software registration law permits foreign software to be sold in Brazil as long as there is no similar national product. Most software submitted for testing under this criteria has been approved. Locally developed software is given priority in

purchases by government agencies. Also, a proposed software bill will eliminate the requirement that imported software be registered. Software copyrights are tightly protected with severe penalties for violations.

Some major U.S. information technology companies with presence in Brazil include: IBM, Unisys, Computer Associates, Cincom Systems, Oracle and leading U.S. PC software companies whose packaged software is sold through distributors. U.S. companies with a market presence in LAN products and services include: Novell, which is allowed to sell in Brazil; Microsoft; IBM; and 3Com. U.S. CASE vendors are represented through distributors.

Exhibit VIII-26 provides the forecast by delivery mode. Exhibit VIII-30, at the end of this profile, provides the detail behind this forecast.

**Market Forecast by Delivery Mode  
Brazil, 1993-1998**



Key contributors to growth are expected to be software products, turnkey systems and professional services. Over the next several years, professional services will assist in identifying ways to strengthen the economy's use of information technology. An improved economic climate will permit greater importation of information technology products; however, implementation skills must be developed locally to ensure successful deployment.

Software product growth can be even more significant if the government takes an aggressive stand on software piracy and

alters its policy of requiring imported products to become products of the country. Recent developments indicate that the government is moving in the right direction.

- Efforts to reduce piracy continue with a new law. The federal government has indicated its commitment to altering its position on product ownership.
- Assuming these efforts are successful and believed by international software products firms, the market for software products will grow from more than \$966 million in 1993 to approximately \$2.2 billion in 1998, an annual growth rate of 18%.
- As in many areas of the world, the key software requirements will be for applications software and applications development tools.

The market for processing services is expected to grow at 7% CAGR. As in many of the Latin American markets, processing and systems operation services are modest in relation to the overall information services market. These vendors need to justify their economies of scale from which significantly higher growth can result.

The market for network services is expected to show modest growth as the country works to develop and expand its national value-added services network. The demand for network services should be driven primarily by the increasing national requirement for electronic information services to improve industrial productivity. Privatization of the telecommunications infrastructure should have a positive effect. But, until a stronger telecommunications infrastructure is in place, this segment will lag behind the industry in growth.

The market for turnkey systems is expected to grow at a rate about double that in the U.S. This growth is due to residual demand for solutions to address immediate requirements. The market for turnkey systems will be near \$400 million by 1998. There will be a heavy dependence on PC- and LAN-based products, leveraging newer technologies and downsized environments.

The market for systems integration in Brazil is small. Professional services remains the favored way to buy systems deployment services in most of the Latin American markets.

As Exhibit VIII-26 shows, the market for professional services in Brazil is of moderate size, considering the size of the country. This market is expected to grow at 15% per year for the next several years. Within professional services, the highest growth rate is expected to be in IS consulting.

- Consulting growth will result from the need for businesses to identify solution alternatives and consider major renovations in internal architecture.
- Software development growth will result from organizations' need for custom solutions and the lack of internally trained systems professionals.
- However, education and training may develop into a major opportunity. Should the economy of Brazil go into a period of sustained and balanced growth, the opportunity for the use of information technology will be limited only by the availability of internally trained personnel. Local professional services firms should look closely at the training opportunity.

Overall, the market for information services in Brazil has strong potential. Recent changes indicate growth could be sustained for several years and could, in fact, exceed that forecast by INPUT. However, much will depend on the success of the government in maintaining a balanced course and a demonstrated record in terms of dealing with copyright protection, etc.

### **3. Market Considerations**

Exhibit VIII-27 lists leading Brazil-based vendors and the delivery modes in which they primarily operate.

EXHIBIT VIII-27

## Selected Vendors by Delivery Mode—Brazil, 1993

Vendor	Processing/ Network Services/ Systems Operations	Professional Services/ Systems Integration	Software Products	Turnkey Systems
Cetil	✓	✓		
Compucenter			✓	
CPM Informatica		✓	✓	
Datalogica			✓	
Embratel	✓			
Gerden Informatica		✓		✓
GSI (Gerdan Servicos de Informatica)	✓		✓	✓
Intertec	✓		✓	✓
Methodus			✓	
Nantutec			✓	
Proceda	✓		✓	
Proconsult		✓		
Serpro	✓			
Villares		✓		✓
Telebras	✓			

Preferring to stimulate and protect indigenous industry, Brazil has not realized the benefit of foreign products and services. Many of the vendors listed above are of modest size, yet they are well established and many have international relationships. In an improved economic climate with improved laws regarding the importation of information technology products, opportunities for local and international vendors abound.

If recent changes in government commitment to a stable, directed economy and a balanced, open IT market are successful, Brazil

could become a major market experiencing strong growth throughout the 1990s.

Entry into the Brazilian market is suggested, but with a high degree of caution. Policies and procedures are lengthy and complex. Ownership of products entering the country can be questioned, although as the new law takes effect this situation should improve.

The most logical form of entry remains through a local representative. Such a move should follow a comprehensive review to ensure a thorough understanding of the opportunities and risks.

Over the long term, Brazil is expected to take a more prominent role in Latin American development. Cautious entry combined with a long growth cycle could bring long-term rewards.

Any company doing business in Latin America must now look at the Brazilian market. It is the largest and has, by far, the greatest total potential.

#### 4. IT Spending

Exhibit VIII-28 provides an estimate of Brazil's total IT spending for 1993.

EXHIBIT VIII-28

#### Total 1993 IT Spending—Brazil

Budget Category	Estimated Spending (\$ Millions)
Data Communications	390
Internal Staff	3,121
Equipment	2,243
Equipment Services	975
Facilities	1,170
Information Services	1,853
<b>Total IT Spending</b>	<b>9,752</b>

Information services spending, which includes software products at \$1.85 billion, represents 19% of the total IT budget, as noted in Exhibit VIII-\*29. The largest expenditures are for internal staff (32% of the IT budget) and equipment (23%). Data communications represents the smallest portion of the IT budget at \$390 million and 4% of the total.

EXHIBIT VIII-29

**1993 IT Spending Percentages—Brazil**

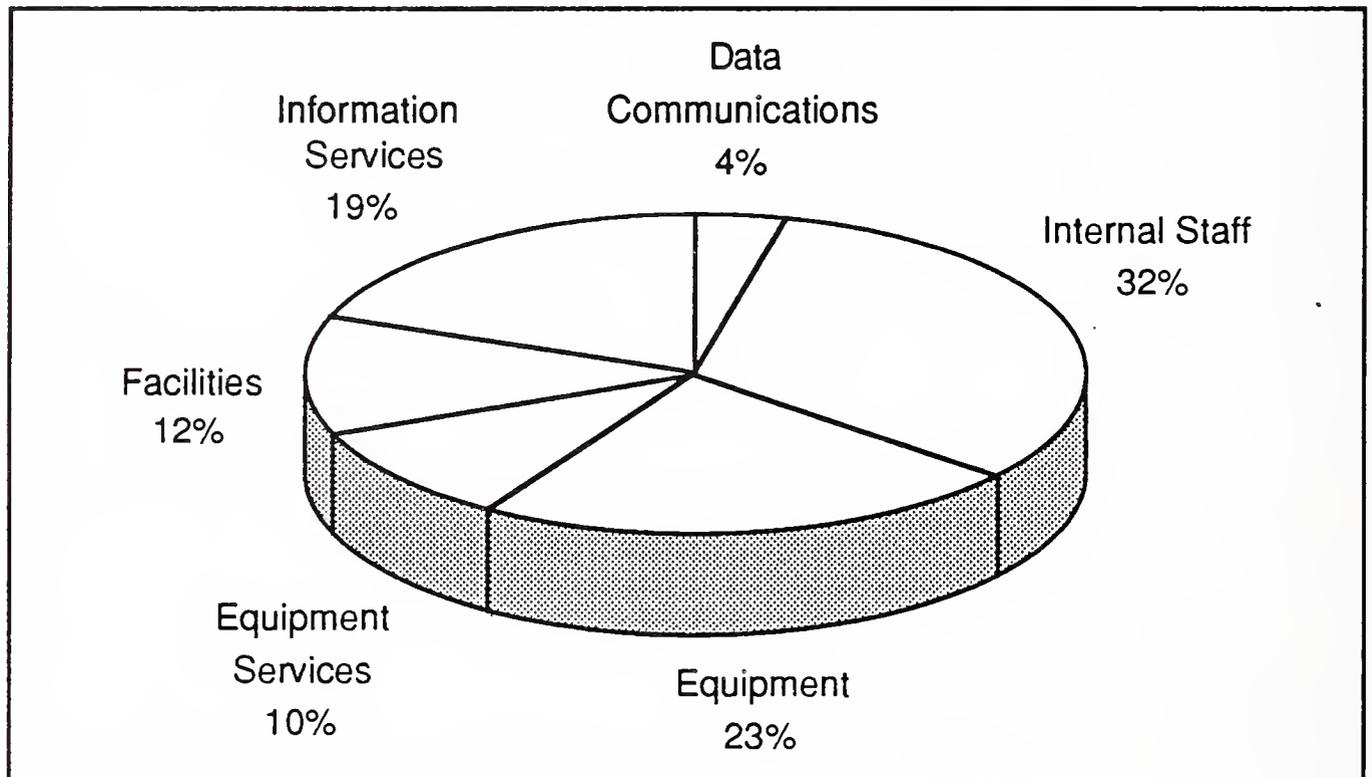


EXHIBIT VIII-30

**Information Services Industry Market Forecast by Delivery Mode  
Brazil, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$M)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$M)</b>	<b>1994 (\$M)</b>	<b>1995 (\$M)</b>	<b>1996 (\$M)</b>	<b>1997 (\$M)</b>	<b>1998 (\$M)</b>	<b>CAGR 93-98 (%)</b>
<b>Total Brazil Information Services Mkt.</b>	1,652	12	1,853	2,082	2,397	2,774	3,245	3,805	15
<i>Professional Services</i>	316	12	355	399	457	533	623	726	15
- IS Consulting	88	16	102	118	141	167	201	234	18
- Education & Training	46	11	51	57	65	74	85	99	14
- Custom Software	182	11	202	224	251	292	337	393	14
<i>Systems Integration</i>	67	7	72	76	83	92	103	116	10
- Equipment	26	4	27	28	30	32	35	39	8
- Software Products	6	0	6	6	6	7	7	8	6
- Professional Services	33	12	37	40	45	51	59	66	12
- Other	2	0	2	2	2	2	2	3	8
<i>Systems Operations</i>	86	6	91	97	105	114	124	135	8
- Platform Operations	48	4	50	53	56	60	65	70	7
- Application Operations	38	8	41	44	49	54	59	65	10
<i>Processing Services</i>	78	4	81	85	91	97	104	113	7
- Transaction Processing	33	6	35	38	42	46	51	55	9
- Utility Processing	29	0	29	29	31	32	33	35	4
- Other Processing	16	6	17	18	18	19	20	23	6
<i>Network Services</i>	78	9	85	93	103	115	131	152	12
- Electronic Info Services	65	9	71	78	87	97	111	129	13
- Network Applications	13	8	14	15	16	18	20	23	10
<i>Systems Software</i>	376	11	419	470	534	618	717	836	15
- Mainframe	234	12	262	295	333	389	453	528	15
- Minicomputer	27	7	29	31	35	38	42	49	11
- Workstation/PC	115	11	128	144	166	191	222	259	15
<i>Applications Software</i>	468	17	547	639	769	917	1,111	1,340	20
<i>Turnkey Systems</i>	183	11	203	223	255	288	332	387	14
- Equipment	77	5	81	85	92	97	106	124	9
- Software Products	59	17	69	79	95	113	135	157	18
- Professional Services	47	13	53	59	68	78	91	106	15

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### Canada

#### 1. National Overview

In late 1993, INPUT conducted its second in-depth assessment of the Canadian information services market. This profile is based on the 1993 study.

General factors IS users report as important in their business environment encouraged the growth of information services in general.

- The recession's impact, NAFTA passage and increasing tax burdens have stimulated users to pursue programs that reduce costs and increase productivity.
- Initial signs of recovery in terms of improving trade have led companies to improve systems that support manufacturing, distribution and customer service.
- NAFTA appears to be a more positive factor than it did in 1992. Trade to the U.S. picked up with the change in value of the Canadian dollar, changes in Canada's sales tax calculation (GST) and improving manufacturing productivity. The IMF expects a growth rate of about 3% in Canada during the next two years, and several Canadian sources agree with this estimate.
- The likelihood of increasing taxes in the U.S. is also expected to aid Canadian trade by raising U.S. prices.

The impact of new information technology has a significant impact on the Canadian business environment as well.

- Users are turning more to information services as a means of lowering costs, improving productivity and improving business functions.
- Users also report a high level of interest in extending information technology to more corporate functions and offices through new technology. Users are investing in new networks and client/server technology to better connect and integrate business activities.

### a. Driving Forces

The forces that user respondents thought were driving their use of information technology are:

- Cost reduction ranks first. Users upgrade and install new accounting and financial systems to analyze, control and cut costs in all market sectors.
- Although cost reduction is a means of reacting to increases in taxes and business costs, users report that it also improves productivity and competitiveness.

Manufacturing users, particularly discrete manufacturers, reduced costs to overcome a disadvantage in productivity against U.S. manufacturers, with whom they compete in transborder trade. This disadvantage has been overcome in many areas. Cost reduction rose sharply in process manufacturing and other market sectors.

The ratification of NAFTA was an impetus to improve productivity in manufacturing.

- Many Canadian corporations expected NAFTA to have a negative impact throughout most of 1993.
- Exports to the U.S. grew as a result of the Canadian dollar revaluation and changes in the GST; Canadian exporters will profit further from increasing taxes in the U.S., according to analyses in the *Financial Times* during 1993. These actions have made NAFTA look much more positive.

In order to profit from increasing trade, many Canadian manufacturers and distributors plan to upgrade customer services, order entry and manufacturing through more intense information technology. The pursuit of these improvements as well as the use of client/server technology have led to upgraded or re-engineered business functions.

The need to reduce costs or improve productivity is still paramount in many market sectors, including finance/banking, insurance and utilities, but a number of users are changing business functions to more effectively manage resources. New client/server technology also influences this development.

## b. Inhibiting Factors

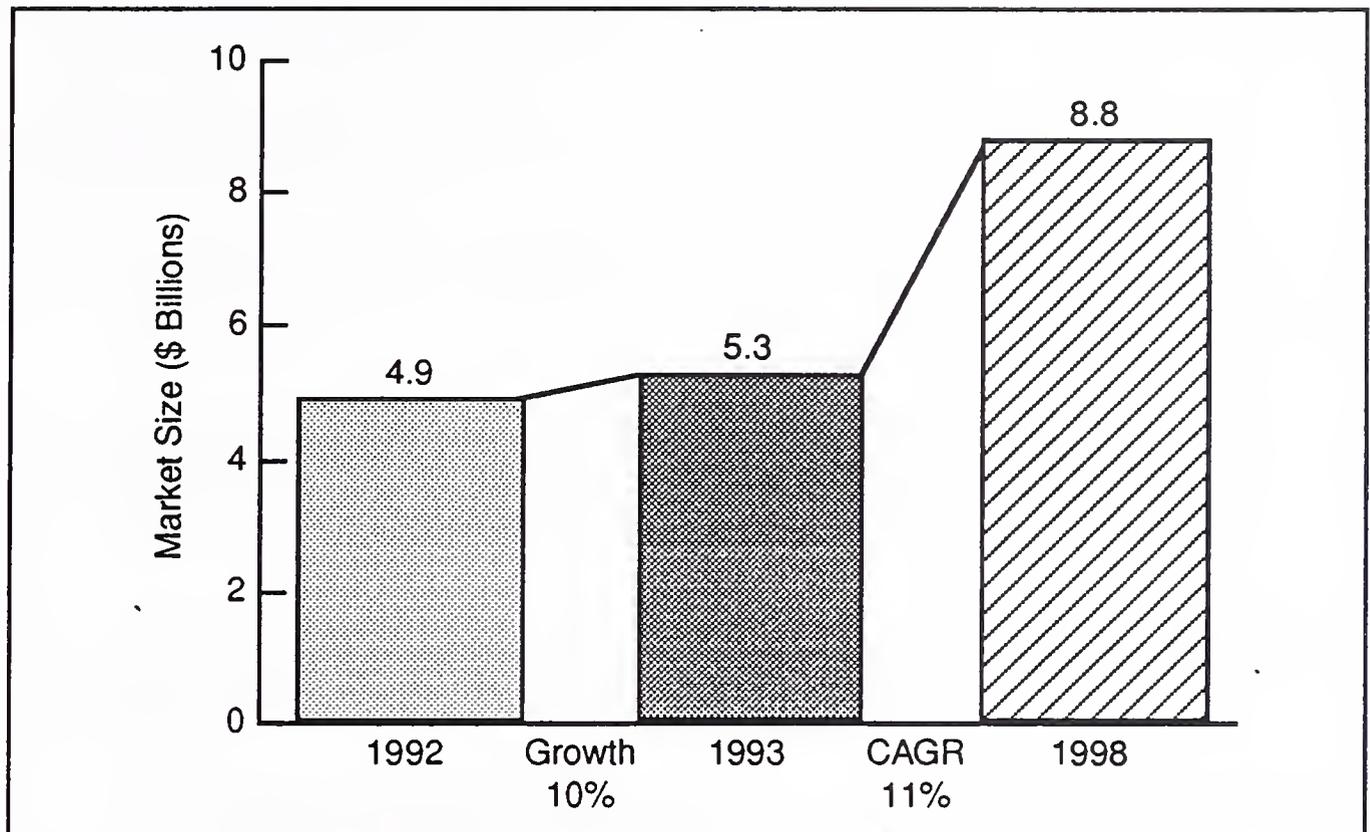
- *Recession*—Canada entered a recession in the third quarter of 1990 that persisted through 1993. This deferred decisions throughout the economy, including within the information services industry. This will likely change as the recovery begun in latter 1993 continues, yet many companies will still choose to err on the side of caution.
- *Isolationism*—A faction within Canadian society would like to return to an isolationist policy to keep out many influences of the industrial world. To date, isolationist efforts have been somewhat obstructive, but without great success. They are not expected to become a major consideration, but do retard the rate of development. NAFTA counters this isolationist attitude and should help Canada's position in the world trade community.
- *U.S. dominance*—There has been continuous effort to develop an indigenous information services industry, and there are a number of large and successful Canadian firms. However, there is continuing concern that, with the liberalized trade agreement, larger U.S. firms will move in and dominate the industry. More likely, however, is a cooperative exchange scenario, which already exists, where Canadian and U.S. firms work toward common goals to benefit local business and foreign vendors.
- *Geographic area*—Canada's business centers are concentrated largely in the southeastern areas, which has made national network connections difficult. NAFTA may make inexpensive technologies available to connect and integrate Canada's varying businesses and industries.

## 2. Information Services Market Forecast

Information services forecasts in the Canadian market assume that the GDP deflator will stay in a range of 3% to 4% in 1993 and 1994 and below 4.5% in 1995 through 1998. These assumptions are based on figures of the conference board reported in the *Financial Times* in May 1993. Exhibit VIII-31 shows the total Canadian market for information services, which is expected to grow from \$5.3 billion in 1993 to about \$9 billion in 1998.

## EXHIBIT VIII-31

## Market Forecast—Canada, 1993-1998



User expenditures in each delivery mode, shown in Exhibit VIII-32, indicate that professional services and applications software products will lead delivery modes through 1998.

- Systems operations and network services, driven by EDI, are the fastest growing modes reported by users.
- Processing services and turnkey systems are the slowest growing modes, although both will expand through the end of the planning period.

The substantial growth in applications and systems software products by 1998 will be fueled by the growth in workstation software products, which are expanding more than twice as fast as products for other platforms. Professional services and SI project work for workstation platforms are growing much faster than work for other platforms.

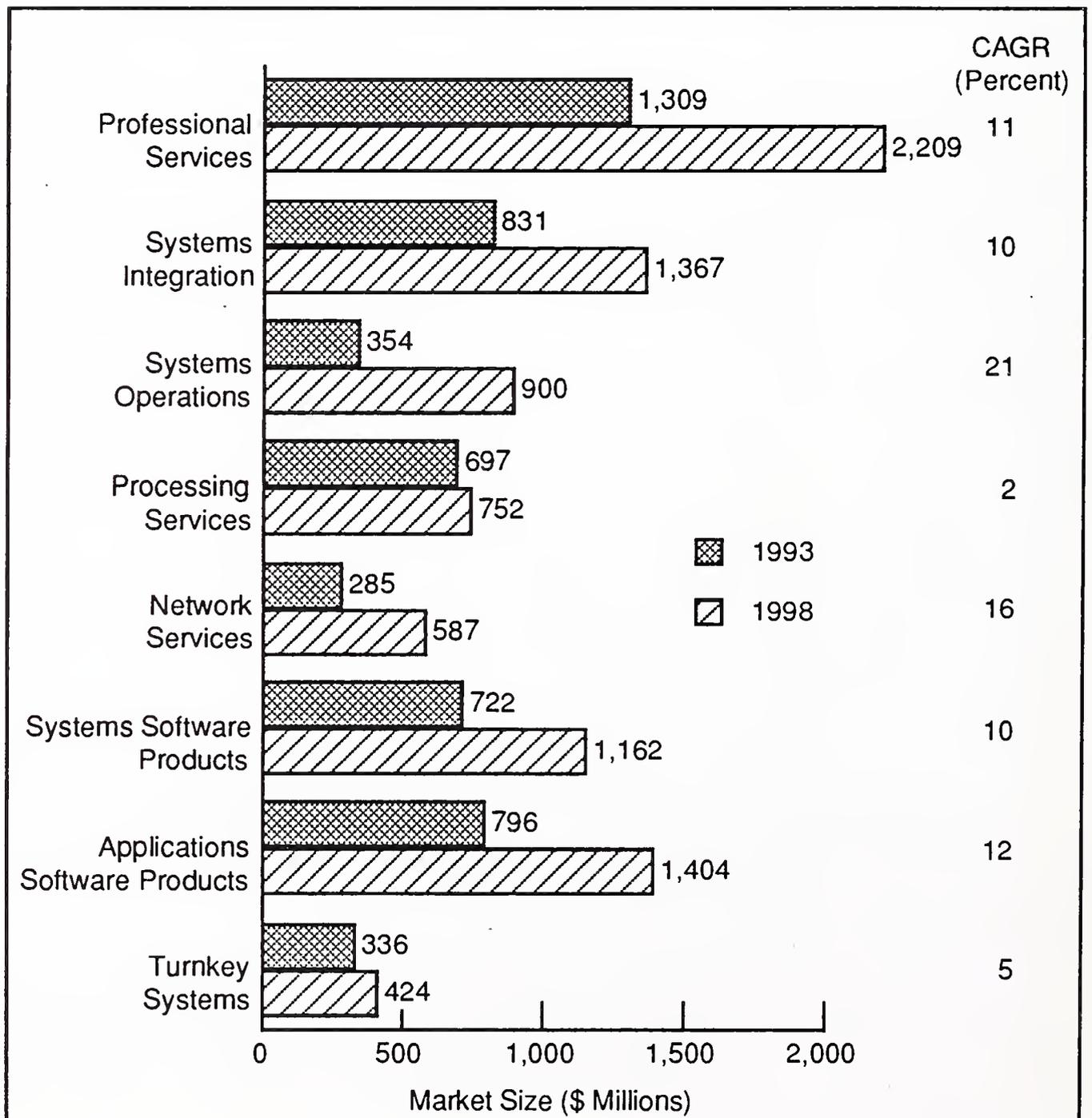
- Systems integration is growing less rapidly in Canada, possibly because users are more inclined to use professional services and/or systems operations in Canada to meet their needs.

- Systems integration work that is done as part of systems operations or professional services assignments may be lumped together and not reported separately.
- The growth of processing, turnkey systems and systems software is also noticeably below rates for the same products in the U.S. The movement of some processing and turnkey systems work to systems operations may explain part of that difference.

Exhibit VIII-32 provides the forecast by delivery mode. Exhibit VIII-36, found at the end of this profile, provides the forecast in greater detail.

EXHIBIT VIII-32

**Market Forecast by Delivery Mode—Canada, 1993-1998**



### 3. Market Considerations

A number of large, well-established companies operate in the information services industry in Canada, including many U.S.-based firms. The top five vendors in Canada are presented in Exhibit VIII-33.

- Canadian firms include SHL Systemhouse and ISM (which resulted from the STM merger with Westbridge and includes IBM Canada as a minority owner). These Canadian vendors have encountered growing interest and success outside the Canadian information services market. They will develop more global, or at least North American strategies.
- In addition to these vendors, there are numerous American companies with significant business interest, such as EDS, Andersen Consulting, Martin Marietta, SAIC, Hewlett-Packard, AT&T, Borland, Computer Associates, Microsoft, Lotus and Software Publishing.

EXHIBIT VIII-33

**Leading Information Services Vendors—Canada, 1993**

Rank	Vendor	Country of Origin
1	IBM	U.S.
2	ISM	Canada
3	DEC	U.S.
4	SHL	U.K.
5	Andersen	U.S.

With an estimated 50% of the market, American firms have a strong position in the Canadian market but are experiencing growing competition from the leading Canadian firms, some of which (STM/Westbridge/IBM) are banding together to provide a broader full-service offering.

### 4. IT Spending

Exhibit VIII-34 provides an estimate of Canada's total IT spending for 1993.

EXHIBIT VIII-34

**Total 1993 IT Spending—Canada**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	1,280
Internal Staff	6,825
Equipment	4,266
Equipment Services	1,493
Facilities	2,133
Information Services	5,332
<b>Total IT Spending</b>	<b>21,329</b>

Information services, which includes software products, represents approximately 25% of the total IT budget, as noted in Exhibit VIII-35. The largest expenditure is for internal staff (32% of the IT budget). Data communications represents the smallest portion of the IT budget at \$1.3 billion and 6% of the total.

EXHIBIT VIII-35

**1993 IT Spending Percentages—Canada**

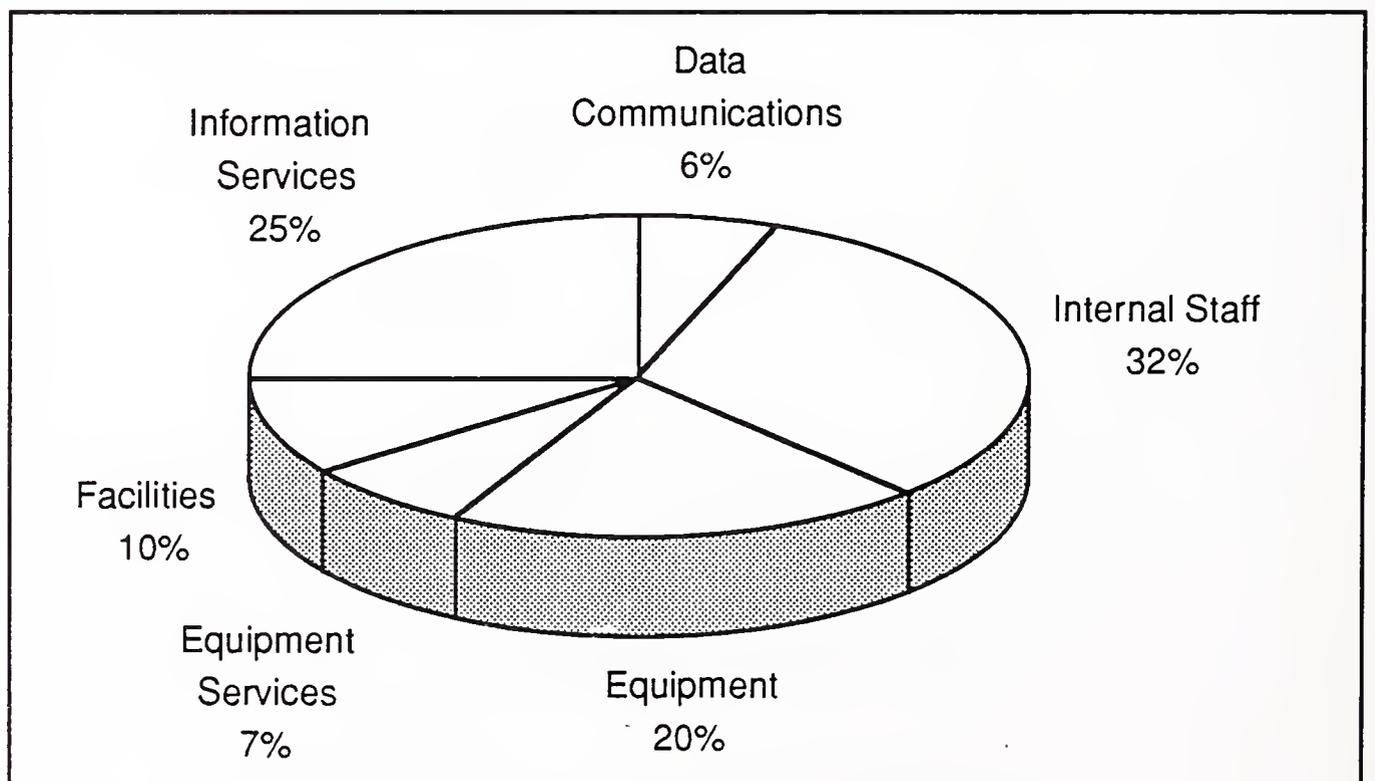


EXHIBIT VIII-36

**Information Services Industry Market Forecast by Delivery Mode  
Canada, 1993-1998**

Delivery Modes	1992	Growth	1993	1994	1995	1996	1997	1998	CAGR
	(\$M)	92-93 (%)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	93-98 (%)
Total Canada Information Services Mkt.	4,852	10	5,332	5,865	6,476	7,161	7,937	8,805	11
<i>Professional Services</i>	1,184	10	1,309	1,453	1,614	1,792	1,990	2,209	11
- IS Consulting	428	12	478	539	608	685	773	870	13
- Education & Training	203	12	227	254	289	329	372	422	13
- Custom Software	553	9	604	660	717	778	845	917	9
<i>Systems Integration</i>	760	9	831	917	1,012	1,118	1,237	1,367	10
- Equipment	311	7	333	358	384	414	445	480	8
- Software Products	145	9	158	171	186	202	220	243	9
- Professional Services	267	12	300	345	396	452	518	586	14
- Other	37	8	40	43	46	50	54	58	8
<i>Systems Operations</i>	296	20	354	426	514	619	746	900	21
- Platform Operations	142	18	167	196	231	275	321	370	17
- Application Operations	154	21	187	230	283	344	425	530	23
<i>Processing Services</i>	685	2	697	711	719	728	740	752	2
- Transaction Processing	418	3	424	431	436	443	449	458	2
- Utility Processing	233	2	237	242	244	245	246	247	1
- Other Processing	34	6	36	38	39	40	44	47	5
<i>Network Services</i>	250	14	285	328	380	439	508	587	16
- Electronic Info Services	89	13	101	116	135	155	179	206	15
- Network Applications	161	14	184	212	245	284	329	381	16
<i>System SW Products</i>	659	10	722	793	873	960	1,057	1,162	10
- Mainframe	303	8	328	356	381	407	428	446	6
- Minicomputer	221	6	235	251	272	294	321	350	8
- Workstation/PC	135	18	159	186	220	259	308	366	18
<i>Application SW Products</i>	698	14	796	887	996	1,118	1,254	1,404	12
- Mainframe	188	9	204	216	226	233	239	256	5
- Minicomputer	211	10	233	253	272	287	299	307	6
- Workstation/PC	299	20	359	418	498	598	716	841	19
<i>Turnkey Systems</i>	320	5	336	352	368	387	405	424	5
- Equipment	106	3	109	113	117	123	128	132	4
- Software Products	178	6	188	197	206	216	225	236	5
- Professional Services	36	8	39	42	45	48	52	56	8

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**H****Denmark****1. National Overview**

Denmark's population is 5.14 million. OECD estimates the 1993 GDP at current prices and current exchange rates to be \$142 billion, about 2% of OECD European members' total GDP.

Denmark was one of the second wave of countries to join the European Community (EC), joining with Ireland and the U.K. in 1973. Since that time the country has experienced a number of ups and downs in its highly taxed economy, although on balance it has benefited considerably from being an EC member, in part because of the important role played by agriculture. In 1992 the Danes voted in a referendum against supporting the EC's Maastricht Treaty, rendering a verdict that was reversed in a later poll in May 1993.

The GDP grew in 1993 only slightly less than in 1992, at a rate (1.1%) just above the OECD European average of 1.0%, and at half the average rate for Denmark in the 1980s. Inflation, already low in 1992, declined to 2.1%. The current account surplus doubled to 3% of GDP, helped by oil exports from the North Sea.

Unemployment at 11.1% exceeded the OECD European average of 9.9%, and was higher than in 1992. This represents a heavy burden on the economy as welfare benefits are generous. Economists point to these benefits, the relatively small and fragmented manufacturing base (at 16% of GDP, compared with, for example, Austria with 26%), and to possible reductions in EC agricultural subsidies as factors that create uncertainty in Denmark's future performance.

However, apart from persistent high levels of unemployment, other forecasted indicators are optimistic. Inflation will remain low, GDP growth declined slightly in 1993 (0.5%), but will recover in 1994 to OECD average rates.

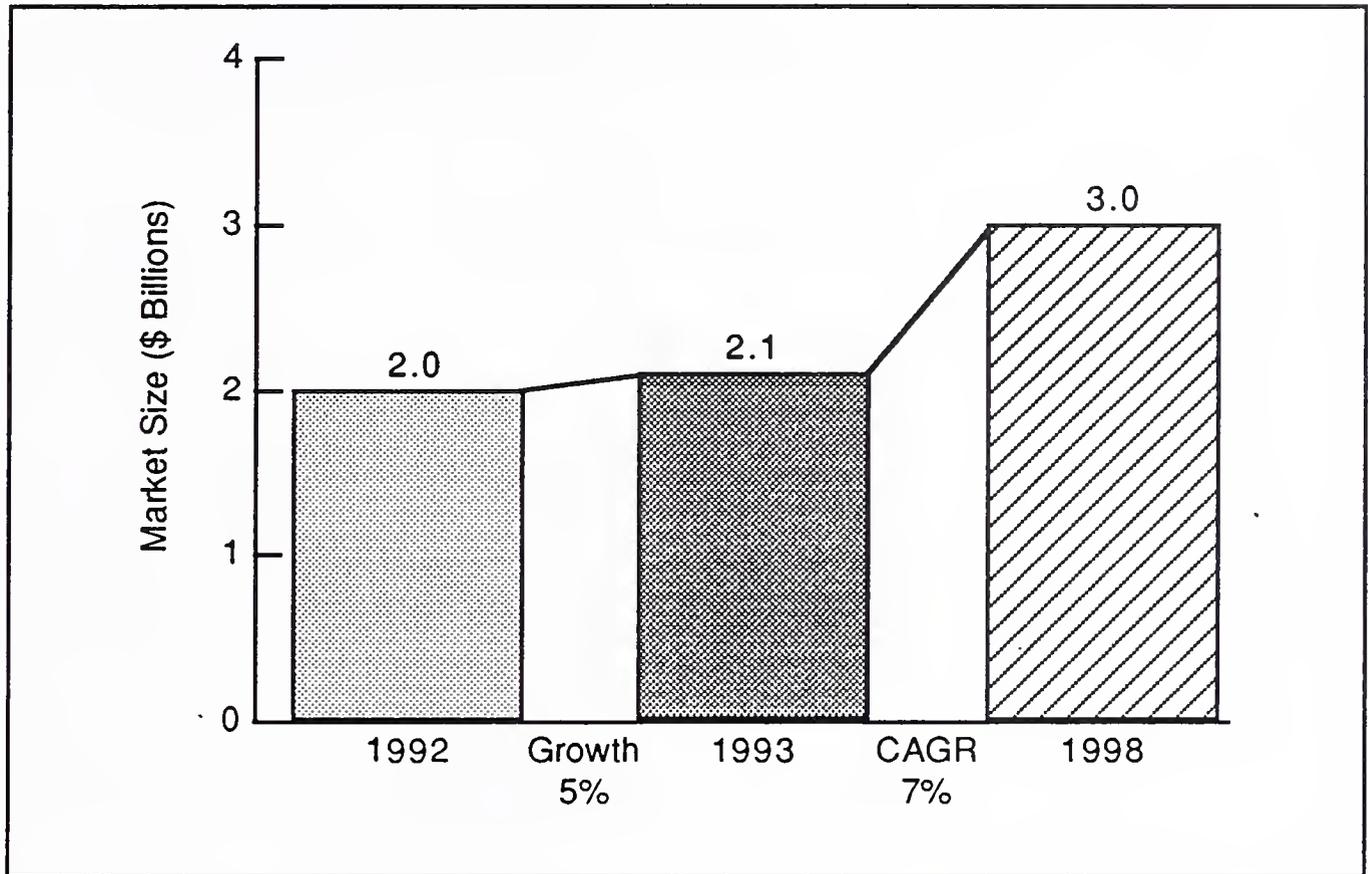
**2. Information Services Market Forecast**

The software, services and maintenance industry in Denmark is closely linked to the state of the country's economy. INPUT forecasts that the Danish information services market will reach

almost \$2.1 billion in 1993, and will grow at an average of 7% CAGR to reach \$3.0 billion by 1998, as shown in Exhibit VIII-37.

EXHIBIT VIII-37

### Market Forecast—Denmark, 1993-1998

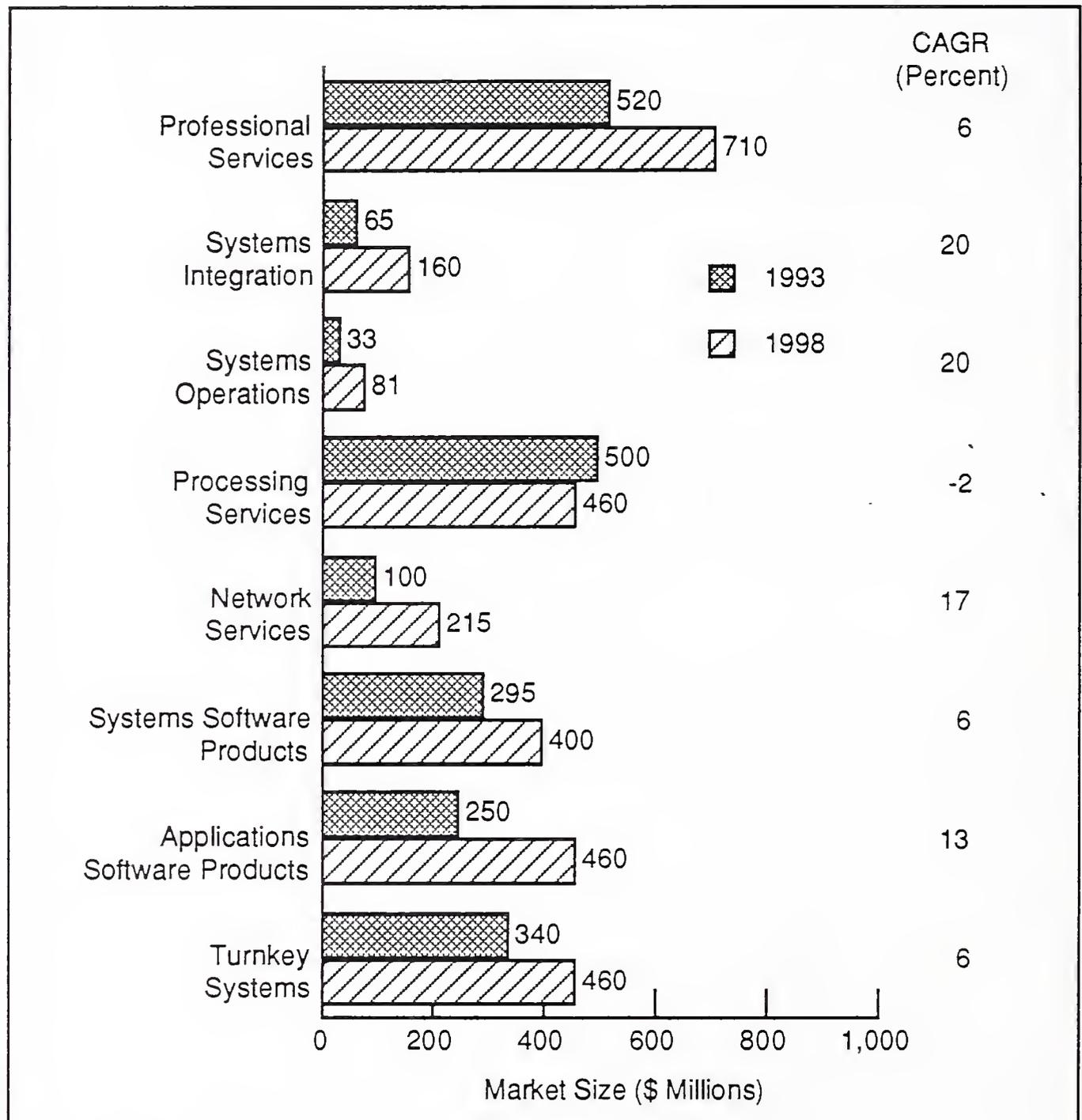


The main opportunity markets (all with forecast growth rates of more than 10%) are in network services, systems integration, systems operations and applications software products. The professional services sector shows strong interest in CASE tools and the application of object-oriented systems techniques. But professional services spending in 1992 was 9% below INPUT's previous forecast due to customers cutting back on consulting and training services.

Exhibit VIII-38 provides the forecast by delivery mode. Exhibit VIII-42, at the end of this profile provides the forecast in greater detail.

EXHIBIT VIII-38

**Market Forecast by Delivery Mode  
Denmark, 1993-1998**



Systems integration in Denmark has half the penetration of Europe as a whole, again due to the small number of large project opportunities. Its growth rate of 17% CAGR is below the European average of 19%. Nevertheless, opportunities will arise for projects in public sector, utilities and financial services.

Systems operations is less favored in Denmark than in the larger country markets of Europe, due to fewer reasonably sized opportunities. It is expected to grow at a good rate of 20% CAGR, with public sector and utilities contracts offering the most opportunities.

Processing services constituted 20% of the 1992 market, more than double the European average, fell at 1% CAGR. Processing services in Denmark is still important, especially in the agricultural and financial services sectors.

Network applications should show the highest growth rate (27% CAGR) over the five-year period of any of the subsectors. The use of network services is more highly developed in Denmark than in some of the other country markets, large and small. The public telecommunications authority, Danish Telecom, was reconstituted to include the previously local telephone companies. It is expected to increase its activities in value-added network services (VANS).

Applications software in Denmark is forecast to grow with a CAGR of 13%. The attractiveness of the prebuilt solution is likely to increase over the five-year forecast period in the midrange and minicomputer sectors, as open systems based on UNIX and networks are already accepted in the Danish market. Downsizing is not a major issue in Denmark because there are few large systems installed.

### **3. Market Considerations**

Exhibit VIII-39 lists the top 10 vendors in the Danish market as measured on their 1992 revenues. It has been compiled using only the information services revenues attributable to the domestic market in Denmark, and excludes exports and revenues gained from within any parent group companies. Such captive markets exclude vendors such as Datacentralen from the list.

As in most other countries, IBM heads the list in information services revenues, assisted by its large component of systems software product revenues. IBM's strengths in Denmark also include PC-level product sales, systems integration, processing and network services. IBM has a joint-venture participation with KTAS, the Copenhagen telephone company in the danNet processing and network services company.

EXHIBIT VIII-39

## Leading Information Services Vendors—Denmark, 1993

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	206	9.8
2	PBS	Denmark	139	6.6
3	JDC Data	Denmark	54	2.6
4	Digital	U.S.	33	1.6
5	Olivetti	Italy	31	1.5
6	ICL (Fujitsu)	U.K. (J)	28	1.3
7	Microsoft	U.S.	26	1.2
8	Oracle	U.S.	22	1.0
9	Danet	Denmark	20	1.0
10	Bording Data	Denmark	19	0.9
	Total Listed		578	27.5
	Total Market		2,100	100.0

## 4. IT Spending

Exhibit VIII-40 provides an estimate of Denmark's total IT spending for 1993.

EXHIBIT VIII-40

## Total 1993 IT Spending—Denmark

Budget Category	Estimated Spending (\$ Millions)
Data Communications	460
Internal Staff	2,250
Equipment	1,400
Equipment Services	515
Facilities	530
Information Services	1,900
Total IT Spending	7,055

Information services, which includes software products, represents approximately 27% of the total IT budget, as noted in Exhibit VIII-41. The largest expenditure is for internal staff (33% of the IT budget). Equipment is also a major component (20%). Data communications represents the smallest portion of the IT budget at \$460 million and 6% of the total.

EXHIBIT VIII-41

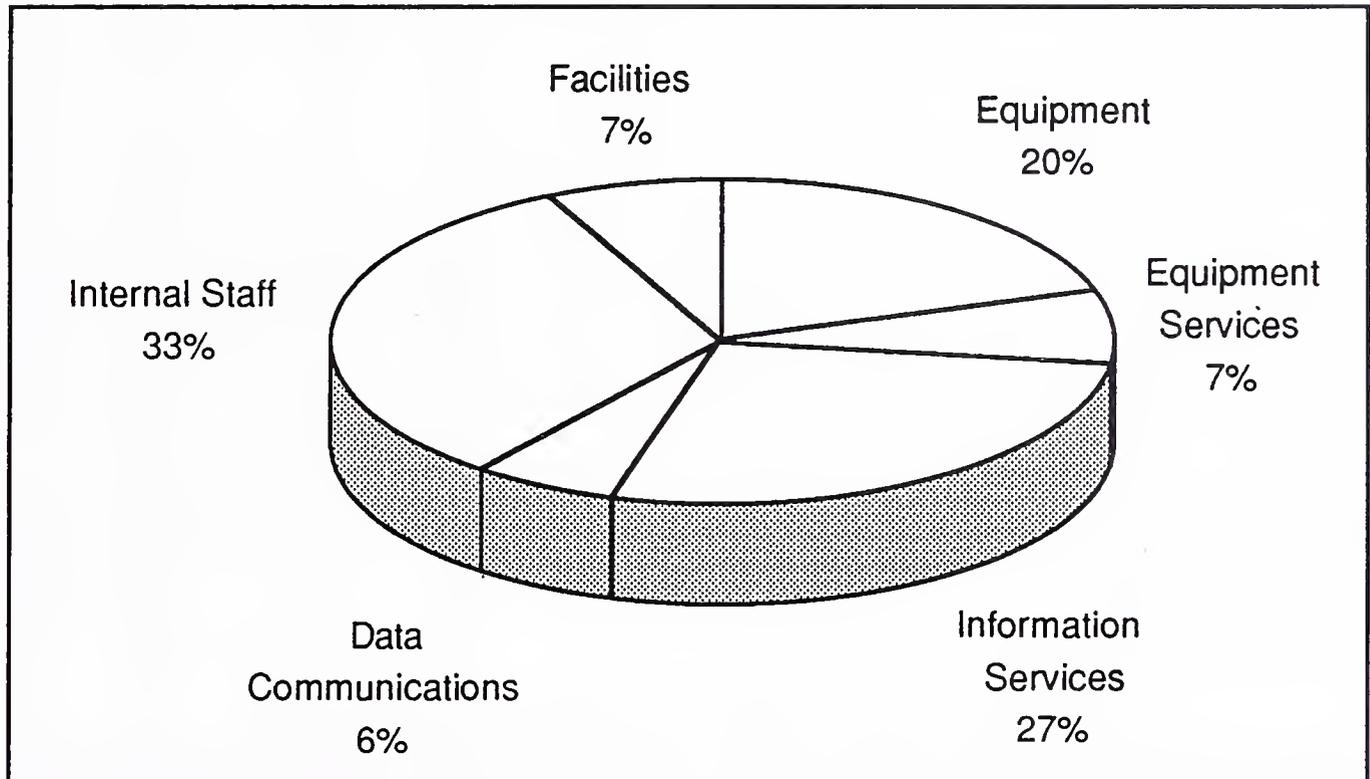
**1993 IT Spending Percentages—Denmark**

EXHIBIT VIII-42

**Information Services Industry Market Forecast by Delivery Mode  
Denmark, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$M)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$M)</b>	<b>1994 (\$M)</b>	<b>1995 (\$M)</b>	<b>1996 (\$M)</b>	<b>1997 (\$M)</b>	<b>1998 (\$M)</b>	<b>CAGR 93-98 (%)</b>
Total Denmark Information Services Mkt.	2,000	5	2,100	2,250	2,400	2,600	2,750	2,950	7
<i>Professional Services</i>	490	6	520	540	580	630	670	710	6
- IS Consulting	79	11	87	96	106	117	129	142	10
- Education & Training	40	9	44	45	49	52	55	59	6
- Custom Software	365	5	385	400	425	450	475	500	5
<i>Systems Integration</i>	57	14	65	79	95	115	135	160	20
- Equipment	15	17	18	21	24	28	31	35	15
- Software Products	15	10	17	23	30	39	53	69	33
- Professional Services	26	13	30	34	39	44	49	54	13
- Other	1	94	2	2	3	3	4	5	24
<i>Systems Operations</i>	28	20	33	41	50	58	69	81	20
- Platform Operations	9	22	11	14	16	19	21	24	17
- Application Operations	11	14	13	15	19	22	26	30	19
- Desktop Services	5	34	7	8	10	12	14	17	20
- Network Management	3	20	3	4	5	7	8	10	27
<i>Processing Services</i>	510	-2	500	490	490	480	470	460	-2
- Transaction Processing	467	-1	460	450	447	438	428	415	-2
- Utility Processing	10	-5	9	9	9	8	8	8	-4
- Other Processing	33	3	34	35	35	36	37	37	2
<i>Network Services</i>	86	16	100	115	140	160	190	215	17
- Electronic Info Services	56	9	61	66	72	77	81	84	6
- Network Applications	30	32	40	51	66	85	107	132	27
<i>System SW Products</i>	275	7	295	320	350	370	390	400	6
- Mainframe	114	4	119	122	124	124	122	119	0
- Minicomputer	96	5	101	109	117	126	126	126	5
- Workstation/PC	64	19	76	92	109	126	142	159	16
<i>Application SW Products</i>	220	14	250	280	320	370	410	460	13
- Mainframe	16	-3	16	15	15	15	14	13	-3
- Minicomputer	70	6	75	81	87	93	99	104	7
- Workstation/PC	135	19	160	185	220	260	300	345	17
<i>Turnkey Systems</i>	320	6	340	370	390	420	440	460	6
- Equipment	159	3	164	170	175	179	180	180	2
- Software Products	79	10	87	96	105	115	125	135	9
- Professional Services	82	12	92	102	114	126	136	146	10

## Eastern Europe

### 1. National Overview

The opening up of trade between Eastern and Western Europe promises new opportunities in software and services. Rather than developing overnight, it is likely to take a decade before new trading patterns are established. The Eastern European market for software, services and maintenance was nearly \$670 billion in 1992.

For the purposes of INPUT's forecasts, Eastern Europe is defined as Albania, Bulgaria, Czechoslovakia, Poland, Romania, the Baltic States (Estonia, Latvia and Lithuania), the independent states emerging from the break-up of Yugoslavia and the new Commonwealth, which was established in January 1992 after the dissolution of the Soviet Union (Byelorussia, the Russian Federation, Ukraine and other republics in Europe).

Exhibit VIII-43 shows population and GDP breakdowns per region.

EXHIBIT VIII-43

#### Population by Region—Eastern Europe, 1993

Country	Population (Millions)	GDP (\$ Billions)	GDP per Capita (\$ Thousands)
Albania	3.3	2.0	0.6
Bulgaria	9.0	9.9	1.1
Czech Republic	10.3	25.7	2.5
Hungary	10.5	31.4	3.0
Poland	38.4	153.5	4.0
Romania	23.2	15.0	0.7
Russia	148.8	230.6	1.6
Slovak Republic	5.3	10.1	1.9
Slovenia	2.0	12.0	6.0

The pace of change in Eastern Europe was unabated during 1992 and 1993.

Inflation rose dramatically in all of these countries as prices were freed of restrictions. The economic recession worsened as workers were laid off from all uneconomic, and until lately, state-owned enterprises. High external debts and lack of hard currency made it difficult for these countries to attract external investment or to "prime the pump" of new industries by making external purchases.

Most of the hordes of Western advisers and consultants who flocked into the newly freed countries in 1989 and 1990 left again in 1991 and 1992. Their overoptimistic initial reactions were replaced by equally excessive predictions of catastrophe. Certainly they learned that a command economy cannot be converted overnight into a market economy. Nevertheless, a significant pent-up requirement for information systems, products and services remains.

## **2. Information Services Market Forecast**

The total market size for information services (including software, software services and equipment services) for 1992 was revised upward 70% to reflect the unexpected number of systems integration contracts placed. Growth of 22% in 1992 gave a forecast market of \$815 million. By 1998, the market is expected to reach \$1.7 billion with an average annual growth rate of 24%. This assumes reasonable economic progress in the most important country markets, namely:

- Czech Republic
- Poland
- Hungary
- Ukraine
- Russian Federation

Exhibit VIII-44 shows the overall information services industry market for Eastern Europe. Exhibit VIII-48, found at the end of this profile, provides the forecast in greater detail. The market reached \$590 million in 1993, and is projected to grow at a CAGR of 24% to \$1.7 billion in 1998.

EXHIBIT VIII-44

**Market Forecast—Eastern Europe, 1993-1998**

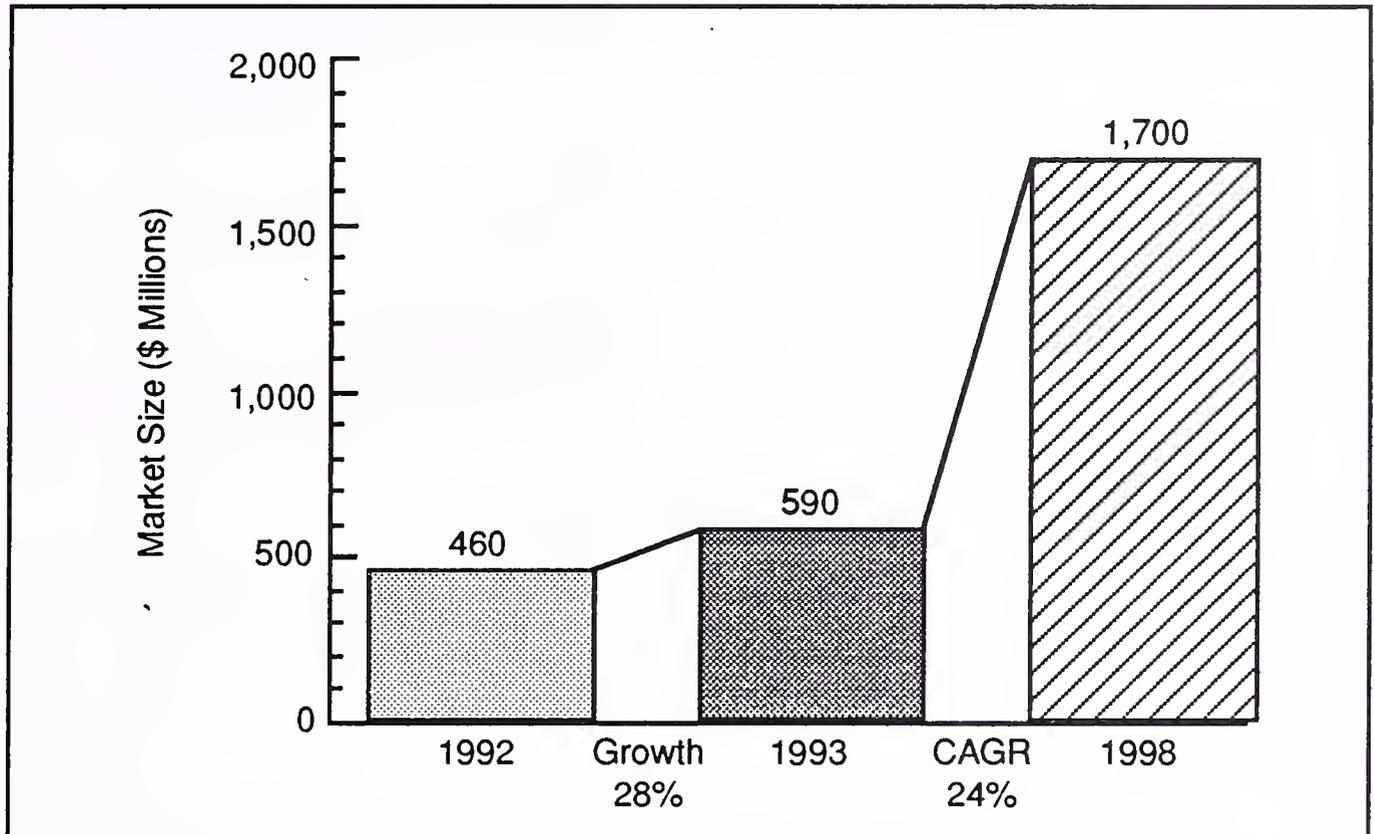
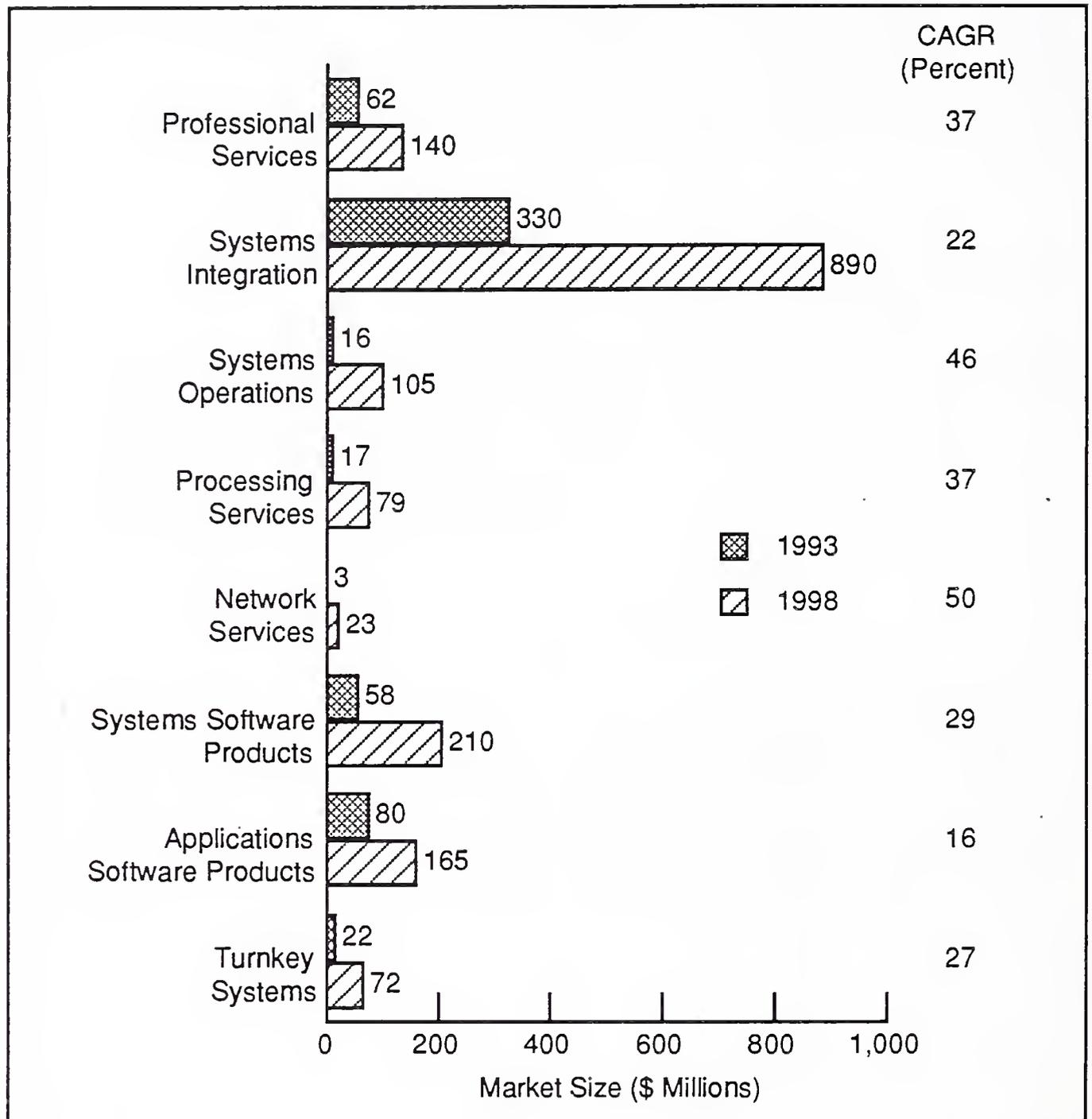


Exhibit VIII-45 provides the market forecast by delivery mode. Exhibit VIII-48, at the end of this profile, lists a detailed summary. In comparison to the rest of Europe, the market for software and services is embryonic in Eastern Europe. As a result, INPUT anticipates a relative rapid rise in nearly all sectors.

EXHIBIT VIII-45

### Market Forecast by Delivery Mode Eastern Europe, 1993-1998



The systems integration sector is booming in Eastern Europe. Major contracts are in the works to establish financial trading, processing and communications infrastructures. This has been especially true in the Czech Republic.

Applications and systems software products are expected to benefit similarly with very positive growth. Systems integration projects will follow the natural adoption of open systems and PCs and the demand for relatively complex systems based on these leading-edge technologies.

Processing and network services will remain fairly small sectors. Systems operations will be an important way to support existing public sector data centers that may have no captive market after privatization.

### **3. Market Considerations**

Telecommunications infrastructures are woefully inadequate in all Eastern European countries. New systems and improvements are obtained by installing cellular-based mobile networks either before or alongside fixed network projects. Banking systems are also installed to help establish Western standards of financial trading services. Logistics is the third key area of infrastructure investment, but is likely to be the last to be funded. German vendors are particularly well placed to develop business in Eastern Europe.

Electronic mail already has more than 15,000 subscribers in Russia from among what were parts of the previous state apparatus. Privatization will bring many similar state-funded systems to the open market.

Local distributors stress the need to reinvest profits locally to counter the vicious circle that follows when technology imports are transferred into inflating economies. Nantucket and Lotus set up local offices and software distributor/dealer networks in the former U.S.S.R. Andersen Consulting's activities include implementing distribution systems. AT&T NCR has interests in government and banking sectors. ICL has long been established in Russia and Poland. IBM and Unisys have announced contract awards. In early 1992, Digital opened its Moscow office.

Many opportunities will arise when working closely with partners in local industry and local government in Eastern European countries. At the strategic level, these countries have the chance to leap-frog technology generations and establish electronic commerce-based businesses in what are effectively "green-field site" economies. Innovative thinking based on partnerships between Western service-oriented companies and local post-communist, neo-capitalist entrepreneurs is the way forward for economies that do not have time to tread the long path beaten by advanced Western industrial nations.

#### 4. IT Spending

Exhibit VIII-46 provides an estimate of Eastern Europe's total IT spending for 1993.

EXHIBIT VIII-46

#### Total 1993 IT Spending—Eastern Europe

Budget Category	Estimated Spending (\$ Millions)
Data Communications	95
Internal Staff	620
Equipment	510
Equipment Services	230
Facilities	130
Information Services	490
<b>Total IT Spending</b>	<b>2,075</b>

Information services, which includes software products, represents 24% of the total IT budget, as noted in Exhibit VIII-47. The largest expenditures are for internal staff (30%) and equipment (25%). Data communications represents the smallest portion of the IT budget at \$95 million and 4% of the total.

EXHIBIT VIII-47

#### 1993 IT Spending Percentages—Eastern Europe

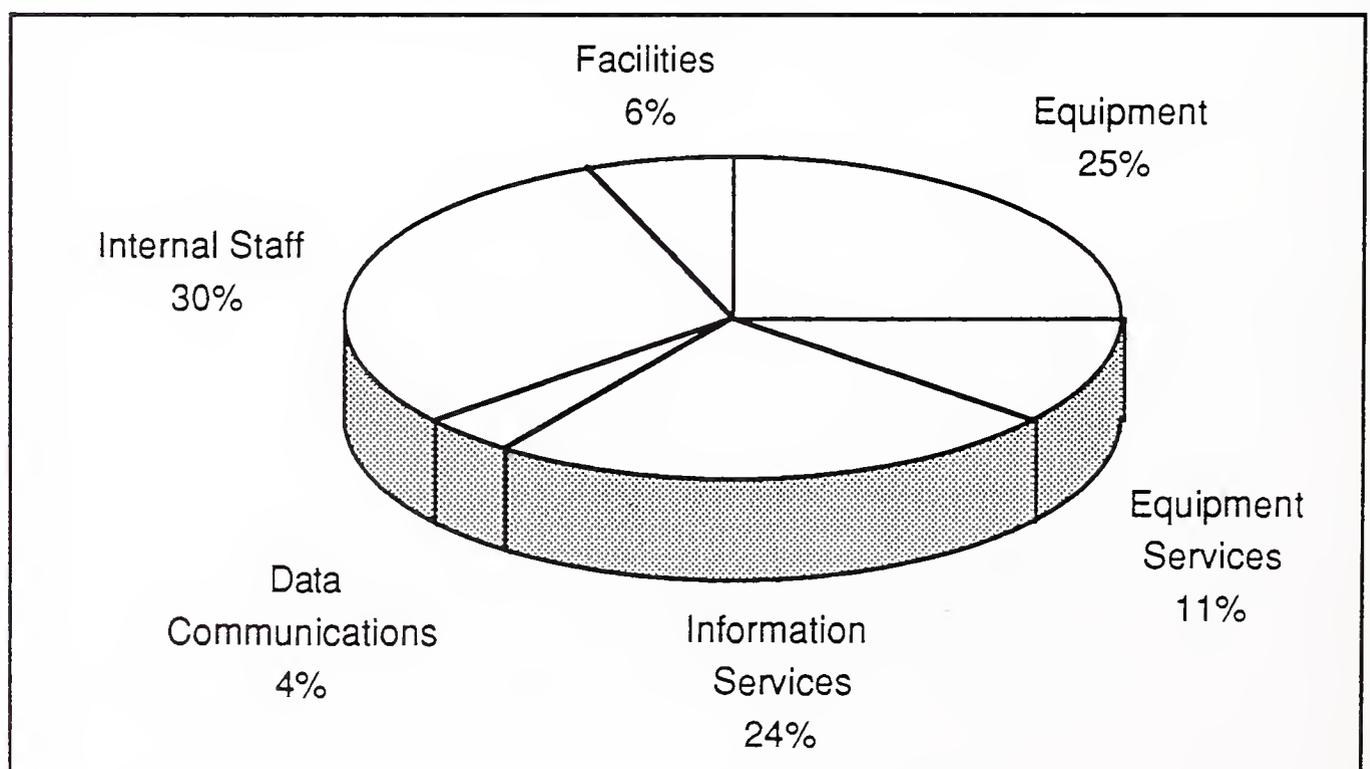


EXHIBIT VIII-48

**Information Services Industry Market Forecast by Delivery Mode  
Eastern Europe, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$M)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$M)</b>	<b>1994 (\$M)</b>	<b>1995 (\$M)</b>	<b>1996 (\$M)</b>	<b>1997 (\$M)</b>	<b>1998 (\$M)</b>	<b>CAGR 93-98 (%)</b>
Total Eastern Europe Information Services Mkt.	460	28	590	690	840	1,050	1,300	1,700	24
<i>Professional Services</i>	52	19	62	72	86	105	120	140	18
- IS Consulting	2	0	2	2	2	2	2	2	0
- Education & Training	30	20	36	42	50	60	70	80	17
- Custom Software	20	20	24	28	34	41	49	57	19
<i>Systems Integration</i>	250	32	330	380	450	550	700	890	22
- Equipment	70	29	90	100	115	135	160	185	16
- Software Products	65	31	85	110	145	195	275	380	35
- Professional Services	110	32	145	160	180	210	250	295	15
- Other	5	0	5	7	9	13	18	25	38
<i>Systems Operations</i>	10	60	16	20	31	45	66	105	46
- Platform Operations	5	40	7	9	13	18	25	35	38
- Application Operations	3	67	5	8	12	19	30	50	58
- Desktop Services	1	100	2	3	4	5	6	10	38
- Network Management	1	100	2	1	2	3	5	10	38
<i>Processing Services</i>	14	18	17	21	28	37	53	79	37
- Transaction Processing	8	13	9	11	13	15	18	21	18
- Utility Processing	5	11	5	5	6	6	7	8	10
- Other Processing	2	67	3	5	9	16	28	50	82
<i>Network Services</i>	2	50	3	5	7	11	15	23	50
- Electronic Info Services	1	0	1	1	2	2	3	4	48
- Network Applications	2	67	3	4	6	9	13	19	50
<i>System SW Products</i>	48	21	58	73	94	120	160	210	29
- Mainframe	15	0	15	16	17	18	19	20	6
- Minicomputer	15	20	18	23	29	36	45	56	25
- Workstation/PC	18	39	25	34	48	67	94	132	39
<i>Application SW Products</i>	69	16	80	94	110	125	145	165	16
- Mainframe	10	0	10	11	11	11	11	11	2
- Minicomputer	23	13	26	30	34	38	43	48	13
- Workstation/PC	36	22	44	53	63	75	89	106	19
<i>Turnkey Systems</i>	18	22	22	29	35	45	57	72	27
- Equipment	9	22	11	14	17	21	27	33	25
- Software Products	4	25	5	7	8	11	13	17	28
- Professional Services	5	20	6	8	10	13	17	22	30

**J****Finland**

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**1. National Overview**

The population of Finland was 5 million in 1992 in a land area of 338,000 square kilometers (making it one of the least densely populated European countries). It is a member of the EFTA, and will therefore be part of the EEC when this is inaugurated in 1994. Restrictions on trade and the movement of capital between EC and EFTA countries will be largely removed. Finland has made an individual application for EC membership, and it is likely that full membership will be negotiated and ratified.

The economy, after enviable growth in the 1980s (3.3% on average 1983-90), was badly affected by the general downturn as well as political changes in Eastern Europe. The 1991 slump was the worst for many years. Soviet trade virtually disappeared, while paper and pulp industries were in a cyclical trough. Bank credit losses plummeted, engineering production and investment slumped and the currency was devalued.

In 1992, the economy shrank by 3.6%. Consumer price inflation moved downward and, at 2.9%, was below the OECD average. Unemployment increased dramatically to reach 13.1%, triple the rate in 1991. The current account deficit continued at a high rate (4.6%) relative to the GDP.

However, there is some guarded optimism with the latest economic forecasts. There was negative GDP growth in 1993, but at a reduced rate (-1.0%), to be followed by a modest recovery in 1994 (+1.5%). Inflation will increase slightly to reach 4.5% in 1994, above the OECD average of 3.3%. The current account should balance in 1994.

**2. Information Services Market Forecast**

The overall information services market in Finland was \$1.2 billion in 1993, as shown in Exhibit VIII-49. The market is expected to grow at an average of 5% CAGR to reach \$1.5 billion by 1998.

## EXHIBIT VIII-49

## Market Forecast—Finland, 1993-1998

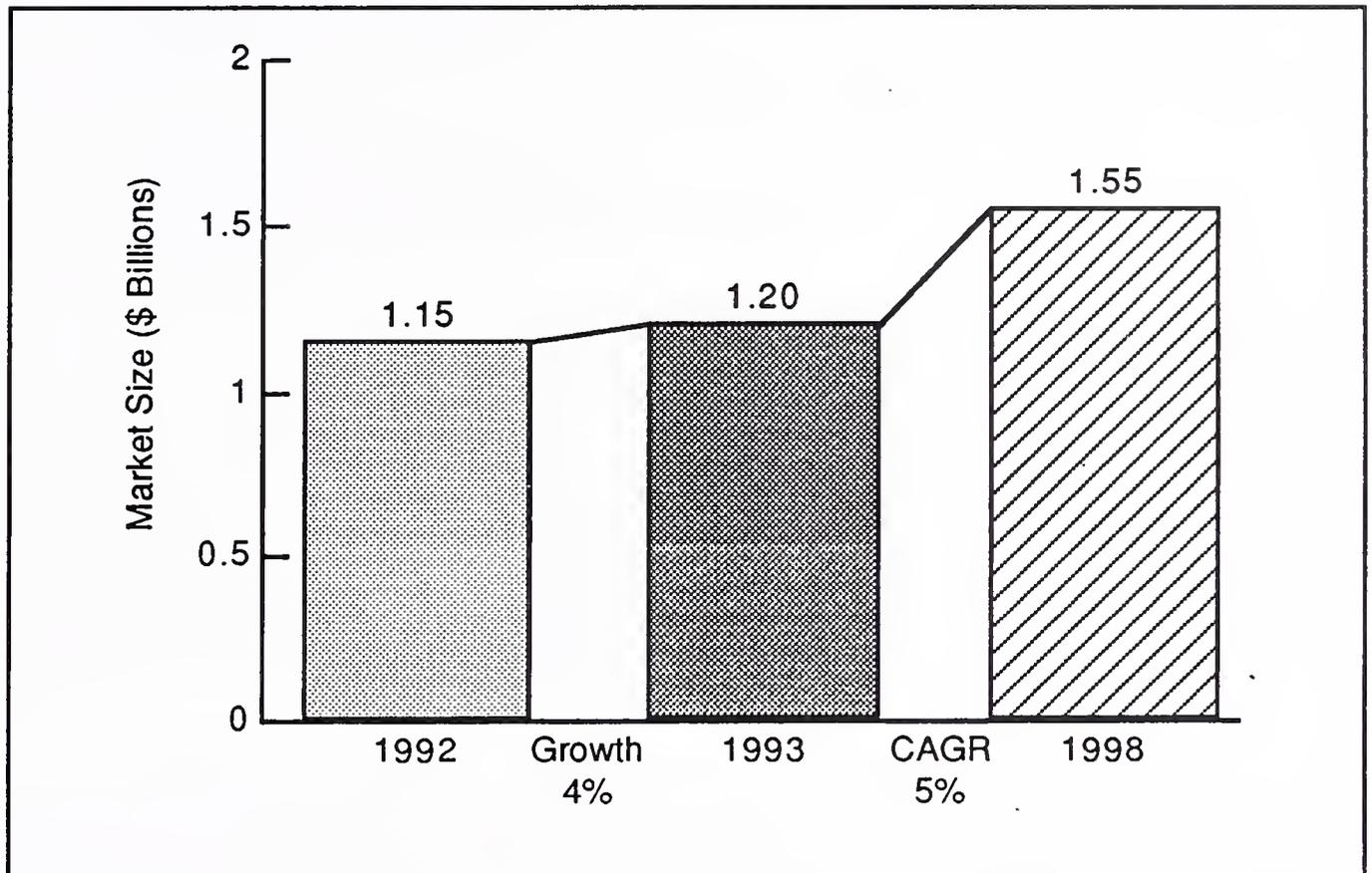
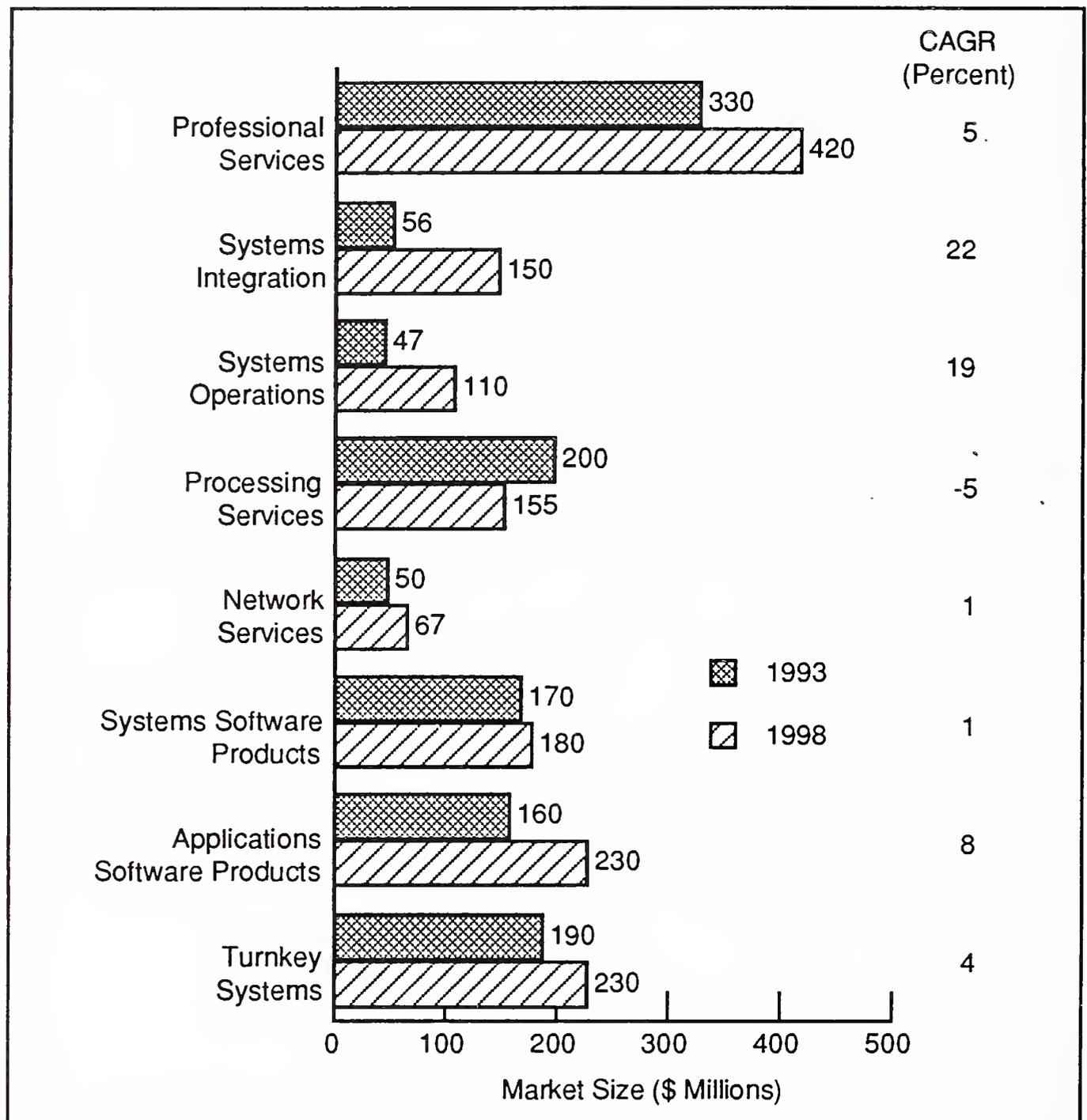


Exhibit VIII-50 provides the forecast by delivery mode.  
Exhibit VIII-54, at the end of this profile provides the forecast in greater detail.

