

Pictures of the Future: Research and Development at Siemens

JASS '05
St. Petersburg, April 2005

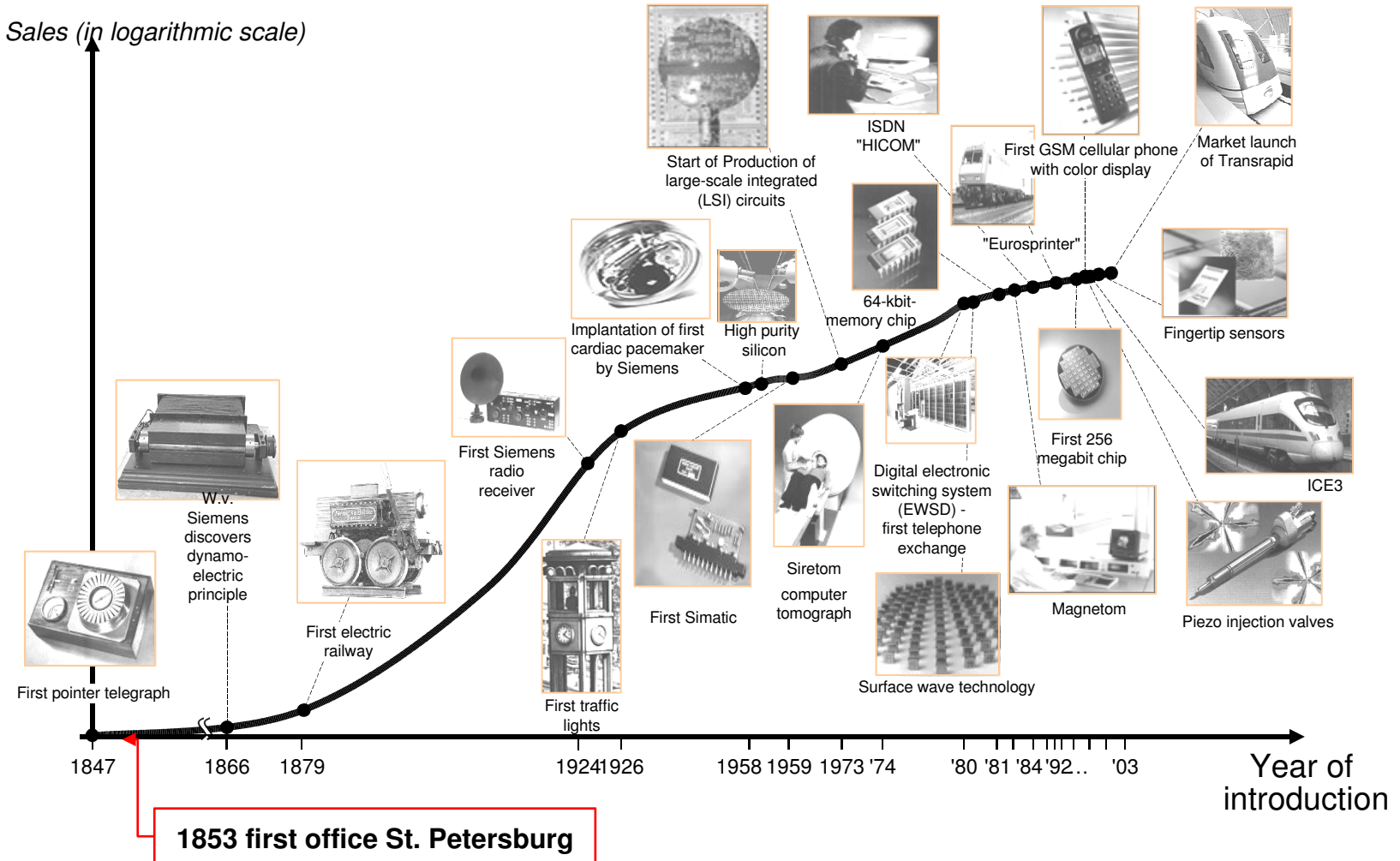
Prof. Dr. Dietmar Theis
dietmar.theis@siemens.com



Innovations have kept Siemens strong for 158 years

Outstanding innovations and sales development by Siemens AG, 1847 – 2005

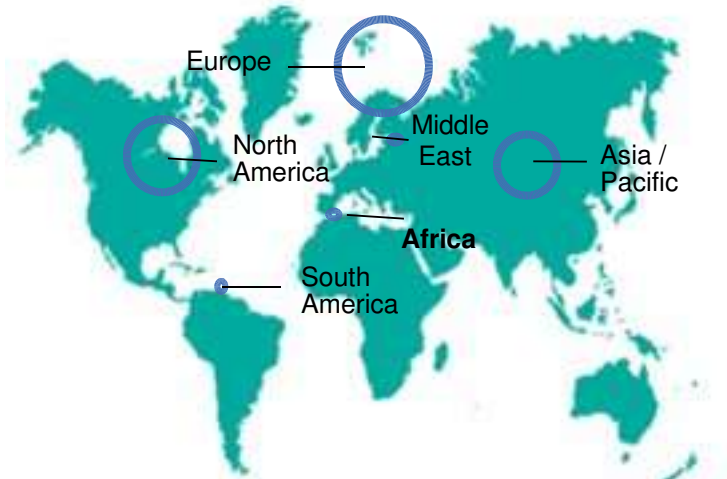
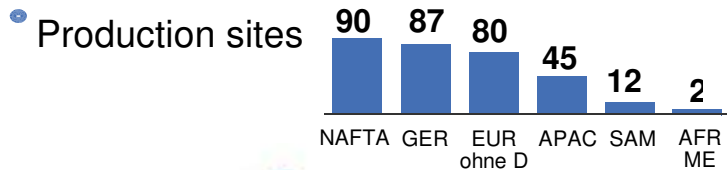
CORPORATE TECHNOLOGY



Siemens – Global Network of Innovation (1)

Global presence

(in more than 190 countries)



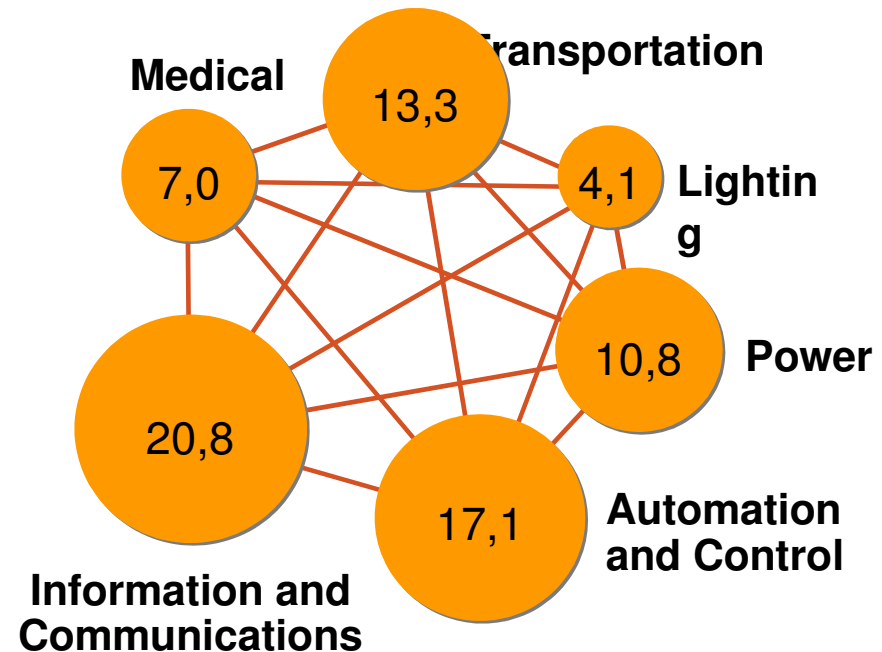
430.000 employees worldwide

- 164.000 (38%) in Germany
- 110.000 (26%) in Europe (w/o Ger)
- 95.000 (22%) in North America
- 52.000 (12%) in Asia-Pacific
- 9.000 (2%) in other countries

