

Role of Services in Integrating Production Networks

Paper Presented at the
ARTNeT Conference on
Empirical and Policy
Issues of Integration in
Asia and the Pacific
November 2, 2012
Hotel Galadari, Colombo,
Sri Lanka

Debdeep De

Lecturer

Jaypee Business School

Noida, INDIA

debdeepde@gmail.com

Biswajit Nag

Associate Professor

Indian Institute of Foreign Trade

New Delhi, INDIA

biswajit@iift.ac.in

Objective

- To understand the international production networks and inter-relationship with Global value chain.
- To understand service linked characteristics of the IPN on select sectors.
- To design service linked IPN cooperation which will facilitate value co-creation crucial to achieve the best possible outcome from free trade regime for deeper integration.

Proposed Plan for the Paper

- International Production Network (IPN)
- IPN and Value chain
- Sectoral Overview of IPN: The Asian Experience
- Role of Service Linkages in IPN
- Integration of Service Linkages: Need for Value Co-creation
- Services Linked IPN Cooperation

What is Production Network?

- “A set of **inter-firm relationships** that bind a group of firms into a larger economic unit”- based on supply chains that procure parts /components from a large no. of firms located in different countries for a final assembly in a separate location as an export base.
- IPN/supply chain in electronics & cars for parts & components (intermediate groups) required in the assembly process
- The **“fragmentation” of production**— scattering of parts of production process across different countries—is a major contributor to regional/global) economic integration because it stimulates FDI & intensification of trade in intermediate goods.
- In East Asia, IPN is characterized by different firms specialize in a certain production process which is located in various locations based on their comparative advantage.

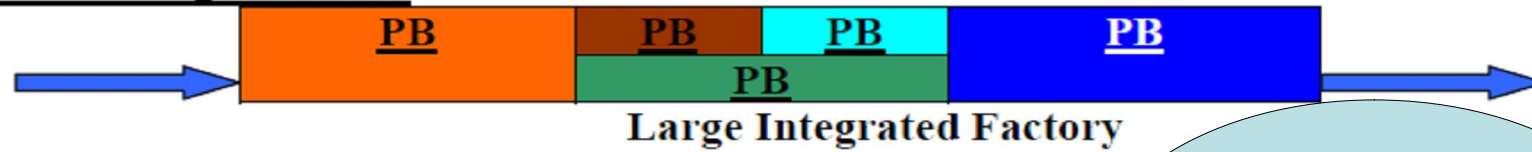
Source: Sturgeon, Timothy. (2001).

Mechanics of IPN

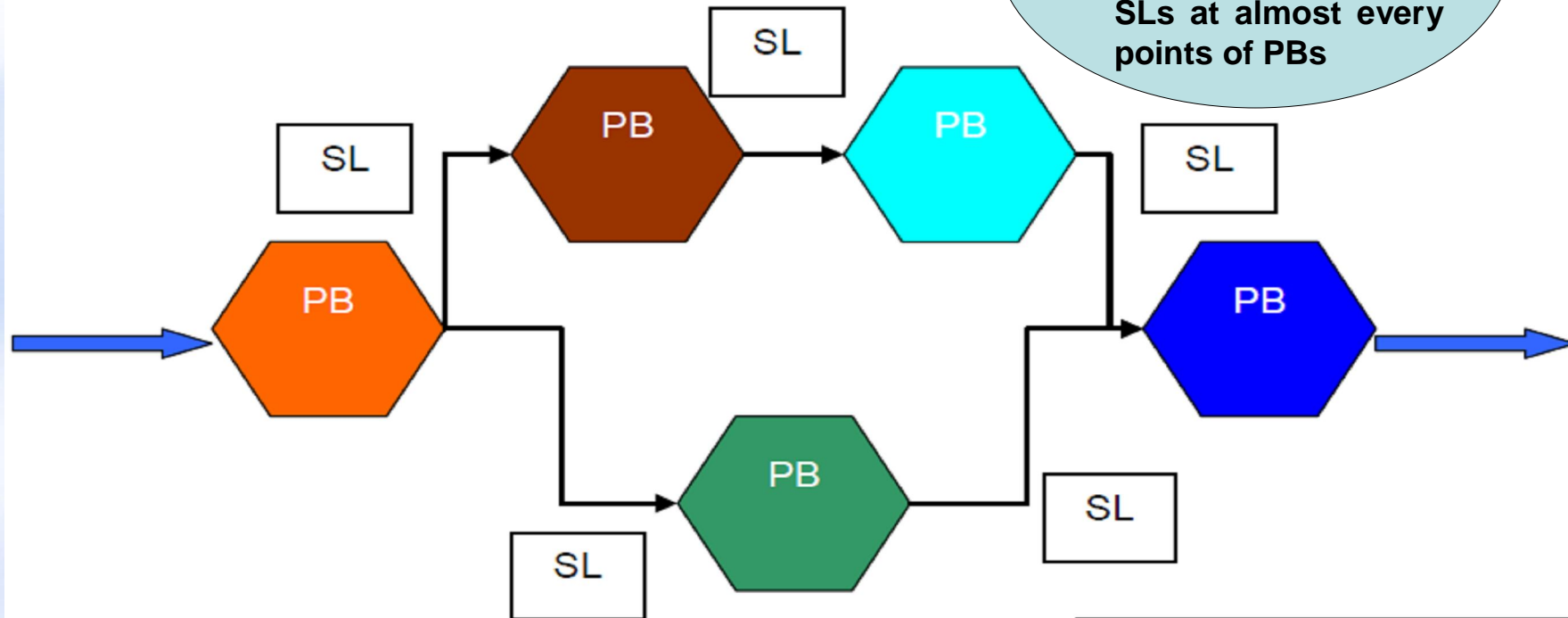
- The first line of thought is the **fragmentation theory**. Deardorff (2001) defines fragmentation as “the splitting of a production process into two or more steps that can be undertaken in different locations but that lead to the same final product”. Fragmentation becomes economical when the cost of service links (SL) connecting production blocks (PB) is low enough. The SL cost includes transport costs, telecommunication costs, and various coordination costs between PBs. SL cost heavily depends on the nature of technology in each industry.
- The second line of thought is the **agglomeration theory**. This is an extension of international trade theory with external economies of scale while introducing the concept of “space” from city planning and other academic fields
- The third line of thought is the **internalization theory** of corporate firms. A firm typically does not conduct everything from upstream to downstream. It sets its upstream-side boundary by purchasing materials or parts from other firms and determines its downstream-side boundary by selling their products to other firms or consumers. Such a boundary setting decision is here called an internalization decision. In addition, a firm cuts its internalized activities into thin slices and places these slices at appropriate places. This is called a “location decision.”