EXHIBIT VIII-50

**Market Forecast by Delivery Mode  
Finland, 1993-1998**



Demand for custom software development projects and contract staff fell in 1992 in Finland as elsewhere in Europe, but some recovery is expected to generate 5% growth in professional services over the next five years.

The size of the systems integration sector has been substantially revised up compared to last year's report. Vendors reported more business than had been assumed previously and a much larger proportion was accounted for by software products. The outlook for growth is also best in this market as more major projects are being contracted out at fixed price.

Outsourced systems operations is expected to continue a healthy growth pattern. This is a market that is generally stimulated by the imposition of tight financial constraints on IT budgets. Downsizing of hardware investments is expected to lead to further falls in equipment services revenues in Finland.

### 3. Market Considerations

Exhibit VIII-51 lists the leading 10 information services vendors in the Finnish market as measured on their 1992 revenues. This list was compiled using only the software and services revenues attributable to the domestic Finnish market, and excludes exports and revenues gained from within any parent group companies. This excludes the City of Helsinki's KT-Tietokeskus, for example, with revenues of \$2.2 billion in 1992.

EXHIBIT VIII-51

#### Leading Information Services Vendors—Finland, 1993

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Billions)	Market Share (Percent)
1	Tietotehdas	Finland	600	10.5
2	IBM	U.S.	430	7.5
3	VTKK	Finland	390	6.8
4	Digital	U.S.	255	4.5
5	ICL (Fujitsu)	U.K. (J)	210	3.7
6	Elog-Data	Finland	160	2.5
7	Paakaupunkiseudom	Finland	140	2.5
8	CMA Data	Denmark	120	2.1
9	Cap Gemini Soget	France	120	2.1
10	Kunnallistieto	Finland	110	1.9
	Total Listed		2,535	44.1
	Total Market		5,700	100.0

Five of the companies are from Finland itself. Last year there were two other Scandinavian-owned vendors, but mergers and changing fortunes removed them. IBM, Digital and ICL are the non-Nordic companies; all these equipment manufacturers have increased their penetration of information services markets as

hardware markets have softened during the past several years. The list excludes equipment service revenues of these vendors.

The leading two Finnish information services companies, Tietotehdas and VTKK, are long established (1960s) companies that developed from the days of sophisticated service bureaus into vendors with a broad range of capabilities, including professional services, equipment supply, processing and network services.

Nokia Data was sold in 1991 to U.K. company ICL, which is itself now 80% owned by Fujitsu of Japan. It is strong in turnkey systems, with special strength in the banking and finance sector.

The largest vendor specializing in professional services rather than processing services is the Finnish subsidiary of Cap Programmer, now part of the Cap Gemini Sogeti group.

#### 4. IT Spending

Exhibit VIII-52 provides an estimate of Finland's total IT spending for 1993.

EXHIBIT VIII-52

#### Total 1993 IT Spending—Finland

Budget Category	Estimated Spending (\$ Millions)
Data Communications	410
Internal Staff	1,300
Equipment	1,150
Equipment Services	325
Facilities	475
Information Services	1,100
Total IT Spending	4,760

Information services, which includes software products, represents approximately 23% of the total IT budget, as noted in Exhibit VIII-53. The largest expenditures are for internal staff (27% of the IT budget) and equipment (24%). Equipment services represents the smallest portion of the IT budget at \$325 million and 7% of the total.

## EXHIBIT VIII-53

1993 IT Spending Percentages—Finland

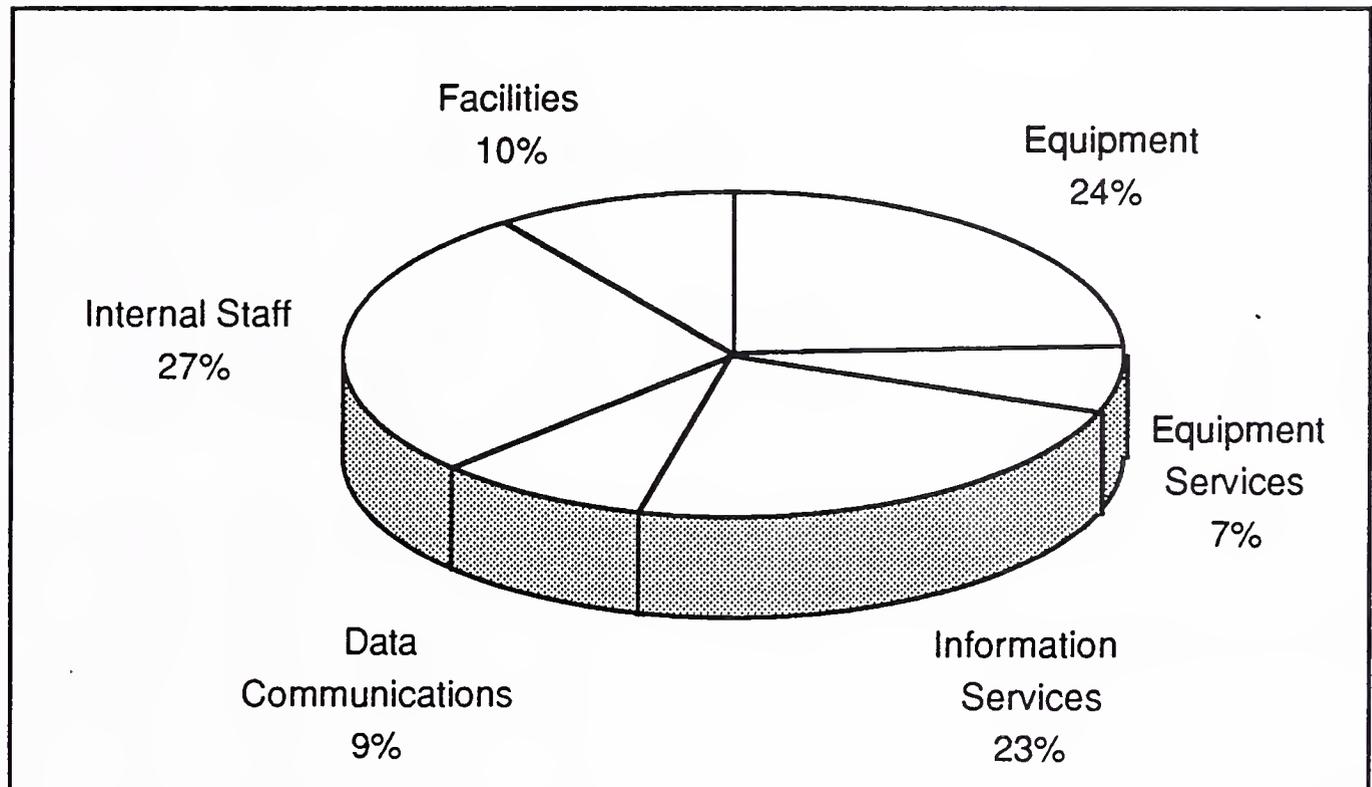


EXHIBIT VIII-54

**Information Services Industry Market Forecast by Delivery Mode  
Finland, 1993-1998**

Delivery Modes	1992 (\$M)	Growth 92-93 (%)	1993 (\$M)	1994 (\$M)	1995 (\$M)	1996 (\$M)	1997 (\$M)	1998 (\$M)	CAGR 93-98 (%)
Total Finland Information Services Mkt.	1,150	4	1,200	1,250	1,300	1,350	1,450	1,550	5
<i>Professional Services</i>	310	6	330	340	350	370	390	420	5
- IS Consulting	51	8	55	59	62	67	73	80	8
- Education & Training	29	3	30	32	32	33	34	35	3
- Custom Software	225	7	240	250	255	270	285	305	5
<i>Systems Integration</i>	48	17	56	66	79	95	115	150	22
- Equipment	13	15	15	17	19	22	26	32	16
- Software Products	13	16	15	20	26	34	46	65	35
- Professional Services	22	16	25	28	33	37	42	50	15
- Other	1	20	1	2	2	3	3	4	30
<i>Systems Operations</i>	40	18	47	56	66	78	92	110	19
- Platform Operations	20	15	23	27	32	37	43	49	16
- Application Operations	14	14	16	19	22	26	30	36	17
- Desktop Services	2	25	3	4	5	6	7	9	25
- Network Management	4	29	5	6	8	10	12	16	28
<i>Processing Services</i>	205	-2	200	190	180	170	165	155	-5
- Transaction Processing	183	-2	179	172	162	152	145	137	-5
- Utility Processing	6	-8	6	5	5	5	4	4	-6
- Other Processing	15	3	16	16	15	15	15	15	-1
<i>Network Services</i>	45	11	50	54	57	59	63	67	6
- Electronic Info Services	29	9	32	33	34	34	35	36	2
- Network Applications	16	13	18	21	23	25	28	32	12
<i>System SW Products</i>	170	0	170	170	170	170	175	180	1
- Mainframe	75	-8	69	63	57	53	49	45	-8
- Minicomputer	55	2	56	57	57	58	60	61	2
- Workstation/PC	42	10	46	51	56	62	69	77	11
<i>Application SW Products</i>	150	7	160	180	190	200	215	230	8
- Mainframe	15	-7	14	13	12	11	11	10	-7
- Minicomputer	46	7	49	52	54	56	59	62	5
- Workstation/PC	90	11	100	115	125	135	145	160	10
<i>Turnkey Systems</i>	180	6	190	205	210	215	225	230	4
- Equipment	88	5	92	95	94	93	93	92	0
- Software Products	45	9	49	54	58	61	64	68	7
- Professional Services	47	11	52	57	60	63	67	71	6

## K

## France

**1. National Overview**

France is the largest single market for information services in Europe, with the only European-owned independent professional services company to operate on a worldwide scale: Cap Gemini Sogeti (CGS).

INPUT forecasts a five year average growth of 7%, from \$20 billion in 1993 to \$20 billion in 1998, for user spending within the information services industry. Growth in 1992 was 4% below expectations and INPUT's forecast growth has been revised down to reflect the weakening demand, particularly in the areas of professional services, such as contract staff, and turnkey systems.

France's total population in 1992 was 57.4 million; the working population in 1989 was 24 million (41% female). Its economy ranks only behind Germany in terms of size within the EC. The 1992 GDP at current prices and current exchange rates was \$1,325 billion, about 17% of OECD European members' total GDP.

Traditional strengths in agriculture and wine making have been augmented by leadership in nuclear power for electricity production and high-speed trains, and by significant positions in defense, aeronautics, space, automobile and telecommunications industries.

A founding member of the EC, France sends 60% of its exports to other Community countries; this figure increases over the years.

While French postwar regeneration was associated with central planning and direction, the late 1980s saw a less *dirigiste* philosophy that encouraged a more dynamic approach. In recent years, takeovers have increased the French penetration of the top 500 companies' European upper levels as identified by the Financial Times (the FT 500). In 1993, the French government announced plans to sell much of the state's stake in nationalized companies, including Groupe Bull.

GDP growth was slightly higher in 1993 than in 1992 largely because of export activity. There was an increase in the

unemployment rate (from 9.5% to 10.2%), in line with EC average. Inflation (2.4%) was below average for the OECD (3.5%) and Germany (4.0%). The current account moved into the black for the first time since 1986.

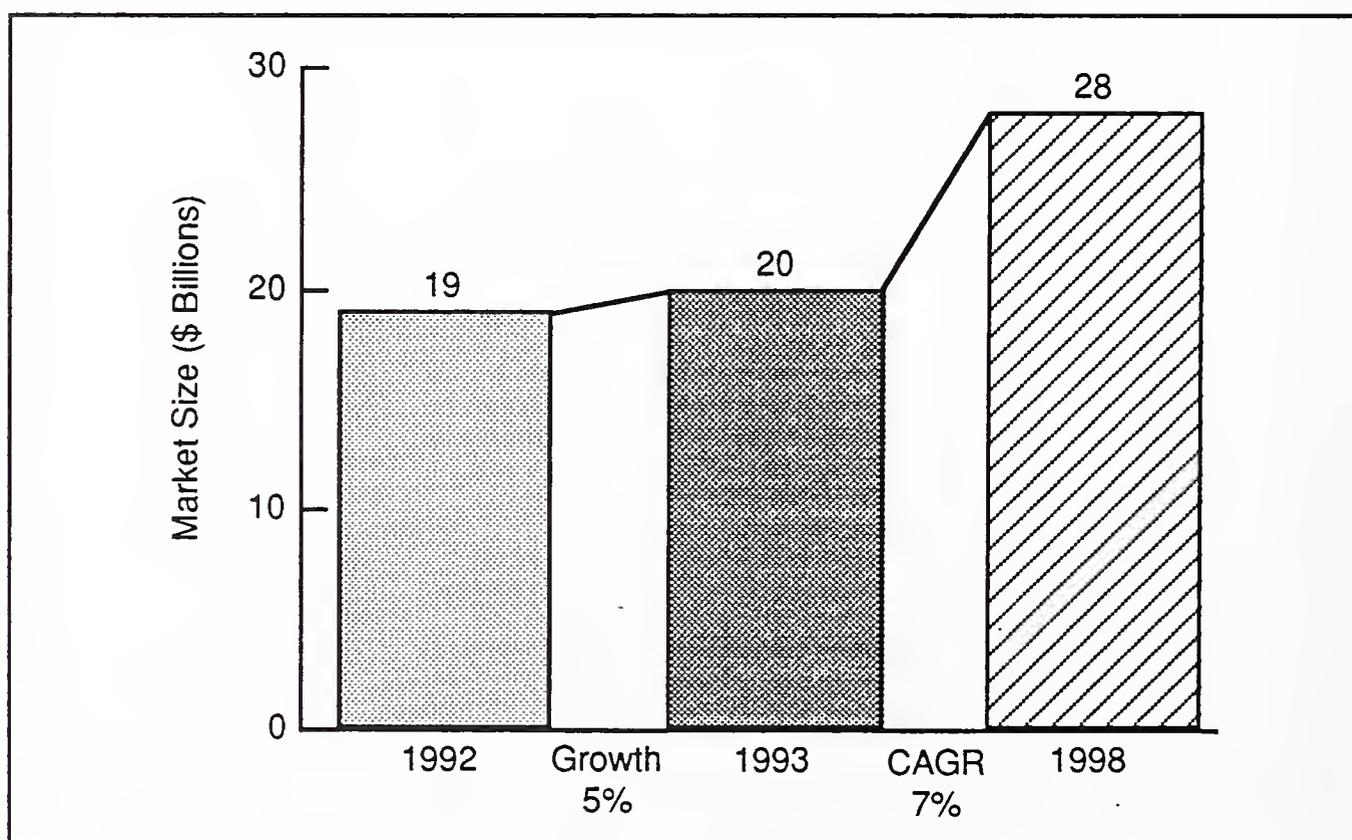
Performance forecasts indicate growth at a modest level, 1.2% in 1994. However, the recent good export performance is not expected to continue in a generally poor market, and the current account is expected to go into deficit. Inflation should hold steady at around 2.5%. Economists are guarded in their view of prospects for the French economy in spite of recent improvements, given sluggish home demand and continued dependence on international trade.

## 2. Information Services Market Forecast

The French market is the largest national market for information services (which now includes equipment services) in Europe and represents 22% of the total European market. The French market reached a total of \$23 billion in 1992 and grew 5% (including inflation) to \$20 billion in 1993. This rate represents a significant slowdown compared with an average annual growth of 24% (including inflation) over the last decade. Exhibit VIII-55 shows the information services industry market for France.

EXHIBIT VIII-55

Market Forecast—France, 1993-1998

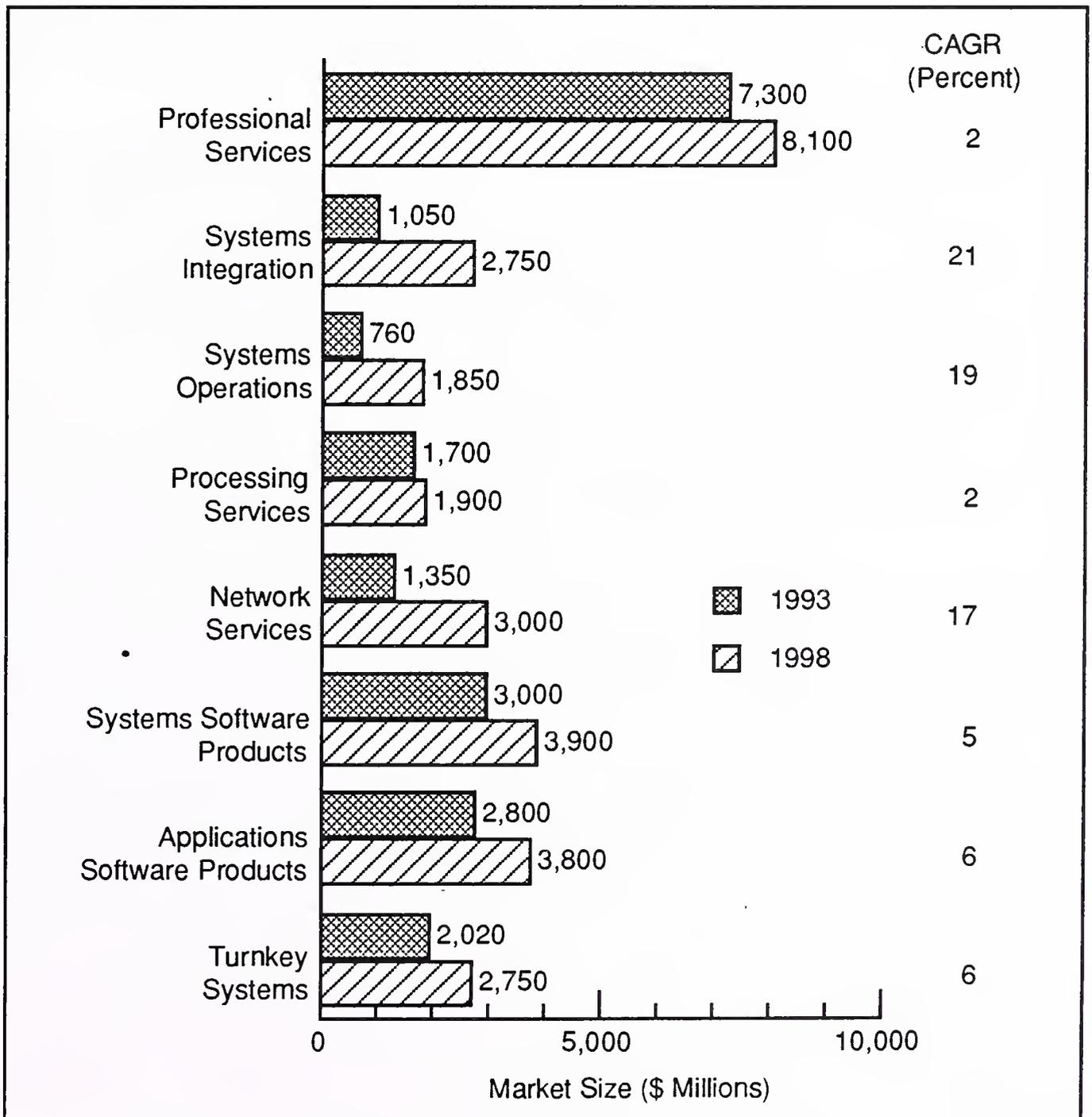


As shown, INPUT forecasts that market growth over the next five years is expected to average only 7% CAGR. Although the overall economic climate is expected to improve over the five-year period, the desire among buyers of software and services for better value for money will limit any return to higher growth rates.

Exhibit VIII-56 provides the forecast by delivery mode. Exhibit VIII-60, at the end of this profile, provides the forecast in greater detail. Short-term growth has been revised downward since the 1992 report for all sectors except systems operations. Only systems integration is expected to grow faster in the longer term.

EXHIBIT VIII-56

**Market Forecast by Delivery Mode  
France, 1993-1998**



Relative to the overall European information services market, professional services represents 32% of the total French market, compared with 23% for the whole of Europe. The French market thus accounts for nearly one-third of the total European professional services market. French professional services vendors, notably CGS, are strongly represented in the professional services markets of other countries. However, this sector is the most threatened by changing demands for custom software, and has seen growth predictions more than halved in the last two years.

The three main professional services subsectors grew more slowly than expected as spending on consulting, training and contract development staff was restrained by financial cutbacks.

Applications management and maintenance, a small subsector of professional services, grew rapidly in popularity over the last three years as vendors offered to support users' in-house-developed operational software.

One of the strongest general trends in France is toward vendor delivery of more complete solutions and away from customized application building. Consequently, strong growth (though lower than in previous forecasts) is expected in the systems integration and applications software products markets.

### **3. Market Considerations**

Historically, the larger French vendors of information services (Sligos, GSI, CGI, SG2 and Steria, in addition to CGS, for example) have succeeded in creating a strong indigenous French industry. This is in stark contrast to the computer systems market where Bull, the state-aided computer systems manufacturer, faces major challenges in its traditional product markets.

Exhibit VIII-57 lists the leading 10 vendors in the French information services market in 1993. France is the only European country to maintain such a strong national presence in its home market.

EXHIBIT VIII-57

## Leading Information Services Vendors—France, 1993

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	1,825	9.1
2	Groupe Bull	France	905	4.5
3	Cap Gemini Sogeti	France	658	3.3
4	Digital	U.S.	487	2.4
5	Axime	France	397	2.0
6	Sligos	France	382	1.9
7	EDS-GFI	U.S.	331	1.7
8	GSI	France	325	1.6
9	Microsoft	U.S.	281	1.4
10	Syseca [Thomson]	France	278	1.4
	Total Listed		5,869	29.3
	Total Market		23,000	100.0

CGS experienced substantial falling revenues in France during 1992, and posted its first-ever loss. Plans for further global expansion attracted Daimler Benz to take a 34% share in CGS holding company Sogeti. With the German industrial giant suffering from the economic recession, it is likely that other financial partners will need to fund the group's organic and acquisition-based growth strategies.

One of the most interesting developments in the French industry has been Sogeti's move into management consultancy with the formation, through acquisitions, of Gemini Consulting. CGS and Gemini are managed separately, but the objective is to build business of mutual interest. Synergy between CGS and Gemini Consulting is growing, with Gemini identifying a wide range of business process re-engineering opportunities.

In 1993, IBM France acquired majority interests in CGI and Axone as it extends its capabilities in the software and services market. CGI is probably best known for its internationally marketed PACbase CASE tools. Axone, previously a joint venture

with Sema, single-mindedly built a strong systems operations business in France.

#### 4. IT Spending

Exhibit VIII-58 provides an estimate of France's total IT spending for 1993.

EXHIBIT VIII-58

#### Total 1993 IT Spending—France

Budget Category	Estimated Spending (\$ Millions)
Data Communications	3.6
Internal Staff	18.0
Equipment	10.3
Equipment Services	4.1
Facilities	6.5
Information Services	18.5
Total IT Spending	61.0

Information services, which includes software products, represents approximately 31% of the total IT budget, as noted in Exhibit VIII-59. The next largest expenditures are for internal staff (29% of the IT budget) and equipment (17%). Data communications represents the smallest portion of the IT budget at \$3.6 billion and 6% of the total.

## EXHIBIT VIII-59

1993 IT Spending Percentages—France

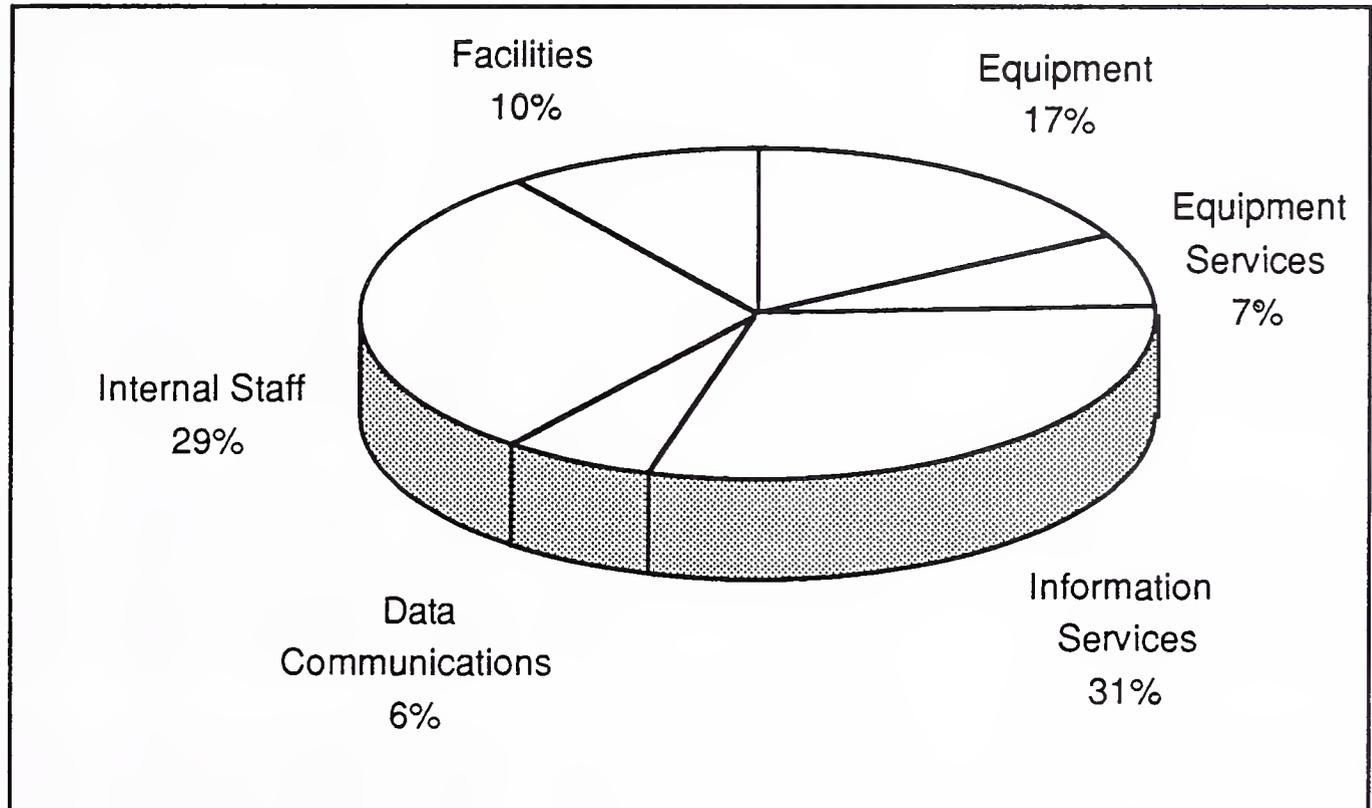


EXHIBIT VIII-60

**Information Services Industry Market Forecast by Delivery Mode**  
**France, 1993-1998**

Delivery Modes	1992	Growth	1993	1994	1995	1996	1997	1998	CAGR
	(\$M)	92-93 (%)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	93-98 (%)
Total France Information Services Mkt.	19,000	5	20,000	21,000	22,000	23,500	25,500	28,000	7
<i>Professional Services</i>	6,900	6	7,300	7,500	7,600	7,700	8,000	8,100	2
- IS Consulting	760	9	830	880	940	1,000	1,060	1,150	7
- Education & Training	600	7	640	670	700	720	760	800	5
- Custom Software	5,500	5	5,800	5,900	5,900	5,900	6,000	6,000	1
<i>Systems Integration</i>	900	17	1,050	1,300	1,550	1,850	2,250	2,750	21
- Equipment	250	12	280	320	370	440	510	600	16
- Software Products	235	17	275	370	490	650	880	1,200	34
- Professional Services	400	23	490	570	640	730	800	890	13
- Other	19	0	19	26	34	47	63	84	35
<i>Systems Operations</i>	650	17	760	880	1,050	1,250	1,500	1,850	19
- Platform Operations	290	14	330	360	410	480	590	760	18
- Application Operations	220	18	260	310	360	430	510	610	19
- Desktop Services	29	31	38	48	62	79	102	131	28
- Network Management	110	18	130	160	200	240	290	340	21
<i>Processing Services</i>	1,650	3	1,700	1,750	1,700	1,750	1,800	1,900	2
- Transaction Processing	1,460	2	1,490	1,490	1,450	1,470	1,510	1,580	1
- Utility Processing	70	0	70	70	70	70	70	70	0
- Other Processing	130	15	150	170	190	200	230	250	11
<i>Network Services</i>	1,150	17	1,350	1,500	1,750	2,050	2,450	3,000	17
- Electronic Info Services	740	12	830	890	960	1,050	1,140	1,260	9
- Network Applications	420	21	510	630	800	1,020	1,330	1,740	28
<i>System SW Products</i>	2,900	3	3,000	3,200	3,300	3,500	3,600	3,900	5
- Mainframe	1,280	1	1,290	1,280	1,250	1,230	1,160	1,060	-4
- Minicomputer	950	3	980	1,000	1,010	1,030	1,060	1,120	3
- Workstation/PC	660	17	770	890	1,030	1,190	1,410	1,670	17
<i>Application SW Products</i>	2,750	2	2,800	2,800	2,950	3,100	3,500	3,800	6
- Mainframe	210	-10	190	170	150	130	120	110	-10
- Minicomputer	920	-11	820	730	680	710	730	750	-2
- Workstation/PC	1,600	13	1,800	1,900	2,100	2,300	2,600	2,900	10
<i>Turnkey Systems</i>	2,050	0	2,050	2,100	2,200	2,350	2,550	2,750	6
- Equipment	1,020	3	1,050	1,070	1,100	1,150	1,200	1,250	4
- Software Products	510	-4	490	520	560	600	680	760	9
- Professional Services	500	-2	490	520	560	600	670	760	9

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**Germany****1. National Overview**

Germany now has by far the largest population in Western Europe following the integration of 16 million East Germans in 1990. Germany was a founding member of the European Community.

Their information services market (including equipment maintenance) is the second largest in Europe, with a total value of \$16 billion in 1992.

The population of Germany, including the 11 Länder of the former West and the five of the former DDR, was 80.7 million, with a work force of 38 million (42% female).

The 1992 GDP at current prices and current exchange rates was reported by the OECD at \$1,775 billion, about 23% of OECD European members' total GDP.

The accession of East Germany was marked by undertakings to raise living standards within a short time and to implement BRD fiscal/commercial laws in the old DDR, with consequent privatization of many former government enterprises. The East German mark was given parity with the deutschmark.

Unification created a boom as infrastructure projects sucked in goods from the old West and the rest of Europe. But 1992 saw the end of the boom and the effects of the strains imposed by reunification.

Germany's recession started in the middle of 1992; although GDP growth for the year was positive, it was down in 1991 (2.0% compared with 3.7%). The trend is apparent in the 1993 forecast decline (-1.5%).

The country's principal economic strength has been its manufacturing base, particularly in sectors such as engineering and chemicals, with companies such as Daimler-Benz, Volkswagen, Siemens, BASF, Bayer and Hoechst. The strength of these sectors is reflected in their information services spending.

However, the manufacturing sector is clearly one of the hardest hit by recession, resulting generally in reduced spending except for outsourcing systems operations and processing services.

Inflation at 4.0% exceeded the OECD average as the money supply expanded because of reunification commitments. High interest rates increased pressure on manufacturing companies already affected by falling demand, internal and external, and by high payroll costs. Germany leads the league of industrial nations for labor rates, partly through its wage rates but also through the 86% of additional employer contributions.

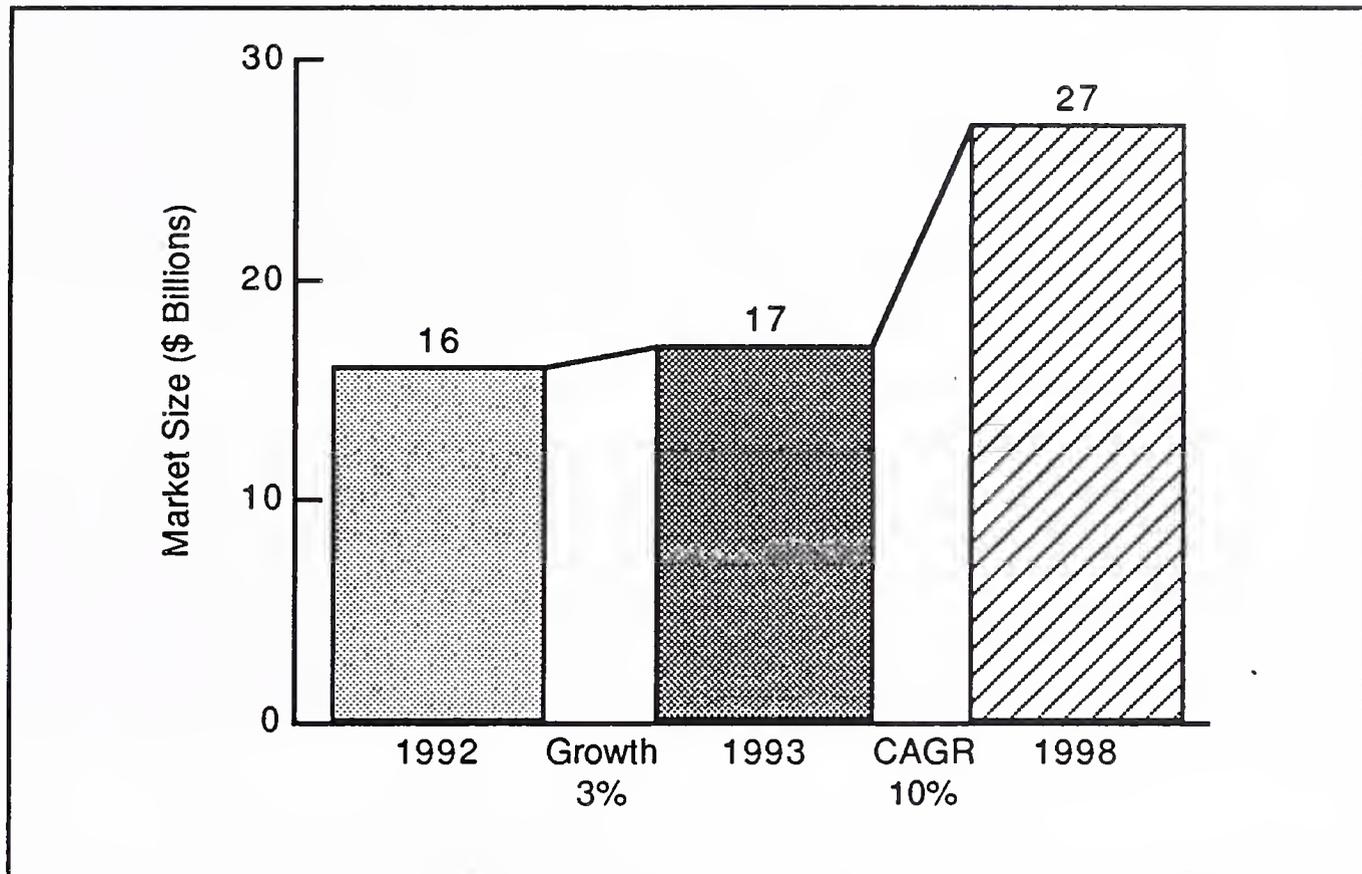
Action by the Bundesbank resulted in lower interest rates, as well as by the federal government easing certain burdens on industry, notably in corporate tax and labor legislation. The outlook is still uncertain, however. Inflation was above the OECD average for 1993, but will decline in 1994, while unemployment is set to remain at around 8%. A current account deficit of 1% of GDP will continue. Modest GDP growth of 1% is expected in 1994.

## **2. Information Services Market Forecast**

The German information services market is the second-largest market in Europe, as shown in Exhibit VIII-61. In 1993, the market totaled \$17 billion, with a prediction to grow at an average CAGR of 10% to \$27 billion by 1998. The development of East Germany is not forecast to significantly increase growth rates for information services in the short-term. However, expenditure will become more widely distributed throughout the entire country.

## EXHIBIT VIII-61

## Market Forecast—Germany, 1993-1998



Professional services adopted a lower profile in Germany compared to other major European national markets. As elsewhere, contracting labor (body-shopping) has been severely curtailed, reducing the custom software subsector growth from a forecast 11% to an actual 3% in 1992.

Another delivery mode where Germany lags behind the European average is systems operations. This is not surprising because Germany has traditionally shown a strong aversion to outsourcing across much of its industry, which preferred to manufacture its own components rather than purchase them from subcontractors. In 1992, this aversion changed and the systems operations market grew rapidly. It is clear that outsourcing is becoming an accepted business practice in Germany.

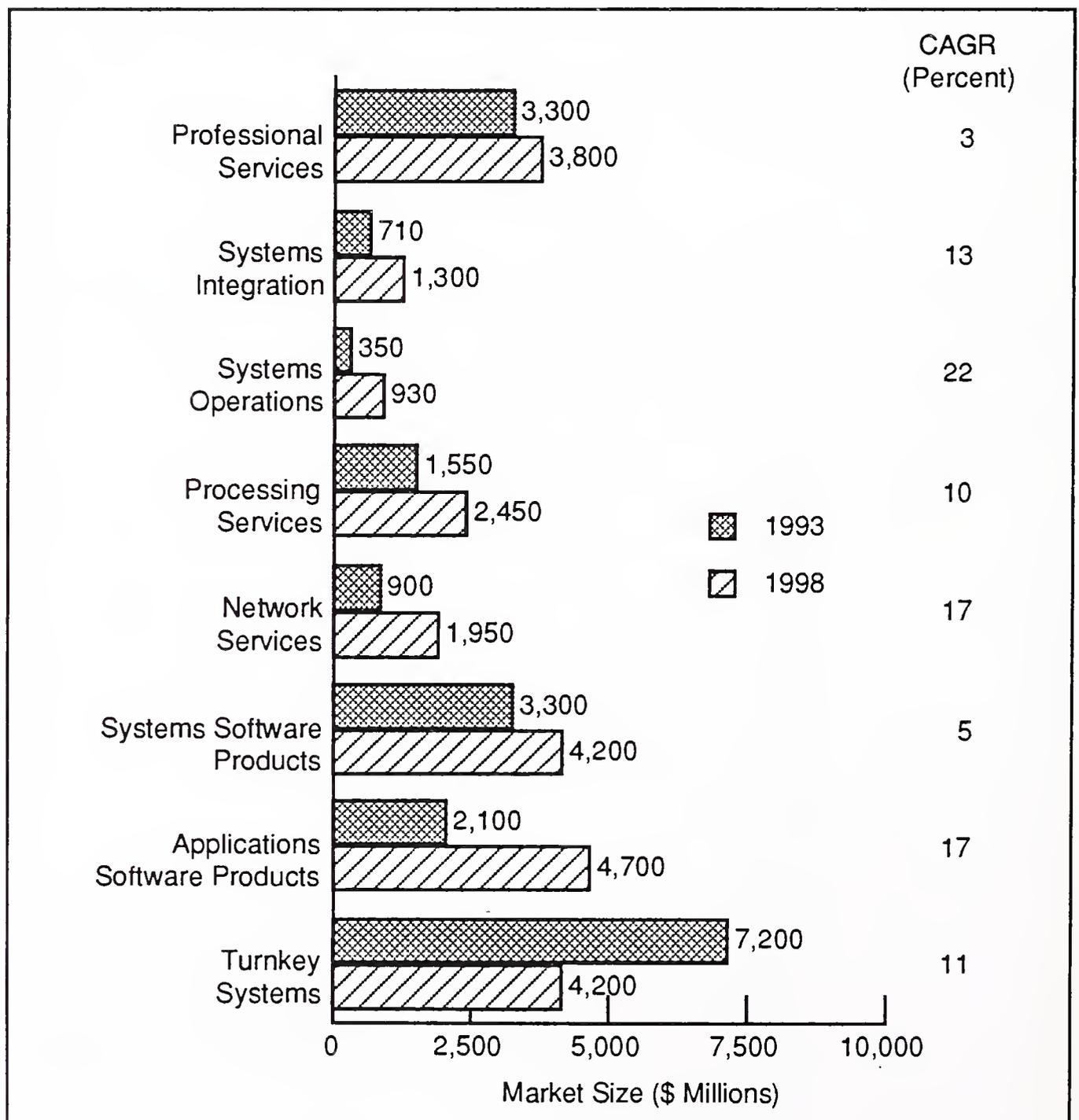
INPUT reassessed the level of systems integration business claimed by vendors in Germany. As a result, the market size was revised downward overall, and the software product content increased. The long-term forecast growth was also reduced to 13% as a result of the poor economic outlook and the likely impact on major projects.

Led by vendors such as Siemens Nixdorf Informations systemes, Digital Kienzle and Taylorix, the German market has always had a strong emphasis on turnkey systems. Competitive pricing and recessionary pressures led to 10% lower growth than INPUT forecast for 1992. The longer-term forecast CAGR has been revised down from 13% last year to 9%, reflecting this dampening of market demand. There is a large element of professional service in the turnkey sector in Germany.

Exhibit VIII-62 provides the forecast by delivery mode. Exhibit VIII-66, at the end of this profile, provides the forecast in greater detail.

EXHIBIT VIII-62

**Market Forecast by Delivery Mode  
Germany, 1993-1998**



### 3. Market Considerations

Exhibit VIII-63 lists the top 10 vendors in the German information services industry market during 1992, compiled using only the information services revenues attributable to the domestic market within Germany, excluding exports or revenues from within any parent group companies.

EXHIBIT VIII-63

**Leading Information Services Vendors—Germany, 1993**

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	2,458	14.9
2	Siemens-Nixdorf	Germany	1,981	12.0
3	Digital	U.S.	632	3.8
4	Datev	Germany	548	3.3
5	Cap debis	Germany	406	2.5
6	Microsoft	U.S.	310	1.9
7	SAP	Germany	310	1.9
8	Reuters	U.K.	284	1.7
9	HP	U.S.	187	1.1
10	Bull	France	181	1.1
	Total Listed		7,297	44.2
	Total Market		16,500	100

As in nearly every European country, IBM leads in software and services revenues. However, in Germany, it is nearly matched by Siemens-Nixdorf Informationsysteme (SNI), which was formally constituted Oct. 1, 1990, following Siemens' earlier acquisition of a majority stake in Nixdorf Computer AG. Both vendors generated significant revenues from the newly merged eastern regions of Germany, particularly in the public administration sector (regional and local government).

IBM, SNI and Digital have each made recent announcements of major staff reductions and plant closures. Employment practices

in Germany mitigate against laying off staff. This slowed difficult decisions regarding downsizing of the equipment vendors operations. All of these vendors have redeployed staff into services roles, but this has not reduced their cost base fast enough to meet new market conditions profitably.

Datev, the third-largest software and services vendor in Germany, is a cooperative owned by German accountants and tax specialists that provides software products and processing services to support specialists in these fields. It achieved more than 20% growth in 1992.

SAP is uniquely successful, establishing itself during the 1980s as the largest and fastest growing European application software products vendor. It dominates the market for accounting and production management applications based on mainframe architectures in Germany.

However, the company also recognized changes taking place in the market, particularly moves toward downsizing and open systems, and has modified its strategy and product development program accordingly. R/3, a new product developed from UNIX-based equipment and initially aimed at medium-sized organizations, was launched in 1992.

A further initiative from SAP was to encourage processing services vendors to offer their software as a service called "SAP outsourcing." This is expected to give the processing services market new growth.

The conservative German market remains a difficult one for foreign software products companies to penetrate. While this is particularly true for commercial applications software products, vendors of technical products, such as the CAD vendors Intergraph and Computervision, have met with greater success. Germany remains the largest national market for Intergraph across Europe.

Cap Gemini Sogeti strengthened its position in Germany over the last year with its 49% share in CAP debis. This joint venture with Daimler-Benz took effect in 1992. CAP debis still receives a large proportion of its business from its German parent group, and has diversified externally to counter the severe losses suffered in the car industry.

#### 4. IT Spending

Exhibit VIII-64 provides an estimate of Germany's total IT spending for 1993.

EXHIBIT VIII-64

#### Total 1993 IT Spending—Germany

Budget Category	Estimated Spending (\$ Millions)
Data Communications	5,100
Internal Staff	26,000
Equipment	12,000
Equipment Services	4,700
Facilities	6,200
Information Services	14,000
<b>Total IT Spending</b>	<b>68,000</b>

Information services, which includes software products, represents 21% of the total IT budget, as noted in Exhibit VIII-65. The largest expenditure is for internal staff (39% of the IT budget). Equipment accounts for 18%. Equipment services represents the smallest portion of the IT budget at \$4.7 billion and 6% of the total.

EXHIBIT VIII-65

#### 1993 IT Spending Percentages—Germany

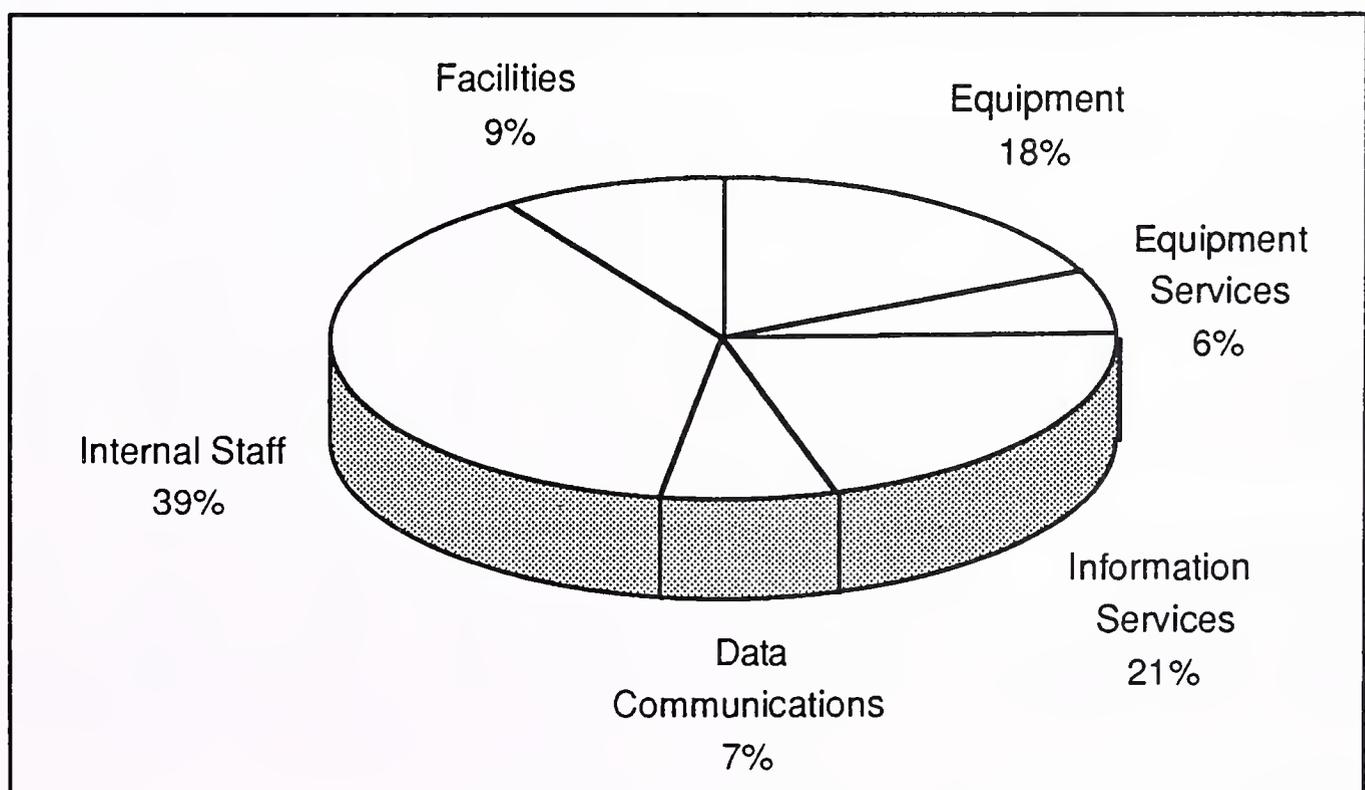


EXHIBIT VIII-66

**Information Services Industry Market Forecast by Delivery Mode  
Germany, 1993-1998**

Delivery Modes	1992	Growth	1993	1994	1995	1996	1997	1998	CAGR
	(\$M)	92-93 (%)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	93-98 (%)
Total Germany Information Services Mkt.	16,000	3	16,500	18,000	19,500	21,500	24,000	26,500	10
<i>Professional Services</i>	3,300	0	3,300	3,400	3,500	3,700	3,800	3,800	3
- IS Consulting	480	10	530	580	650	710	770	850	10
- Education & Training	650	5	680	710	750	790	820	850	5
- Custom Software	2,200	-5	2,100	2,100	2,100	2,200	2,200	2,100	0
<i>Systems Integration</i>	620	15	710	800	910	1,050	1,150	1,300	13
- Equipment	170	12	190	210	220	240	250	270	7
- Software Products	160	16	185	225	280	350	440	560	25
- Professional Services	280	14	320	350	390	430	450	430	6
- Other	13	0	13	16	19	23	29	39	25
<i>Systems Operations</i>	280	25	350	420	510	610	750	930	22
- Platform Operations	100	20	120	140	170	200	250	310	21
- Application Operations	60	33	80	100	120	140	170	220	22
- Desktop Services	39	33	52	61	74	90	110	135	21
- Network Management	80	25	100	120	150	180	220	260	21
<i>Processing Services</i>	1,550	0	1,550	1,650	1,800	2,050	2,250	2,450	10
- Transaction Processing	1,300	-2	1,280	1,350	1,480	1,650	1,810	1,980	9
- Utility Processing	70	0	70	70	70	70	70	70	0
- Other Processing	180	17	210	240	270	310	360	410	14
<i>Network Services</i>	830	8	900	1,000	1,200	1,400	1,650	1,950	17
- Electronic Info Services	680	3	700	730	770	810	810	810	3
- Network Applications	150	33	200	290	410	580	830	1,150	42
<i>System SW Products</i>	3,200	3	3,300	3,500	3,600	3,800	3,900	4,200	5
- Mainframe	1,580	-1	1,570	1,570	1,520	1,420	1,250	1,090	-7
- Minicomputer	940	2	960	1,000	1,050	1,100	1,170	1,250	5
- Workstation/PC	650	15	750	890	1,060	1,260	1,510	1,830	20
<i>Application SW Products</i>	1,900	11	2,100	2,550	2,850	3,400	4,000	4,700	17
- Mainframe	280	-7	260	250	240	240	230	230	-2
- Minicomputer	630	5	660	780	900	1,100	1,270	1,380	16
- Workstation/PC	1,000	20	1,200	1,500	1,700	2,100	2,500	3,100	21
<i>Turnkey Systems</i>	4,200	0	4,200	4,500	5,100	5,700	6,400	7,200	11
- Equipment	2,080	0	2,080	2,120	2,200	2,290	2,360	2,460	3
- Software Products	1,050	0	1,050	1,200	1,450	1,700	2,000	2,350	17
- Professional Services	1,040	3	1,070	1,220	1,420	1,680	2,000	2,360	17

## M Hong Kong

### 1. National Overview

On July 1, 1997, Hong Kong will become a Special Administrative Region (SAR) of the People's Republic of China. According to ostensible terms of the joint agreement, Hong Kong's capitalist economic, governmental and social systems will continue until at least 2047. However, as 1997 approaches, it is apparent that there is a disparity between the actual terms of the agreement and what many of Hong Kong's citizens believe it will do.

With the agreement looming, thousands of highly-skilled professional people are migrating to Australia, Canada, the U.S. and other nations. Most of those leaving are young professionals who want to continue living a capitalist lifestyle, but émigrés also include older people who want to stay as far ahead as possible of the Communist Revolution they fled in 1949. As this exodus of intellectual power and capability continues, Hong Kong's healthy economy could suffer in the long run.

Nevertheless, Hong Kong's economy remains vibrant, and the island is a major producer of electronics, construction materials, textiles and garments, food, beverages and chemical products. In 1993, the GDP stood at \$108 billion, an increase of 15.7% over 1992. This is expected to increase by the same percentage to \$125 billion in 1994. Hong Kong's external debt reached \$20 billion in 1993, with an increase in 1994 to \$23 billion projected. Foreign investment grows at approximately 9.7% per year.

Speculation as to whether these figures improve, maintain, or decline is liberally mixed with anxiety. The Hong Kong economy held up well, in large measure, from its increasing involvement in southern China. The Chinese government unofficially allowed capitalist dealings to thrive in its southern reaches, thus making it a natural investment and development ground for Hong Kong. It is likely this intermingling will continue, although 1997 may curtail mutual economic growth.

The colony's bond with China could provide Hong Kong and foreign companies a wider gateway into China's embryonic information and telecommunications systems markets. Over the past several years, Hong Kong and the PRC explored several joint

projects in technological areas. Technology trends of importance to the Hong Kong market remain consistent with those in INPUT's 1992 report.

- *On-line services*—Building on a processing services infrastructure already in place, Hong Kong focuses on the development of on-line services such as cable-based services and interactive cable television.
- *Gateway services*—As well as being a developed technological center, Hong Kong is a primary gateway for information services provided to other countries in Southeast Asia, including China.
- *Transaction processing*—As work shifts from an economy based on manual labor to one based on information, the country is developing a broad spectrum of processing alternatives, including transaction processing services. Continued emphasis on on-line transaction processing (OLTP) services is expected.
- *Digital and cellular services*—In July 1993, Hong Kong Governor Chris Patten made the last telephone call on an analog communications line to officially celebrate the completion of a 12-year project to digitize Hong Kong telecommunications services.
- *Software services*—There is a continuing need for quality software services. Historically, foreign firms have not provided high-quality support for products brought to the colony. In the past, this lack of support has resulted in a generally poor quality of software being used. However, major vendors such as Computer Associates, Lotus and Microsoft, are collaborating with Hong Kong's Business Software Alliance (BSA) to ensure product quality and prevent software piracy.

#### a. Driving Forces

Forces driving the information services market are:

- *Economic freedom*—A policy of “positive nonintervention” contributes to a continuing flow of funds to develop and provide more services. The government does not control, protect or subsidize industry, nor are there any import tariffs.

- *Asian entree*—Numerous firms, such as the ones mentioned above, consider Hong Kong the primary center for entrance into the Asian market, although these numbers decline as other centers, such as Singapore, grow in importance.
- *Technological infrastructure*—Hong Kong has a developed technological infrastructure that provides a base for advanced products, particularly in the area of financial services. The completed digital telecommunications infrastructure is a major advantage in this area.
- *Chinese trade*—Hong Kong is the recognized center for contacts and business development with the People's Republic of China. This recognition is increasingly more important, and is a primary focus for foreign firms seeking contracts with the PRC.
- *Financial services*—As a financial center for Southeast Asia, Hong Kong is in continuing need of services to improve its position in the world financial community. The colony vies with Tokyo for the title of the world's third-largest financial center.

#### **b. Inhibiting Factors**

A number of inhibiting factors exist that could have a significant effect on future development in the colony.

- *Political uncertainty*—Concern over long-term political stability is expected to be the most significant factor affecting future investment and development. This may be mitigated to some degree by China's own interest in increasing its development of capitalist marketplaces such as Shanghai. Unfortunately, Governor Patten has made provocative plans to increase the franchise for the 1995 elections, a move that has Chinese officials poised to create a rival government when the island comes under their control.
- *Labor shortage*—There is a growing shortage of skilled labor in the colony. Emigration is reducing the labor force and driving up wages. The colony needs services that can supplant the waning pool of middle management and technical skills.

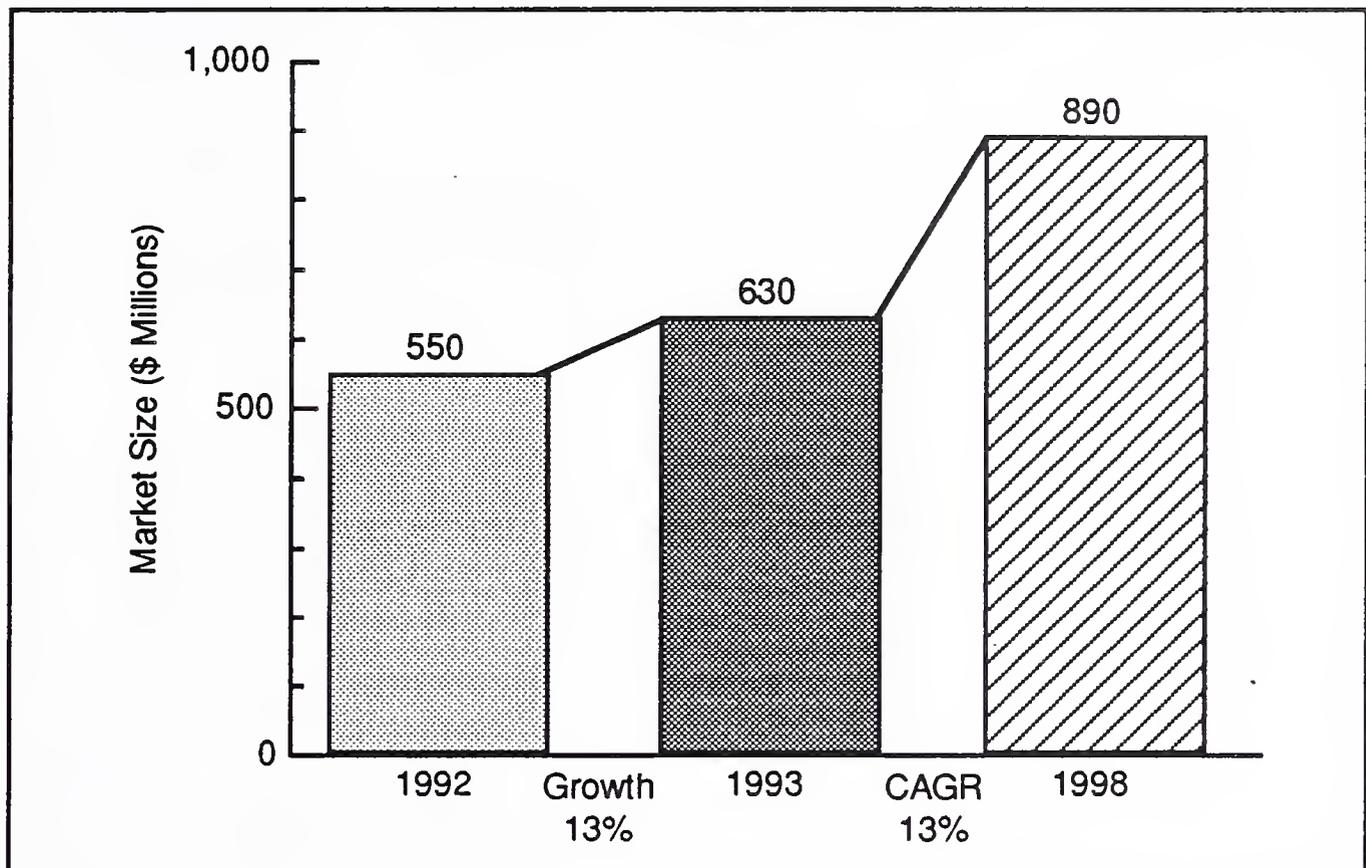
- *Labor cost*—With the declining labor supply, salaries are spread over fewer workers; therefore, wages are increasing. This increase causes a number of firms to consider other geographic areas as opportunities for investment or relocation. With cheaper land and comparable labor experience, Australia is a prime geographical relocation candidate.
- *Capital flight*—Also related to the political situation, a number of firms are protecting their economic position by moving portions of their capital from the colony, thus reducing the amount of funds available for long-term investment. In addition, as middle management and professionals leave, they take their capital with them.

## 2. Information Services Market Forecast

Exhibit VIII-67 shows that the market for information services in Hong Kong was nearly \$630 million in 1993. This is about \$20 million less than estimated in last year's report. The forecast reduction was due to the general global economic situation to which Hong Kong's economic fate is closely tied, and to a growing business caution as the 1997 change in ownership approaches. Nevertheless, INPUT estimates the information services market will grow to approximately \$895 million by 1996, the last year INPUT can offer a knowledgeable estimate of market size. At 13%, INPUT's growth rate projection is lower than last year's 17% five-year CAGR.

## EXHIBIT VIII-67

## Market Forecast—Hong Kong, 1993-1993



This year, INPUT limited its market projection for Hong Kong to a three-year forecast—1993 through 1996. Although INPUT could offer numbers for 1997 and 1998, INPUT believes China's assumption of political and economic control of the island in July 1997 offers enough business uncertainties to make any forecast of the information services market highly speculative. There is every reason to believe it is in the best interests of China and Hong Kong to allow Hong Kong to function as one of the world's major business and financial centers. However, the departure of many skilled technical and business professionals from the island and the implications of such a reduction in the skilled labor force is a concern.

As more information becomes available over the next few years, and there a clearer picture emerges of how Hong Kong will function under Chinese control, INPUT will extend its forecast accordingly.

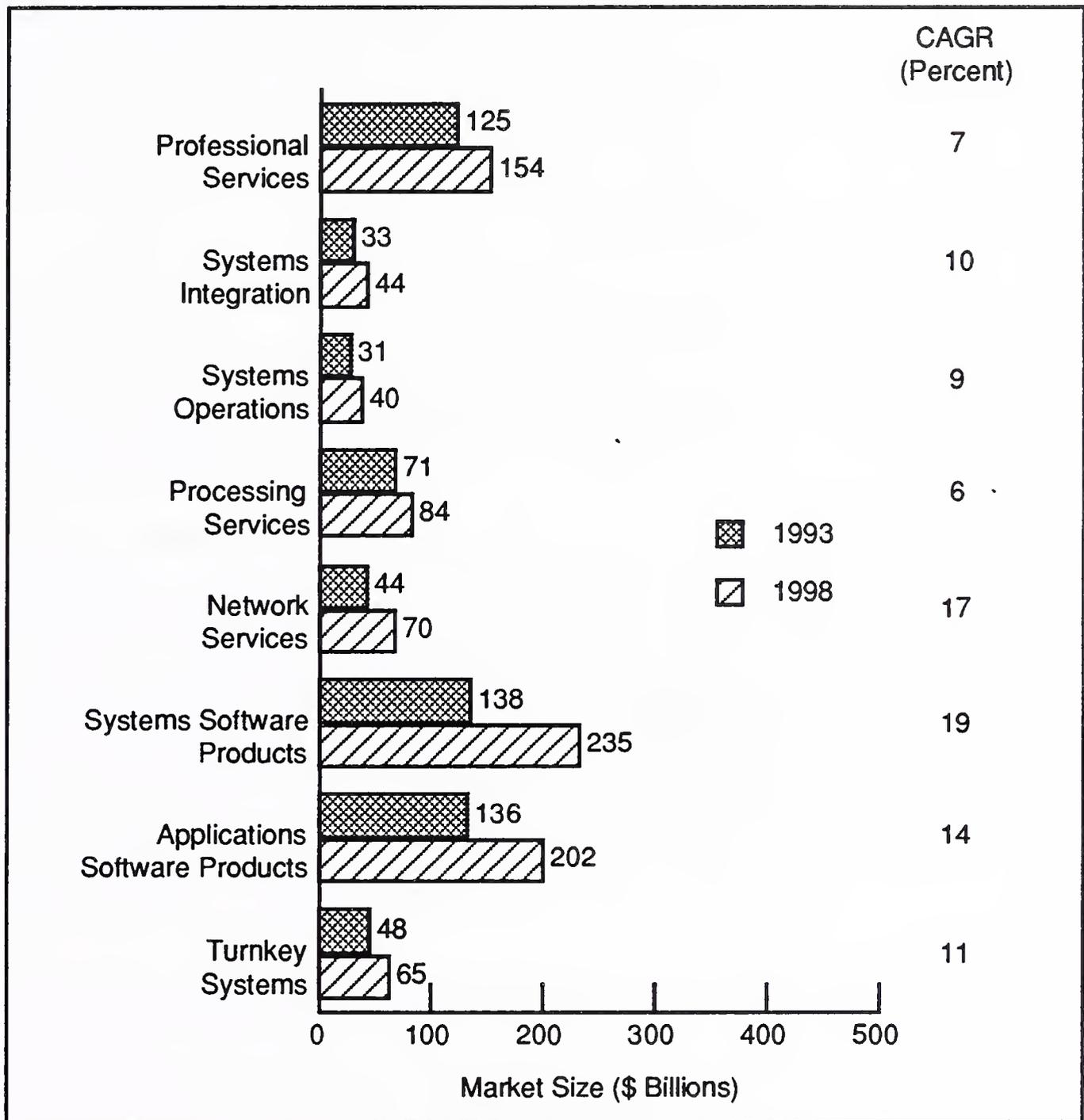
As noted in earlier analyses, although the size of the economic base would suggest the market might be bigger, there are significant reasons why this is not occurring:

- *The Nature of the Business Community* —Many major users of information services are foreign firms that acquire hardware and support services (maintenance, etc.) locally, but rely on a headquarters office in another country for much of their software, software development and consulting services.
- *Industrial Base* —Unlike Japan, the U.S. and European countries, Hong Kong has a comparatively low industrial base. Hong Kong's GDP is derived primarily from labor-intensive financial services and trading businesses. Consider that in Hong Kong, industry contributes only 28% to the total GNP; whereas in Japan, the contribution of industry is more than 40%. In addition, a large portion of the industrial community is geared to the re-export of products (adding value to imported products that are subsequently exported). Without a large and growing industrial base, the potential market for information services products is somewhat limited.

Exhibit VIII-68 provides the forecast by delivery mode. Exhibit VIII-71, at the end of this profile, provides the detail behind the forecast.

EXHIBIT VIII-68

**Market Forecast by Delivery Mode  
Hong Kong, 1993-1996**



Overall, the delivery mode growth rates are several percentage points lower than those noted in the 1992 forecast, for the economic and political reasons noted earlier in this chapter.

The 1993 market for processing services was approximately \$70 million. The market will grow at 6% per year to an estimated \$84 million by 1996.

The market for turnkey systems will grow from almost \$50 million to an estimated \$65 million by 1996. The interest in

applications solutions for smaller businesses is expected to grow because:

- The market for turnkey systems is driven primarily by companies outgrowing their microsystems or downsizing their mainframe environments and seeking cost-effective micro- and mini-based solutions. In addition, an increasing number of smaller businesses need application-specific micro-based solutions.
- In Hong Kong especially, there will be greater demand for customized rather than packaged software. Negative experiences with support of packaged software has led many companies to purchase customized software and rely increasingly on local providers for after-sales support.

The applications software products market is approximately 22% of the total information services market, experiencing steady growth at 14% per year. As noted in the 1992 report, because of the growing scarcity of professional staff, companies seek vendors who will provide high-quality products and follow-on support services. As a result, growth is expected to be from more than \$135 million in 1993 to more than \$200 million in 1996. The greatest opportunity for applications software products is in the constantly expanding micro market. Applications software products is one area where established U.S. vendors are favored.

Systems software products will experience somewhat stronger growth—from almost \$140 million to \$235 million in 1996—a 19% CAGR. The systems control products needed to support the increasingly more sophisticated financial systems are a key factor driving this growth.

The market for systems integration in Hong Kong is quite small.

- Because many of the larger companies are foreign, major systems changes such as those driven by, or resulting from, systems integration projects, are typically initiated and managed by the headquarters office.
- Professional services are expected to grow from \$125 million in 1993 to nearly \$155 million in 1996. For the general economic and political reasons noted earlier, the annual growth rate projection is 7%, down somewhat from 1992's 11%.

- As seen in Exhibit VIII-46, software development activities continue to be the largest and fastest growing market segment, followed by consulting and education and training activities.
- Network services are expected to show strong growth (17%) for the next several years, from almost \$45 million in 1993 to \$70 million in 1996.
- Services such as E-mail and EDI will also help to drive the market; however, the implementation of EDI is already underway and it will be several years before significant revenues are realized. Even as part of China, Hong Kong will almost certainly serve as a business hub for the region and can be expected to benefit from the expanded use of EDI in the Asia/Pacific area.

The market for information products and services should remain modestly strong for at least the next several years, and under Chinese control, Hong Kong should logically continue as a strong center of financial and business activity for the next 100 years, because this would appear to be in China's best interests. Hopefully, INPUT's caution in extending forecasts beyond 1996 will be unfounded, and Hong Kong will continue as a vital and robust member of the global economy. Only time will tell.

### **3. Market Considerations**

Entry into the market is generally easy. However, with cost for facilities already high and labor rates rising, operating costs can also be quite high.

Key opportunities are for telecommunications and software support services. Hong Kong also provides opportunities for entry into China.

All major U.S., European and Japanese vendors of hardware and software are represented in Hong Kong. In addition, many information services vendors have representation through local firms.

- Companies interviewed by INPUT in 1992 identified primarily major U.S.-based vendors (IBM, DEC, HP, American Express) as the leaders in the Hong Kong market, with a growing number of software vendors entering in the wake of improved copyright controls.
- Unlike Japan, Australia or the major Latin American countries, there are very few local vendors who are major factors in this market.
- The major accounting firms also have information services offices in Hong Kong.

The demand for professional services will grow as emigration of technical and professional staff continues, creating additional market opportunities if the staff can be provided.

Least represented are firms providing software support. Although most products are available, after-sales support is generally considered quite poor.

#### 4. IT Spending

Exhibit VIII-69 provides INPUT's estimate of Hong Kong's IT spending for 1993.

EXHIBIT VIII-69

#### Total 1993 IT Spending—Hong Kong

Budget Category	Estimated Spending (\$ Millions)
Data Communications	209
Internal Staff	939
Equipment	548
Equipment Services	104
Facilities	183
Information Services	626
<b>Total IT Spending</b>	<b>2,609</b>

Information services spending, at approximately \$2.6 billion, represents approximately 24% of the total IT budget, as noted in Exhibit VIII-70. The largest expenditures are for internal staff (36% of the IT budget) and information services (24%). Data communications represents the smallest portion of the IT budget at \$209 million and 8% of the total.

