Automation Industry Overview

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Agenda

- Who is ARC Advisory Group
- Industry Update general
- Market Outlook
- Market Situation in Japan
- Conclusion

Who is ARC Advisory Group?

Strategic Advisory and Management Consulting firm:

- ♦ **Formed in 1986**
- ♦ **The leader in Manufacturing & Logistics Intelligence**
  - **Supply Chain: Sourcing to Fulfillment**
  - **Plant Systems: Production Mgt. to Process Control**
- ♦ **First-hand industry & application experience**
- ♦ **Technology trends & business forecasts**

Enterprise to Plant Floor

ARC Technology and Industry Coverage

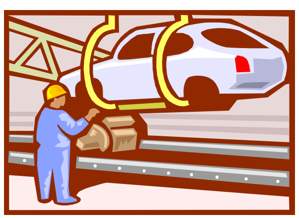
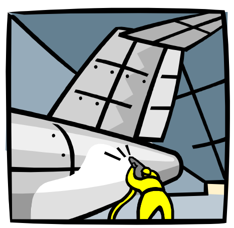
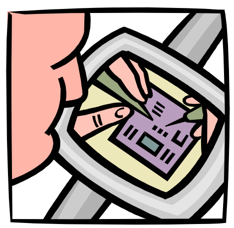
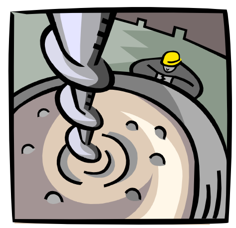
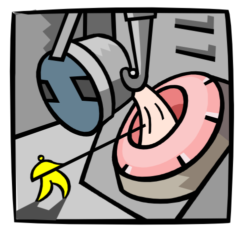
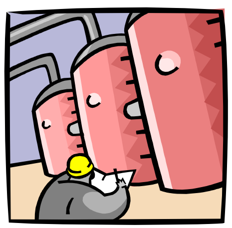
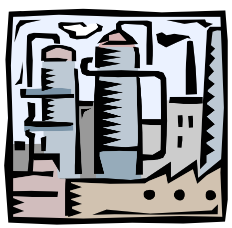
- Technologies:

Enterprise Systems — Supply Chain — Logistics — Production Systems — Industrial Networks — Plant Systems

Enterprise Group | **Automation Group**

- **Industries:**

Automotive | Aerospace | Semicon | Food&Bev | Metals | Chemical | Petroleum

Machinery | Electronics | Consumer Goods | Paper | Pharm | Gas & Electric

ARC has Global Presence

Headquarters: Boston (Dedham), MA

US Offices: Philadelphia, Pittsburgh, Phoenix, San Francisco

Foreign Offices: UK, Germany, Japan, India

People: 70+

Thought Leaders for Manufacturing

ARC Advisory Group

ARC Community Touch Points . . .

ARC is the premier source for market insight:

- **ARCwire: 60,000+ executives weekly**
- **ARCweb.com: 1,500 unique visitors daily**
- **ARC events: 3,000+ attend yearly**
- **ARC clients: 3,000 advisory service & study readers**
- **Press Quotes: 1,000+/yr = #1 in the industrial pubs**
- **Speakers: 100+/yr = #1 for manufacturing**
- **Contact Database 110,000 worldwide**