Source: CD S 8 - 11/04

Broad scope of business

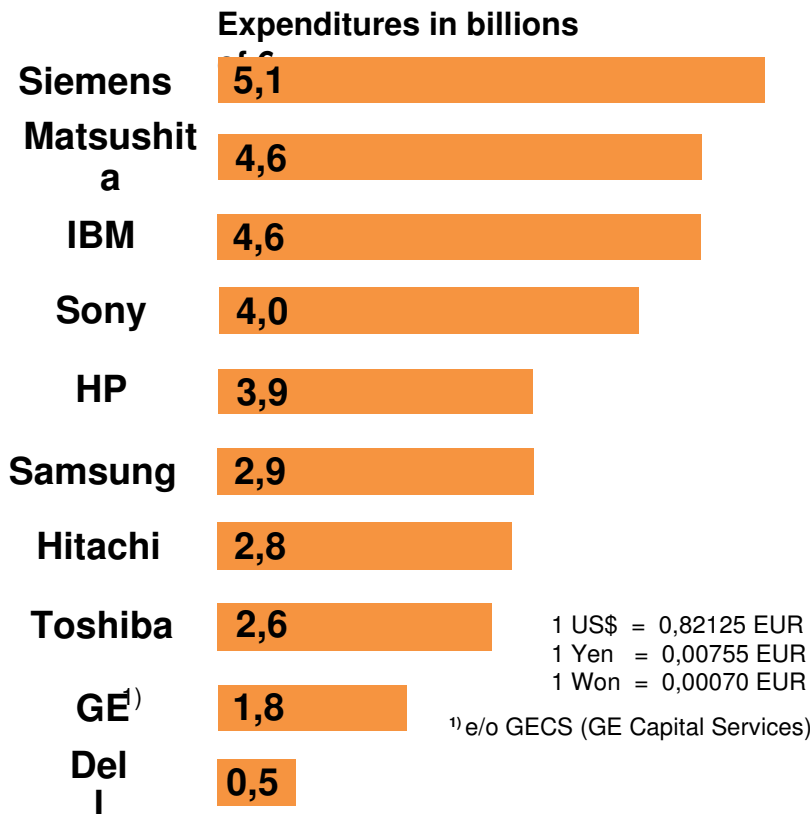
(6 business segments, 13 Groups + SFS, SRE)



External sales in billions of €
w/o SFS, SRE) - FY
2003/04

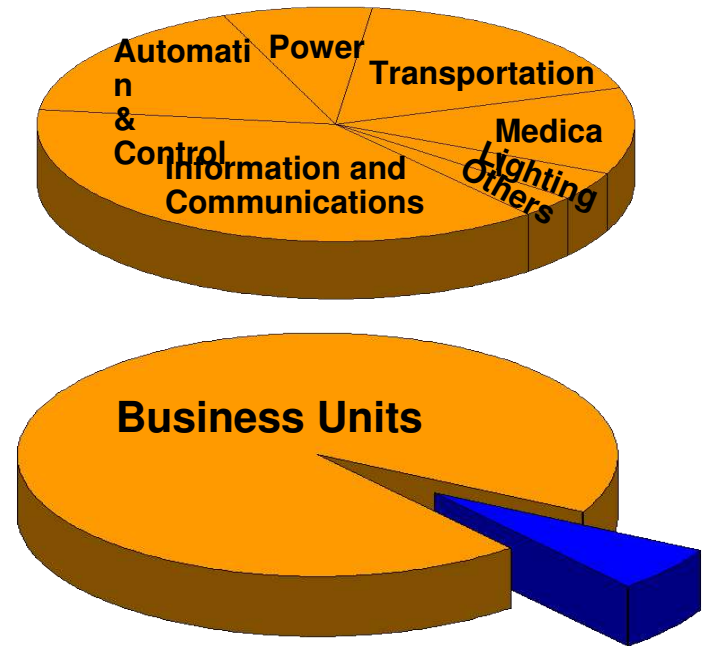
Siemens – Global Network of Innovation (2)

R&D expenditure in 2004:
5,1 billions of € ...



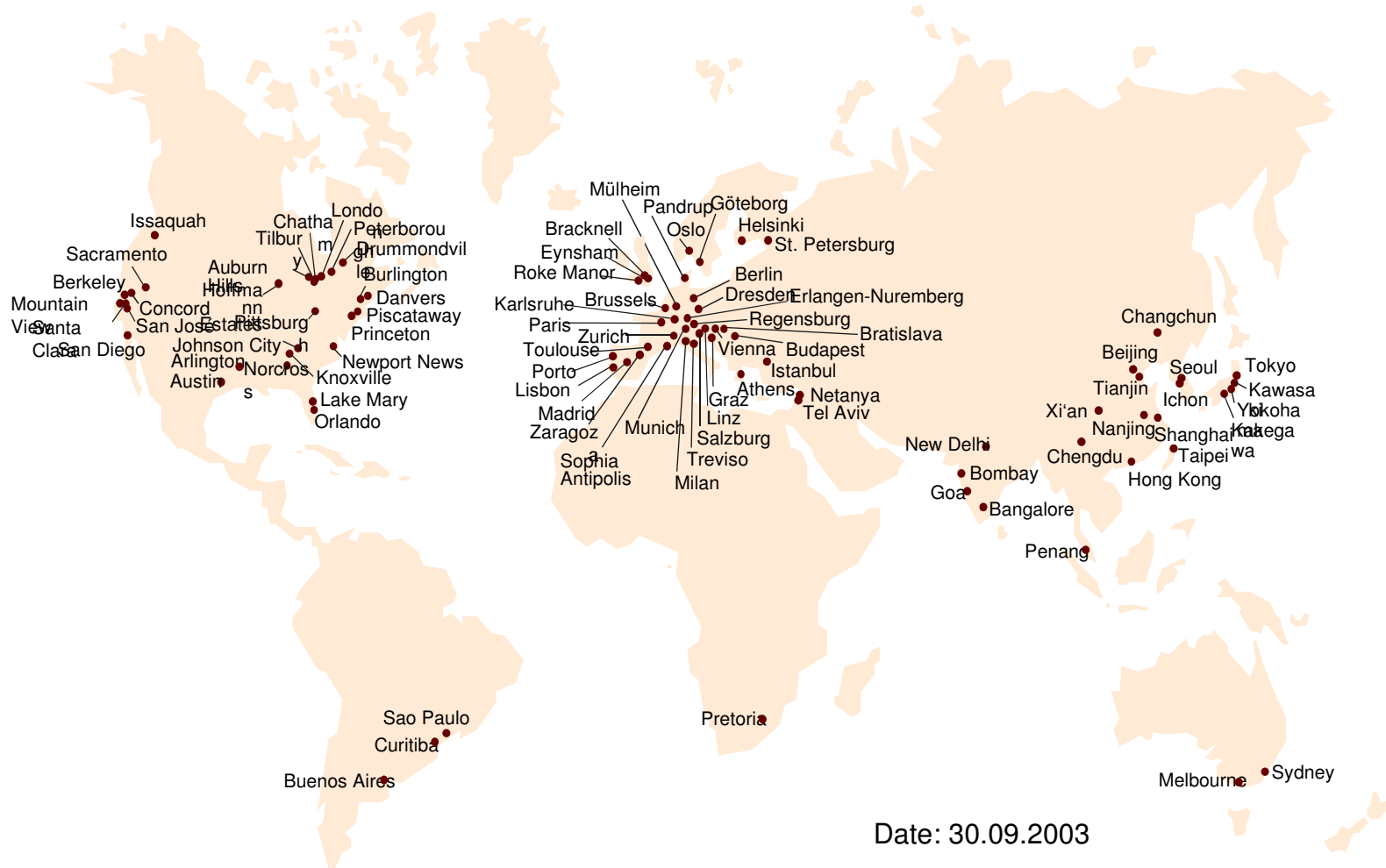
... more than 50% for
Software

(worldwide about 30 000 Software engineers)