The Fragmentation

Before Fragmentation



After Fragmentation

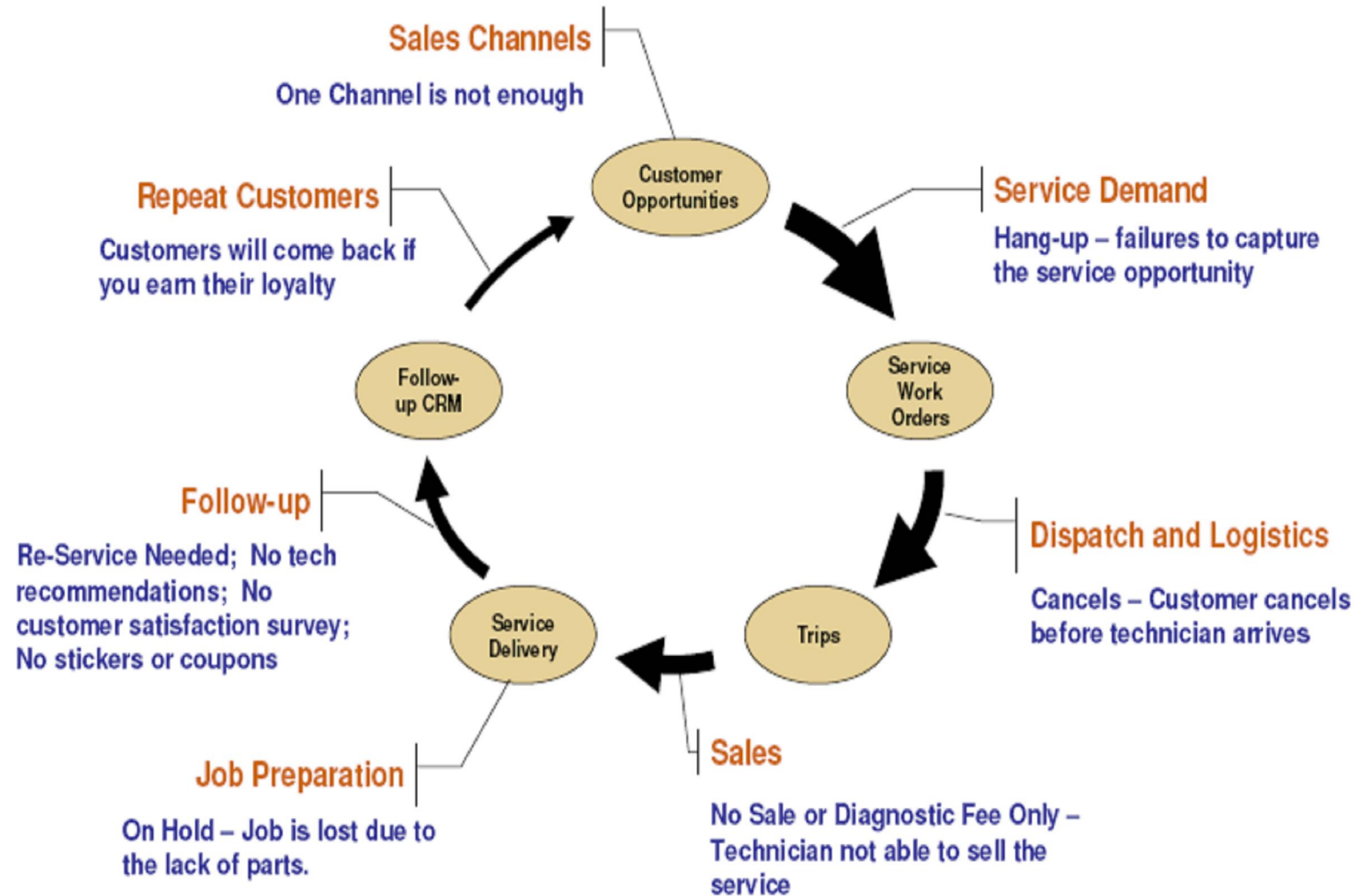


The linkages are not really one way but it has become both ways riddled with SLs at almost every points of PBs