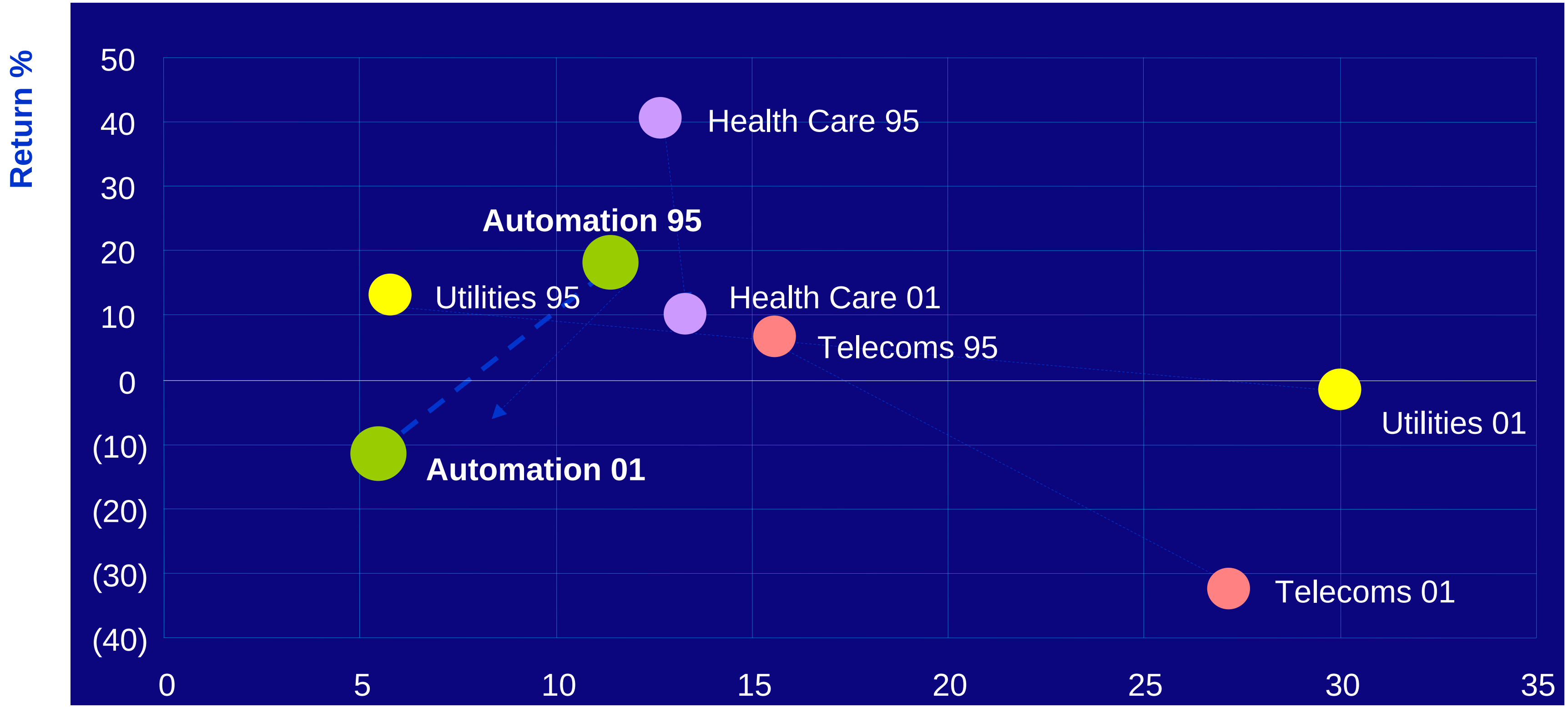
Industrial Decision Makers Listen to ARC

Industry Update

Industry attractiveness for Investors

Total Return [1] to Shareholders vs. Growth [2]

Two-Year Average Return and Growth 1994/1995 and 2000/2001, in %



Notes

1. Total Return defined as price change plus the dividends that occurred during the period, including special or cash equivalent distributions
2. Growth of reported sales figure

Source : Morgan Stanley

Manufacturers Feel The Pressure

Environmental Regulations

Increasing Material & Energy Costs

Cyclical Market Demand

Better Product Quality

Mergers

Shareholder Value

Shorter Life Cycles

Downward Price Pressure

Tighter Delivery Requirements

Global Competition

More Suppliers

Smaller Orders

CEO Dictates: "Fix It"

Increase Throughput

Increase Productivity & Asset Utilization

Improve Visibility

Reduce Costs

Reduce TCO

Focus on Customer

Minimize Waste

Improve Yield

Speed Product Innovation

Manage Supply Chain

Increase Responsiveness

Optimize Operations

Challenges For Automation Suppliers

- Flat market
- Very competitive prices
- Declining earnings
- Declining R&D spending
- Aging system architecture
- Ongoing supplier consolidation
- Customers want strategic solutions, not products
- Customer relationships driven by ROI, not technology
- Plant & enterprise systems need to be integrated