## EXHIBIT VIII-70

## 1993 IT Spending Percentages—Hong Kong

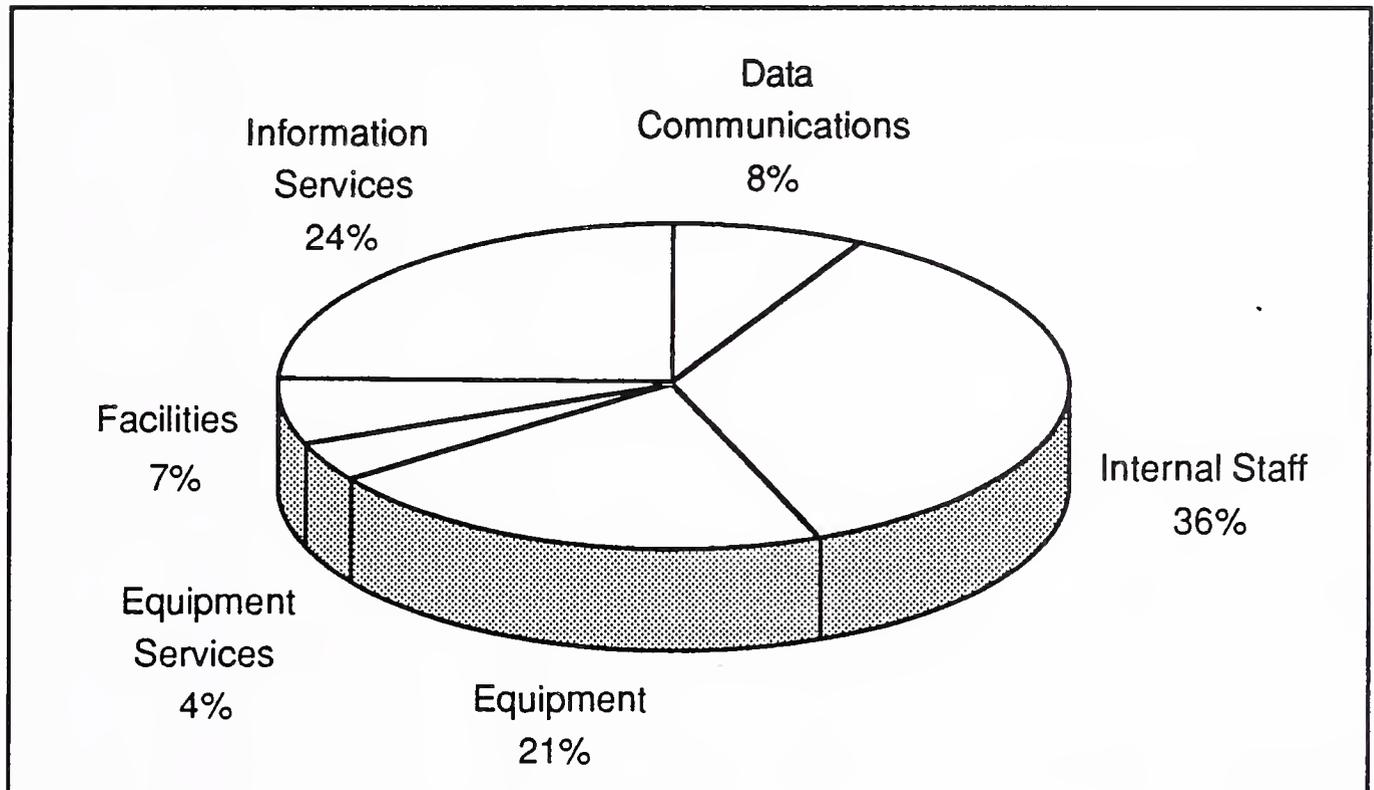


EXHIBIT VIII-71

### Information Services Industry Market Forecast by Delivery Mode Hong Kong, 1993-1998

(Note: Hong Kong reverts to China in 1997)

Delivery Modes	1992 (\$)	Growth 92-93 (%)	1993 (\$)	1994 (\$)	1995 (\$)	1996 (\$)	CAGR 93-96 (%)
Total Hong Kong Information Services Mkt.	554	13	626	706	801	894	13
<i>Professional Services</i>	115	9	125	134	145	154	7
- IS Consulting	30	7	32	34	36	38	6
- Education & Training	11	9	12	12	14	14	5
- Software Development	74	9	81	88	95	102	8
<i>Systems Integration</i>	30	10	33	38	42	44	10
- Equipment	16	6	17	19	21	22	9
- Software Products	3	0	3	4	4	4	11
- Professional Services	9	22	11	12	14	15	10
- Other	2	0	2	3	3	3	14
<i>Systems Operations</i>	27	15	31	35	39	40	9
- Platform Operations	17	12	19	22	25	25	10
- Applications Operations	10	20	12	13	14	15	8
<i>Processing Services</i>	66	8	71	75	80	84	6
- Transaction Processing	47	9	51	54	58	60	6
- Utility Processing	11	9	12	12	13	14	5
- Other Processing	8	0	8	9	9	10	8
<i>Network Services</i>	38	16	44	51	60	70	17
- Electronic Information Svcs	17	12	19	22	26	29	15
- Network Applications	21	19	25	29	34	41	18
<i>Systems Software</i>	115	20	138	165	198	235	19
- System Control	59	20	71	87	105	126	21
- Data Center Management	27	19	32	36	42	48	14
- Applications Development	29	21	35	42	51	61	20
<i>Applications Software</i>	119	14	136	155	178	202	14
<i>Turnkey Systems</i>	44	9	48	53	59	65	11
- Equipment	21	10	23	26	29	32	12
- Software Products	10	10	11	11	12	12	3
- Professional Services	13	8	14	16	18	21	14

## N India

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### 1. National Overview

India is paradoxically poor, yet an important and growing source for information software and services professionals.

Unfortunately, much of the attention the country received in 1993 for its burgeoning software industry was the result of a transoceanic scandal involving "body shops." Several western information services companies were discovered by the American media to have contracted with Indian software houses for programmers, to which the Indian firms paid substandard wages. This resulted in re-examining off-shore contracting practices, which may hurt India's growing software industry.

Overall, India is a nation with more than 100 million middle-class people and, while still considered a developing nation, is an open and growing market for consumer products, including televisions, cellular telephones and computing systems.

India's citizens have become so hungry for western ideas and technology that cities such as Bombay and New Delhi have growing numbers of pirate satellite television stations.

"Dishwallas," as the station operators are known, cause the Indian government some concern because these unauthorized agents buy and sell unlicensed satellite television equipment to broadcast foreign transmissions, such as CNN, via cable to as many as 600 households per operator. Dishwallas often operate from a single rented room, and are difficult for the government to track or regulate.

Economically, India has begun a journey toward true membership in the world economy, but there remains much to be done. Prime Minister P.V. Narasimha Rao and his administration implemented austerity-based reforms that reduced the government deficit and interest rate—but more reductions are needed. In addition, Rao pledged to liberalize labor laws, privatize state-owned industries and decrease the government's employee base. This raised sharp objections from trade and industrial groups and members of government bureaucracy.

Key trends in India center on the need to provide a base from which to develop the country.

- *Infrastructure development*—The country is expected to invest in the basic infrastructure development by liberalizing trade and investment policies and encouraging partnerships that will result in a transfer of technology. The government's Foreign Investment Promotion Board (FIPB) has the authority to negotiate with international companies and speed the clearance of commerce and technology proposals that are not covered by India's existing, out-of-date policies.
- *Education*—The country emphasizes data processing skills and professional development. India's goal is to export skills and capabilities, not people. Yet the existence of the "body shops," which ship Indian programmers overseas, indicates that people are still a viable export.
- *Network development*—Development of a national network is high on the list of national priorities. The country recognizes that a reliable communications capability is necessary to support multinational investment in the country. At present, myriad forms of communications-related services are available, and the government is devising and regulating standards.
- *Mini/personal computer growth*—As in many newly developing countries, personal and mini-computer systems are increasingly important to achieving automation. India has strong antipiracy and copyright laws, and when coupled with improving trade conditions should speed the influx of better and cheaper minicomputer and PC technology.

#### **a. Driving Forces**

The driving forces behind the development of information services are consistent with the 1992 report and include the following:

- *Industrial development*—India has made a commitment to changing from a rural, agrarian society to a knowledge-based society. Part of Rao's plan is to cut spending for, and subsidies to, certain industries as well as collect taxes more effectively. Problems may arise from potentially violent protests among trade unions and India's powerful farming lobby.

- *Trade liberalization*—Growth of information products and services is stimulated by recent changes in trade policies. These changes encourage investment and partnering in information technology, allowing outside firms to achieve 51% equity in partnered ventures. The Indian government's Department of Electronics (DOE) and several of the country's state governments have set up Software Technology Parks (STPs) for the introduction and assimilation of western technology. U.S. companies, such as Texas Instruments, established 100 percent export-focused software development joint ventures, although piracy and import duties as high as 110% still make it difficult to market imported software.
- *Technology transfer*—The country has expressed eagerness to enter into agreements that will permit the training and transfer of technology in a number of high-technology areas. India has particular interest in telecommunications products and services. In general, India has become more liberal about importing information technology in an effort to strengthen internal skills, which can then be exported through contract labor.
- *Software development*—The government believes its highly trained, English-speaking work force can provide resources for complex software development projects, and is receptive to cooperative development arrangements. Local nongovernmental trade associations are active and provide effective facilitation of joint ventures.

#### **b. Inhibiting Factors**

There are also a number of inhibiting factors.

- *Political instability*—With a fractious political environment, there are concerns about the country's long-term political stability. Lack of confidence in India's stability keeps a number of firms from making long-term investments that involve substantial investments in permanent infrastructure. Prime Minister Rao wrestles with a parliament that has no clear majority, antagonistic state governments and continuing violence in Kashmir.

- *Poor infrastructure*—A poor technological infrastructure reduces the willingness of many companies to invest in the country. Telecommunications capabilities remain limited, but are improving due to increasing interaction with European, North American and more advanced Asian corporations and business partners.
- *Currency convertibility*—The Finance Ministry is reviewing the Foreign Exchange Regulation Act of 1973, which put complex and comprehensive controls in place for exchanging foreign currency. The government wants to decrease the hindrances foreign companies must face when doing monetary business in India. In addition, restrictions in converting the local currency to other currencies hampers a company's ability to freely move funds to meet demands. Declines of the rupee and other major currencies substantially increased the costs of purchasing technology and services from outside the country.
- *Employment policies*—Until recently, the government provided tax incentives to firms for hiring more people. There have been no incentives for investment in technology except to export software development services.

## **2. Information Services Market Forecast**

The economy of India has steadily grown, with potential for even greater growth. INPUT projected the five-year growth in information services at 26%, which could be significantly greater within the next few years.

The market for information services in India is small today, but with economic stimulation, has the potential to become much larger. As shown in Exhibit VIII-72, the market in 1993 was estimated to be about \$400 million, a 27% growth over 1992. INPUT projects that the market will grow to more than \$1.2 billion by 1998, with a compound annual growth rate of 26%. Inflation and an unpredictable economy are countering factors.

## EXHIBIT VIII-72

## Market Forecast—India, 1993-1998

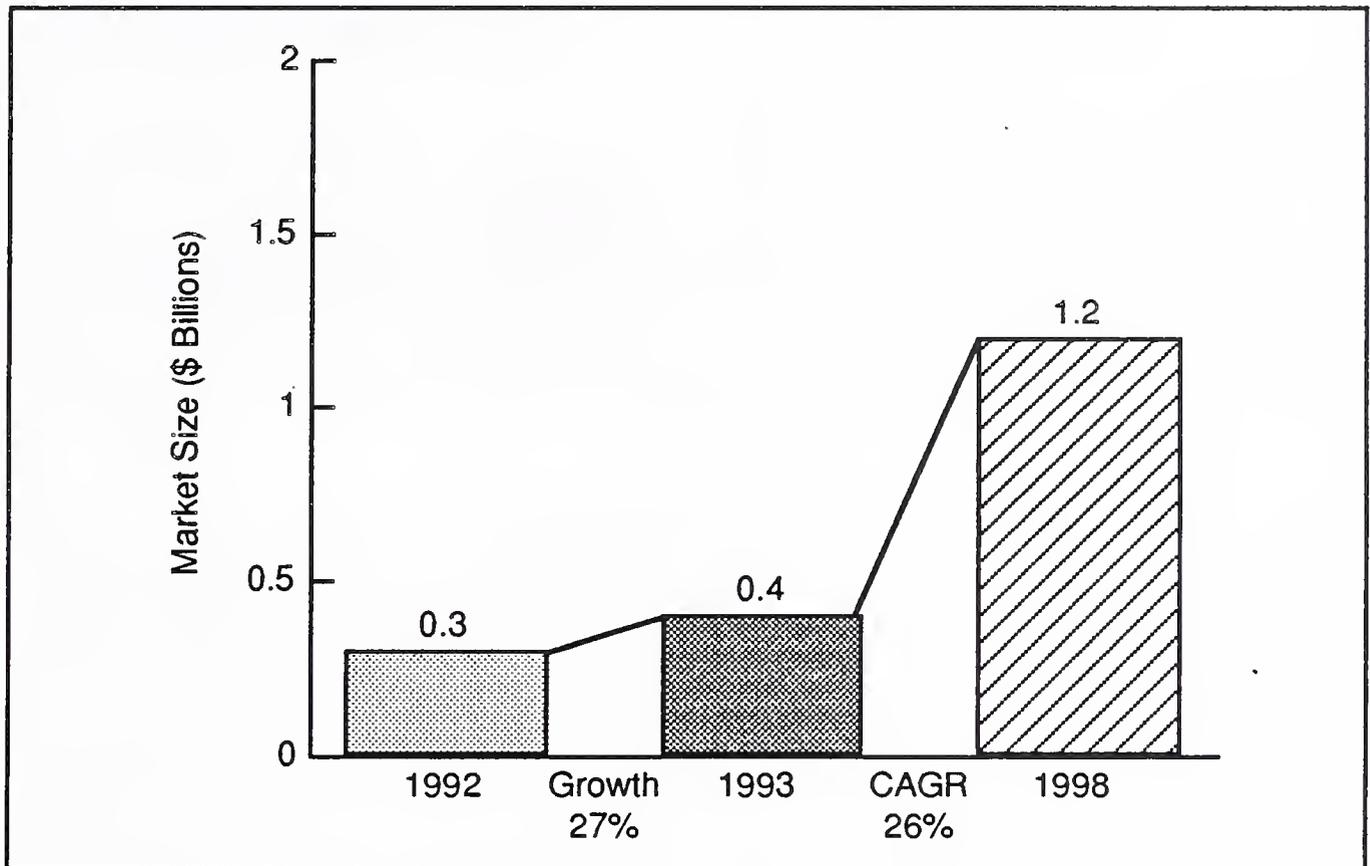
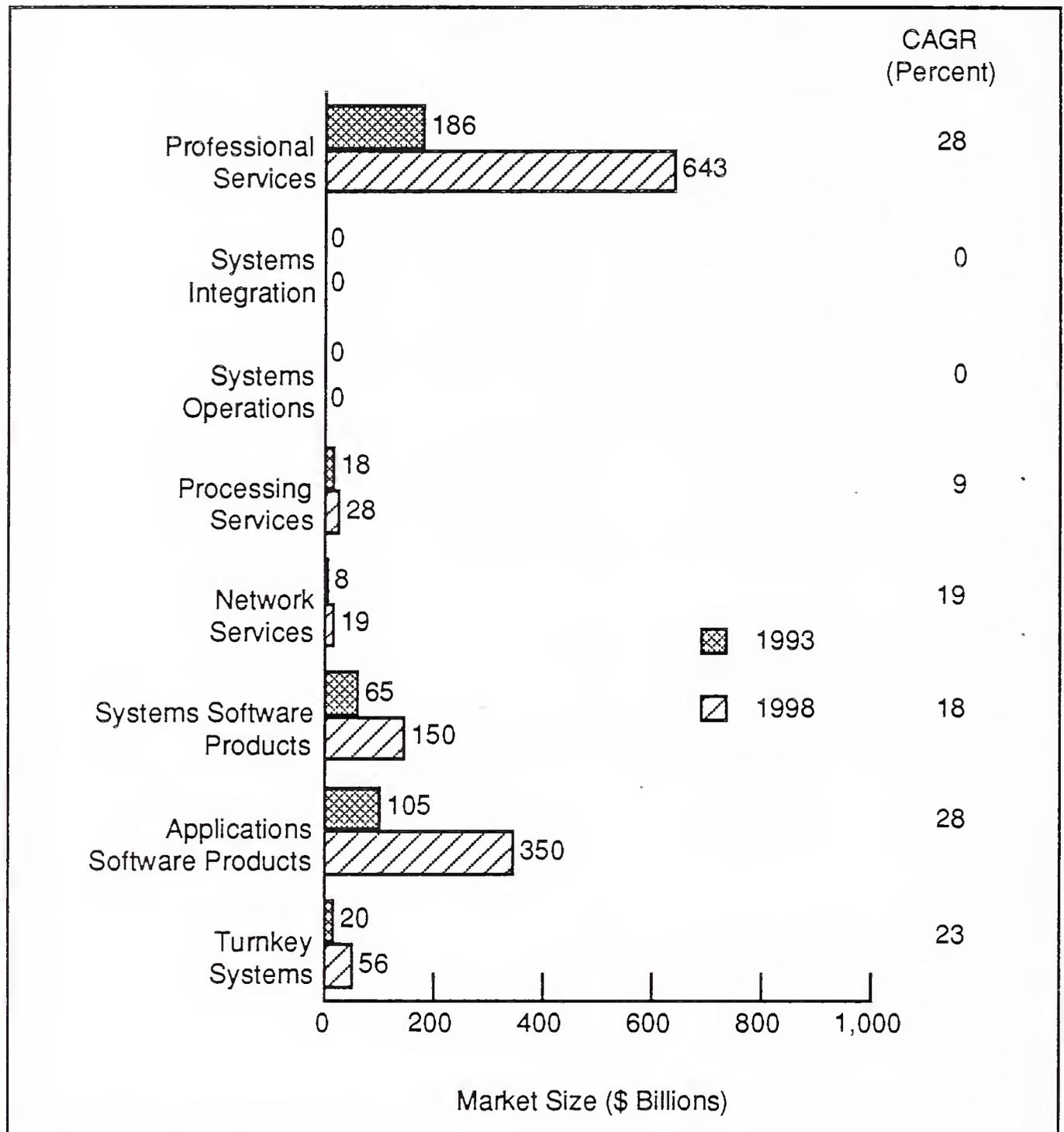


Exhibit VIII-73 provides the forecast by delivery mode. Exhibit VIII-77, at the end of this profile, provides the detail behind this forecast.

EXHIBIT VIII-73

### Market Forecast by Delivery Mode India, 1993-1998



Only a few firms provide processing services due to the small number of companies with sufficiently large processing requirements. In an industry that has a strong people-intensive orientation, there has been only limited demand for processing services. The market was a modest \$18 million in 1993.

Demand for turnkey systems results from the demand for mini- and PC-based system solutions from the few, but growing, number of companies that need integrated processing solutions. As the general economy strengthens, turnkey systems, based on

personal computer platforms, should develop into a significant market. INPUT projects growth over the next five years at a strong 23% CAGR.

The software sector is one of the bright spots in the industry and is expected to continue its strong growth pattern. Major national efforts to establish an offshore software development industry are successful, with high interest in the use and development of all types of software. The applications software market will grow from more than \$100 million in 1993 to approximately \$350 million in 1998.

There is no significant market for systems operations. Many firms large enough to consider this type of option are associated with major American or European firms, and in effect, outsource to their parent corporations. Although some projects undoubtedly would qualify as systems integration activities, no substantial market exists for systems integration, either. This situation could change over the next several years as the government automates its own processes and stimulates the information services industry.

Professional services is one of the two strongest areas of the information services market, with a growth rate of 28% per year (matching the rate for applications software). The market will grow from more than \$186 million in 1993 to almost \$650 million in 1998. It is, and will continue to be, the latest information services market segment. Its size and growth rate, in fact, drive India's total IS market.

There is high demand for professional services in India, particularly as a participant in software development efforts. In addition, consulting services are needed in the public sector to assist in developing technology-based services. A strong professional services market is key to India's goal to expand the export information services skills under contract and establish the resources to speed the education and training required to support a growing and vital information services industry.

There is a very limited network capability in India. The infrastructure is poor and there is limited demand for any of the traditional services. What demand there is results from the needs of multinational firms communicating with offices in other

countries. This modest market will grow at 19% per year, primarily as a result of starting from such a small base.

Like applications software products, the systems software products market is strong, growing at a very respectable 18% per year. The demand is driven mostly by personal and mini-computer requirements for systems control products (e.g., operating systems such as Microsoft's Windows or MS/DOS) and for application development tools to support software development.

### **3. Market Considerations**

With an underdeveloped infrastructure and limited market opportunities, full representation would be considered less than cost-effective in the short and medium terms. At the same time, the local vendor base is small.

Representation through joint ventures is recommended as the most cost-effective method of entry or expansion in the market. It is an approach that is positively endorsed by the government and local industry associations. Investments should be considered long-term.

In the short and medium terms, the greatest areas of opportunity are in the development of telecommunications and in personal computer-based applications.

Until recently, there was only limited representation by U.S. firms in India. Policies requiring Indian nations to hold majority stock in companies caused IBM to significantly reduce its representation, while others hesitated to enter the market. Recent liberalization stimulated a number of firms to re-enter the market. IBM reopened offices in major cities. Unisys continued its presence through joint-venture agreements. DEC now has representation.

The major information services companies are Indian. The leaders are Tata Consulting (also Tata Unisys) and Wipro. Both are involved in hardware and software sales and service. Tata is the largest consulting company.

Exhibit VIII-74 lists the Indian information services vendors identified by INPUT research.

## EXHIBIT VIII-74

## Selected Vendors by Delivery Mode—India, 1993

Vendor	Processing/ Network Services/ Systems Operations	Professional Services/ Systems Integration	Software Products	Turnkey Systems
CMC	✓	✓	✓	✓
Datamatics	✓			
HCL		✓		✓
IDM	✓			
Kale Consultants		✓		
Mastek		✓	✓	
NIIC	✓			
Softtek			✓	
Sonata			✓	
Tata Consultancy Services	✓	✓	✓	✓
TUL		✓	✓	
Wipro			✓	✓

#### 4. IT Spending

Exhibit VIII-75 provides INPUT's estimate of India's IT spending for 1993.

EXHIBIT VIII-75

**Total 1993 IT Spending—India**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	67
Internal Staff	517
Equipment	383
Equipment Services	133
Facilities	167
Information Services	400
<b>Total IT Spending</b>	<b>1,667</b>

Information services spending, at approximately \$1.7 billion, represents close to 24% of the total IT budget, as noted in Exhibit VIII-76. The largest expenditures are for internal staff (31% of the IT budget) and information services (24%). Data communications represents the smallest portion of the IT budget at \$67 million and 4% of the total.

EXHIBIT VIII-76

**1993 IT Spending Percentages—India**

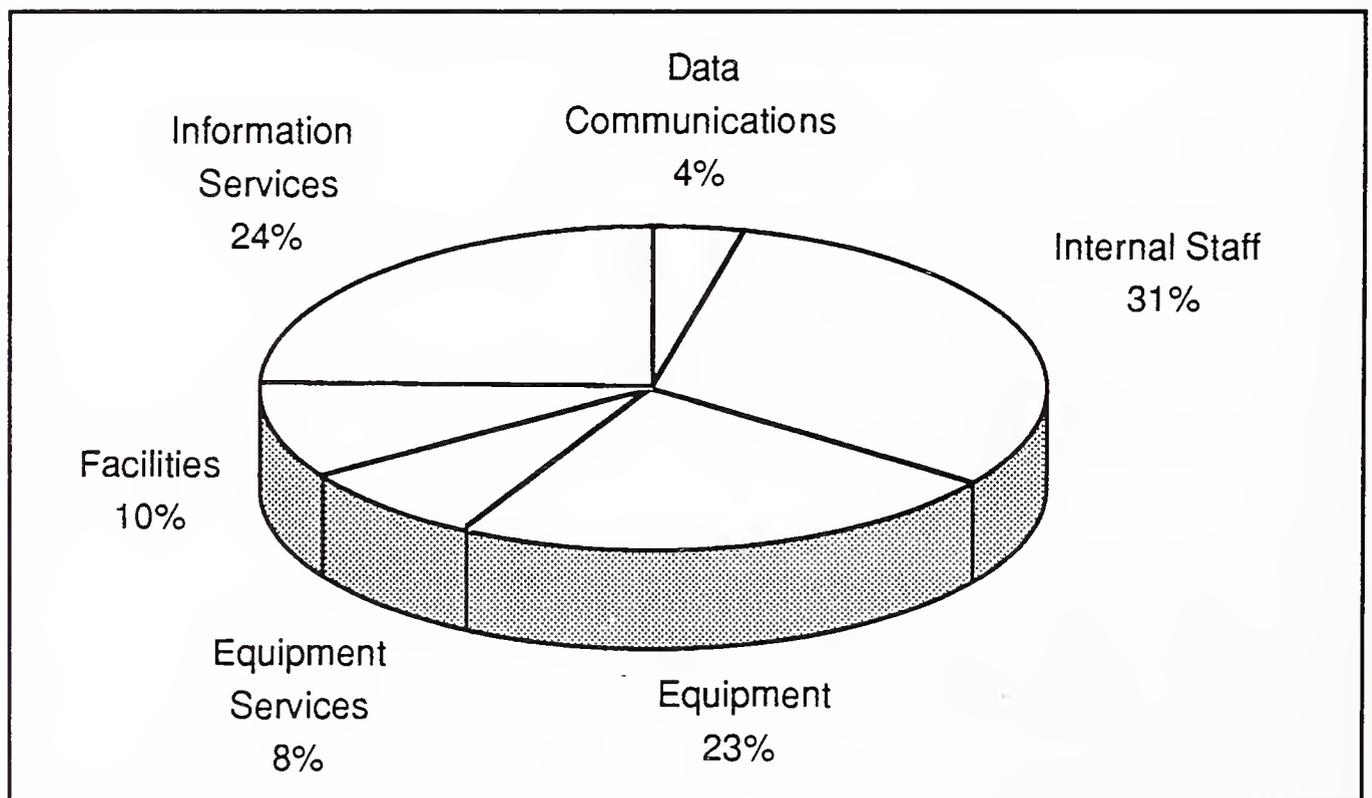


EXHIBIT VIII-77

**Information Services Industry Market Forecast by Delivery Mode  
India, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$)</b>	<b>1994 (\$)</b>	<b>1995 (\$)</b>	<b>1996 (\$)</b>	<b>1997 (\$)</b>	<b>1998 (\$)</b>	<b>CAGR 93-98 (%)</b>
Total India Information Services Mkt.	315	27	400	506	638	799	1,000	1,246	26
<i>Professional Services</i>	144	29	186	241	310	397	506	643	28
<i>Processing Services</i>	16	13	18	19	20	22	24	28	9
<i>Network Services</i>	7	14	8	10	12	14	16	19	19
<i>Systems Software</i>	54	20	65	78	93	110	129	150	18
<i>Applications Software</i>	78	32	103	133	172	219	279	350	28
<i>Turnkey Systems</i>	16	25	20	25	31	37	46	56	23

## O Italy

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### 1. National Overview

Although the Italian economy is considered to be the third-largest in Europe, its information services market is only the fourth-largest after France, Germany and the United Kingdom. Thus, the Italian information services business is still only about 60% as big as the that of United Kingdom and less than half as big as that of France, the largest single country market in Europe.

To date, with the exception of Olivetti, Italian information services firms have made little impact outside their home market.

Although Finsiel, the largest vendor, ranks in revenue as one of the top five independent information services firms in Europe, it obtains more than 95% of its business from within Italy.

During the 1980s, a dynamic expansion of the economy was based on high levels of investment, and the flexibility and drive of small and medium companies were a more important constituent of the Italian scene than most industrialized countries.

The Italian economy is noted for the high involvement of its state. Government outlays accounted for 53% of GDP in 1990, compared with the EC average of 49%. State controlled enterprises accounted for 25% of total output. In the late 1980s, an estimated 40% of industry was publicly owned. The three state holding companies had stakes in almost 1,000 companies and controlled 500 of them. In addition, there are public utilities such as railways and electricity.

External trade is less significant than elsewhere in the EC. Italian exports and imports together accounted for 20% of the GDP in 1990 as opposed to the EC average of 29%. And the economy of the South is markedly different from of the industrialized North. Southern GDP per head is only 56% of the North.

Growth rate was down in 1992 to 0.9% (1.3% in 1991), and so was inflation at 5.4% (6.5% in 1991). The current account deficit worsened again to 2.2% of the GDP in 1993. The huge fiscal deficit increased, although the government addressed the problem with a package of measures.

A devaluation of the lira took place in the currency crisis of September 1992, which affected the pound and the peseta. The lira weakened over the year, by 3.43% in relation to the U.S. dollar, against which the German mark and French franc appreciated by more than 10%.

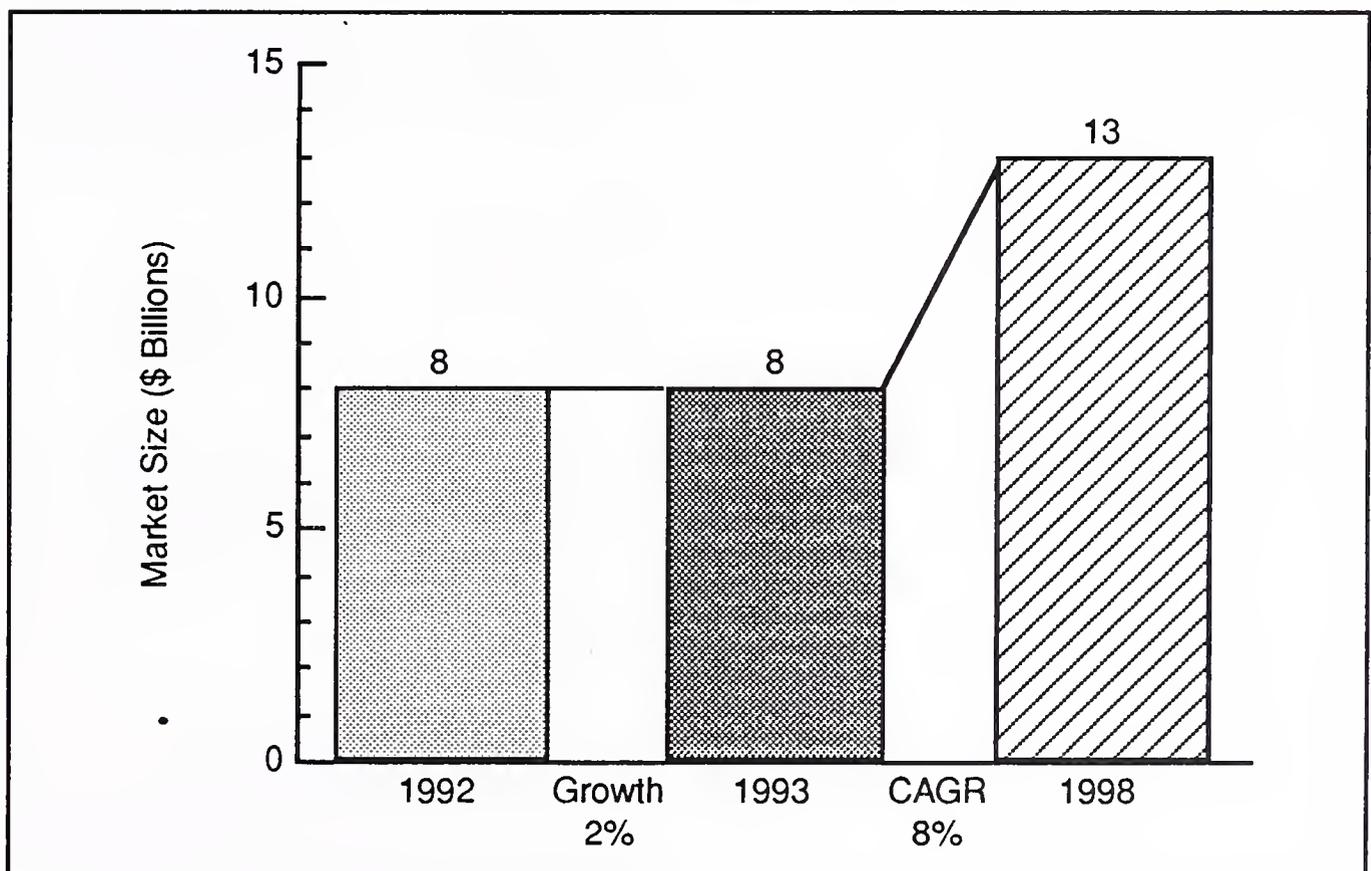
Forecasts include: lingering stagnation from 1993, but a growth rate of 1.7% in 1994, as the economies of trading partners recover; slightly declining inflation (4.5% in 1993) which will remain above the OECD average; persistent current account deficits; and above-average unemployment rates.

## 2. Information Services Market Forecast

Exhibit VIII-78 shows the overall information services industry market for Italy.

EXHIBIT VIII-78

Market Forecast—Italy, 1993-1998



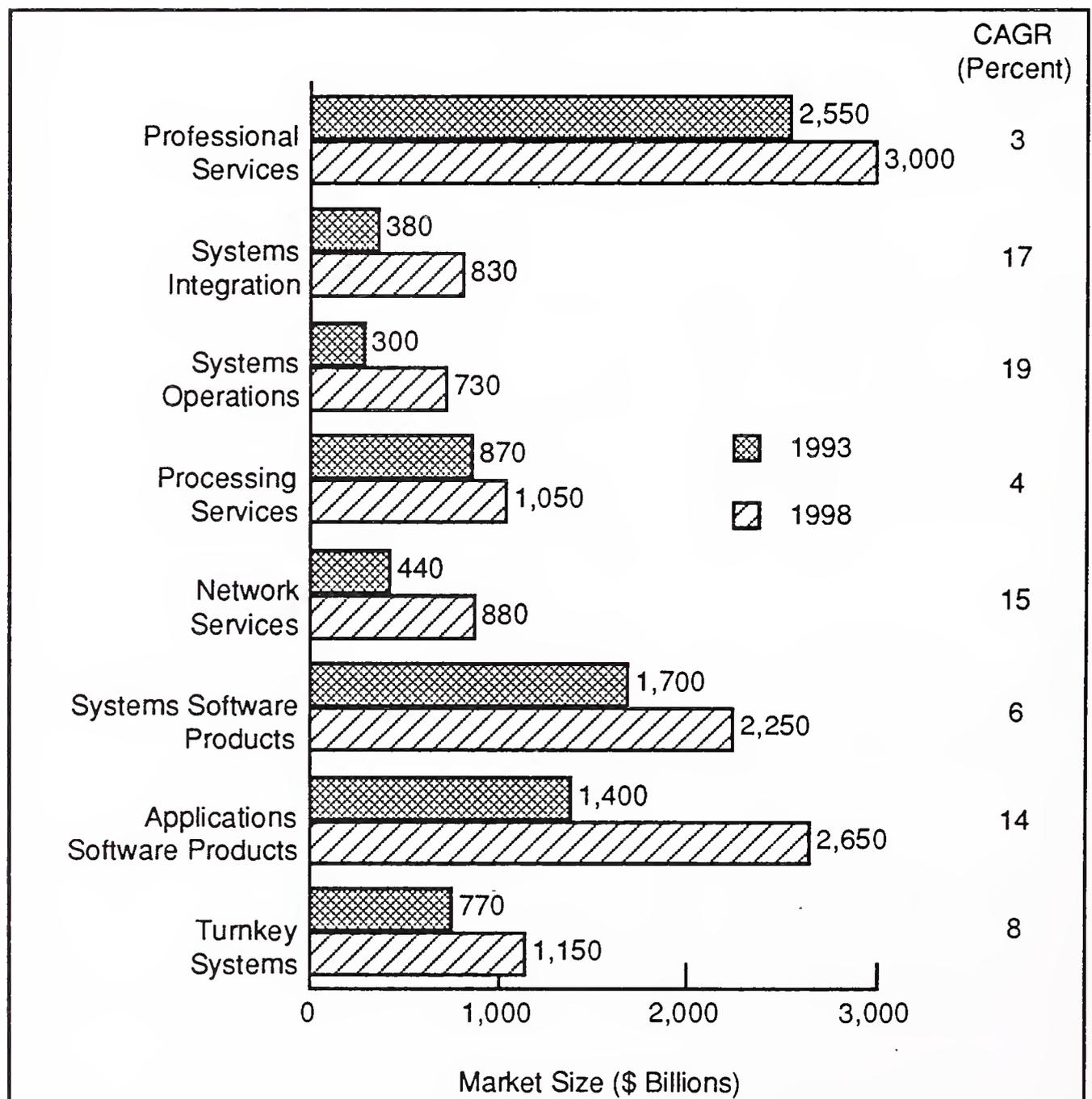
The Italian information services industry, following strong growth (around 30% CAGR) throughout the 1980s, showed only 2% annual growth between 1992 and 1993. The market size in 1993 was more than \$8 billion, growing at 6% to \$13 billion in 1998.

The Italian government initiated investment programs to support Olivetti research and development initiatives. However, it has not used public sector procurement as an instrument to support the information technology industry. Although the public sector is the largest customer of the computer industry, government expenditure on computers has grown less rapidly than the commercial market. Demand for computer software and services, once largely unaffected by macroeconomic and general investment trends, has now reached a size and level of penetration that subjects it strongly to these influences.

Exhibit VIII-79 provides the forecast by delivery mode. Exhibit VIII-83 provides the forecast in greater detail.

EXHIBIT VIII-79

**Market Forecast by Delivery Mode  
Italy, 1993-1998**



As with the rest of Europe, systems integration, systems operations and network services (specifically network applications services) offer the highest level growth opportunities.

In comparison with the whole of Europe, the Italian market is particularly strong in both software products sectors, despite a reputation within Italy of widely accepted software piracy.

Professional services is another delivery mode that represents a larger share of the overall information services market within Italy as compared to Europe. Correspondingly, the turnkey systems sector is proportionally lower in Italy, only 8% of the market, compared to a European average of 16%. Italian users want an individual solution, albeit based upon a standard applications package, to meet system needs.

### **3. Market Considerations**

Exhibit VIII-80 lists the leading 10 organizations active in the Italian information services market. This exhibit demonstrates the high representation of indigenous vendors with the following exceptions:

- U.S.-owned companies, primarily computer system vendors, are strongly represented, reflecting their dominance of the systems markets.
- Similarly, the software and services businesses of two other European-owned equipment vendors, Bull and Siemens-Nixdorf, are also represented.

EXHIBIT VIII-80

## Leading Information Services Vendors—Italy, 1993

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	1,301	15.5
2	Finsiel	Italy	867	10.3
3	Olivetti	Italy	735	8.8
4	Digital	U.S.	353	4.2
5	Bull	France	265	3.2
6	Siemens-Nixdorf	Germany	176	2.1
7	Andersen Consulting	U.S.	154	1.8
8	Microsoft	U.S.	140	1.7
9	Reuters	U.K.	118	1.4
10	Computer Associates	U.S.	96	1.1
	Total Listed		4,205	50.1
	Total Market		8,400	100.0

Finsiel was the leading European information services vendor with Italian noncaptive revenues of more than \$1 billion in 1992. Majority state ownership of this company, the largest domestic Italian vendor, was changed in 1993 to put it under the control of the state-owned telephone company STET. Finsiel controlled 10% of the overall Italian market, specializing in processing services and customized software development. More than 50% of its total revenues come from government clients, and it is trying to diversify into more commercial sectors.

Olivetti, the Italian equipment vendor specializing in PCs and minicomputers, was the third-largest information services vendor in 1993 with revenues of nearly a half billion lira. Despite falling revenues and losses in the parent group, software and services grew, largely through its subsidiary, Olivetti Information Systems (OIS).

#### 4. IT Spending

Exhibit VIII-81 provides an estimate of Italy's total IT spending for 1993.

EXHIBIT VIII-81

**Total 1993 IT Spending—Italy**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	2,150
Internal Staff	9,500
Equipment	6,000
Equipment Services	2,600
Facilities	3,300
Information Services	7,900
<b>Total IT Spending</b>	<b>31,450</b>

Information services, which includes software products, represents approximately 25% of the total IT budget, as noted in Exhibit VIII-82. The largest expenditure is for internal staff (31% of the IT budget). Equipment is third-largest (19%). Data communications represents the smallest portion of the IT budget at \$2.1 billion and 7% of the total.

EXHIBIT VIII-82

**1993 IT Spending Percentages—Italy**

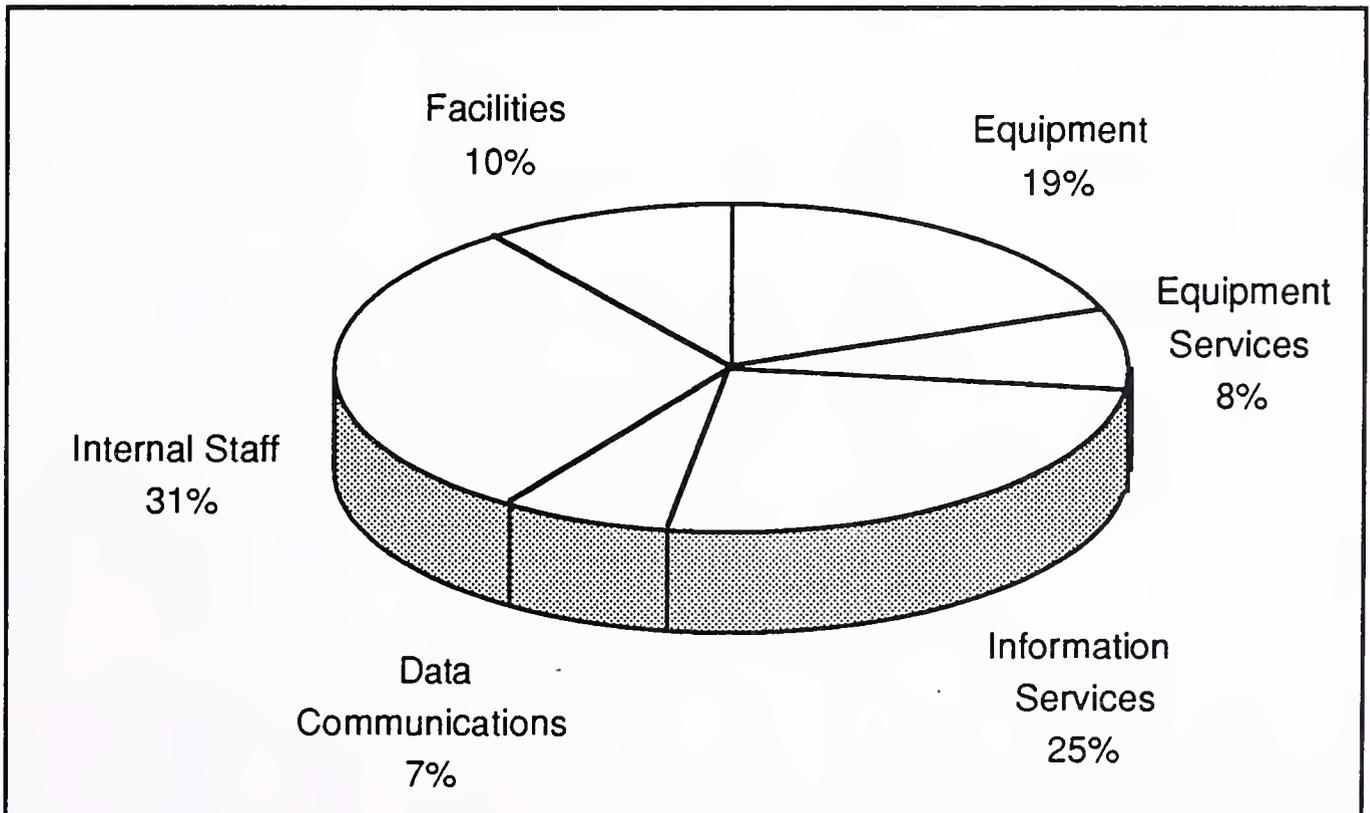


EXHIBIT VIII-83

**Information Services Industry Market Forecast by Delivery Mode  
Italy, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$M)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$M)</b>	<b>1994 (\$M)</b>	<b>1995 (\$M)</b>	<b>1996 (\$M)</b>	<b>1997 (\$M)</b>	<b>1998 (\$M)</b>	<b>CAGR 93-98 (%)</b>
Total Italy Information Services Mkt.	8,200	2	8,400	8,900	9,500	10,500	11,500	12,500	8
<i>Professional Services</i>	2,650	-4	2,550	2,500	2,550	2,700	2,900	3,000	3
- IS Consulting	330	12	370	390	420	470	540	620	11
- Education & Training	180	0	180	180	190	210	230	250	7
- Custom Software	2,100	-5	2,000	1,900	1,900	2,000	2,100	2,100	1
<i>Systems Integration</i>	330	15	380	430	510	600	700	830	17
- Equipment	90	11	100	110	130	140	150	170	11
- Software Products	81	22	99	125	160	205	270	350	29
- Professional Services	150	13	170	180	210	240	260	280	10
- Other	7	0	7	10	13	16	21	26	30
<i>Systems Operations</i>	260	15	300	350	420	510	600	730	19
- Platform Operations	100	10	110	120	140	170	200	240	17
- Application Operations	120	17	140	170	200	240	270	330	19
- Desktop Services	9	22	11	14	18	22	27	34	25
- Network Management	30	33	40	50	60	80	100	130	27
<i>Processing Services</i>	870	0	870	890	930	960	1,000	1,050	4
- Transaction Processing	780	0	780	790	820	850	890	920	3
- Utility Processing	10	0	10	10	10	10	10	10	0
- Other Processing	80	0	80	90	100	100	110	120	8
<i>Network Services</i>	400	10	440	500	570	650	770	880	15
- Electronic Info Services	280	4	290	310	330	350	380	380	6
- Network Applications	120	25	150	190	240	300	390	500	27
<i>System SW Products</i>	1,600	6	1,700	1,800	1,900	2,000	2,150	2,250	6
- Mainframe	640	5	670	660	650	620	560	470	-7
- Minicomputer	530	6	560	590	630	660	710	760	6
- Workstation/PC	410	15	470	550	640	740	870	1,010	17
<i>Application SW Products</i>	1,300	8	1,400	1,650	1,750	2,000	2,350	2,650	14
- Mainframe	120	-8	110	110	100	100	90	90	-4
- Minicomputer	380	3	390	420	470	500	550	540	7
- Workstation/PC	800	13	900	1,100	1,200	1,400	1,700	2,000	17
<i>Turnkey Systems</i>	780	-1	770	810	850	930	1,050	1,150	8
- Equipment	390	0	390	410	430	450	470	490	5
- Software Products	200	-5	190	200	210	240	280	320	11
- Professional Services	190	0	190	200	210	240	280	320	11

**P****Japan****1. National Overview**

Whether Morihiro Hosokawa will be in office by the end of 1994 is less important than the victory he represents. Hosokawa is the first Japanese prime minister in 38 years who is not a member of the Liberal Democratic Party (LDP). That the non-LDP parties were able to form a coalition to put Hosokawa in office is a clear indication of the change many Japanese view as necessary to rescue their beleaguered economy.

When the bubble burst, the Japanese economy was enjoying average annual growth of around 4%. It grew less than 1% in 1993, and will only grow 1.6% in 1994. During 1993, Japan's finance ministry succeeded in quelling panicky rumors of a national financial crisis by propping up the Nikkei with new equity issues, seeding it with funds from the government's postal savings system. This system is a virtual money tree that holds roughly \$1.5 trillion in deposits that can easily support the system.

Japan's banks are wrestling with an estimated \$400 billion in bad loans and losses, vastly inflated stock prices and real estate values, results from the expanding bubble of the 1980s. The Japanese banking and insurance industries are the largest consumers of information services and software, occupying nearly 30% of the market. The flailing economy has caused most firms to curtail all new systems development.

The finance ministry's goal is to support the Nikkei enough to keep the index at, or above, 17,000. If it stays at this level long enough in 1994, the government is confident few banks will fail, and larger firms will be able to acquire their junior competitors. Property owners and developers will also be protected, as any run to divest real estate will drive prices down and further deflate the economy.

With the finance ministry's support and judicious limits on loans and expenditures, Japan's finance industry will recover during 1994 and into 1995. However, the Japanese worker is now faced with the reality that labor is an expense that must be controlled. Japanese unemployment lingered at 2.5% during 1993, yet during

the year, the number of applicants seeking a given opening went from one to two.

Japanese business can no longer afford to guarantee employment for life, particularly when the average production worker in Japan costs 25 times more than a Vietnamese counterpart. Japan's major corporations employ an estimated 1 million surplus or unwanted workers who have contributed to more than four years of declining profits. Unemployment in 1994 is likely to surpass the official 1993 rate not only from work force downsizing, but also from a job market that is already shrinking as Japanese manufacturers build new factories and pay lower wages in cheaper countries such as Thailand and Vietnam.

#### a. Driving Forces

In addition to the discussion above, the following forces are causing changes in the Japanese economy:

- *Globalization*—Rice is such a simple commodity, yet it has become a symbol for the external pressure exerted on Japan to open its markets, and the resistance this has caused internally. The Clinton administration applied consistent pressure during 1993 for Japan to lower trade barriers. During talks in November 1993, Prime Minister Hosokawa announced a plan for Japan to ease or eliminate 475 government, legal and economic regulations that have restricted foreign imports. Progress on these reforms is expected to be slow.
- *Increasing competition*—Japanese products are no longer the cheapest produced in the world. Expensive Japanese labor has made it more difficult for manufacturers to sell cheaply with an acceptable profit. Therefore, Japan is investing more in foreign factories and labor, with China being a primary target. In semiconductors, Japan now faces increased competition from the U.S., which has captured 20% of the Japanese market.
- *Outsourcing*—With an ailing economy, Japanese businesses have found it increasingly desirable to use outsourcing services rather than invest in their own technology.

- *Government policies*—In August 1993, the Japanese Ministry of International Trade and Industry (MITI) announced a program to fund software development, which the government admits lags far behind the country's computer hardware industry. Starting in April 1994, funding will be available to universities and educational institutions, which must codevelop software with private companies. MITI also has plans to provide low-rate loans to private software companies to further stimulate software development.

#### **b. Inhibiting Factors**

Despite strong growth, a few inhibiting factors continue to be a modest retarding force.

- *Economic caution*—Japanese companies err on the side of caution when it comes to new investment, including information technology. Japanese computer systems are still largely mainframe-based, and the cost of replacing them is considered prohibitively expensive and unnecessary. However, with less hiring and more dismissals, Japanese companies will eventually have to invest in systems to compensate for a streamlined work force.
- *Domestic software development capabilities*—The Japanese software industry suffered greatly when the nation's economy stumbled. Numerous small software houses went bankrupt in 1992 and 1993, largely because many software projects were scaled back or canceled when hard times arrived. Also, many large businesses are doing more in-house software development, and using outside contractors sparingly. The MITI development program discussed above may provide a remedy for the software industry's troubles.
- *"Japan-bashing"*—Trade issues and its economic problems increased the amount of severe criticism leveled at Japan by the U.S. and other countries. In the face of decreased competitiveness and fiscal woe, the Japanese continue to slowly and grudgingly alter their trade practices and are perceived as unreasonable and difficult.
- *Language*—Japan's highly complex language, with its three alphabets and emphasis on oblique, unspoken communication, poses a stumbling block for foreign business relationships.

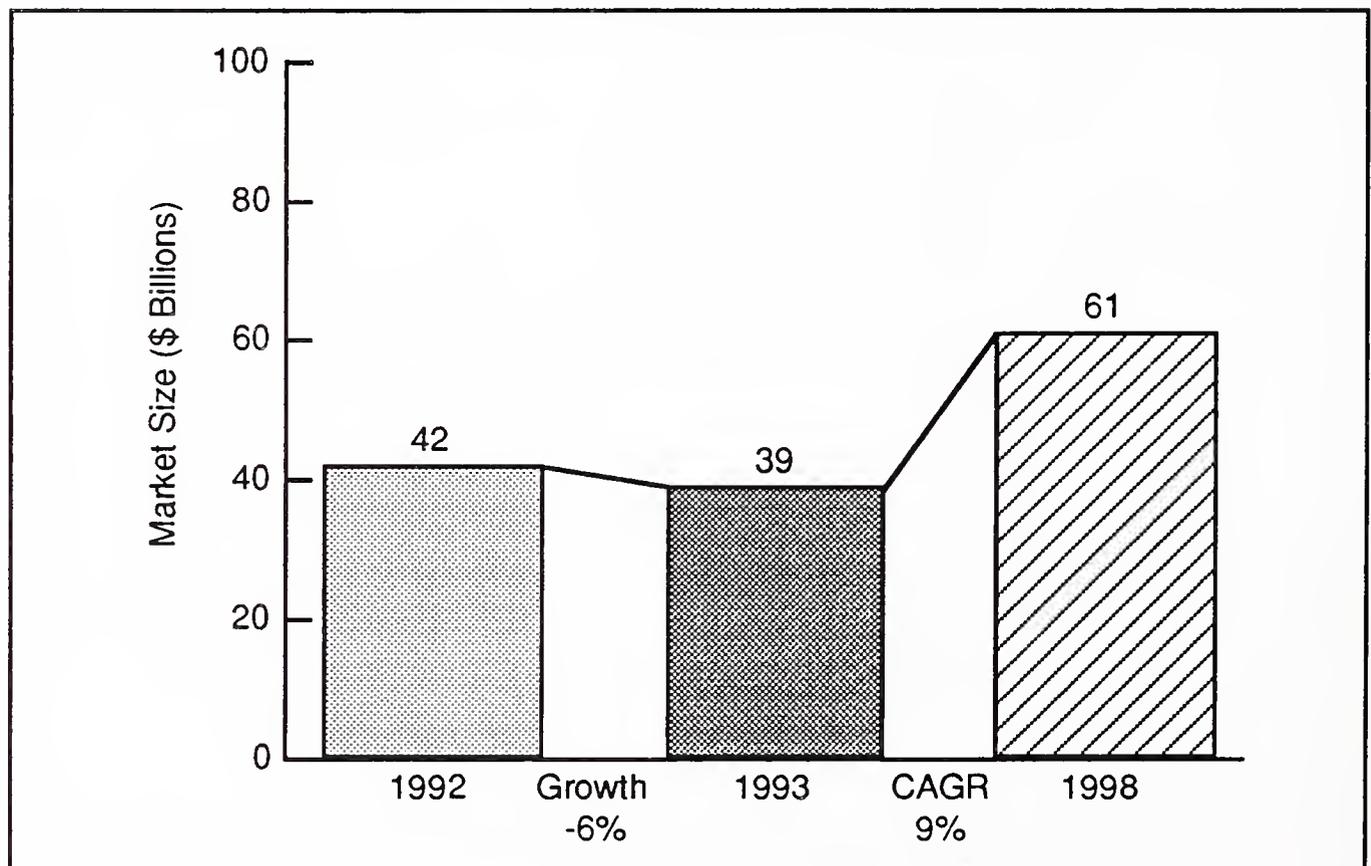
## 2. Information Services Market Forecast

The information services industry experienced strong growth in 1991, but slowed to almost no growth in 1992. In 1993, the downward trend continued, and the information services market declined by 6%, as indicated in Exhibit VIII-84. This decline paralleled Japan's economic difficulties, but budget and management constraints now being implemented will allow a slight 1% growth in 1994.

Long-term, the market for information services in Japan is projected to grow from an estimated \$39 billion in 1993 to more than \$61 billion in 1998. The overall growth rate is estimated at a conservative 9%. This is 4% lower than 1992's forecasted growth rate. INPUT has lowered its five-year projection for Japan to 9% in the belief that the slowdown in the overall economy will continue through 1994. Renewed growth is expected after that.

EXHIBIT VIII-84

Market Forecast—Japan, 1993-1998



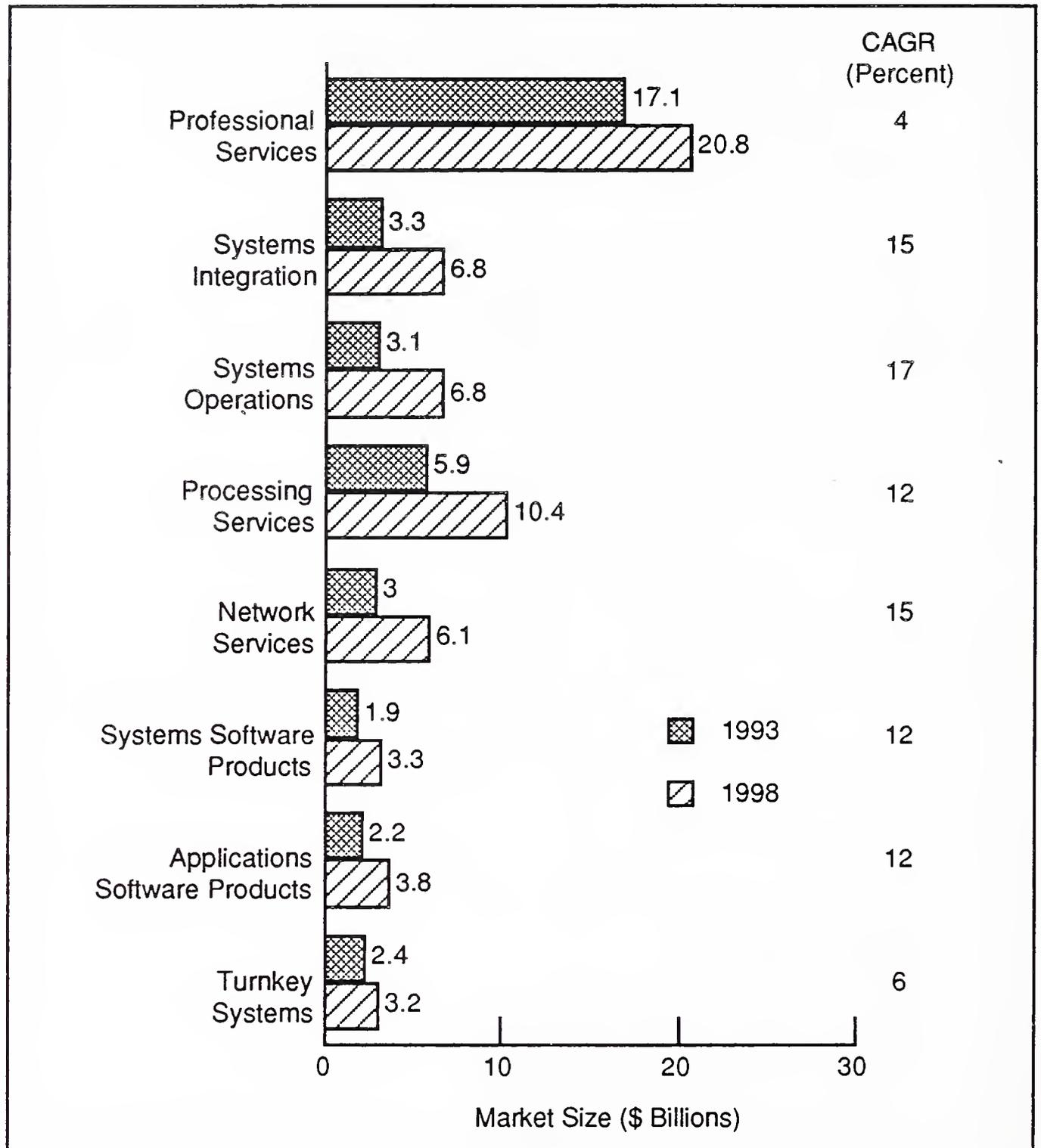
In spite of Japan's current economic difficulties, the major information services trends that impact Japan will provide the stimulus for growth in this industry. Downsizing, outsourcing, networking and open systems are all areas of concern and opportunity. For instance:

- *Downsizing*—The IS function has been traditionally centralized in Japanese corporations, but with growing concern about economic growth and costs, downsized and distributed computing capabilities are gaining interest. As Japanese industry considers responses to economic pressures, full employment and centralized processing, other traditional practices are coming under review.
  - INPUT expects the near-term benefits of outsourcing to act as a catalyst, driving the downsizing trend. As with American industry, many companies in Japan will return to core business activities, and IT functions will be candidates for either outsourcing or movement to user departments.
  - INPUT believes user-oriented information systems will lead to more dependence on vendors than in-house IS functions. This will be especially true for the development of client/server-based systems.
- *Outsourcing*—As noted above, while Japanese firms have traditionally made use of subcontractors, the concept of entering into a partnership for managing IS functions is relatively new. There will be significant growth in this area as companies increasingly explore outsourcing opportunities, particularly where it is possible to obtain some significant near-term reduction in operating costs.
- *UNIX*—The UNIX operating environment has attracted attention because it provides a basis for Japan to develop software products for sale on an international basis. The UNIX operating environment allows Japan to stay outside the market defined by IBM operating systems and still compete on an international scale.

Exhibit VIII-85 provides the forecast by delivery mode. Exhibit VIII-89, at the end of this profile, provides the detail behind this forecast.

EXHIBIT VIII-85

**Market Forecast by Delivery Mode  
Japan, 1993-1998**



In 1993, the Japanese market for information services declined slightly from 1992. INPUT estimates the compound annual growth rate (CAGR) over the next five years to be approximately 9%. This is significantly lower than the rate achieved in the last decade, but still a solid growth scenario given the turbulent nature of the Japanese economy over the last two years and the dominant size of the Japanese market in comparison to other Pacific Rim nations.

Analysis of the delivery modes for the Japanese market indicates two key differences between the market in Japan and in other countries:

- The percentage represented by systems integration and professional services remains at more than 52% of the information services industry. The much higher percentage of professional services is attributable to the high level of custom software development in Japan.
- The 1993 market for systems and applications software products in Japan totaled \$4 billion and represented approximately 10% of the total information services market, compared to an estimated 34% in the United States. The low percentage is attributable to three reasons:
  - The Japanese place great emphasis on reliable software and expend considerable effort to ensure product reliability. The Japanese are frequently displeased with the quality of foreign software products and continue to develop them (primarily in-house).
  - The Japanese generally prefer products that are industry- and task-specific, as compared to more generalized packaged software available in the U.S. and Europe.
  - The differences in language cause the Japanese considerable problems. Frequently, documentation and programs must be translated into Japanese to be fully usable.

Only recently has a true software products industry begun to develop in Japan. In the second half of the decade, the software products markets are expected to slowly increase their share of the total market within Japan, to 12% by 1998. This growth will be further accelerated by the shift to open systems and client/server technologies.

This represent the second-largest category of information services. The estimated market for processing services is approximately \$5.9 billion in 1993 and will grow to nearly \$10.4 billion by 1998.

In 1993, applications software product revenues were approximately \$2.2 billion. This market is expected to grow to

approximately \$3.8 billion by 1998, at a CAGR of 12%. This growth rate has decreased from 15% in the 1992 report due to recessionary impacts. However, the willingness to buy packaged software is growing and software developers are gaining ground.

Systems software is expected to grow at the same rate as applications software, from \$1.9 billion in 1993 to \$3.3 billion by 1998. The CAGR for systems software products will be 12%, with the CAGR for application development tools at 13% and systems control products at 14%.

Turnkey systems will grow at 6%, from \$2.4 billion in 1993 to \$3.2 billion in 1998. The growth will be driven by increased emphasis on computerization by medium-sized and smaller companies, which will place greater emphasis on tailoring software to meet specific needs, rather than using standard packaged software.

The market for systems integration services is expected to grow at 15%, from \$3.3 billion in 1993, to an estimated \$6.8 billion in 1998. This market is well established in Japan. It will see significant growth in a post-recessionary scenario as users become more involved in the development process through downsizing efforts. In the market for systems integration services, all services except "other" are expected to have growth rates in the 14% to 16% range, reflecting continued emphasis on the development of custom software to meet specific needs.

As in the past, professional services is the dominant delivery mode in the Japanese information services market. With 1993 revenues of \$17.1 billion, it represents 44% of the total market. And even with growth projected at only 4% per year, it will reach \$20.8 billion in 1998. At that point, professional services will make up 34% of the market. As the dominant professional services offering, software development will experience moderate growth—a result of the growing trend toward acceptance of applications and systems software products. Growth in these markets will modulate the growth of professional services.

As a percentage of the information services industry, network services are comparatively small (8%). Independent VANs are relatively scarce and companies have traditionally developed private networks with their trading partners. However, the five-year rate of growth is expected to be 15%, from an estimated \$3.0 billion in 1993 to \$6.1 billion by 1998.

As noted earlier, the concept of outsourcing the complete (or large portions of) the IT function is relatively new to Japan, but gaining growing acceptance as a result of economic and business pressures. As a result of this recognition, expenditures in 1993 were \$3.1 billion, growing at a CAGR of 17% to \$6.8 billion in 1998.

### 3. Market Considerations

The conditions and opportunities identified in the 1992 report are somewhat different than those seen at this point in time. While some regulations and constraints on market entry have eased and more progress is promised, current economic conditions have heightened competition. Nevertheless, Japan represents the second-largest information services market worldwide. Consequently, any serious international vendor not already present in the market must consider an entry strategy.

Whether now is an appropriate time is debatable, given the tough economic conditions. Nevertheless, there is a continuing receptivity to outside providers of software and services, yet the same guidelines listed in earlier reports apply.

- *Long-term investment*—Any investment should be considered very long term. Significant value is placed on relationships in Japan and developing relationships can require extended time.
- *Japan-specific products*—Generic products and services will generally meet with little success. To be successful, products and services must reflect the differences in the way business is conducted in Japan and the Japanese language.
- *Creative products*—Products that provide only basic services will not meet with great success. Japanese industry is creative and looks for products that will meet future goals rather than just immediate needs.
- *Vertical-industry knowledge*—To be successful in a vertical industry, a high degree of industry knowledge is required. With the exception of the medical industry, generalized industry products are not expected to compete successfully.
- *Unique personal computers*—Most PCs in Japan have been adapted to provide Japanese language support. IBM Japan has converted its PCs to meet local requirements.

- *Distributor agreements*—Considering the high cost of startup and marketing, distributor and partner agreements are recommended as the best means of market entry.

Key opportunities are expected for the following products and services:

- *CASE/DBMS products*—Development tools and database products are expected to have the highest growth in the near term.
- *Client/Server products*—Systems are expected to support the emerging trend toward downsizing.
- *Project management systems*—Products to manage large, complex development efforts are expected to be in great demand over the next several years.

There are numerous large and small vendors of information products and services in Japan, including representatives from the majority of the large foreign companies. However, the majority of the market is dominated by several large companies. The leading vendors are listed in Exhibit VIII-86.

## EXHIBIT VIII-86

## Leading Information Services Vendors—Japan, 1993

Vendor	Revenue (\$ Billions)
NTT Data	3.09
Nomura Research	1.05
Hitachi Information Systems	0.86
CSK	0.68
Hitachi Software Engineering	0.68
Japan Research Institute	0.63
Quick	0.58
INTEC	0.53
Toyo Information Systems	0.51

**4. IT Spending**

Exhibit VIII-87 provides INPUT's breakdown of Japan's IT spending for 1993.

EXHIBIT VIII-87

**Total 1993 IT Spending—Japan**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	15,941
Internal Staff	65,537
Equipment	37,197
Equipment Services	8,856
Facilities	10,628
Information Services	38,968
<b>Total IT Spending</b>	<b>177,127</b>

Information services spending, at \$39 billion, represents 22% of the total IT budget, as noted in Exhibit VIII-88. The largest expenditures are for internal staff (37%), information services (22%) and equipment (21%). Equipment services represents the smallest portion of the IT budget at \$8.9 billion and 5% of the total.

EXHIBIT VIII-88

**1993 IT Spending Percentages—Japan**

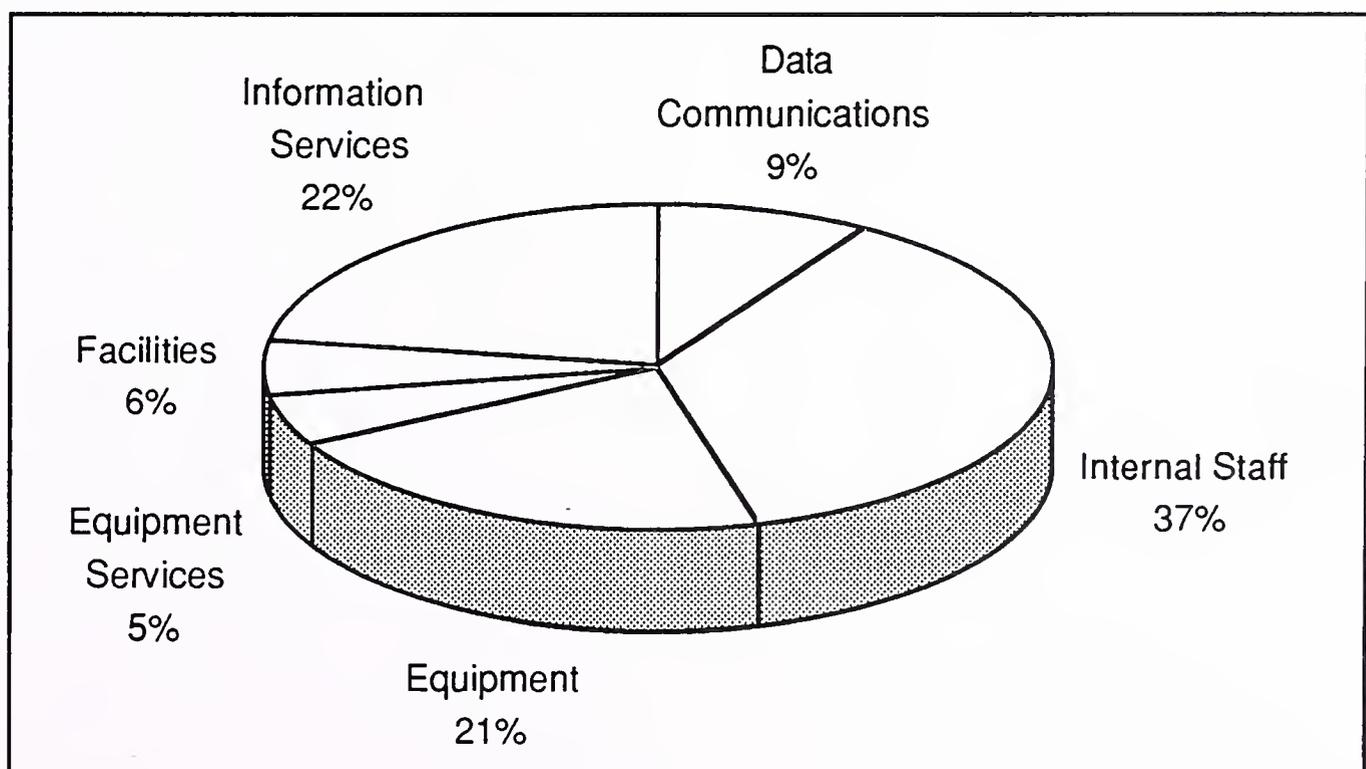


EXHIBIT VIII-89

**Information Services Industry Market Forecast by Delivery Mode  
Japan, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$)</b>	<b>1994 (\$)</b>	<b>1995 (\$)</b>	<b>1996 (\$)</b>	<b>1997 (\$)</b>	<b>1998 (\$)</b>	<b>CAGR 93-98 (%)</b>
Total Japan Information Services Mkt.	41,536	-6	38,968	39,448	43,816	48,832	54,560	61,144	9
<i>Professional Services</i>	18,504	-8	17,072	17,072	17,928	18,824	19,768	20,760	4
- IS Consulting	1,112	-5	1,056	1,088	1,120	1,160	1,200	1,248	3
- Education & Training	736	-5	696	712	728	744	760	784	2
- Software Development	16,656	-8	15,320	15,272	16,080	16,920	17,808	18,728	4
<i>Systems Integration</i>	3,400	-2	3,320	3,488	4,112	4,856	5,728	6,760	15
- Equipment	1,184	-2	1,160	1,240	1,440	1,696	1,992	2,336	15
- Software Products	344	-2	336	360	416	480	560	648	14
- Professional Services	1,784	-2	1,744	1,800	2,168	2,584	3,072	3,664	16
- Other	88	-9	80	88	88	96	104	112	7
<i>Systems Operations</i>	3,192	-2	3,128	3,288	3,944	4,736	5,680	6,816	17
- Platform Operations	2,872	-2	2,816	2,928	3,520	4,240	5,096	6,136	17
- Applications Operations	320	-3	312	360	424	496	584	680	17
<i>Processing Services</i>	6,048	-2	5,920	5,920	6,808	7,832	9,008	10,360	12
- Transaction Processing	5,144	-2	5,040	5,032	5,840	6,784	7,872	9,136	13
- Utility Processing	304	-3	296	296	296	288	288	288	-1
- Other Processing	600	-3	584	592	672	760	848	936	10
<i>Network Services</i>	3,176	-5	3,016	3,168	3,736	4,408	5,200	6,136	15
- Electronic Info Svcs	1,576	-5	1,496	1,616	2,016	2,336	2,712	3,144	16
- Network Applications	1,600	-5	1,520	1,552	1,720	2,072	2,488	2,992	15
<i>Systems Software</i>	2,088	-10	1,880	1,880	2,160	2,488	2,864	3,296	12
- System Control	816	-10	736	736	872	1,032	1,232	1,448	14
- Data Center Mgt	752	-10	680	680	744	816	888	976	7
- Applications Dvlpmt	520	-11	464	464	544	640	744	872	13
<i>Applications Software</i>	2,408	-9	2,192	2,192	2,520	2,896	3,328	3,824	12
<i>Turnkey Systems</i>	2,720	-10	2,440	2,440	2,608	2,792	2,984	3,192	6
- Equipment	896	-11	800	784	800	824	848	880	2
- Software Products	1,088	-10	976	984	1,064	1,112	1,144	1,208	4
- Professional Services	736	-10	664	672	744	856	992	1,104	11

## Q

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**Mexico****1. National Overview**

The passage of the North American Free Trade Agreement (NAFTA) in 1993 provides major new opportunities for U.S. and Canadian information technology companies to market computer systems and information services in Mexico—a nation of more than 90 million population—and develop Mexico as a manufacturing base.

Mexico's decision to seek inclusion in NAFTA surprised many, for it went against the long-standing policies of the Partido Revolucionario Institucional (PRI) party that has ruled the country in various guises for more than 50 years. Prior to the ascension of Carlos Salinas as head of the party in 1988, the PRI's economic policy was to protect Mexico's economy with monolithic foreign investment regulations, tariffs and import barriers. (While the tariffs were being phased out prior to NAFTA, they still boosted the cost of U.S. computer hardware imported into Mexico by 10% to 20% over the past year.)

Foreign investment in Mexico has been greatly encouraged by the prospect of NAFTA as well as other economic programs of President Carlos Salinas. These programs include privatization of many of Mexico's state-owned industries (the proceeds of which helped reduce Mexico's high level of public debt); tight monetary policy; reduced government spending on corporate subsidies and individual entitlement programs; and government-mandated constraints on wage and price increases.

Such programs addressed the major economic problems of Mexico since the early 1980s, when the country accumulated large external debts accompanied by a rapid rise in its annual rate of inflation, which peaked in 1987 at a level of 132%. For 1993, the annual rate of inflation dropped below 10%.

The total level of the country's long-term debt remains high, but the debt service level has declined due to lower global interest rates. Mexico's foreign debt stands at around \$130 billion, up from \$115 billion in 1992, which is probably the second highest (next to Brazil) among developing nations. The continued high level of foreign investments is helping to mitigate the potential

negative impact on the Mexican economy from the large account deficit, exacerbated by a major acceleration in imports compared to a moderate rate of export growth. This helped Salinas adhere to his strict financial policy, but also possibly led to an over-valuation of the peso. The country's weakened currency is a problem that must be addressed over the next year to deal with the rather severe problem of unemployment. However, this could also cause a temporary bottoming out in the level of decline in the annual rate of inflation.

For 1993, Mexico's real GDP grew at a 2.8-3.0% annual rate, compared to 2.6% in 1992. The inflation rate for 1993 dropped to around 9%, compared to 16.4% in 1992. Although the real GDP increased to 3% in 1991, the real GDP in Mexico averaged 1.2% between 1986 and 1990. This is below the annual growth rate of the population, estimated at 2% annually.

Mexico has a very young population and by the year 2000, three-fourths of the population could be under 29 years of age if the present rate of population growth continues. In the 1994 presidential election year, President Salinas could be under pressure to boost the economy through some reversal in the recent historical policy of economic restraint. However, passage of NAFTA is expected to be a significant stimulus to new job creation in Mexico, along with an anticipated continuing recovery in the United States economy, Mexico's largest trading partner. The U.S. recession has been a contributing factor in Mexico's lagging economy in recent years.

Essentially, NAFTA will provide, over a period a years, a nearly duty-free environment for trade between Mexico and its North American trading partners. At present, Mexico is the fourth-largest market for U.S. exports and the U.S. represents approximately two-thirds of Mexico's export market.

Anticipation of NAFTA's passage created a major expansion in Mexican and foreign company investments in Mexico in recent years, with the thought that NAFTA could make Mexico the low-cost manufacturer of North America.

Growth in Mexican real GDP for 1994 is expected to be 3.2%, with inflation possibly leveling out at the high single-digit level for the near term. The recent strength in the Mexican stock market, following the passage of NAFTA, indicates investors are

expecting the Mexican economy to be one of the better alternative international investment environments, which implies above-average GDP growth with moderate inflation.