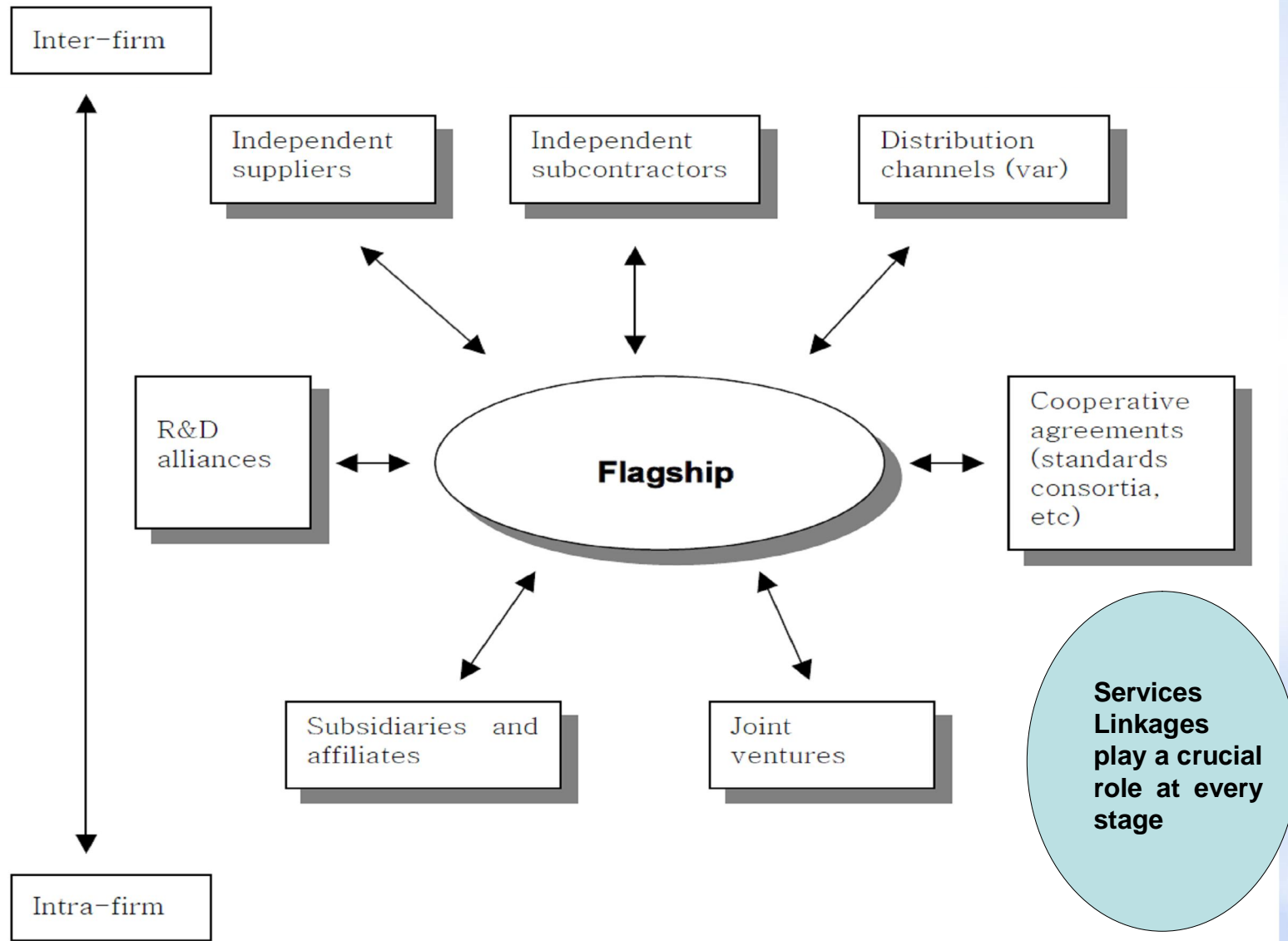
PB: production blocks
SL: service links

Source: Kimura, F. (2006)

The Network of Services Chain



Understanding the Linkages in Production Network



Source: Dieter Ernst And Linsu Kim (2001)