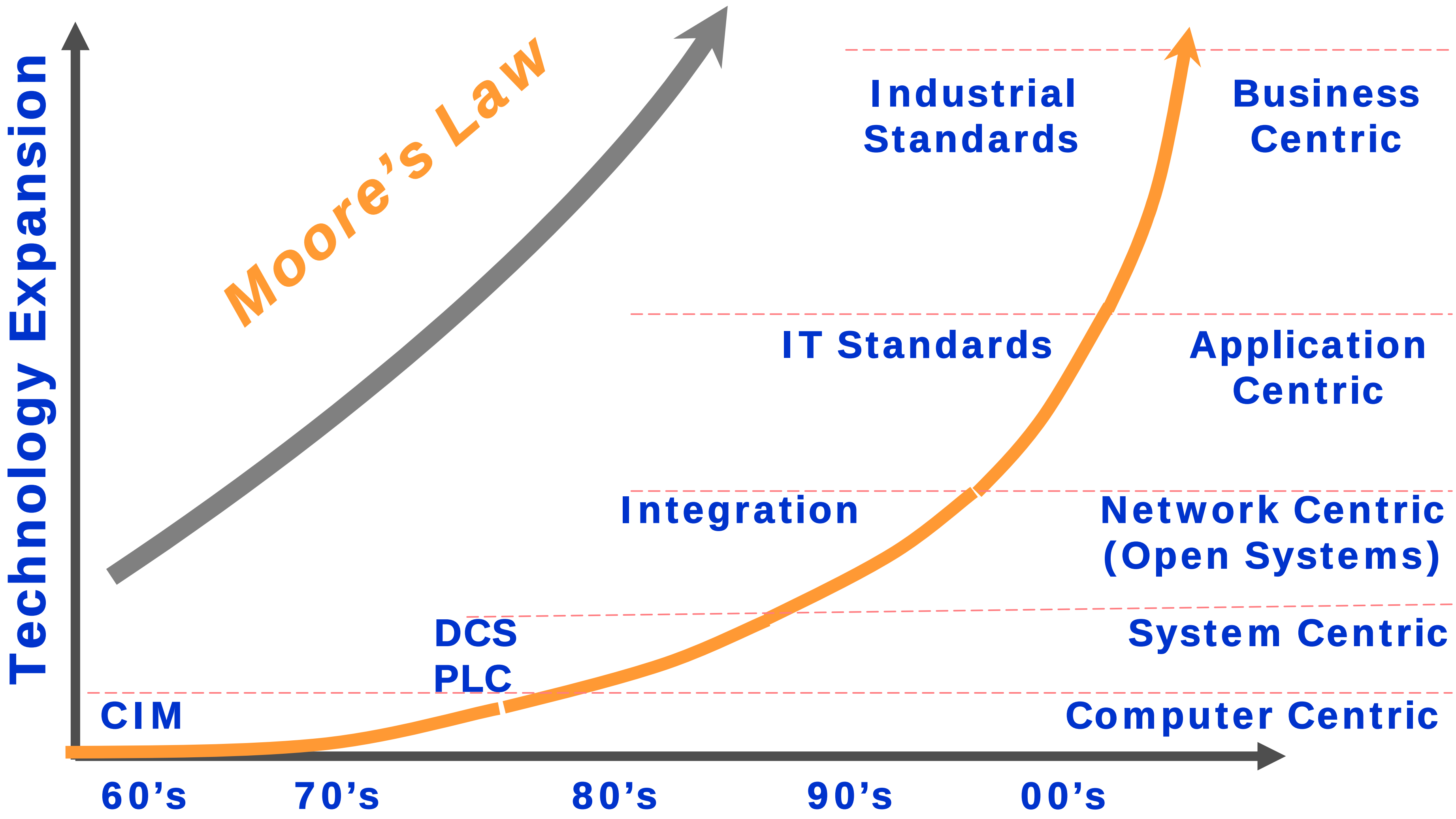
Manufacturers Are Demanding Higher Returns From Their Suppliers

- Provide good ROI on Automation Investment
- Provide Life Cycle Cost Savings
- Lower Total Capital Outlay
- Offer Performance-Based Selling Approach
- Adopt Risk-Sharing Philosophy
- Provide Plant Optimization
- Offer Industry-Specific Solutions
- Take Turnkey Responsibility - Build, Own, Operate

