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# Environmentally Friendly SCs



The Balance of Nature

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# Compete on Environment

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- ◆ Environmental excellence for competition in addition to price, quality, delivery time.
- ◆ Pollution is a waste. Avoiding waste must increase profitability.

# Environment in SC development

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- ◆ Decisions lead to wastes
  - Where to buy from, what to buy, how to produce
- ◆ According to ISO 14000 companies can be held accountable for wastes their decisions create
- ◆ Tradeoff between environmental responsibility and traditional competition metrics
- ◆ Environmentally Conscious SCM = ECSCM

# ECSCM

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- ◆ Environmentally conscious manufacturing
  - Sony’s “care for the environment” program
    - » Reduced material use, Energy savings, Shorter product disassembly times, Increased recyclability, Reduced use of harmful substances
    - » Keeps a database of all environmentally sensitive materials used in production
- ◆ Accounting and Goal setting for the environment
  - Measuring the benefit of environmentally sound management
  - A Korean consumer products company, received \$30M fine for non-compliance, is implementing an environmental program with quantitative goals
  - Herman Miller, a furniture manufacturer, monitors gallons of oil used, number of trees cut, waste of fabric, foam, leather, paper and polyvinyl film.

# ECSCM

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- ◆ Environmentally responsible product design
  - Honda and Toyota. Electric powered cars.
    - » Hybrid cars, 40 mpg
    - » Cars have battery in the back seat
    - » Car uses the kinetic energy to charge batteries when brakes are applied
  - A high-end furniture manufacturer worked with its paint supplier to eliminate solvent-based painting. They developed water-based and powder-based paints, which requires no solvents for cleanup.

# Environmentally Friendly Sourcing

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- ◆ Examine environmentally sensitive components
- ◆ List component suppliers
  - Environmental record, previous fines, databases
  - Chrysler, Quad Graphics, Baxter and At&T have a database of “green” measures for their major suppliers
- ◆ Integrate “green” measures into strategies ?
  - Dow corporation realized that environmental hazards happen not in manufacture but in transportation. It spent over \$800 M to educate drivers about emergencies.
  - Transportation of hazardous materials (gasses, explosives)
    - » Away from public places, as fast as possible
    - » HazMat transportation received big attention after 9/11

# Environmentally Friendly Sourcing

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- ◆ Integrate measures into strategy?
  - Herman Miller works with only suppliers who have forest sustainment programs
    - » Forests are divided into lots
    - » Lots are cut cyclically. Cycle may repeat every 50 years: the same lot is cut every 50 years.
- ◆ Continue to monitor suppliers

# Reverse Logistics

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- ◆ Supply Chains are becoming Supply Cycles
  - Instead of selling goods rent/lease them
  - At the end of the lease term, the manufacturer is responsible to collect goods
    - » Investigated by car manufacturers
    - » European companies accept used packaging at the store
  - Manufacturer can easily recycle used goods
  - Recycling is a profitable business, one with minimum material costs

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# Global Supply Chains

# Wal-Mart in South America

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## ◆ Product differences

- Are there global products?
  - » Nike sport shoes, NY Deli sandwich, Supply Chain book?
- Is globalization a trend?
- What is the balance between local tastes, global products?

## ◆ Dealing with established competition, aggressive competitors

## ◆ Developing local market knowledge

# Wal-Mart in South America

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- ◆ Lack of critical mass
- ◆ Different infrastructure/ business environment
  - distribution problems
  - different equipment standards
  - cultural differences
- ◆ Issues with foreign governments
- ◆ Deep pockets for success
  - Success may not come at once

# Increasing Globalization

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- ◆ 1/5 of output of US firms produced abroad
- ◆ US Companies hold \$500 Billion in foreign asset stocks (7% annual growth)
- ◆ 1/4 of US imports between foreign affiliates and US parent companies
- ◆ Over half of US companies increased the number of countries in which they operate (late 80's to early 90's)
- ◆ The weight of US economy in world economy

# Forces Driving Globalization

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- ◆ Global Market Forces
- ◆ Technological Forces
- ◆ Global Cost Forces
- ◆ Political and Economic Forces