Corporate Technology

Worldwide Activities in R&D



Date: 30.09.2003

Corporate Structure

(as of

October 1, 2004)

Managing Board

Operations

Information and
Communications
Communications
(COM)

**Siemens Business
Services GmbH & Co.
OHG (SBS)**
Transportation

**Transportation
Systems**
(TS)

**Siemens VDO
Automotive AG (\$V)**

Medical
Medical Solutions

(Med)

Automation and
Control
**Automation and
Drives (A&D)**

**Industrial Solutions
and Services (I&S)**

**Siemens Logistics
and Assembly**

**Systems (L&A)
Siemens Building
Technologies AG ***
(SBT)
Lighting

Osram GmbH

Power
Power Generation
(PG)

**Power Transmission
and Distribution**
(PTD)

Financing and Real
Estate
**Siemens
Financial ***
Services GmbH

**Siemens Real
Estate**
(SRE)

Corporate Departments

Corporate Finance
(CF)

Corporate Personnel
(CP)

**Corporate
Technology**
(CT)

**Corporate
Development (CD)**

Corporate Centers:
Corporate Communications
(CC)

**Corporate Information and
Operations**
(CIO)

Global Procurement and Logistics
(GPL)

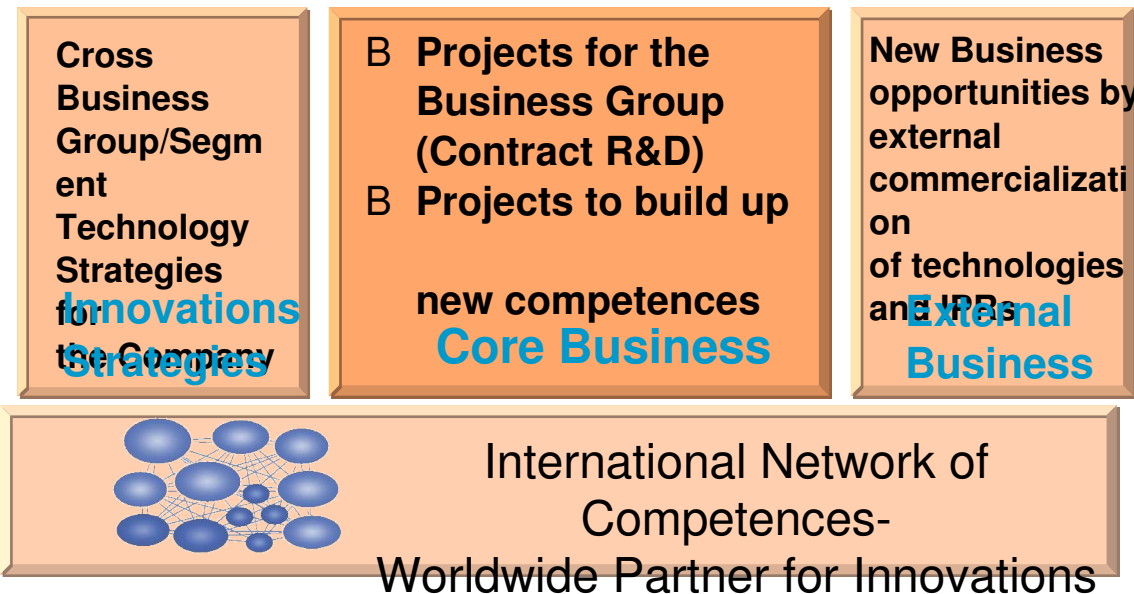
**Chief Economist / Corporate
Relations**
(ECR)

Management Consulting Personnel
(MCP) *Separate Group*

Regional Units: Regional Offices, Regional Companies, Representative Offices, Agencies

Business Model of Corporate Technology

Goal: Creation of Economic Value Added for the Company



- Pictures of the Future
 - Markets
 - Trends
 - Technology
 - Business Opportunities
- Technology Screening & Analysis

Cross Business Group/Segment Technology Strategies for the Company
Innovations Strategies

B Projects for the Business Group (Contract R&D)
B Projects to build up new competences
Core Business

New Business opportunities by external commercialization of technologies and IP's
External Business

- Spin off's (STA, TTB*)
- IP marketing
- External marketing of technological services

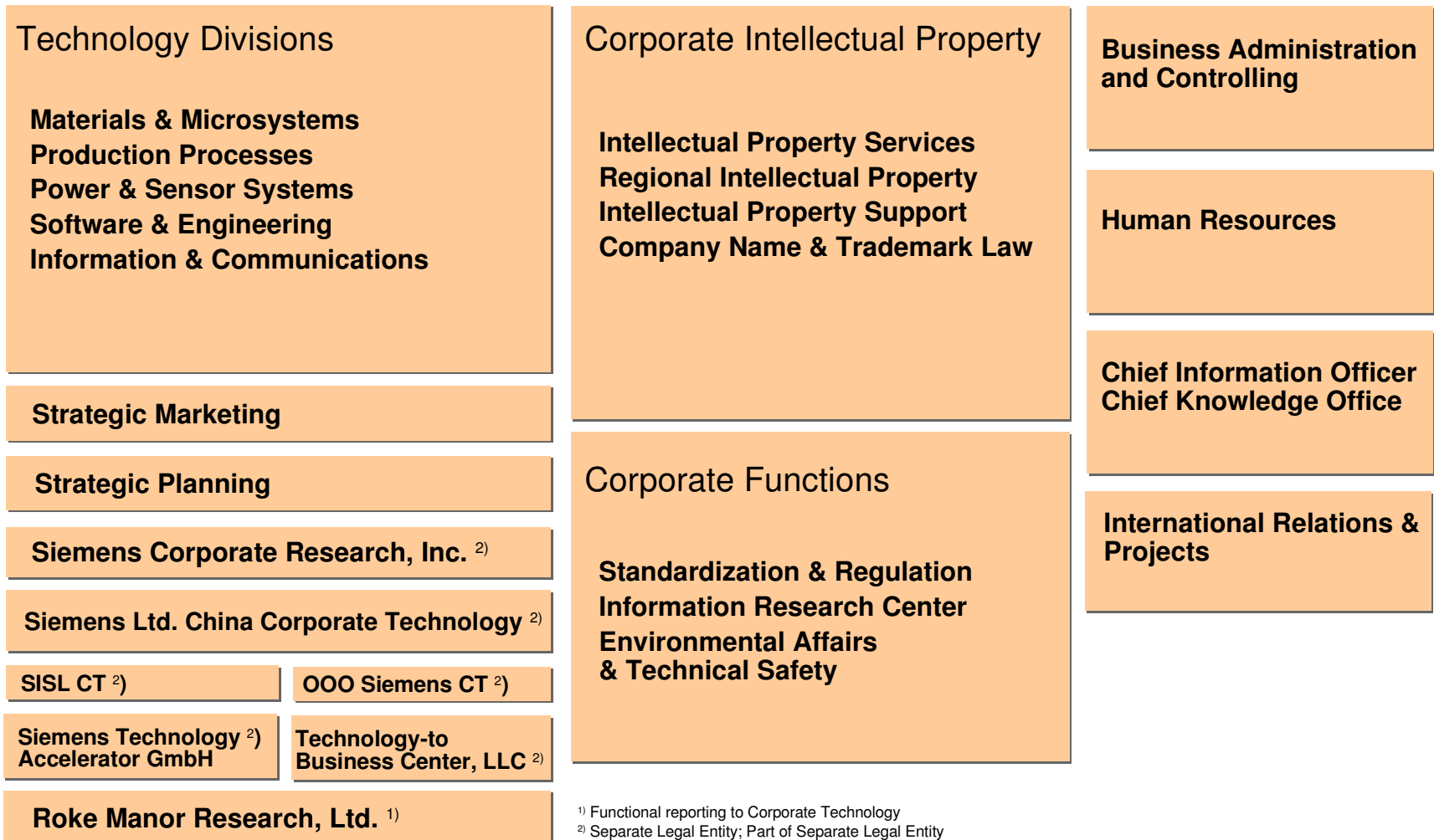
* Partnership with A&D, including spin-in's

CORPORATE TECHNOLOGY

Structure of Corporate Technology (Status: October 1, 2004)

Corporate Technology

CORPORATE TECHNOLOGY



¹⁾ Functional reporting to Corporate Technology
²⁾ Separate Legal Entity; Part of Separate Legal Entity

Corporate Technology: About 1,700 Researchers and Developers Worldwide ...