Process Manufacturing Statistics

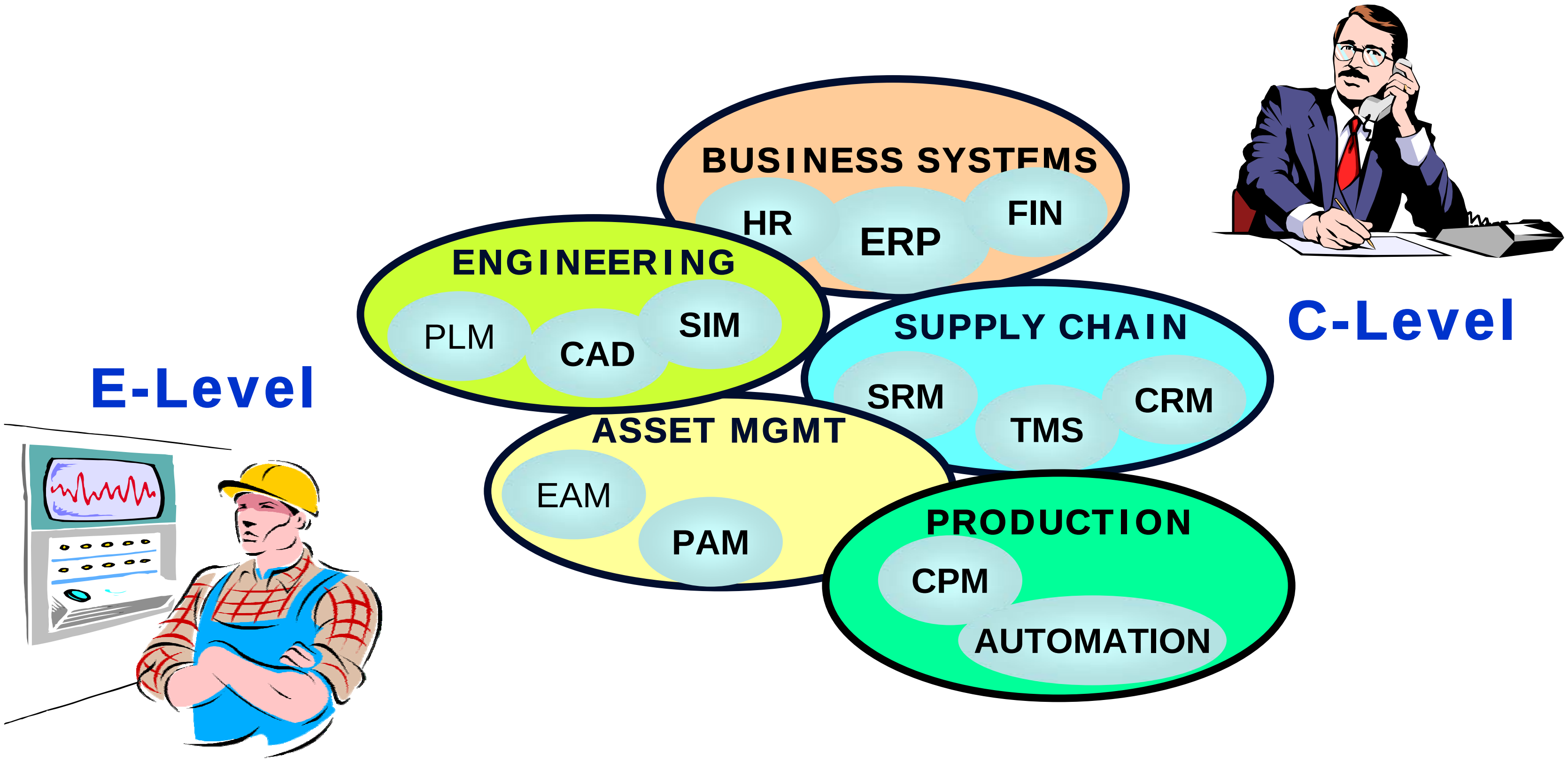
- 75 % Capital Assets In Manufacturing
- 65 % Annual Operating Costs Are Raw Materials And Conversion
- >$20B/Yr Lost To Abnormal Situations (78% Caused By Human Error)
- Most Processes Run Steady State At About 4σ (2 σ During State Changes)
- >$65B near End-of-Life Legacy Automation Systems

Keeping Pace With Technology



Applied Technology Is Not Helping

Manufacturing Era: Technology-based Decisions at Automation Level



Manufacturers Want Business Results. Suppliers Keep Offering Technology!

ARC: Worldwide Focus on Manufacturing

Automation Industry Outlook

www.arcweb.com

Total Automation Business Worldwide

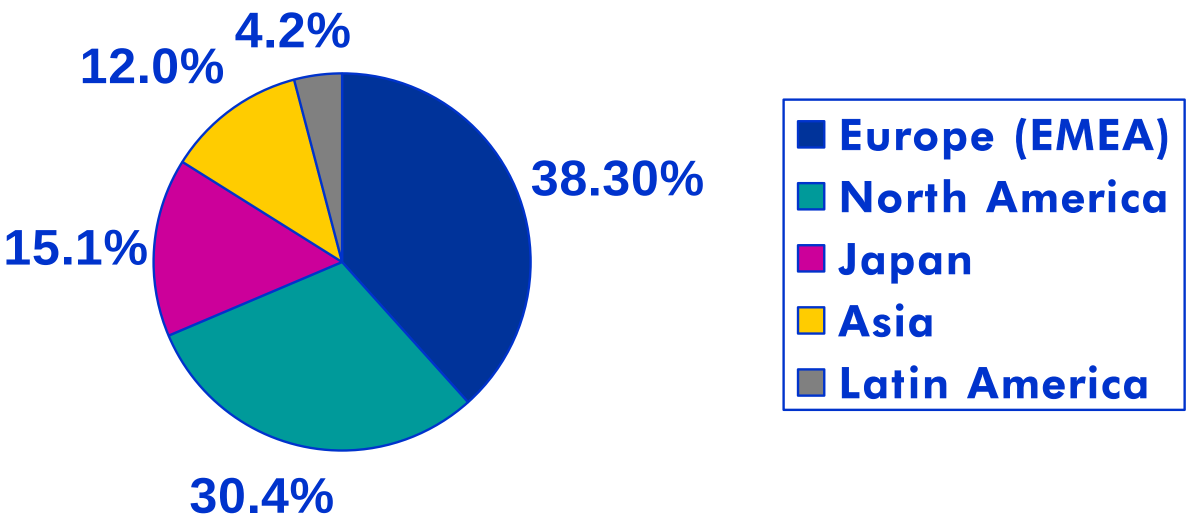
Total Automation Business including HW, SW & Services

