Information Technology Platform for the Australian TransPort Industry

Case Study: Port of Singapore




Karyn Welsh
Co-Director
Industrial Logistics Institute
29th October 2009

Singapore and its Economy

- Small Country, situated in Southeastern Asia
- Total Area is 660 sq. km
- Population: 3.5 million People
- Limited Land, Sea Space, Number of People
- Local Market is very small
- Today, Singapore is a global Hub → Leveraged global Resources, used its Expertise, Skills, Organization and Technology to build the World's Port of Call with high Productivity, Efficiency and global Presence

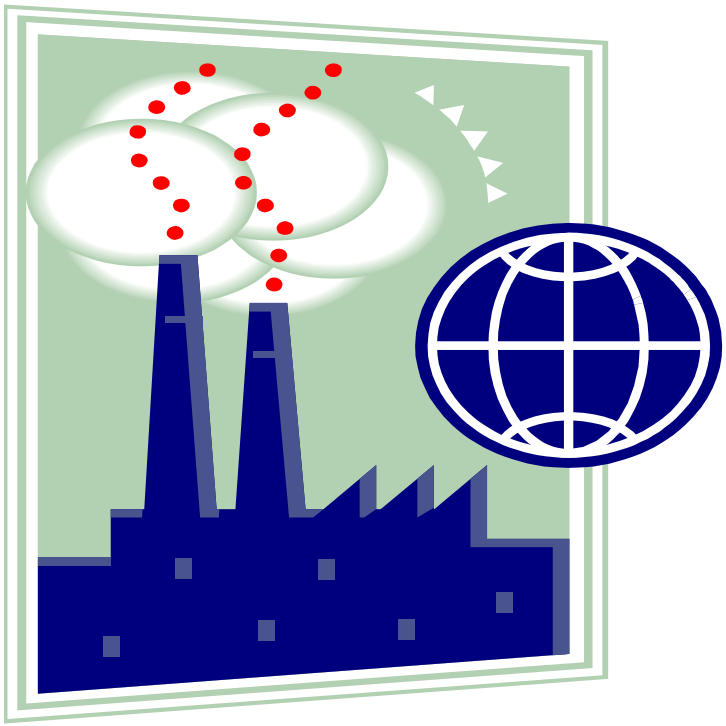
Singapore and its Economy

- The Government supported the Growth of the Economy with offering Special Taxes or Capital
- The Port of Singapore is the second busiest Port since 1982 with a high Efficiency

Industrial vs. Network Economy Business

Industrial Economy

- More Certain and Stable Environment
- Hierarchical Structure and static
- Internal Economies of Scale
- Internal Economies of Scope
- Focus on Production
- Development over Decades



Port of Singapore Authority

- Reconstructed into PSA Corporation and the Maritime and Port Authority in 1997.
- Portnet.com Ltd. was formed in May 2000 as a subsidiary of PSA Corporation.
- Portnet.com's products:

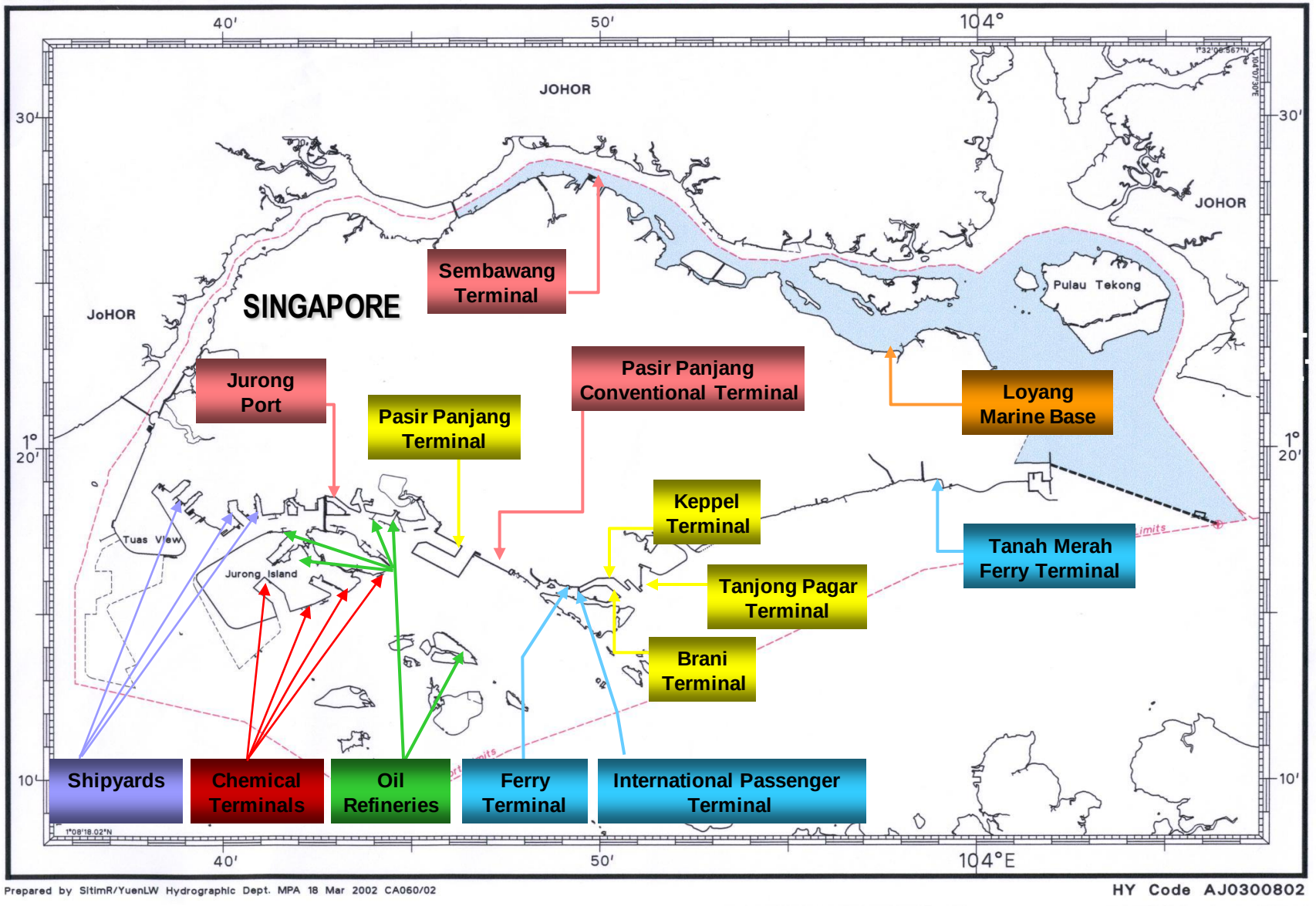
  1.P-Commerce

  2.eMart

  3.eSolution

  4.Inforhub

PORT FACILITIES



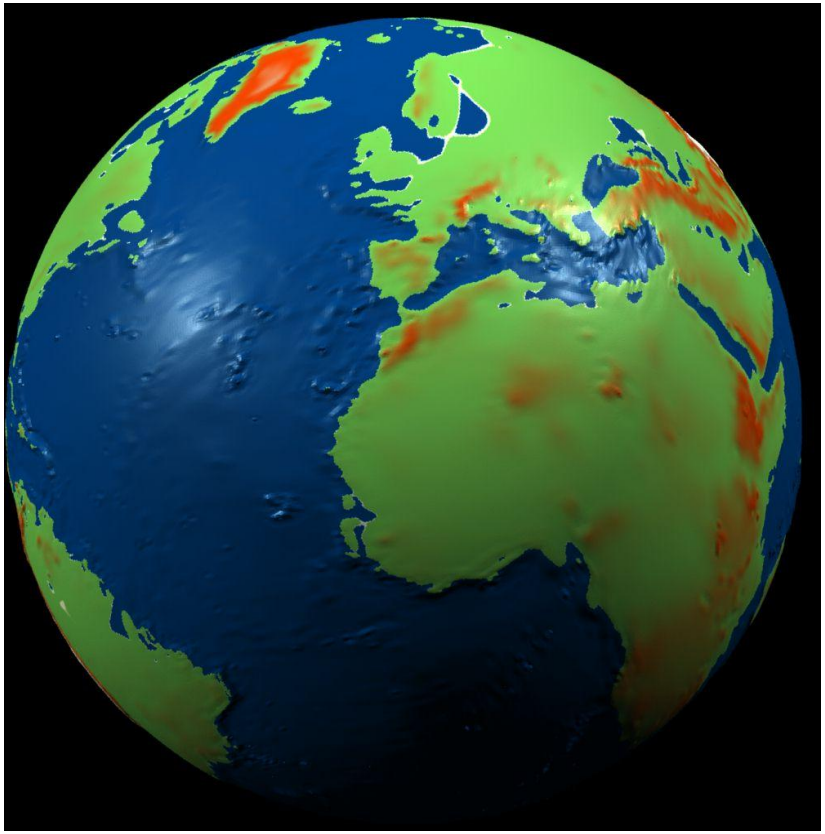
Terminals

- In Singapore, PSA Singapore Terminals operate four container terminals at:
  - Tanjong Pagar,
  - Keppel,
  - Brani and
  - Pasir Panjang,

  With a total of 54 container berths when completed. They operate as one seamless and integrated facility.