# Global Market Forces

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- ◆ Foreign competition in local markets
- ◆ Growth in foreign demand
  - Domestic consumption from 40% to <30% of world consumption since 1970
  - Foreign sales fuel growth
- ◆ Global presence as a risk management tool
- ◆ Presence in state-of-the-art markets
  - Japan -- consumer electronics
  - Germany -- machine tools
  - US: SUV's

# Technological Forces

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- ◆ Diffusion of knowledge
  - Many high tech components developed overseas
  - Need close relationships with foreign suppliers
  - For example, Canon has 80% of laser engines
- ◆ Technology sharing/collaborations
  - Access to technology/markets
- ◆ Global location of R&D facilities
  - Close to production (as cycles get shorter)
  - Close to expertise (Indian programmers?)

# Global Cost Forces

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## ◆ Low labor cost

- Diminishing importance (Costs underestimated, benefits overestimated)

## ◆ Other cost priorities

- Integrated supplier infrastructure
- Skilled labor

## ◆ Capital intensive facilities

- tax breaks
- joint ventures
- price breaks
- cost sharing

# Political and Economic Forces

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- ◆ Exchange rate fluctuations and operating flexibility
  - Euro vs. Dollar
- ◆ Regional trade agreements (EU, NAFTA, Pacific Rim)
  - Being in a country in one of these region is valuable for producers
  - Implications for supply network design
  - Reevaluation of foreign facilities (Production processes designed to avoid tariffs)

# Political and Economic Forces

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## ◆ Trade protection mechanisms

- Tariffs
- Quotas
  - » “Cotton ... quota is tightening up worldwide. We will probably be in an embargo situation in Bangladesh by August, with Indonesia, and Malaysia right behind. This will put additional pressure on China. Expect prices to escalate through the year. ... We may need to make some [purchase] commitments earlier than usual.” A JCPenny memo in April 2002.
- Voluntary import restrictions
  - » Japanese consumers for US autos
- Local content requirements
  - » Japanese automakers in the EU
  - » TI/Intel factories in EU
- Health/environmental regulations
  - » Japanese refused to import US skis for many years (different snow)
- Government procurement policies
  - » Up to 50% advantage for American companies on US Defense contracts

# Added Complexities

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- ◆ Substantial geographic distances
- ◆ Added forecasting difficulties
- ◆ Infrastructural Inadequacies
  - Worker skill, performance expectations
  - Supplier availability, reliability, contracts
  - Lack of local technologies
  - Inadequacies in transportation, communications infrastructure

# Added Complexities

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- ◆ Exchange rate uncertainties
- ◆ Cultural differences
  - Accepted partnerships styles
  - Value of punctuality
  - Culture
    - » Finish make deals in sauna
    - » Japanese tend to do business with their acquaintances
  - Language
    - » Nova car in Spanish speaking countries
- ◆ Political instability
  - tax rates
  - government control
- ◆ Added competition “at home”

# Pizza Hut Moscow

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- ◆ Moscow - May 1991
- ◆ Two Pizza Huts to open in Moscow -- “Toe in the water for Western business”
- ◆ Pizza Hut - 49% partner in joint venture
- ◆ *Key Issue*: Foreign companies cannot repatriate their earnings (ruble earnings could not be converted to hard currencies)

# Pizza Hut Moscow

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## ◆ Difficulties

- Communication was difficult
- Construction difficult due to lack of supplies
  - » Even nuts and bolts needed to be imported
- Difficult to get suppliers
  - » 70% USSR sourcing desired to ensure long-term viability
  - » Difficulty with winter shortages
  - » Mozzarella unavailable
    - ◆ Couldn't be made due to poor quality cows
    - ◆ Cows had to be raised differently

# Pizza Hut Moscow

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## ◆ Difficulties

- Quality, reliability unavailable from meat plants
- Refrigerated trucks unavailable

## ◆ Two restaurants set up: **ruble restaurant and hard currency restaurant**

- Hard currency restaurant more expensive for same items, better service
- Hedge against exchange rate risk, get hard currency

## ◆ Human Resources

- Extremely well educated staff
- Unfamiliar with western concepts of quality
- Incentive systems critical
- Two separate staffs - more qualified in hard currency restaurant