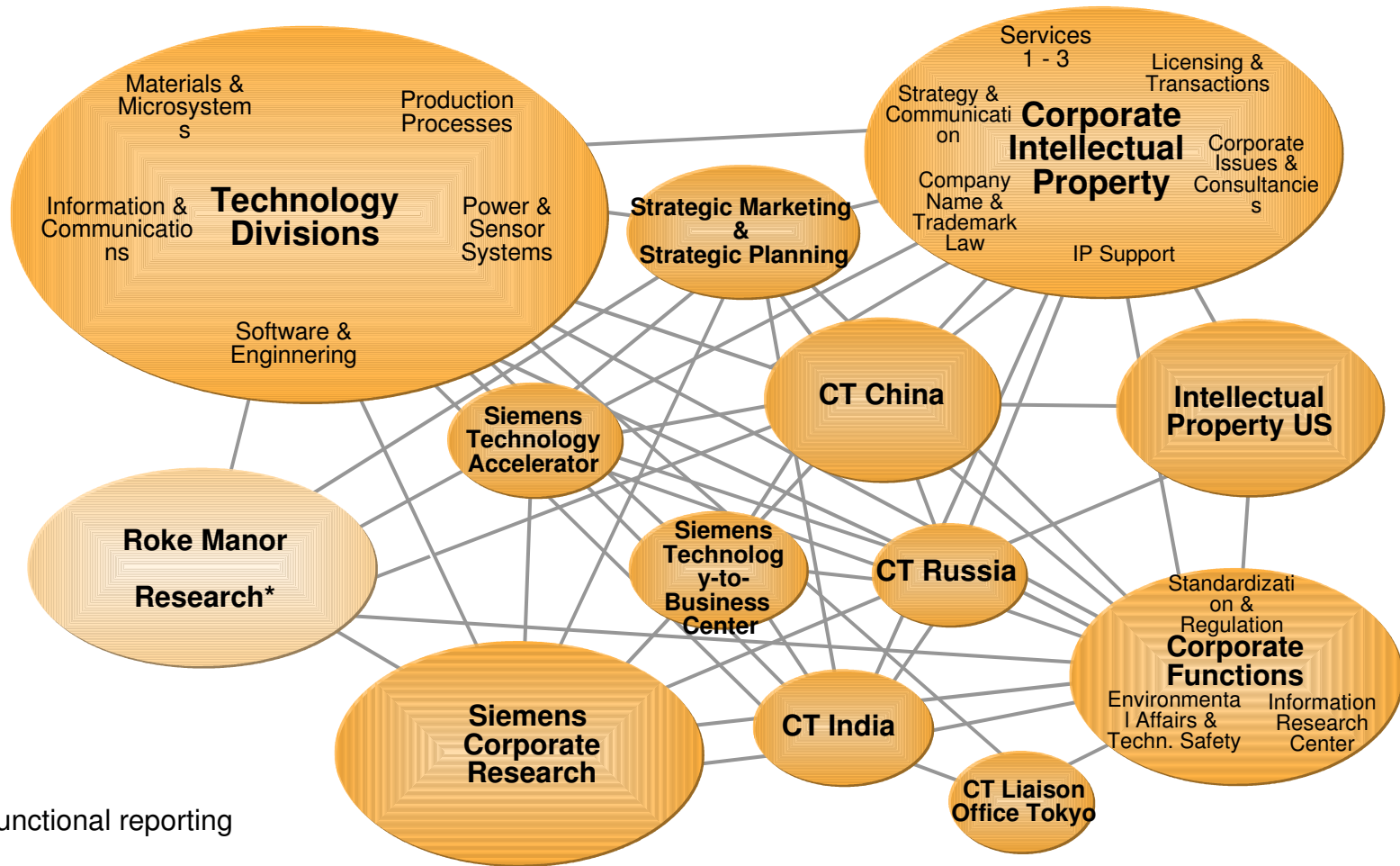


**New Sites planned
in 2005:**

- Shanghai
- St. Petersburg
- Moscow

Corporate Technology: International Network of Competences – Worldwide Partner for Innovations