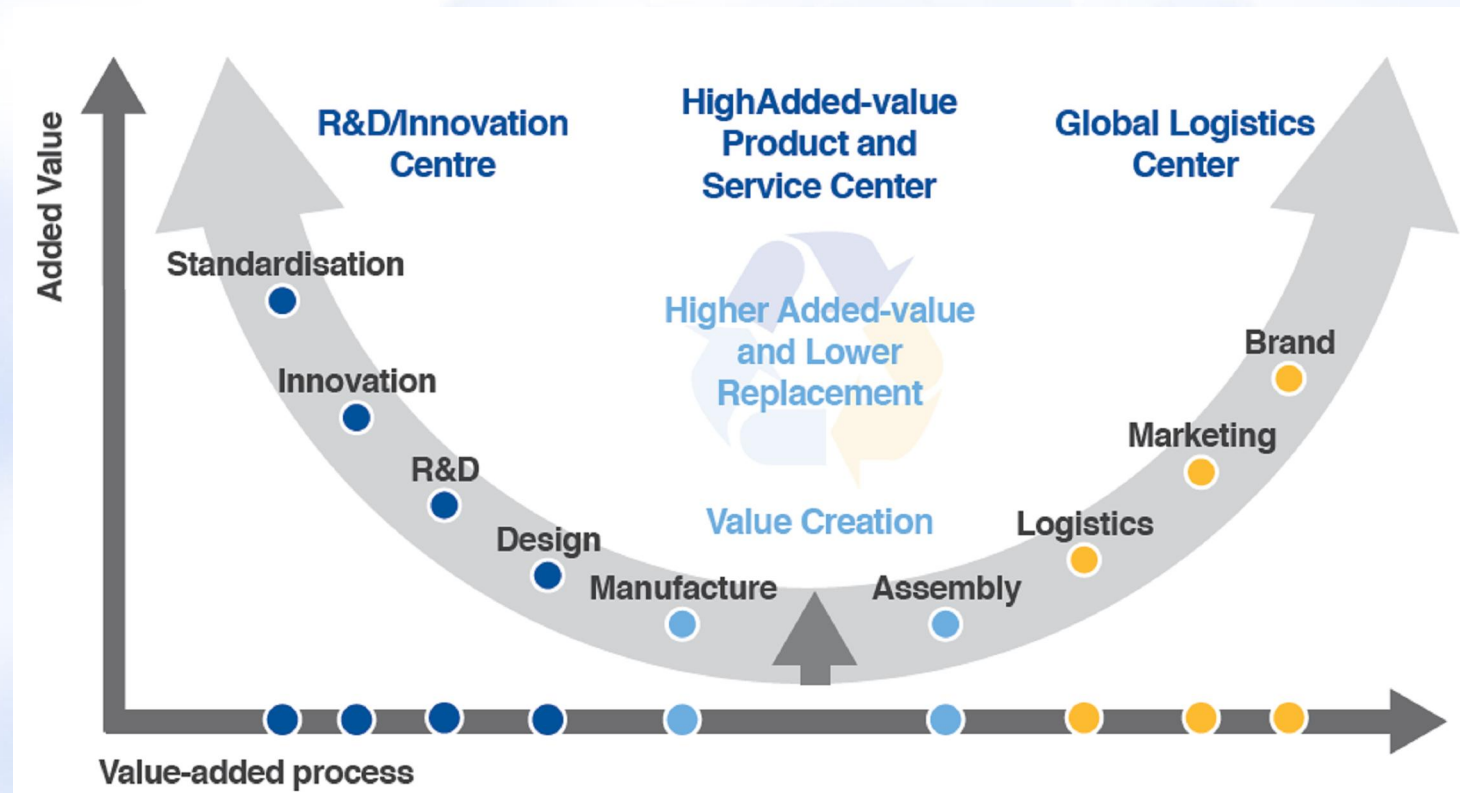
IPN and Value Chain

- Issues for an IPN to be converted into an evolving international value chain:
 - **End Market competitiveness:** Opportunities for upgrading and sustainability of competitiveness (incentives, conditions, opportunities, etc)
 - **Technology Absorption Capacity**
 - **Trade Policy Environment:** Identification of sectors, scope of liberalisation (tariff and non tariff issues), investment opportunities,
 - **Opportunities for SMEs:** Strengthening horizontal and vertical linkages, cluster development, empowerment of SMEs through scope of dialogues with various level of governments, etc.
 - **Trade Facilitation issues:** For fast movement among the production facility it is necessary

IPN and Value Chain

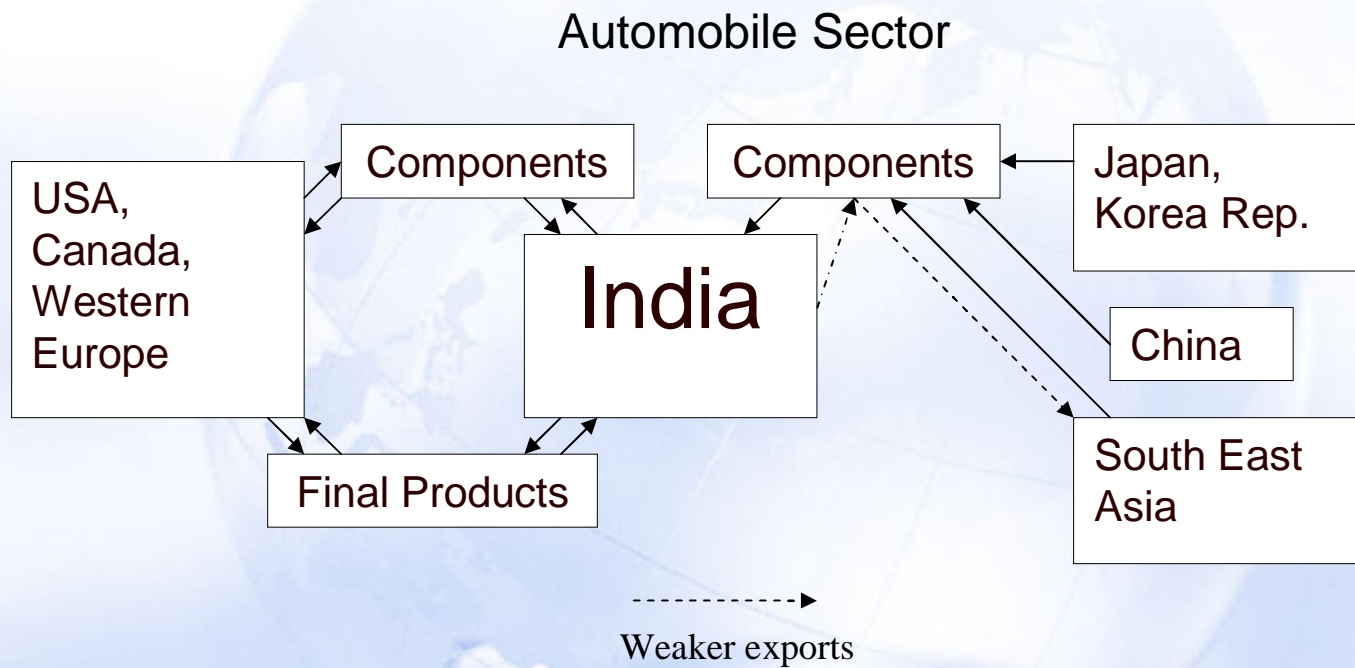
- **Value Chain** is based on a simple idea: Design, production, marketing of a product, involve a **chain of activities** carried out by **different enterprises, in different places. Each activity adds value.**
- IPN may or may not get integrated with value chain. A low level IPN is limited to only trading of raw materials/ intermediate goods in a B2B form. However, IPN can provide enough opportunities in value creation, if ideas, design, technology also flows along with goods for
 - **Product/process upgrading**: Increasing efficiency in production process or developing new products or upgrading existing products
 - **Functional upgrading**: changing the mix of value chain activities undertaken by a supplier
 - **Inter-chain upgrading**: using existing capabilities to upgrade to a new and more attractive value chain

IPN and Value Chain



Source: Business Week International online extra, May 2005

India and Asian IPN: Example Automobile Sector



Source: Nag (2011)