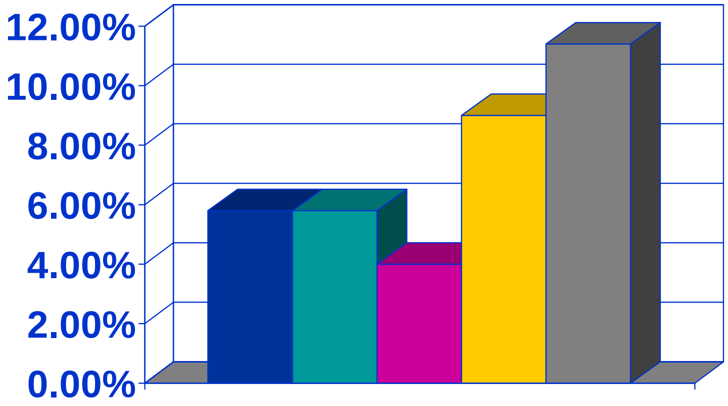
(Millions of US$)

	2002	2006	CAGR
Discrete Automation	26,384	36,377	7,9%
Process Automation	46,506	56,811	5,1%
TOTAL Automation	**72,890**	**93,188**	**6,3%**

Total Automation Business by Region

Base Year 2002: 72,809 Mio US$





CAGR 2002 - 2006

Thought Leaders for Manufacturing

ARC Advisory Group

Discrete Automation Breakout Europe

Discrete Automation Business including HW, SW & Services for selected European Countries

(Millions of US$)

	2002 Millions of Dollars	Percent	2006 Millions of Dollars	Percent	CAGR
Germany	2,617.6	31.6%	3,423.2	31.9%	7.0%
UK & Ireland	1,122.0	13.6%	1,345.5	12.5%	4.7%
France	1,063.8	12.9%	1,329.4	12.4%	5.7%
Italy	985.9	11.9%	1,157.3	10.8%	4.1%
Nordic	456.8	5.5%	625.3	5.8%	8.1%
Benelux	378.0	4.6%	489.4	4.6%	6.7%
Eastern Europe	723.7	8.7%	1,112.6	10.4%	11.3%
Rest of Europe	858.5	11.2%	1,248,5	11.6%	7.8%
Total	**8,273.3**	**100.0%**	**10,731.1**	**100.0%**	**6,7%**

Process Automation Breakout Europe

Process Automation Business including HW, SW & Services for selected European Countries
(Millions of US$)

	2002 Million of $	Percent	2007 Million of $	Percent	CAGR
France	1,540.6	9.0%	1,860.0	8.4%	3.8%
Germany	2,625.0	15.4%	3,125.2	14.1%	3.5%
Italy	1,518.2	8.9%	1,850.0	8.4%	4.0%
United Kingdom	2,009.4	11.8%	2,440.0	11.0%	4.0%
Benelux	943.7	5.5%	1,140.0	5.2%	3.9%
Scandinavian	1,714.0	10.0%	2,276.7	10.3%	5.8%
Eastern Europe	2,004.7	11.7%	3,204.9	14.5%	9.8%
ME, Africa	2,561.4	15.0%	3,163.2	14.3%	4.3%
Others	2,173.1	12.7%	3,027.0	13.7%	6.9%
EMA Total	**17,090.0**	**100.0%**	**22,086.9**	**100.0%**	**5.3%**