CORPORATE TECHNOLOGY



* functional reporting



Ultrafast Ceramics for Computed Tomography



Functional Materials for Optoelectronics



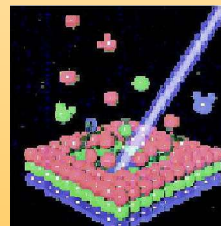
Polymerelectronic



Multichip Module for Radar Evaluation



Eco-Design of Products



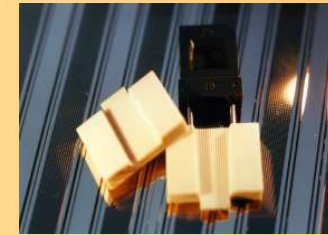
Materials Analysis by Ion Bombardment



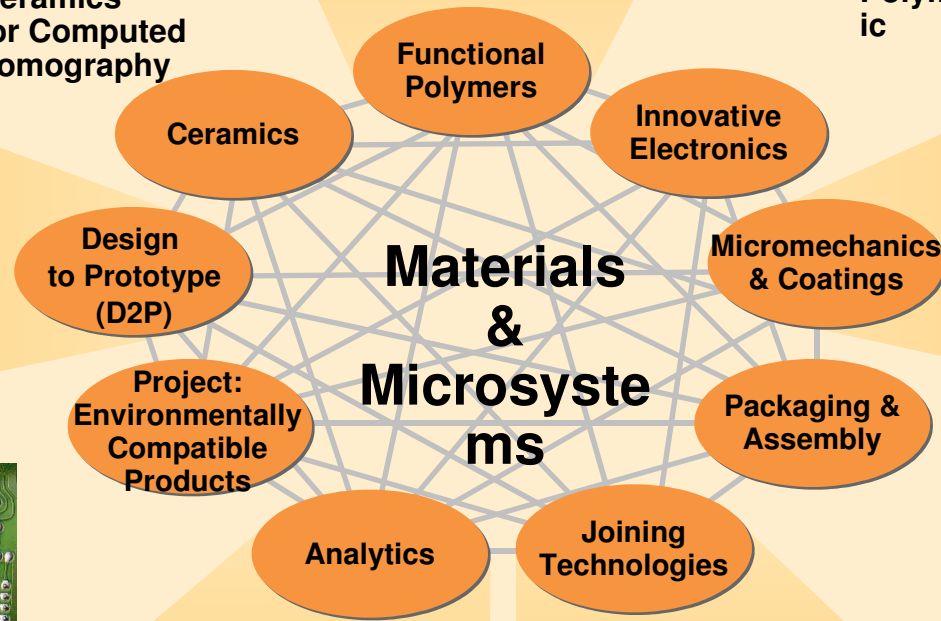
Joining of Plastic Materials



Electronic Assembly

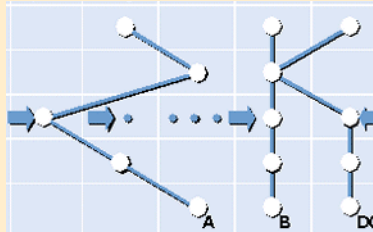


Parallel Optical Link

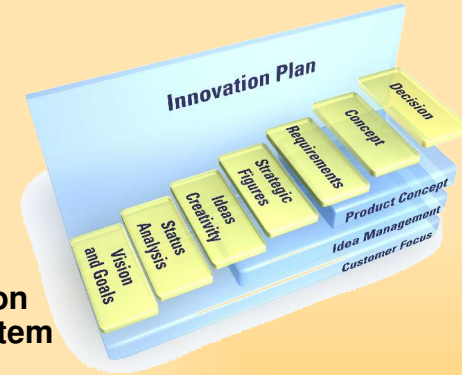




Remote Service Center



Become Front-Runner with holistic Solutions

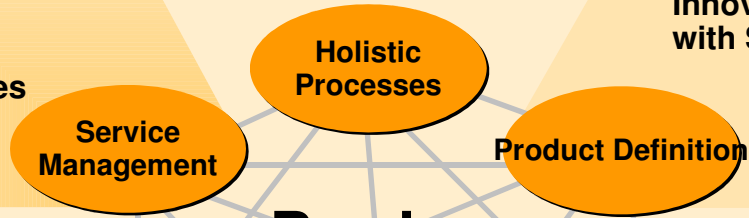


Innovation with System



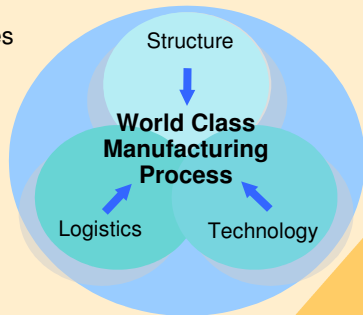
Field Service

Service Strategies and Processes



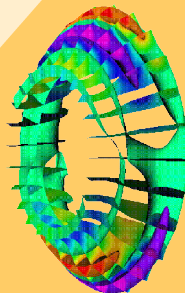
Realized Manufacturing Processes

Innovative Manufacturing Technologies and Processes



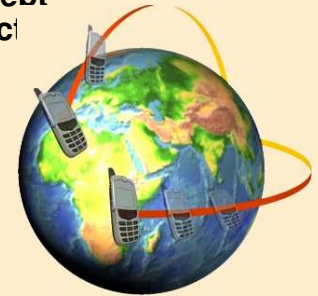
Production Processes
Simulation & Risk Management

Optimized and reliable Products



Risk Analysis of hybrid Systems

From Concept to Product



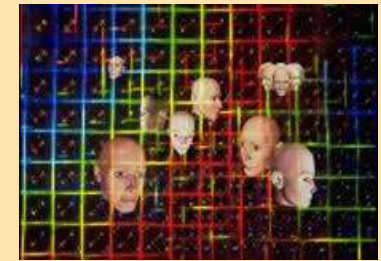
With virtual Products and Processes to shorter Time to Market



Design Award Winner 2000
BEST OF CATEGORY



Protection of critical I&C infrastructure: Hacking prevention, incident handling



Knowledge Management: Processes, Methods and Tools for distributed

User Interface Design Usability Lab



... at Home



... in Public

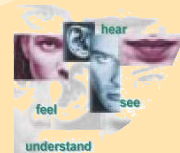


... in Transport



... at Work

... Everywhere



Interaction Technologies
Speech Processing
Gesture Processing
Biometrics
Document Interfaces

We add SENSE to Interaction

Interaction Solutions
Communication
Command & Control
Documentation



Emergency Response Team (CERT)

User Interface Design

Intelligent Autonomous Systems

Interaction Technologies

Information & Communications

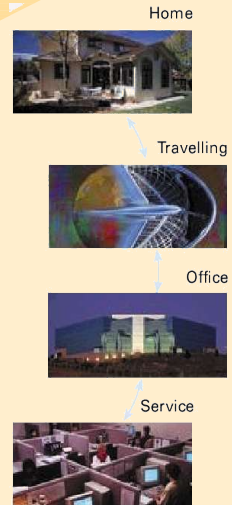
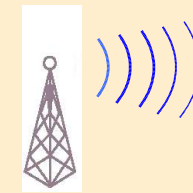
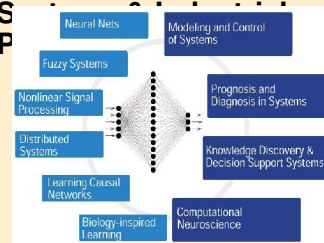
Neural Computation