Supply Chain Structure in Automobile Industry

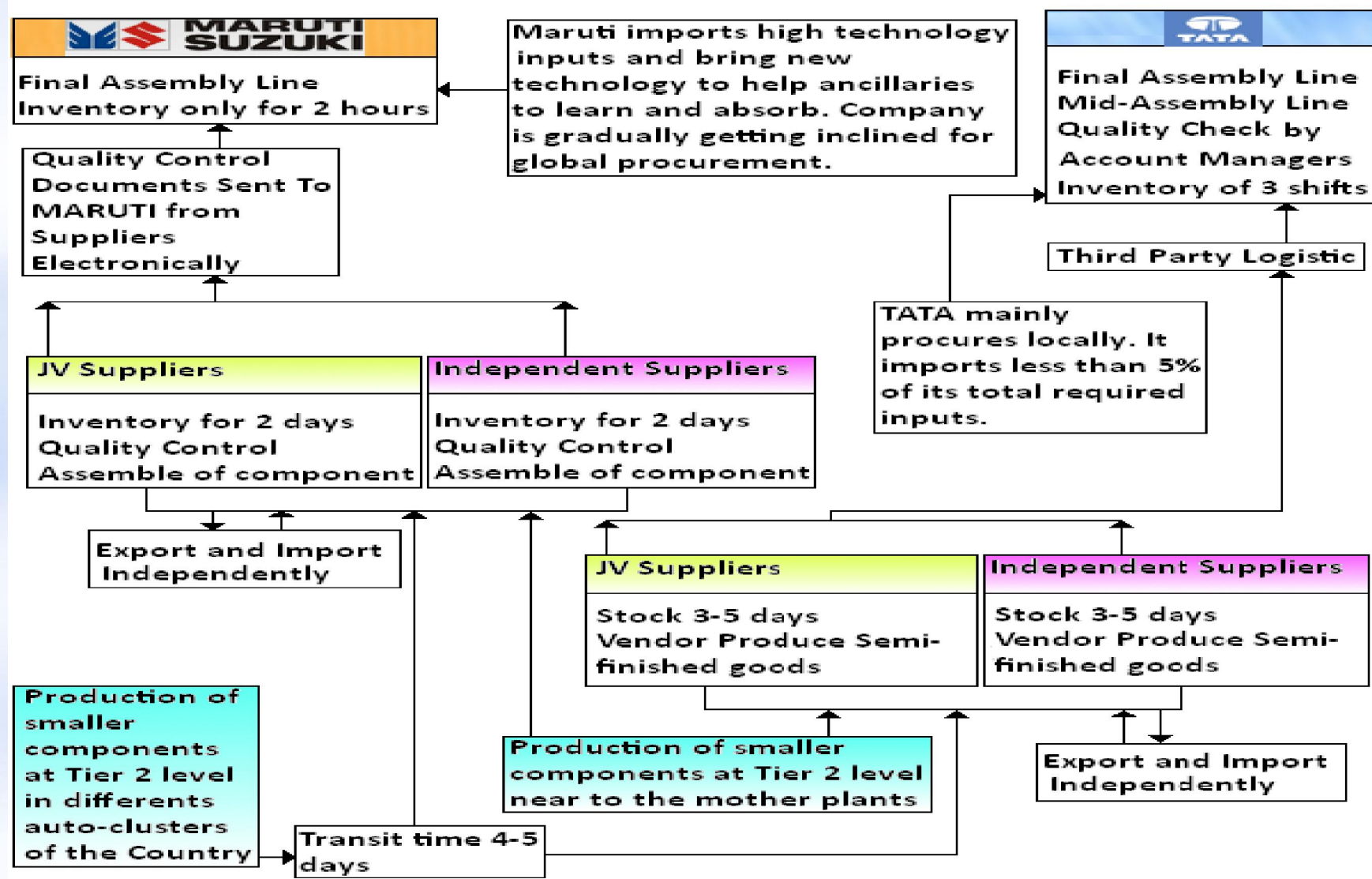
	Past	Present
OEM	R&D Purchasing Assembly	System Integration Testing Assembly Supplier management
Tier I Supplier	Component Manufacturing	System Supply R&D on System Module Assembly Sub supplier Management
Tier 2 Supplier		Sub Component Manufacturing