The major sectors of the Mexican economy to benefit initially from NAFTA are expected to be the infrastructure-related industries, such as construction, telecommunications and computer technology. Multinational companies expanding their base of operations in Mexico will stimulate demand for improved telecommunications facilities as well as information systems and services. A Mexican subsidiary of DHL, for example, recently invested in a new fiber-optic telecommunications network for data, voice and video transmission, which makes its communications facilities comparable with the rest of DHL's worldwide telecommunications facilities.

Guiding factors in Mexico's push to develop its information services industry will be improving the telecommunications infrastructure and further developing interconnections with network services in the U.S. and Canada. To become a full trading partner, Mexican companies must expand the implementation of electronic data interchange and related technology beyond its existing use in the automotive manufacturing and maritime shipping industry sectors. The privatization in May 1992 of the government-controlled national public telecommunications operating company, Telmex, will greatly assist efforts to upgrade Mexico's networking capabilities.

Information technology trends in Mexico include the following:

- *Personal computer growth*—There is a major focus on personal computers as the best solution for meeting the needs of small- and medium-sized businesses. Mexico's PC growth rate is expected to stay close to 25% per year through the end of 1995.
- *Industry-specific software*—As in many countries, industry-specific applications are increasingly preferred over generic solution applications.

- *Network growth*—There is increasing emphasis on the development of nationwide networks to support EDI and E-mail services. Even though the national monopoly, Telmex, has been privatized, the current telecommunications system has significant inadequacies. The company manages approximately eight million lines with diminished transmission capacity (because of increased demand). Telmex intends to have 20 million lines by the end of the decade. In addition, the market for cable television and cellular communications is expected to show strong expansion with the development of international delivery standards.

#### a. Driving Forces

Driving forces positively affecting the development of the information services industry in Mexico include the following:

- *Trade liberalization*—Liberalization of trade policies and reduced licensing fees stimulate a higher rate of importation for information services technology. NAFTA will provide new impetus to the importation of information technology products. Mexican tariffs for U.S. produced goods, prior to NAFTA, have been considerably higher than U.S. tariffs for Mexican goods.
- *U.S. influence*—Trends and directions in Mexico are strongly influenced by U.S. information services industry trends, which have a stimulating effect on the decisions of Mexican companies. Most of the international relationships of Mexican information services vendors are with U.S.-based companies.
- *Personal computer availability*—Continuing growth of lower-cost personal computer products encourages to small- and medium-sized businesses to make greater use of information services solutions. Sun Microsystems, in early 1993, signed an agreement with a division of Commercializador Inmobiliaria Mexicana, S.A. de CV, a Guadalajara-based real estate franchising corporation, to provide workstations for a multimedia network to provide a multinational real estate listing service.

- *Enhanced U.S. corporate presence*—U.S. companies have a strong market share in personal software products and are expected to greatly expand their marketing presence in Mexico. U.S. computer manufacturers are also expected to relocate their Asian production to Mexico to benefit from low-labor rates and gain an advantage in transportation costs.

The so-called maquilas (maquiladora plants), companies that do intermediate-stage manufacturing in Mexico and ship their output back to the U.S. at reduced-tariff levels, are expected to expand their operations. Under NAFTA, they will be able to sell up to 55% of the total value of the exports within Mexico. Currently, they represent a major portion of Mexico's exported manufacturing goods.

NAFTA also expands the opportunities for addressing the multibillion-dollar Mexican telecommunications market by U.S. equipment and network services suppliers.

- *Latin American entree*—An established market in Mexico is seen by many Latin American countries as an indication of a company's interest in Latin America. A number of South American firms are turning to Mexico as a source of supply and expertise. Also, Mexican information services vendors are looking toward market opportunities in their neighboring countries to the south.
- *Computer literacy*—Emphasis on education and use of computing capabilities is increasing the computer literacy of the working class. The current literacy rate of the Mexican population is estimated at around 90%. Over time, this will strengthen the resources of the native information services industry, making it more attractive and independent.

- *Increasing urbanization rate*—The accelerating rate of Mexican urbanization is providing a large pool of highly productive, relatively low-wage industrial workers. A moderately high percentage of the Mexican population also speaks English. Much of the early-stage groundwork for the transformation of Mexico, from an agrarian to an industrialized society, has taken place; with the passage of NAFTA, this process is expected to accelerate. In addition, an aggressive environmental clean-up program is underway, which also provides business opportunities for U.S. companies providing environmental equipment and services.

#### **b. Inhibiting Factors**

Inhibiting factors are:

- *Recognition of IS value*—As in most Latin American countries, the value of information services remains undervalued in Mexico. However, this will change as its role in international trade grows.
- *Inflation rate*—Closely related to stability is the trend in inflation rates. A resurgence of inflation will slow growth in information services.
- *Less-than-acceptable telecommunications infrastructure*—Overall, the national telecommunications infrastructure is weak and unable to support extensive use of technology. Changes are underway. By the middle of the 1990s, this should no longer be a significant inhibitor.
- *Local consultants*—With minimal resources, many companies turn to local, poorly trained consultants who are not knowledgeable about the most up-to-date methods and procedures. There is a significant need for education and training of information services professionals. However, schools, such as the Monterey Institute of Technology, help boost the number of skilled local business professionals.

- *Unemployment problems*—There could be increasing pressure by the working classes to participate more fully in the economic recovery of Mexico. This could mean increasing trade union pressure for higher wages and a possible meaningful challenge to the Salinas presidency in 1994. The per capita income in Mexico is less than \$5,000.

## **2. Information Services Market Forecast**

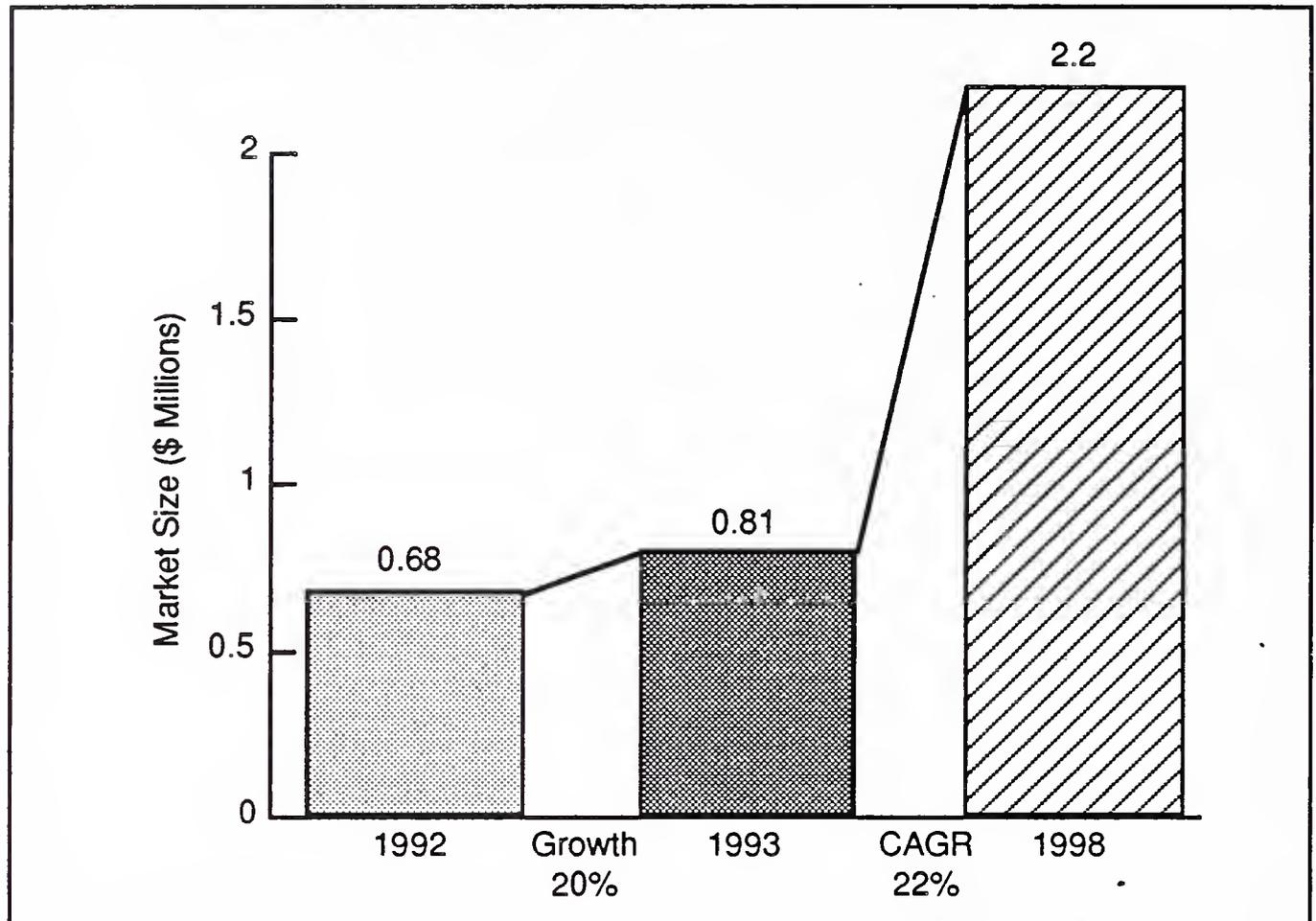
Actual market sizes for 1992 and 1993 are up slightly from those made in 1992's report. INPUT originally forecast the total market for Mexico to be \$660 million in 1992, but revised that estimate to \$675 million for this report. This upward adjustment, and a comparable adjustment to 1993, is due to the ongoing worldwide recession. Nevertheless, prospects for the market in Mexico look good for in the longer term.

Exhibit VIII-90 shows the market for information services in Mexico is expected to grow at an annual rate of 22% for the next several years, from an estimated \$807 million in 1993 to \$2.2 billion by 1998. This represents an upward revision from a five-year CAGR projection in INPUT's prior year forecast. Contributing factors to the upward revision are:

- Passage of NAFTA
- Major accomplishments in lowering the inflation rate
- Improving U.S. economy

## EXHIBIT VIII-90

## Market Forecast—Mexico, 1993-1998

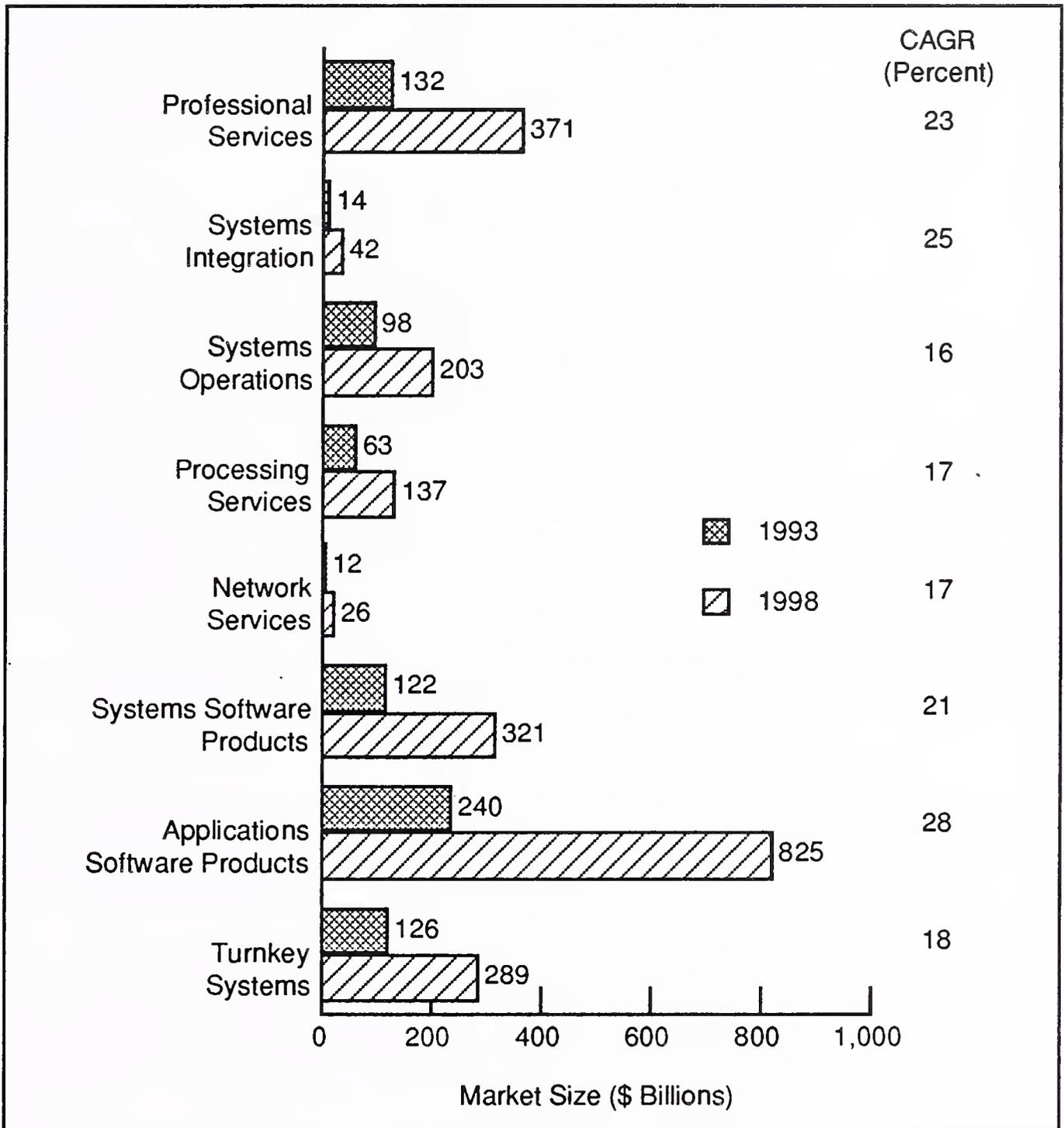


The Mexican market is believed to offer significant potential, but as with many Latin American countries, it will require a stabilized economy for the full potential to be realized over the long term. The level of information technology as a percent of the gross national economy remains well below average, but with an expected steady increase in per capita income, significant growth is expected later in the decade.

Exhibit VIII-91 provides the forecast by delivery mode. Exhibit VIII-95, at the end of this profile, provides the detail behind this forecast.

EXHIBIT VIII-91

**Market Forecast by Delivery Mode  
Mexico, 1993-1998**



The relatively modest market for processing services (less than 10% of the total market) is expected to grow at a 17% CAGR from \$63 million to \$137 million over the next five years, as shown in Exhibit VIII-91.

- As in most countries, the key processing services requirement will be increasing for transaction services as the country begins to develop and expand its national network services capabilities. Processing services and systems operations should each represent long-term potential to speed the use of information technology while minimizing capital investment for companies.
- In Mexico, utility processing is expected to show growth. This growth results, to a great extent, from efforts of companies to develop in-house systems, frequently in anticipation of the availability of hardware and other support services.

Turnkey systems is also expected to show strong growth because of the number of expanding companies that need short-term solutions. Exhibit VIII-91 illustrates that the turnkey systems market grew from \$126 million in 1993 to \$290 million by 1998. This market is also fueled by a growing willingness to accept packaged solutions.

Software products (applications and systems) are in great demand in Mexico.

- The highest demand is for applications software, which is generally in short supply due to high duties and tariffs. Declining tariffs under new trade agreements should increase the demand.
- Applications development products are a growing need as companies begin to develop more comprehensive systems. New systems are required to meet the requirements of a growing economy.
- Applications software products are projected to grow at a 28% rate to \$825 million in 1998.
- Systems software products will grow at a slightly slower rate of 21%, to reach about \$321 million by 1998. This growth is primarily tied to availability of computer hardware and adoption of applications development tools at the minicomputer and personal computer levels. However, intense price competition is expected to continue among leading vendors of operating systems software in their bid to become the *de facto* standard for enterprise computing.

The information services industry remains small and fragmented. However, as the use of professional services grows, some portion of that demand will shift to the systems integration segment.

There is demand for systems integration services in the governmental sector as well as a rising interest in network integration services by a rapidly growing group of international companies establishing division locations in Mexico.

The professional services market is expected to show strong growth as companies search for alternatives to modernize their industries. Overall, growth is expected to be from approximately \$132 million in 1993 to about \$371 million in 1998, a growth rate of 23%.

- The key requirements for professional services are for consulting and custom software development. The consulting market in Mexico is considered to be quiet and underdeveloped. Local consultants have little training and frequently provide poor information. They need relationships with U.S. firms to gain access to the required expertise.
- The need for quality consulting services is expected to be greater as companies seek to modernize. Following years of neglect, major changes are needed in most firms. And, as these companies seek membership in the international community, they will require significant advice on establishing supporting information infrastructures. This provides a major opportunity for leading U.S. information services consulting firms to partner with Mexican companies.

The network services market is very small and will remain small for at least the next several years. The telecommunications infrastructure to support the development of this delivery mode is lacking. Increasing interaction with U.S. manufacturing corporations may well speed this growth.

- Network services could grow at a higher rate near the end of the five-year period if the telecommunications infrastructure is improved.

- There is a high degree of interest in Mexico for network-based services. Foreign firms have an interest in E-mail and EDI services, and there is interest in database and other on-line services as well as transaction processing services.
- INPUT expects EDI capabilities to become a key ingredient in future information systems activities of all larger Mexican companies as they expand their international trading activities.

Growth of markets in Mexico is highly dependent on a stable political environment and economic development. The reasonably stable business environment is expected to continue through the end of the decade. If this happens, and the positive benefits of NAFTA are realized and result in a stronger Mexican economy, the information services industry could experience growth above that projected by INPUT.

### **3. Market Considerations**

Exhibit VIII-92 lists leading Mexico-based vendors and the delivery modes in which they primarily operate. Many of them have well-established relationships with U.S.-based information services companies.

## EXHIBIT VIII-92

## Selected Vendors by Delivery Mode—Mexico, 1993

Vendor	Processing/ Network Services/ Systems Operations	Professional Services/ Systems Integration	Software Products	Turnkey Systems
Bertex	✓			
Casas Alatristes		✓		
CCS	✓	✓	✓	
Dicom	✓		✓	
Execuplan		✓	✓	
Gama	✓	✓		
Grupo Tea		✓	✓	
Intertec de Mexico	✓			
Kronos	✓		✓	
Lanix	✓	✓		✓
Mancera Hermanas		✓		
Megaplan			✓	
MPS	✓			
Sistemas Erickson			✓	
Tecnovision	✓		✓	
Zylog			✓	

Key opportunities for companies entering or expanding in Mexico are in the personal computer, workstation and LAN product areas.

- Opportunities also exist in consulting and after-sales support for companies willing to invest in development of qualified local staff. Providing local education and training is essential to any market entry in Mexico, and is fundamental to establishing a long-term business.

- If progress continues to be made in economic stability, the investment in establishing a well-trained local staff is expected to be of significant benefit within the next three to five years.
- The leading vendors of information services hardware are IBM, Hewlett-Packard and Unisys. DEC, NCR, Honeywell and Olivetti are also represented.
- Leading providers of software include Computer Associates, Microsoft, Borland and Lotus Development.
- Nearly all the largest accounting firms are represented and have information services practices.

#### 4. IT Spending

Exhibit VIII-93 provides an estimate of Mexico's total IT spending for 1993.

EXHIBIT VIII-93

#### Total 1993 IT Spending—Mexico

Budget Category	Estimated Spending (\$ Millions)
Data Communications	179
Internal Staff	1,390
Equipment	1076
Equipment Services	448
Facilities	583
Information Services	807
<b>Total IT Spending</b>	<b>4,483</b>

Information services, which includes software products, represents 18% of the total IT budget, as noted in Exhibit VIII-94. The largest expenditures are for internal staff (31% of the IT budget) and equipment (24%). Data communications represents the smallest portion of the budget at \$179 million and 4% of the total.

EXHIBIT VIII-94

**1993 IT Spending Percentages—Mexico**

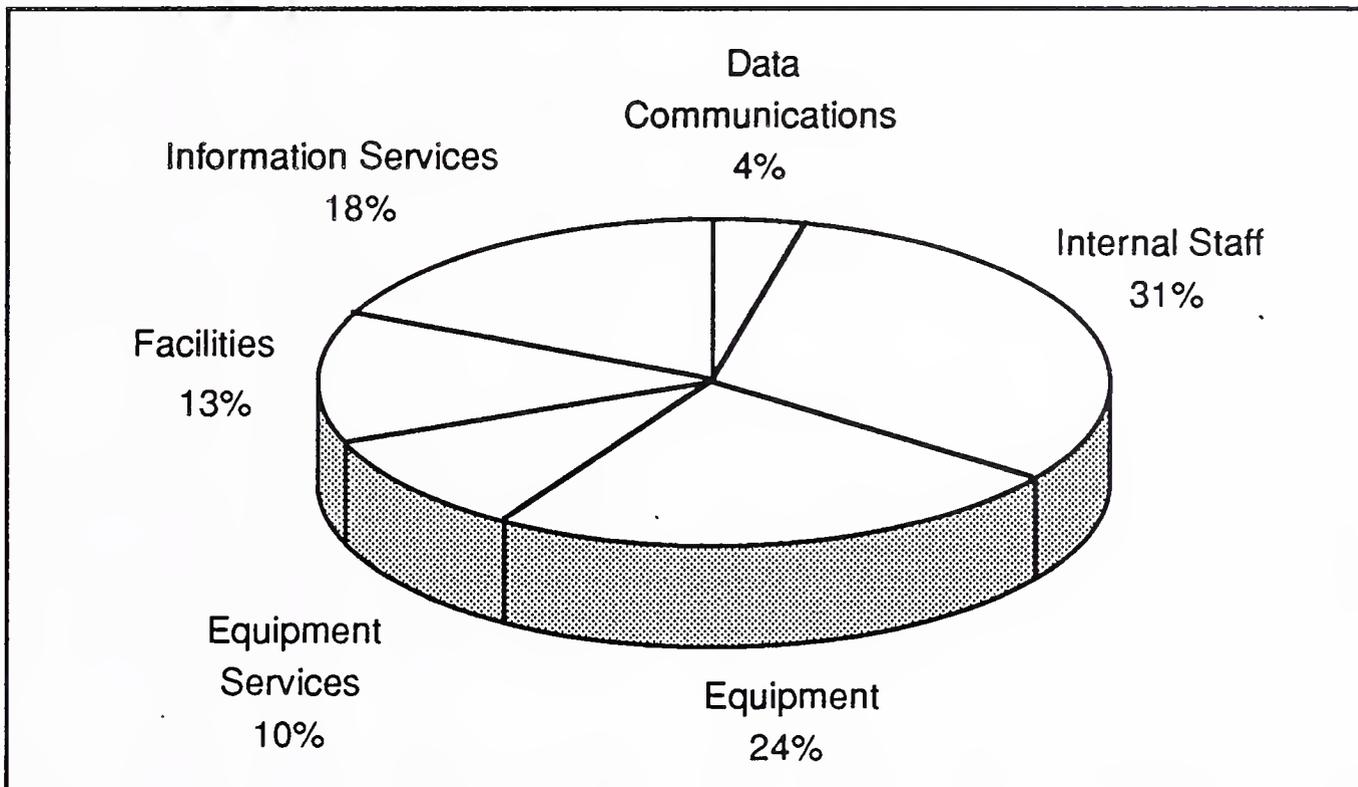


EXHIBIT VIII-95

**Information Services Industry Market Forecast by Delivery Mode  
Mexico, 1993-1998**

Delivery Modes	1992 (\$M)	Growth 92-93 (%)	1993 (\$M)	1994 (\$M)	1995 (\$M)	1996 (\$M)	1997 (\$M)	1998 (\$M)	CAGR 93-98 (%)
Total Mexico Information Services Mkt.	675	20	807	966	1,170	1,427	1,762	2,214	22
<i>Professional Services</i>	101	31	132	161	196	240	298	371	23
- IS Consulting	45	22	55	67	84	105	134	167	25
- Education & Training	12	8	13	16	17	19	21	26	15
- Custom Software	44	45	64	78	95	116	143	178	23
<i>Systems Integration</i>	11	27	14	16	20	25	32	42	25
- Equipment	4	25	5	5	6	8	9	11	17
- Software Products	1	0	1	2	2	2	3	4	32
- Professional Services	6	33	8	9	12	15	20	27	28
- Other	0	N/A	0	0	0	0	0	0	N/A
<i>Systems Operations</i>	89	10	98	110	124	142	163	203	16
- Platform Operations	54	11	60	67	77	88	102	127	16
- Application Operations	35	9	38	43	47	54	61	76	15
- Desktop Services	0	N/A	0	0	0	0	0	0	N/A
- Network Management	0	N/A	0	0	0	0	0	0	N/A
<i>Processing Services</i>	56	13	63	71	81	93	110	137	17
- Transaction Processing	30	13	34	39	44	53	62	75	17
- Utility Processing	22	14	25	27	32	35	41	52	16
- Other Processing	4	0	4	5	5	5	7	10	20
<i>Network Services</i>	11	9	12	14	16	18	21	26	17
- Electronic Info Services	9	11	10	11	13	14	15	19	14
- Network Applications	2	0	2	3	3	4	6	7	28
<i>System SW Products</i>	104	17	122	145	175	210	258	321	21
- System Control	42	14	48	58	70	84	102	127	21
- Data Center Mgmt	18	22	22	25	28	33	40	50	18
- Applications Mgmt	44	18	52	62	77	93	116	144	23
<i>Application SW Products</i>	192	25	240	305	390	502	647	825	28
- Mainframe	0	N/A	0	0	0	0	0	0	N/A
- Minicomputer	0	N/A	0	0	0	0	0	0	N/A
- Workstation/PC	0	N/A	0	0	0	0	0	0	N/A
<i>Turnkey Systems</i>	111	14	126	144	168	197	233	289	18
- Equipment	49	10	54	59	66	74	84	104	14
- Software Products	25	16	29	33	39	45	53	66	18
- Professional Services	37	16	43	52	63	78	96	119	23

**R****The Netherlands****1. National Overview**

The Netherlands (Holland), one of the founding members of the EC, has a population of 15 million. The information services market in the Netherlands is the fifth-largest in Europe and was \$6.1 billion for 1992.

Population of the Netherlands is more than 15 million and its work force is 6 million (36% female). History, geography, culture and government policy have combined to give the Dutch economic advantages. They are heirs to a long mercantile tradition. Nearly 50% of the EC's 320 million consumers live within a 500-kilometer radius of Amsterdam.

The Dutch are proficient at languages, science and technology. Government incentives resulted in foreigners contributing 25% of industrial investment in Holland. Perhaps as a result of these factors, the Netherlands, with only 4.5% of the EC population, accounts for 13.5% of EC foreign trade and exports, equal to about 56% of the GDP.

One of the OECD's star performers of recent years, the Dutch economy slowed to a rate of 2.2% GDP growth in 1991 and 1.5% in 1992, very close to the OECD average. Inflation was also in line with the OECD average at 3.7%, and Holland's current account balance was the best surplus in the EC.

The GDP showed zero growth in 1993 but will increase 1.8% in 1994. Inflation will remain under control below OECD averages for 1993 and 1994, and current account balances will remain steady at around 2%.

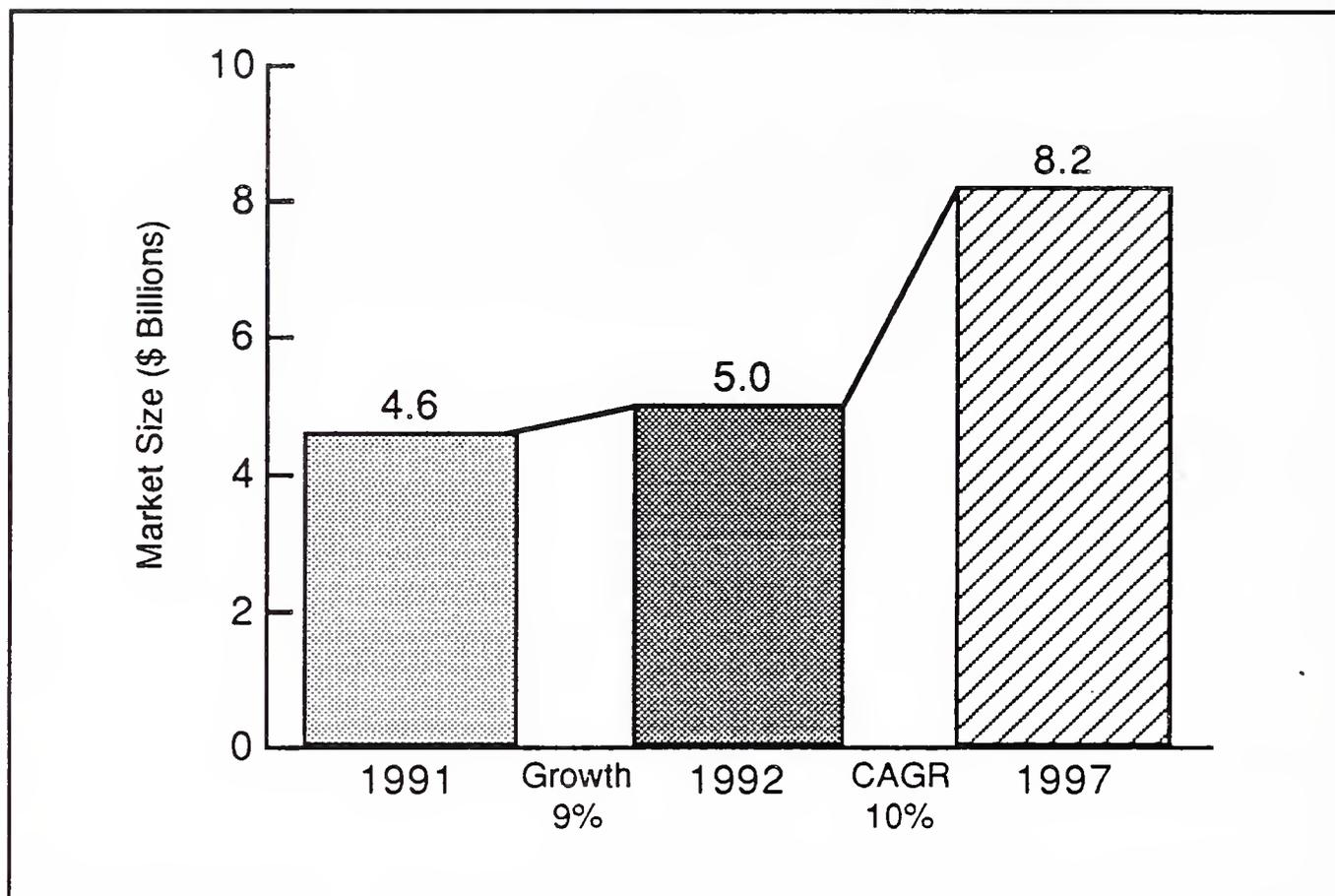
**2. Information Services Market Forecast**

The Dutch information services market is forecast to grow from \$5 billion to \$8 billion between 1993 and 1998. This is a growth rate averaging 10% per year over the period slightly down on the last forecast.

Exhibit VIII-96 shows the overall information services industry market for the Netherlands.

## EXHIBIT VIII-96

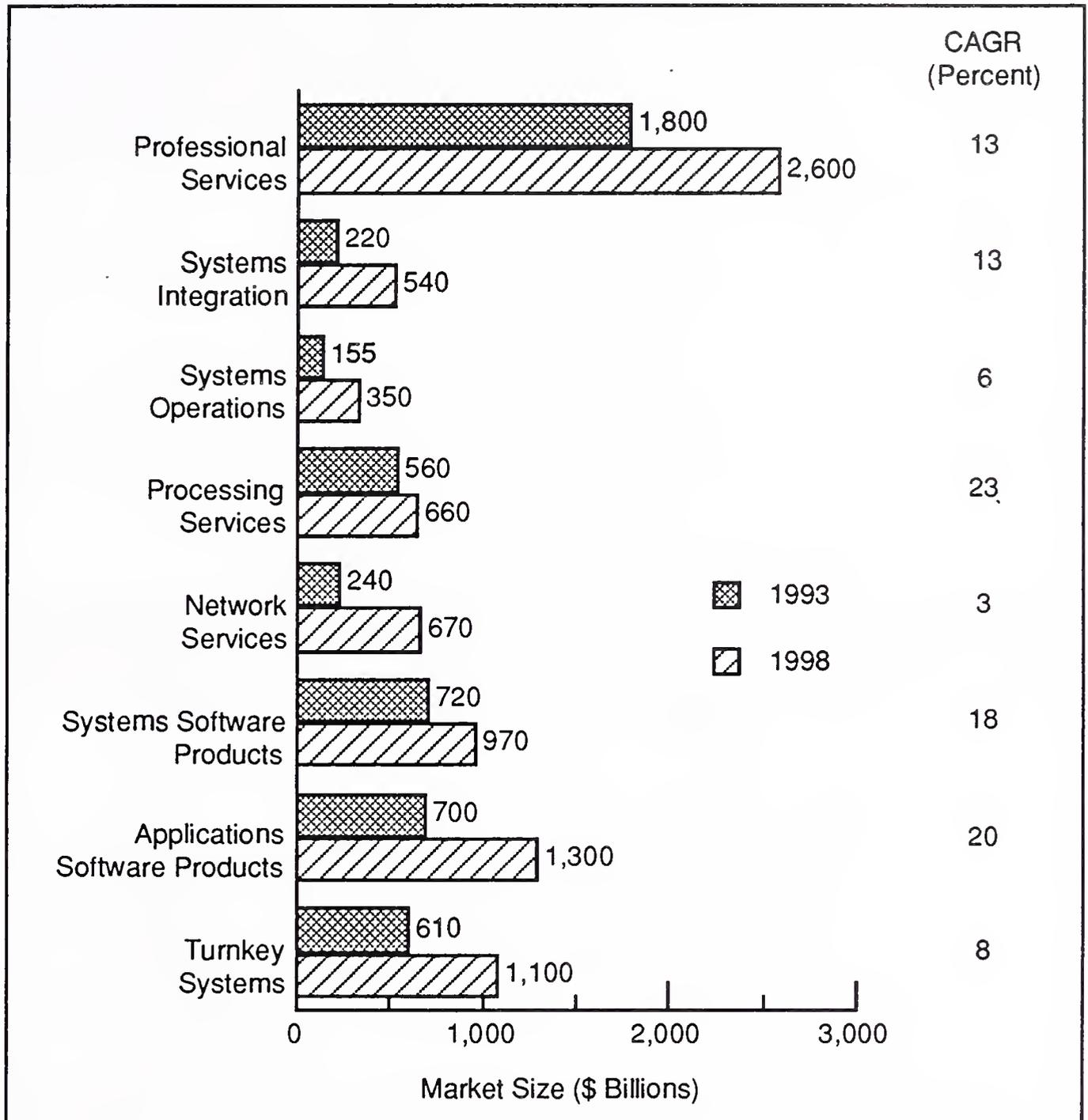
## Market Forecast—The Netherlands, 1993-1998



The Netherlands market represents about 6% of the overall European information services market. Exhibit VIII-97 gives the breakdown of the market by delivery mode. Exhibit VIII-101, at the end of this profile, provides the forecast in greater detail.

EXHIBIT VIII-97

**Market Forecast by Delivery Mode  
The Netherlands, 1993-1998**



The professional services sector remains strong, growing faster than the market as a whole, reflecting a continued strong demand for advanced skills and the development of custom software.

**3. Market Considerations**

Exhibit VIII-98 lists the top 10 vendors in the Dutch market during 1993. It is compiled using only the information services revenues attributable to the domestic market within the Netherlands, excluding exports and revenues from within any parent group companies.

EXHIBIT VIII-98

**Leading Information Services Vendors—The Netherlands, 1993**

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	540	10.8
2	Cap Volmac	France	425	8.5
3	Raet	Netherlands	422	8.4
4	Getronics	Netherlands	339	6.8
5	BSO Origin	Netherlands	259	5.2
6	Digital	U.S.	190	3.8
7	Unisys	U.S.	98	2.0
8	CMG	U.K.	86	1.7
9	Siemens-Nixdorf	Germany	72	1.4
10	Microsoft	U.S.	69	1.4
	Total Listed		2,500	50.0
	Total Market		5,000	100.0

Cap Volmac (which merged with the Dutch subsidiary of Cap Gemini Sogeti group in 1992) is now the information services market leader in the Netherlands. Last year, IBM was number one. About 90% of Cap Volmac's revenues come from within the Netherlands. Most of the rest came from neighboring Belgium.

Active in most industry sectors, 28% of Volmac business is in banking and insurance, and 15% in the public sector. In 1991, Volmac was a group of 24 operating companies with a wide variety of primarily professional services specializations. During 1992, the company restructured to gain more synergy among subsidiaries and with the rest of Cap Gemini Sogeti.

Second-largest Dutch vendor Raet N.V. also saw revenues rise with acquisitions. It absorbed AC Service into the Group. Just more than 20% of business is now international, with subsidiaries in Switzerland, Germany, Austria, Belgium and Cyprus, and the company offers a wide range of products and services to practically all industry sectors.

BSO/Origin reorganized its four companies (including Origin/Technology in Business), operating in different market sectors to provide a clearer management structure. Origin was previously a 50-50 joint ownership between BSO and Philips, which now owns only 20%. Origin was formed from the international systems operations of both companies.

CMG operates primarily in the Netherlands and the U.K. with a strong specialization in financial services. It was one of the few independent leaders who increased revenues in 1992.

#### 4. IT Spending

Exhibit VIII-99 provides an estimate of the Netherlands' total IT spending for 1993.

EXHIBIT VIII-99

#### Total 1993 IT Spending—The Netherlands

Budget Category	Estimated Spending (\$ Millions)
Data Communications	830
Internal Staff	3,500
Equipment	2,400
Equipment Services	1,430
Facilities	1,100
Information Services	4,700
<b>Total IT Spending</b>	<b>13,960</b>

Information services, which includes software products, represents the largest expenditures at approximately 34% of the total IT budget, as noted in Exhibit VIII-100. The next largest expenditures are for internal staff (25% of the IT budget) and equipment (17%). Data communications represents the smallest portion of the IT budget at \$830 million and 6% of the total.

EXHIBIT VIII-100

**1993 IT Spending Percentages—The Netherlands**

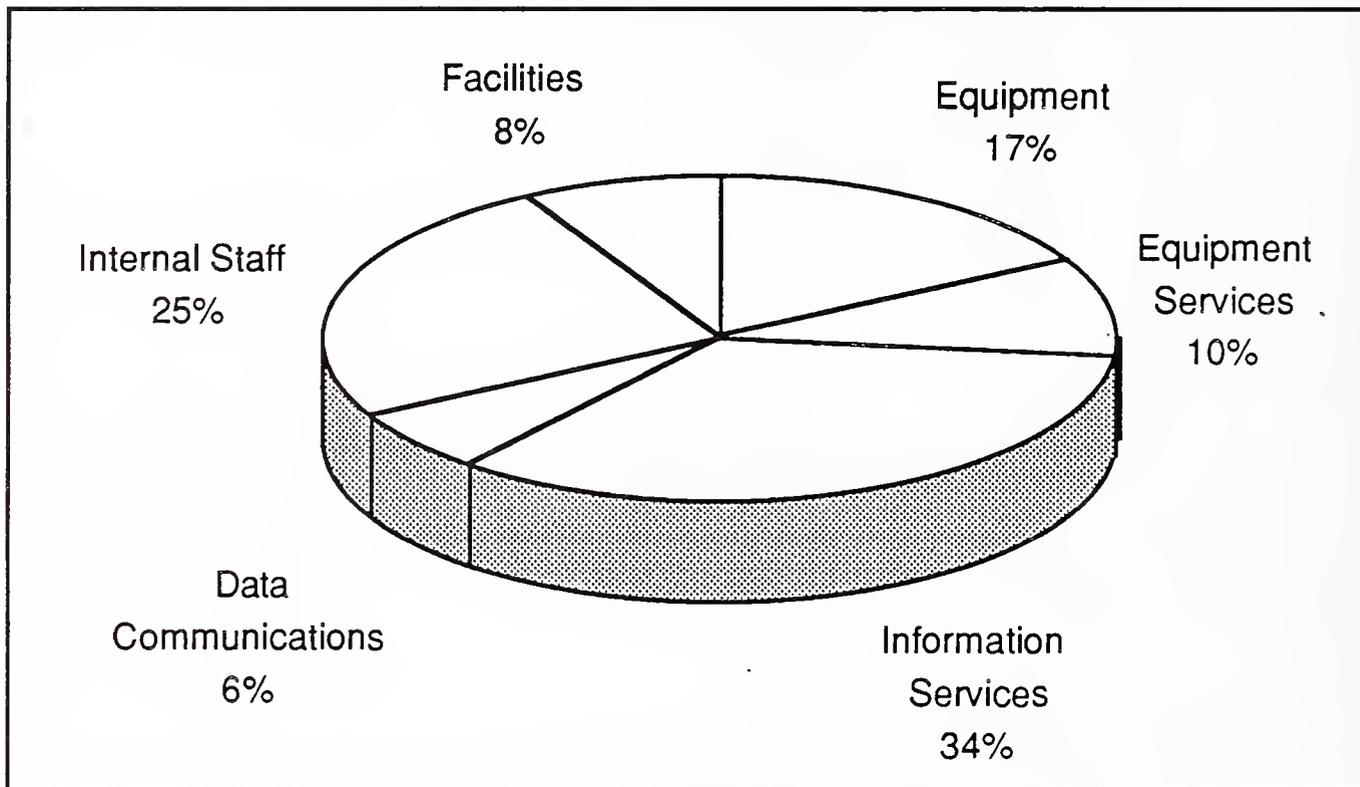


EXHIBIT VIII-101

**Information Services Industry Market Forecast by Delivery Mode**  
**The Netherlands, 1993-1998**

Delivery Modes	1992	Growth	1993	1994	1995	1996	1997	1998	CAGR
	(\$M)	92-93 (%)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	93-98 (%)
Total Netherlands Information Services Mkt.	4,600	9	5,000	5,400	5,900	6,500	7,300	8,200	10
<i>Professional Services</i>	1,700	6	1,800	1,900	2,000	2,100	2,300	2,600	8
- IS Consulting	224	9	245	267	293	319	359	417	11
- Education & Training	190	6	201	213	227	242	265	299	8
- Custom Software	1,280	5	1,340	1,395	1,455	1,515	1,625	1,810	6
<i>Systems Integration</i>	185	19	220	260	310	370	450	540	20
- Equipment	49	17	58	66	78	89	101	115	15
- Software Products	48	17	56	75	98	130	175	235	33
- Professional Services	84	20	101	115	130	144	161	178	12
- Other	4	0	4	5	7	9	11	14	29
<i>Systems Operations</i>	125	24	155	180	210	250	295	350	18
- Platform Operations	58	20	69	81	92	107	124	144	16
- Application Operations	32	19	38	43	52	61	72	86	18
- Desktop Services	23	37	32	37	46	55	66	80	21
- Network Management	12	26	15	17	20	26	32	38	21
<i>Processing Services</i>	540	4	560	570	600	620	640	660	3
- Transaction Processing	477	4	495	506	523	540	558	575	3
- Utility Processing	16	0	16	16	16	16	17	17	1
- Other Processing	46	9	50	54	58	63	68	74	8
<i>Network Services</i>	210	14	240	295	360	440	540	670	23
- Electronic Info Services	135	6	144	158	173	190	207	222	9
- Network Applications	75	31	98	135	184	250	336	449	36
<i>System SW Products</i>	690	4	720	760	820	870	920	970	6
- Mainframe	342	2	348	359	371	382	388	394	3
- Minicomputer	196	3	201	213	224	236	245	253	5
- Workstation/PC	150	11	167	193	222	253	285	319	14
<i>Application SW Products</i>	620	13	700	790	890	1,000	1,150	1,300	13
- Mainframe	61	0	61	61	61	61	61	61	0
- Minicomputer	184	11	204	224	247	273	302	334	10
- Workstation/PC	375	16	435	505	585	685	795	920	16
<i>Turnkey Systems</i>	570	7	610	680	750	860	960	1,100	13
- Equipment	276	5	290	308	331	362	394	423	8
- Software Products	155	10	170	195	225	265	300	350	16
- Professional Services	135	13	153	173	199	230	267	305	15

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**New Zealand****1. National Overview**

New Zealand is a verdant country occupying two small islands in the Pacific, southeast of Australia. The pastures that cover more than 50% of the country contribute to the nation's status as one of the world's most successful exporters of agrarian commodities such as beef, lamb and wool.

Traditionally, New Zealand has been considered on the fringes of international business, though it has competed aggressively for success in export since the United Kingdom joined the European Common Market in 1972. This act removed a long-standing, secure market for the small country, and in the ensuing years New Zealand has competed successfully.

The country is not historically known for its software industry. Currently, there are more than 75 native software houses in New Zealand developing programs and tools for international distribution. One of the New Zealand software industry's first success stories was Linc, a CASE development system. Created locally, Linc was eventually purchased by Unisys Corporation, which sells the system globally.

The country's Ministry of Commerce considers the local software industry a crucial component to New Zealand's future. In 1993, the government estimated New Zealand's software exports were worth \$50 million. Roughly 30 companies, nearly all based exclusively in Australia and the U.S., account for 90% of software sales.

For the overall economy, New Zealand's inflation rate increased from 1.2% in late 1992 to 1.4% in 1993. It is expected to increase further, to 2%, in 1994. GDP for 1992 was \$40.7 billion, increasing slightly to \$41.2 billion in 1993. An increased growth rate of roughly 8% will raise the GDP to nearly \$45 billion. External debt, which has grown less than 2% per year since 1987, was approximately \$34 billion in 1993 and is expected to increase another \$1 billion in 1994.

New Zealand's government considers its small (but relatively stable) economy to be the best enticement for foreign investors, to

whom it offers no incentives. However, foreign investment is encouraged by the government's Overseas Investment Commission (OIC). The OIC reviews foreign investment applications to assess to what degree they will spur local economic growth and development, including benefits such as increased competition and the transfer of technology or skills. Reviews by OIC are thorough, although nearly all applications submitted are approved.

The legislature plans to simplify the application and review process. Technology is of particular importance to New Zealand, where the software industry arose from the need to more effectively use old computers, as import controls on new machines made them too expensive. Tariffs on all industries, except automobiles and clothes, are expected to fall by 14% by 1996.

#### **a. Driving Forces**

Driving forces identified in the 1992 report influencing the information services market persist in New Zealand. They are:

- *Economic/Political reform*—Over the last several years, the government has enacted reforms that have:
  - Re-engineered the tax system
  - Deregulated the finance and labor markets
  - Devaluated and floated the currency
  - Privatized government industries, including telecommunications
- *Limited labor supply*—As a result of neglect over the years, New Zealand needs to invest in upgrading skills. In addition, it needs to turn to outside consultants to provide short-term expertise. Training and education opportunities exist.

- *Increased competitiveness*—Increased competition, resulting from a freer economy, forces organizations to become more competitive. The economic liberalization has done much toward opening up opportunity for native and foreign investment. In addition, New Zealand and the U.S. have a Trade and Investment Framework Agreement (TIFA) that has targeted reciprocal opportunities and worked to remove hindrances to the flow of trade and investment.

## **b. Inhibiting Factors**

Although changes have stimulated growth of the information services industry, there are a number of inhibiting forces.

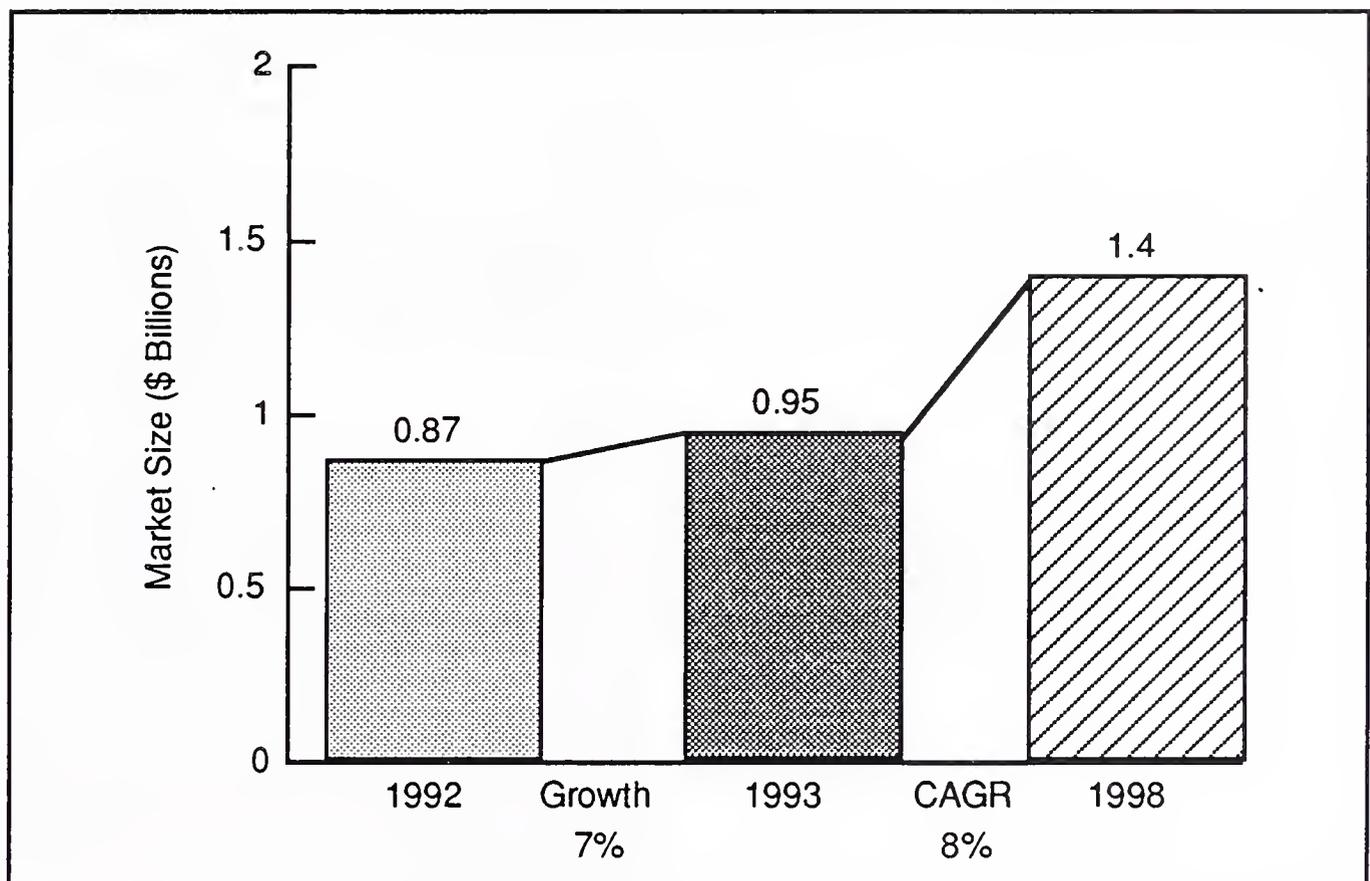
- *World economy*—Shifts in the world economy are driving the country to make changes. Until several years ago, there was little need for some of the changes made. However, loss of world product position for some of New Zealand's products forced the country to consider changes. There remains a concern that despite numerous reforms, this small but industrious country continues to be on the fringe of the world economy and is not able to capture its share of world trade.
- *Geographic location*—New Zealand's distant location tends to retard investment considerations for all but the largest multinational companies.
- *Social focus*—The country traditionally placed emphasis on developing government-sponsored social systems. There is some uncertainty about whether this focus will restrict investment opportunities, but the government has decreased spending on health care programs and associated benefits as well as its comprehensive welfare system to improve its financial status.
- *Nuclear power*—Since 1984, no nuclear-armed nor nuclear-powered vessels have been allowed to visit New Zealand. This remains the government's standing policy and has caused friction between New Zealand and nations, such as the U.S., that own and operate nuclear ships. Though New Zealand is generally on warm terms with its nuclear-powered allies and trading partners, it has been pressured to revise this policy, with the possible economic benefits it could bring.

## 2. Information Services Market Forecast

In 1993, INPUT decreased its forecast for the New Zealand market for the next five years. Exhibit VIII-102 illustrates projected market growth from approximately \$950 million in 1993 to \$1.4 billion in 1998. The growth rate of 8% is one-third lower than the rate forecast in 1992.

EXHIBIT VIII-102

### Market Forecast—New Zealand, 1993-1998



The size of the market seems stable, but despite strong emphasis on software products, significant growth is not on the near-term horizon. Although growth in the Asia/Pacific market is expected to outpace most other world markets (including the U.S. and Europe), the small size of the New Zealand economy, growing competition in the global information services marketplace and lingering effects of the recent economic slowdown will temper the growth of information services in New Zealand. INPUT's conservative growth estimate may increase in 1995 if New Zealand's plans to expand their technology offerings show strong results.

Exhibit VIII-103 provides the forecast by delivery mode. Exhibit VIII-107, at the end of this profile of New Zealand, provides the detail behind this forecast.

EXHIBIT VIII-103

### Market Forecast by Delivery Mode New Zealand, 1993-1998

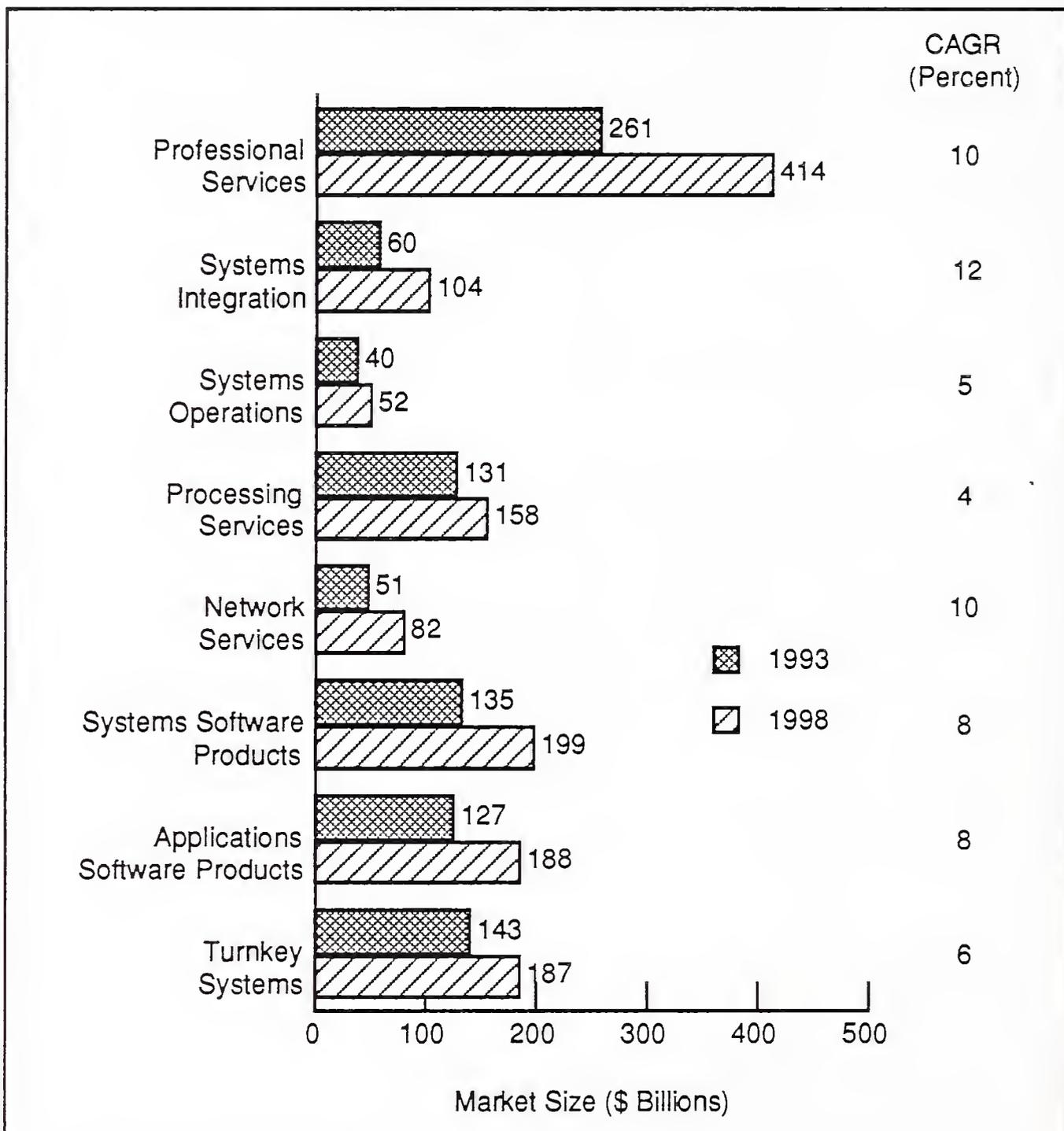


Exhibit VIII-103 indicates processing services in New Zealand are projected to grow from approximately \$130 million in 1993 to \$160 million in 1998, a growth rate of 4%.

- Processing services has been strong in New Zealand for a number of years, but the slowdown in the economy is a tempering effect on expected growth. Industry consolidation also reduces the number of large clients and prospects.

- Some revenues shown as a part of processing services may, in fact, be more properly shown as part of network services or systems operations. Many service activities traditionally associated with network services (and now systems operations) are performed by processing services companies in New Zealand, and revenue allocations to one or the other service modes is occasionally based upon estimates.

Network services in New Zealand are projected to grow at a rate of 10% for the next five years, from \$50 million in 1993 to approximately \$80 million in 1998.

- Network services will become increasingly important over the next several years as a result of privatization. An increasing number of companies use network services to provide financial transaction (EFT, POS, ATM, etc.) and other (E-mail, EDI) services.
- Until the late 1980s, as in Europe, the telecommunication services market was tightly controlled by the New Zealand Post Office. With the privatization of the telecommunications authority, all value-added services may now be provided by private vendors.

The two software product delivery modes will experience moderate growth through 1998:

- Applications software products will grow from \$127 million in 1993 to \$188 million in 1998 at an 8% growth rate. The key reason the growth rate for application software products has been reduced is because many internal software requirements have now been met and technology improvements are driving equipment costs to all-time lows (especially for PCs), thereby easing the effects of tariffs on new equipment purchases. Current generation platforms also allow a huge inventory of software products available for standard applications and operating environments to be used.
- Systems software products, with a current market size of \$135 million, will also grow at an 8% CAGR to about \$200 million in 1998. The growth in systems software will result from the need to develop more complex systems as privatization progresses and newer systems require modifications to meet specific business needs.

The overall market for turnkey systems is expected to grow from nearly \$145 million in 1993 to \$187 million in 1998. The growth rate will be a modest 6%. Customized software that meets unique local requirements will be the primary driver for turnkey systems growth.

Markets for systems integration and systems operations in New Zealand are small and are expected to remain the same for the next several years. Systems integration expenditures will be \$60 million in 1993, growing at a 12% CAGR to almost \$105 million in 1998. The market for systems operations is \$40 million and will grow at a modest 5% to slightly more than \$50 million by 1998.

Professional services are expected to grow at 10% in New Zealand, the same rate forecast for the U.S. market. Exhibit VIII-107 illustrates that growth in all submodes will be at a 9% or 10% level. The market will increase from more than \$260 million in 1993 to almost \$415 million in 1998.

The growth of the New Zealand market depends highly on the success of privatization and the government's emphasis on business expansion. At present, these policies are not causing an expansion in the economy; therefore, the demand for information services is minimal. Also affecting growth is the lingering impacts of recessionary trends in world markets and the moderate technological growth of the New Zealand economy.

### **3. Market Considerations**

There are few entry barriers into the New Zealand market. Many leading providers are foreign companies that have established New Zealand business operations. However, users indicate a preference for long-established, local firms. This fact was reconfirmed through research conducted for this report.

Because of a preference for local firms, organizations considering entering the New Zealand market are advised to seek partnership arrangements to provide services not generally available.

The information services industry is generally characterized by many smaller companies that hold specialty niches. This characterization is particularly true in the software services delivery mode, where there are a significant number of companies.

Exhibit VIII-104 lists local vendors identified in INPUT's research during 1993. The primary delivery modes in which they offer services are also indicated.

EXHIBIT VIII-104

**Selected Vendors by Delivery Mode  
New Zealand, 1993**

Vendor	Processing/ Network Services/ Systems Operations	Professional Services/ Systems Integration	Software Products	Turnkey Systems
Azimuth		✓		
CCL	✓			
Campbell Software		✓	✓	✓
Centron	✓			
Creative Solutions	✓	✓	✓	
Databanks	✓			
GCS	✓			
Mycrift Systems			✓	
Netways	✓			
PAXUS	✓	✓		✓
Renaissance Software		✓		
SDI			✓	
Vogel Computing	✓			

IBM and DEC, as well as many of the major U.S.-based accounting firms, have active offices in New Zealand. Andersen Consulting however, does not have a local office, but conducts its New Zealand business from Australia.

#### 4. IT Spending

Exhibit VIII-105 provides INPUT's breakdown of New Zealand's IT spending for 1993.

EXHIBIT VIII-105

**Total 1993 IT Spending—New Zealand**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	200
Internal Staff	1,497
Equipment	1,247
Equipment Services	499
Facilities	599
Information Services	948
<b>Total IT Spending</b>	<b>4,990</b>

Information services spending, at approximately \$948 million, represents 19% of the total IT budget, as noted in Exhibit VIII-106. The largest expenditures are for internal staff (30% of the IT budget) and equipment (25%). Data communications represents the smallest portion of the IT budget at \$200 million and 4% of the total.

EXHIBIT VIII-106

**1993 IT Spending Percentages—New Zealand**

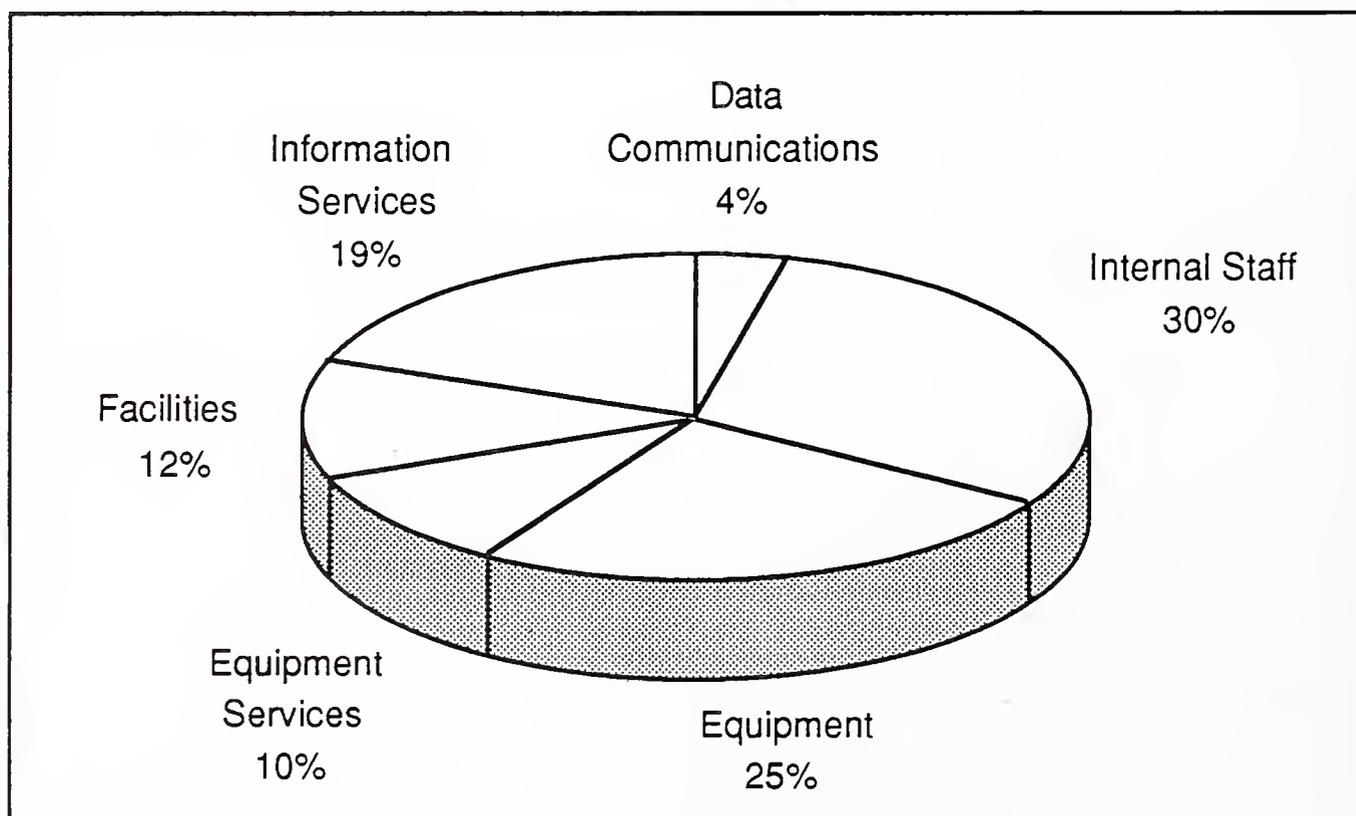


EXHIBIT VIII-107

**Information Services Industry Market Forecast by Delivery Mode**  
**New Zealand, 1993-1998**

Delivery Modes	1992 (\$)	Growth 92-93 (%)	1993 (\$)	1994 (\$)	1995 (\$)	1996 (\$)	1997 (\$)	1998 (\$)	CAGR 93-98 (%)
Total New Zealand Information Services Mkt.	887	7	948	1,013	1,090	1,174	1,272	1,384	8
<i>Professional Services</i>	240	9	261	283	309	340	374	414	10
- IS Consulting	66	9	72	78	85	93	103	115	10
- Education & Training	25	8	27	29	32	34	38	42	9
- Software Development	149	9	162	176	192	213	233	257	10
<i>Systems Integration</i>	54	11	60	67	75	83	93	104	12
- Equipment	21	5	22	24	25	27	29	32	8
- Software Products	6	17	7	8	10	11	13	14	15
- Professional Services	25	16	29	33	38	43	49	55	14
- Other	2	0	2	2	2	2	2	3	8
<i>Systems Operations</i>	38	5	40	41	42	44	47	52	5
- Platform Operations	21	5	22	23	24	25	27	30	6
- Applications Operations	17	6	18	18	18	19	20	22	4
<i>Processing Services</i>	126	4	131	135	141	145	151	158	4
- Transaction Processing	108	4	112	116	120	124	128	134	4
- Utility Processing	10	10	11	11	12	12	13	14	5
- Other Processing	8	0	8	8	9	9	10	10	5
<i>Network Services</i>	47	9	51	56	62	68	75	82	10
- Electronic Info Svcs	37	8	40	44	49	54	60	66	11
- Network Applications	10	10	11	12	13	14	15	16	8
<i>Systems Software</i>	126	7	135	145	155	167	182	199	8
- System Control	47	9	51	55	59	64	70	77	9
- Data Center Mgt	29	7	31	33	35	37	40	43	7
- Applications Dvlpmt	50	6	53	57	61	66	72	79	8
<i>Applications Software</i>	119	7	127	136	147	159	173	188	8
<i>Turnkey Systems</i>	137	4	143	150	159	168	177	187	6
- Equipment	61	5	64	67	70	73	77	81	5
- Software Products	38	3	39	41	44	47	49	52	6
- Professional Services	38	5	40	42	45	48	51	54	6

**T****Norway****1. National Overview**

Norway has a population of 4.27 million. It is the largest non-OPEC exporter of oil. Only 14% of the GDP derives from manufacturing. Norway is the seventh-largest software, services and maintenance market in Europe, representing \$1.8 billion in 1992.

In 1992, the GDP growth was higher at 3.3% than in 1991 (1.9%). Inflation dropped, for the third year running, to 2.3%. The current account surplus was lower than in 1991 but was still of the order of 3% of GDP.

The growth rate declined slightly in 1993 (to 1.5%), to be followed by higher growth in 1994 (2.5%). Inflation, little changed in 1993, will remain at 3.0%, below the OECD average of 3.3% in 1994. The current account surplus will hover around the current level or marginally less until 1995.

Norway is a member of the European Free Trade Association (EFTA) and will, therefore, be part of the European Economic Area when this is inaugurated, probably in 1994. Under this, restrictions on trade and the movement of capital between EC and EFTA countries will be largely removed. It is possible that the Norwegians will not ratify the move to join the EC as full members, although negotiations are in the works.

The largest Norwegian companies listed in the European Top 100 are the two state-owned energy companies, Statoil and Norsk Hydro.

**2. Information Services Market Forecast**

INPUT forecasts that the Norwegian market for software and services will be \$1.9 billion in 1993, growing at 6% CAGR to reach \$2.5 billion by 1998, as shown in Exhibit VIII-108, Norway's overall information services industry market forecast.

EXHIBIT VIII-108

## Market Forecast—Norway, 1993-1998

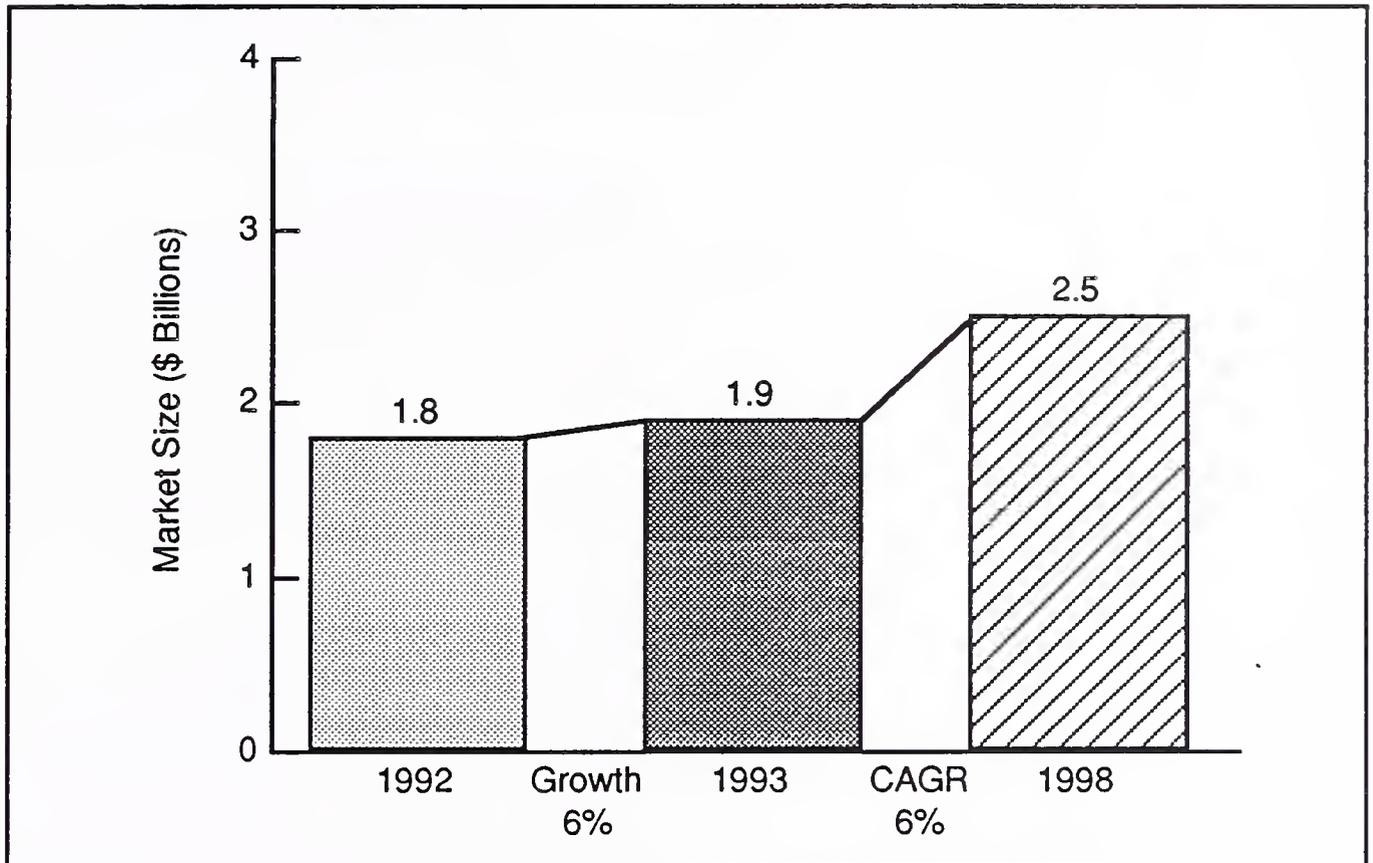
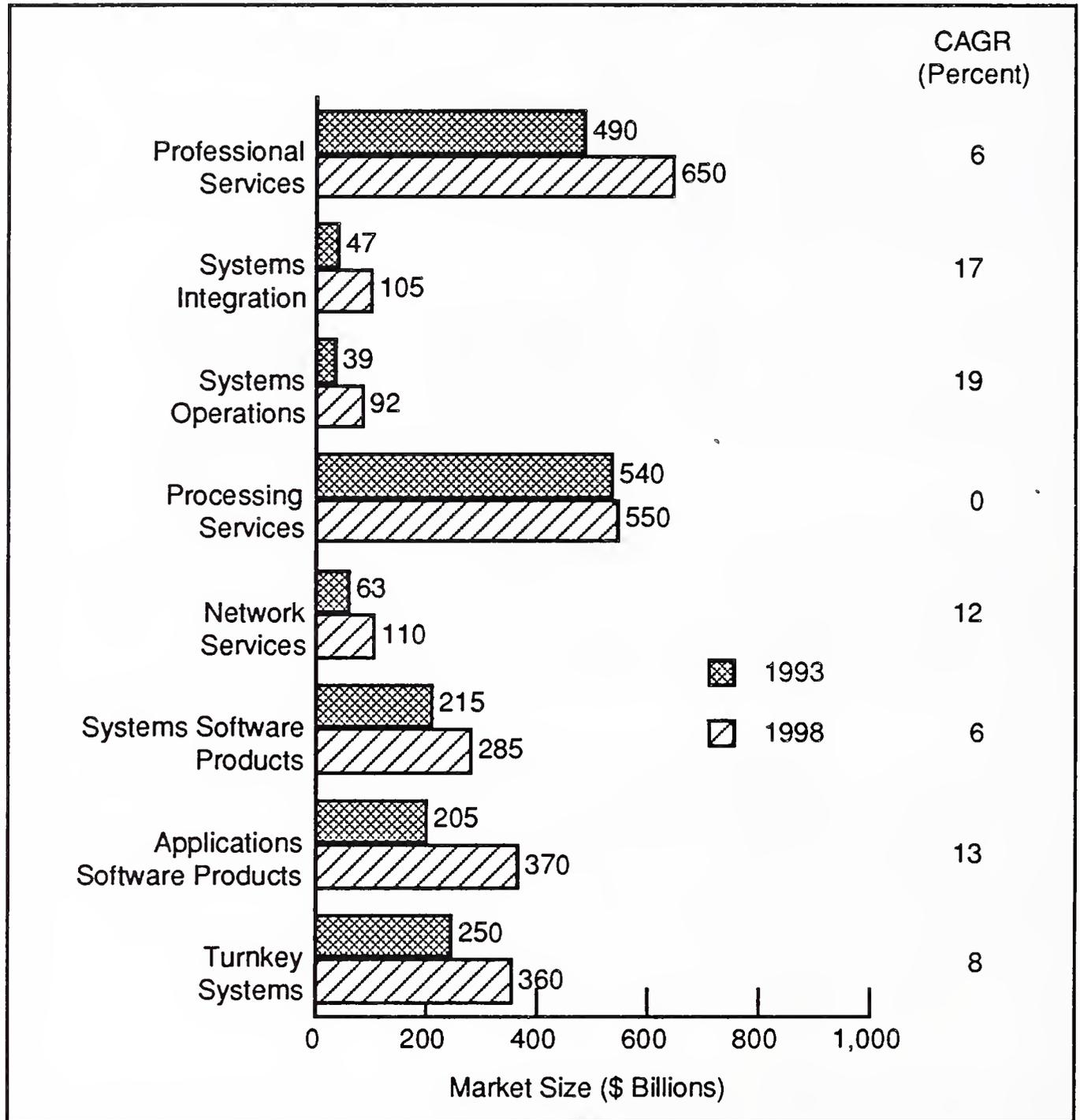


Exhibit VIII-109 provides the forecast by delivery mode.  
Exhibit VIII-113, at the end of this profile, provides the forecast in greater detail.