Discrete Automation (World) by Industry

Including HW, SW and Services	2001 Millions of Dollars	Percent	2006 Millions of Dollars	Percent	CAGR
Aerospace & Defense	1,058.6	4.3%	1,537.0	4.2%	7.7%
Automotive	6,406.7	25.8%	8,668.6	23.8%	6.2%
Building Automation	1,695.2	6.8%	2,614.7	7.2%	9.1%
Electrical	751.8	3.0%	898.1	2.5%	3.6%
Electronics & Semiconductors	4,486.4	18.1%	8,435.9	23.2%	13.5%
Fab. Metals	2,287.6	9.2%	3,113.4	8.6%	6.4%
Machinery	4,108.8	16.6%	5,601.2	15.4%	6.4%
Plastic & Rubber	1,372.9	5.5%	1,982.2	5.4%	7.6%
Printing	381.1	1.5%	422.3	1.2%	2.1%
Other Discrete	2,269.8	9.1%	3,103.3	8.5%	6.5%
Total	**24,818.9**	**100.0%**	**36,376.8**	**100.0%**	**7.9%**

Process Automation by Industry

Including HW, SW and Services	2001 Millions of Dollars	Percent	2006 Millions of Dollars	Percent	CAGR
Oil & Gas	4,565.4	10.3%	5,893.3	10.4%	5.2%
Refining	3,806.5	8.6%	4,769.4	8.4%	4.6%
Chemical	8,708.8	19.7%	10,983.6	19.3%	4.8%
Pharmaceutical	2,215.2	5.0%	3,243.6	5.7%	7.9%
Food & Beverage	5,089.2	11.5%	6,963.3	12.3%	6.5%
Pulp & Paper	3,885.0	8.8%	4,718.2	8.3%	4.0%
Power	6,536.7	14.8%	8,281.5	14.6%	4.8%
Metals & Mining	2,880.2	6.5%	3,567.6	6.3%	4.4%
Water & Wastewater	2,880.4	6.5%	4,087.9	7.2%	7.3%
Other	3,681.9	8.3%	4,302.9	7.6%	3.2%
Total	**44,249.2**	**100.0%**	**56,811.4**	**100.0%**	**5.1%**

Discrete Automation by Product

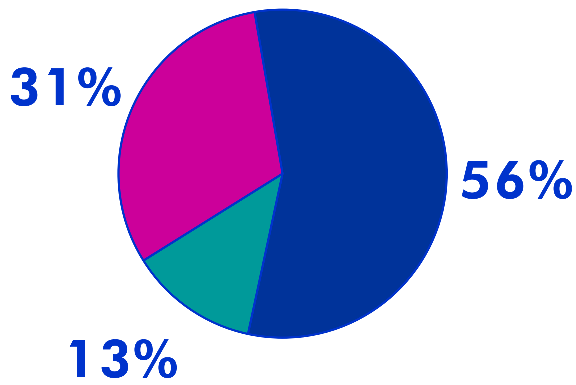
Including HW, SW and Services	2001 Millions of Dollars	Percent	2006 Millions of Dollars	Percent	CAGR
PLC	3,458.3	13.9%	4,380.7	12.0%	4.8%
GMC	3,326.3	13.4%	4,999.7	13.7%	8.5%
CNC	3,931.3	15.8%	5,497.9	15.1%	6.9%
AC Drives	2,447.7	9.9%	3,325.8	9.1%	6.3%
HMI	169.6	0.7%	250.7	0.7%	8.1%
OIT	522.8	2.1%	871.2	2.4%	10.8%
MHCS SW	446.4	1.8%	872.6	2.4%	14.3%
Production Management SW	616.3	2.5%	1,410.2	3.9%	18.0%
System Integration	4,496.6	18.1%	6,219.3	17.1%	6.7%
Other Products	5,403.7	21.8%	8,548.7	23.5%	9.6%
Total	24,818.9	100.0%	36,376.8	100.0%	7.9%

Process Automation by Product

Including HW, SW and Services	2001 Millions of Dollars	Percent	2006 Millions of Dollars	Percent	CAGR
DCS	7,125.0	16.1%	8,232.0	14.5%	2.9%
Process PLCs	2,814.5	6.4%	3,317.4	5.8%	3.3%
SCADA	2,145.0	4.8%	2,745.0	4.8%	5.1%
Safety Systems	675.0	1.5%	847.4	1.5%	4.7%
AC Drives	3,125.6	7.1%	3,987.9	7.0%	5.0%
Software	3,662.5	8.3%	6,112.9	10.8%	10.8%
Control Valves	2,738.5	6.2%	3,145.2	5.5%	2.8%
On/Off Valves	3,574.8	8.1%	3,940.0	6.9%	2.0%
Transmitters	2,370.0	5.4%	2,915.0	5.1%	4.2%
Flow	2,405.0	5.4%	3,020.0	5.3%	4.7%
Analytical	2,369.9	5.4%	2,925.2	5.1%	4.3%
3rd Party Services	5,825.2	13.2%	9,658.2	17.0%	10.6%
Other	5,418.2	12.2%	5,965.2	10.5%	1.9%
Total	44,249.2	100.0%	56,811.4	100.0%	5.1%