Cost Pressure

Risk Sharing

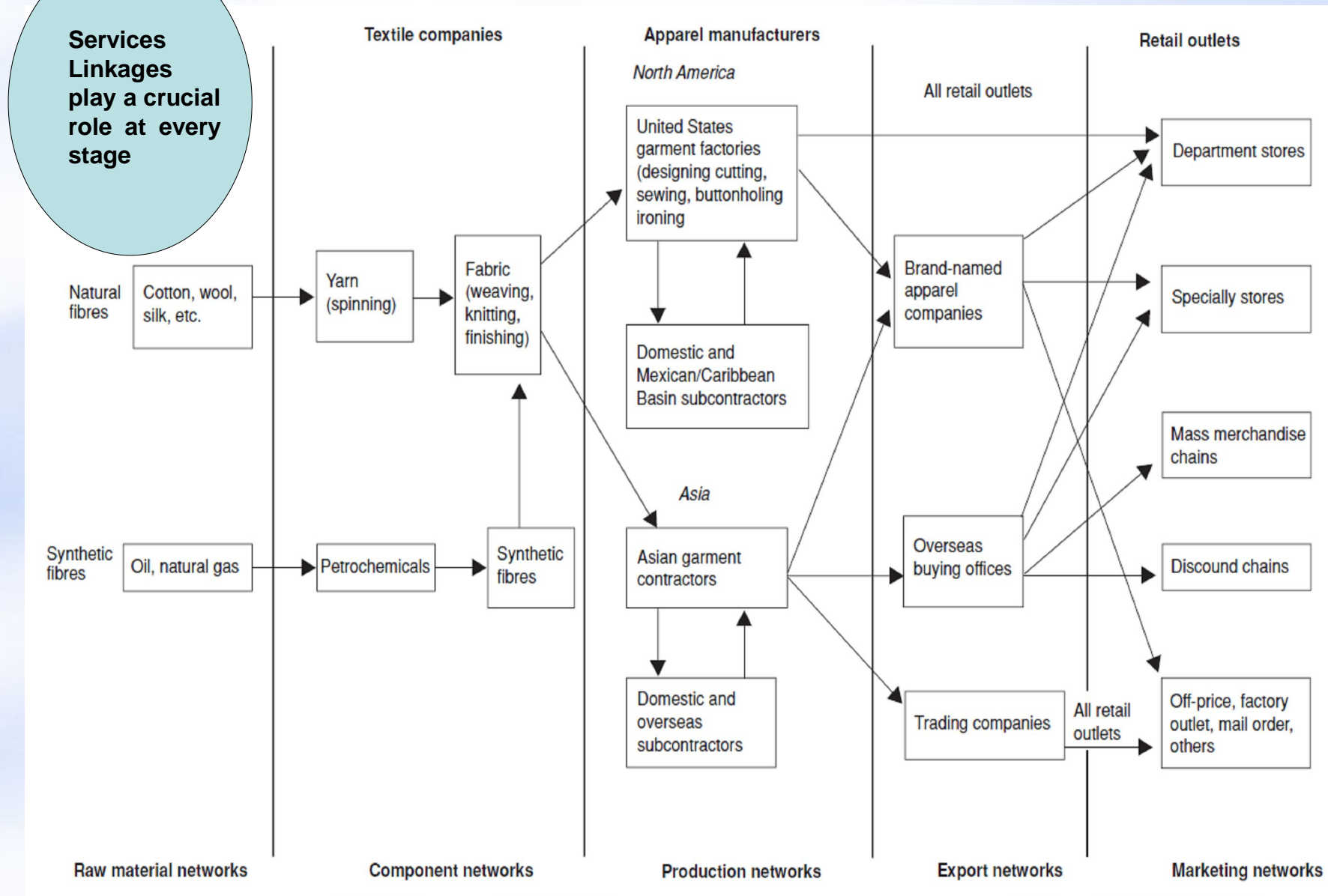
Cost Pressure

Inventory and SCM Model for Maruti-Suzuki and TATA Motors



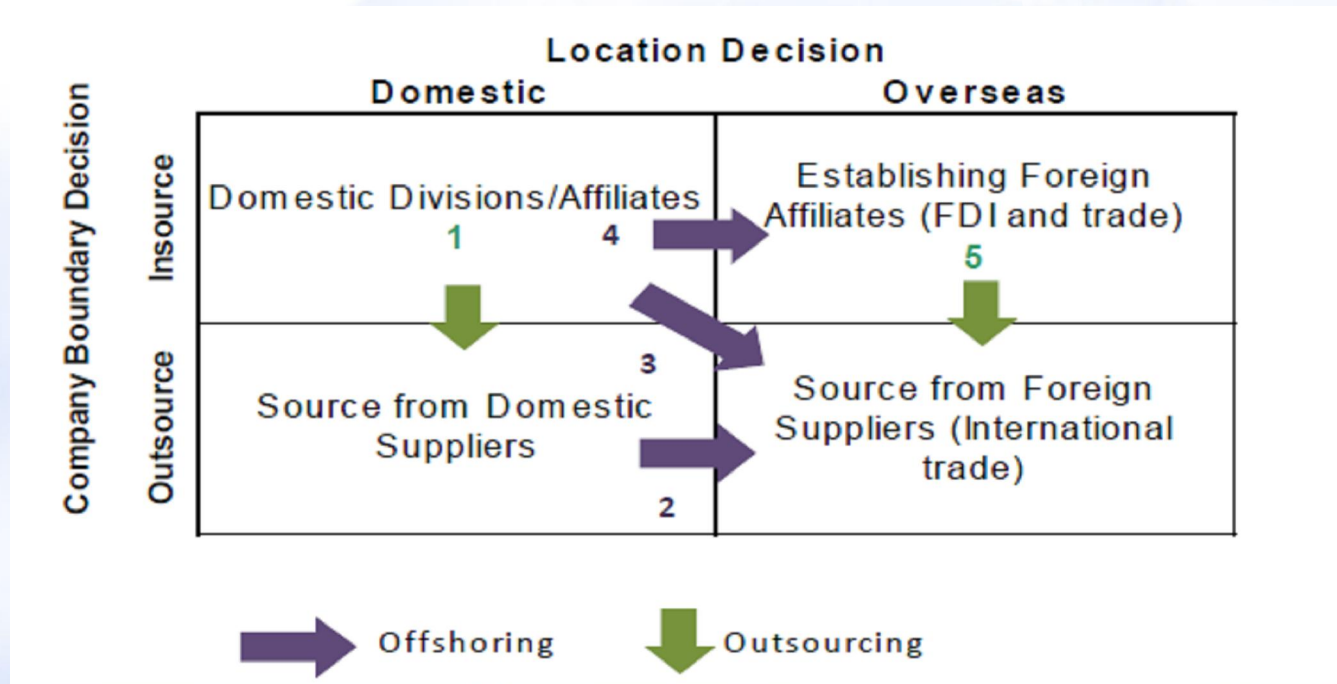
Source: Nag (2009)