EXHIBIT VIII-108

### Market Forecast by Delivery Mode Norway, 1993-1998



In Norway, the largest sector of the software and services market in 1993 is processing services, accounting for about 24% of the total market. However, growth in the processing services sector is forecast at 0% CAGR between 1993 and 1998—in real terms, a falling market.

By 1998, professional services will be the largest sector forecast, representing 22% of the total information services market in Norway. User demand for software development services, although hardly growing, represents the largest portion of the

professional services market, accounting for about 75% of user expenditure in this sector.

Primary growth opportunities in the Norwegian market lie in the areas of applications software products and network applications.

### 3. Market Considerations

Exhibit VIII-110 lists the leading 10 information services vendors in the 1993 Norwegian market. This list is compiled using software and services revenues attributable to the domestic market in Norway, excluding exports and revenues from within any parent group or subsidiaries.

EXHIBIT VIII-110

#### Leading Information Services Vendors—Norway, 1993

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Billions)	Market Share (Percent)
1	NIT	Norway	1,120	10.1
2	IBM	U.S.	850	7.7
3	Fellesdata	Norway	540	4.9
4	Bankenes	Norway	525	4.7
5	Betalingssentral	Norway	395	3.6
6	EDB	Norway	250	2.3
7	Rogalandsdata	Norway	220	2.0
8	Olivetti	Italy	205	1.8
9	Cap Gemini Sogeti	France	170	1.5
10	Digital	U.S.	165	1.5
	Total Listed		4,440	40.1
	Total Market		11,100	100.0

Unlike many European markets, IBM is not the leading vendor in the software and services market. In Norway, IBM is relegated to second place behind NIT, an indigenous company. Within the Norwegian software and services market, seven of the leading 10 vendors are indigenous companies.

The leading software and services vendor in Norway, NIT, commands a 10% share of the market. The company is dedicated

to the local and national government in Norway. The primary activity of this company is the provision of processing services, which account for about 75% of revenue. In 1992, the company employed a staff of 1,000. All NIT 1992 activities were within the Norwegian market.

IBM follows a policy of vigorously pursuing additional software and services revenues in a move to counter reducing revenue and margins from equipment sales. IBM has been particularly successful at establishing a European-wide systems integration business, and this sector of the software and services market in Norway accounts for almost 7% of the total compared with the overall European average of 4%.

Fellesdata primarily supplies the savings banking sector in Norway. Processing services dominate its activities.

#### 4. IT Spending

Exhibit VIII-111 provides an estimate of Norway's total IT spending for 1993.

EXHIBIT VIII-111

#### Total 1993 IT Spending—Norway

Budget Category	Estimated Spending (\$ Millions)
Data Communications	430
Internal Staff	1,400
Equipment	1,030
Equipment Services	460
Facilities	500
Information Services	1,700
<b>Total IT Spending</b>	<b>5,520</b>

Information services, which includes software products, represents approximately 31% of the total IT budget, as noted in Exhibit VIII-112. The next largest expenditures are for internal staff (25% of the IT budget) and equipment (19%). Data communications represents the smallest portion of the IT budget at \$430 million and 8% of the total.

EXHIBIT VIII-112

**1993 IT Spending Percentages—Norway**

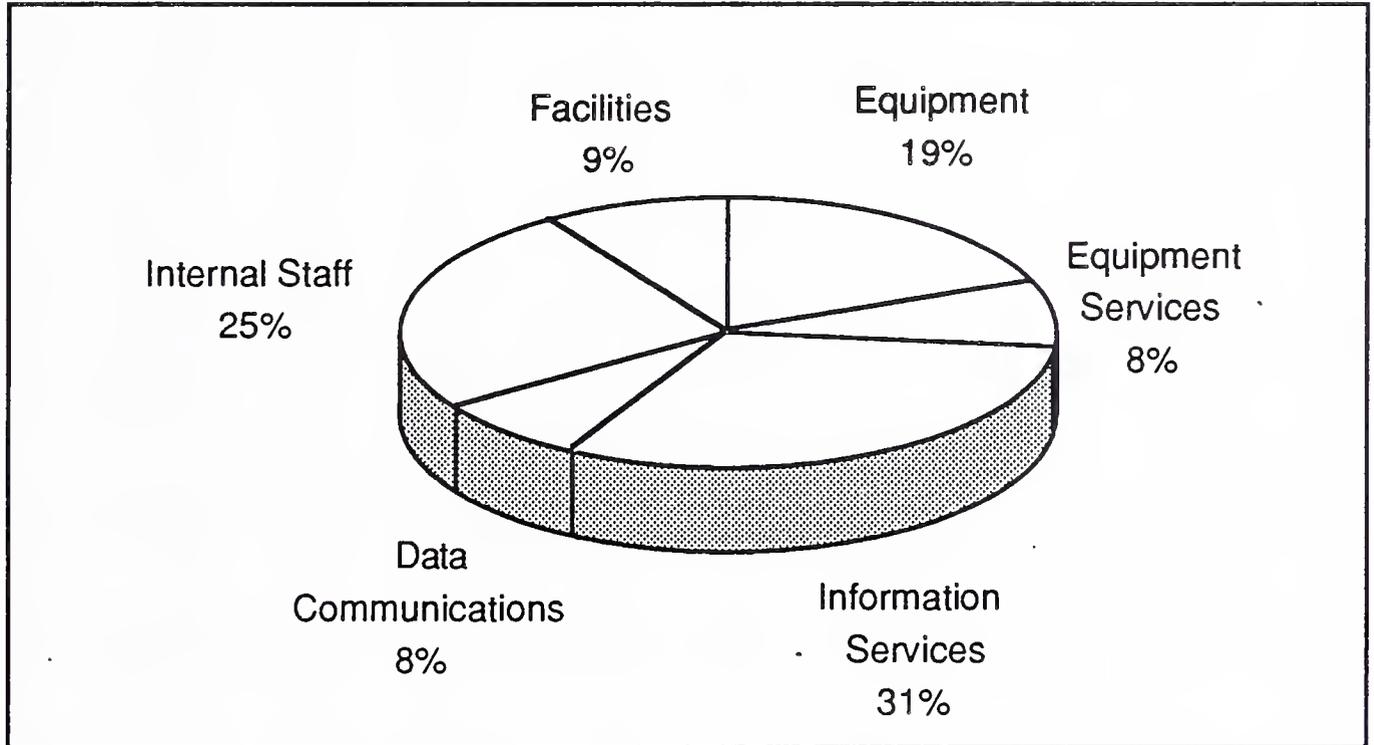


EXHIBIT VIII-113

**Information Services Industry Market Forecast by Delivery Mode  
Norway, 1993-1998**

Delivery Modes	1992 (\$M)	Growth 92-93 (%)	1993 (\$M)	1994 (\$M)	1995 (\$M)	1996 (\$M)	1997 (\$M)	1998 (\$M)	CAGR 93-98 (%)
Total Norway Information Services Mkt.	1,750	6	1,850	1,950	2,050	2,200	2,350	2,500	6
<i>Professional Services</i>	470	4	490	520	550	590	620	650	6
- IS Consulting	61	9	67	74	81	89	98	105	9
- Education & Training	53	10	58	64	70	78	86	92	10
- Custom Software	350	4	365	380	400	420	435	445	4
<i>Systems Integration</i>	40	18	47	56	64	74	88	105	17
- Equipment	11	14	13	14	16	17	20	22	12
- Software Products	10	25	13	17	21	27	34	44	29
- Professional Services	19	14	21	24	27	29	32	35	10
- Other	1	0	1	1	1	2	3	3	31
<i>Systems Operations</i>	32	22	39	46	54	65	77	92	19
- Platform Operations	14	15	16	18	21	24	28	33	16
- Application Operations	11	23	14	16	18	21	24	28	16
- Desktop Services	5	33	6	8	9	12	15	18	23
- Network Management	3	33	4	5	6	8	10	13	27
<i>Processing Services</i>	520	4	540	540	540	540	550	550	0
- Transaction Processing	476	4	493	490	493	495	498	499	0
- Utility Processing	10	0	10	10	10	9	9	9	-3
- Other Processing	34	7	36	37	38	39	41	42	3
<i>Network Services</i>	59	7	63	69	78	89	99	110	12
- Electronic Info Services	41	4	42	44	47	51	53	56	6
- Network Applications	18	17	21	26	31	38	46	56	22
<i>System SW Products</i>	205	5	215	225	235	250	265	285	6
- Mainframe	96	-1	95	95	94	93	93	92	-1
- Minicomputer	65	8	70	74	80	86	92	99	7
- Workstation/PC	45	12	51	57	64	72	81	92	13
<i>Application SW Products</i>	180	14	205	225	255	290	320	370	13
- Mainframe	17	0	17	17	17	17	17	17	-1
- Minicomputer	55	10	60	65	70	77	83	90	8
- Workstation/PC	110	18	130	145	170	195	225	260	15
<i>Turnkey Systems</i>	230	9	250	265	280	300	330	360	8
- Equipment	117	7	126	131	137	145	155	162	5
- Software Products	58	12	65	71	78	87	98	110	11
- Professional Services	55	10	60	63	67	73	79	84	7

**U****Other Asia/Pacific****1. Overview**

For the purpose of INPUT's worldwide forecast, the Other Asia/Pacific area consists mainly of China (PRC), Indonesia, Malaysia, the Philippines and Thailand. The region also includes Burma, Cambodia, Pakistan, Sri Lanka and Vietnam, by virtue of their geographic location. Because these latter countries are believed to represent only minimal revenues, they are not addressed specifically.

The Other Asia/Pacific area is already regarded as the next major area for economic development in the Far East. Nearly every country in this grouping has a national interest in technology, though not all have developed a governmental technology policy. Nevertheless, these countries continue to develop economically, and their interest in technology is a direct result of commercial interaction with technologically superior trading partners.

The economic and political setting of the Other Asia/Pacific area is extremely diverse. For instance:

- Economic growth in the region will vary by country. For example, Indonesia, Malaysia and Thailand will experience 7%-8% GDP growth from 1993 to 1994. In China, the GDP grew by 11% for 1993, but is expected to grow 4% less in 1994. On the modest side, the Malaysian GDP only grew 2% in 1993, but this figure will at least double in 1994.
- Politically, there are numerous flashpoints in this region.
  - In Indonesia, the waning tenure of President Suharto has caused tension over who will succeed him and how future economic policy will be handled.
  - In Thailand, Prime Minister Chuan Leekpai has been accused of ineffectiveness, and his administration was damaged by exposed corruption and an apparent inability to deal with Golden Triangle opium smuggling.
  - In the Philippines, President Fidel Ramos has gained popularity by stabilizing political in-fighting, but Communist agitators and Muslim rebels continue to annoy.

- In the Philippines, President Fidel Ramos has gained popularity by stabilizing political in-fighting, but Communist agitators and Muslim rebels continue to annoy.
- And in China, the government enforces austere economic policies which frown on conspicuous consumption. This may lead to an attempt to liberalize the government, including ousting conservative Prime Minister Li Peng.

Technology trends vary by country. However, several trends remain common to the majority of the countries in the area as well as to many other developing countries of the world.

- *Industrial sector development*—Development of a competitive industrial infrastructure is a leading requirement of the majority of governments in Asia. Having historically relied on low-cost labor, most countries recognize that development of their industrial sector is necessary to compete in the next century. Ironically, low-cost labor is the very reason countries such as China, Indonesia, Thailand and Vietnam have seen increased foreign investment from their Asian neighbors and Western nations. Japan and Taiwan, for example, export numerous manufacturing jobs to southern China.
- *Network development*—The ability to communicate domestically and internationally is increasingly recognized as critical to a country's development. Recognizing this need, many countries allocate larger portions of their national budgets to develop national telecommunications networks and services.
- *Mini/personal computer systems*—With comparatively small industrial organizations and increasingly powerful personal and mini-computer systems, organizations in many countries primarily emphasize the development of low-end systems. This level of technology has communications requirements that can be handled by locally installed and managed LANs as opposed to national telephone networks of questionable reliability.

#### **a. Driving Forces**

Some driving forces are unique to a specific country; some are more universal.

- *International competition*—Countries increasingly recognize that they must invest in technology to compete in the international business arena. As noted above, the need to remain competitive prompted the more developed nations to build and operate manufacturing facilities in Other Asia/Pacific countries. Other Asia/Pacific governments encourage this, recognizing the economic, educational and technological benefits of foreign investment and trade. For example, China may re-enter the General Agreement on Tariffs and Trade during 1994, although the U.S. will likely object, based on the nation's record on human rights.
- *Network access*—As the global telecommunications infrastructure becomes more advanced and widespread, Other Asia/Pacific countries actively solicit inclusion. AT&T, Sprint and KDD, Japan's international long-distance company, are examples of foreign firms that worked in this region to provide more advanced communications links to countries such as Indonesia, Malaysia and Thailand. Ongoing trade with the "Four Dragons" and the West introduced optic fiber and digital technology to this region, a trend that continues.

#### **b. Inhibiting Factors**

There are a number of inhibiting forces in each country. The following inhibiting forces are critical to the success of information technology development:

- *Global economy*—With trade in natural resources, simple manufacturing or low-cost labor the primary source of revenues, most countries heavily depend on global economic trends. The global recession adversely affected these countries for a number of years, curtailing national development projects and impeding the ability to invest in new technology. Ironically, Japan's economic woes are likely to stimulate the economies of its less-developed neighbors as it seeks cheaper labor and real estate for automotive and computer manufacturing.

- *Intellectual property rights*—Copyrights for computer software and other electronic media are violated as a matter of course in all of Other Asia/Pacific. In Thailand, for example, computer hardware and software, like drugs, are easily smuggled across borders with Myanmar (Burma), Cambodia and Laos. Software easily finds its way into the respective capital cities, where illegal copies are made. Vietnam, which has a well-educated work force, is developing a small but respectable software industry. Unfortunately, the country has almost no software piracy laws and has been subject to sanctions from the U.S. as a result.
- *Political instability*—Political instability is a reality in most of these countries. From the assassination of Aquino in the Philippines to the Tianenmen Square riots in China in the 1980s, including the examples discussed above, nations in this region have been plagued with political and military turmoil for decades. Understandably, this makes outsiders unwilling or unable to invest in these countries. Often, instability arises from a particular government's inability to effectively stimulate the economy, causing hard conditions for the populace, who often take action. What stability there is has allowed for increased foreign trade, which may be the key factor in energizing the region.

## **2. Information Services Market Forecast**

Exhibit VIII-114 shows that although the market for information services is small, the Other Asia/Pacific area is expected to grow an estimated 19% per year through 1998. At a 19% CAGR, the five-year forecast is the same as last year's estimate, but the 1992 to 1993 growth was down 2% from the 21% estimated in 1992. The slightly slower growth is a result of the general economic slowdown affecting most of the more developed nations, whose business needs drive much of this area's economy. Assuming continued stable and growing economies, the markets should grow from an estimated \$344 million in 1993 to approximately \$835 million by 1998.

EXHIBIT VIII-114

**Market Forecast—Other Asia/Pacific, 1993-1998**

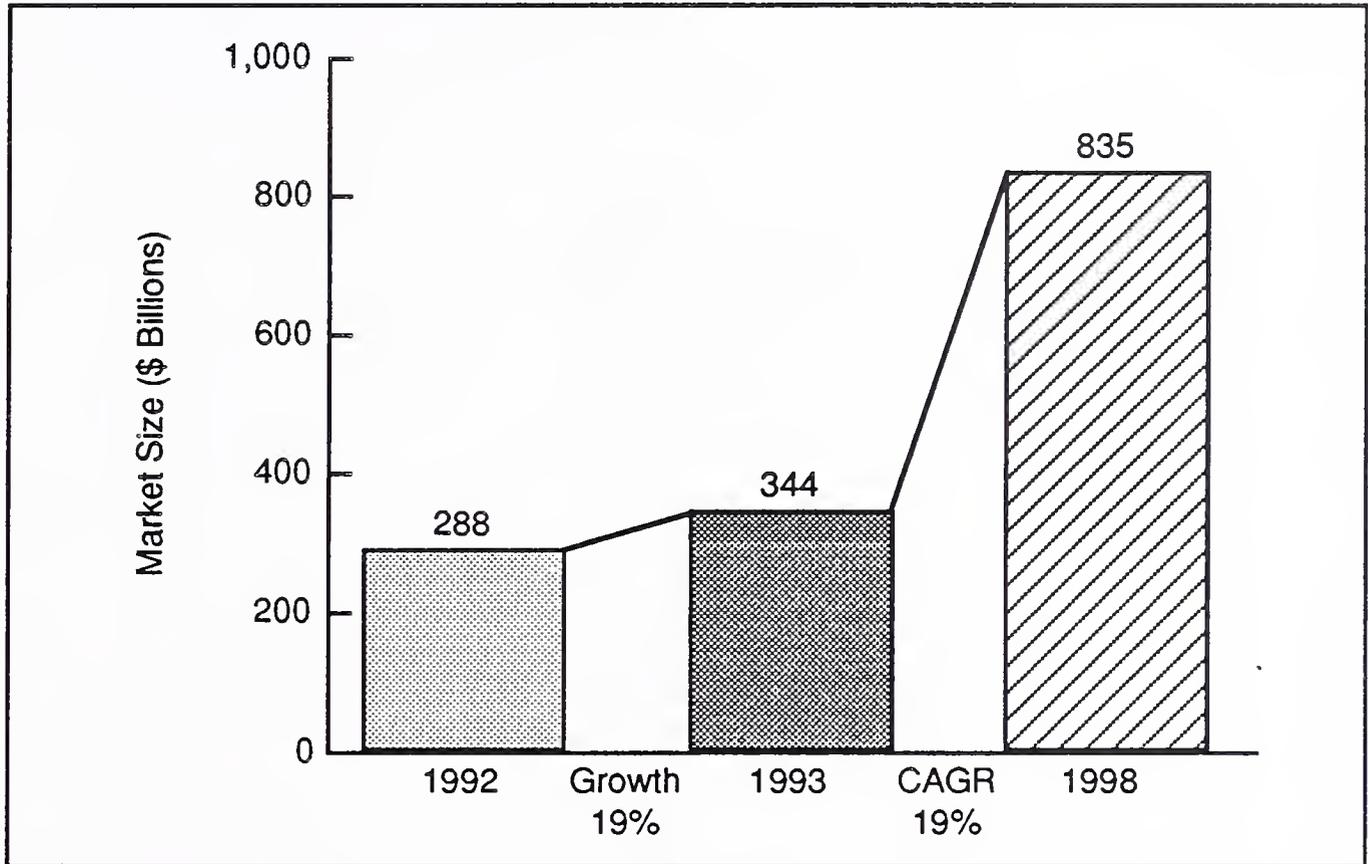
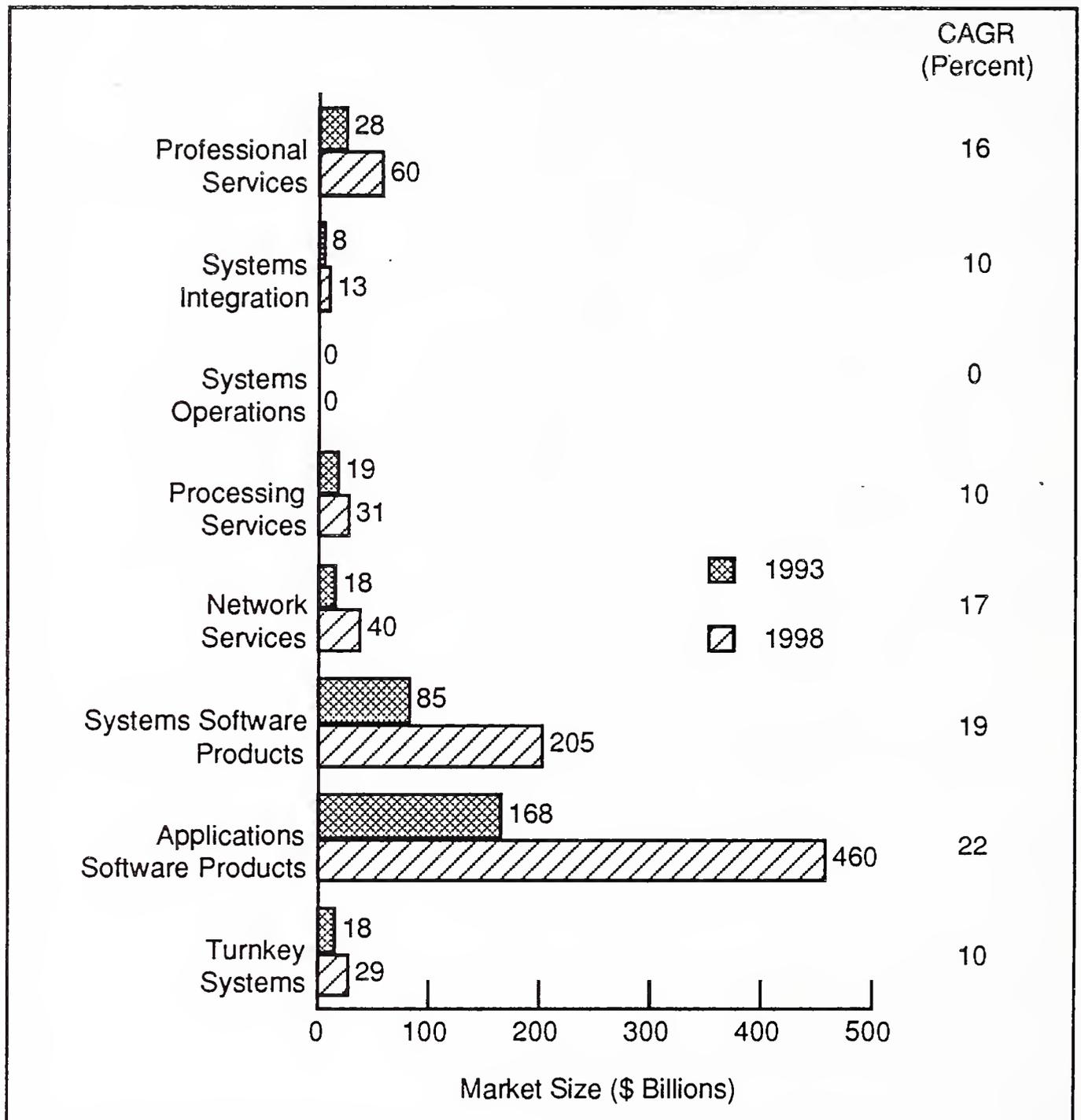


Exhibit VIII-115 provides the forecast by delivery mode. Exhibit VIII-118, at the end of this profile, provides the detail behind this forecast.

EXHIBIT VIII-115

**Market Forecast by Delivery Mode  
Other Asia/Pacific, 1993-1998**



Relative to the markets in the Other Asia/Pacific area:

- Network Services*—INPUT has reduced the growth rate for network services from 20% in last year's forecast to 17% for 1993 through 1998. This slight reduction is based on the continued slow growth in the less developed areas of the Asia/Pacific economy, and the ongoing trend to defer from outdated public networks to the use of LANs with satellite and other types of linkages that bypass local telecommunications facilities. As national programs to improve the telecommuni-

cations infrastructure show results, higher growth rates for this mode can be expected.

- *Applications and Systems Software Products*—Applications and systems software products still represent the largest portions of the market in total size and projected growth rates. This dominance is not expected to change for a number of years. The need for software products steadily increases for nearly all economic areas in most countries. However, as with most other nations—sophisticated or unsophisticated (technological)—the greatest need will be for industry-specific applications software products.
- *Professional Services*—Although small in size (\$28 million in 1993), the professional services market is expected to grow at a healthy 16% to almost \$60 million over the next five years. The needs of businesses will drive this growth, which requires guidance and assistance with establishing and expanding their information technology resources to meet the growing demands of this region.
- *Other Delivery Modes*—Due primarily to a lack of infrastructure, growth in other delivery modes is not expected to be as great. Most countries do not have a sufficiently large installed base to support major information services investments, and IT organizations have not yet reached the size where systems operations (outsourcing) is a reasonable alternative. However, this situation can be expected to change in the next few years as the Other Asia/Pacific countries benefit from the general economic growth expected for the region.
- *IT Market*—Indonesia, Malaysia and Thailand provide incentives for information technology investments and aggressively encourage information services investments. Long term, these countries are expected to develop more rapidly into markets of interest.

In general, the services modes (processing services and systems integration) are of modest importance, and the growth for turnkey systems is expected to remain at a conservative 10% over the forecast period.

### 3. Market Considerations

Entry into Asian markets can be a lengthy process. Even though many manufacturers have offices in the key countries, most successful companies align with organizations that have established relationships in a specific country.

A key to success in Asian markets is to demonstrate a presence over the long term, which requires a significant investment in staff. Historically, Asian firms have been dissatisfied with foreign software firms that did not provide the support necessary to ensure product success. For companies considering initiating or expanding operations, a strong business relationship with a local company is necessary to succeed.

In the majority of the Other Asia/Pacific area, leading vendors are large hardware manufacturers such as IBM, DEC, Wang and NEC. Leaders in software include Borland and Microsoft. The leading providers of professional services are primarily the major professional services firms, such as the Big 6 from the United States and PRC from the United Kingdom.

### 4. IT Spending

Exhibit VIII-116 provides INPUT's breakdown of Other Asia/Pacific's IT spending for 1993.

EXHIBIT VIII-116

**Total 1993 IT Spending—Other Asia/Pacific**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	86
Internal Staff	645
Equipment	559
Equipment Services	237
Facilities	280
Information Services	344
<b>Total IT Spending</b>	<b>2,151</b>

Information services spending, at \$344 million, represents approximately 16% of the total IT budget, as noted in

Exhibit VIII-117. The largest expenditure is for internal staff (30% of the IT budget). Data communications, at \$86 million and 4% of the total, is the smallest portion of the IT budget.

EXHIBIT VIII-117

**1993 IT Spending Percentages—Other Asia/Pacific**

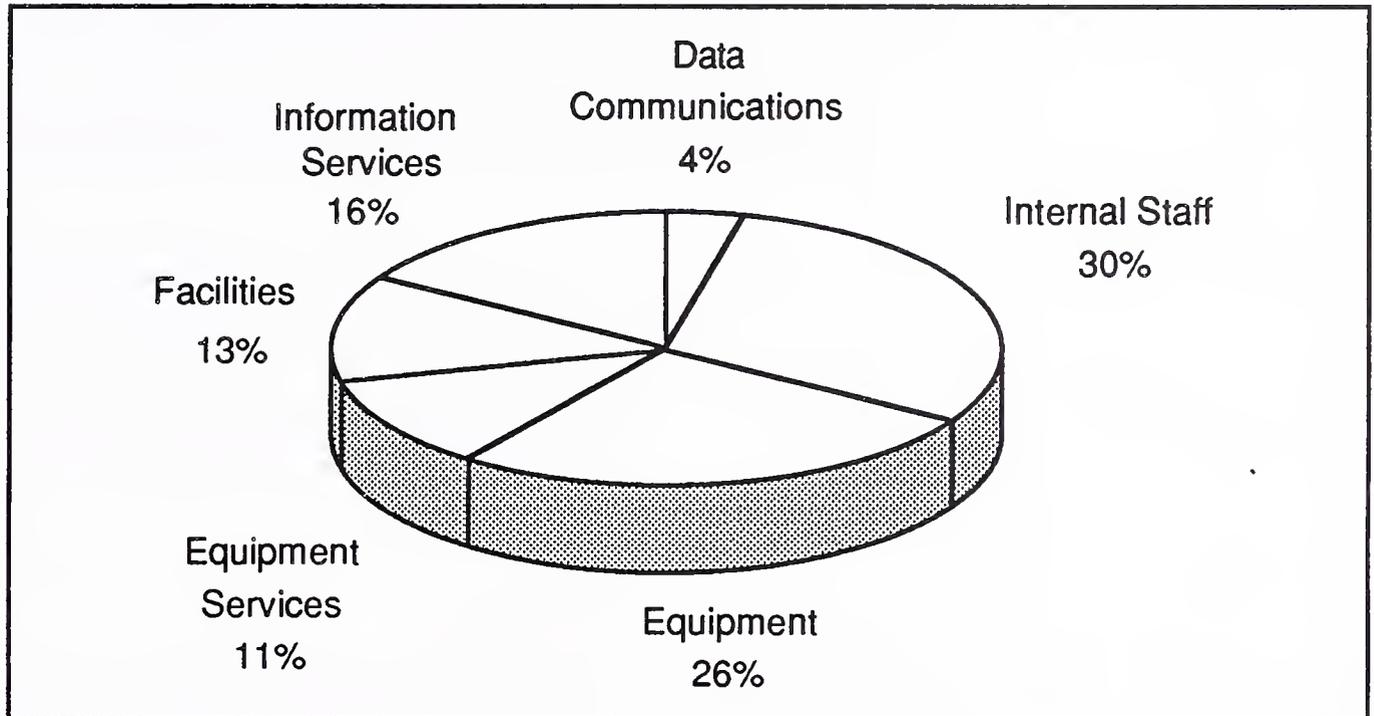


EXHIBIT VIII-118

**Information Services Industry Market Forecast by Delivery Mode  
Other Asia/Pacific, 1993-1998**

Delivery Modes	1992 (\$)	Growth 92-93 (%)	1993 (\$)	1994 (\$)	1995 (\$)	1996 (\$)	1997 (\$)	1998 (\$)	CAGR 93-98 (%)
Total Other Asia/Pacific Information Services Mkt.	288	19	344	412	491	585	698	835	19
Professional Services	24	17	28	32	37	42	47	58	16
Systems Integration	7	14	8	9	10	11	12	13	10
Processing Services	17	12	19	21	23	25	28	31	10
Network Services	15	20	18	22	26	30	35	40	17
Systems Software	71	20	85	103	122	147	176	206	19
Applications Software	138	22	168	205	251	306	374	458	22
Turnkey Systems	16	13	18	20	22	24	26	29	10

## V

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**Other Europe****1. Overview**

The market designated as Other Europe was valued at \$1.3 billion in 1993. It primarily consists of three member countries of the EEC: Portugal, Greece and Ireland. Portugal and Greece each have populations of around 10 million, whereas Ireland has 3.5 million.

The 1993 GDP at current prices and current exchange rates is estimated by OECD as follows:

- Portugal           \$84 billion
- Greece             \$79 billion
- Ireland            \$46 billion

In total, this represents about 2.7% of OECD European members' total GDP.

Portugal's growth rate (2.2%) in 1992 again exceeded EC and OECD averages, but so did its inflation rate at 11.3%. Continued steady growth rates are forecast, along with a small improvement in inflation.

Greece's 1992 growth rate (1.8%) was clearly positive after the 1991 figure at around zero. Consumer price inflation improved marginally, but at 18.8% was almost four times the EC average. Current forecasts are for continued modest real growth, combined with stubbornly persisting current account deficits and inflation declining to around 10% in 1994.

Of the three, Ireland had the highest growth rate (1.7%). But inflation was much lower at 3.2%, better than the OECD and EC averages. It also had high unemployment at around 15%. Forecasts indicate growth rates not far from 2% in 1992 and 1993, with inflation just above 3%. A small continuing surplus on the current account is predicted.

## 2. Information Services Market Forecast

The software and services market is relatively healthy in all three countries. The following exhibits, VIII-119 through VIII-130, give forecasts based on available economic data for each country. Exhibits VIII-131 through VIII-133, found at the end of this profile, provide the forecast in greater detail.

Portugal is expected to grow overall from \$320 million in 1993 to \$660 million by 1998, a CAGR of 15% including inflation.

In the same period, Greece will also increase at 15% CAGR from \$370 million to \$740 million.

Ireland is forecast to grow from \$710 million to more than \$1 billion, a CAGR of 8%.

EXHIBIT VIII-119

Market Forecast—Portugal, 1993-1998

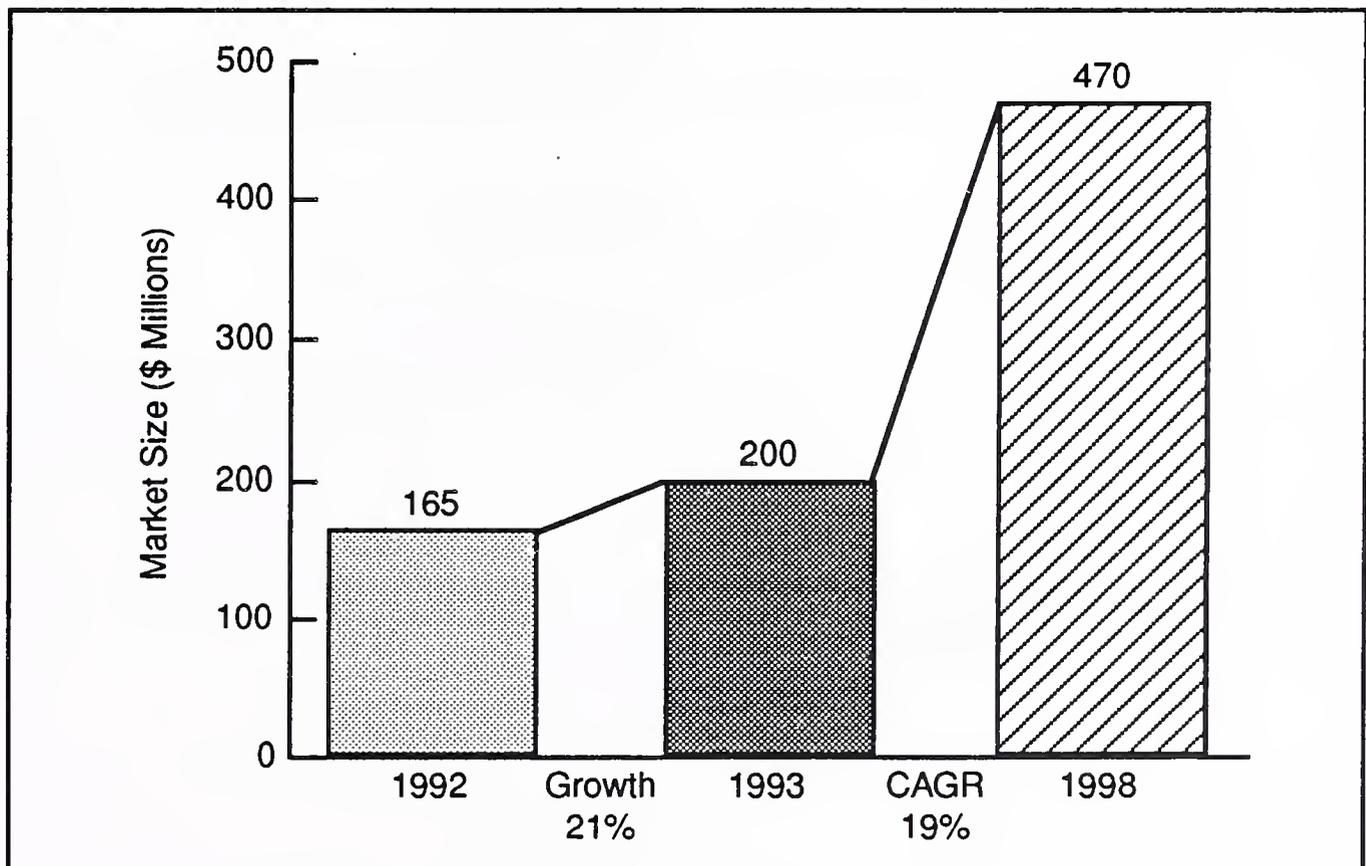


EXHIBIT VIII-120

### Market Forecast by Delivery Mode Portugal, 1993-1998

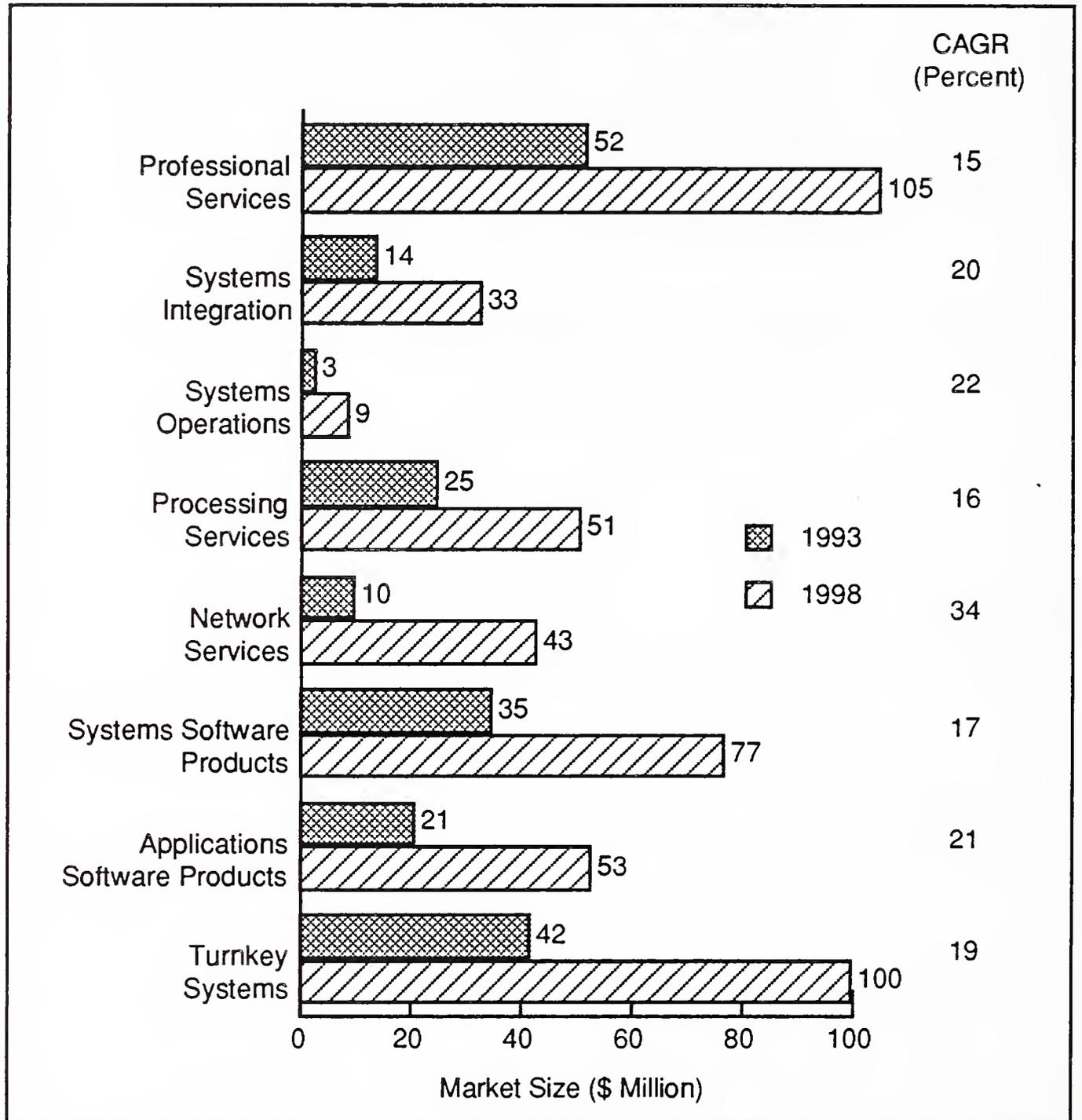


EXHIBIT VIII-121

**Total 1993 IT Spending—Portugal**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	100
Internal Staff	390
Equipment	300
Equipment Services	123
Facilities	115
Information Services	175
<b>Total IT Spending</b>	<b>1,203</b>

EXHIBIT VIII-122

**1993 IT Spending Percentages—Portugal**

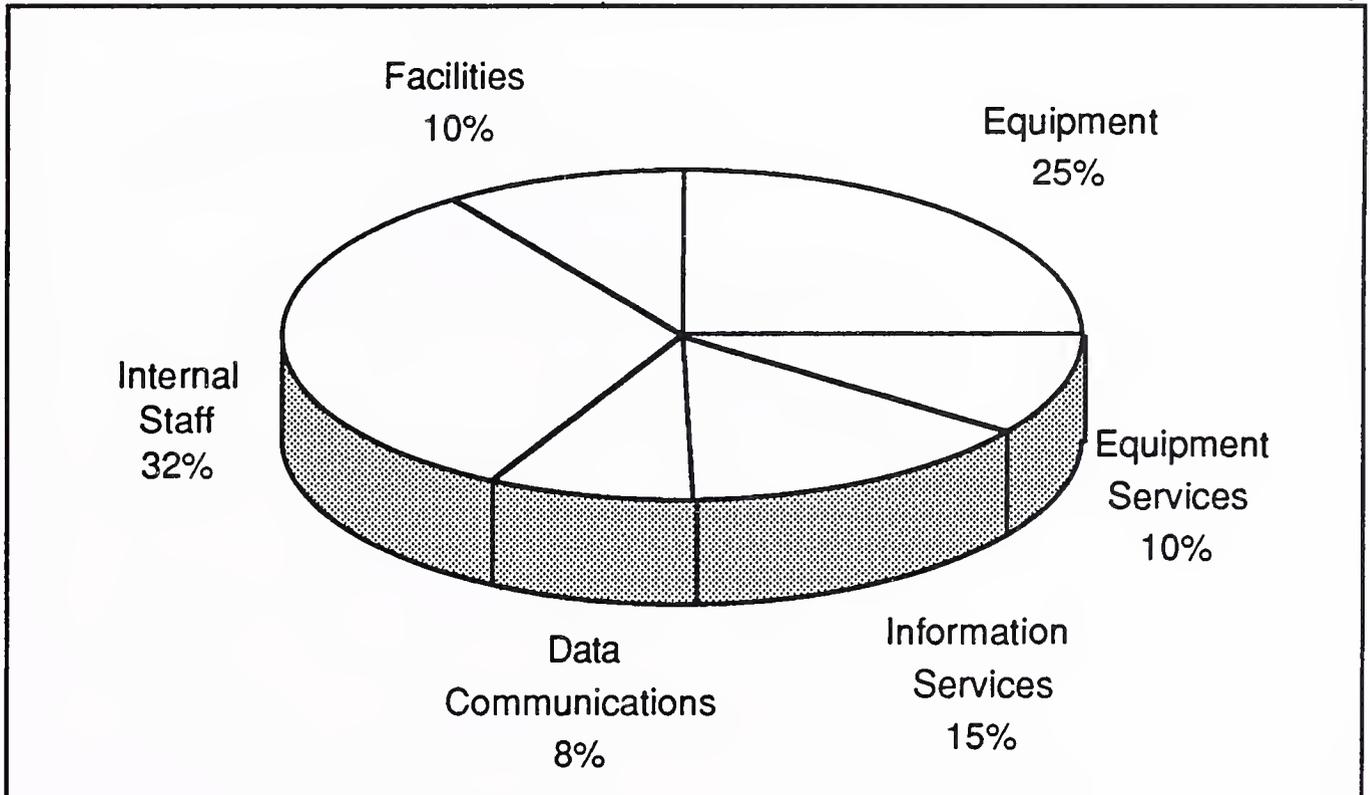


EXHIBIT VIII-123

**Market Forecast—Greece, 1993-1998**

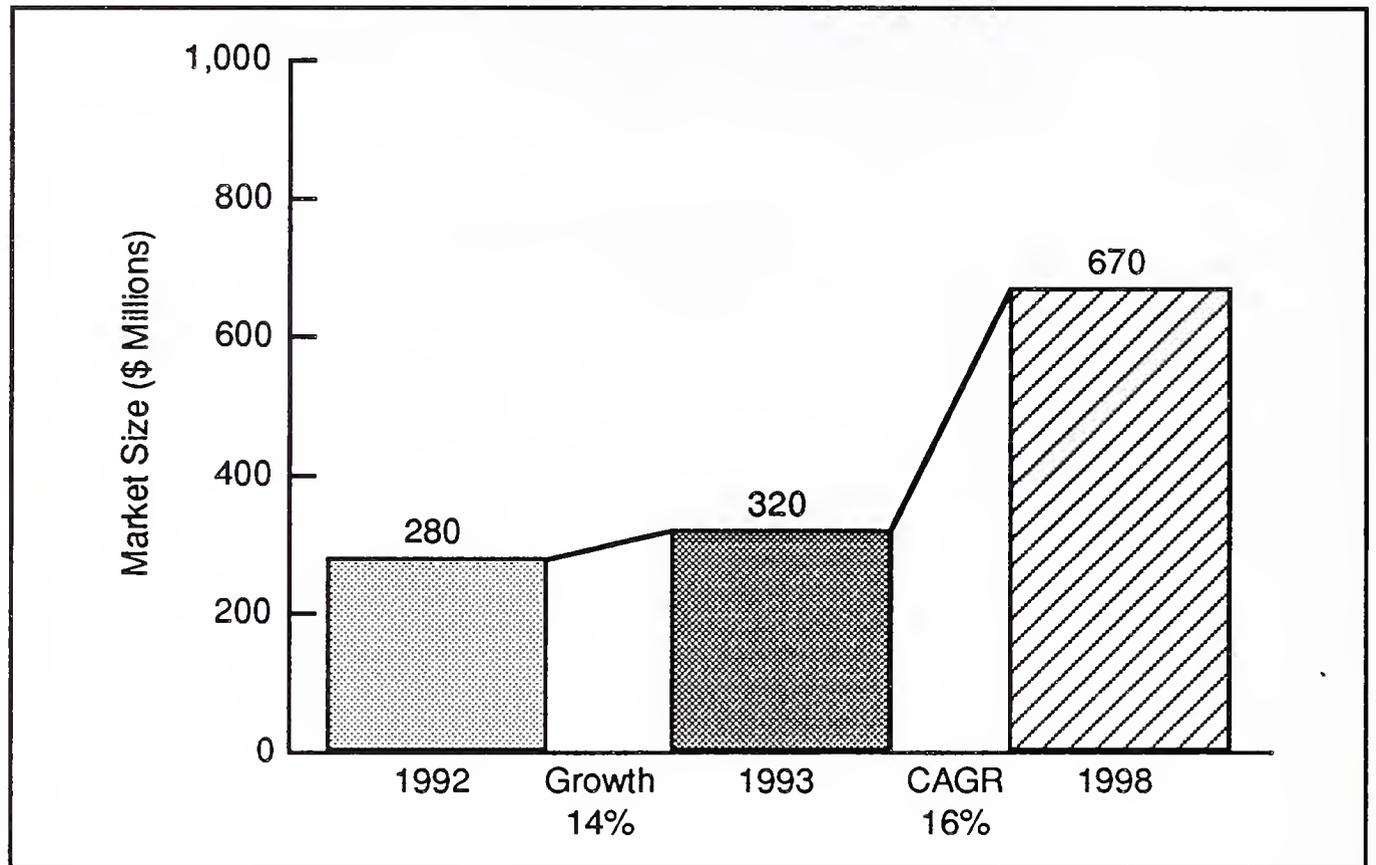


EXHIBIT VIII-124

### Market Forecast by Delivery Mode Greece, 1993-1998

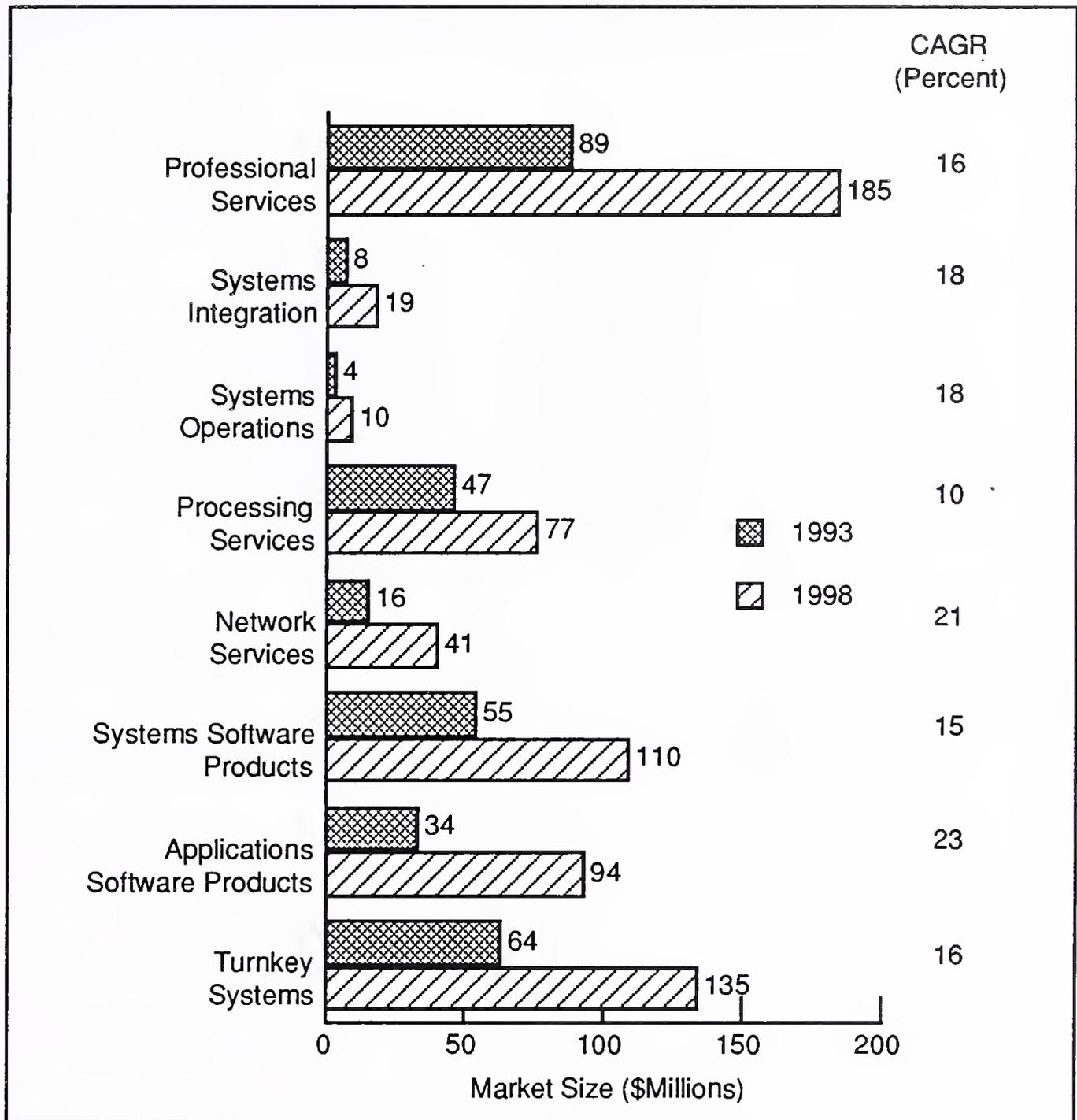


EXHIBIT VIII-125

**Total 1993 IT Spending—Greece**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	125
Internal Staff	480
Equipment	285
Equipment Services	48
Facilities	150
Information Services	285
<b>Total IT Spending</b>	<b>1373</b>

EXHIBIT VIII-126

**1993 IT Spending Percentages—Greece**

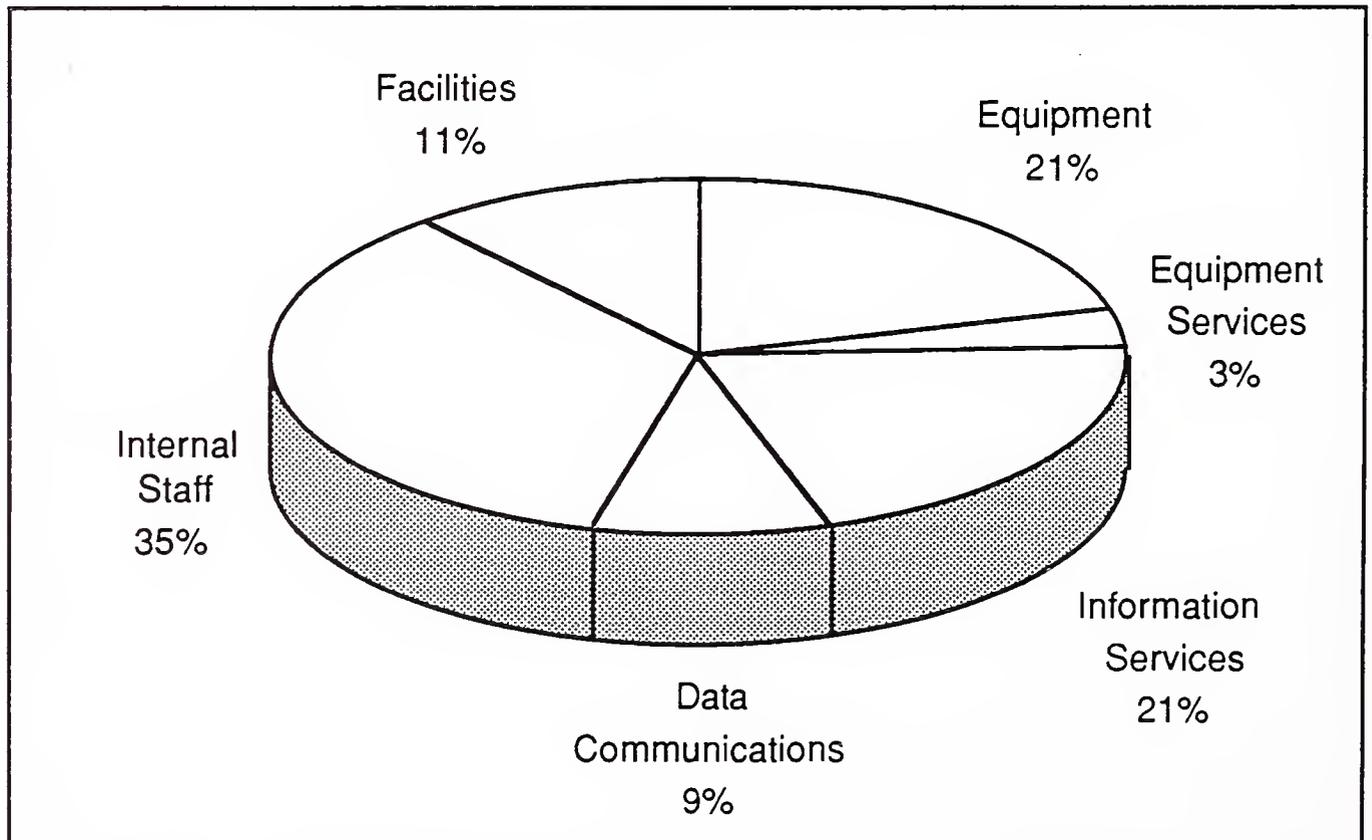


EXHIBIT VIII-127

Market Forecast—Ireland, 1993-1998

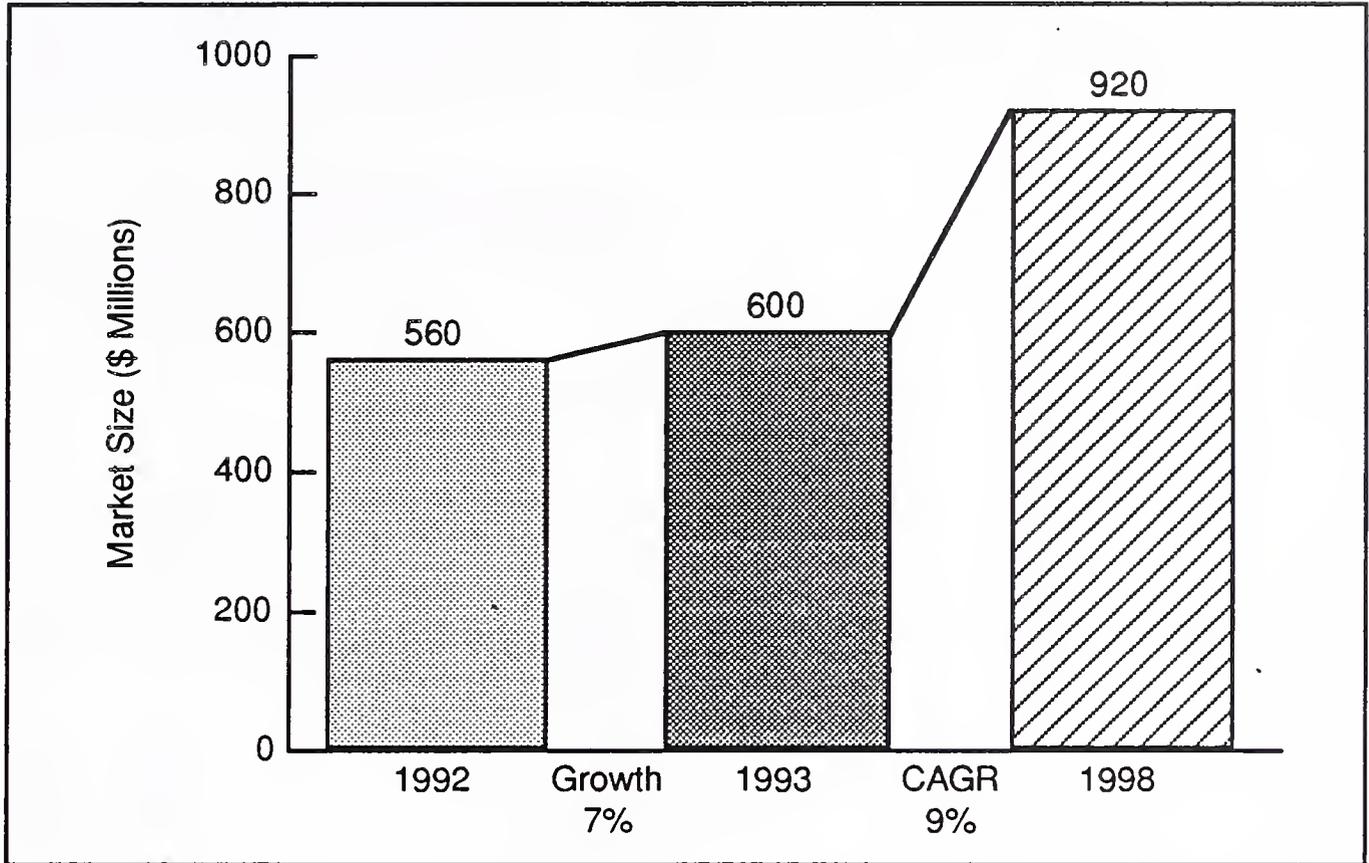


EXHIBIT VIII-128

### Market Forecast by Delivery Mode Ireland, 1993-1998

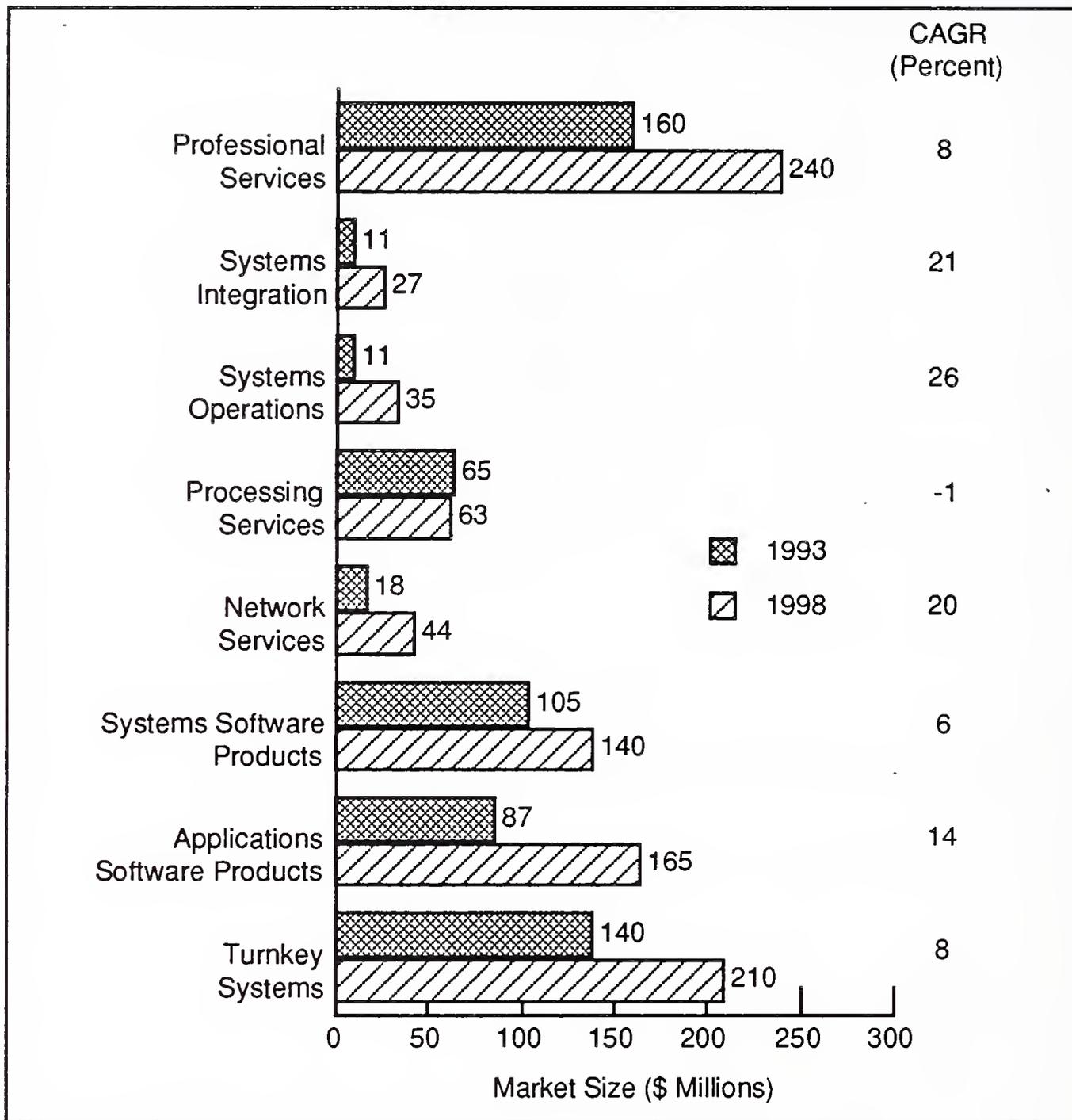


EXHIBIT VIII-129

**Total 1993 IT Spending—Ireland**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	115
Internal Staff	470
Equipment	540
Equipment Services	107
Facilities	150
Information Services	285
<b>Total IT Spending</b>	<b>1,667</b>

EXHIBIT VIII-130

**1993 IT Spending Percentages—Ireland**

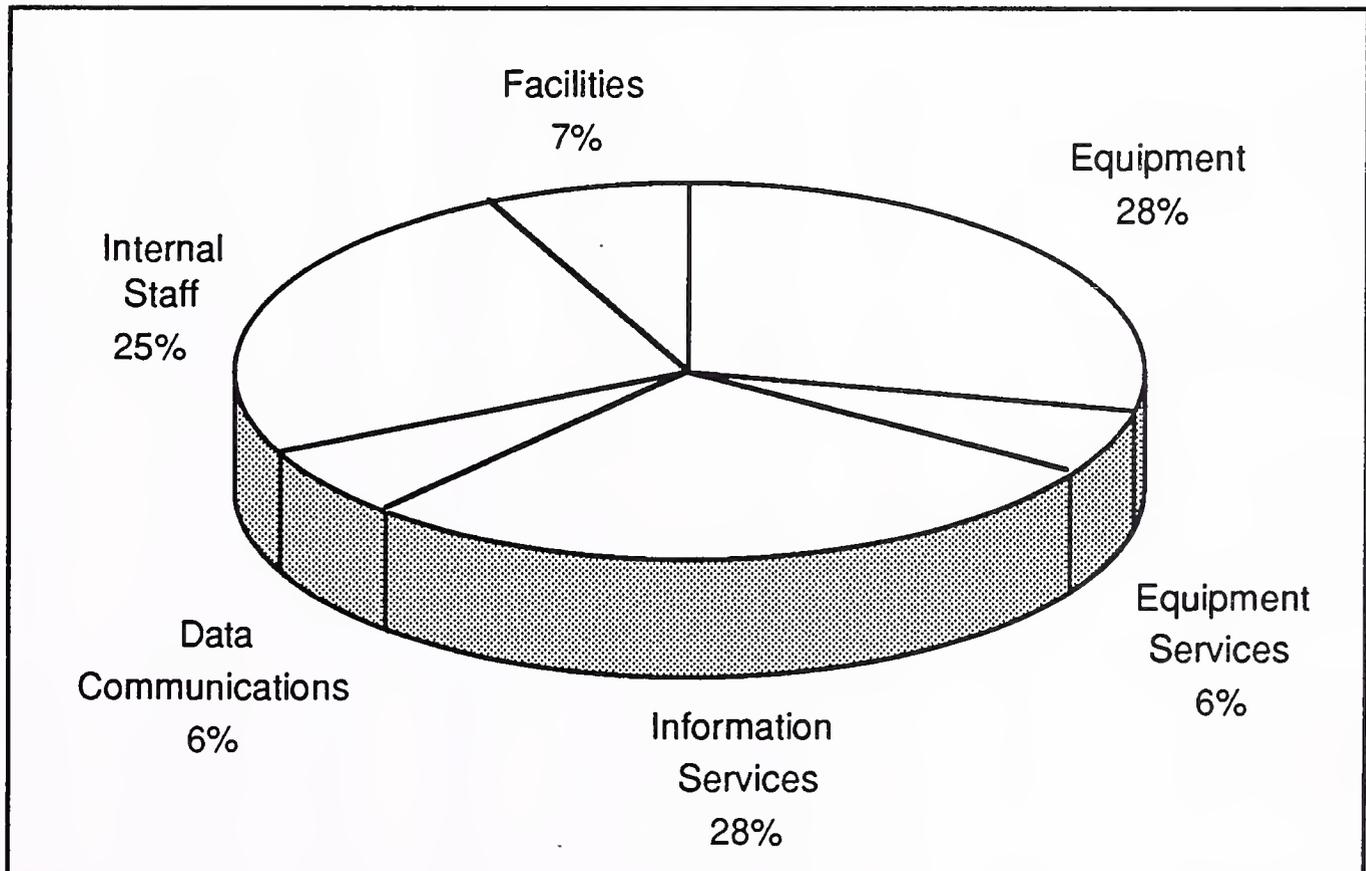


EXHIBIT VIII-131

**Information Services Industry Market Forecast by Delivery Mode  
Portugal, 1993-1998**

Delivery Modes	1992 (\$M)	Growth 92-93 (%)	1993 (\$M)	1994 (\$M)	1995 (\$M)	1996 (\$M)	1997 (\$M)	1998 (\$M)	CAGR 93-98 (%)
Total Portugal Information Services Mkt.	165	21	200	235	280	340	410	470	19
<i>Professional Services</i>	44	18	52	60	70	81	95	105	15
- IS Consulting	6	24	7	9	10	12	15	18	20
- Education & Training	5	18	6	7	8	9	10	11	14
- Custom Software	33	18	39	45	52	60	70	78	15
<i>Systems Integration</i>	11	23	14	16	19	23	28	33	20
- Equipment	3	20	4	4	5	5	6	7	14
- Software Products	3	25	4	5	6	8	11	14	32
- Professional Services	5	23	6	7	8	9	10	11	13
- Other	0	14	0	0	0	1	1	1	29
<i>Systems Operations</i>	3	16	3	4	5	6	7	9	22
- Platform Operations	1	11	1	1	1	2	2	2	18
- Application Operations	1	14	1	1	1	1	2	2	20
- Desktop Services	0	23	1	1	1	1	1	1	21
- Network Management	1	29	1	1	2	2	3	3	27
<i>Processing Services</i>	21	17	25	29	33	39	46	51	16
- Transaction Processing	18	16	21	25	29	34	39	44	16
- Utility Processing	1	11	1	1	1	1	2	2	11
- Other Processing	2	24	2	3	3	4	5	6	22
<i>Network Services</i>	8	31	10	13	18	25	33	43	34
- Electronic Info Services	6	25	7	9	12	15	20	25	29
- Network Applications	2	45	3	4	6	9	13	18	44
<i>System SW Products</i>	30	17	35	41	48	57	67	77	17
- Mainframe	14	8	15	16	18	20	21	22	9
- Minicomputer	10	18	12	15	17	21	25	29	20
- Workstation/PC	6	26	8	10	13	16	21	26	27
<i>Application SW Products</i>	16	28	21	25	30	36	44	53	21
- Mainframe	1	7	2	2	2	2	3	3	12
- Minicomputer	5	23	6	7	8	10	12	14	19
- Workstation/PC	10	30	13	16	20	24	30	37	23
<i>Turnkey Systems</i>	35	20	42	50	59	73	88	100	19
- Equipment	18	15	20	23	27	32	37	41	15
- Software Products	9	22	11	13	16	20	26	30	23
- Professional Services	9	20	11	13	17	21	26	31	24

EXHIBIT VIII-132

**Information Services Industry Market Forecast by Delivery Mode  
Greece, 1993-1998**

Delivery Modes	1992	Growth	1993	1994	1995	1996	1997	1998	CAGR
	(\$M)	92-93 (%)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	93-98 (%)
Total Greece Information Services Mkt.	280	14	320	370	420	500	570	670	16
<i>Professional Services</i>	79	13	89	105	120	140	160	185	16
- IS Consulting	9	15	10	11	13	15	17	20	15
- Education & Training	8	6	8	9	10	10	11	12	8
- Custom Software	62	15	71	83	96	113	132	154	17
<i>Systems Integration</i>	7	17	8	10	12	14	16	19	18
- Equipment	2	16	2	3	3	3	4	4	13
- Software Products	2	17	2	3	4	5	6	8	31
- Professional Services	3	19	4	4	5	5	6	6	11
- Other	0	13	0	0	0	0	0	1	26
<i>Systems Operations</i>	4	17	4	5	6	7	8	10	18
- Platform Operations	2	18	2	2	3	3	4	4	15
- Application Operations	1	18	1	2	2	2	2	3	14
- Desktop Services	0	20	0	0	0	1	1	1	23
- Network Management	1	20	1	1	1	1	2	2	30
<i>Processing Services</i>	42	12	47	51	57	63	70	77	10
- Transaction Processing	37	11	41	45	50	56	62	69	11
- Utility Processing	2	5	2	2	2	2	3	3	7
- Other Processing	3	12	4	4	4	5	5	6	9
<i>Network Services</i>	13	19	16	19	23	28	34	41	21
- Electronic Info Services	9	12	10	12	13	15	17	19	13
- Network Applications	4	30	5	7	9	13	17	22	34
<i>System SW Products</i>	49	12	55	62	71	82	95	110	15
- Mainframe	22	5	23	25	26	27	29	31	6
- Minicomputer	16	14	18	21	25	28	33	38	16
- Workstation/PC	11	23	13	17	21	26	33	41	25
<i>Application SW Products</i>	29	19	34	42	51	63	76	94	23
- Mainframe	3	3	3	3	3	4	4	4	5
- Minicomputer	8	16	9	10	12	14	17	19	17
- Workstation/PC	18	22	22	28	36	45	56	71	26
<i>Turnkey Systems</i>	56	14	64	73	84	99	115	135	16
- Equipment	27	10	30	34	38	43	49	55	13
- Software Products	14	19	16	19	22	27	32	38	19
- Professional Services	15	17	17	21	25	30	36	43	20

EXHIBIT VIII-133

**Information Services Industry Market Forecast by Delivery Mode  
Ireland, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$M)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$M)</b>	<b>1994 (\$M)</b>	<b>1995 (\$M)</b>	<b>1996 (\$M)</b>	<b>1997 (\$M)</b>	<b>1998 (\$M)</b>	<b>CAGR 93-98 (%)</b>
Total Ireland Information Services Mkt.	560	7	600	640	690	770	840	920	9
<i>Professional Services</i>	155	3	160	170	180	200	220	240	8
- IS Consulting	19	0	19	20	20	21	23	25	6
- Education & Training	15	0	15	16	17	18	20	21	7
- Custom Software	119	7	127	136	144	161	178	195	9
<i>Systems Integration</i>	10	6	11	13	15	18	22	27	21
- Equipment	3	7	3	3	4	4	4	5	9
- Software Products	2	32	2	3	4	6	8	12	36
- Professional Services	5	0	5	6	7	8	9	11	16
- Other	0	0	0	0	0	0	0	0	0
<i>Systems Operations</i>	9	22	11	15	18	22	28	35	26
- Platform Operations	5	16	6	8	9	11	14	17	24
- Application Operations	2	32	3	3	4	5	6	8	25
- Desktop Services	0	100	1	1	2	2	3	5	48
- Network Management	2	0	2	3	3	4	5	6	27
<i>Processing Services</i>	66	-2	65	65	64	63	62	63	-1
- Transaction Processing	51	-3	49	48	46	44	42	42	-3
- Utility Processing	2	0	2	2	2	2	2	2	0
- Other Processing	14	6	14	15	16	17	18	19	5
<i>Network Services</i>	16	16	18	21	26	31	37	44	20
- Electronic Info Services	10	8	11	13	14	16	18	20	12
- Network Applications	5	33	7	9	11	14	19	25	29
<i>System SW Products</i>	100	5	105	110	115	125	130	140	6
- Mainframe	51	-3	49	48	47	46	44	42	-3
- Minicomputer	29	9	31	34	37	41	43	47	8
- Workstation/PC	20	17	24	28	33	39	45	52	17
<i>Application SW Products</i>	77	13	87	98	110	130	145	165	14
- Mainframe	9	0	9	9	9	9	9	9	0
- Minicomputer	20	8	22	24	26	27	30	32	8
- Workstation/PC	48	17	56	66	78	92	107	126	18
<i>Turnkey Systems</i>	130	8	140	150	165	180	195	210	8
- Equipment	70	6	74	77	81	84	87	91	4
- Software Products	29	10	32	36	41	45	51	57	12
- Professional Services	31	14	35	39	44	49	55	62	12

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**Other Latin America****1. Overview**

The remainder of the Latin America region consists of many smaller countries and economies such as Panama, El Salvador, Guatemala, Honduras, Costa Rica, Uruguay, Peru, Chile, Bolivia and Columbia. Although each country has some information services activity, each is relatively modest on its own. Only Chile might be considered as a market of some size and stability.

Most of these countries suffer from economic instability, some level of civil unrest and inflationary problems of significant magnitude. All of these are inhibiting factors in the development of the local information services industry and to entry by international vendors.

Some countries recorded moderate improvement in stability over the past two years. If it lasts, these countries will develop into attractive secondary markets for the information services vendors gaining success in the larger Latin American countries.