Singapore had a Problem

- Challenges of Globalization
- The impacts of privatization



PROBLEMS

- limited land
- limited sea space
- limited people
- high level of fixed costs

COMPETITION

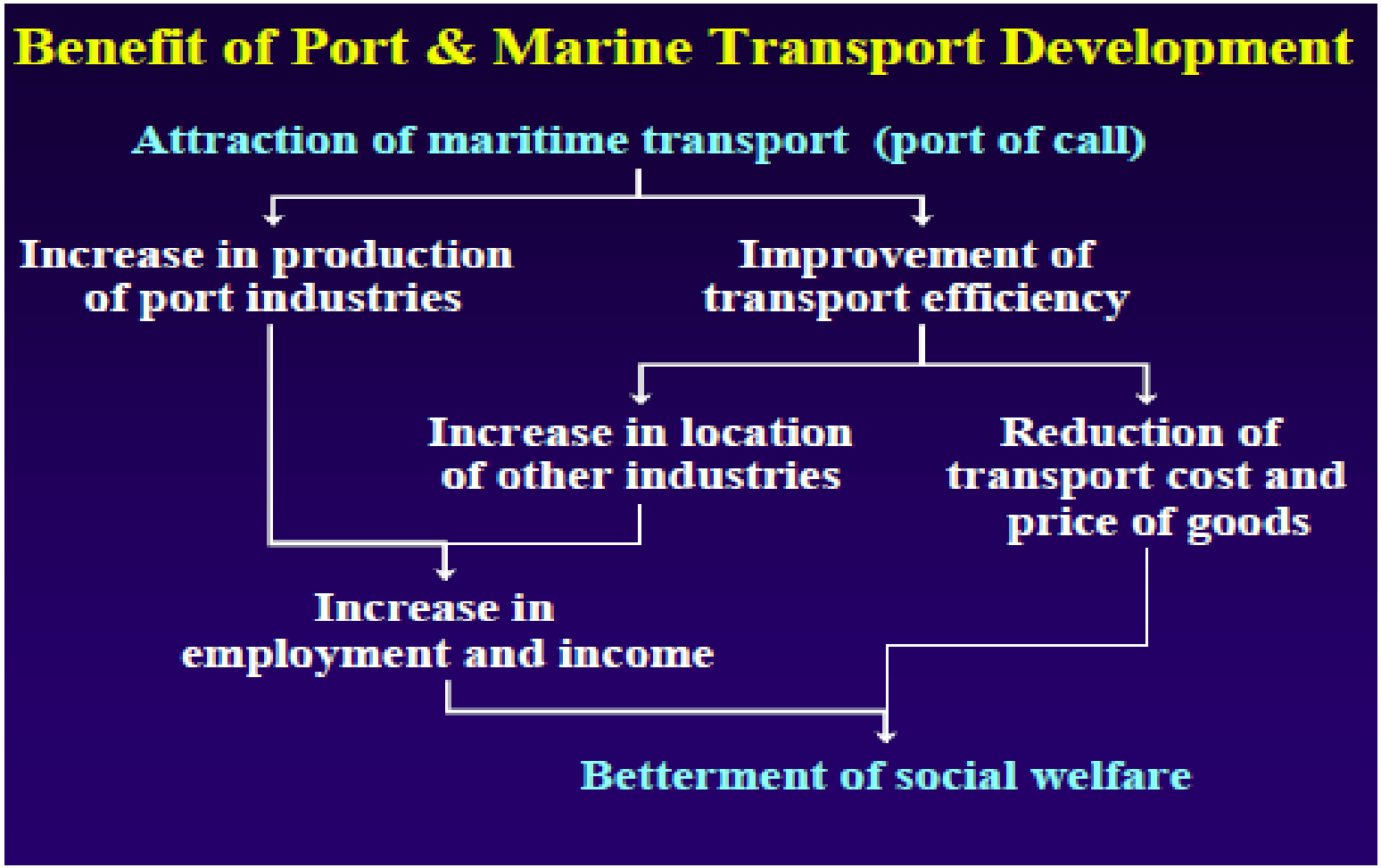
- Regional level – Malaysian ports – in special Northport and Westport from Klang;