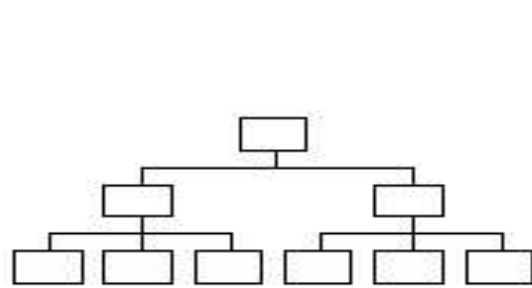
# Pizza Hut Moscow

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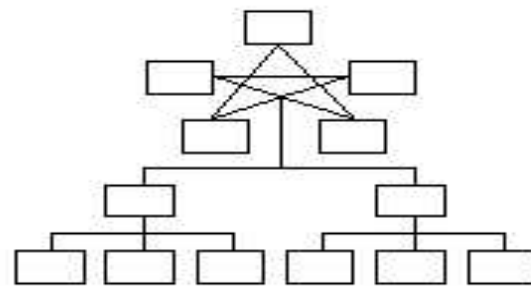
## ◆ Initial operations

- Government randomly shut down the facilities several times
- Prices changed rapidly and without warning
- Even with relatively low employee turnover -- one new employee a day
- Incentive programs didn't work
  - » Program started with bonus, decreased if goals not met
  - » Salary floor was higher than typical salary
- Absenteeism is a problem