Bolivia was one of the first Latin America countries to develop an economic reform package to address inflationary and growth issues. Inflation, which peaked at an annual rate of 23,000% in 1985, dropped to the low, double-digit range in recent years. The country is also beginning to attract foreign capital, and the economy is on a modest growth track.

Columbia has the potential for becoming a major market in Latin America with its huge, largely undeveloped oil reserves. It also liberalized its trade policies by substantially decreasing import tariffs, and is working on developing a common market trade with Venezuela. However, the inflation rate is still in the high double-digit range, and civil unrest and drug trafficking are significant barriers to providing a stable economic environment.

One of the positive surprises in Latin America is Central America. The countries in this region, particularly Guatemala, El Salvador, Honduras, Costa Rica and Panama, show signs of increasing economic progress, along with progress in democratic reform. The economic programs of all of these countries focus on monetary policies to bring inflation down to respectable levels, and

also on economic growth through development of a common market environment. They are also beneficiaries of Ronald Reagan's Caribbean Basin Initiative, which helps them attract more foreign capital to the region.

The strongest economies of the region are Costa Rica and Panama. Privatization is also stressed throughout the area. Panama has probably shown the most initiative in this direction as part of its effort to develop its port facilities in the Colon Free Zone.

Peru continues to be mired in poverty, and is also bogged down by political turmoil and drug trafficking.

### *Uruguay*

Along with other countries in Latin America, the countries of the so-called Southern Cone, which includes Uruguay, are planning an economic union to help increase foreign investment and to promote economic growth.

The proposed Southern Cone common trade bloc (MERCOSUR) includes Argentina, Brazil, Paraguay and Uruguay. These countries expect to finalize the agreement for this economic unification by December 31, 1994. The goals of the union are to eliminate trade barriers and deregulate their principal industries. By the December deadline, they plan to eliminate tariffs among themselves and establish a common external tariff.

Companies can consolidate their facilities to one location serving the whole region rather than maintain separate operations in each country. This common market, without tariffs and other import/export restrictions, creates a much larger market for companies within these countries. Also, improved efficiencies of resource allocation should help each country maximize marketing opportunities for producing products where each has a competitive advantage. This could also help address inflationary pressures.

Multinational companies located in this free-trade zone should also benefit. Many large international companies have already begun increasing their operations within the area. There has also been a substantial increase in U.S. exports to the region in recent years.

This economic zone will be South America's largest industrial base, with a market of close to 190 million and a gross regional product of more than \$425 billion.

The major area of economic development is expected to be in the 1,200-mile zone from Sao Paulo, Brazil, to Buenos Aires. Uruguay, situated in the middle with major port facilities, would be a good location for wholesale operations. Infrastructure improvement has also been a high priority in Uruguay in recent years. Also, the government set up a series of free-trade zones to facilitate trading, storing and handling foreign and domestic goods or raw materials within the zones; this is particularly advantageous for establishing wholesale distribution centers. Commercial activities within the free-trade zones are exempt from taxes and duties. Goods brought into the zones are not considered imports to Uruguay unless they are actually sold within Uruguay. In addition, the goods would be entitled to the preferential trade provisions granted to MERCOSUR members.

The banking industry of Uruguay is also well-developed, and the nation also provides for banking and tax secrecy protection. In addition, there is no personal tax system in the country.

Uruguay also represents one of the more stable political environments in Latin America. A significant percentage of the population is of European ancestry, and the literacy rate is 95%, probably the highest in Latin America. Forty percent of the adult population are high school or technical school graduates, and close to 20% are university graduates. A relatively high level of the population also knows some English.

High inflation is a continuing problem. The government's goal, in connection with a credit arrangement with IMF, was to reduce inflation to the 30% level by the end of 1993. Moderate economic growth of 2.3% a year is also targeted.

### *Chile*

Chile's relatively strong economy, along with its recent political stability, has made it one of the more attractive countries for new foreign investment in Latin America. The December 1993 election of a new pro-business president, Christian Democratic Eduardo Frei, further reinforces the belief in a continuing favorable political and economic environment for foreign investments.

Chile is also the first country to achieve an investment-grade rating from Standard and Poors on its internal debt.

The United States and Canada represent approximately 40% of the total foreign investment in Chile.

Most foreign investment in Chile is in mining, but more recently there has been a diversification strategy put in place that includes the services industry. Bell South has a major investment contract in Chile to upgrade the facilities of the country's leading telecommunications company (Cidom). The government stresses the development of the telecommunications sector, an area which is expected to experience strong growth over the next several years.

Individuals and businesses in Chile, except foreign subsidiaries, are subject to a fairly high income tax. Future tax reform is expected under the new presidential administration that could shift the tax focus more toward consumption-based taxes to further encourage capital investment.

The economic growth of Chile is expected to moderate somewhat in 1993 and 1994, with the lower worldwide commodity pricing on its principal export, copper, and from tight fiscal and monetary policies. The rate of inflation, 13% by the end of 1993, was up slightly from the 12.7% rate of 1992. Growth in real GDP for 1993 was approximately 6%, down from a 10.4% growth rate in 1992. For 1994, real GDP is expected to expand at a 5.0% annual rate, and the rate of inflation is expected to moderate slightly, in a slower growth environment, to around the 12% level.

## **2. Information Services Market Forecast**

Taken in total, the Other Latin America region represents expenditures of \$899 million in 1993, which will grow at a five-year CAGR of 20% to \$2.3 billion in 1998, as shown in Exhibit VIII-134. This growth rate, which is higher than INPUT's prior year's forecast of a five-year growth rate of 17%, presumes continued progress in the creation of stable, balanced economies and improved conditions that will attract international vendors. Also, progress in the establishment of tariff-free trade programs in Latin America in 1993 should represent an important impetus to economic growth in this area.

EXHIBIT VIII-134

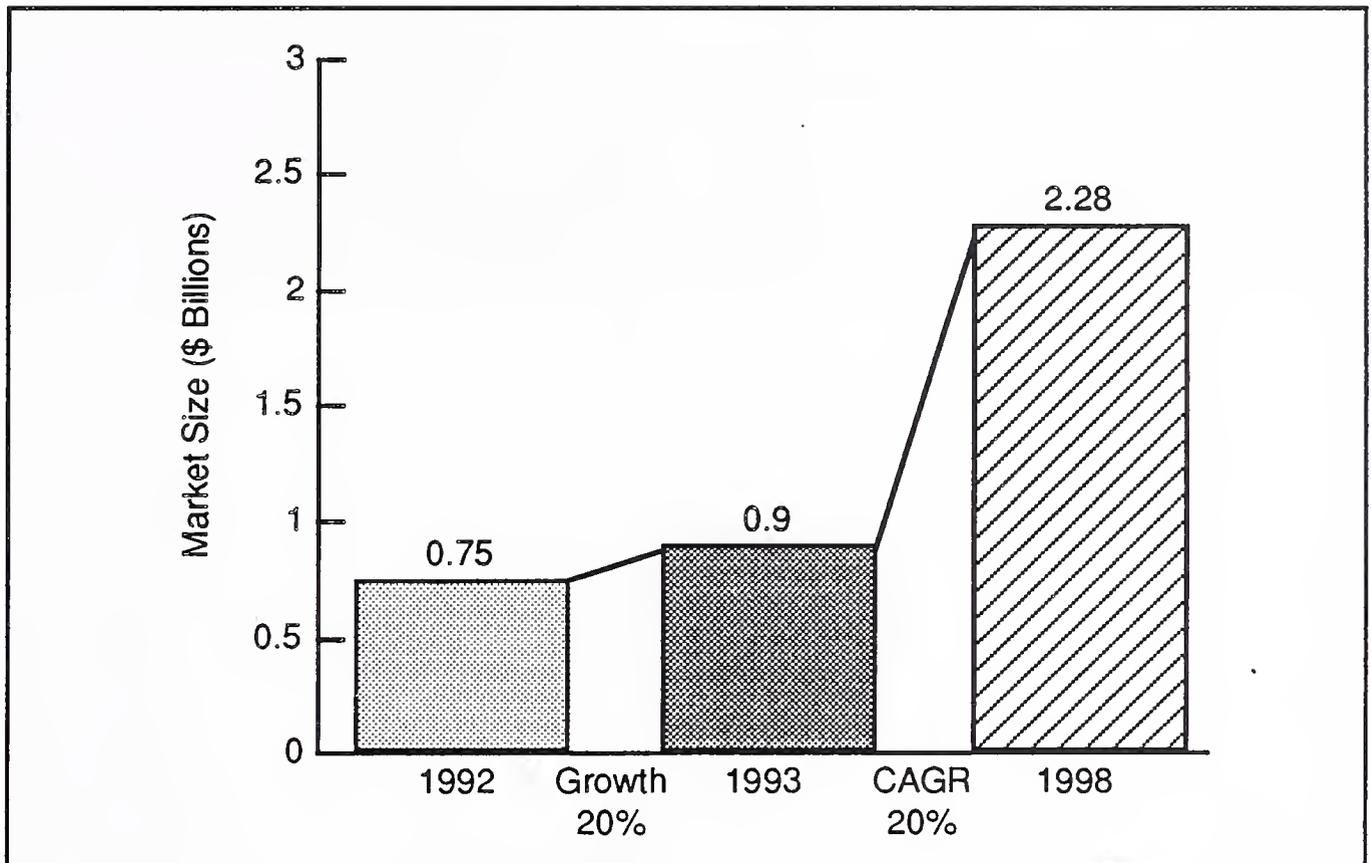
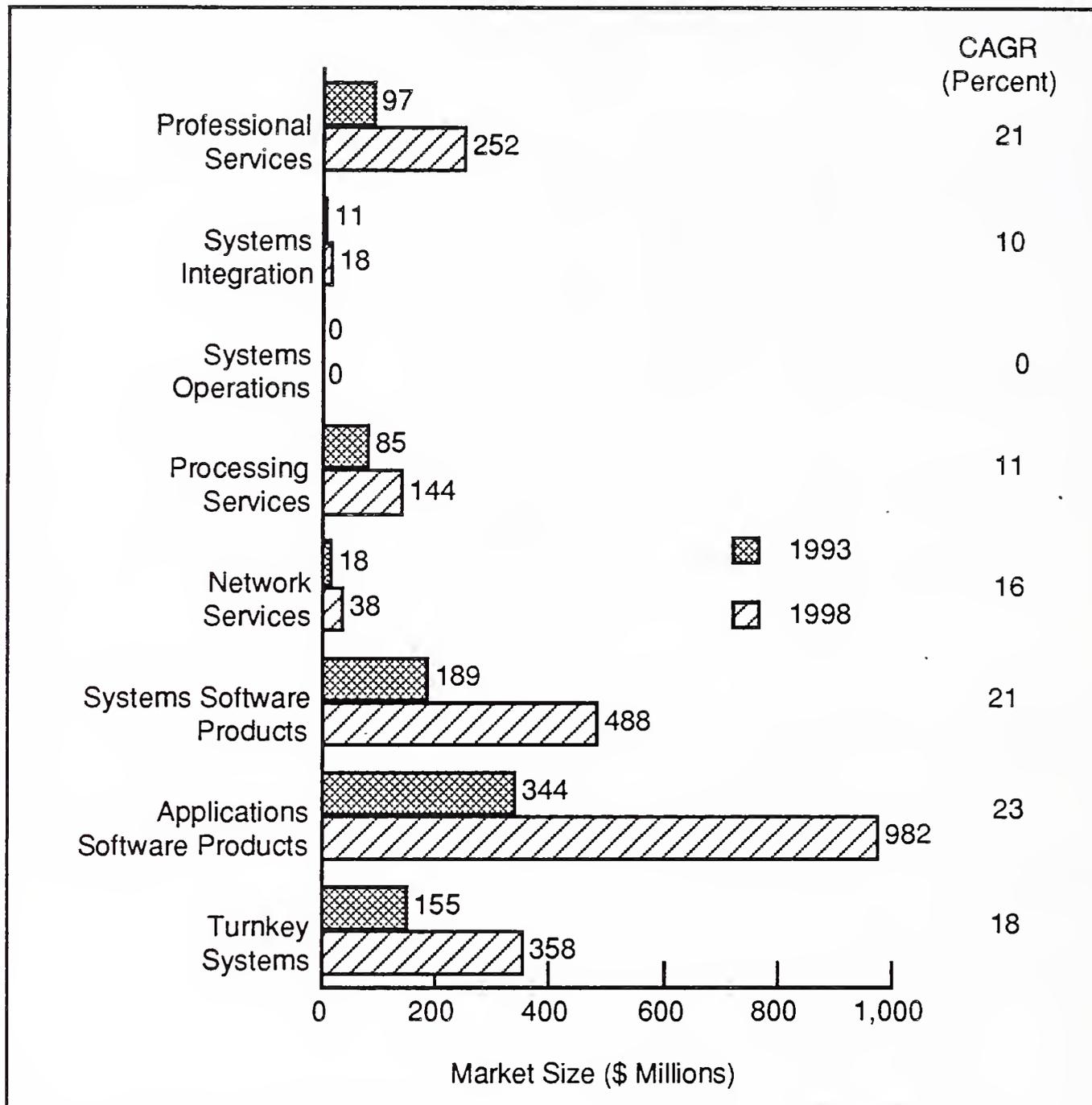
**Market Forecast—Other Latin America, 1992-1993**

Exhibit VIII-135 provides the forecast by delivery mode. Exhibit VIII-139, at the end of this profile, provides the detail behind this forecast.

EXHIBIT VIII-135

### Market Forecast by Delivery Mode Other Latin America, 1993-1998



Chile, while still a small market, does have a number of well-established vendors. They are listed in Exhibit VIII-136.

EXHIBIT VIII-136

**Selected Vendors by Delivery Mode  
Other Latin America, 1993**

Vendor	Processing/ Network Services/ Systems Operations	Professional Services/ Systems Integration	Software Products	Turnkey Systems
Abesco	✓	✓		
Asicom		✓	✓	
Edicon	✓			
Entel	✓			
Logica	✓	✓		
Orden	✓		✓	
Sinapsis	✓		✓	
Siscom			✓	
Sisteco			✓	✓
Sonda	✓	✓	✓	✓
Tecnos	✓			

#### 4. IT Spending

Exhibit VIII-137 provides an estimate of Other Latin America's total IT spending for 1993.

EXHIBIT VIII-137

**Total 1993 IT Spending—Other Latin America**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	189
Internal Staff	1,325
Equipment	1,230
Equipment Services	473
Facilities	615
Information Services	899
<b>Total IT Spending</b>	<b>4,731</b>

Information services (which includes software products), represents approximately 19% of the total IT budget, as noted in Exhibit VIII-138. The largest expenditures are for internal staff (28% of the IT budget) and equipment (26%). Data communications represents the smallest portion of the IT budget at \$189 million and 4% of the total.

EXHIBIT VIII-138

**1993 IT Spending Percentages—Other Latin America**

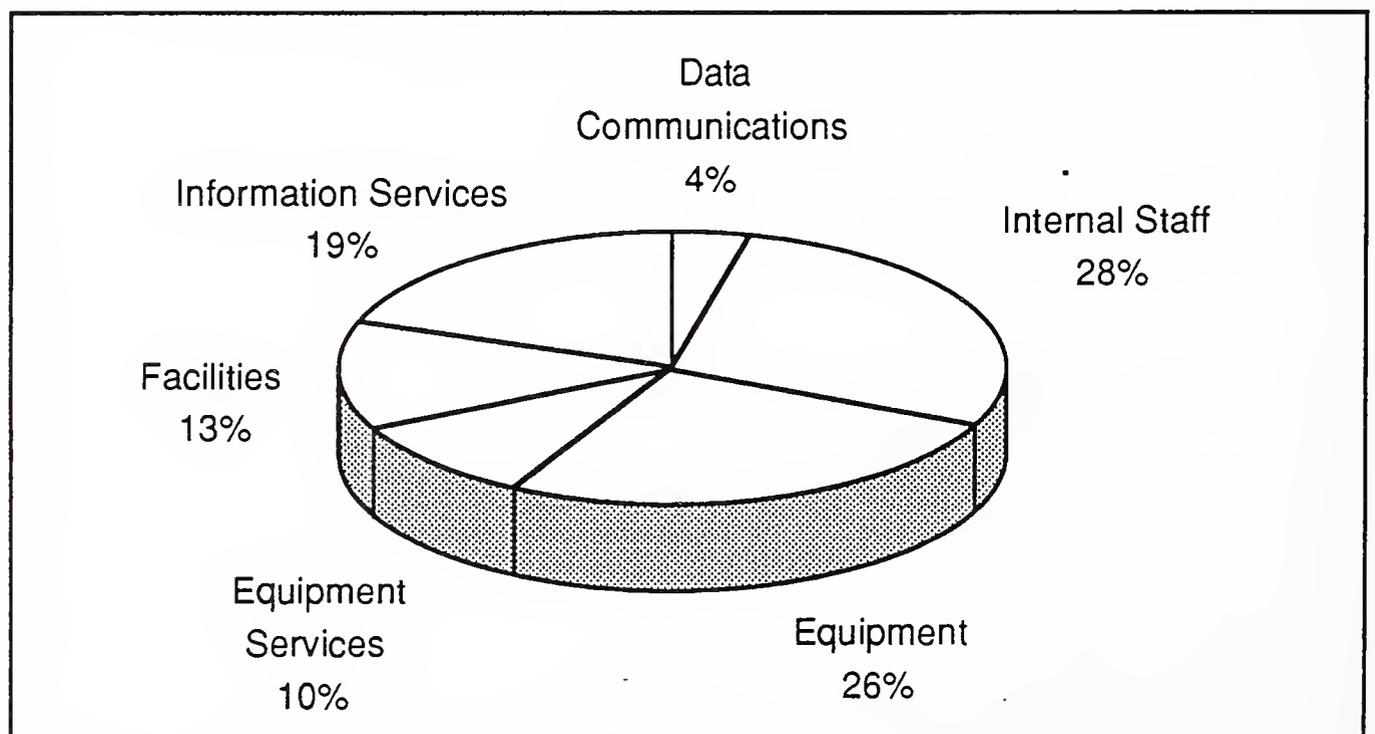


EXHIBIT VIII-139

**Information Services Industry Market Forecast by Delivery Mode  
Other Latin America, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$M)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$M)</b>	<b>1994 (\$M)</b>	<b>1995 (\$M)</b>	<b>1996 (\$M)</b>	<b>1997 (\$M)</b>	<b>1998 (\$M)</b>	<b>CAGR 93-98 (%)</b>
Total Other Latin America Information Services Mkt.	752	20	899	1,073	1,288	1,546	1,872	2,280	20
<i>Professional Services</i>	81	20	97	117	141	170	206	252	21
<i>Systems Integration</i>	10	10	11	12	13	14	16	18	10
<i>Systems Operations</i>	0	N/A	0	0	0	0	0	0	N/A
<i>Processing Services</i>	78	9	85	92	101	111	125	144	11
<i>Network Services</i>	16	13	18	21	25	29	33	38	16
<i>Systems Software</i>	157	20	189	227	274	329	399	488	21
<i>Applications Software</i>	278	24	344	423	522	645	800	982	23
<i>Turnkey Systems</i>	132	17	155	181	212	248	293	358	18

**X****Singapore****1. National Overview**

For Singapore, 1993 was the first full year spent without the governing hand of Lee Kuan Yew. The initial pessimism Singaporeans experienced after Lee stepped down in 1992 gradually gave way to respect and trust for his successor, Goh Chok Tong. Goh kept his charge on course and is headed for a prosperous future.

The GDP, after growing 14.9% from 1991 to 1992, only improved 7.9% from 1992 to 1993. This was largely attributed to Lee stepping down from office. However, from \$49.5 billion in 1993, the GDP is expected to grow 11% to \$55 billion in 1994, reflecting increased confidence in the Goh administration and its ability to guide the city-state's 2.8 million citizens.

Singapore's economy remains widely diversified and quite attractive. The country still exports crude rubber, computers and parts, consumer electronics products, telecommunications equipment, electrical machinery, textiles, refined petroleum and related products. In fact, Singapore remains the third-largest refining center in the world. Other industrial sectors include metal engineering, chemical processing, oil rig/shipbuilding, precision optics and integrated chip manufacturing. Manufacturing employs slightly less than 30% of Singapore's work force and accounts for a comparable percentage of the GDP. Therefore, manufacturing is viewed as the base around which the financial, commercial and service sectors will be further built.

Singapore's top five trading partners are the U.S., Japan, Malaysia, Taiwan and the European Community. The Singapore government's Economic Development Board (EDB) routinely welcomes international companies with the technology and experience needed to broaden the country's industrial base. The EDB encourages foreign firms to use the island as a "total business center" for them to design, develop, produce, market and service their products and manage funds from Singapore-based operational headquarters.

In addition to the EDB, Singapore's National Science and Technology Board (NSTB) is working toward doubling national

research and development spending for technology to 2% of the GDP by 1995. The NSTB also provides grants and fiscal arrangements to encourage local and foreign companies to conduct more R&D on the island. Enticements are particularly aimed at companies specializing in information technology, microelectronics, biotechnology, agrotechnology and medical science. Overall, government allocated \$1.2 billion from 1991 to 1996 for NSTB initiatives.

Key trends in the further development of the information services infrastructure in Singapore include:

- *Regional technology center*—Singapore's government devised a strategic framework that defines the nation's future information infrastructure. Over the next 10 to 15 years, the IT2000 project will pursue a goal of fully connecting Singapore citizens and businesses with each other and the world beyond. Termed "The Vision of an Intelligent Island," the project's goal is to eliminate isolated pockets of intelligence and bring the nation into an idea-sharing, digitally-connected information age.
- *Network services hub*—Because Singapore serves as a financial and manufacturing hub, it is logical for it to work toward interconnecting with worldwide information network services. The country has numerous agreements regarding state-of-the-art telecommunications technology. For example, KDD, Japan's international telephone company, agreed to connect Singapore with other Asian countries using 5-gigabit optical cable. KDD's competitor, IDO, has a reciprocal contract with Singapore Telecom to rent cellular phones in Singapore and Japan.

#### **a. Driving Forces**

Driving forces impacting the economy and information services industry include:

- *Regional growth*—Despite the lingering effects of a global recession, Singapore is a virtual focal point surrounded by the healthy economies of Indonesia, Malaysia and Thailand. In addition, Singapore has focused less on China trade and more on India and Southeast Asia, so it is unlikely any downturn in the Chinese market will have an effect.

- *Educational quality*—National emphasis on education and the resulting highly educated population helps attract high-technology firms. Stressing technology and science, the NSTB is trying to raise the number of engineers and scientists in the work force from less than 30 per 10,000 workers to nearly 60.
- *Free-port country*—As a free-port country, there are no duties on technology products. This stimulates computing capabilities by local industry and government organizations. However, it also makes the island an easy location for black-market technology traffic.

#### **b. Inhibiting Factors**

- *Labor costs and supply*—Singapore's successful economy created some of the most highly paid workers in all of Asia. However, Singaporeans are becoming more expensive and come from such a small national population that their salaries, and hence labor costs, will likely climb further.
- *Piracy & copyright infringement*—In mid-1993, investigators from Microsoft Corporation and the Business Software Alliance for Asia (BSA) discovered illegal copies of MS-DOS 6.0 being sold before the product's official release. Singapore police conducted a raid that revealed signs of a syndicate for software counterfeiting that may be headquartered on the island. Singapore's government has the strictest copyright and intellectual property protection laws in Southeast Asia, yet indications are that it may be one of the worst violators in the region.

## **2. Information Services Forecast**

Research in 1993 and 1994 indicated that concerns regarding Singapore's flattening economic and information services growth rates as a result of new political leadership were unfounded, and growth, if anything, has increased slightly. A stable government and aggressive economic and technology programs caused INPUT to increase estimates of current and future information services performance.

Exhibit VIII-140 provides the overall information services industry forecast for Singapore. The total information services market for 1993 was \$671 million, up slightly from the \$669 million

forecast in 1992. The 1993 market was \$765 million, up \$20 million from 1992's estimate, and the five-year growth is now forecast to be at 15%, to more than \$1.5 billion in 1998. Singapore is clearly using its strong economy, stable government, liberal trade posture and well-trained work force to capitalize on the Pacific Rim's explosive growth.

## EXHIBIT VIII-140

Market Forecast—Singapore, 1993-1998

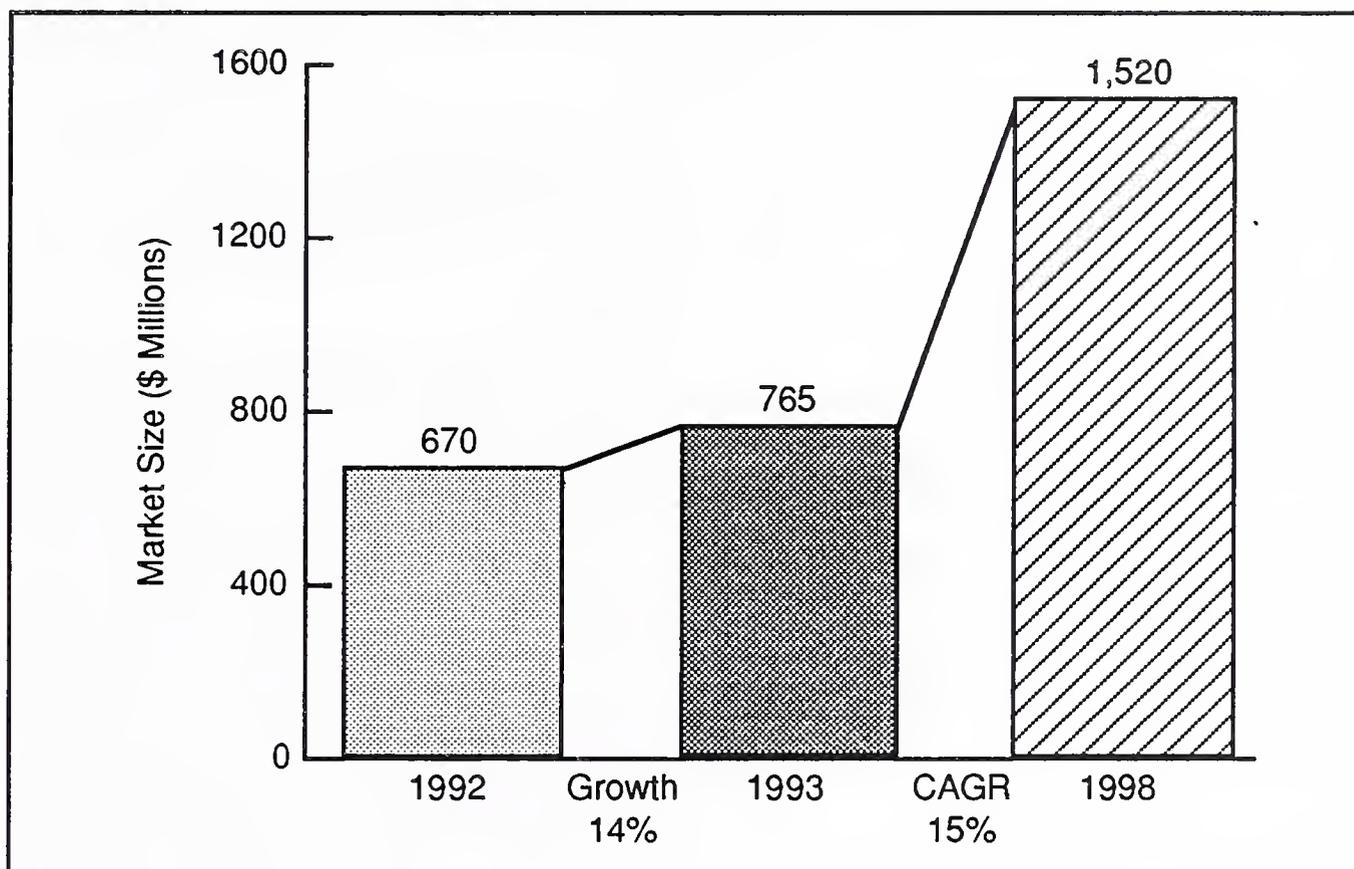
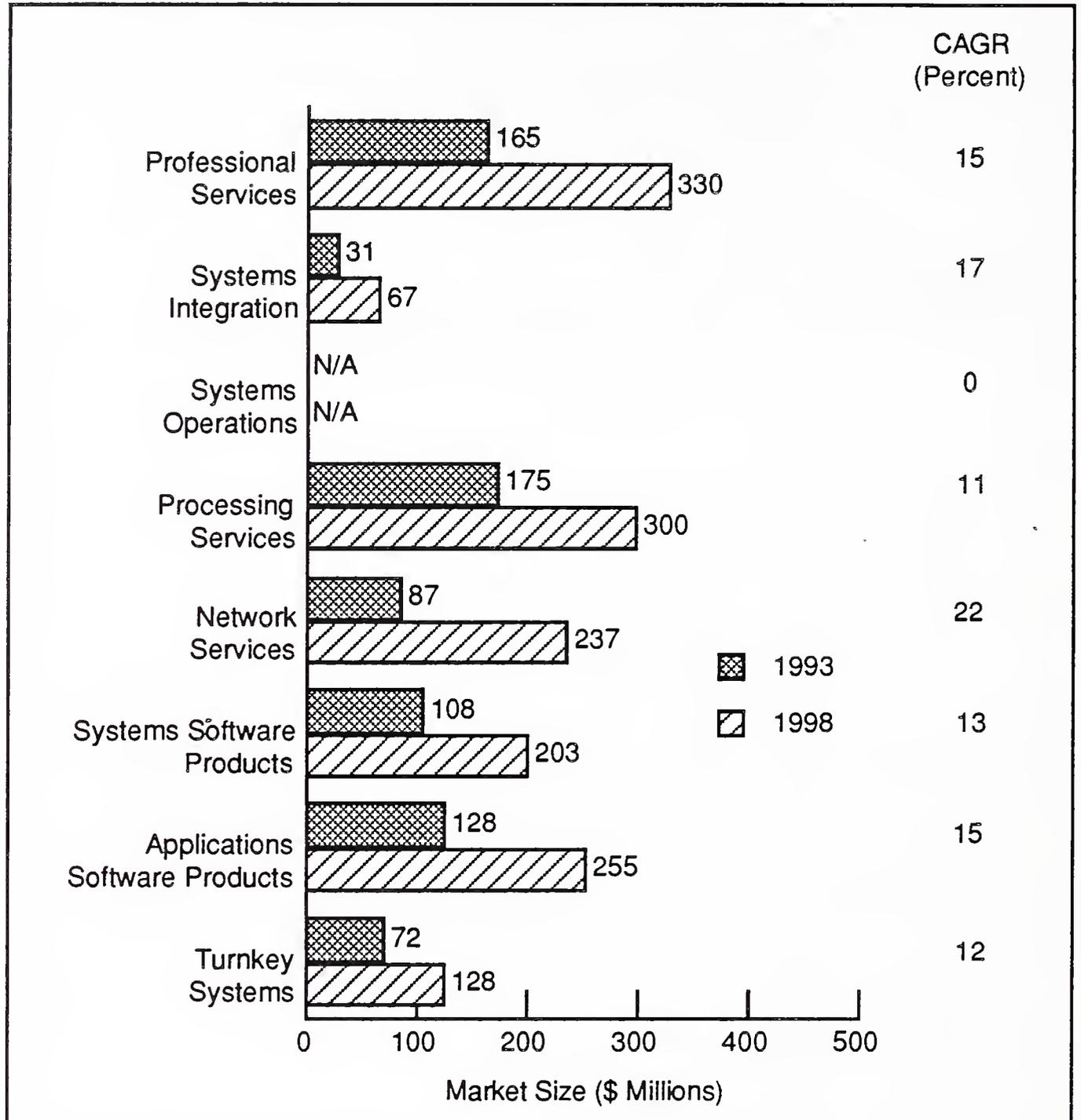


Exhibit VIII-141 provides the forecast by delivery mode and Exhibit VIII-145, at the end of this profile, gives the detail behind this forecast. All delivery mode forecasts have increased from last year's estimates, and the overall performance of the information services market has been expanded from last year's CAGR forecast of 12% for 1992 through 1997 to 15% for 1993 to 1998.

EXHIBIT VIII-141

**Market Forecast by Delivery Mode—Singapore, 1993-1998**



Professional services and systems integration will continue to see strong growth, maintaining Singapore's tradition of developing customized solutions that exactly satisfy information technology needs. Both markets grew 15% from 1992 to 1993, but because of its smaller base and the growing interest in integrated solutions, systems integration's five-year growth will be at a 17% CAGR, while professional services will be at a 15% CAGR.

The growth in applications and systems software products and turnkey systems areas is primarily supports personal computers and LANs. The growing population of multinational firms

operating in Singapore also stimulates the applications and systems solutions markets. Taken together, these three delivery modes will comprise 39% of the information services market in Singapore in 1998.

Although the processing services market grew 12% from 1992 to 1993, the five-year growth is expected to decline slightly to 11% as a result of the growing sophistication of installed systems.

Although Singapore's established position as a major business and trading center attracts manufacturing and services firms, especially with Hong Kong's uncertain future, foreign companies entering Singapore are increasingly sophisticated, with well-established internal IT capabilities that require less processing services support. Despite this, however, processing services will grow to \$300 million in 1998 and represent approximately 20% of all information services expenditures.

Network services is expected to grow the most rapidly of all Singapore's information services markets, from \$87 million in 1993 to more than \$235 million in 1998—a strong five-year CAGR of 22%. Growth is stimulated by an equivalent growth in established and new business, and Singapore's stated intent of becoming a (if not *the*) major Pacific Rim financial, trading and business hub. Such actions as Singapore's optical cabling agreement with Japan's KDD indicate the seriousness of their commitment to provide state-of-the-art, network-based electronic information and applications services.

### **3. Market Considerations**

Local presence is absolutely required in the Singapore information services market. Entry is relatively easy, as there are few legal or financial restrictions. A number of well-established distributors for software products have quality support reputations, and enforcement of a relatively new copyright law enhances protection.

A strong interest in customizing systems in this market gives rise to an established professional services industry.

The Singapore government does have a number of very strict business regulations that apply to local and international companies. It is a highly disciplined environment, requiring time to develop and gain acceptance.

The market is big enough to offer affordable opportunities that must often be taken through a local relationship, except for the largest vendors.

Exhibit VIII-142 lists local vendors identified in INPUT's 1993 research and the delivery modes in which they are active.

EXHIBIT VIII-142

### Selected Vendors by Delivery Mode—Singapore, 1993

Vendor	Processing/ Network Services/ Systems Operations	Professional Services/ Systems Integration	Software Products	Turnkey Systems
Acer			✓	
Asian Computer Services	✓	✓		
CAD-IT Consultants				✓
Computer Engineering Systems	✓			
Datamini		✓		
Digitech	✓			
Ermca-Wonny		✓		
IPC	✓			
Samsung			✓	
Singapore Computer Systems				✓
Singapore Technologies	✓			
Sonica	✓			
Syspro Systems				✓
Unify Software		✓		

As would be expected, a number of major international computer manufacturers offer software products and services in the Singapore market. Included are IBM, DEC, HP, Computer Associates, Microsoft, Fujitsu, NEC, Xerox and Hitachi Data Systems. This is one country market in which a number of Japanese vendors have a strong and growing presence.

#### 4. IT Spending

Exhibit VIII-143 provides INPUT's estimate of Singapore's IT spending for 1993.

EXHIBIT VIII-143

#### Total 1993 IT Spending—Singapore

Budget Category	Estimated Spending (\$ Millions)
Data Communications	191
Internal Staff	1,020
Equipment	638
Equipment Services	255
Facilities	319
Information Services	765
<b>Total IT Spending</b>	<b>3,188</b>

Information services spending, at \$765 million, represents approximately 24% of the total IT budget, as noted in Exhibit VIII-144. The largest expenditures are for internal staff (32% of the IT budget). Data communications represents the smallest portion of the IT budget at \$191 million and 6% of the total.

EXHIBIT VIII-144

1993 IT Spending Percentages—Singapore

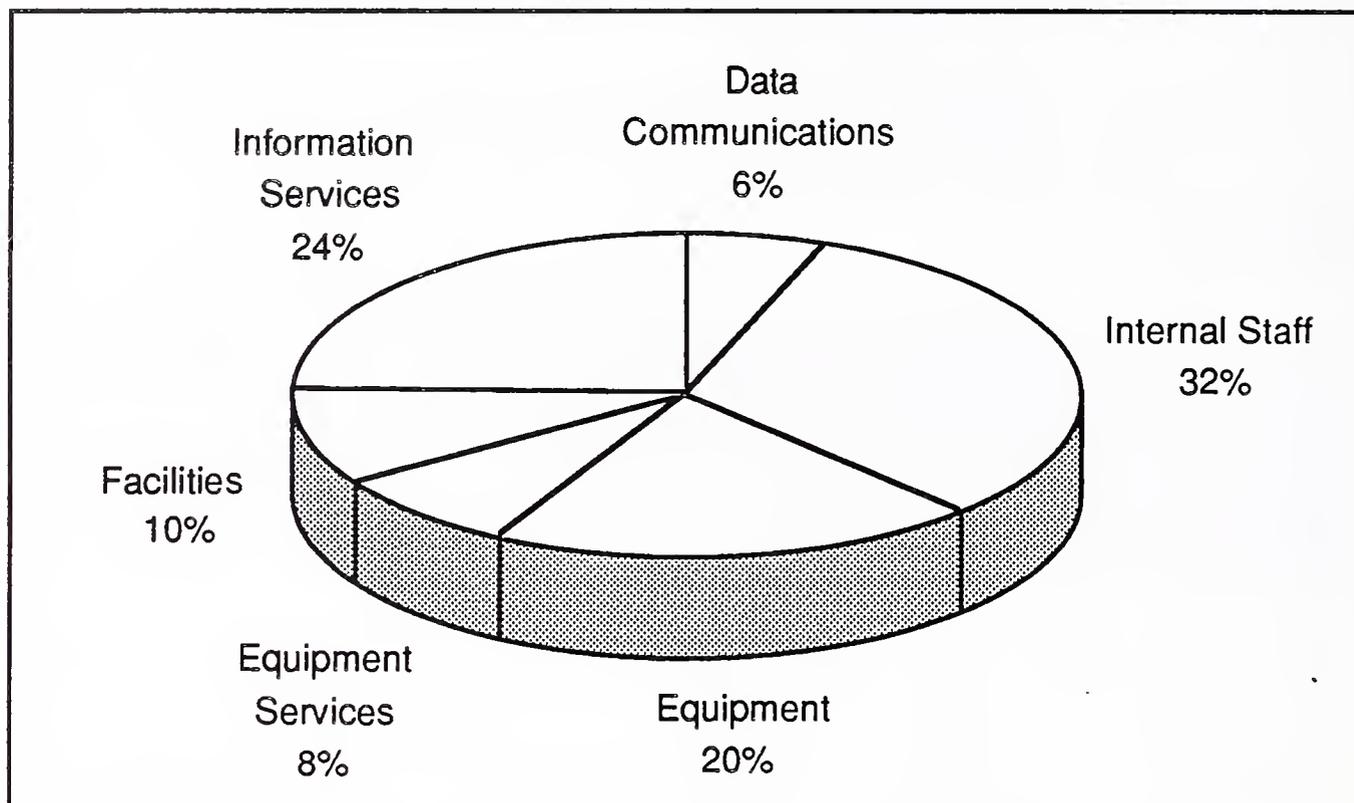


EXHIBIT VIII-145

Information Services Industry Market Forecast by Delivery Mode  
Singapore, 1993-1998

Delivery Modes	1992 (\$)	Growth 92-93 (%)	1993 (\$)	1994 (\$)	1995 (\$)	1996 (\$)	1997 (\$)	1998 (\$)	CAGR 93-98 (%)
Total Singapore Information Services Mkt.	671	14	765	875	1,005	1,160	1,339	1,520	15
<i>Professional Services</i>	143	15	164	190	216	245	283	330	15
<i>Systems Integration</i>	27	15	31	37	44	50	58	67	17
<i>Processing Services</i>	156	12	175	195	218	245	272	300	11
<i>Network Services</i>	70	24	87	105	130	162	202	237	22
<i>Systems Software</i>	95	14	108	123	140	162	185	203	13
<i>Applications Software</i>	115	11	128	146	166	190	220	255	15
<i>Turnkey Systems</i>	65	11	72	79	91	106	119	128	12

## Y

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**South Korea****1. National Overview**

After slowing down in the latter part of 1992, South Korea's economy grew at a healthier pace during 1993. This was a direct result of policies enacted by the country's latest president, Kim Young Sam, who has shifted fiscal and monetary focus away from economic stability toward economic growth. As a result, one of these measures, banning the use of false names for purposes of avoiding taxes and other investment-related fees, has cut a large piece from the heart of South Korea's underground economy.

In the short term, the false name ban has hurt the economy by removing an important means for small and medium-sized businesses to obtain financing they otherwise could not get from banks. This has shaken the small and middle tiers of South Korea's business infrastructure, yet has also given President Sam the momentum to carry out his anticorruption program and encourage Korean banks to speed deregulating interest rates. By doing this, the banks stand to benefit substantially from all of the underground money that must now be manipulated through legitimate means.

Hopefully, the immediate negative effects of fiscal reform are over and the GDP, which only grew by 4.3% in 1993, should now grow 5.5% and 6.0% in 1994 and 1995 respectively. Inflation will match the same percentages in 1994 and 1995, while unemployment will decline below the 2.7% maintained during most of 1993.

Overall, South Korea is still the giant among the four "Little Dragons" of Asia as its economy eclipses those of Hong Kong, Singapore and Taiwan. Due to new fiscal policies, South Korea is the only dragon for which internal and external investment growth is expected to grow, from 5% of 1993 GDP, to 8% in 1995.

### a. Driving Forces

Driving forces behind the changes and growth in the information services market in South Korea include:

- *Industrial modernization*—Industrial growth is the foundation for economic growth and success in South Korea's world market. This success comes from intense use of automation, which requires progressive information technology. Automation directly responds to increased wages and the rising cost of South Korean labor. In 1993, for example, wages increased an average of 12.9%, even though the government is pushing for a 5% limit. As other countries have discovered, South Korea also determined machines are cheaper than people.
- *Network development*—The government is deregulating the network services market, permitting greater growth and competition. The market has opened enough that foreign vendors make headway selling their products and services. For example, South Korea is the second-largest international market for Artisoft's LANtastic networking product. In early 1993, British Telecom expanded its Global Network Services managed network offering to South Korea.
- *Decentralization*—Many organizations are forced to decentralize to gain necessary control as they become much larger. As authority is pushed down, automation necessary for control is implemented.

### b. Inhibiting Forces

Working against the driving forces are a number of inhibiting forces:

- *Geopolitical uncertainty*—Internally, the Sam administration has successfully steered South Korea on to a healthier economic path, including the anticorruption initiatives. But external corruption became a possible threat during 1993 when North Korean leader Kim Jong Il made overtures many considered a prelude to invading the South. These threats may have been a ploy for Kim to impress his wavering followers, but South Korea remains wary.

- *Language requirement*—The Korean language, like Japanese, creates unique computing requirements that affect imported information systems. It is an old language that uses a character-based alphabet, and though less complex than the Chinese from which it is derived, poses similar difficulties.
- *Self-sufficiency*—The general tendency of the larger Korean businesses is to be self-sufficient and not rely on outside expertise. Independence is paramount to South Korea, which resorted to importing foreign technology, at great cost, while keeping direct foreign investment and joint development. Independence and increasing labor costs have made Korean business impatient with the time necessary to develop technology internally.
- *Software piracy*—In spite of new laws, software piracy remains a deterrent to importing software from the U.S. and other countries. As of late 1993, the country was on the “priority watch list” under the Special 301 provision of U.S. trade law. In addition to computer software, Korea is known for pirating compact discs, textiles and footwear. The Korean government and the Clinton administration agreed that foreign investment is likely to improve as piracy is eradicated.

## **2. Information Services Market Forecast**

Exhibit VIII-146 shows that the market for information services in South Korea continues to grow very rapidly. In 1992, it exceeded \$1 billion for the first time, reached \$1.7 billion in 1993 and is projected to reach approximately \$7.8 billion by 1998.

Japan's economy has staggered and is only slowly recovering, while South Korea stands ready under its new political leadership to assume a major role in the Pacific Rim business community. As business grows, so will the information services that support and enhance the IT function. It is this strong growth, coupled with the relatively small information services base that is driving the five-year CAGR at a 36% level—the highest of all the nations in Asia/Pacific area.

EXHIBIT VIII-146

**Market Forecast—South Korea, 1993-1998**

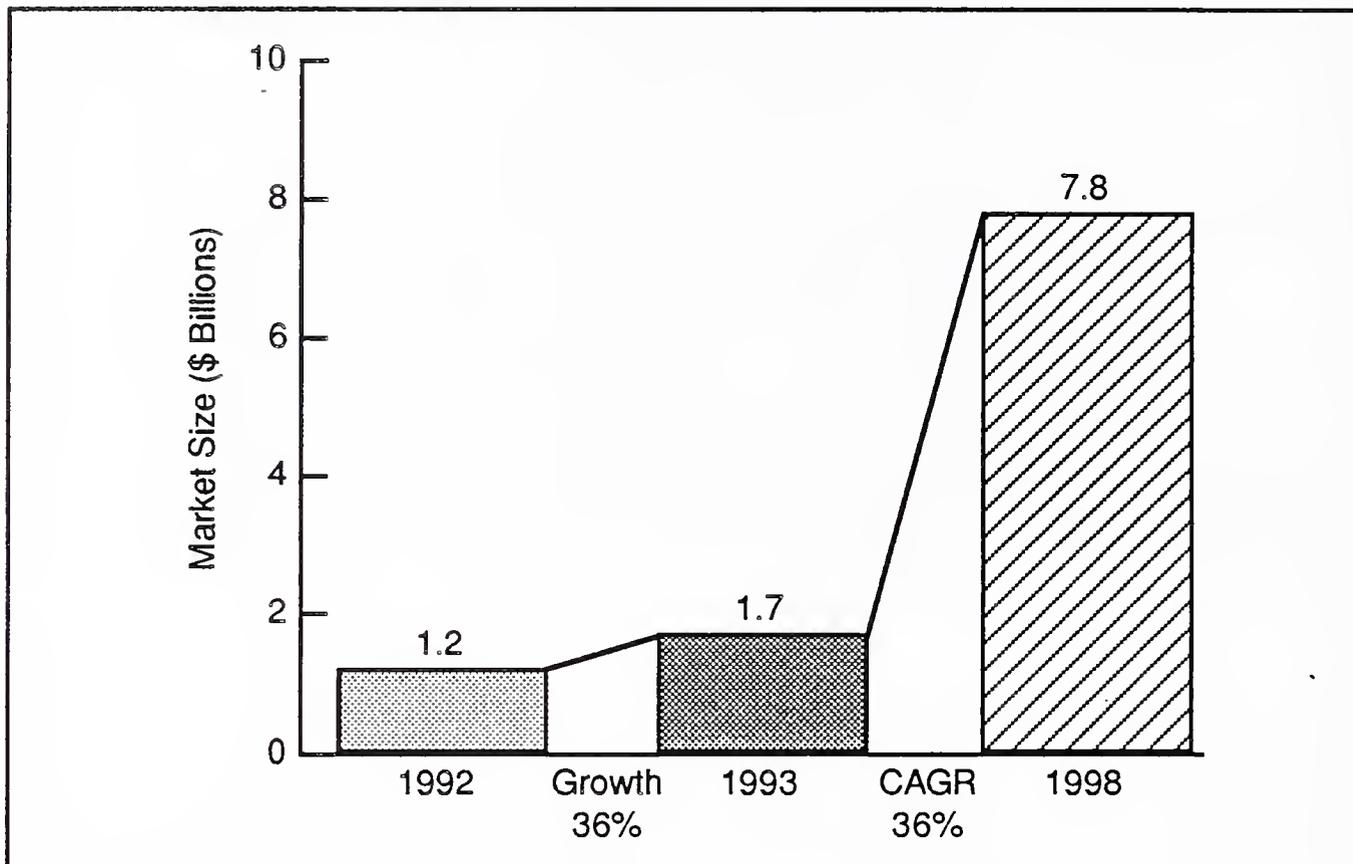
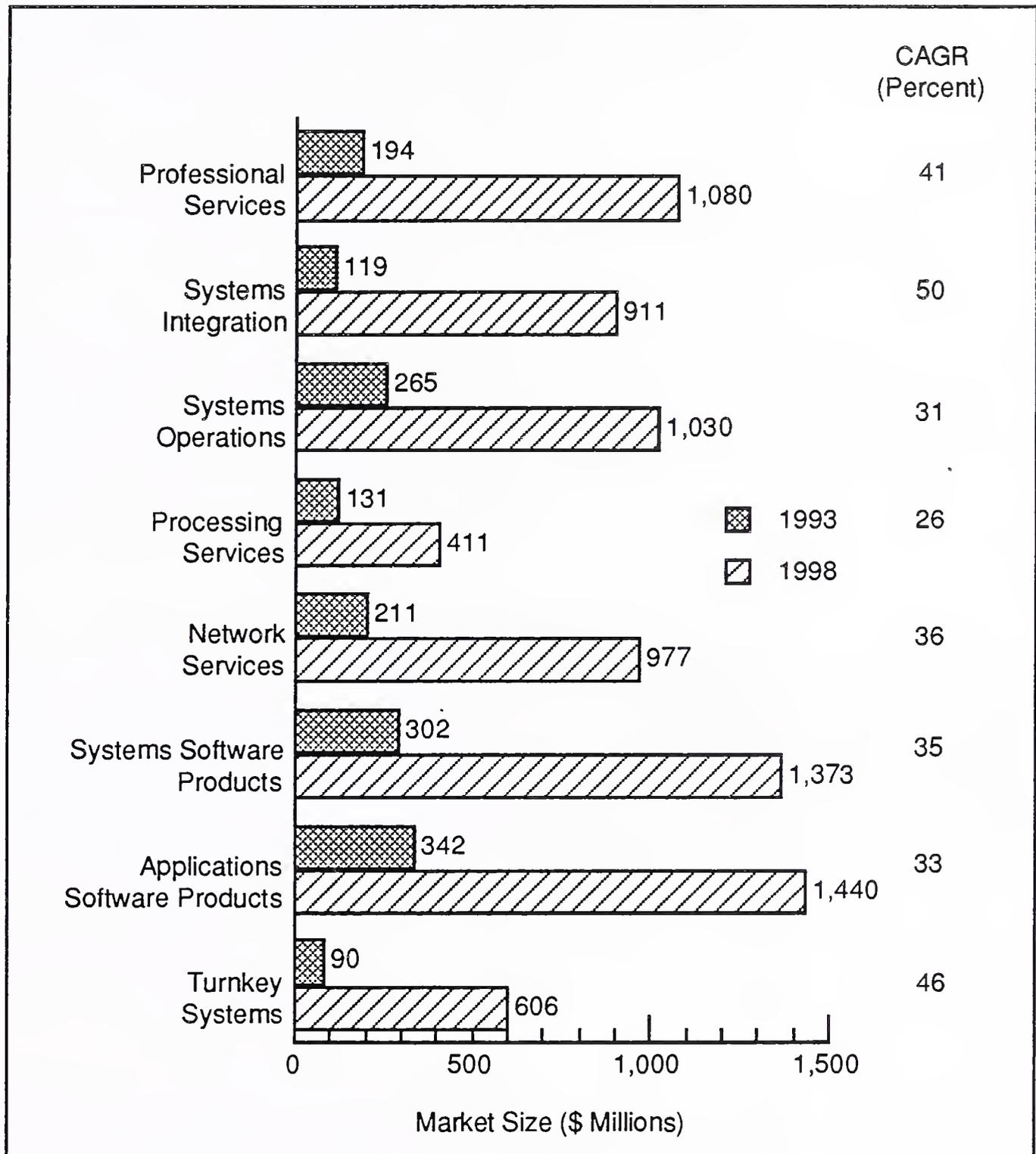


Exhibit VIII-147 provides the forecast by delivery mode. Exhibit VIII-151, at the end of this profile, provides the detail behind this forecast.

EXHIBIT VIII-147

### Market Forecast by Delivery Mode South Korea, 1993-1998



In a market of such strong growth over the next five years, each delivery mode offers opportunities.

Turnkey systems and applications software products will see strong growth, at 46% and 33% respectively. For buyers to keep up with new technology, they must buy more of the solution. The software piracy issues will be resolved because piracy is not unique to either this geography or this industry, and will certainly

not be allowed to interfere with the economic growth of any major nations in the Asia/Pacific region.

For turnkey systems vendors, the most rapidly growing solutions offered are typically PC-based (a platform with a 55% CAGR) and locally developed and customized software.

Projected growth is slightly up for this year's report to about 33% CAGR for applications software products and 35% CAGR for systems software products through 1998.

Professional services is the third most rapidly growing information services market in South Korea. The continuing decline in hardware prices and revenues has impacted hardware vendors in South Korea, as it has elsewhere, and caused a shift in focus to hardware-related services. INPUT increased its growth projection from 37% in 1992 to 41% in 1993, based on the fact that larger companies are more aggressive users of outside services.

The same belief exists for systems integration, as major corporations rely on automation and cost-efficiency to drive opportunities to implement complex systems and technology. Simply stated, the industrial and financial communities are reaching the size and sophistication levels needed before systems integrators becomes a viable alternative to provide complex systems solutions. The largest and most rapidly growing segments of this market are the equipment submode at \$350 million in 1998 and a 49% five-year CAGR and SI-based professional services at almost \$463 million in 1998 with a 53% CAGR.

As previously mentioned, the deregulation of the network services market is expected to encourage strong growth. By 1998, this market should reach almost \$980 million in expenditures.

Although not growing at the ballistic rate of many other information services, processing services (at \$130 million in 1993, growing at a 26% CAGR to \$410 million in 1998) and systems operations (at almost \$265 million in 1993, growing at a 31% CAGR to more than \$1 billion in 1998) represent strong and healthy market opportunities.

### 3. Market Considerations

Entry into the South Korean market can be difficult because the government protects favored industries. The two sectors for which there is demand and limited protection are software and professional services. Although the cloud of piracy remains, the software products market is attractive.

In the systems software products segment, there are a number of highly regarded distributors. As with most of the rest of Asia, distribution agreements are the favored method of marketing.

As the list of local vendors suggests, there are a number of companies where relationships can be formed. Exhibit VIII-148 lists the top 10 information services vendors in South Korea. Of the top 20 vendors, only three are international firms. The other 16 are all local South Korean firms.

EXHIBIT VIII-148

#### Leading Information Services Vendors South Korea, 1993

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Billions)	Market Share (Percent)
1	DACOM	Korea	100	6.0
2	IBM	U.S.	95	5.6
3	STM	Korea	75	4.5
4	KOSCOM	Korea	70	4.2
5	Samsung Data Systems	Korea	35	2.1
6	Ssangyong Computer	Korea	21	1.3
7	POSDATA	Korea	18	1.1
8	Unisys	U.S.	18	1.1
9	Goldstar	Korea	17	1.0
10	Fujitsu	Japan	15	0.9
	Total Listed		464	28.0
	Total Market		1,652	100.0

#### 4. IT Spending

Exhibit VIII-149 provides INPUT's estimate of South Korea's IT spending for 1993.

EXHIBIT VIII-149

#### Total 1993 IT Spending—South Korea, 1993

Budget Category	Estimated Spending (\$ Millions)
Data Communications	431
Internal Staff	2,227
Equipment	1,580
Equipment Services	646
Facilities	646
Information Services	1,652
Total IT Spending	7,182

Information services spending at \$1.7 billion, represents 23% of the total IT budget, as noted in Exhibit VIII-150. The largest expenditure is for internal staff (31%). Data communications represents the smallest portion of the IT budget at \$431 million and 6% of the total.

## EXHIBIT VIII-150

## 1993 IT Spending Percentages—South Korea

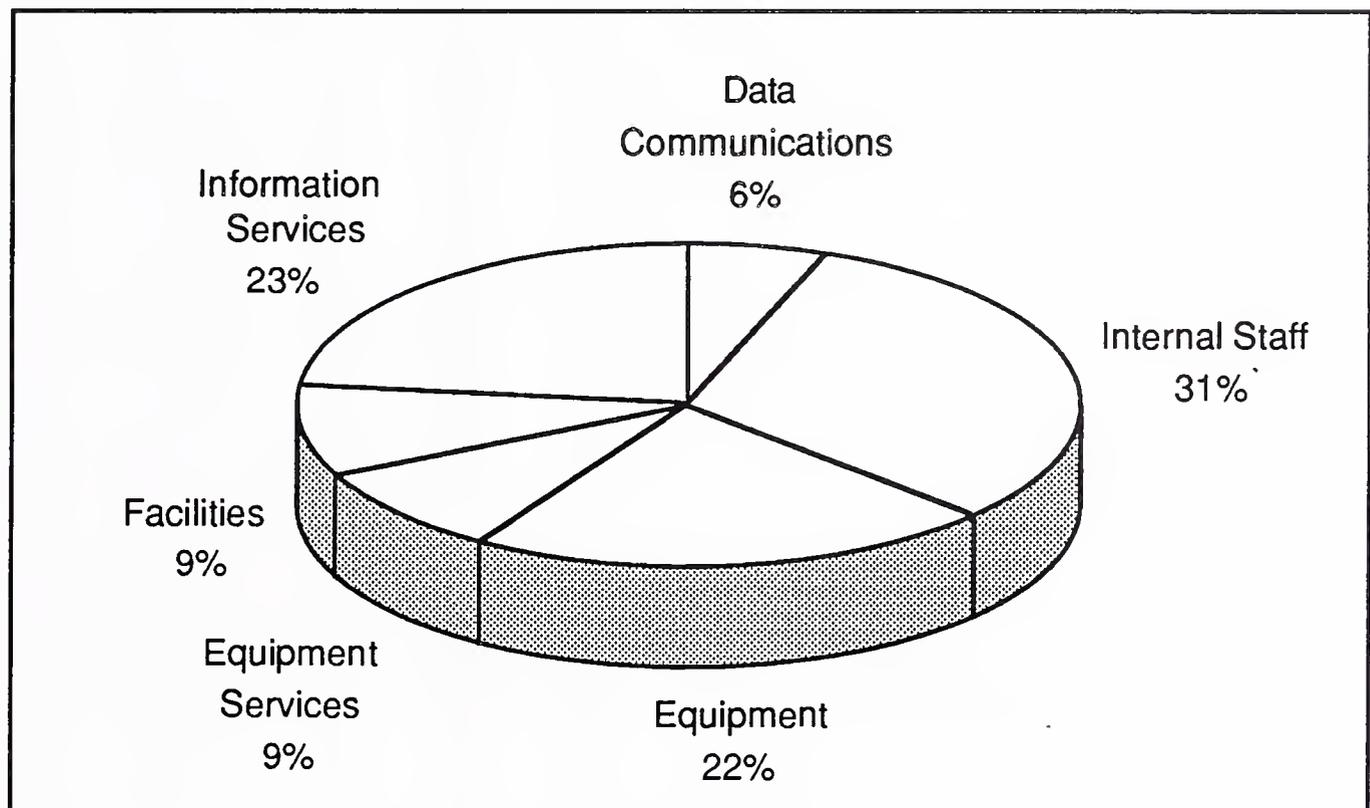


EXHIBIT VIII-151

**Information Services Industry Market Forecast by Delivery Mode  
South Korea, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$)</b>	<b>1994 (\$)</b>	<b>1995 (\$)</b>	<b>1996 (\$)</b>	<b>1997 (\$)</b>	<b>1998 (\$)</b>	<b>CAGR 93-98 (%)</b>
Total South Korea Information Services Mkt.	1,215	36	1,652	2,279	3,126	4,283	5,809	7,828	36
<i>Professional Services</i>	139	40	194	282	396	558	776	1,080	41
- IS Consulting	46	43	66	99	144	209	300	398	43
- Education & Training	17	35	23	32	41	56	73	92	32
- Software Development	76	38	105	151	211	293	403	590	41
<i>Systems Integration</i>	81	47	119	185	285	429	642	911	50
- Equipment	33	45	48	75	114	170	254	350	49
- Software Products	9	56	14	21	30	44	65	95	47
- Professional Services	37	49	55	87	139	213	320	463	53
- Other	2	0	2	2	2	2	3	3	8
<i>Systems Operations</i>	196	34	263	348	460	609	792	1,030	31
<i>Processing Services</i>	106	24	131	172	220	282	350	411	26
- Transaction Processing	72	29	93	130	174	231	295	350	30
- Utility Processing	17	12	19	21	23	26	28	31	10
- Other Processing	17	12	19	21	23	25	27	30	10
<i>Network Services</i>	153	38	211	288	392	533	716	977	36
- Electronic Info Svcs	112	38	154	209	283	381	509	657	34
- Network Applications	41	39	57	79	109	152	207	320	41
<i>Systems Software</i>	225	34	302	416	564	761	1,018	1,373	35
- System Control	105	33	140	195	265	357	477	616	34
- Data Center Mgt	37	30	48	60	77	97	122	185	31
- Applications Dvlpmt	83	37	114	161	222	307	419	572	38
<i>Applications Software</i>	253	35	342	456	609	815	1,080	1,440	33
<i>Turnkey Systems</i>	62	45	90	132	200	296	435	606	46
- Equipment	35	46	51	73	104	149	211	305	43
- Software Products	7	14	8	11	13	16	19	21	21
- Professional Services	20	55	31	48	83	131	205	280	55

**Z****Spain****1. National Overview**

Spain's population is 39 million and its work force numbers 14.6 million (32% female). It joined the EC in 1986, and enjoyed considerable growth (5%-plus per year) in the late 1980s. A land area of more than 500,000 kilometers makes it the second-largest country in Europe (after France). Traditional agriculture, a rapidly expanding industrial sector, and continuing foreign exchange earnings from tourism contributed to growth.

With a software and services market of \$2.9 billion in 1993, Spain is the seventh-largest market in Europe.

Growth rate has slowed in recent years, but at 2.4% it still exceeded the EC average, keeping Spain among the leaders in growth in 1991, but slowed to 1.0% in 1992. The current account deficit remained constant at 6.2% of GDP, compared with the EC average of 1.0%. Inflation rates remained above the OECD average at 5.9%. Unemployment increased by two points to 18.4%. The peseta was devalued while remaining in the ERM.

While some of the downturn is the result of the general situation in Europe (70% of Spanish exports are to other EC countries), the other factor is the government deflationary policy. Inflation will decline in 1994 by 3.8%, in sight of the OECD average of 3.3%. Unemployment will persist at high levels for the foreseeable future, with one forecast for 1997 of 18%. The current account deficit should improve to around 4% of the GDP in 1994, but no surplus is yet on the horizon.

**2. Information Services Market Forecast**

The information services industry in Spain shares in the general difficulties of the economy. The Spanish market reached \$2.9 billion in 1993, and will grow at an average of 12% CAGR to reach \$5.1 billion by 1998, as shown in Exhibit VIII-152.

## EXHIBIT VIII-152

## Market Forecast—Spain, 1993-1998

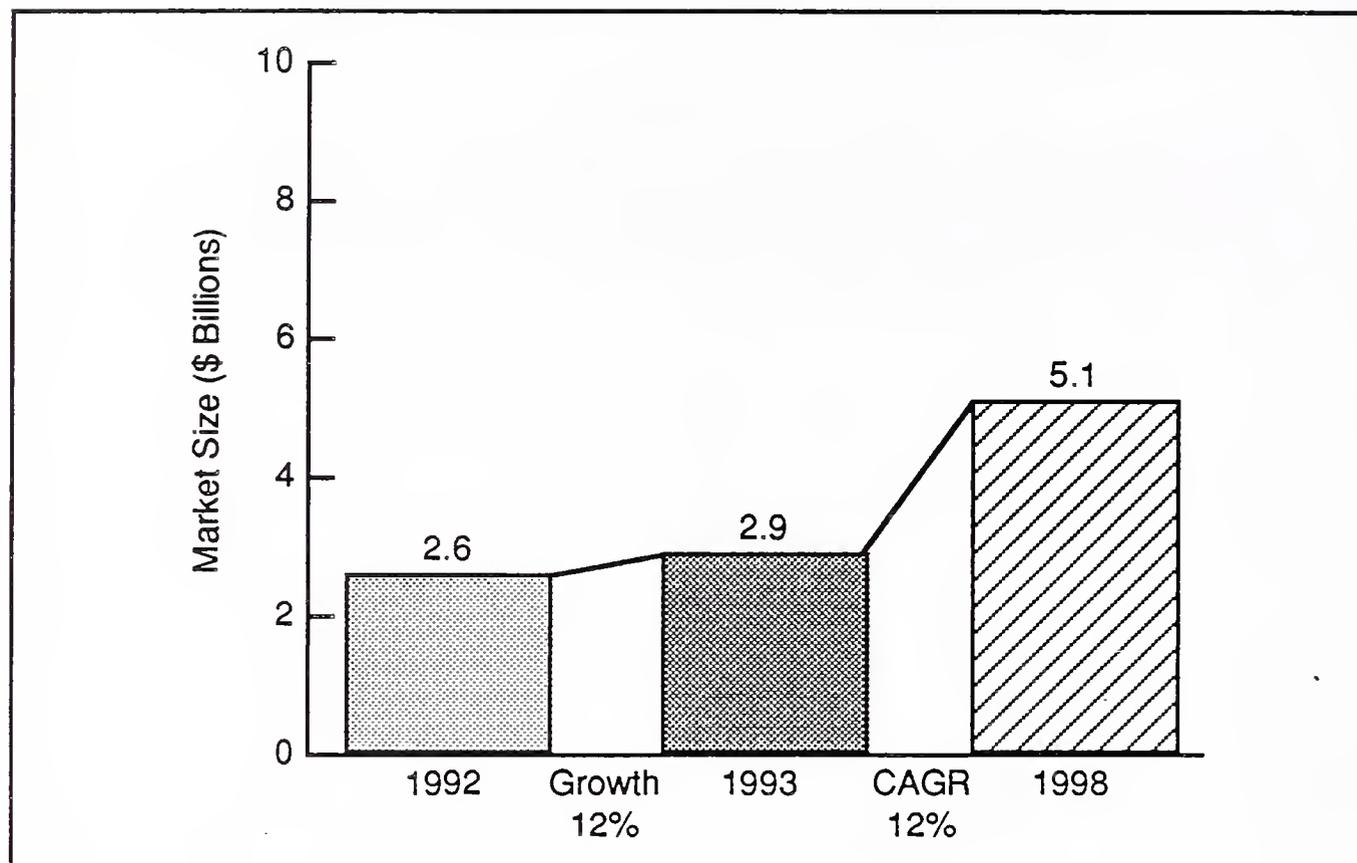
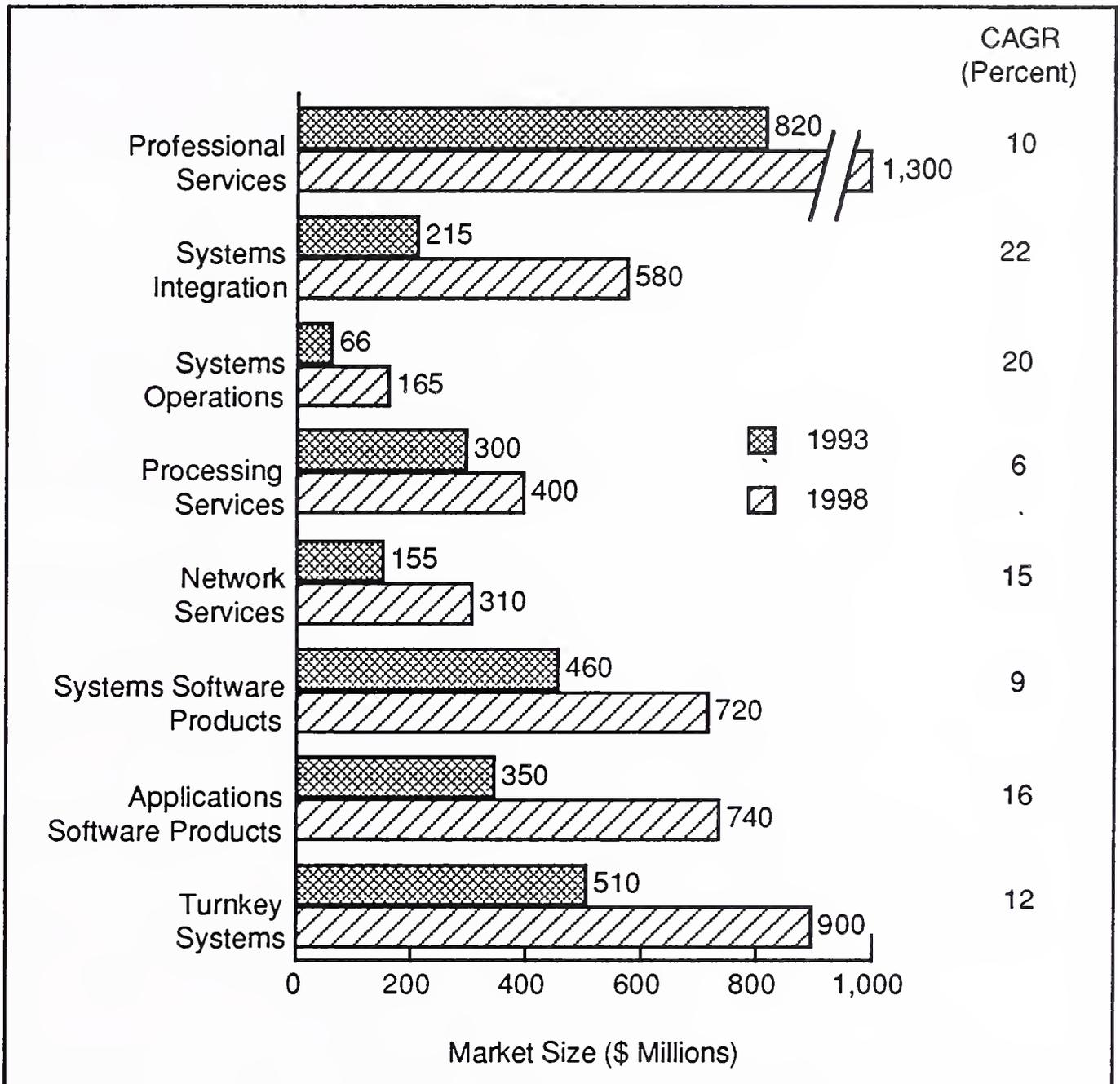


Exhibit VIII-153 shows the detailed forecast by INPUT delivery mode. Exhibit VIII-157, found at the end of this profile, provides the forecast in greater detail. The Spanish market is strong in professional services, with IS consulting, systems integration, applications software and turnkey systems exhibiting good market growth.

EXHIBIT VIII-153

**Market Forecast by Delivery Mode  
Spain, 1993-1998**



In the professional services sector, IS consulting was down in 1993 some 4% below last year's prediction due to the uncertainty in the business climate. However, long-term expectations remain relatively unchanged. The propensity of Spanish companies to opt for a custom developed solution is giving way to greater use of pre-built application products. But custom software project demand is still expected to grow much more rapidly than elsewhere in Europe.

The systems integration growth rate has been revised up from 18% to 22%. INPUT has also revised upward the size of the systems integration market in Spain as a result of new revenue data from vendors. The extensive use of standard software

products within systems integration projects had previously been underestimated.

Processing services is forecast to grow faster at 6% than the average for the European market. Processing services in Spain are still important, especially in the financial services sectors of banking, securities and insurance.

Network applications services are expected to show a healthy growth rate (15% CAGR) over the five-year period. The services are less highly developed in Spain than in larger country markets, but Spain intends to catch up in this and other areas. The public telecommunications operator (PTO), Telefonica SA, is investing considerably in the country's infrastructure, and also has a strong presence in the information services industry.

Applications software in Spain is a strong market at the lower end of the system price range where multiuser or networked microcomputers are installed with proprietary software products from multinational vendors. The attractiveness of the pre-built solution is likely over our forecast period to increase in the mainframe and minicomputer sectors, as open systems based on UNIX and networks are installed to replace older and larger systems (downsizing).

Turnkey systems has always been a strong sector in Spain due to the number of small systems platforms being sold into the country's large number of relatively small companies. It is expected to continue with good growth as many small enterprises install their first company systems. Average prices for new installations are expected to continue falling.

### **3. Market Considerations**

Exhibit VIII-154 lists the top 10 vendors in the Spanish market as measured on their 1992 (or equivalent 1992) revenues. It was compiled from software and services revenues attributable to the domestic market in Spain, and excludes exports and revenues gained from within any parent group companies.

EXHIBIT VIII-154

## Leading Information Services Vendors—Spain, 1993

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	239	8.2
2	Eritel	Spain	130	4.5
3	Digital	U.S.	93	3.2
4	Andersen Consulting	U.S.	86	3.0
5	Logic Control	Spain	83	2.9
6	CISI	France	66	2.3
7	Iberimatica	Spain	59	2.0
8	Siemens-Nixdorf	Germany	57	2.0
9	Olivetti	Italy	54	1.9
10	Microsoft	U.S.	54	1.9
	Total Listed		921	31.9
	Total Market		2,900	100.0

As in most other countries, IBM heads the list, strongly assisted by its large component of systems software product revenues. IBM's strengths in Spain also include PC-level product sales, systems integration and network services.

Eritel is now the largest of the indigenous computer services vendors, formed as a merger between two companies, Entel and Eria, the latter having previously acquired Ceninsa, of comparable size. Eritel is owned by the INI state holding company and Telefonica, the Spanish PTO. Its strategic thrusts are in systems integration, consultancy and other professional services.

Logic Control is a market leader in the standard microcomputer hardware and software markets. Ibermatica is partly owned by Eritel and specializes in financial services applications. The high proportion of foreign vendors illustrates eagerness of the large players in Europe to participate in the Spanish market.

**4. IT Spending**

Exhibit VIII-155 provides an estimate of Spain's total IT spending for 1993.

EXHIBIT VIII-155

**Total 1993 IT Spending—Spain**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	1,000
Internal Staff	3,600
Equipment	2,600
Equipment Services	1,050
Facilities	1,100
Information Services	2,550
<b>Total IT Spending</b>	<b>11,900</b>

Information services, which includes software products, represents 21% of the total IT budget, as noted in Exhibit VIII-156. The largest expenditures are for internal staff (31%) and equipment (21%). Data communications represents the smallest portion of the IT budget at \$1 billion and 8% of the total.