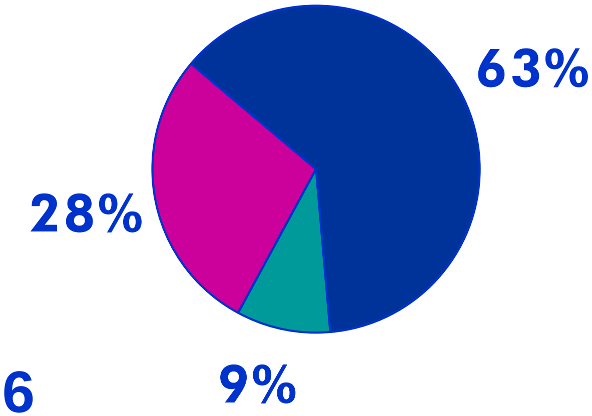
Software and Services Driving Growth

Process Automation
46,506 Mio $

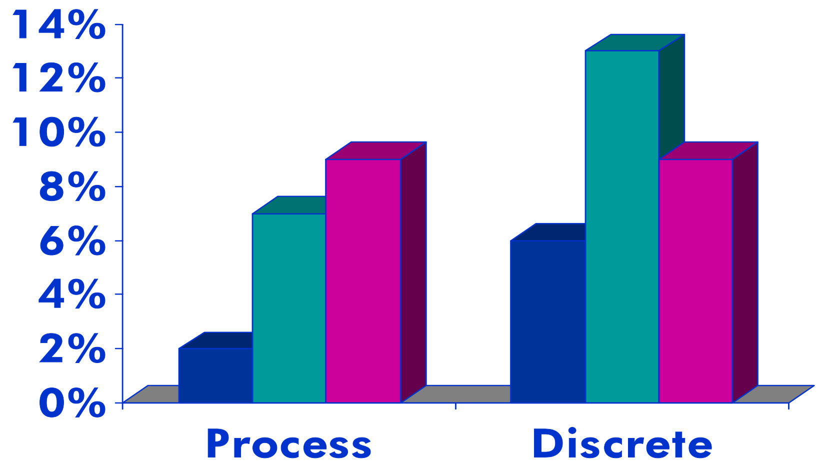


2002

Discrete Automation
26,384 Mio $



CAGR 2002 - 2006



Europe

The rising Euro against the dollar is hurting exports in general. GDP for the Euro Area will remain flat at barely 1 percent in 2003. Germany, the EU's economic engine, is gravely ill and will continue to perform below the EU average at least into 2004.

The bright spot for investment is Central Europe where 10 nations will likely join the European Union in 2004, opening the gates for foreign investment to take advantage of cheap labor, EU incentives and more affluent consumer markets in the long-term.

Automation investments was flat in 2003 so far but we see some signs for improvment