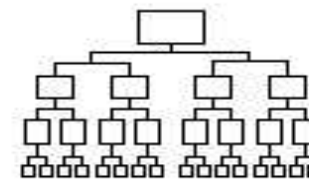
# ORGANIZATION SCHEMES



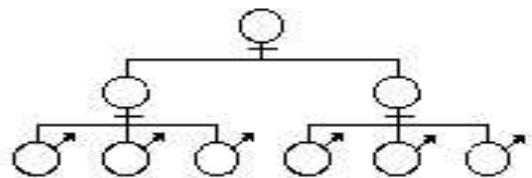
**TRADITIONAL**



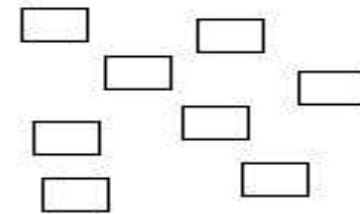
**RUSSIA**



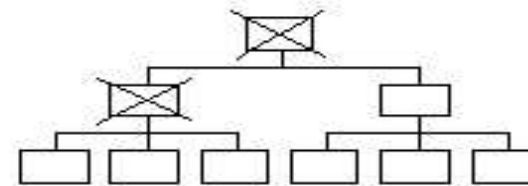
**POLAND**



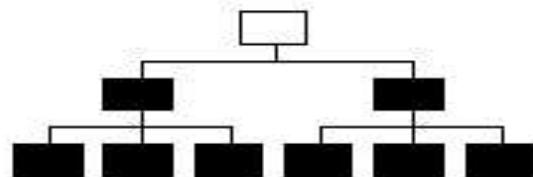
**WOMAN'S ORGANIZATION**



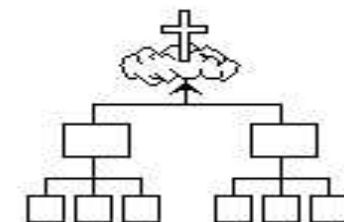
**ARABIAN COUNTRIES**



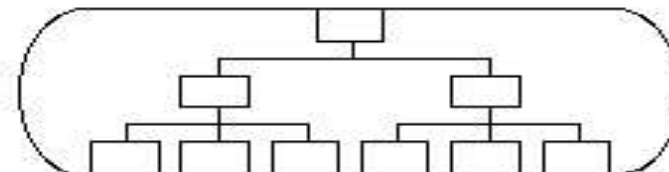
**LATIN AMERICA**



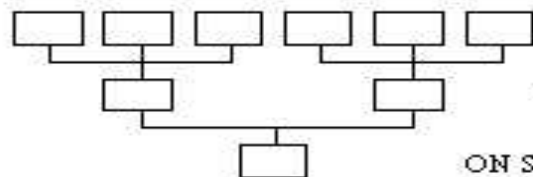
**SOUTH AFRICA**



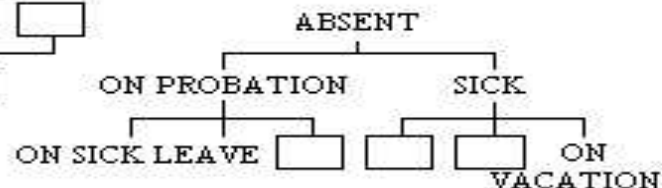
**VATICAN**



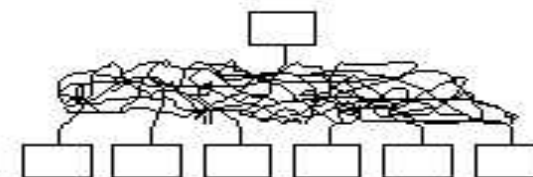
**U.S.A.**



**CHINA**



**FRANCE**



**TURKEY**

# Exchange Rates

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- ◆ Transaction Exposure
  - The results of transactions denominated in foreign currencies change (cash deposits, debt obligations)
- ◆ Translation Exposure
  - Result of translating foreign financial statements into the currency of the parent company
- ◆ Financial instruments used to hedge these

# Operating Exposure

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- ◆ Changes a firm's competitive position and future cash flows
- ◆ In the short run, changes in currency rates don't necessarily reflect changes in inflation rates
- ◆ Regional operations become relatively more or less expensive

# Effect of Operating Exposure

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- ◆ Depends on
  - Customer reactions
  - Competitor reactions
    - » market share
    - » profit
  - Supplier reactions

# Examples

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- ◆ Company which manufactures and sells exclusively domestically
- ◆ Company which imports and sells domestically
- ◆ Company which manufactures and sells globally

# Operational Strategies

To Address These Risks

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## ◆ Speculative Strategy

- Bet on a single scenario
- Japanese auto manufacturing in Japan

## ◆ Hedged Strategy

- Losses in one area offset by gains in another
- VW in US, Brazil, Mexico, Germany

# Operational Flexibility

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- ◆ Flexibility to take advantages of operational exposure
- ◆ Requires a flexible supply chain
  - multiple suppliers
  - flexible facilities
  - excess capacity
  - various distribution channels
- ◆ Can be expensive to implement
  - coordination mechanisms
  - capital investments
  - loss of economies of scale

# Operational Flexibility

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- ◆ Production/sourcing shifts are key to strategy
  - This has many switching/startup costs
- ◆ Distribution channels must be flexibility so sourcing is invisible to end customers
- ◆ Other benefits include:
  - improved information availability
  - global coordination
  - political leverage

# Example

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## ◆ Becton Dickinson

- Global network for manufacturing disposable syringes
- Plants in US, Ireland, Mexico, Brazil
- When Peso devalued, shifted production to Mexico

## BMW -- Globalizing Manufacturing Operations

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- ◆ 1994 - Majority of BMW manufacturing in Germany
  - Some “kit factories” in Far East
- ◆ Disappointing market share in 1994
- ◆ US Problems
  - 1986-1989 Sales in US fell 65%
  - Gas guzzler tax
  - Luxury tax
  - Japanese Competition
    - » Dramatically Cheaper

# BMW -- Globalizing Manufacturing Operations

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## ◆ US Problems, Continued

- High German labor costs
  - » 45% Higher than US
  - » Longer vacations
  - » Higher Absenteeism
- Appreciating mark
- Production costs in Germany 30% Higher than US

## ◆ Solution - US Plant

- Enables operational flexibility

# BMW -- Globalizing Manufacturing Operations

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## ◆ Additional Issues

- Tax breaks in South Carolina
- Opportunity to build new, flexible plant
  - » New labor practices
  - » New culture
  - » New technology
- To ensure quality, much training

## ◆ Building a Global Supplier Network

- Local supplier base key to success
- Requires careful selection, training
- Value of local suppliers vs. firms which could supply all BMW plants