- Global level – vertical integration by container shipping lines; example: Maersk-Sealand.

Examine OBJECTIVES

- Reduce costs and increase operational efficiency
- Expansion and modernization of infrastructure
- Much more integration with global shipping
- Become a global multinational corporation

Objective


Benefit of Port & Marine Transport Development
Attraction of maritime transport (port of call)
Increase in production of port industries
Improvement of transport efficiency
Increase in location of other industries
Reduction of transport cost and price of goods
Increase in employment and income
Betterment of social welfare

DIRECTIONS

- the energy and resources for growing the core business
- providing world-class integrated port and logistics services
- better meeting the customers' requirements
- increasing the application of technology
- e-commerce solutions

EFFICIENCY & QUALITY

- CITOS
- Port.net
- PSA cranes
- PSA was restructured in two private entities:
  - PSA Corporation
  - Maritime and Port Authority

ACTIONS

- The strategy to differentiate the services: implementing the technology that allow Singapore to operate with high level of productivity and accuracy
- The strategy to be specialized in a unique niche of the port business as a transshipment center.
- Direct delivery in a cost reduction environment
- World-class operations and regional and global transshipment port.

Increased volume and potential time delays -PSA

- Busiest port in the world for ship arrivals – 1.3 B GT
- Top container port – 24.4m TEU's handled
- Top bunkering port – 28.4m Tonnes sold
- World leader in building of jack-ups rigs and vessel conversion

*2006 figures

What did Singapore Ports achieve with ICT–PERFORMANCE!

- Unloading of 2,001 containers in 9 hour and 51 minutes;
- Loading and unloading 243 containers per hour
- By comparison, only some of the world's ports surpassed the limit of 100 containers per hour.
- PSA handles an average of 500,000 TEUs per year, in comparison with other ports 200,000-300,000 TEUs.

Technology Development

Development of Port Construction Technology

Design • Stability of structure and foundation
• Anti-Earthquake

Construction • Large scale earth work in the sea and waterfront

Kobe in Jan. 1995

CUSTOMER'S STRATEGY

- Customer First Program
- Direct involvement of top management
- Creating of key customer managers
- E-commerce solutions

Customized Services

- Preventive maintenance programme for reefer machinery
- Washing the exterior of boxes
- Assembly and dismantle of hangertainers/ flatracks
- Securing of tarpaulin for open top/ open side container
- Scrap/Disposal of container
- Painting
- Precooling
- Pre Trip Inspection

Shipper Services

- Shippers Services was set up to address the needs of shippers through the provision of container-centric solutions and value-added services.
- Connected to 600 ports in 123 countries via 200 shipping lines, PSA offers shippers a wider choice of carriers, global market access, faster time to market and a higher shipping frequency.

Boxcare: Basic Services

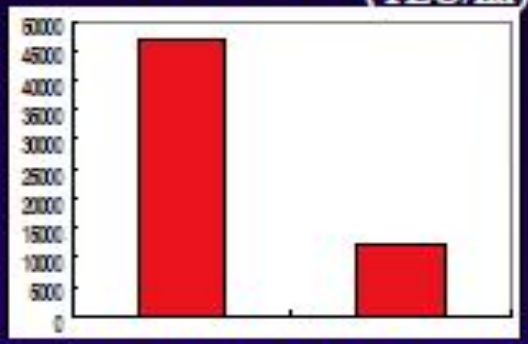
- Survey of containers
- Sweeping/Washing (Normal/Chemical)
- Reefer Machinery Repair
- Structure Repair
- Pre trip Inspection

Services Rationalised

Rationalization of port service (Singapore)