EXHIBIT VIII-156

**1993 IT Spending Percentages—Spain**

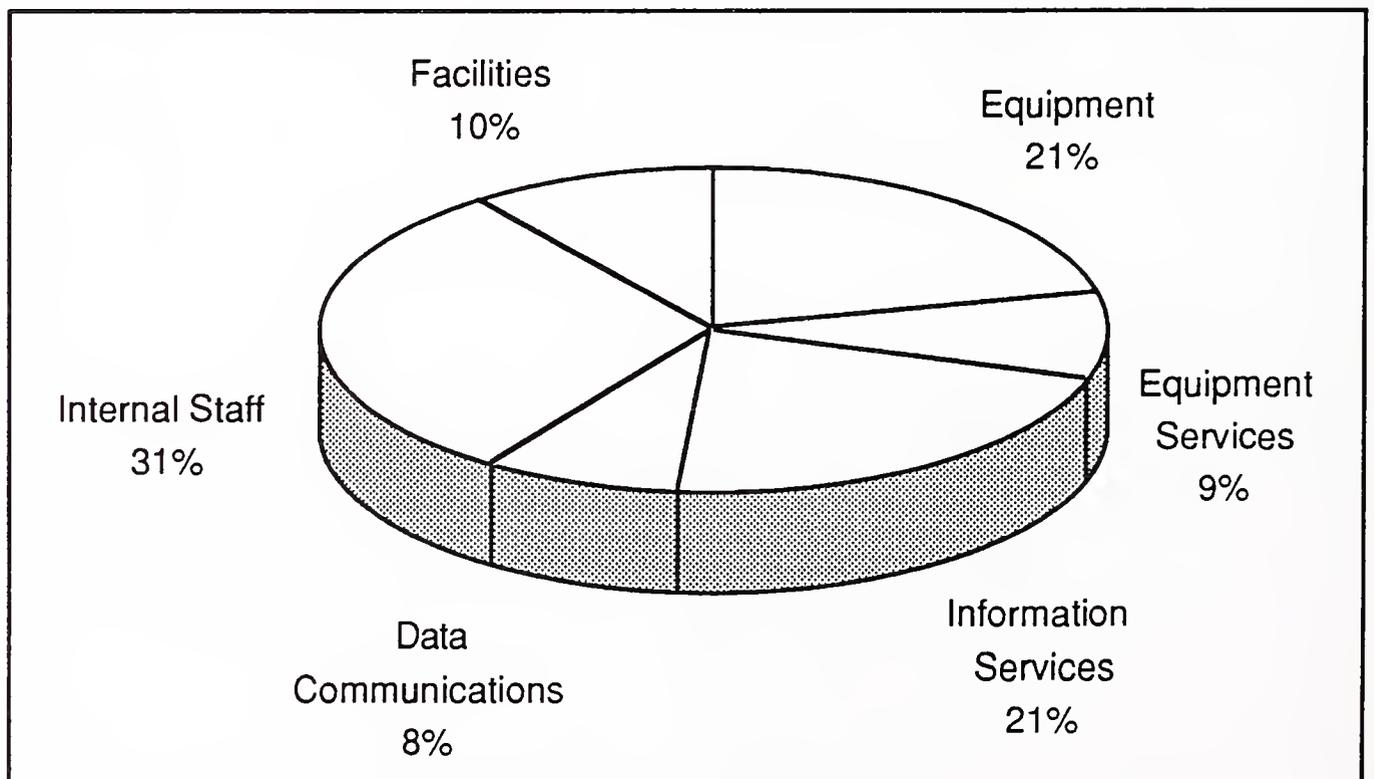


EXHIBIT VIII-157

**Information Services Industry Market Forecast by Delivery Mode  
Spain, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$M)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$M)</b>	<b>1994 (\$M)</b>	<b>1995 (\$M)</b>	<b>1996 (\$M)</b>	<b>1997 (\$M)</b>	<b>1998 (\$M)</b>	<b>CAGR 93-98 (%)</b>
Total Spain Information Services Mkt.	2,600	12	2,900	3,200	3,600	4,000	4,500	5,100	12
<i>Professional Services</i>	760	8	820	890	980	1,050	1,150	1,300	10
- IS Consulting	107	15	123	143	167	195	229	266	17
- Education & Training	77	4	80	83	87	91	96	100	5
- Custom Software	570	8	615	660	715	765	830	895	8
<i>Systems Integration</i>	180	19	215	265	320	380	470	580	22
- Equipment	49	21	59	69	81	92	107	124	16
- Software Products	45	24	56	76	100	135	185	250	35
- Professional Services	83	17	98	113	130	147	169	193	15
- Other	4	21	4	5	7	10	14	18	33
<i>Systems Operations</i>	55	20	66	79	95	115	135	165	20
- Platform Operations	20	18	24	27	32	37	44	52	17
- Application Operations	18	17	21	25	29	34	40	48	18
- Desktop Services	3	26	3	4	5	7	8	10	25
- Network Management	15	24	18	23	29	37	46	56	25
<i>Processing Services</i>	285	5	300	320	330	350	380	400	6
- Transaction Processing	243	6	257	270	286	303	322	341	6
- Utility Processing	19	3	19	20	20	21	21	22	3
- Other Processing	24	9	26	27	29	31	33	35	6
<i>Network Services</i>	140	11	155	180	210	240	280	310	15
- Electronic Info Services	104	9	113	126	139	155	173	184	10
- Network Applications	36	22	44	55	69	86	107	128	24
<i>System SW Products</i>	430	7	460	500	540	590	650	720	9
- Mainframe	190	-1	188	190	192	193	195	197	1
- Minicomputer	149	9	163	181	201	222	247	275	11
- Workstation/PC	94	16	109	128	152	179	211	249	18
<i>Application SW Products</i>	300	17	350	400	470	540	630	740	16
- Mainframe	28	-2	28	28	29	29	29	30	1
- Minicomputer	91	9	100	110	122	136	150	166	11
- Workstation/PC	185	19	220	260	315	375	450	540	20
<i>Turnkey Systems</i>	460	11	510	560	630	710	800	900	12
- Equipment	230	6	244	266	288	317	349	377	9
- Software Products	120	13	135	150	175	200	230	265	14
- Professional Services	113	12	127	146	166	192	224	256	15

## AA

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### Sweden

#### 1. National Overview

Sweden is a member of the European Free Trade Association (EFTA) and will therefore be part of the EEA (European Economic Area) when this is inaugurated, probably in 1994. Under this, restrictions on trade and the movement of capital between EC and EFTA countries will be largely removed.

Subject to a referendum sometime in 1994, Sweden may become a full EC member in 1995. The move logically follows the increased importance of the EC as a trading partner. The proportion of exports going to EC countries reached 53% in 1992, from an average of 44% in the 1980s.

Sweden is the fifth-largest software and services market in Europe, estimated at \$3.6 billion in 1993.

The 1992 GDP decline was -1.7%, the same rate as 1991. However, the high 1991 inflation rate of 9.3% was replaced by a 2.2%, below the OECD average. The current account deficit worsened to about 4% of GDP. The Swedish kroner was devalued during the year. Unemployment moved up three percentage points to 8%.

World trading conditions account for some of Sweden's current difficulties. Fundamental internal changes are also important factors, notably the transition from high wages, outstanding welfare benefits and the shift to a big government sector to a leaner, more competitive, productive economy.

Recession lingered in 1993, but will ride below average growth in 1994, inflation rates first increasing then declining to 3.5% in 1994 (close to OECD average) and unemployment increasing. Even after a decline in 1995, unemployment will remain at levels much greater than those of the 1980s.

#### 2. Information Services Market Forecast

INPUT forecasts that the Swedish market for software and services will be more than \$3.6 billion in 1993, growing at an average 8% CAGR to \$5.3 billion by 1998, as shown in Exhibit 158.

## EXHIBIT VIII-158

## Market Forecast—Sweden, 1993-1998

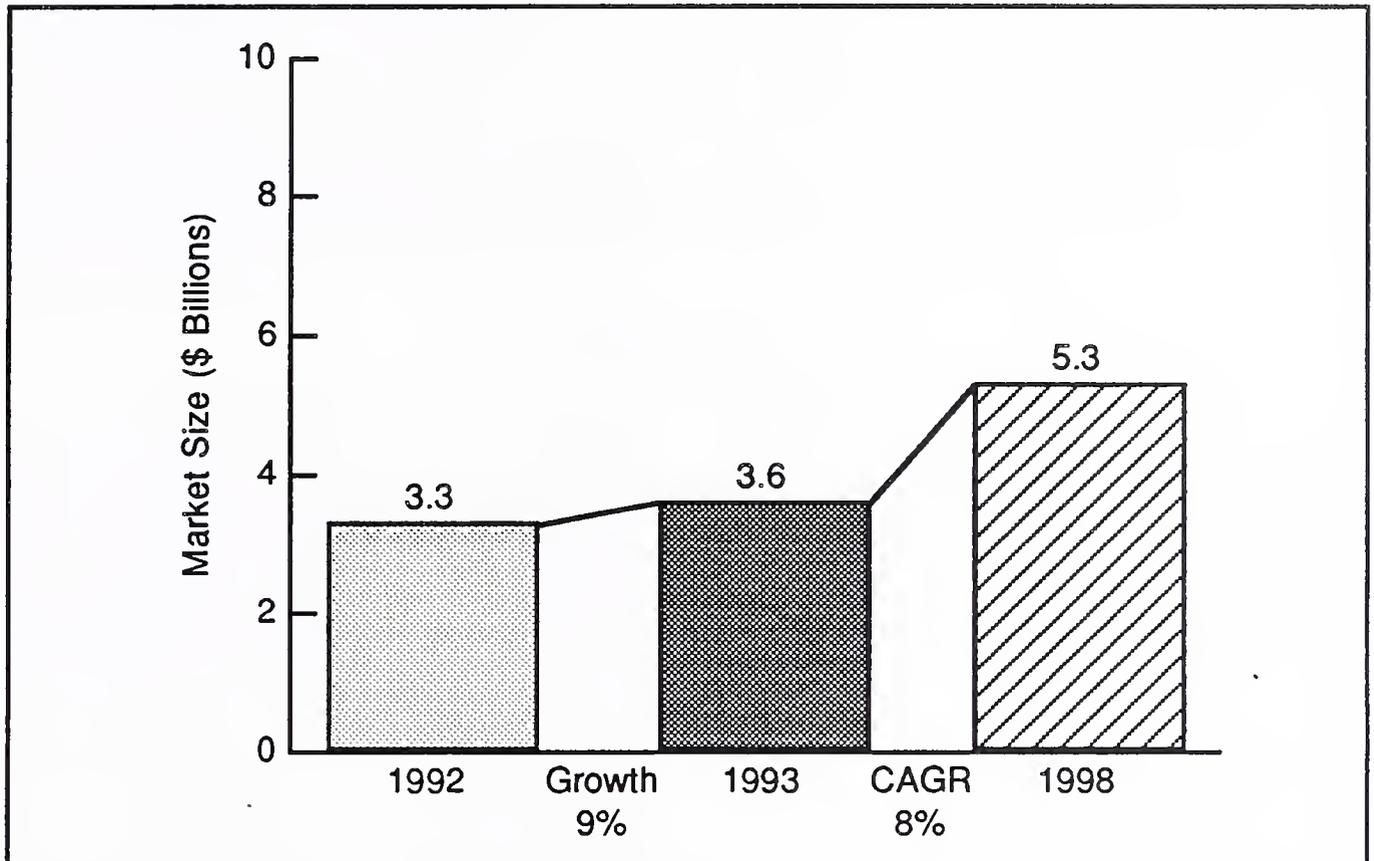
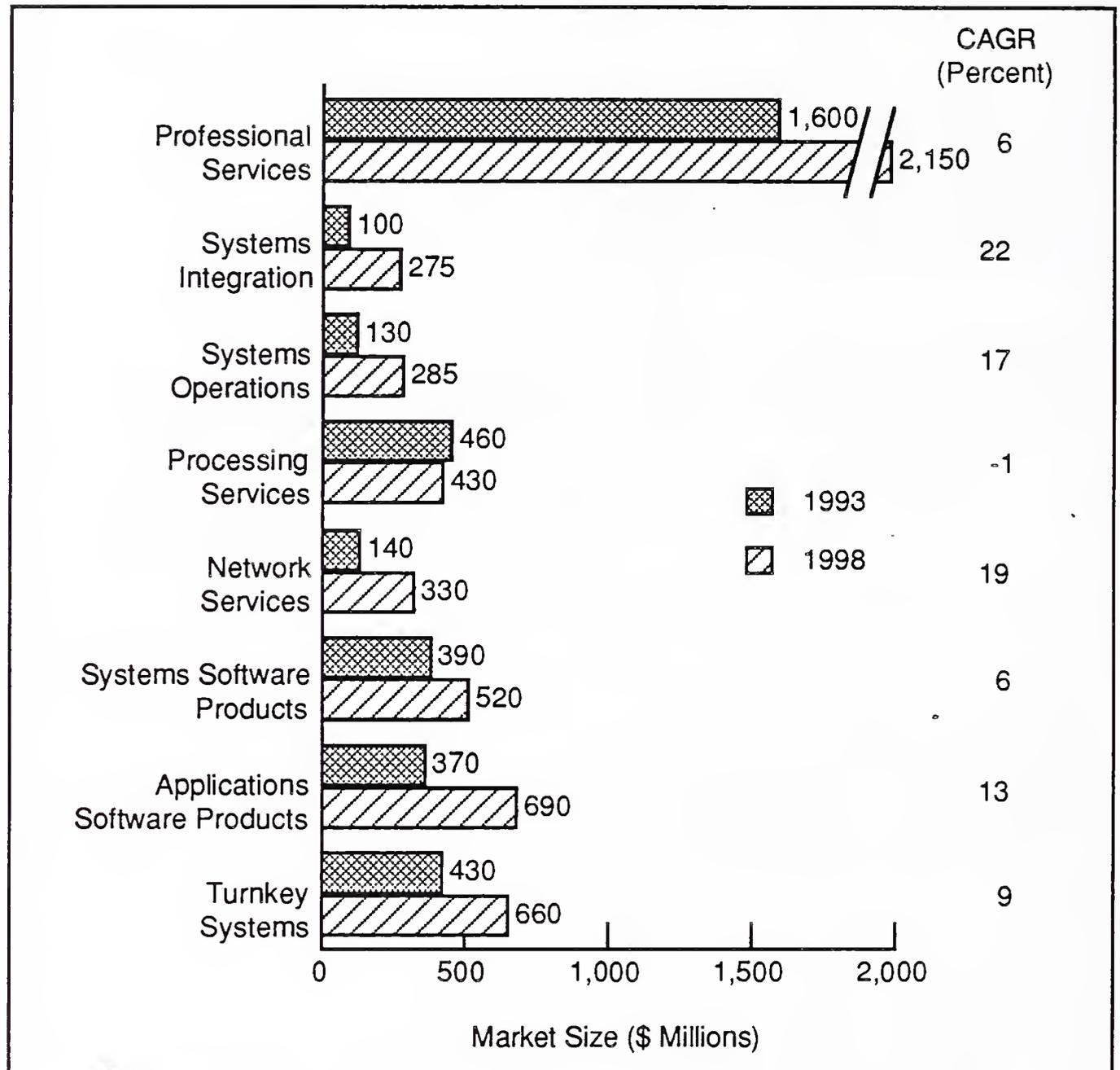


Exhibit VIII-159 provides the forecast by delivery mode.  
Exhibit VIII-163, at the end of this profile, provides the forecast in greater detail.

EXHIBIT VIII-159

**Market Forecast by Delivery Mode  
Sweden, 1993-1998**



Professional services forms the largest sector of the Swedish software and services market, accounting for more than 36% of the total in 1992. This indicates the strength of the professional services market in Sweden when compared with the overall European average of 23% for professional services.

Software development services comprise the largest portion of the Swedish professional services market, accounting for about 82% of total user expenditure for professional services. The primary growth opportunities in the Swedish market are in applications solutions, especially systems integration, software products, workstation and PC applications, and network applications.

### 3. Market Considerations

Exhibit VIII-160 lists the 10 leading information services vendors in the Swedish market during 1993. This list is compiled using software and services revenues attributable to the domestic market within Sweden, excluding exports and excluding revenues from within any parent group companies or subsidiaries.

EXHIBIT VIII-160

**Leading Information Services Vendors—Sweden, 1993**

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	373	10.4
2	Cap Programmator [CGS]	France	186	5.2
3	ICL (Fujitsu)	U.K.	143	4.0
4	Digital	U.S.	141	3.9
5	Enator	Sweden	66	1.8
6	Unisys	U.S.	56	1.6
7	Siemens-Nixdorf	Germany	46	1.3
8	Reuters	U.K.	40	1.1
9	Microsoft	U.S.	35	1.0
10	Bull	France	27	0.8
	Total Listed		1,113	31.1
	Total Market		3,600	100.0

IBM gained the leading place in the Swedish market, pushing Cap Programmator, an indigenous company, into second place for the first time in INPUT's rankings.

Of the leading 10 vendors in Sweden, six are indigenous companies.

In a move to counter reducing revenue and margins from equipment sales, IBM is vigorously pursuing additional business in software and services. During 1991 and 1992, IBM consolidated operations on the Scandinavian market by reorganizing these operations to report into a central office in the region. Further,

IBM succeeded in establishing a European-wide systems integration business, represented by their 20% share of the Swedish SI market.

In 1992, Cap Gemini Sogeti acquired a controlling interest in Programmatör and merged its own Swedish operations into Cap Programmatör. In 1991, Programmatör itself acquired share holdings in eight additional companies, three of which were in Sweden. The company operates in six European country markets, including Sweden. The largest IT revenue contribution, more than 85%, is derived from the Swedish market. In 1991 and 1992, the overall revenues of Programmatör reduced, primarily as a consequence of the company divesting itself of nonstrategic units.

The third-largest software and services vendor in Sweden is Sapia AB. The key software and services activities of this company are in the areas of data processing services, consultancy and turnkey systems.

The leading 10 vendors have between them about a 35% share of the total information services market.

#### 4. IT Spending

Exhibit VIII-161 provides an estimate of Sweden's total IT spending for 1993.

EXHIBIT VIII-161

#### Total 1993 IT Spending—Sweden

Budget Category	Estimated Spending (\$ Millions)
Data Communications	860
Internal Staff	2,750
Equipment	1,500
Equipment Services	930
Facilities	1,000
Information Services	3,400
<b>Total IT Spending</b>	<b>10,440</b>

Information services, which includes software products, represents approximately 33% of the total IT budget, as noted in Exhibit VIII-162. The next largest expenditures are for internal staff (26% of the IT budget) and equipment (14%). Data communications represents the smallest portion of the IT budget at \$860 million and 8% of the total.

EXHIBIT VIII-162

**1993 IT Spending Percentages—Sweden**

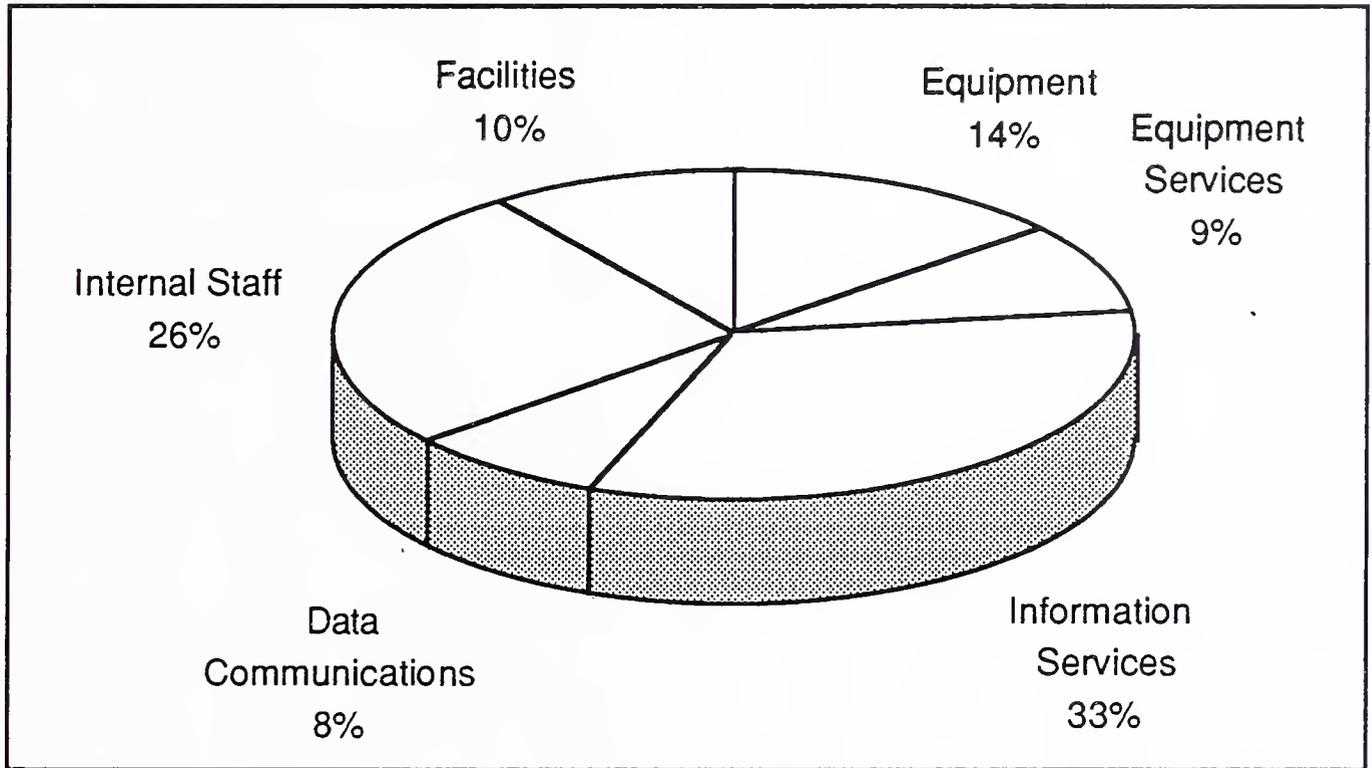


EXHIBIT VIII-163

**Information Services Industry Market Forecast by Delivery Mode  
Sweden, 1993-1998**

Delivery Modes	1992	Growth	1993	1994	1995	1996	1997	1998	CAGR
	(\$M)	92-93 (%)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	93-98 (%)
Total Sweden Information Services Mkt.	3,300	9	3,600	3,900	4,300	4,600	5,000	5,300	8
<i>Professional Services</i>	1,500	7	1,600	1,700	1,850	1,950	2,100	2,150	6
- IS Consulting	159	10	175	193	213	234	255	273	9
- Education & Training	103	6	109	117	127	136	144	151	7
- Custom Software	1,240	6	1,315	1,395	1,490	1,580	1,660	1,705	5
<i>Systems Integration</i>	89	12	100	125	155	185	225	275	22
- Equipment	24	13	27	32	39	44	51	58	16
- Software Products	24	13	27	36	50	67	88	120	35
- Professional Services	40	14	45	53	62	70	80	90	15
- Other	2	50	2	3	4	5	6	8	27
<i>Systems Operations</i>	67	94	130	155	180	210	245	285	17
- Platform Operations	39	17	45	52	60	69	79	91	15
- Application Operations	13	392	64	76	88	101	116	135	16
- Desktop Services	8	20	10	12	14	18	21	25	21
- Network Management	7	36	10	13	17	22	28	36	30
<i>Processing Services</i>	440	5	460	450	450	450	440	430	-1
- Transaction Processing	401	3	414	409	409	401	393	385	-1
- Utility Processing	9	0	9	9	9	8	8	8	-2
- Other Processing	32	8	35	36	38	40	40	42	4
<i>Network Services</i>	120	17	140	165	200	235	280	330	19
- Electronic Info Services	76	8	82	89	97	104	109	113	7
- Network Applications	43	32	56	76	101	133	170	218	31
<i>System SW Products</i>	360	8	390	410	440	460	490	520	6
- Mainframe	193	2	196	199	201	199	197	196	0
- Minicomputer	96	9	105	113	122	129	137	145	7
- Workstation/PC	76	17	88	103	119	135	154	175	15
<i>Application SW Products</i>	320	16	370	420	480	540	610	690	13
- Mainframe	29	2	30	29	29	28	27	27	-2
- Minicomputer	87	12	97	106	116	124	132	142	8
- Workstation/PC	200	20	240	285	335	390	455	525	17
<i>Turnkey Systems</i>	390	10	430	460	510	560	610	660	9
- Equipment	193	6	204	212	223	234	245	253	4
- Software Products	99	11	110	125	140	155	175	195	12
- Professional Services	100	13	112	128	144	169	193	217	14

**BB****Switzerland**

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**1. National Overview**

The Swiss population is small in comparison with many European countries. But Switzerland ranks fourth in terms of the capitalization of its FT500 companies, ahead of bigger countries such as Spain and the Netherlands, ranking behind France with about half the figure.

The information services market is the eighth-largest in Europe, with a total size of \$3.0 billion in 1993.

GDP decline continued in 1993. Unemployment increased to 2.5%. The Zürich Stock Exchange was one in a minority of European exchanges to register growth, ending 10.5% up on the year. The future should include a modest return to growth in 1994 (2.0%) after a flat 1993. Inflation should decline to fall below the OECD average in 1994 at 2.5%. Current account surpluses will continue.

However, there is concern for the longer-term future of the Swiss economy after the referendum rejecting integration with the European Economic Area. The dangers of isolation from the European mainstream are considerable.

Economists warn that investment in innovative new products and reskilling the labor force must take priority if Switzerland is to retain its high competitive ranking in industrial Europe.

**2. Information Services Market Forecast**

The Swiss Information Services market is forecast by INPUT to grow from \$3.0 billion in 1993 to \$4.8 billion in 1998, as shown in Exhibit VIII-164. This is an average annual growth rate of 10%, similar to of the European market as a whole. As one would expect of a dominantly German speaking nation, the pattern of business is very similar to Germany's, with turnkey systems and application products larger than usual.

## EXHIBIT VIII-164

## Market Forecast—Switzerland, 1993-1998

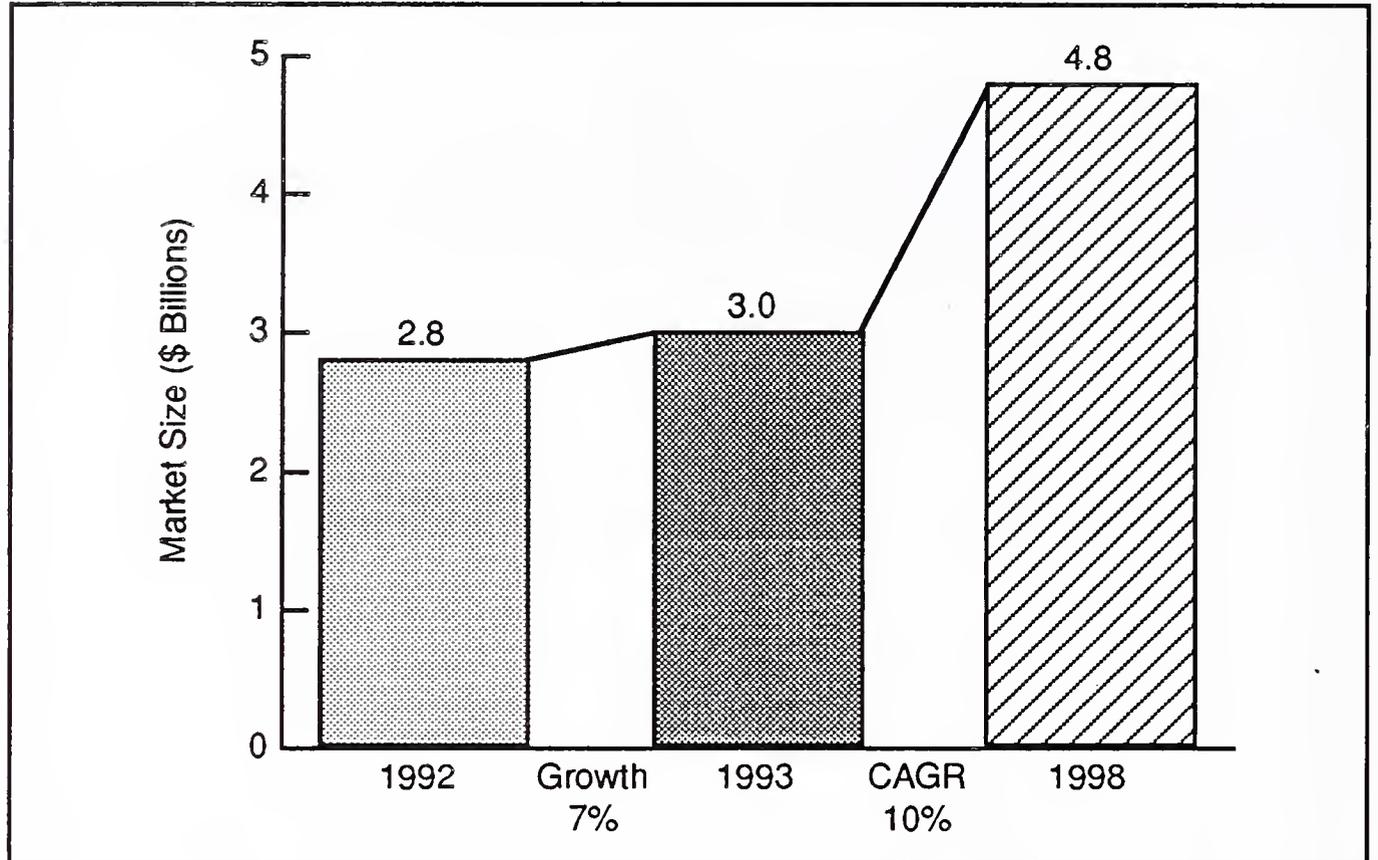
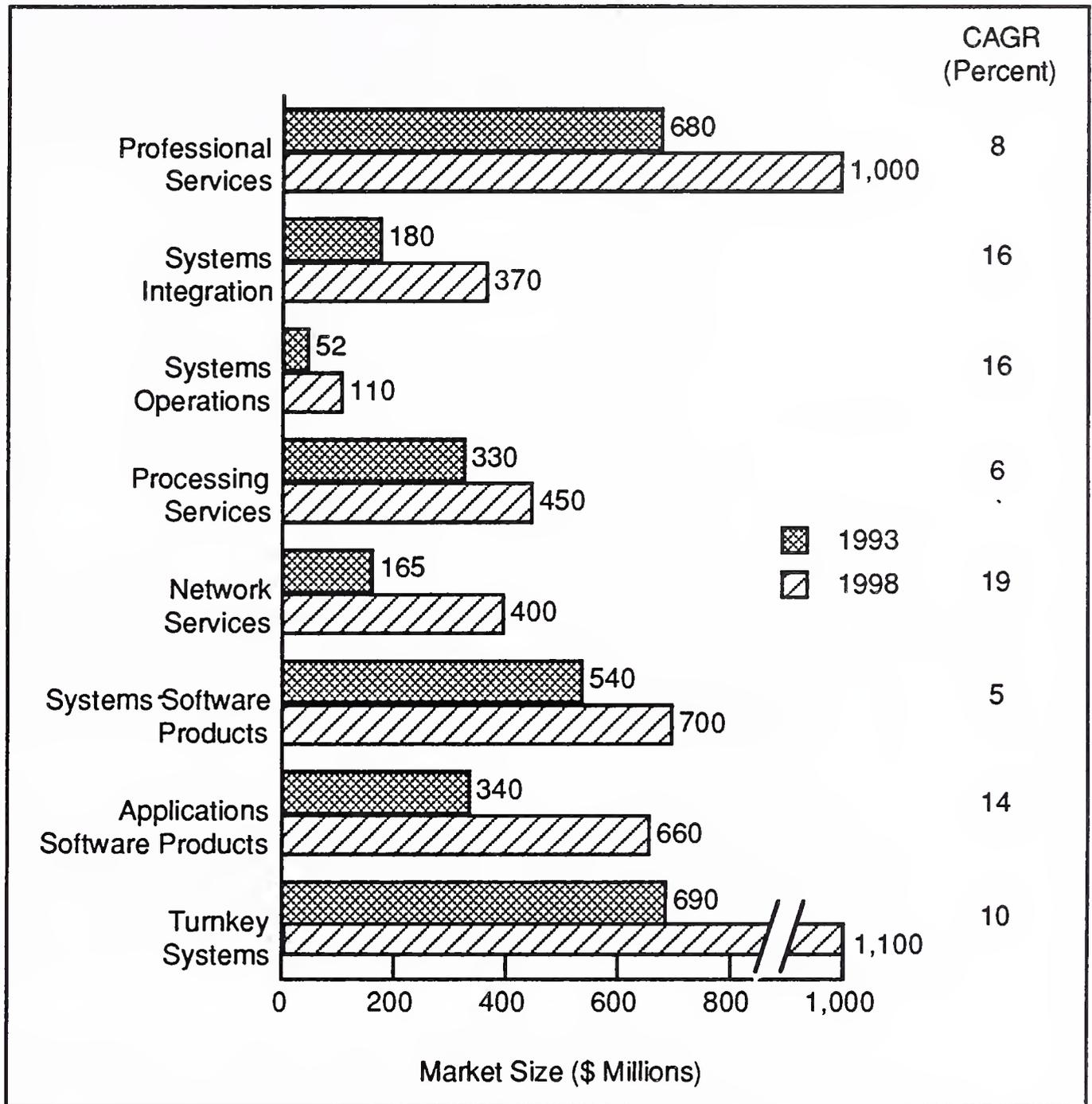


Exhibit VIII-165 illustrates the breakdown of the market into INPUT's nine information service delivery modes. Exhibit VIII-169, found at the end of this profile, provides the forecast in greater detail.

EXHIBIT VIII-165

**Market Forecast by Delivery Mode  
Switzerland, 1993-1998**



**3. Market Considerations**

The top 10 vendors in the Swiss market for 1993 are listed in Exhibit VIII-166. This list uses software and services revenues attributable to the domestic market in Switzerland, excluding exports and revenues from within any parent group or subsidiaries.

EXHIBIT VIII-166

**Leading Information Services Vendors—Switzerland, 1993**

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	281	9.4
2	Telekurs	Switzerland	155	5.2
3	Digital	U.S.	137	4.6
4	Fides	Switzerland	72	2.4
5	Reuters	U.K.	68	2.3
6	Siemens-Nixdorf	Germany	56	1.9
7	Microsoft	U.S.	56	1.9
8	Unisys	U.S.	54	1.8
9	Andersen Consulting	U.S.	40	1.3
10	AT&T	U.S.	32	1.1
	Total Listed		951	31.9
	Total Market		3,000	100.0

Two Swiss vendors feature in the list. Telekurs is a major European electronic information services vendor to the banking and finance sector. They sell on-line financial information, trading systems, processing services and related professional services.

An association of largely Swiss banks own Telekurs, and is also responsible for the Swiss computer center where all electronic payments are transferred between Swiss banks.

Fides Informatics is part of the Fides Group that also includes a Trust Division and a Management Consultancy. The company specializes in banking, insurance, health care, communications and industrial automation.

#### 4. IT Spending

Exhibit VIII-167 provides an estimate of Switzerland's total IT spending for 1993.

EXHIBIT VIII-167

**Total 1993 IT Spending—Switzerland**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	870
Internal Staff	3,200
Equipment	2,150
Equipment Services	965
Facilities	730
Information Services	2,600
<b>Total IT Spending</b>	<b>10,515</b>

Information services, which includes software products, represents approximately 25% of the total IT budget, as noted in Exhibit VIII-168. The largest expenditure is for internal staff (31% of the IT budget). Facilities represents the smallest portion of the IT budget at \$730 million and 7% of the total.

EXHIBIT VIII-168

**1993 IT Spending Percentages—Switzerland**

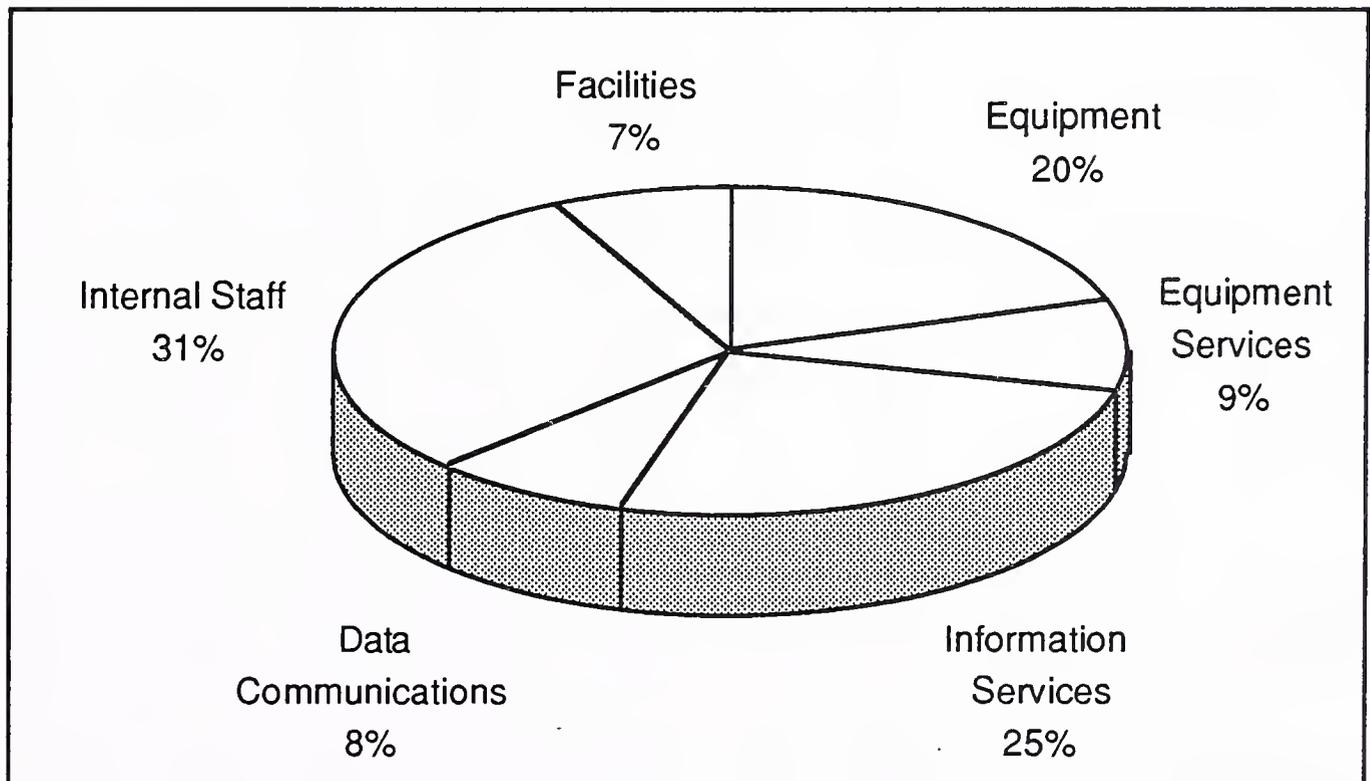


EXHIBIT VIII-169

**Information Services Industry Market Forecast by Delivery Mode  
Switzerland, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$M)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$M)</b>	<b>1994 (\$M)</b>	<b>1995 (\$M)</b>	<b>1996 (\$M)</b>	<b>1997 (\$M)</b>	<b>1998 (\$M)</b>	<b>CAGR 93-98 (%)</b>
Total Switzerland Information Services Mkt.	2,800	7	3,000	3,200	3,500	3,900	4,300	4,800	10
<i>Professional Services</i>	660	3	680	720	770	840	910	1,000	8
- IS Consulting	72	10	79	87	97	108	123	141	12
- Education & Training	115	0	115	119	123	130	137	148	5
- Custom Software	470	3	485	515	550	595	645	705	8
<i>Systems Integration</i>	160	13	180	210	245	280	320	370	16
- Equipment	43	14	49	55	61	67	74	79	10
- Software Products	43	9	47	60	76	96	125	155	27
- Professional Services	69	20	83	90	101	108	115	123	8
- Other	4	0	4	4	6	7	9	11	25
<i>Systems Operations</i>	44	18	52	59	70	82	96	110	16
- Platform Operations	22	16	25	28	32	36	40	43	11
- Application Operations	15	14	17	19	22	25	29	33	15
- Desktop Services	3	24	4	4	6	7	9	12	26
- Network Management	5	30	7	9	11	14	18	23	29
<i>Processing Services</i>	310	6	330	350	370	400	420	450	6
- Transaction Processing	266	7	284	299	320	342	364	389	6
- Utility Processing	12	0	12	12	13	13	13	14	2
- Other Processing	29	9	32	36	39	43	48	53	11
<i>Network Services</i>	150	10	165	195	230	275	330	400	19
- Electronic Info Services	119	6	126	141	155	173	187	205	10
- Network Applications	29	36	40	54	76	105	141	191	37
<i>System SW Products</i>	520	4	540	550	580	620	660	700	5
- Mainframe	263	-3	256	245	241	238	234	230	-2
- Minicomputer	159	7	169	177	191	205	220	238	7
- Workstation/PC	101	14	115	130	151	177	202	234	15
<i>Application SW Products</i>	310	10	340	390	440	500	580	660	14
- Mainframe	46	-1	46	45	44	43	43	42	-2
- Minicomputer	90	8	97	108	119	130	144	159	10
- Workstation/PC	175	14	200	235	280	330	390	455	18
<i>Turnkey Systems</i>	640	8	690	740	810	900	1,000	1,100	10
- Equipment	335	4	349	371	396	432	468	500	7
- Software Products	155	13	175	185	210	235	275	310	12
- Professional Services	155	9	169	187	209	238	270	302	12

**CC****Taiwan**

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**1. National Overview**

Taiwan is an island caught between a past and a future bearing the same name: China. Since political fugitive Chiang Kai-shek and his followers took control of this undeveloped, agrarian island more than 40 years ago, Taiwan has grown into one of Asia's top economic powers. But unlike Hong Kong, where older citizens are migrating to avoid the Chinese in 1997, Taiwan still has conservative, powerful "One China" factions that push for reuniting their island with the mainland. Heated political debates persist between older conservatives and younger, up-and-coming "Independence" liberals who argue pointedly and sometimes violently for Taiwanese separatism and autonomy.

During 1993, this external issue took a back seat as the Taiwanese held their nation up to a mirror and found compelling needs which must be satisfied if Taiwan is to help shape the economic landscape of Asia as one of the "little dragons." The ostensible solution to Taiwan's problems is a six-year, \$246 billion development plan designed to add new highways, power stations, sewage systems, hospitals and other infrastructural necessities.

Unfortunately, even cutting the plan down from its original cost of \$303 billion has not improved the difficulties and delays many projects have suffered. One of the more controversial improvements, a \$16.4 billion, 200 mph commuter train, will likely not run by 1997 as planned because of delays in other transportation projects. The train is part of a plan to alleviate highway congestion, yet new highway projects are also running behind schedule.

Among Taiwan's 21 million people, the GDP per capita in 1993 averaged \$10,500, with a GDP growth rate of 6.1% over 1992. The GDP is expected to increase from \$216 billion in 1993 to \$230 billion in 1994. The country also maintained a \$10.7 billion trade surplus in 1993, and has the world's highest level of foreign-exchange reserves at more than \$98 billion. These reserves are expected to reach \$100 billion by the end of 1994.

### a. Driving Forces

Driving forces for the local information services market include:

- *Computer systems manufacturing*—Sometimes considered “the arms dealer in the global computer war,” Taiwan surpassed neighbor South Korea as a leading supplier of computers and peripherals, particularly color monitors. U.S. companies such as Apple, Dell and IBM are supplied various components by Taiwanese firms. Local company First International Computer, Inc., is the world’s leading supplier of PC motherboards. In 1993, Japanese giant Matsushita Electric imported Taiwanese-made PCs for sale in Japan.
- *Investment incentives*—Taiwan’s government is poised to enact tax exemptions for foreign companies that make direct investments in local businesses or projects. Under terms of the proposal, foreign investors would be exempt from corporate income taxes for five years. It is aimed primarily at firms making heavy investments in high priority industries, particularly leading-edge technology.
- *Economic growth*—The government has been under continuous pressure from outside and within to curtail spending and stimulate economic growth. The cuts made to the multibillion dollar development plan bring spending down to a level the government is confident of retaining, a 6.2% growth rate, for the next three years. Proactively, in early 1993, the government made \$1.5 billion available for low-cost loans to small and medium-sized private sector businesses. In addition to foreign investment incentives, \$800 million has been set aside to develop priority industry sectors. There are also government plans to create free trade zones on Taiwan’s west coast to attract domestic and foreign investment by allowing shipments to mainland China.

### b. Inhibiting Factors

Factors inhibiting growth of information services include:

- *Software piracy and copyright infringement*—The U.S. and other countries made Taiwan’s admittance into the General Agreement on Tariffs and Trade (GATT) depend heavily on changes to the country’s laws on patents and intellectual property rights. Their government software inspection

program moves slowly, while value estimates of the software pirated in Taiwan run as high as \$500 million per year.

- *Trade restrictions*—Taiwan's manufacturers favor government regulations that restrict imports, although GATT membership, if allowed, will force the Taiwanese to forego numerous protectionist practices.
- *Shadow of the PRC*—Ironically, the island's labor-intensive industries are moving production facilities to China and other Southeast Asian countries to avoid growing labor and real estate costs at home. Although the Taiwanese government believes tax incentives and lower interest rates will revive domestic investment, the island's more entrepreneurial firms see China as a better place to do business. This hurts the Taiwanese economy at a time when export growth for manufactured goods is already weak. Migrating business to China also fueled the debate between conservative and liberal political factions.
- *Ailing Municipal Infrastructure/Environment*—This remains the government's largest undertaking. More than 140 of the 775 projects proposed for development have been cut to curtail the drain on government funds. Nevertheless, this is an ambitious project which got off to an unspectacular start.

## **2. Information Services Market Forecast**

Rapid growth for information services in Taiwan slowed in 1990 and is sluggish today. Exhibit VIII-170 shows that the overall market was about \$500 million in 1992, grew to almost \$600 million in 1993 and should expand at a 15% CAGR over the 1993 to 1998 period. This growth projection is 1% less than was forecast in the 1992 report and reflects economic and technological challenges Taiwan will encounter over the forecast period.

Exhibit VIII-170

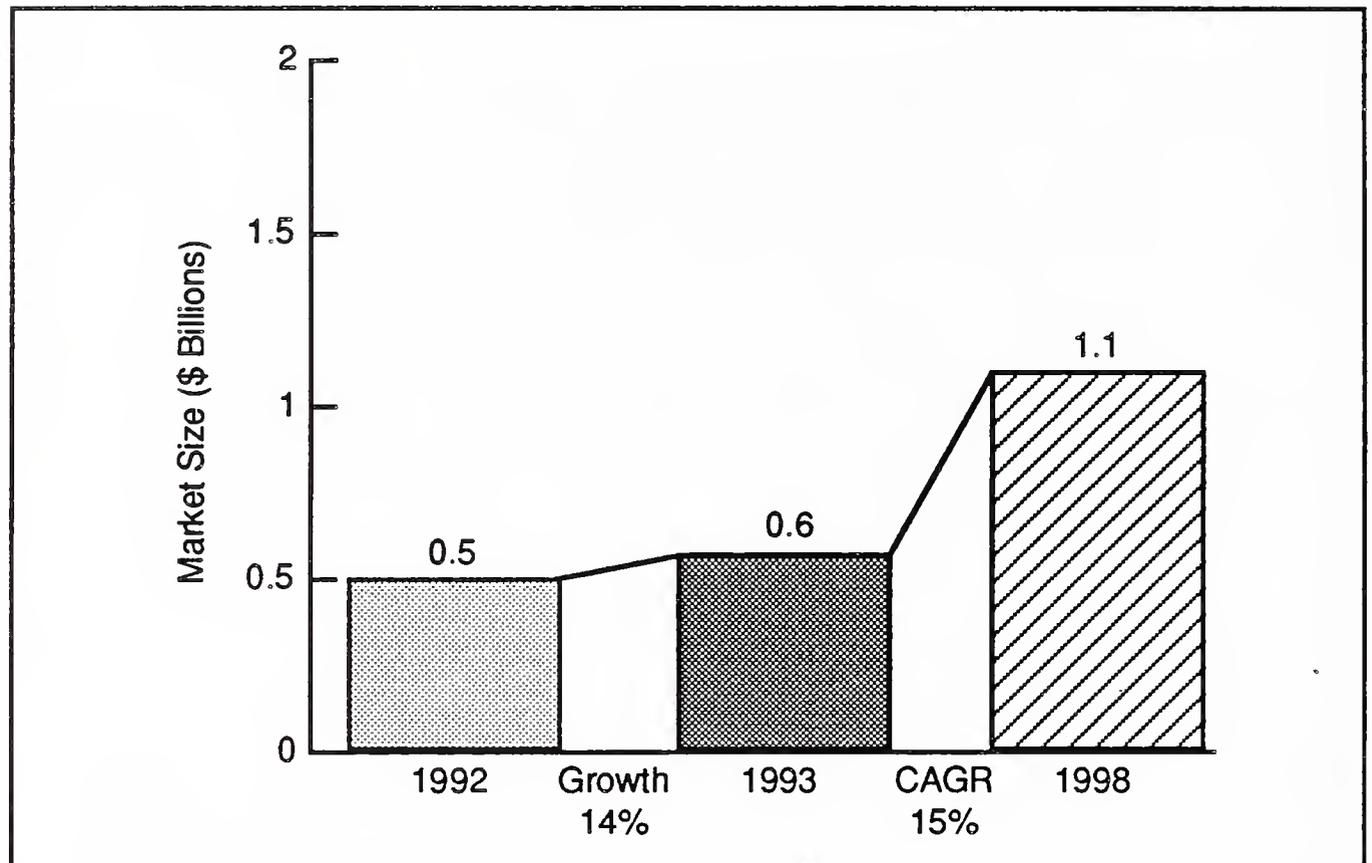
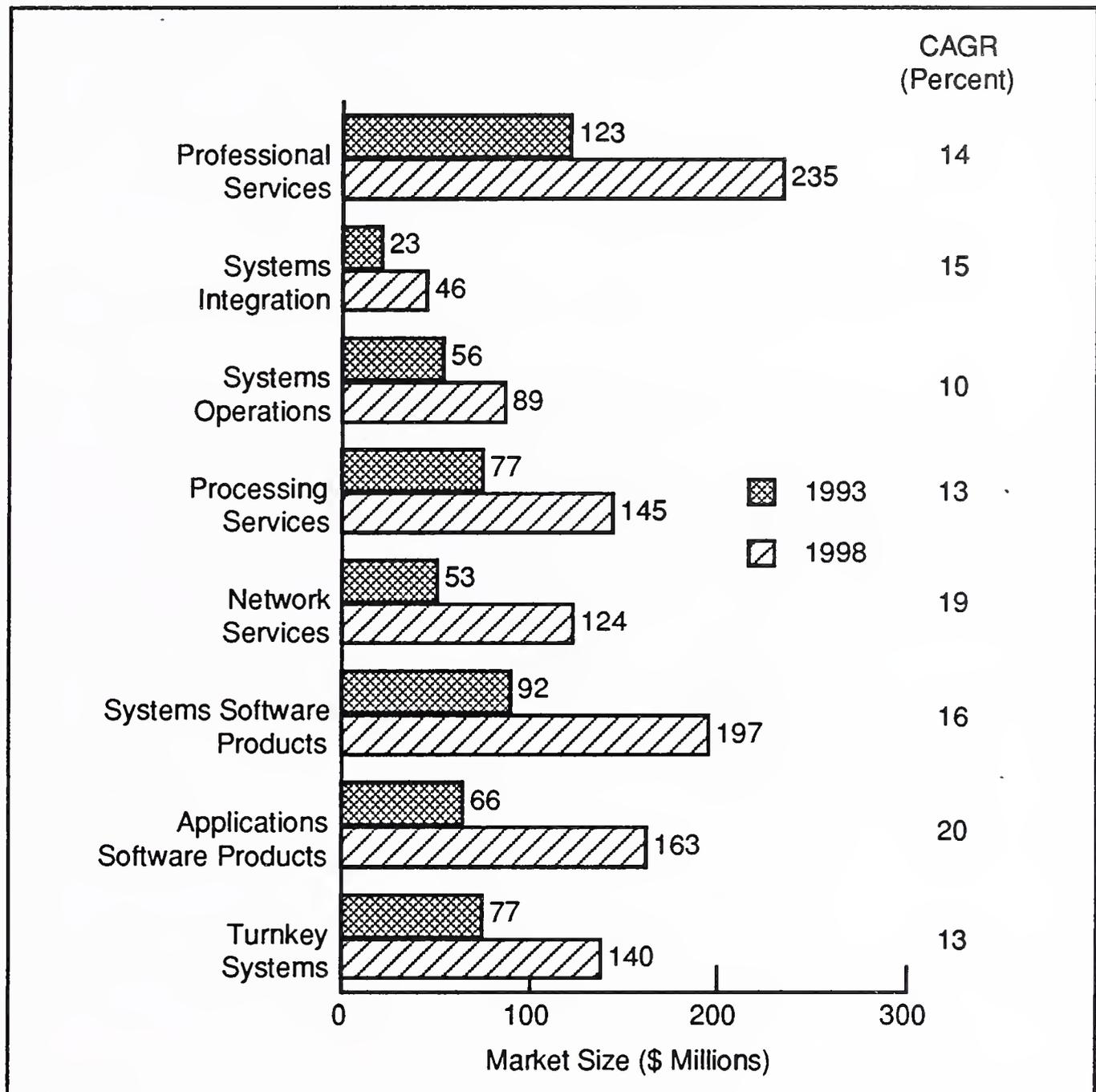
**Market Forecast—Taiwan, 1993-1998**

Exhibit VIII-171 provides the 1993 to 1998 forecast by delivery mode and Exhibit VIII-175, at the end of this profile, provides the detail behind this forecast.

Exhibit VIII-171

### Market Forecast by Delivery Mode Taiwan, 1993-1998



All delivery modes continue to experience double-digit growth and represent opportunities for vendors to the information services market.

- Processing Services and Systems Operations*—Processing services, with a 13% CAGR, is projected to grow faster than in all other Far East countries (except South Korea) because of continuing acceptance of this service as a viable processing alternative and the leverage offered by such activities when hardware investment capital is tight. Vendors provide full data center operations services, but business is growing only modestly—a condition that will improve as hardware and

labor costs rise to a level that makes major IT outsourcing a logical business option.

- *Applications and Systems Software Products*—Applications and systems software products, at 1993 to 1998 CAGRs of 20% and 16% respectively, show strong growth for local and international developers, in spite of the piracy concerns. The weakness will be at the personal computer level, where piracy is easiest and therefore the greatest threat.
- *Turnkey Systems*—The turnkey systems market is relatively large due to a strong local hardware industry. The turnkey market of approximately \$77 million in 1993 will reach \$140 million in 1998, growing at an average of 13% per year.
- *Systems Integration and Professional Services*—The market for systems integration is quite modest—\$23 million in 1993, growing at a 15% CAGR to more than \$46 million in 1998; but there is a sizable professional services market of almost \$125 million, growing at a consistent 14% CAGR to reach \$235 million in 1998. As shown in Exhibit VIII-172, there are a number of key vendors providing professional services and systems integration services to the Taiwan market.
- *Network Services*—At a 1993 level of slightly more than \$50 million, the market for network services is small, but under the stimulation of Taiwanese infrastructure improvements, a growing population of foreign corporations and an improved business environment, this market will grow at a 19% CAGR to almost \$125 million in 1998.

### 3. Market Considerations

Entry into this market can be difficult. Government policies and procedures are complex and cause delays. There is a local bias toward locally provided goods and services which was confirmed again in 1993 by field research.

The least risky opportunities are for professional services such as consulting and software development. Entering the market by offering consulting services can provide a knowledge of this market and a means to build the required relationships.

For companies considering product opportunities, the selection of an established company as a Taiwan representative, is the

recommended approach just as it is in most other Asian countries.

Most international vendors active in Taiwan are U.S.-based companies and Japanese vendors are generally not present. Major trade relationships exist with U.S. companies IBM, HP, DEC, Oracle and Informix.

There is also a very active local vendor community. Exhibit VIII-172 lists major local vendors within the Taiwanese information services identified by INPUT's research in 1992.

## EXHIBIT VIII-172

## Selected Vendors by Delivery Mode—Taiwan, 1993

Vendor	Processing/ Network Services/ Systems Operations	Professional Services/ Systems Integration	Software Products	Turnkey Systems
Action Information		✓		
Bonanea Int'l Computer			✓	
Chimat	✓		✓	
Chung-Mei	✓			
Comet Software		✓		
D.M.A.	✓		✓	
Datex Systems		✓	✓	
Egen		✓	✓	
Eten	✓	✓	✓	
Fortune Information	✓			
Four Dimension Computer		✓		
Golden	✓			
M.I.C.		✓		

### 4. IT Spending

Exhibit VII-173 provides INPUT's breakdown of Taiwan's IT spending for 1993.

Exhibit VIII-173

#### Total 1993 IT Spending—Taiwan

Budget Category	Estimated Spending (\$ Millions)
Data Communications	213
Internal Staff	874
Equipment	496
Equipment Services	95
Facilities	118
Information Services	567
<b>Total IT Spending</b>	<b>2,363</b>

Information services spending, at \$567 million, represents 24% of the total IT budget, as noted in Exhibit VIII-174. The largest expenditures are for internal staff (37%, reflecting Taiwan's extremely high labor costs). Equipment services (at 4%) and facility costs (at 5%) represent the smallest portions of the IT budget.

Exhibit VIII-174

#### 1993 IT Spending Percentages—Taiwan

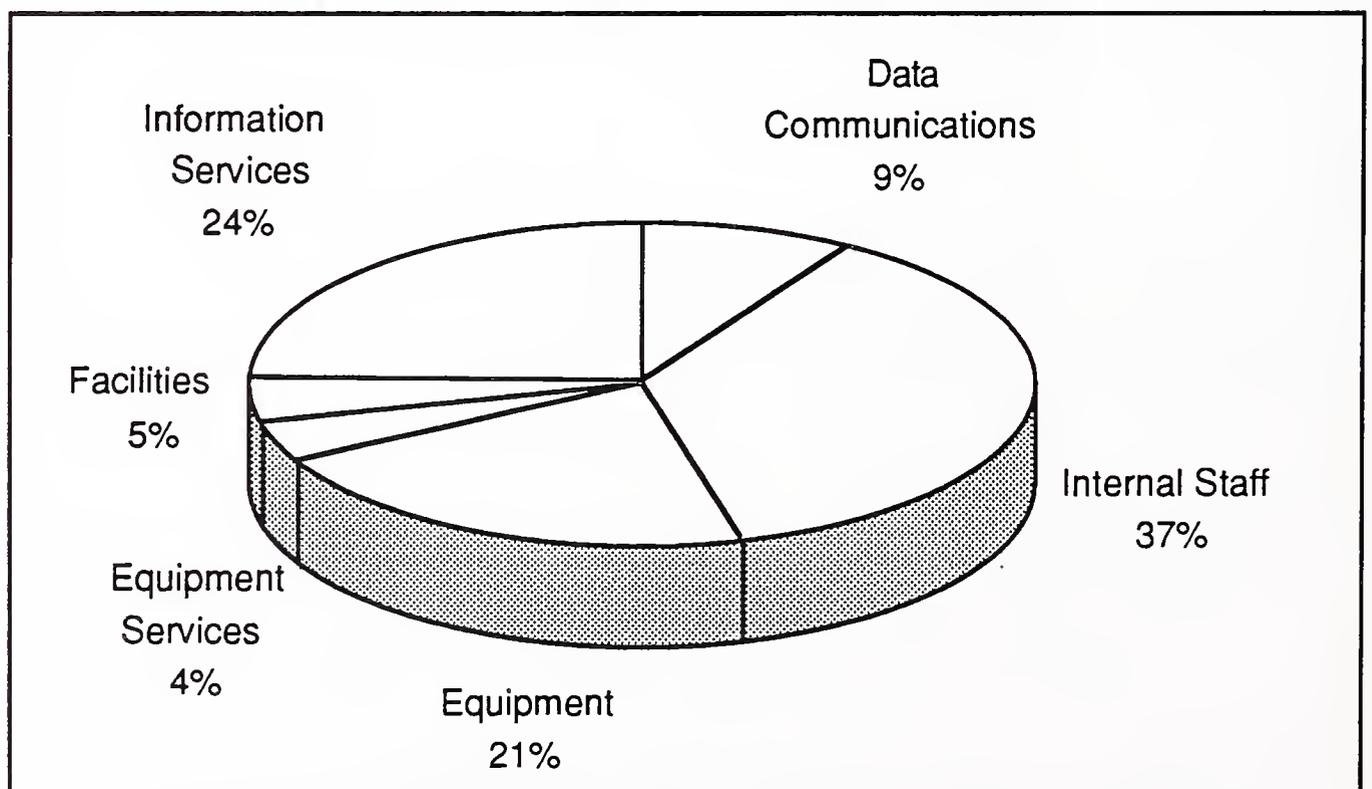


EXHIBIT VIII-175

**Information Services Industry Market Forecast by Delivery Mode  
Taiwan, 1993-1998**

Delivery Modes	1992 (\$)	Growth 92-93 (%)	1993 (\$)	1994 (\$)	1995 (\$)	1996 (\$)	1997 (\$)	1998 (\$)	CAGR 93-98 (%)
Total Taiwan Information Services Mkt.	498	14	567	647	746	858	990	1,139	15
<i>Professional Services</i>	109	13	123	140	158	180	204	235	14
- IS Consulting	28	11	31	36	41	47	53	59	14
- Education & Training	12	8	13	14	15	17	18	20	9
- Software Development	69	14	79	90	102	116	133	156	15
<i>Systems Integration</i>	20	15	23	26	29	34	40	46	15
- Equipment	10	20	12	13	14	16	19	22	13
- Software Products	1	0	1	1	2	2	2	3	25
- Professional Services	1	0	1	1	1	1	2	2	15
- Other	8	13	9	11	12	15	17	19	16
<i>Systems Operations</i>	52	8	56	61	68	75	82	89	10
- Platform Operations	32	9	35	38	42	47	51	55	9
- Applications Operations	20	5	21	23	26	28	31	34	10
<i>Processing Services</i>	68	13	77	86	99	113	130	145	13
- Transaction Processing	35	14	40	47	56	65	76	85	16
- Utility Processing	20	10	22	24	26	29	32	35	10
- Other Processing	13	15	15	15	17	19	22	25	11
<i>Network Services</i>	45	18	53	63	75	88	105	124	19
- Electronic Info Svcs	38	18	45	53	63	75	90	105	18
- Network Applications	7	14	8	10	12	13	15	19	19
<i>Systems Software</i>	78	18	92	105	124	144	169	197	16
- System Control	45	20	54	63	75	88	104	121	18
- Data Center Mgt	12	17	14	14	16	19	21	24	11
- Applications Dvlpmt	21	14	24	28	33	37	44	52	17
<i>Applications Software</i>	56	18	66	79	94	112	134	163	20
<i>Turnkey Systems</i>	70	10	77	87	99	112	126	140	13
- Equipment	36	6	38	42	45	49	52	55	8
- Software Products	15	13	17	19	22	26	30	34	15
- Professional Services	19	16	22	26	32	37	44	51	18

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## United Kingdom

### 1. National Overview

The United Kingdom has a population of about 57 million, and a work force of about 28 million (46% female). One feature of its economy is a concentration of large companies, illustrated by fact that the market capitalization of U.K. corporations in the Financial Times FT500 for 1992 is \$712 billion, compared with German and French companies at \$264 billion and \$259 billion respectively. It has been a member of the European Community since 1973.

The U.K.'s information services market is the third-largest in Europe, totaling \$16 billion in 1993. Growth was severely curtailed by the economic recession and loss of confidence in IT investment generally. Worst hit sectors were demand for contract IS labor and consulting.

The 1980s saw radical changes in the industrial scene. Labor productivity grew by 50% and industrial relations improved. Tax rates were cut while deregulation and privatization were pursued. Labor costs are lower than those of many industrial countries. In comparison, U.K. costs equate to 54% of German costs and 84% of French. Investment by U.S. and Japanese firms in the U.K. accounts for 40% and 33%, respectively, of those countries' stakes in the EC.

After a financial crisis in September 1992, Britain departed the ERM (Exchange Rate Mechanism) and devalued the pound sterling, which was one of only three European currencies to weaken during 1993 (by 4% in relation to the U.S. dollar) against which the German mark and French franc appreciated by more than 10%. A speculative attack on the pound resulted in an improved competitive position for the U.K. This meant a small trade upturn in late 1993.

In 1993, the U.K. was the only EC country for which GDP growth was as high as 1.9%. All the others were negative (in recession) or declining. U.K. inflation ran at about half that of the OECD as a whole, so the country is well placed. But the fact that trading partners such as Germany do not offer buoyant markets makes

the U.K. recovery seem vulnerable, until a more general upswing occurs.

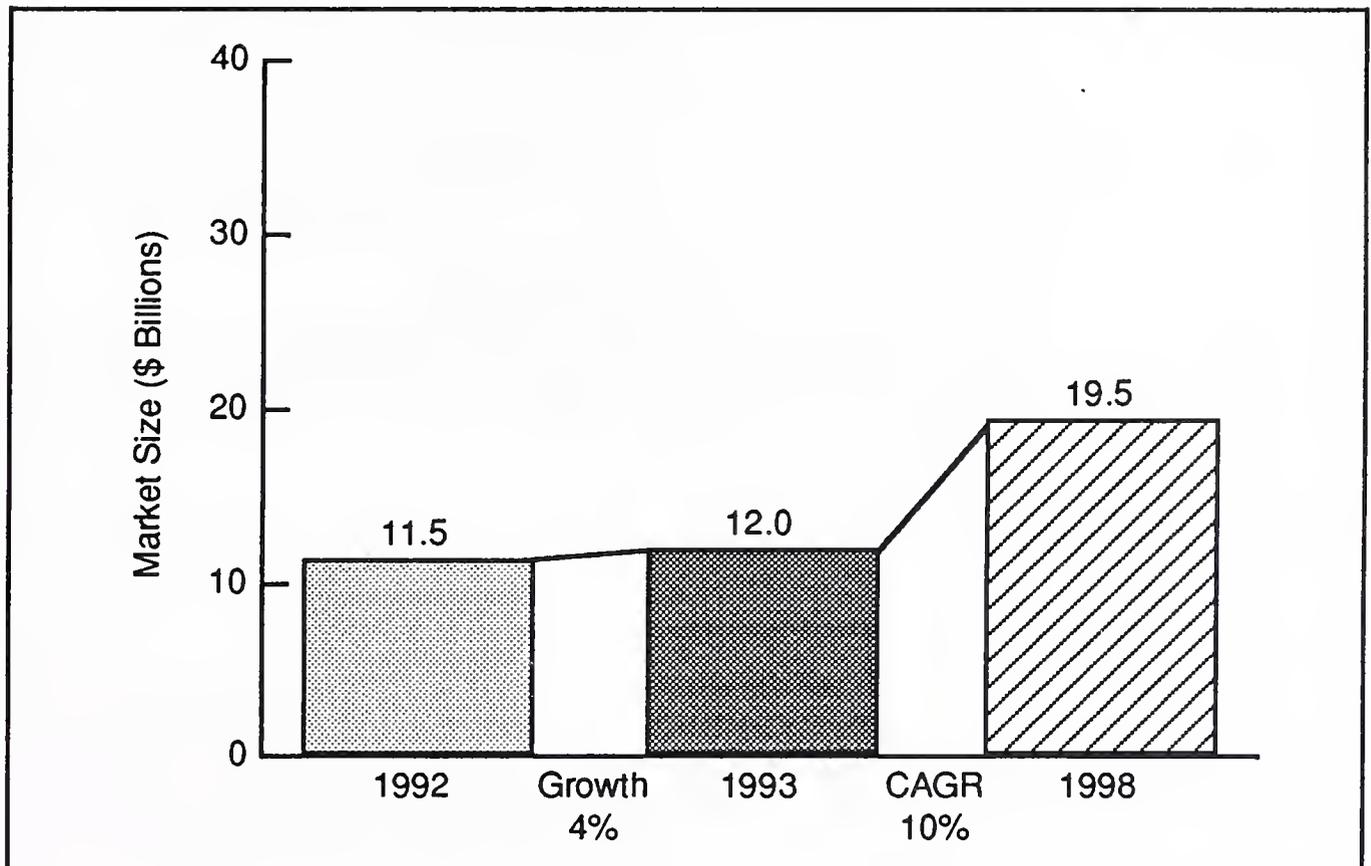
The economic pressures also led to reduced in-house IS spending in the financial services sector and a greater propensity to use external information services vendors. The proportion of total information services dollars spent by the financial services sector in the United Kingdom is significantly higher than the European average.

**2. Information Services Market Forecast**

The U.K. market for information services was \$12 billion in 1993, growing at an average of 10% CAGR to \$24 billion by 1998, as shown in Exhibit VIII-176. This growth is slightly up on last year's forecast for the same period due primarily to an improved economic outlook.

EXHIBIT VIII-176

**Market Forecast—United Kingdom, 1993-1998**



The professional services sector in the U.K. is shrinking. This is due primarily to continued falling demand for custom software development and contract staff. New development tools improve programmer productivity, but customers prefer ready-made

solutions. These come either in the form of applications packages or as systems integration projects based on such packages.

The U.K. still has the largest systems integration market in Europe, and also the leading network services market.

The systems integration market is forecast to show comparatively low-level, short-term growth in the U.K. because major projects were postponed as a result of the recession. But this is forecast to improve over the next five years.

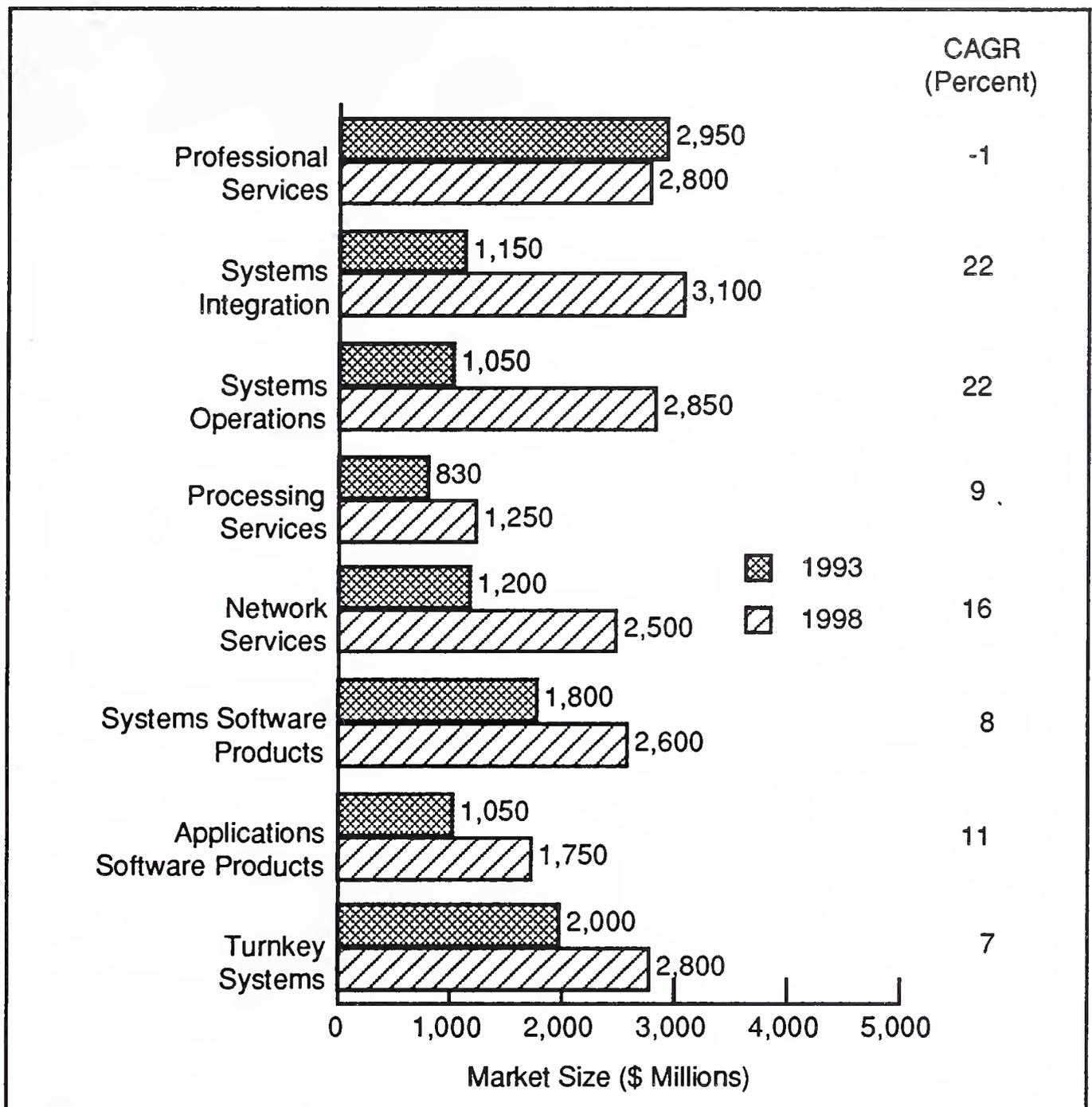
The U.K. accounts for an estimated 35% of the European market for systems operations, and this leadership position is forecast to be further fueled by the recession's impact on users eager to fix their computing costs over a period of years. U.K. culture also shows a greater propensity to outsource than is typically found in continental Europe.

The network services market in the United Kingdom is two to five years ahead of the rest of Europe, especially in developing services such as EDI and electronic commerce. Part of this is due to the influence of U.S. vendors in the U.K., and part is due to the strength of the City of London after the Big Bang in 1986, which led to a major boom in financial electronic information services and dealing systems.

Exhibit VIII-177 provides the forecast by delivery mode. Exhibit VIII-181, at the end of this profile, provides the forecast in greater detail.

EXHIBIT VIII-181

**Market Forecast by Delivery Mode  
United Kingdom, 1993-1998**



**3. Market Considerations**

Exhibit VIII-182 lists the top 10 vendors of information services in the United Kingdom during 1993.

EXHIBIT VIII-183

## Leading Information Services Vendors—United Kingdom, 1993

Rank	Vendor	Country of Origin	Estimated Sector Revenues (\$ Millions)	Market Share (Percent)
1	IBM	U.S.	1,230	10.3
2	ICL (Fujitsu)	U.K. (J)	1,167	9.7
3	Digital	U.S.	726	6.1
4	Reuters	U.K.	379	3.2
5	Andersen Consulting	U.S.	347	2.9
6	Hoskyns (CGS)	U.K. (F)	347	2.9
7	AT&T	U.S.	347	2.9
8	EDS-Scicon	U.S.	284	2.4
9	Sema Group	France	268	2.2
10	Hewlett-Packard	U.S.	237	2.0
	Total Listed		5,332	44.6
	Total Market		12,000	100.0

As in nearly every European country, IBM leads in software and services revenues. In the U.K., IBM is now closely followed by ICL. ICL is one of the most profitable of the equipment vendors operating in Europe and has gained new respect following its acquisition by Fujitsu. ICL is particularly strong in the retail and public sectors in the United Kingdom. Like most other equipment manufacturers, ICL is increasingly active in the systems integration and systems operations delivery modes. It has an acquisition strategy to assist the cultural change to a software and services orientation.

Following the acquisition of SD-Scicon by EDS and the acquisition of Hoskyns by CGS, only 22% of revenues shown in Exhibit VIII-178 originate within U.K.-owned vendors. Overall, the U.K. information services market is dominated by U.S.-owned organizations that account for 53% of the revenues shown. ACT's recent acquisition of BIS will restore some balance in next year's rankings.

Of the four major European economies—Germany, France, the U.K. and Italy—the U.K. has by far the highest penetration by foreign vendors.

U.K.-owned Reuters is Europe's largest electronic information services vendor. It specializes in on-line financial and trading systems.

Hoskyns, part of the Paris-based Cap Gemini Sogeti group, is the market leader in outsourced systems operations. The company pioneered this business during the 1980s, and is now investing in a similar initiative in applications management. Though small, applications management is set to grow rapidly. Hoskyns and other specialist vendors offer to take on full responsibility for ongoing software maintenance, even when the software was developed in-house many years ago. Sometimes this means employing some or all of the customer's staff.