The Apparel Network



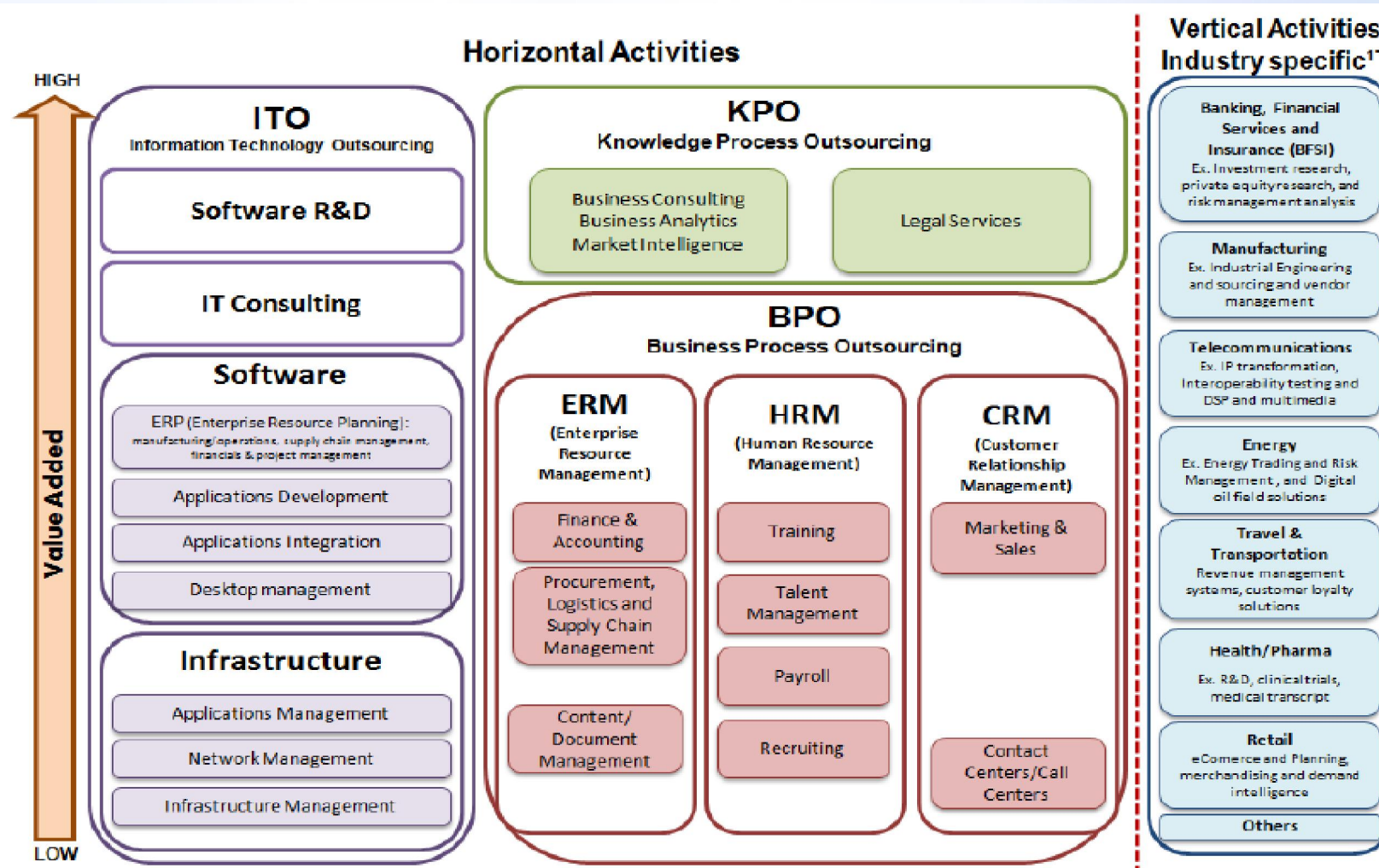
Source: Source: G. Source: G. Gerefi Gerefi and O. and O. Memedovic Memedovic (UNIDO, 2003)

Business Models in Outsourcing and Offshore Services



Source: Gary Gereffi Karina Fernandez-Stark; (2010)

Example: IT Integration as a service enabler



Source: CGGC, Duke University

¹ Vertical Activities- Industry specific: Each industry has its own value chain. Within each of these chains, there are associated services that can be offshored. This diagram identifies the industries with the highest demand for offshore services.

² This graphical depiction of vertical activities does not imply value levels. Each industry may include ITO, BPO, KPO and other advanced activities.

Critical Issues of Asian IPN

- Literature: Athukurala & Yamashita (2006), Kimura & Ando (2005), Ng & Yeats (2003), Ando (2006)
- So far IPNs in Asia are driven by **private sectors** independent of government initiatives mainly (with some exceptions).
- Larger companies develop IPNs with respect to economic reality in terms of location of markets and production cost. Many of them don't use RTA routes.
- **Service links** related to manufacturing across the borders are weak.
- **Human capital development** is not symmetric across Asia, so is IPR related issues and informational cost is still high in many parts. Trade Facilitation is complex.
- IPN must result into a two way trade so that both countries get benefit of **increasing intra-industry trade**.
- However, there is no guarantee that PTA/FTA will ensure that. Thus Initial industry environment and efficiency level is necessary to reap the benefit of FTA otherwise it may result into only a one way trade.

Critical Issues of Asian IPN

- Overlapping RTAs with multiple RoO creates confusion
- **'Rules of origin'** can be more binding for fragmentation trade compared to conventional final good trade. There is a scope to have re-look into this issue
- **Value added** at each stage of production is generally very small, so, presumably more sensitive to trade cost and delays arising from rules of origin compliance.
- Even a small reduction of trade barriers appear to encourage B2B trade
- There is also fear among countries (especially in South Asia) that SMEs will be in danger with greater opening of those sectors.
- The development and expansion of international production networks calls for better **trade facilitation** measures because fragmentation of the production process is only profitable if the cost of transporting parts and components across borders is low enough in time and money.
- Shepherd and Wilson (2009) presented empirical evidence that trade flows in ASEAN are particularly sensitive to transport infrastructure and ICT networks. Their estimates suggested that the **region could make significant economic gains from trade facilitation reform, which would be considerably larger than those from comparable tariff reforms.**
- ICT Integration, Data related issues to be sorted out on priority.

IPN is negatively related to RoO of Asian RTAs but not significantly

Dependant Variable	IIT value in 2008	IIT value in 2008	IIT value in 2008
Independent Variables	Auto Component Sector	Integrated Circuit	Textile
Constant	0.313192*	0.074506	0.419822
IIT value for 2004	0.711889*	0.929151*	0.524532
Export growth between 2004-08	-0.000502*	0.000263	-0.000465
RoO Restrictive Index			0.132928
R-Sq	0.70	0.71	0.22

Note: * these coefficients are significant at 95%.