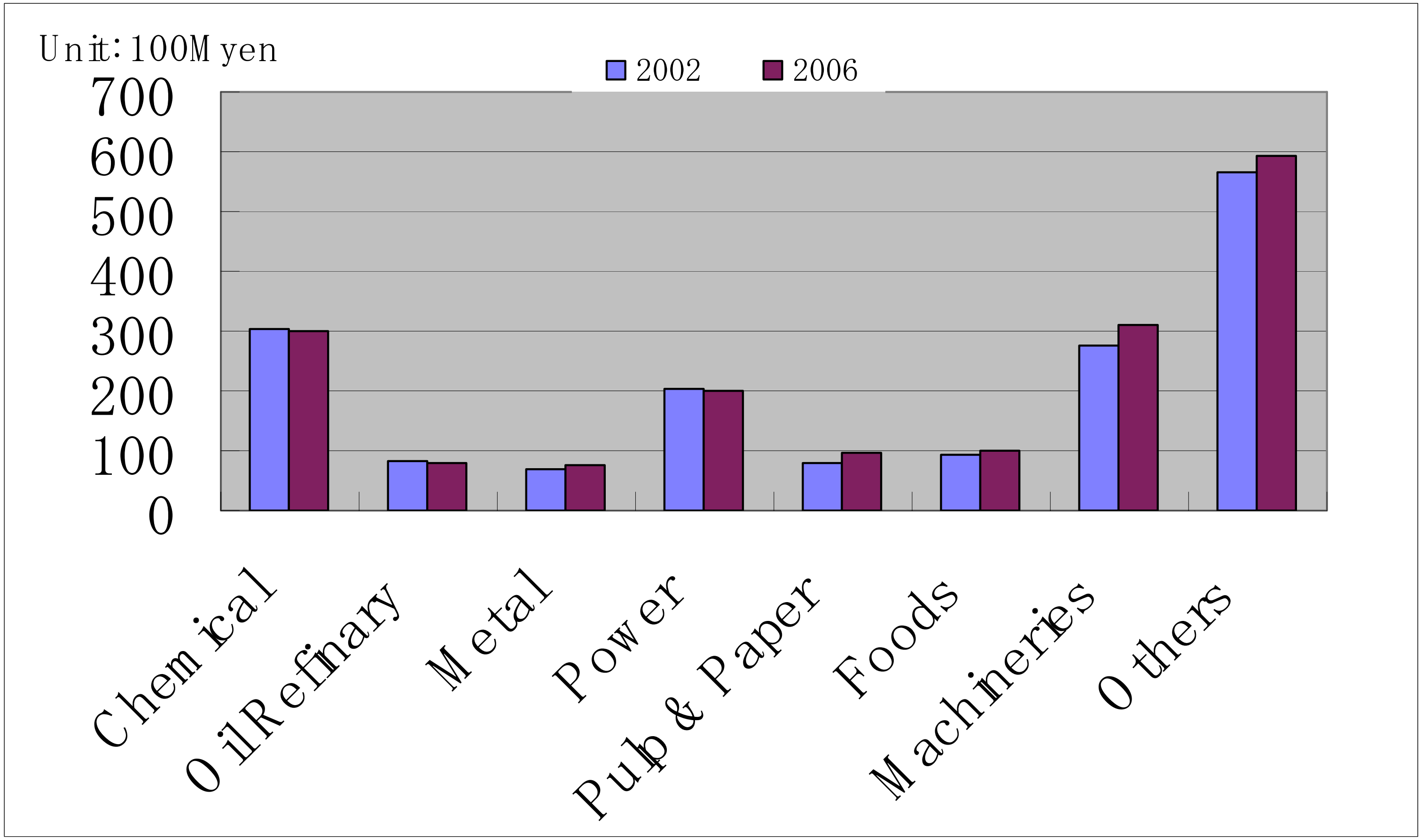
Automation Market Japan

Major chances in the different market, Japan

- Now that the first half of FY03 was just over as of Sep-30, up-tick signs are increasing, such as :
- April-June GDP 3.9% up in terms of annual rate, and Nikkei 225 stock index has rebounded by more than 40% since April.
- V-shape profit recovery among winners where capital investment bottoming out, but much in China.
- Investment flooding into China as manufacturing basement and exploding market, which can be a drag to domestic automation rebounding.
- Rapid appreciation of Japanese Yen to US$, and still high unemployment rate for continuing restructuring are drags for sustainable recovery.
- Automotives, Steel, Electronics and semiconductors up-tick, but not every body.
- Cell production way for agile manufacturing and Traceability for Security & Safety requesting new solutions.

Automation Market Growth by Industry in Japan

Not included inflation during the forecasted period



Source: Jemima

Major chances in the different market: Japan

- Process Automation systems are continuing decline over 10 years
- PA Instruments 169.6Byen in 2002 to 161.4Byen in 2006
- While continuing restructuring and consolidation and decline in capital investment in Electric Power, Water, Gas, refinery, Chemicals, etc.,
- Control system consolidation and migration are a focus.
- New products for hybrid and even discrete market are increasing competition: ex: Stardom from Yokogawa and Harmonas-FLeX from Yamatake
- FDA regulation compliance, Batch STD S88 & S95 are still likely in the future.

Major chances in the different market: Japan

- Discrete industry rebounding and its automation market : 512.3Byen in 2002 7.4% up from 2001's and 3.6% up in 2003.
- PLC 163.0 Byen in 2002: Multifunctional PLC (PAC) also developing hybrid and process market : ex: MELSEC-Q from Mitsubishi and Sysmac CS1 from OMRON.
- Value proposition for solutions is another competition here: ex: eF@ctory by Mitsubishi, and Sensor solutions from OMRON
- Automotives and consumer goods are pulling Semiconductors, Machine tools, Robotics, etc.
- Exports 16.7% up (+27.0% to Asia, 12.5% to NA, and 6.1% to Europe) are driving the rebound, too.

Summary

- Plants Are Heterogeneous
  - Legacy Systems
  - Multi-supplier
- Few True Standards
- Users Want Solutions – Suppliers Sell Technology
- Business Performance Is Not Measured In Real-Time The pressure will continue to increase performance on both side
- All suppliers has to increase revenue in new markets- like East Europe and Asia
- A plan has to make for industry focused marketing – Food, Pharma, Oil & Gas..
- End-user has to increase performance in the old market’s
- Europe is still the biggest market in Automation – Japanese Companies has to increase export to Europe

Thank You