AT&T Istel was formed out of the U.K. car manufacturer Rover Group as BL Systems. The company's ongoing acquisition program increased its overall presence in France and Germany, but it slimmed down again in 1992 as revenues fell short of expectations.

EDS-Scicon is now a reputable growing company after a period of uncertainty when it was bought by EDS.

#### **4. IT Spending**

Exhibit VIII-179 provides an estimate of United Kingdom's total IT spending for 1993.

EXHIBIT VIII-179

**Total 1993 IT Spending—United Kingdom**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	2,450
Internal Staff	10,500
Equipment	7,100
Equipment Services	3,900
Facilities	4,400
Information Services	10,500
<b>Total IT Spending</b>	<b>38,850</b>

Information services, which includes software products, represents the largest portion of the total IT budget, approximately 28%, as noted in Exhibit-180. The next-largest expenditures are for internal staff (27% of the IT budget) and equipment (18%). Data communications represents the smallest portion of the IT budget at \$2.45 billion and 6% of the total.

EXHIBIT VIII-180

**1993 IT Spending Percentages—United Kingdom**

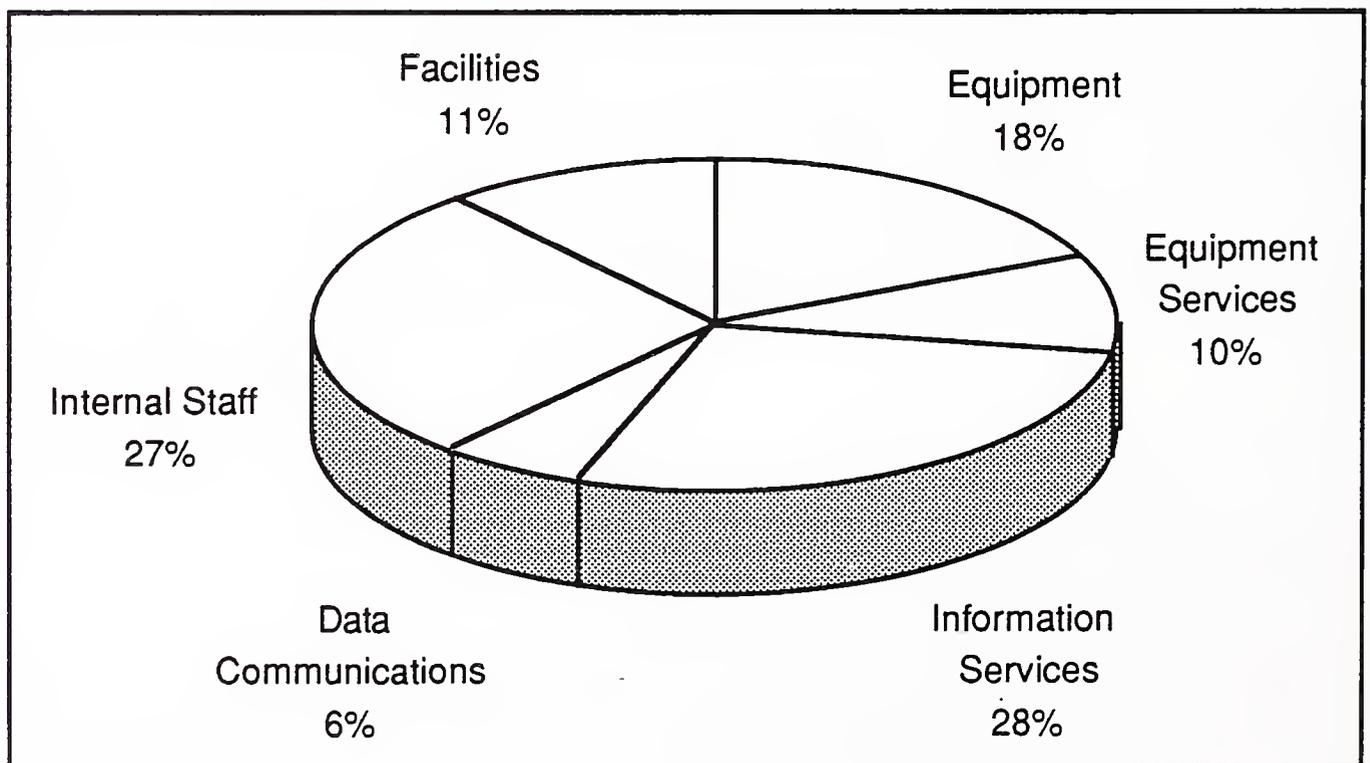


EXHIBIT VIII-181

**Information Services Industry Market Forecast by Delivery Mode  
United Kingdom, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$M)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$M)</b>	<b>1994 (\$M)</b>	<b>1995 (\$M)</b>	<b>1996 (\$M)</b>	<b>1997 (\$M)</b>	<b>1998 (\$M)</b>	<b>CAGR 93-98 (%)</b>
<b>Total United Kingdom Information Services Mkt.</b>	11,500	4	12,000	13,000	14,500	16,000	17,500	19,500	10
<i>Professional Services</i>	3,100	-5	2,950	2,850	2,850	2,850	2,800	2,800	-1
- IS Consulting	650	6	690	740	790	850	920	990	7
- Education & Training	300	3	310	320	330	350	360	380	4
- Custom Software	2,100	-10	1,900	1,700	1,600	1,500	1,300	1,100	-10
<i>Systems Integration</i>	1,000	15	1,150	1,400	1,700	2,100	2,550	3,100	22
- Equipment	280	14	320	360	420	490	570	650	15
- Software Products	260	15	300	400	540	740	1,000	1,350	35
- Professional Services	460	13	520	600	700	810	930	1,050	15
- Other	24	0	24	32	41	54	71	91	31
<i>Systems Operations</i>	850	24	1,050	1,300	1,550	1,900	2,300	2,850	22
- Platform Operations	430	14	490	570	650	760	900	1,100	18
- Application Operations	250	32	330	430	540	680	870	1,070	27
- Desktop Services	79	30	103	126	158	197	244	300	24
- Network Management	90	33	120	150	190	240	310	390	27
<i>Processing Services</i>	780	6	830	900	990	1,050	1,150	1,250	9
- Transaction Processing	620	3	640	670	710	720	730	750	3
- Utility Processing	20	0	20	20	20	20	20	20	0
- Other Processing	140	21	170	210	260	320	390	470	23
<i>Network Services</i>	1,100	9	1,200	1,400	1,550	1,850	2,100	2,500	16
- Electronic Info Services	820	6	870	910	960	1,030	1,040	1,060	4
- Network Applications	280	25	350	470	600	810	1,080	1,440	33
<i>System SW Products</i>	1,750	3	1,800	1,950	2,150	2,300	2,450	2,600	8
- Mainframe	790	-4	760	760	730	650	610	540	-7
- Minicomputer	540	6	570	620	680	740	770	800	7
- Workstation/PC	400	20	480	590	730	890	1,060	1,250	21
<i>Application SW Products</i>	1,050	0	1,050	1,200	1,300	1,400	1,650	1,750	11
- Mainframe	100	-10	90	90	80	80	70	70	-5
- Minicomputer	270	4	280	300	320	340	360	390	7
- Workstation/PC	700	0	700	800	900	1,000	1,200	1,300	13
<i>Turnkey Systems</i>	2,050	-2	2,000	2,100	2,200	2,400	2,600	2,800	7
- Equipment	1,020	2	1,040	1,080	1,140	1,210	1,270	1,330	5
- Software Products	510	-4	490	520	540	600	670	740	9
- Professional Services	510	-6	480	510	540	600	670	740	9

**EE****United States****1. National Overview**

Interaction of the economy with the overall size of the industry is a significant factor in user expenditure levels for information services in the U.S.

- Although improving, economic growth is still slow and inflation remains low, which causes less growth in industry sales due to price increases.
- Real economic growth, which was modest over the few years prior to the recession that started in late 1990, will remain low (though improving) during the forecast period.
- Blue chip economic indicators forecast a nominal growth rate of 6.0% during the next five years; but 3.2% of that is anticipated to be inflation-related, leaving a real GDP annual growth rate during 1993-1998 of 2.8%. Although this represents a 0.2% improvement over the 1992-1997 GDP growth rate, low growth may defer plans for expanding information services in many industry sectors.
- Shifting information processing to smaller computers was encouraged by the economy as well as by the current cost and level of technology. This shift lowered software products investment based on current pricing practices.
- Quantities of software products sold will increase, but revenue levels will grow at more modest rates unless software products are sold together with professional or systems integration services, where price might be increased in line with actual value.

The 1993 market improved somewhat over the 1992 market. Nominal GDP grew from 5.3% in 1992 to 5.8% in 1993, with inflation holding between 2% and 3%. However, the information services industry grew at an unchanging 10%.

The continuing slow upturn will have the following positive and negative impacts on the U.S. information services industry in the near term:

**a. Driving Forces**

- Increased motivation to buy new information technology solutions rather than make them, particularly for larger systems requirements. Re-engineering and streamlining business processes are the key criteria supporting use of outside services.
- The interest in outsourcing, which permits organizations to redeploy capital investments and lower direct staffing levels, is encouraged by slow economic conditions and the desire to control costs.
- A tight economy sustains interest in lower-cost solutions that come from client/server-based applications software products.

**b. Inhibiting Factors**

- Continuing uncertainties in decision processes, although not as severe as in 1992 and 1993, will cause some delays or deferrals of major information systems projects.
- With tight constraints on external information services expenditures at some companies, management may decide to burden the internal IS staff with applications maintenance, enhancement and development assignments rather than use contracted professional services vendors; this would have a negative effect on a major segment of the industry.

**2. Information Services Market Forecast**

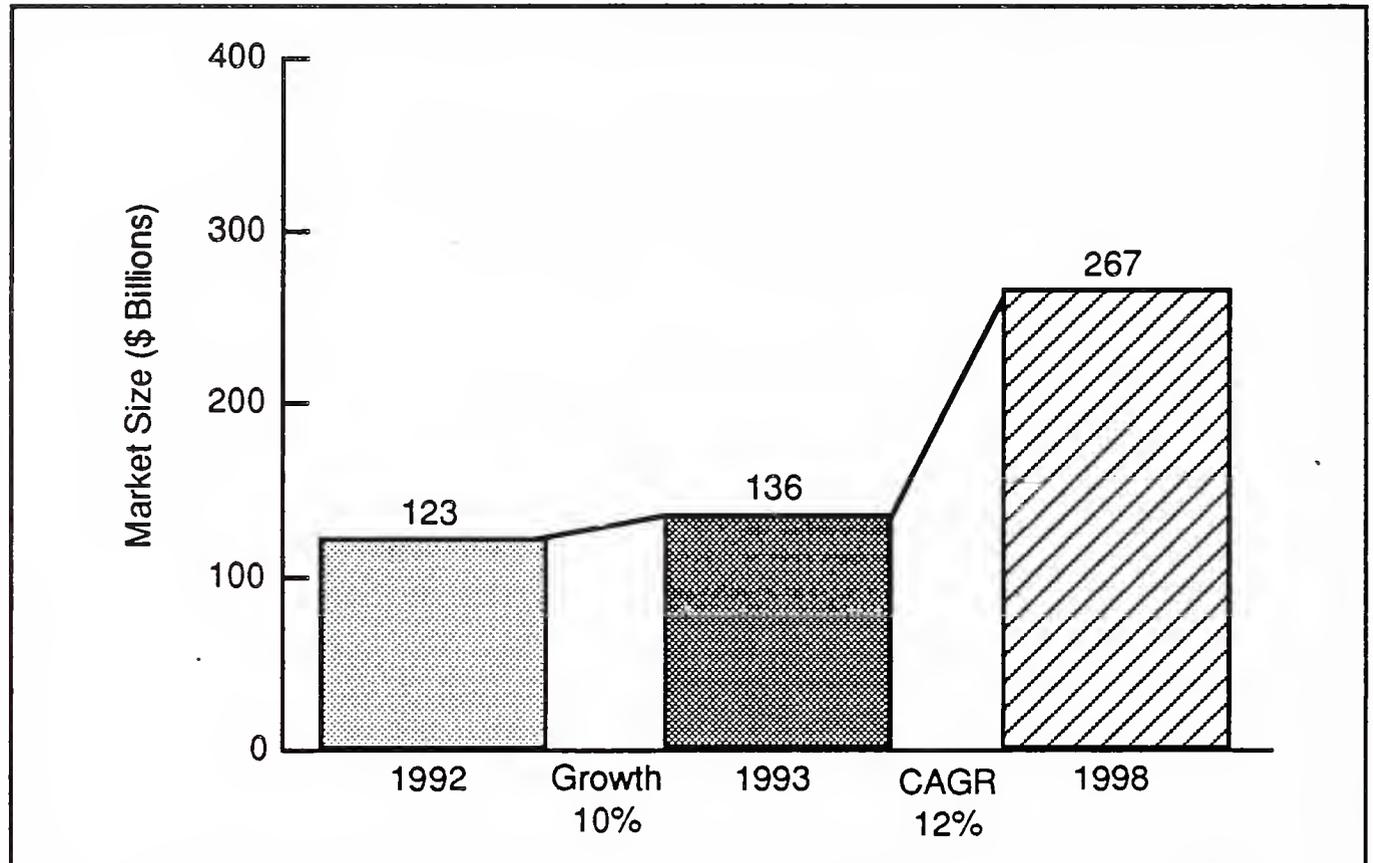
Despite the lingering effects of the recession, with its severe restrictions on capital investment and general spending on information services and systems, the U.S. market still managed to grow at a respectable 10% rate during 1993. This is a tribute to the dynamic forces of change in the industry and the large number of innovative new products finding their way to market. While it remains a difficult, even perilous, time for many marginal players, the industry as a whole will continue its steady growth, and a number of well-positioned vendors will succeed dramatically.

INPUT forecasts that the U.S. market will grow at a CAGR of 12% during the next five years, as shown in Exhibit VIII-182, to a \$237 billion level in 1998. This means that real market growth in the

later years of this forecast will be in the range of \$15 million to \$20 million each year, another indicator of the viability of the information services market.

EXHIBIT VIII-182

Market Forecast—United States, 1993-1998



Within the industry structure, there is considerable variation in the size and growth rates of the eight delivery modes covered by INPUT.

The two software product categories, taken together, comprise one-third of the industry. The software industry is a very crowded field, with profit margins currently under strong downward pressure. The strong trend to client/server computing creates many opportunities for new software products within these environments. Also, the ease of vendor entry via sophisticated development tools employed on inexpensive PC/workstation platforms attracts large numbers of new entrants and drives technological change at a fast pace.

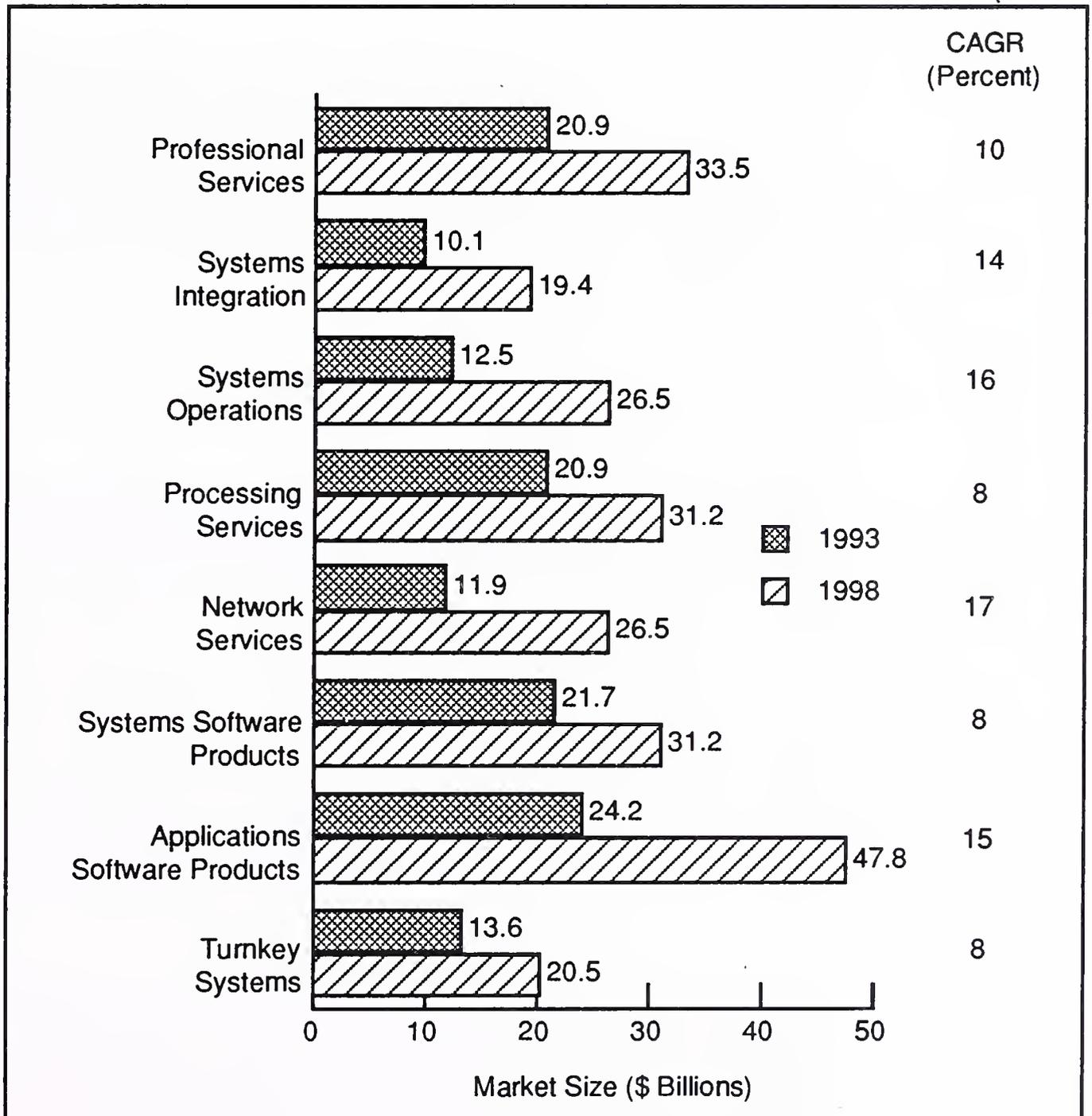
The smallest of the eight delivery modes, systems integration, represents a \$10 billion market today. It has attracted considerable interest and publicity, as this approach is used to deliver large, complex, multivendor systems to users.

Industry delivery mode size and growth rates are shown in Exhibit VIII-183. Exhibit VIII-188, found at the end of this profile, provides the forecast in greater detail. Growth is strongest in network services, reflecting this sector's growing base and rapid expansion due to strong demand for database services, value-added networks and electronic commerce.

Lower growth is expected in the processing services market, which has been a stable, steady growth sector for some time due to its large size, and niche orientation to delivery of solutions and services via vendor-owned facilities and systems.

EXHIBIT VIII-183

**Market Forecast by Delivery Mode  
United States, 1993-1998**



Similarly, the 8% growth foreseen for turnkey systems is a manifestation of the trend toward less costly equipment, and the decision on the part of many turnkey systems vendors to concentrate on software and services, leaving low margin hardware to other distribution channels.

INPUT also categorizes the industry by its 15 vertical industry sectors. These are not treated in detail in this report, but it may be useful to present the largest vertical markets, plus those that are fastest growing, as points of interest. Exhibit VIII-184 identifies discrete manufacturing as the largest industry sector, a position it has occupied for some time. Continuing requirements to automate manufacturing processes and control systems will keep this market growing steadily during the rest of the 1990s.

EXHIBIT VIII-184

### Leading United States Vertical Markets

<b>Largest Vertical Markets</b>	<b>1993 U.S. Market (\$ Billions)</b>
<b>SECTOR</b>	
Discrete Manufacturing	18.6
Banking and Finance	14.6
Federal Government	11.2
<b>Highest-Growth Vertical Markets</b>	<b>1993-1998 CAGR (%)</b>
<b>SECTOR</b>	
Telecommunications	17.0
Retail Distribution	15.0
Discrete Manufacturing	14.0
Process Manufacturing	14.0

For the first time, banking and finance has tied with discrete manufacturing in market size. The continuing pressures to reduce costs and provide fast, flexible customer service drives continuing growth in this market. Despite past problems of the savings and loan industry, plus cyclical problems in brokerage

and securities firms, high demand for information services will continue.

The federal government sector currently occupies the third-largest spot, but with a significantly reduced growth rate over past years, serious attempts to curtail federal spending in all categories continue.

Telecommunication, retail, distribution, discrete and process manufacturing sectors are the fastest growth areas.

Telecommunications benefits from investments of AT&T, the "Baby Bells" and other major telecommunications firms to position themselves to deliver high technology capabilities and solutions to their own customers, through a wide variety of vehicles.

Recent alliances between telecommunications vendors and media companies such as cable operators have also fueled growth in this sector.

In discrete and process manufacturing, several factors spur information services growth. Business re-engineering and restructuring have increased the need for IS, as has competition for market share among vendors of manufacturing applications. Also, increased user knowledge of their business needs has driven the need for niche vendors and expertise.

### **3. Market Considerations**

The information services market, which consists of thousands of companies, most quite small, still has a sizable set of very large vendors who are highly visible and exercise some degree of market power and control because of sheer size. This varies among the INPUT delivery modes, depending on the concentration of market share in each. When INPUT looks at the information services market as a whole, the leading vendors are those shown in Exhibit VIII-185.

EXHIBIT VIII-195

**Leading Information Services Vendors—United States**

Rank	Vendor	Country of Origin
1	IBM	U.S.
2	EDS	U.S.
3	CSC	U.S.
4	Digital Equipment	U.S.
5	Andersen Consulting	U.S.
6	ADP	U.S.
7	Microsoft	U.S.
8	Unisys	U.S.
9	Hewlett-Packard	U.S.
10	First Financial Management	U.S.

The world's largest computer company was still the largest information services vendor in 1993. In spite of financial turmoil, internal restructuring and a grim outlook for its mainframe market, IBM remains a company to reckon with. Software and services have grown to more than 40% of the company's revenue in the last two years, and IBM continues to concentrate on increasing these business segments.

With outsourcing and systems integration its top capabilities, EDS again ranked second among information services vendors. Although parent General Motors suffered some financial woes in 1993, EDS' non-captive revenues in software and services contributed well to a healthy bottom line. Since 1992, the company has successfully gained business in the manufacturing and telecommunications markets, and has been active overseas despite lingering recessions in Europe and Japan.

Third-place Computer Sciences Corporation continues its efforts to draw at least half of its revenues from the private sector, although the company has been quite successful with federal contacts. However, through its commercial market subsidiaries, CSC has sought contract diversity by winning contracts in process manufacturing and agriculture markets, among others.

Client/server technology became both a strategic direction and a product focus for Digital in 1993. In October, the company made perhaps its most important product announcement ever by introducing more than 170 new or upgraded products aimed at the client/server marketplace. According to Digital, the October announcement began what will become an ongoing series of product and strategy announcements as the company moves further away from proprietary systems.

Andersen Consulting also holds client/server computing high on a pedestal, incorporating these methods into its systems integration, business process management and change management contracts. The move to client/server architectures further increased Andersen's Foundation CASE tool product suite, which has become one of the most popular and respected application development systems in the information services industry.

#### 4. IT Spending

Exhibit VIII-186 provides an estimate of the United State's total IT spending for 1993.

EXHIBIT VIII-186

#### Total 1993 IT Spending—United States

Budget Category	Estimated Spending (\$ Billions)
Data Communications	50.9
Internal Staff	203.8
Equipment	113.2
Equipment Services	22.6
Facilities	39.6
Information Services	135.8
<b>Total IT Spending</b>	<b>565.9</b>

Information services, which includes software products, represents approximately 24% of the total IT budget, as noted in Exhibit VIII-187. The largest expenditure is for internal staff (36% of the IT budget). Equipment services represents the smallest portion of the IT budget at \$22.6 billion and 4% of the total.

EXHIBIT VIII-187

1993 IT Spending Percentages—United States

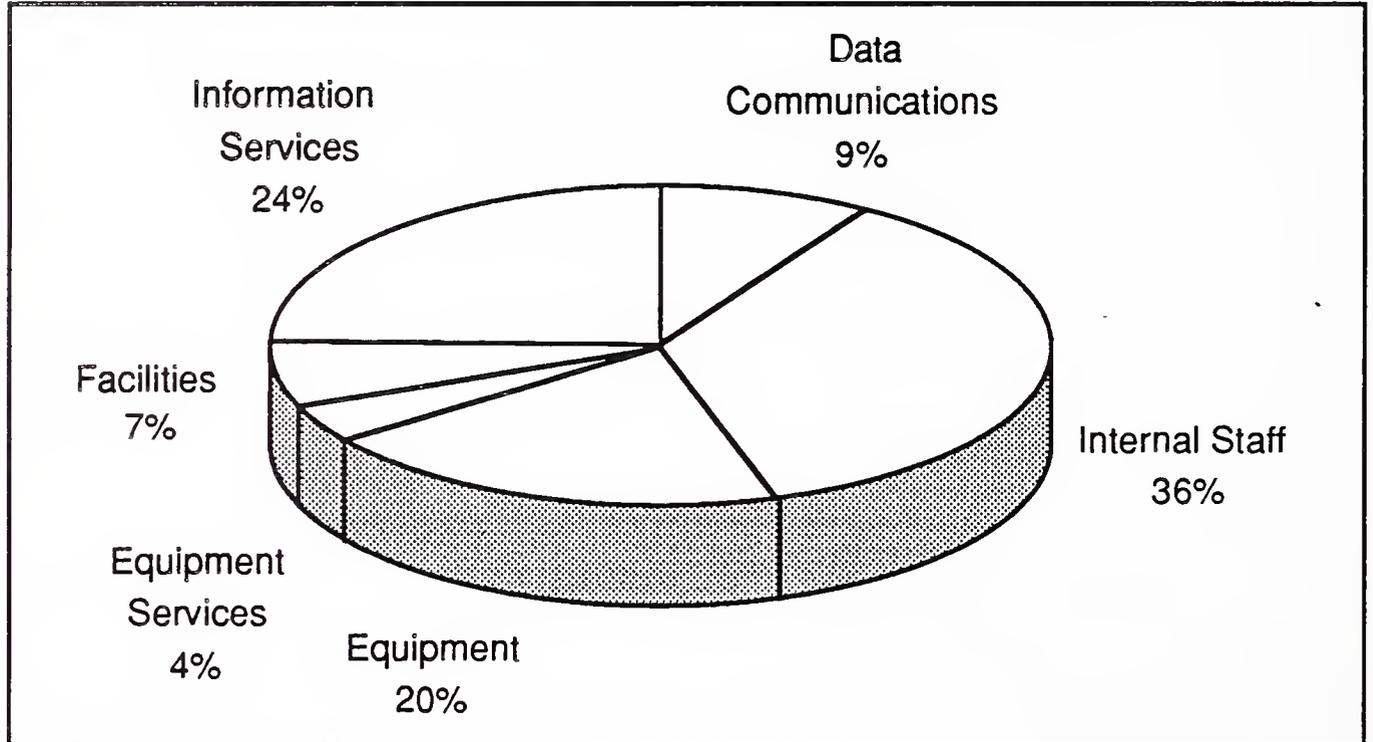


EXHIBIT VIII-188

**Information Services Industry Market Forecast by Delivery Mode  
United States, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$M)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$M)</b>	<b>1994 (\$M)</b>	<b>1995 (\$M)</b>	<b>1996 (\$M)</b>	<b>1997 (\$M)</b>	<b>1998 (\$M)</b>	<b>CAGR 93-98 (%)</b>
<b>Total United States Information Services Mkt.</b>	123,290	10	135,843	150,516	167,914	187,642	210,611	236,730	12
<i>Professional Services</i>	19,287	9	20,930	22,951	25,207	27,649	30,414	33,542	10
- IS Consulting	4,649	11	5,154	5,785	6,515	7,325	8,248	9,297	13
- Education & Training	2,838	10	3,113	3,403	3,679	4,024	4,388	4,816	9
- Custom Software	11,800	7	12,663	13,764	15,013	16,300	17,778	19,429	9
<i>Systems Integration</i>	9,265	9	10,076	11,418	13,073	14,966	17,109	19,361	14
- Equipment	3,869	22	4,707	5,283	5,988	6,791	7,637	8,543	13
- Software Products	685	12	767	885	1,035	1,197	1,373	1,544	15
- Professional Services	4,371	-4	4,210	4,801	5,530	6,380	7,419	8,522	15
- Other	340	15	392	449	520	599	681	752	14
<i>Systems Operations</i>	11,284	11	12,528	14,418	16,703	19,402	22,676	26,538	16
- Platform Operations	3,781	8	4,095	4,565	5,106	5,695	6,347	7,092	12
- Application Operations	4,962	11	5,485	6,239	7,186	8,285	9,649	11,328	16
- Desktop Services	1,358	12	1,520	1,838	2,222	2,690	3,288	3,875	21
- Network Management	1,183	21	1,428	1,776	2,189	2,733	3,393	4,244	24
<i>Processing Services</i>	19,403	8	20,878	22,594	24,477	26,564	28,813	31,222	8
- Transaction Processing	15,613	6	16,513	17,584	18,757	20,064	21,463	22,902	7
- Utility Processing	985	5	1,030	1,075	1,120	1,170	1,220	1,270	4
- Other Processing	2,805	19	3,335	3,935	4,600	5,330	6,130	7,050	16
<i>Network Services</i>	10,380	15	11,926	13,882	16,268	19,126	22,553	26,546	17
- Electronic Info Services	8,280	15	9,534	11,061	12,880	15,037	17,615	20,657	17
- Network Applications	2,100	14	2,392	2,821	3,388	4,089	4,938	5,889	20
<i>Systems SW Products</i>	19,825	9	21,702	23,042	24,639	26,513	28,664	31,186	8
- Mainframe	9,007	5	9,416	9,508	9,619	9,741	9,881	10,037	1
- Minicomputer	6,444	8	6,987	7,287	7,605	7,944	8,290	8,658	4
- Workstation/PC	4,374	21	5,299	6,247	7,415	8,828	10,493	12,491	19
<i>Application SW Products</i>	21,582	12	24,176	27,449	31,552	36,067	41,528	47,850	15
- Mainframe	5,247	7	5,598	5,986	6,405	6,814	7,221	7,670	7
- Minicomputer	5,859	8	6,347	6,902	7,501	8,138	8,823	9,562	9
- Workstation/PC	10,475	17	12,231	14,562	17,646	21,115	25,485	30,619	20
<i>Turnkey Systems</i>	12,265	11	13,627	14,761	15,996	17,355	18,853	20,484	8
- Equipment	5,474	7	5,873	6,192	6,519	6,799	7,195	7,601	5
- Software Products	4,582	13	5,178	5,660	6,223	6,818	7,489	8,185	10
- Professional Services	2,209	17	2,576	2,909	3,254	3,739	4,168	4,698	13

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## Venezuela

### 1. National Overview

The discovery of petroleum changed Venezuela from just another poor agricultural country into the most prosperous nation in South America. Over the past several decades, the government of Venezuela aggressively supported industrial development, based in large part on revenues from production expansion of its rich natural resource base, particularly its extensive oil reserves.

During the 1960s, the relatively well-balanced Venezuelan economy grew at an average annual rate of 5.6%, with an annual rate of inflation below 3%, which reflected a policy of oil production expansion and a fixed exchange rate monetary policy. However, social unrest was evident, representing the ongoing struggle between the two political forces in the country, the Accion Democratica (AD) party and the Social Christian Party (Copei).

During the early to mid-1970s, the Venezuelan economy also showed strong GDP growth, averaging 5.1% in the years between 1973 and 1977. However, a strong surge in import activity led to a gradual increase in inflationary pressures and the decline in oil prices that had a significant negative impact on economic growth. Under the presidential leadership of Carlos Andres Perez of the AD party in the 1970s, the then-populist Perez nationalized the petroleum and steel industries and oil revenues were used to diversify the economy. Substantial resources were used to develop aluminum, steel and iron resources and increase the production of pulp and paper, industrial glass, hydroelectric power and cement.

A Copei administration won the presidency in the late 1970s at the beginning of a period of a weakening economy. A foreign debt crisis developed by 1983, resulting from a balance of payment and accelerating inflation problems. The Venezuelan economy dropped to recessionary levels from 1983 to 1988 with GDP averaging a negative 0.1%.

In 1989, when Venezuelan President Carlos Andres Perez again took office, the country was in an economic crisis, which he addressed with a major change in economic policy. A government policy was implemented that involved a structural

change toward a free market-oriented economy. Key policy measures included trade liberalization; loosening price controls and interest rates; increasing prices for government-supplied goods and services; and positive adjustments in corporate and personal taxes, including the elimination of taxes on dividends.

Other structural changes have included the reduction of tariff barriers and the development of a free-trade agreement with Columbia in 1992; discussions of a similar agreement with Ecuador, Chile and Mexico; and a privatization program with the encouragement of foreign investments and monetary reforms. Public foreign debt was also renegotiated in 1990 that involved a debt-equity swap program. The Venezuelan government also made free-trade negotiations a tool for economic development.

The initial public reaction was explosive, particularly in reaction to higher prices. Major riots broke out.

The country's estimated 22 million people have continued to resist the more stringent economic measures. The structural changes in government economic policy in 1989 initially resulted in a drop in GDP growth by 8.5% and inflation flared out of control to 84.5%. This was due, in large part, to a floating foreign exchange rate policy. The Perez administration continued with its austerity program but also introduced new social programs, including an unemployment program and a jobs creation program, which increased wages to soften the impact of his austerity programs.

Overall, the change in economic policy has been successful in reducing inflation and returning the economy to positive GDP growth, which has been aided by a significant increase in the level of foreign investment.

The inflation rate decreased from 36% in 1990 to 32% in 1992. However, inflation continues to be a significant problem of the Perez administration, with an inflation rate in 1993 at around 25%. Real GDP increased 5.3% in 1990, 10.3% in 1991 and 7.3% in 1992. Per capita income in 1992 was \$3,110 and the GDP rate grew from 4.2% in 1992 to 4.5% in 1993. In 1994, the growth rate in real GDP could increase to the 5.0 to 5.5% range, based on a continuation of a successful privatization program. Inflation will continue to be a problem, but the continuing worldwide recession should help control prices of imports in an economic environment

with an excess of imports over exports. The inflation rate should drop below 20% in 1994.

The fiscal deficit as a percentage of GDP, was as high as 9.4% in the late 1980s, but was changed by a deficit surplus in 1991. The IMF and World Bank has shown approval of the Venezuelan government economy program with major funding commitments.

The year 1992 showed some moderation in economic growth. A relatively sharp decline in oil revenues combined with social unrest led to a re-emphasis on government spending for social programs and a return to a fiscal deficit position.

In 1993, the economy showed a similar pattern of using government spending to help offset lower oil revenues to encourage economic growth and prevent social unrest.

Privatization of state-owned companies reaccelerated in 1993 following a period of slower activity in 1992, and helped improve the balance of payments that had returned to a deficit in 1992.

The tight monetary policy has continued to address inflationary concerns, but high interest rates have had a negative effect on credit expansion and overall economic growth.

A continuing improvement in inflationary and growth figures depends primarily upon whether President Perez and his economic policies can remain in place. In 1992, Perez was the target of at least two coup attempts. In nationwide elections held on December 6, 1992, nine days after one coup attempt, the president's Democratic Action party lost badly to the opposing Social Christian Party. The opposition believed the government was not spending enough on improving social services.

For privatization and the general restructuring of economic policy to work, personal productivity must improve, which means convincing people to work harder to make their lives better over the longer term.

Also, the Perez government works toward a more diversified economy, away from major dependence on oil exports. The country has traded multiple currency exchange rates for a single standard that is expected to improve Venezuela's ability to export nonpetroleum products and make it more attractive to

multinational firms. The government has also emphasized the development and adoption of information technology, focusing on UNIX, LANs, computer education and locally developed applications software products.

The forces driving and inhibiting Venezuela's drive for information technology development include the following:

**a. Driving Forces**

Primary driving forces include:

- *IT emphasis*—Venezuela has a strong record of utilizing current and leading-edge information technology.
- *Computer literacy*—The exposure to computing at all levels of the education system is a government priority.
- *Local IT industry*—There is a large local community of vendors developing and deploying IT successfully.
- *Economic reform*—Focus on the stimulation of a free-enterprise market is expected to increase the demands for technology-based products and services.
- *Telecommunications system*—Although 10,000 of Venezuela's 80,000 trunk lines are inoperable due to government neglect, the country is pushing hard to modernize the telecommunications infrastructure. In 1992, the Ministry of Transport and Communications awarded MCI a concession to provide full satellite telecommunications services to Venezuela. Several other companies are providing cellular phone services.

**b. Inhibiting Factors**

Key inhibiting forces include the following:

- *Political unrest*—The Perez government is making firm strides, but more coup attempts and further recrimination from voters against the Democratic Action party loom large.
- *Software piracy*—The lack of effective action against software piracy reduces the ability of international firms to import products profitably.

- *Competition*—The large number of local and international information services firms increases competition and reduces profitability, which decreases investment by vendors.
- *Government economic control*—The level of privatization is still modest and government regulation of the economy and government spending for social problems remain high. In addition, labor union activity is relatively strong in Venezuela with active political party association.

## **2. Information Services Market Forecast**

With the substantial liberalization of import restrictions in recent years and elimination of restrictions on foreign remittances of profits and dividends, the environment for exports and investments in Venezuela is quite promising. However, foreign competition has also considerably developed in Venezuela for U.S. companies. Venezuelan businessmen, many of whom have been educated abroad, are also highly knowledgeable about the information services markets.

The U.S. is the major foreign supplier of software to Venezuela, but there is increasing competition from local and European companies.

Exhibit VIII-189 shows the market for information services to be \$540 million in 1993, with a projected five-year compound annual growth rate (CAGR) of 16%, resulting in a market exceeding \$1.1 billion in 1998. This represents an upward revision from last year's forecast of a 14% five-year CAGR, based on improving prospects for the Venezuelan economy and its major trading partners. A change in presidential leadership could increase the turmoil in Venezuela, which could negatively impact the forecasted growth rate.

## EXHIBIT VIII-189

## Market Forecast—Venezuela, 1993-1998

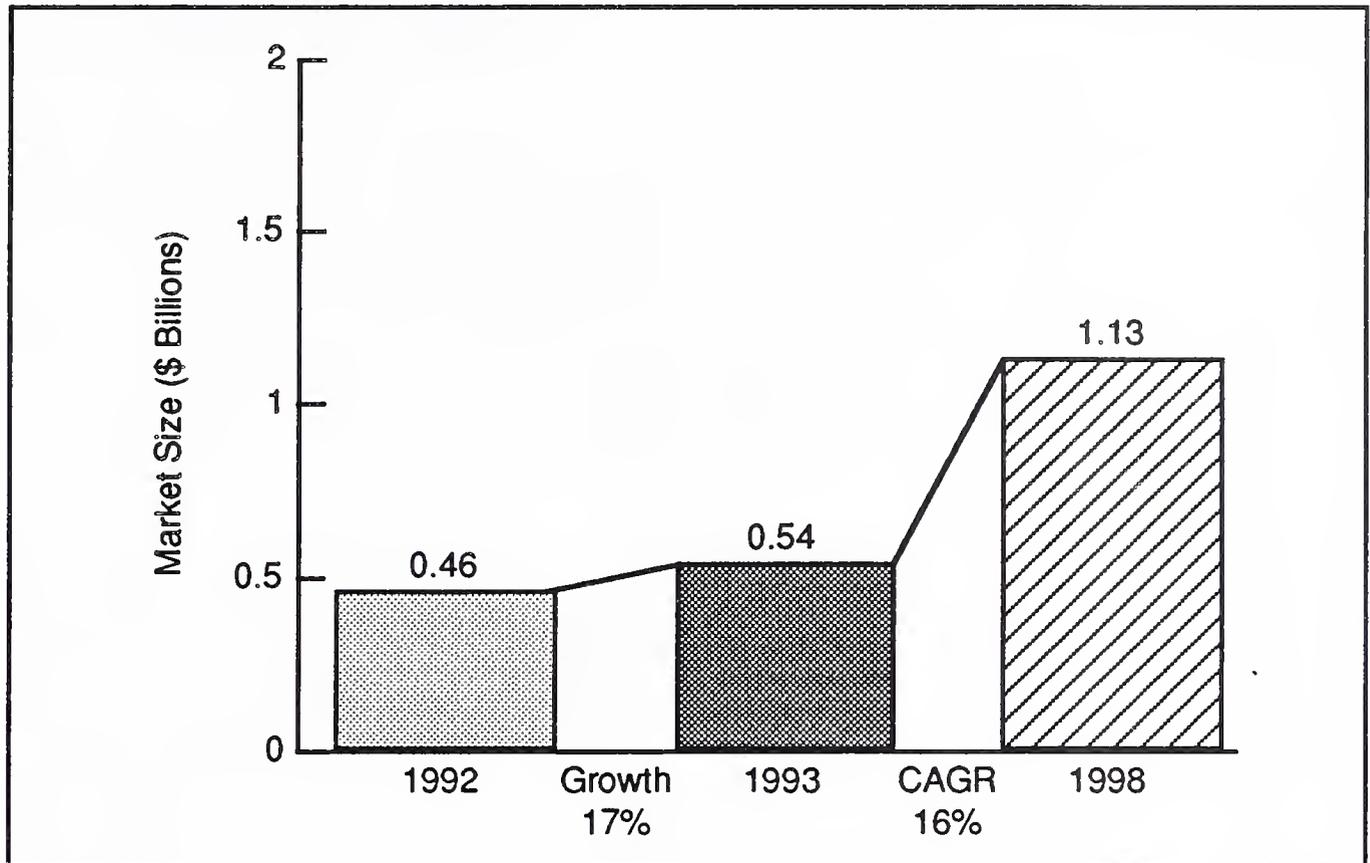
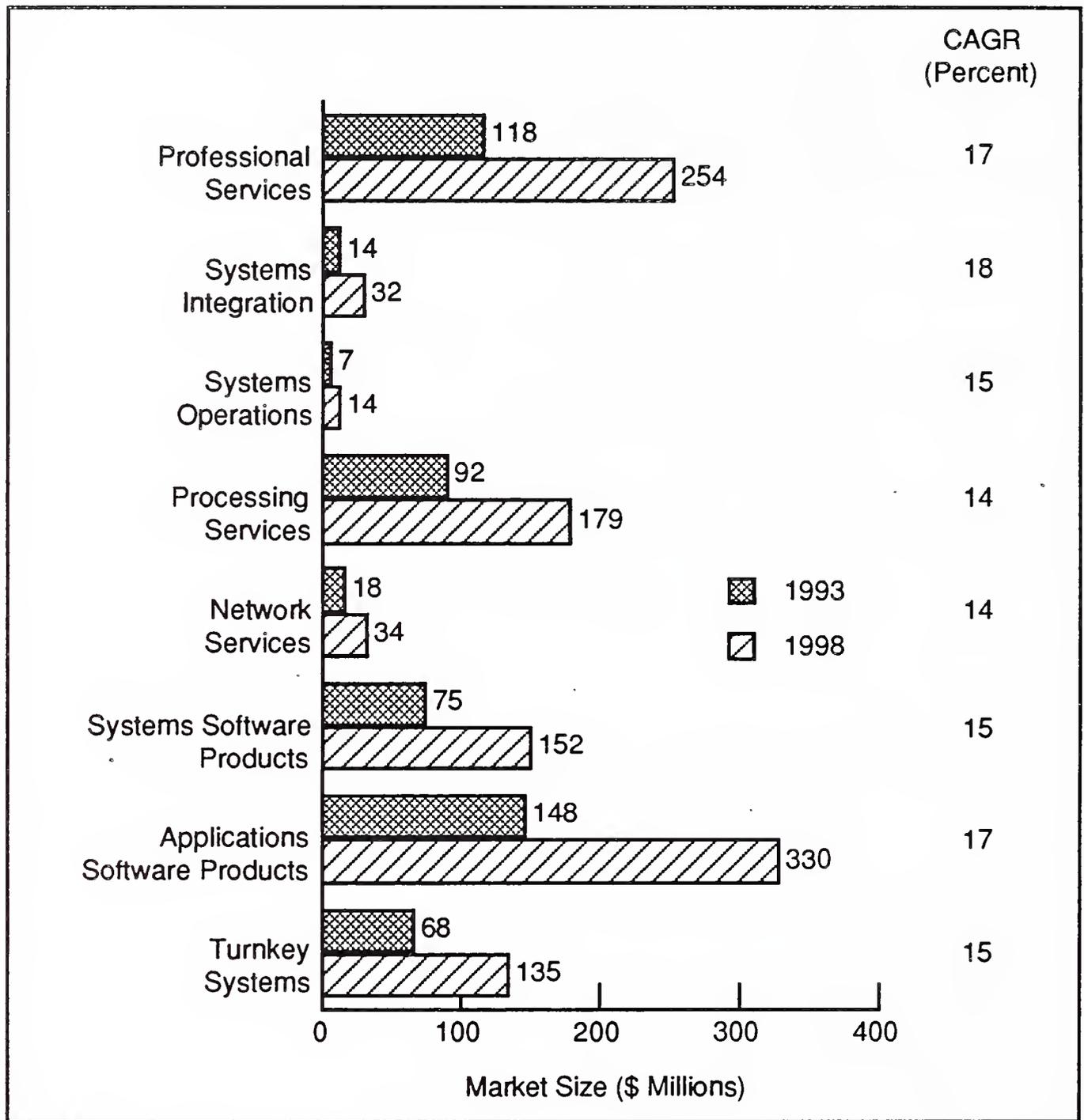


Exhibit VIII-190 provides the forecast by delivery mode. Exhibit VIII-194, found at the end of this profile, provides the forecast in greater detail.

### Market Forecast by Delivery Mode Venezuela, 1993-1998



The processing services market in Venezuela is better established than in the other major Latin American markets, representing approximately 17% of the total information services industry. Systems operations, on the other hand, is just getting established as a delivery mode.

Software products is the largest market sector. Applications and systems software products combine to represent more than 40% of the industry. The applications software market is especially quite well established and will exceed \$330 million by 1998.

Professional services is the other well-developed market sector. There are a large number of firms, primarily local to Venezuela, offering these services.

As with other Latin America markets, the turnkey systems segment is reasonably large and strong. The emphasis is on PC- and LAN-based applications.

The network services market is modest but growing, and suffers from many of the same telecommunications infrastructure problems as other Latin American countries.

### **3. Market Considerations**

Exhibit VIII-191 lists leading Venezuela-based vendors and the delivery modes in which they primarily operate. Many international vendors are also active and are identified in Chapter V on Latin America.

Entering the Venezuelan market can be difficult. There are a number of local regulations that protect the local companies; and there are import exposures, including software piracy.

Business is dominated by a number of well-established families with whom business relationships must be developed for business success.

The market is highly competitive, the skill levels relatively high and the local applications software products market well developed. Successful entry requires a relationship with a well-established and connected locally-based company, such as those listed in Exhibit VIII-191.

EXHIBIT VIII-191

## Selected Vendors by Delivery Mode—Venezuela, 1993

Vendor	Processing/ Network Services/ Systems Operations	Professional Services/ Systems Integration	Software Products	Turnkey Systems
BDT		✓		✓
Caracas Dataclub	✓			
Contadata	✓			
Consis Int.			✓	
Datamax			✓	
Grupo Tea (Mexico)			✓	
Infogesa		✓		✓
Infotec		✓	✓	
Kriegier, Mentilla & Assoc.	✓	✓		
Manapro		✓	✓	
Perez, Mena & Assoc. (E&Y)		✓	✓	
Spineira, Sheldon (Price Waterhouse)	✓			
T&G Int.			✓	
Telares Maracay	✓			
Tercer Medio		✓	✓	

## 4. IT Spending

Exhibit VIII-192 provides an estimate of Venezuela's total IT spending for 1993.

EXHIBIT VIII-192

**Total 1993 IT Spending—Venezuela**

Budget Category	Estimated Spending (\$ Millions)
Data Communications	141
Internal Staff	751
Equipment	493
Equipment Services	188
Facilities	235
Information Services	540
<b>Total IT Spending</b>	<b>2,348</b>

Information services spending (which includes software products) at slightly more than \$500 million, accounts for approximately 23% of the total IT budget, as noted in Exhibit VIII-193. The largest expenditures are for internal staff (32% of the IT budget) and equipment (21%). As with most of the Latin American IT spending profiles, data communications represents the smallest portion of the IT budget at \$141 million and 6% of the total.

EXHIBIT VIII-193

**1993 IT Spending Percentages—Venezuela**

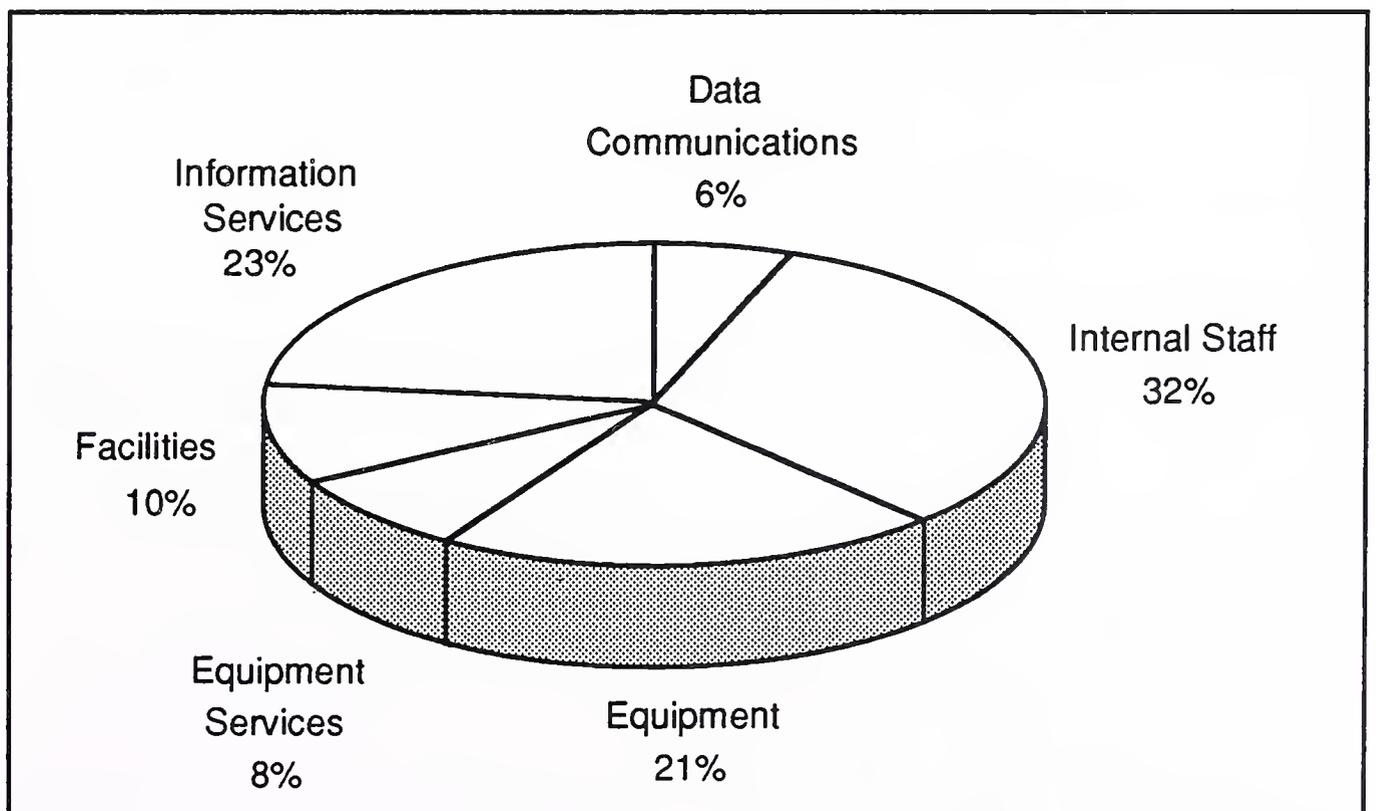
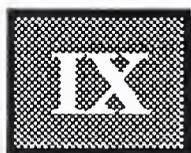


EXHIBIT VIII-194

**Information Services Industry Market Forecast by Delivery Mode  
Venezuela, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$M)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$M)</b>	<b>1994 (\$M)</b>	<b>1995 (\$M)</b>	<b>1996 (\$M)</b>	<b>1997 (\$M)</b>	<b>1998 (\$M)</b>	<b>CAGR 93-98 (%)</b>
Total Venezuela Information Services Mkt.	460	17	540	628	730	844	974	1,130	16
<i>Professional Services</i>	99	19	118	138	163	190	220	254	17
<i>Systems Integration</i>	12	17	14	17	20	23	27	32	18
<i>Systems Operations</i>	6	17	7	8	9	10	12	14	15
<i>Processing Services</i>	81	14	92	105	120	137	155	179	14
<i>Network Services</i>	16	13	18	20	22	25	29	34	14
<i>Systems Software</i>	65	15	75	87	100	115	132	152	15
<i>Applications Software</i>	124	19	148	173	203	238	279	330	17
<i>Turnkey Systems</i>	57	19	68	80	93	106	120	135	15



## Conclusions and Recommendations

INPUT's fifth assessment of the worldwide market for information software and services reaffirms that a number of the underlying trends for this industry are applicable on a worldwide basis.

Growth rates in almost all countries and all five regions continued to slow, suggesting the following:

- Economic impacts of continuing recession are truly worldwide, which reinforces the fact that information services is becoming a worldwide market. Vendors who operate on a worldwide basis should not plan on significant growth in one region to overcome slowdowns in another; they will need strategies built on a worldwide basis to deal with changing global economics.
- Revolutions now present in the North American and Western European markets—downsizing, outsourcing, networking and re-engineering—already have worldwide impacts. Expect them to evolve rapidly over the next two years.

### A

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## Conclusions

The information services industry will wear a different face by the beginning of the second half of the decade.

### 1. Client/Server and Personal Computing

In the smaller developing markets, cost effectiveness of personal computers and their more powerful relative, the client/server, are allowing companies to leverage information technology. In established markets, client/server technology is launching a revolution of application re-engineering and network integration. In both cases, information technology is moving closer to the user.

This shift is not without impact on the information services market. It causes many vendors to rethink their strategies and re-engineer their products and services. Users must also rethink their strategies and architectures. The result is a pause in spending in some instances and expansion in others, as well as reinvestment by vendors.

As client/server architecture becomes more stable, whole new markets will open in developing countries where smaller firms that could not afford traditional mainframe solutions will find client/server solutions affordable and adaptable to fulfilling their applications solutions needs.

## **2. Outsourcing**

Whether dealing with software products, professional services, complete systems integration, data center operations or network management, the trend to outsource is growing and becoming a *revolution*.

- Outsourcing is an established market in North America, growing quickly in Japan and emerging in Europe. Network management follows closely. Strong growth continues for the foreseeable future.
- Systems integration is the fastest growing sector of the industry in all of the established markets, and the tendency to contract for the full solution with a single vendor is becoming common worldwide.

## **3. Relationships and Organization**

Undertaking partnerships, alliances, acquisitions and reorganization has become an underlying element of information services vendors' strategies worldwide. Channels of distribution are changing and the role of the large vendor is growing.

Digital, IBM and others are reorganizing and rethinking their structural strategies for the 1990s. Alliances, emphasis on services and independence of business units will distinguish the information services vendors of the 1990s.

Outsourcing firms strive to provide full applications support services to maintain competitiveness. Just running data centers is not enough for today's outsourcing revolution.

Acquisitions by many large services firms turn them into full-service companies, while software products companies speed growth by acquisition in addition to new product development. Many software firms are expanding their professional services capabilities to qualify them to provide full solutions to user information systems requirements.

#### **4. International Markets**

Today's largest information technology users operate worldwide and require information services support at that level. The 1990s will see a true worldwide information services market develop.

- The European market is quickly integrating, with vendors active throughout that market.
- Latin American countries are addressing their inadequate laws concerning imported technology and their lack of a telecommunications infrastructure.
- Even the Japanese market is somewhat more open as Japanese vendors seek worldwide opportunities.

## **B**

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### **Recommendations**

INPUT makes the following recommendations to information services vendors striving for worldwide market opportunities and presence. These recommendations remain relatively unchanged from the 1992 report. They are, however, more applicable than they were one year ago.

#### **1. Know the Real Buyer**

Today's vendors all want to market solutions. The buyer of a solution is the general manager, not the information systems executive. You must teach your sales forces to sell to the buyer of the 1990s to achieve success.

#### **2. Relationships**

Form relationships with real purpose and work to make them successful. Too many alliances seem to be marriages of convenience and therefore are short-lived. The result is user mistrust (both information systems and general management). As users focus

more on a single vendor for complete service, they will inspect that vendor's dependence on relationships with other vendors.

### **3. Commitment**

Outsourcing, long-term contracts and relationships with clients and other vendors require increased commitment. Information services vendors must recognize the length and degree of commitment required when they enter a new geographic market, offer a new service or product, or form a relationship. Commitment will become a significant aspect of performance measurement in the 1990s and will include:

- Commitment to the local market
- Commitment to the specific product
- Commitment to after-sale service
- Commitment to partners
- Commitment to providing a full-support environment

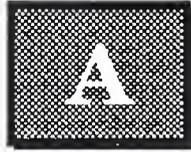
### **4. Flexibility**

The 1990s will see a number of revolutions: outsourcing, downsizing, rightsizing, true network integration and open systems. None of these revolutions are clearly defined, nor will their foundations become fixed. Only vendors who balance commitment and service with flexibility will survive.

### **5. International and Country Focus**

The large multinational vendors need strategies for international and local country markets. Smaller vendors must adapt their strategies to the specific countries they choose to enter. One key to success will be to efficiently tailor product, service and sales/support strategies to localized geographies and cultural situations. One size in software and service does not fit all.

Despite the slowdown in most markets, significant opportunities exist to participate in what has truly become a global industry.



## Market Forecast Database

Appendix A of the *Worldwide Information Services Forecast* provides the detailed market forecast data for the worldwide total and each of the regional summaries. For convenience, the detailed market forecast data for each country or subregion has been included with the national profile in Chapter VIII.

### EXHIBIT A-1

#### Information Services Industry Market Forecast by Delivery Mode Worldwide, 1993-1998

Delivery Modes	1992 (\$)	Growth 92-93 (%)	1993 (\$)	1994 (\$)	1995 (\$)	1996 (\$)	1997 (\$)	1998 (\$)	CAGR 93-98 (%)
Total Worldwide Information Services Market	260,213	6	276,794	301,182	333,486	370,829	415,647	466,424	11
Professional Services	64,957	2	66,195	69,351	74,236	79,521	85,736	92,326	7
Systems Integration	18,145	9	19,736	22,255	25,896	30,158	35,146	40,824	16
Systems Operations	17,971	11	19,859	22,705	26,592	31,288	37,035	44,006	17
Processing Services	35,849	5	37,554	39,754	43,041	46,799	51,017	55,593	8
Network Services	19,099	11	21,246	24,256	28,368	33,416	39,348	46,458	17
Systems Software Products	37,617	7	40,157	42,950	46,383	49,760	53,833	58,745	8
Applications Software Products	37,435	10	41,146	46,670	53,054	60,604	70,227	80,837	14
Turnkey Systems	29,140	6	30,901	33,241	35,916	39,283	43,305	47,635	9

## EXHIBIT A-2

**Information Services Industry Market Forecast by Region  
Worldwide, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$)</b>	<b>1994 (\$)</b>	<b>1995 (\$)</b>	<b>1996 (\$)</b>	<b>1997 (\$)</b>	<b>1998 (\$)</b>	<b>CAGR 93-98 (%)</b>
Total Worldwide Information Services Market	260,213	6	276,794	301,182	333,486	370,829	415,647	466,424	11
Asia/Pacific Region	485,760	-3	47,030	48,811	54,843	61,934	69,253	78,966	11
European Region	78,000	5	82,000	89,000	96,000	105,000	115,000	130,000	10
Latin American Region	4,058	16	4,706	5,455	6,408	7,555	8,983	10,746	18
Middle East/Africa Region	1,286	15	1,485	1,734	2,044	2,437	2,964	3,678	20
North American Region	128,143	10	141,173	156,382	174,391	194,803	218,547	245,534	12

## EXHIBIT A-3

**Information Services Industry  
Market Forecast—Professional Services, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$)</b>	<b>1994 (\$)</b>	<b>1995 (\$)</b>	<b>1996 (\$)</b>	<b>1997 (\$)</b>	<b>1998 (\$)</b>	<b>CAGR 93-98 (%)</b>
Total Worldwide Professional Services	64,957	2	66,195	69,351	74,236	79,521	85,736	92,326	7
Asia/Pacific Region	19,938	-6	18,714	18,981	20,164	21,465	22,749	24,393	5
European Region	23,500	2	24,000	24,500	25,500	26,500	28,000	29,000	4
Latin American Region	695	18	817	950	1,116	1,320	1,568	1,862	18
Middle East/Africa Region	353	20	425	516	635	795	1,015	1,320	25
North American Region	20,471	9	22,239	24,404	26,821	29,441	32,404	35,751	10

## EXHIBIT A-4

**Information Services Industry**  
**Market Forecast—Systems Integration, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$)</b>	<b>1994 (\$)</b>	<b>1995 (\$)</b>	<b>1996 (\$)</b>	<b>1997 (\$)</b>	<b>1998 (\$)</b>	<b>CAGR 93-98 (%)</b>
Total Worldwide Systems Integration	18,145	9	19,736	22,255	25,896	30,158	35,146	40,824	16
Asia/Pacific Region	3,849	0	3,839	4,112	4,878	5,811	6,899	8,249	17
European Region	4,100	17	4,800	5,600	6,700	8,000	9,600	11,500	29
Latin American Region	138	12	154	169	190	216	249	287	23
Middle East/Africa Region	33	9	36	39	43	47	52	60	11
North American Region	10,025	9	12,335	12,335	1,4085	16,084	18,346	20,728	14

## EXHIBIT A-5

**Information Services Industry**  
**Market Forecast—Systems Operations, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$)</b>	<b>1994 (\$)</b>	<b>1995 (\$)</b>	<b>1996 (\$)</b>	<b>1997 (\$)</b>	<b>1998 (\$)</b>	<b>CAGR 93-98 (%)</b>
Total Worldwide Systems Operations	17,971	11	19,859	22,705	26,592	31,288	37,035	44,006	17
Asia/Pacific Region	3,619	0	3,634	3,892	4,675	5,630	6,732	8,123	17
European Region	2,550	22	3,100	3,700	4,400	5,300	6,500	8,000	21
Latin American Region	222	9	243	269	300	337	381	445	13
Middle East/Africa Region	0	N/A	0	0	0	0	0	0	N/A
North American Region	11,580	11	12,882	14,844	17,217	20,021	23,422	27,438	16

## EXHIBIT A-6

**Information Services Industry**  
**Market Forecast—Processing Services, 1993-1998**

Delivery Modes	1992 (\$)	Growth 92-93 (%)	1993 (\$)	1994 (\$)	1995 (\$)	1996 (\$)	1997 (\$)	1998 (\$)	CAGR 93-98 (%)
Total Worldwide Processing Services	35,849	5	37,554	39,754	43,041	46,799	51,017	55,593	8
Asia/Pacific Region	6,894	-1	6,843	6,935	7,937	9,092	10,324	11,817	12
European Region	8,200	2	8,400	8,700	9,000	9,400	10,000	10,500	5
Latin American Region	329	10	361	398	442	493	555	641	12
Middle East/Africa Region	338	11	375	416	466	522	585	661	12
North American Region	20,088	7	21,575	23,305	25,196	27,292	29,553	31,974	

## EXHIBIT A-7

**Information Services Industry**  
**Market Forecast—Network Services, 1993-1998**

Delivery Modes	1992 (\$)	Growth 92-93 (%)	1993 (\$)	1994 (\$)	1995 (\$)	1996 (\$)	1997 (\$)	1998 (\$)	CAGR 93-98 (%)
Total Worldwide Network Services	19,099	11	21,246	24,256	28,368	33,416	39,348	46,458	17
Asia/Pacific Region	3,810	-1	3,760	4,052	4,802	5,704	6,705	7,999	16
European Region	4,500	13	5,100	5,800	6,700	7,900	9,300	11,000	17
Latin American Region	139	10	153	170	191	216	247	287	13
Middle East/Africa Region	20	10	22	24	27	31	35	39	12
North American Region	10,630	15	12,211	14,210	16,648	19,565	23,061	27,133	17

## EXHIBIT A-8

**Information Services Industry**  
**Market Forecast—Systems Software Products, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$)</b>	<b>1994 (\$)</b>	<b>1995 (\$)</b>	<b>1996 (\$)</b>	<b>1997 (\$)</b>	<b>1998 (\$)</b>	<b>CAGR 93-98 (%)</b>
Total Worldwide Systems Software Products	37,617	7	40,157	42,950	46,383	49,760	53,833	58,745	8
Asia/Pacific Region	3,269	-1	3,243	3,475	4,046	4,734	5,275	6,213	14
European Region	13,000	4	13,500	14,500	15,500	16,000	17,000	18,000	6
Latin American Region	784	15	903	1,045	1,221	1,438	1,709	2,042	18
Middle East/Africa Region	80	9	87	95	104	115	128	142	10
North American Region	20,484	9	22,424	23,835	25,512	27,473	29,721	32,348	8

## EXHIBIT A-9

**Information Services Industry**  
**Market Forecast—Applications Software Products, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$)</b>	<b>1994 (\$)</b>	<b>1995 (\$)</b>	<b>1996 (\$)</b>	<b>1997 (\$)</b>	<b>1998 (\$)</b>	<b>CAGR 93-98 (%)</b>
Total Worldwide Applications Software Products	37,435	10	41,146	46,670	53,054	60,604	70,227	80,837	14
Asia/Pacific Region	3,799	0	3,809	4,088	4,768	5,578	6,320	7,479	14
European Region	9,800	7	10,500	12,000	13,000	14,500	17,000	19,000	13
Latin American Region	1,208	20	1,450	1,740	2,120	2,581	3,165	3,863	22
Middle East/Africa Region	348	19	415	506	618	760	960	1,241	24
North American Region	22,280	12	24,972	28,336	32,548	37,185	42,782	49,254	15

EXHIBIT A-10

**Information Services Industry**  
**Market Forecast—Turnkey Systems, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$)</b>	<b>1994 (\$)</b>	<b>1995 (\$)</b>	<b>1996 (\$)</b>	<b>1997 (\$)</b>	<b>1998 (\$)</b>	<b>CAGR 93-98 (%)</b>
Total Worldwide Turnkey Systems	29,140	6	30,901	33,241	35,916	39,283	43,305	47,635	9
Asia/Pacific Region	3,398	-6	3,188	3,276	3,573	3,920	4,249	4,693	8
European Region	12,500	4	13,000	14,000	15,000	16,500	18,500	20,500	10
Latin American Region	543	15	625	714	828	954	1,109	1,319	16
Middle East/Africa Region	114	10	125	138	151	167	189	215	11
North American Region	12,585	11	13,963	15,113	16,364	17,742	19,258	20,908	8

EXHIBIT A-11

**Information Services Industry Market Forecast by Delivery Mode  
Asia/Pacific, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$)</b>	<b>1994 (\$)</b>	<b>1995 (\$)</b>	<b>1996 (\$)</b>	<b>1997 (\$)</b>	<b>1998 (\$)</b>	<b>CAGR 93-98 (%)</b>
Total Asia/Pacific Information Services	48,576	-3	47,030	48,811	54,843	61,934	69,253	78,966	11
Professional Services	19,938	-6	18,714	18,981	20,164	21,465	22,749	24,393	5
Systems Integration	3,849	0	3,839	4,112	4,878	5,811	6,899	8,249	17
Systems Operations	3,619	0	3,634	3,892	4,675	5,630	6,732	8,123	17
Processing Services	6,894	-1	6,843	6,935	7,937	9,092	10,324	11,817	12
Network Services	3,810	-1	3,760	4,052	4,802	5,704	6,705	7,999	16
Systems Software Products	3,269	-1	3,243	3,475	4,046	4,734	5,275	6,213	14
Applications Software Products	3,799	0	3,809	4,088	4,768	5,578	6,320	7,479	14
Turnkey Systems	3,398	-6	3,188	3,276	3,573	3,920	4,249	4,693	8

EXHIBIT A-12

**Information Services Industry Market Forecast by Delivery Mode  
Europe, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$)</b>	<b>1994 (\$)</b>	<b>1995 (\$)</b>	<b>1996 (\$)</b>	<b>1997 (\$)</b>	<b>1998 (\$)</b>	<b>CAGR 93-98 (%)</b>
Total Europe Information Services	78,000	5	82,000	89,000	96,000	105,000	115,000	130,000	10
Professional Services	23,500	2	24,000	24,500	25,500	26,500	28,000	29,000	4
Systems Integration	4,100	17	4,800	5,600	6,700	8,000	9,600	11,500	19
Systems Operations	2,550	22	3,100	3,700	4,400	5,300	6,500	8,000	21
Processing Services	8,200	2	8,400	8,700	9,000	9,400	10,000	10,500	5
Network Services	4,500	13	5,100	5,800	6,700	7,900	9,300	11,000	17
Systems Software Products	13,000	4	13,500	14,500	15,500	16,000	17,000	18,000	6
Applications Software Products	9,800	7	10,500	12,000	13,000	14,500	17,000	19,000	13
Turnkey Systems	12,500	4	13,000	14,000	15,000	16,500	18,500	20,500	10

EXHIBIT A-13

**Information Services Industry Market Forecast by Delivery Mode  
Latin America, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$)</b>	<b>1994 (\$)</b>	<b>1995 (\$)</b>	<b>1996 (\$)</b>	<b>1997 (\$)</b>	<b>1998 (\$)</b>	<b>CAGR 93-98 (%)</b>
Total Latin America Information Services	4,058	16	4,706	5,455	6,408	7,555	8,983	10,746	18
Professional Services	695	18	817	950	1,116	1,320	1,568	1,862	18
Systems Integration	138	12	154	169	190	216	249	287	13
Systems Operations	222	9	243	269	300	337	381	445	13
Processing Services	329	10	361	398	442	493	555	641	12
Network Services	139	10	153	170	191	216	247	287	13
Systems Software Products	784	15	903	1,045	1,221	1,438	1,709	2,042	18
Applications Software Products	1,208	20	1,450	1,740	2,120	2,581	3,165	3,863	22
Turnkey Systems	543	15	625	714	828	954	1,109	1,319	16

EXHIBIT A-14

**Information Services Industry Market Forecast by Delivery Mode  
Middle East/Africa, 1993-1998**

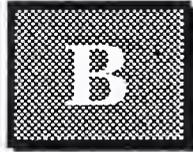
Delivery Modes	1992 (\$)	Growth 92-93 (%)	1993 (\$)	1994 (\$)	1995 (\$)	1996 (\$)	1997 (\$)	1998 (\$)	CAGR 93-98 (%)
Total Middle East/Africa Information Services	1,286	15	1,485	1,734	2,044	2,437	2,964	3,678	20
Professional Services	353	20	425	516	635	795	1,015	1,320	25
Systems Integration	33	9	36	39	43	47	52	60	11
Systems Operations		N/A							N/A
Processing Services	338	11	375	416	466	522	585	661	12
Network Services	20	10	22	24	27	31	35	39	12
Systems Software Products	80	9	87	95	104	115	128	142	10
Applications Software Products	348	19	415	506	618	760	960	1241	24
Turnkey Systems	114	10	125	138	151	167	189	215	11

## EXHIBIT A-15

**Information Services Industry Market Forecast by Delivery Mode  
North America, 1993-1998**

<b>Delivery Modes</b>	<b>1992 (\$)</b>	<b>Growth 92-93 (%)</b>	<b>1993 (\$)</b>	<b>1994 (\$)</b>	<b>1995 (\$)</b>	<b>1996 (\$)</b>	<b>1997 (\$)</b>	<b>1998 (\$)</b>	<b>CAGR 93-98 (%)</b>
Regional Total	128,143	10	141,173	156,382	174,391	194,803	218,547	245,534	12
Professional Services	20,471	9	22,239	24,404	26,821	29,441	32,404	35,751	10
United States	19,287	9	20,930	22,951	25,207	27,649	30,414	33,542	10
Canada	1,184	11	1,309	1,453	1,614	1,792	1,990	2,209	11
Systems Integration	10,025	9	10,907	12,335	14,085	16,084	18,346	20,728	14
United States	9,265	9	10,076	11,418	13,073	14,966	17,109	19,361	14
Canada	760	9	831	917	1,012	1,118	1,237	1,367	10
Systems Operations	11,580	11	12,882	14,844	17,217	20,021	23,422	27,438	16
United States	11,284	11	12,528	14,418	16,703	19,402	22,676	26,538	16
Canada	296	20	354	426	514	619	746	900	21
Processing Services	20,088	7	21,575	23,305	25,196	27,292	29,553	31,974	8
United States	19,403	8	20,878	22,594	24,477	26,564	28,813	31,222	8
Canada	685	2	697	711	719	728	740	752	2
Network Services	10,630	15	12,211	14,210	16,648	19,565	23,061	27,133	17
United States	10,380	15	11,926	13,882	16,268	19,126	22,553	26,546	17
Canada	250	14	285	328	380	439	508	587	16
Systems SW Products	20,484	9	22,424	23,835	25,512	27,473	29,721	32,348	8
United States	19,825	9	21,702	23,042	24,639	26,513	28,664	31,186	8
Canada	659	10	722	793	873	960	1,057	1,162	10
Applications SW Products	22,280	12	24,972	28,336	32,548	37,185	42,782	49,254	15
United States	21,582	12	24,176	27,449	31,552	36,067	41,528	47,850	15
Canada	698	14	796	887	996	1,118	1,254	1,404	12
Turnkey Systems	12,585	11	13,963	15,113	16,364	17,742	19,258	20,908	8
United States	12,265	11	13,627	14,761	15,996	17,355	18,853	20,484	8
Canada	320	5	336	352	368	387	405	424	5

(Blank)



## Currency Conversion Factors

Appendix B lists the currency conversion factors used to convert from local currencies to U.S. dollars. For Europe, the factors are those used by INPUT, Ltd. in its 1993 research. The factors for other countries were derived from the Wall Street Journal, March 17, 1994.

Country	Currency	Value
Argentina	Peso	.99
Australia	Dollar	1.40
Austria	Schilling	10.89
Belgium	Franc	31.91
Brazil	Cruzeiro	760.95
Canada	Dolloar	1.36
Denmark	Krone	5.98
Finland	Markka	4.96
France	Franc	5.26
Germany	Mark	1.55
Greece	Drachma	202.32
Hong Kong	Dollar	7.72
India	Rupee	31.13
Ireland	IR Punt	0.59
Italy	Lira	1,360.00
Japan	Yen	105.98
Mexico	Peso	3.28
Netherlands	Guilder	1.74
New Zealand	Dollar	1.73
Norway	Krone	6.41
Portugal	Escudo	138.26
Singapore	Dollar	1.59
South Africa	Rand	3.45
South Korea	Won	807.20

Country	Currency	Value
Spain	Peseta	110.82
Sweden	Krona	6.24
Switzerland	Franc	1.39
Taiwan	Dollar	26.39
United Kingdom	Pound Sterling	0.63
Venezuela	Bolivar	112.50



