Dancing with the Wolves: Localization of MNC R&D centers in Shanghai

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Who are the wolves?

- The Multinationals?
- The Government?

Outline

- Globalization of R&D
- Case studies of MNC R&D centers in Shanghai
- MNC R&D centers in relations to Shanghai Innovation System
- Technology Spillover in the Localizatoin process

Globalization of Corporate R&D

- Globalization of R&D – 90-95% confined in the Triad (Western Europe, U.S.A & Japan)
- The second tier recipient countries – Ireland, Israel, India, Singapore, China, Taiwan
- Within China : Beijing, Shanghai, Shenzhen, Nanjing, Guangzhou

General Characteristics of MNC R&D centers in Shanghai

- Mostly after 1998
- Size: 80 – 500 engineers
- Investment: 2 millions to 10 millions US$
- Sectors: software, telecommunications, automobile, biotech and machinery
- Leadership: Chinese Returnees from the West

4 Types of MNC R&D center

- Technology-driven
- Market-driven
- Production-driven
- Cost-driven

Technology-driven R&D

- Basic research - > 10 years to commercialize
- Applied research – 3-5 years to commercialize
- >50% engineers has Ph.D. degree

GE Global Research

- Established in 2000.6
- 500 Researchers , High Ratio of Ph.D/Master
- 10% on immediate, less than 1 year; 70% Applied Research 4-5 years; 20% Basic Research >10 years
- Web-based technology
- Collaborate closely with the other two centers, New York and Bangalore

Global Division of Innovation Labor

- "This global project is to lower the noise level and improve the efficiency of Heating Air Ventilation of air conditioning systems. It is led by the US team. The US team's main work is mechanical design. The control algorithm and DSP coding are carried out by the Shanghai team, and the Indian team do some of the sub-testing of the project."

Motorola China Research Center

- Established in 2000
- 5th overseas research Center
- 85% of employees holding Ph.D. degrees
- Mid-to-long term on human-machine interface technologies, embedded Chinese recognition, speech generation, Chinese natural language processing, Chinese character and multi-modal communication over China 3G systems.

Market-driven R&D

- New Product Innovation
- Local Market first, regional and global market second
- Close collaboration between research, sales and production
- Input from local vendors and clients

HP Software Solution Center

- Established in October 2002
- 5th Software Solution Center
- 200 engineers, 1500 in 5 years
- Designed by the Indian R&D manager
- Chinese market and Eastern Asian market
- Close relations between software engineers and sales team

Production driven R&D

- Process & production innovation to speed up the production to market time
- Increasing engineering skills of the branch factories
- The concentration of IT manufacturers and suppliers in the late 1980s.

Lucent Technology Optical Network (LTON)

- Established in 1999
- Lead by Chinese returnees from the U.S.
- Grow to 300 engineers in a year
- Produce the first product in less than 6 months
- Design, customize and testing optical network product

Cost-driven R&D

- Subcontract labor intensive parts of a global R&D project.
- Replace an expensive R&D division in the home country.
- Technical support for local and global vendors and clients.
- It requires engineers with bachelor degree and English proficiency