Source: Nag & De (2011)

EDI Model for APTA

Generalising the issues

For generalising the country specific issues, countries need to identify the minimum flexibility required to run effective data exchange system and initiate negotiation on that. They also need to develop MoU to deliver and monitor those issues

Technical Instruments for Operational and Monitoring Module

Analytical module for Customs Data Analysis

Analytical module for trade in goods under Preferential Agreements

Monitoring Module

Countries need to identify domestic institutional issues and assess the cost of streamlining towards the common goal of effective data exchange system

India:
Coverage Issues, EDI is not fully implemented, lack of coordination among agencies, no preferential data collection system

Korea:
EDI system Implemented but lacks refinement, Considerable time lag relating to the publication of trade data

Srilanka:
EDI system Implemented but lacks refinement, Considerable time lag relating to the publication of trade data, Lacks in managing preferential trading system, custom takes longer time to scrutinise certificates

Bangladesh:
EDI system Implemented but lacks refinement, Considerable time lag relating to the publication of trade data, Informal trade not considered, coverage issue, re-evaluation by customs not reported properly, multiple agencies

China:
Adjustment of difference in FOB and CIF, Transshipment via Hong Kong and cities/countries need attention, Official conversion table, definitional issues in many places

Sector wise issues of concern: Potential for Value Co-Creation

- **Banking Sectors**

- Entry Barrier, authorisation, equity limit, barriers on day-to-day transactions, branches recognised as foreign entity, access to fund more costly, limit on expansion, limit on lending, etc. restriction on banks to go into other financial services. For banking services, Singapore banks have limited access in mode 3 in India. In case of maritime cargo handling, India has put restriction even in mode 1.

- **Accountancy Services**

- Issues related to MRA (requirement of various accreditations) , Licensing requirement, Mode 4 etc. are major concerns. In some countries, citizenship and residency criteria is also in place. Increasing Finance and Accounting Outsourcing (FAO) opens the opportunity in Mode 1 also.

IT/ITes

Major concerns are Visa requirements (longer time to get work permits), investment regulations, tax discrimination, data protection and labour market regulations.

Sector wise issues of concern: Potential for Value Co-Creation

Telecommunication

Role of regulators in telecom is very important. However, it remains inconsistent in many countries especially in case of spectrum allocation, pricing and bundling of services. Restrictions are there in the form of licensing, equity limits, limit on resale, etc. Markets are often fragmented.

Hence, synergy is required for delivering the services coupled with investment which with the help of efficient management system can develop a unique value creation in the form of affordable yet high quality service.

Types of Co-Creation: B2B Relation amongst Players

	Type 1	Type 2	Type 3
Major targets	Developed countries	Developing and Less developed countries	Developed countries
Types of co-created value	Cost Reduction/Efficiency Improvement	Quality Assurance/ Capability Improvement	Problem Solving for the system challenges/Long-waiting time resolving
Strategies for Entry	Process Standardization	Resource exchange and leverage between each other	Resource expansion by building partnerships
Pre-conditions	Standardized process /activity Clarification of each party's responsibility Feasibility of replacing current activities with ICT applications	Clarification of each party's responsibility Capabilities for problem solving/with reputation	Willingness for service payers taking the responsibilities Recognized service quality and price
GATS Modes Applied	Mode 1& 2	Mode 1,3 &4	Mode 2
Applied primary activities in front stage	Customer movement	Set up branches, including post delivery support	Transfer of services if any required
Applied primary activities in back stage	Call centre	Remote service proving	Remote service proving
Applied supportive activities	Outsourced transcript	Plan/ consultancy services, staff training programmes	Information Transparency

Source: Modified from Kuo et al (2009)

Customer Centric Value Co-Creation: B2C Relation

	Type 1	Type 2	Type 3	Type 4	Type 5
Major targets	Rich people	People willing to avail allied services	Rich people caring for basic services	People without sufficient ability to pay	People unwilling to wait and with limited budget
Types of co-created value	Holistic Experience	Value Added services	Higher Services level in terms of quality desirable	Cost down	Elimination of waiting time for receiving services
Strategies for Entry	Co-create new service climate	Add services to service stakeholders	Deliver reputation service quality than domestic player	Deliver cheaper but qualified services	As current providers' partners for resource expansion
Pre-conditions	Fantastic experience	Capability of bundling extra services into existing packages	Reputation with customized guarantee e.g. privacy	Clarification of each activity's responsibilities	Clarification of each activity's responsibilities
GATS Modes Applied	Mode 2 (supported by Mode 1 and Mode 3)	Mode 2 (supported by Mode 3)	Mode 2 & 3 (supported by Mode 1)	Mode 2 (supported by Mode 1 & 3)	Mode 2 (supported by Mode 1)
Applied primary activities in front stage	Customer movement Call Centre Set up Branches	Customer movement Set up Branches	Customer movement Set up Branches	Customer movement Call Centre Set up Branches	Customer movement

Source: Modified from Kuo et al (2009)

Service Linked IPN Cooperation Model: Macro View

- A holistic model can be developed through **public-private partnership** in select sectors can collaborate through the existing regional arrangements and making more broad based through government participation at various levels.
- **Indian efficiency** in **service delivery system** with competent professionals can be explored with varied complementarity already existing amongst its East and South East Asian neighbors.
- Companies can develop partnership in R&D, staff training and in other related issues. A facilitating **regulatory and legal framework** is necessary to accentuate it.
- Several **interrelated regulatory issues** are matter of concern such as MRA, data protection, visa requirements, etc.
- Insufficient foreign market information, regional regulations, and perceived investment risks are found critical in determining the modes for service trade.

Service Linked IPN Cooperation Model: Micro Strategy

A service provider can create value by two means:

- 1. creating B2B oriented business lines**, and is especially achieved through the extension of supportive and back-end activities, and
 - 2. generating new customer base**, which is **B2C** oriented and is especially achieved through tourism and local reach.
- These two strategies are **closely linked with the mode of entry**. On the one hand, for those who are interested in creating new business lines, they may emphasize on developing practices through **Mode 1** and **Mode 4**. Through B2B engagement the trust and information base get extended.
 - On the other hand, for those who want to focus on earning new customer base, they may start their service trade business by **Mode 2** and **Mode 3**.
 - **A firm must understand the production network it belongs to when it wants to penetrate foreign markets.**
 - **It also needs to comprehend both the customer need and its own competency before deciding the mode of entry.**



THANKS

debdeepde@gmail.com

biswajit@iift.ac.in