Knowledge Management & Business Transformation

Networks & Multimedia Communications

Security

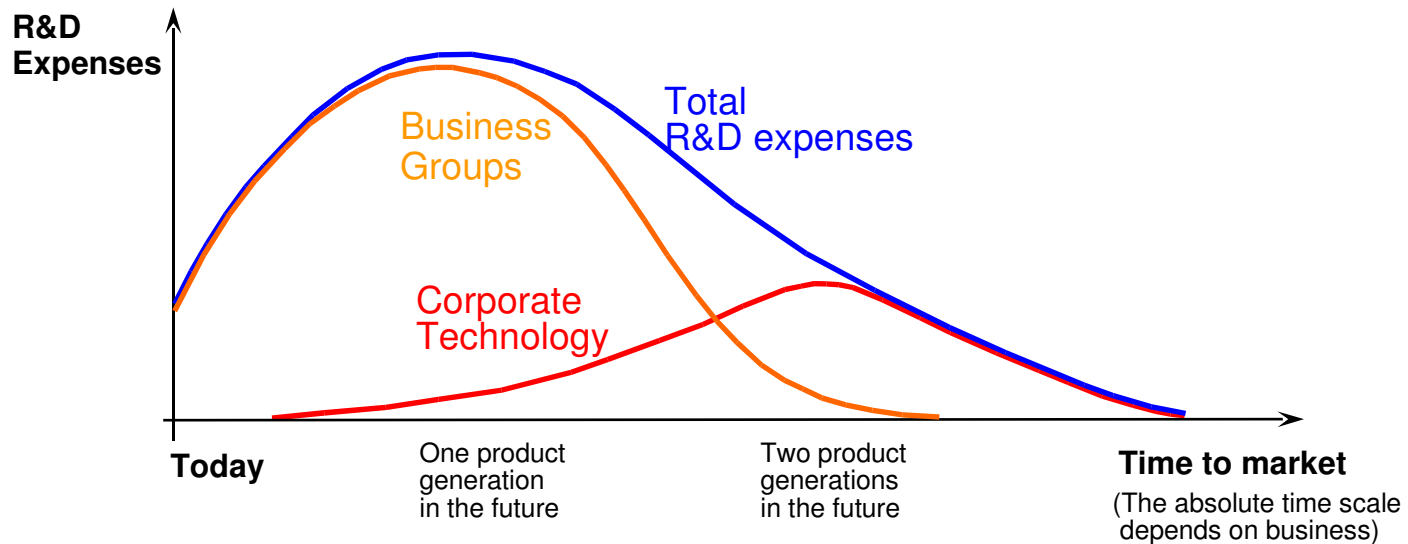
Neuro-Fuzzy Techniques for SP



Cryptographic Algorithms and Security Solutions and Consulting

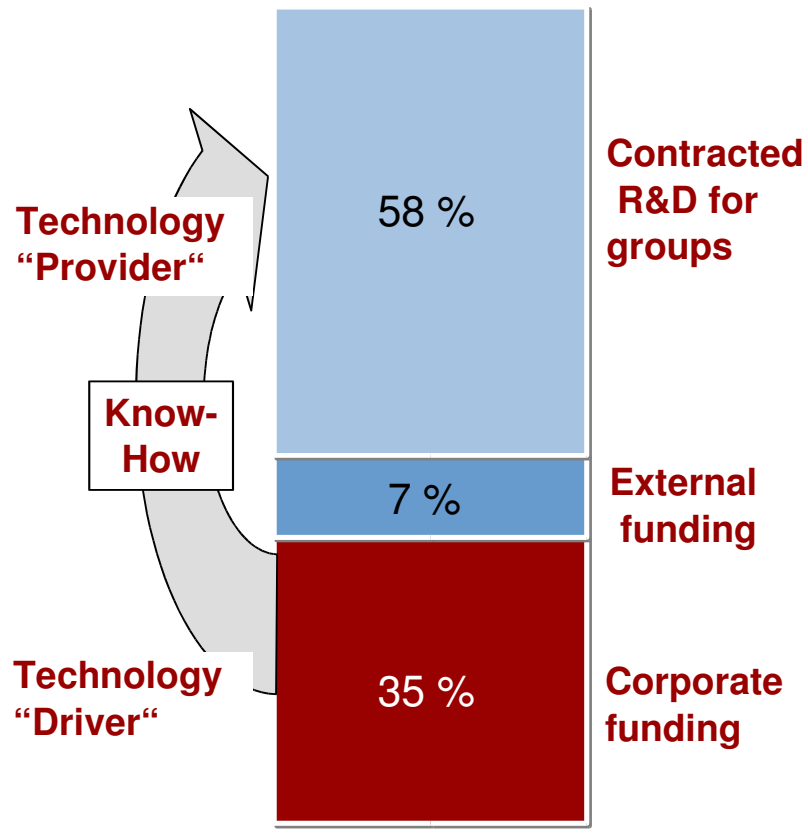


The Time Horizons of the R&D Activities of the Business Groups and of Corporate Technology are Different



A seamless transition from R&D in Corporate Technology to the Business Groups is crucial for our success

CT's Technology Divisions: „Driver“ and „Provider“ of Innovations and Technologies



Strategic principles

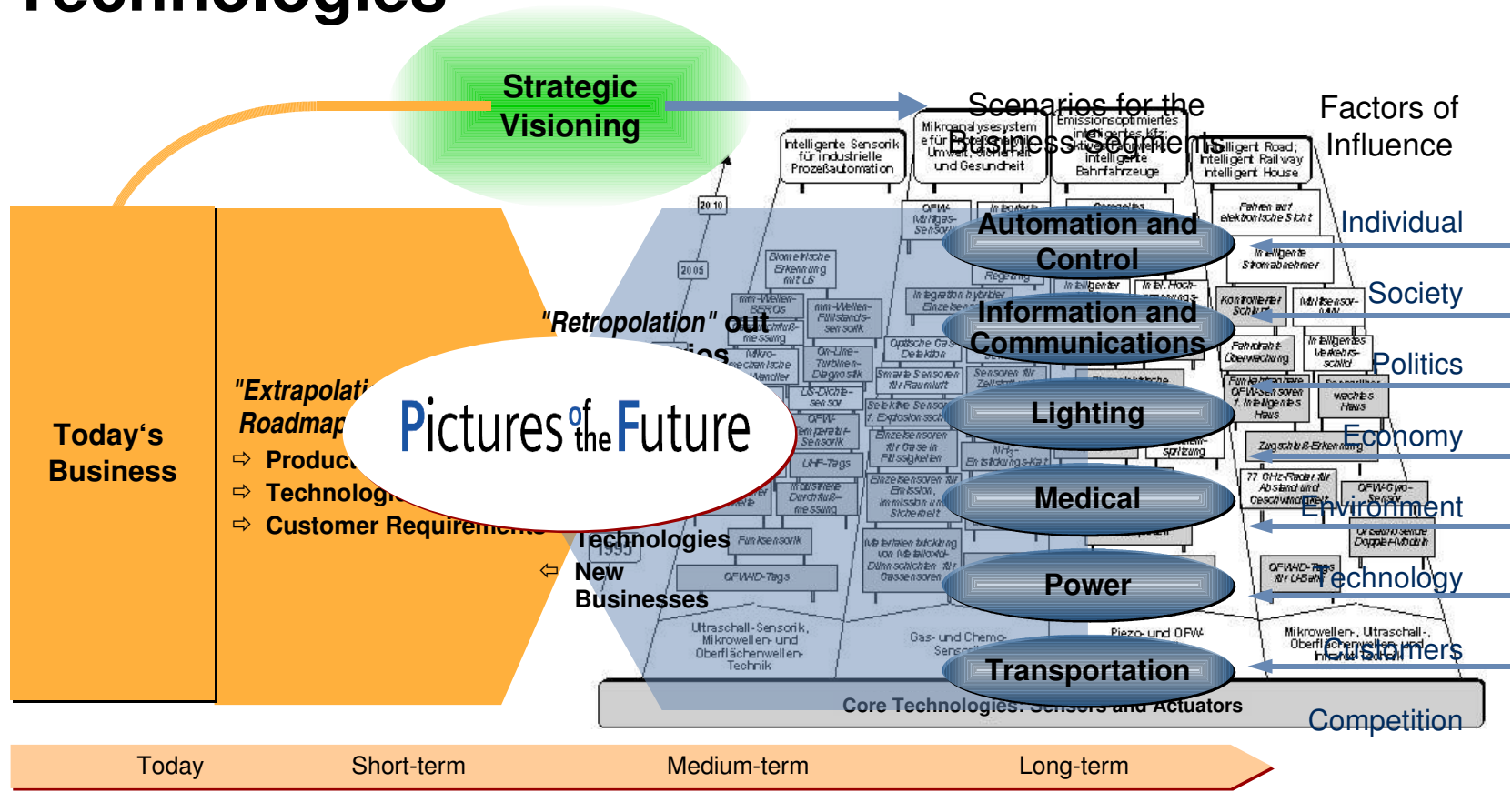
- ▶ Focus & Multiple Impact
- ▶ Key Account Management
- ▶ Networking internally & externally
- ▶ Systematic Technol.&Innov. Planning
- ▶ „Strengthen the strength“
- ▶ Acting as entrepreneurs
- ▶ Decentralization of responsibilities
- ▶ Performance differentiation

Technology-to-Business Center and Siemens Technology Accelerator



- ▶ **Driving innovative technologies for “emerging markets”**
- ▶ **Combining technology and business orientation**
- ▶ **Generating new business through innovations:**
 - | embedded in existing Siemens structures
 - | as start-up foundation
- ▶ **Providing support through “seed money” from the business partners**
- ▶ **Impact on innovation and entrepreneurship culture**

Strategic Planning of Innovations & Technologies



Horizon of time
 (varies significantly in the different business segments)
 The combination of extrapolation and retropotation leads to the
Pictures of the Future