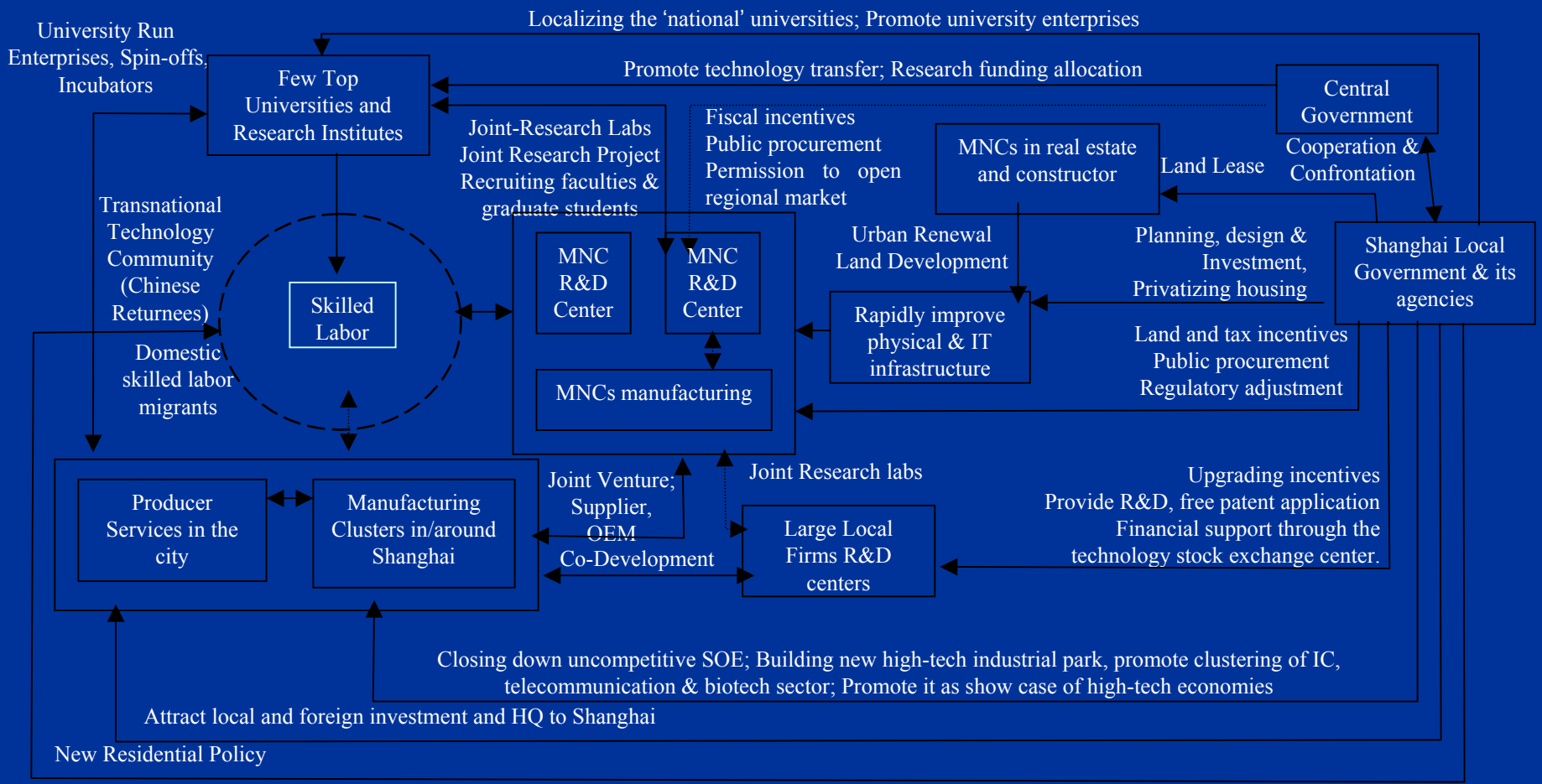
Intel Shanghai Software Center

- Established in 1993
- 200 engineers
- Supporting vendors working on Intel architecture platform
- Rapid expansion of Linux research team

Ericsson Technical Support Center

- Established in 1997
- Provide software development and technical support for their telecommunication clients in Europe

MNC R&D Centers in relations to Shanghai's innovation system



Skilled Labor Supply

- Expansion of the Engineering Schools
- Expansion of graduate program
- New Shanghai Residency (Shanghai Green Card)
- Incentives to attract Chinese returnees
- Incentives for MNCs to set up training facilities and programs.
- Expansion of MBA program

Technology Spillover Effects

- Labor Mobility – individual leaving the center for local firms
- Spin-off – research teams the center to create own design house
- Demonstration Effects – Large local firms increase in R&D investment
- MNC-University Joint Research Labs – ignite a new research field in the university

Bell Labs joint research labs in Jiaotong University

- "With around 1 million RMP research grant, we can support 4-5 faculties and more than 20 Masters and Ph.D. students. Without this joint-research lab, we will never even start a research team on phonetics [part of the speech research]. We are doing pretty well considering that we started from scratch." by director of Joint-research labs in 2002.

The Negative Effects

- Local Firms lost talents to the MNCs.
- Lock-in – Public Labs are privatized by the MNCs, focus on MNC research agenda only

- **"Engineers often choose platforms they know well, especially those systems they learned in college."**