Pictures of the Future All

: Detailed Description of

Relevant Trends of Our Business Segments



Socio-economic trends

- society
- life of work

Market trends

- size / growth
- structure
- geographical

Customer / business trends

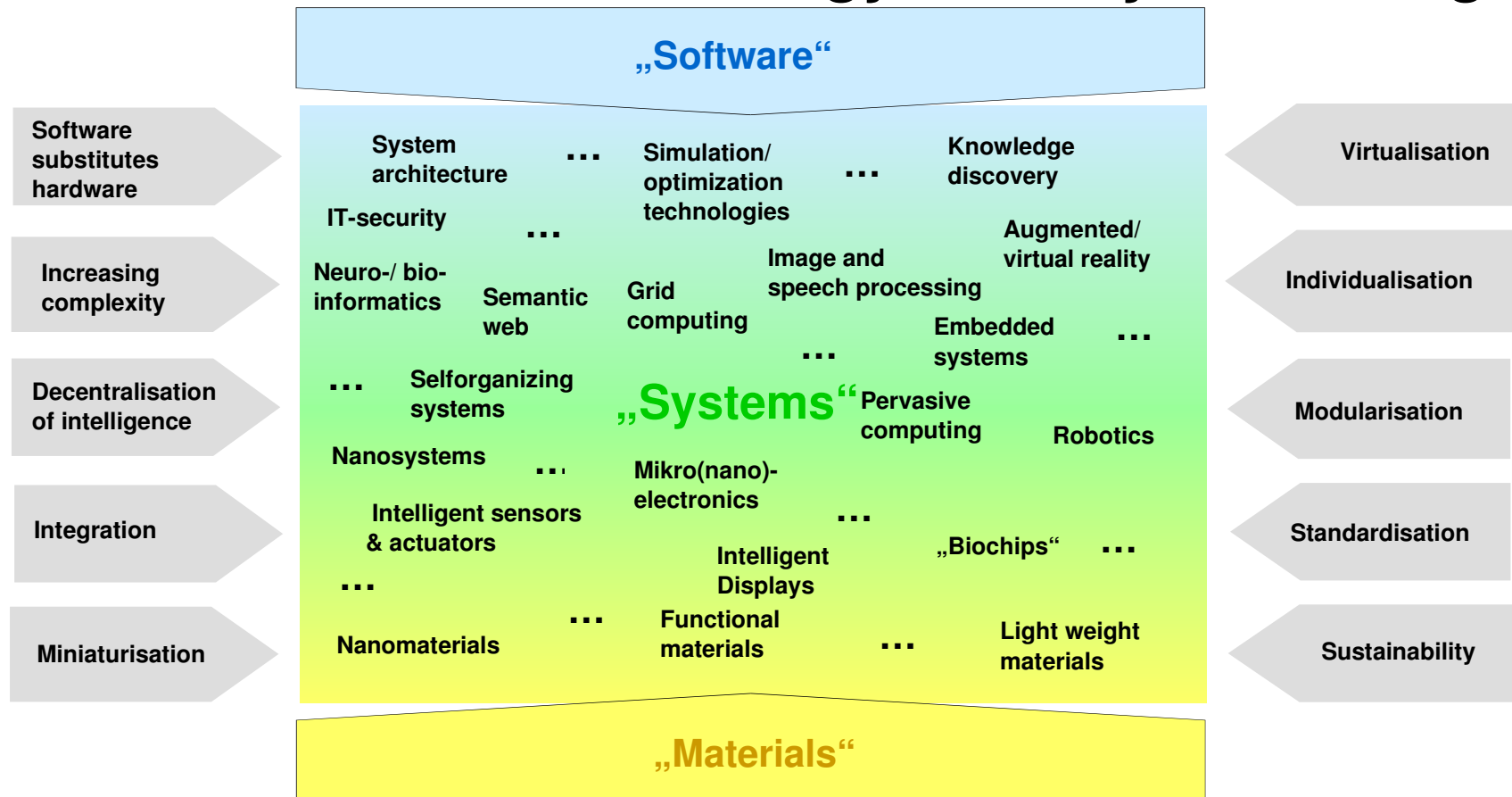
- value chains / networks
- company's structure
- processes

Technological trends

- strategic importance
- multiple impact
- disruptive

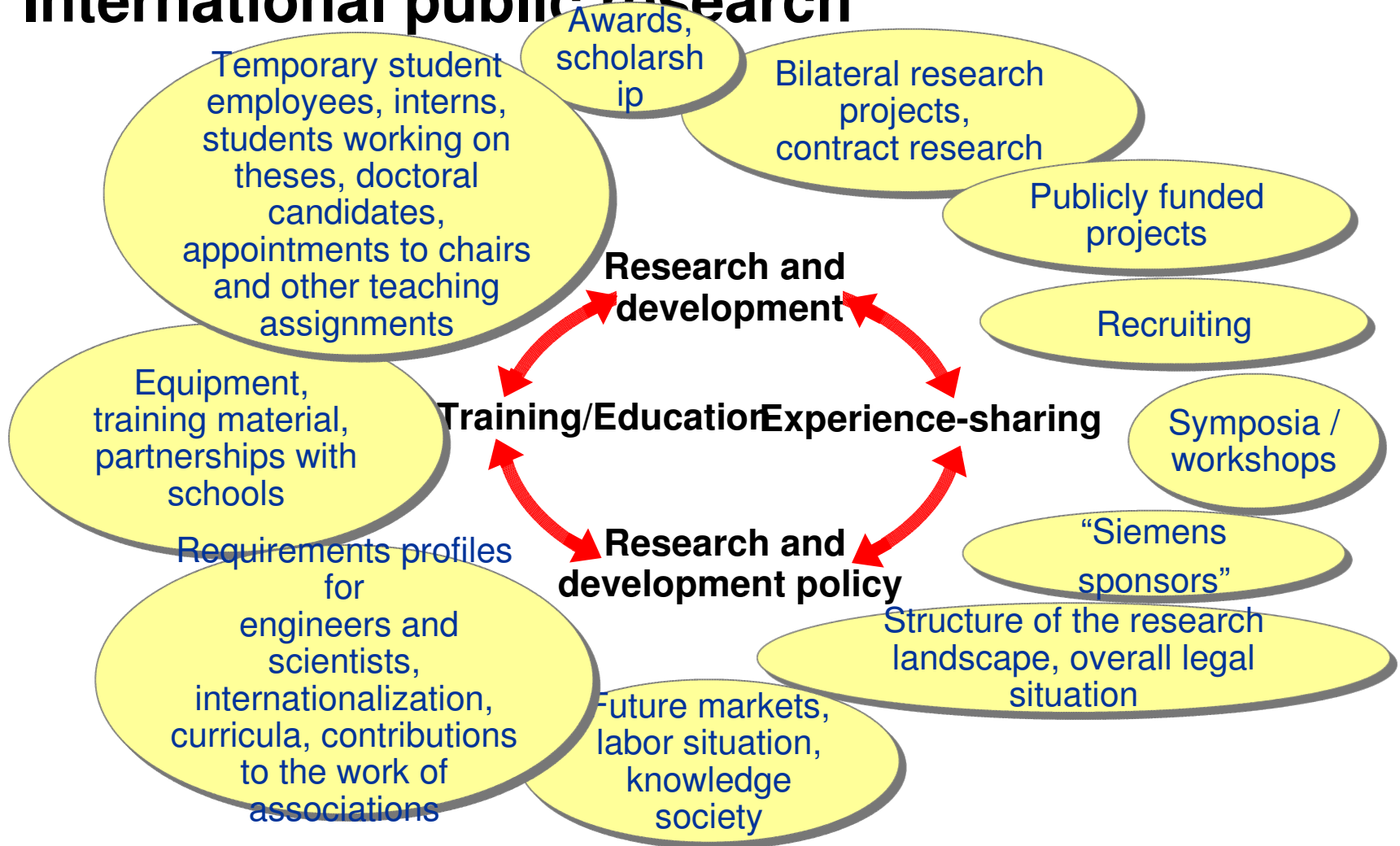
Future Electrical Engineering and Electronics: Main Trends

with Relevance to Technology and Key Technologies



➤ **Core competence: interdisciplinary research and knowledge management**

Aspects for the Cooperation With the International public research



Scientific Cooperation with International Public Research

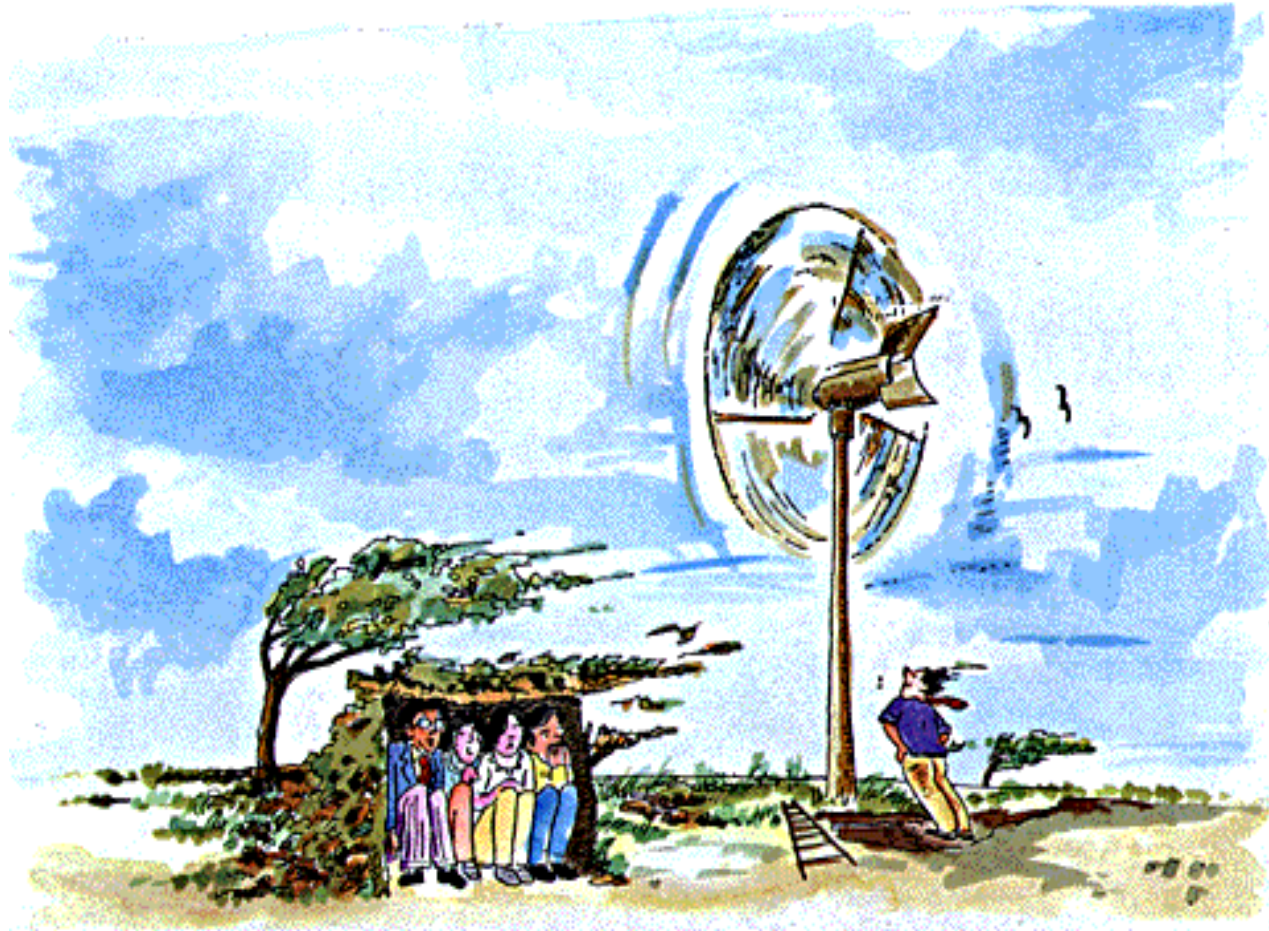
Institutions is of Great Importance for Siemens

- It helps integrating our R&D base in areas in which we do not (yet) have expertise of our own.
- It gets us in touch with the latest results of basic research and likewise supports the understanding of the research partner for modern applications.
- It facilitates recruiting top-notch young talent in the areas of engineering and science.
- It builds up our image by giving us a presence in the “scientific community”.

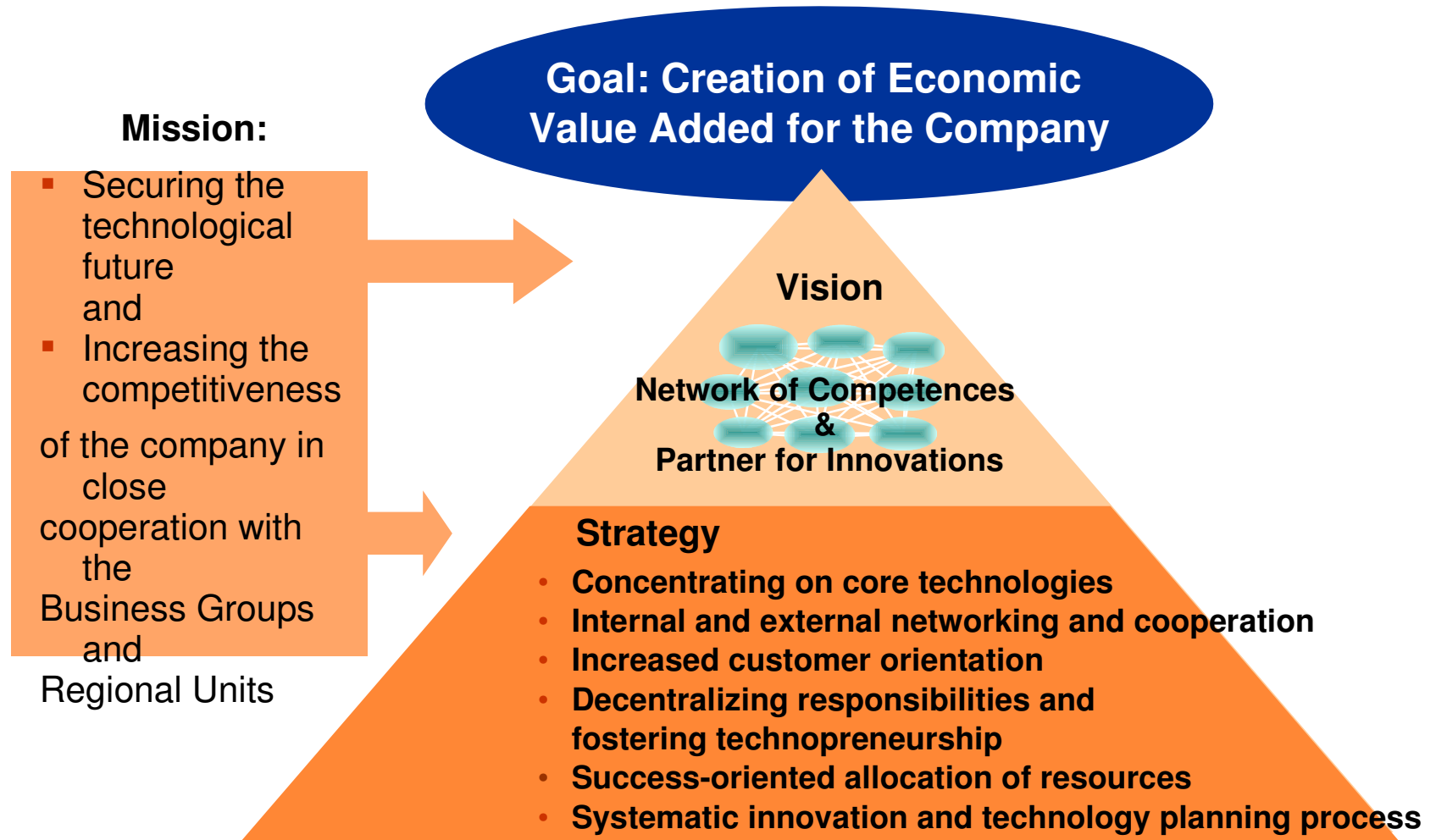
- ▶ We also support university research and education by supplying experts for about 350 teaching and visiting positions.

**When the winds of change are blowing,
some build shelters and some build windmills .**

• •



Siemens Corporate Technology: Mission, Vision and Strategy



The Top Ten Companies in Electrical Engineering and Electronics in Fiscal Year 2004

CORPORATE TECHNOLOGY