- Highly Integrated IT Solutions
  - enables 6-9 container stacking
- Flow through gate system
  - processes truck every 25 seconds
- Remotely-operated yard cranes

Container Volume per unit area (TEU/ha)



Source : *PSA Co.*

Welcome back to Australia

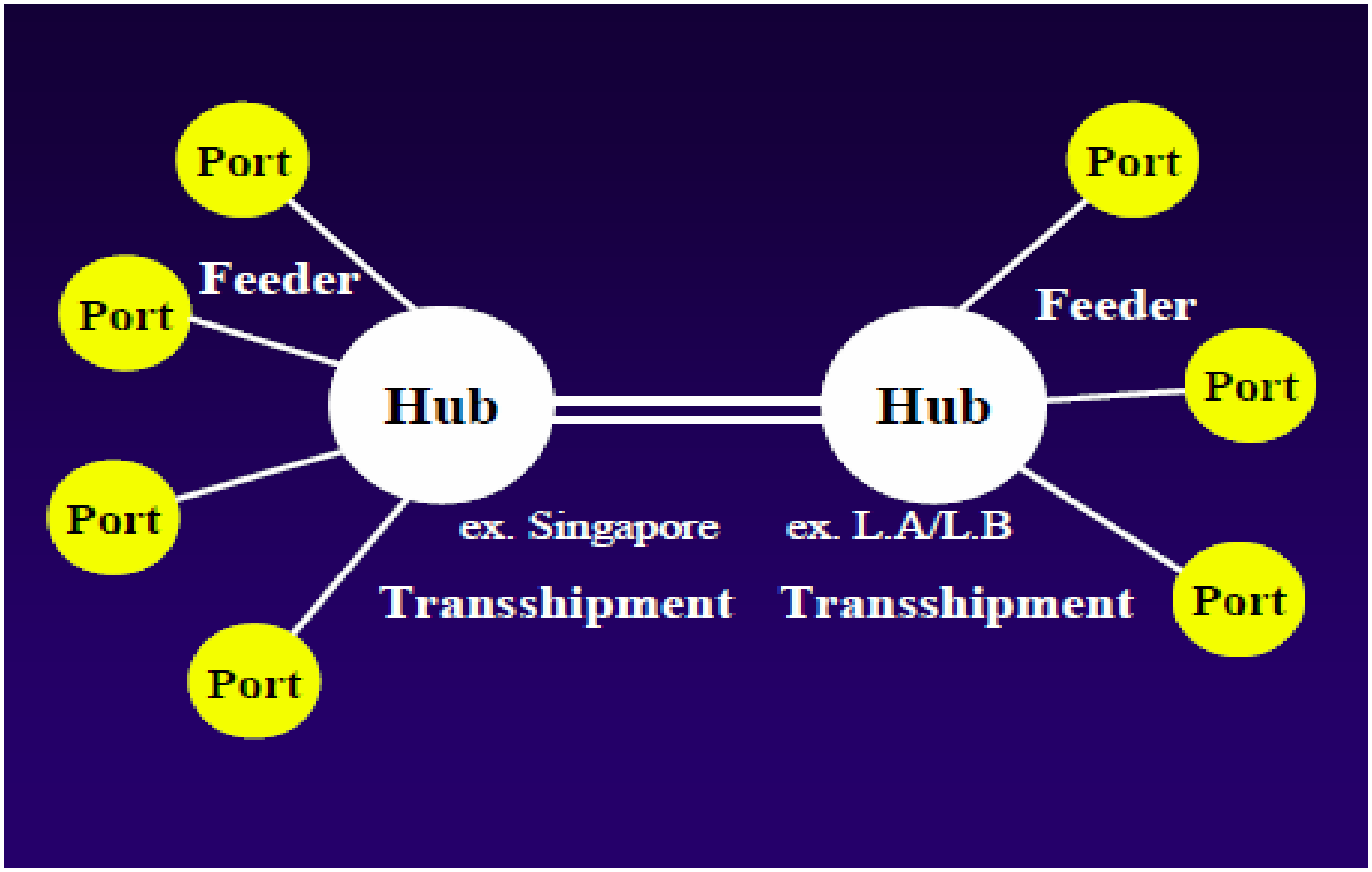
Lets look at things in our context:

Back in Melbourne….and our Port

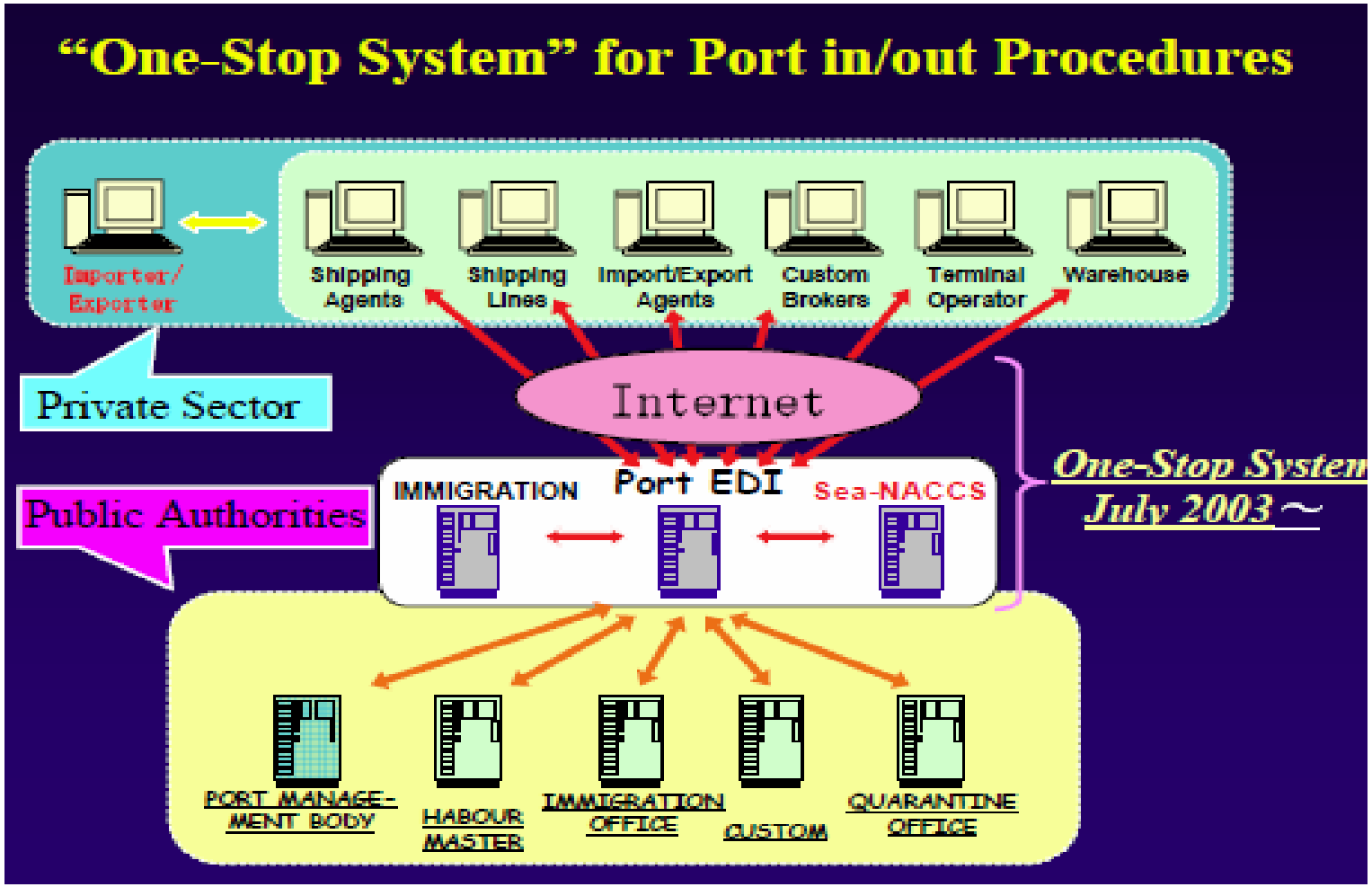
Logistics within ICT – New word for today “ICT Logistics”

- Complexity with transport, rail and shipping co-ordination – complexity also exist with technology if not managed and it is costly!
- Big players can afford the systems, small players cannot – Is this true?
- False! We now have Service Oriented Architecture and Software as a Service (SaaS) – Yes leased technology.
- ICT should be seen not as a barrier but an enhancer to business processes whilst adding efficiencies for industry players – so start the conversation on how can we make it easier!
- To understand processes is fine for FTE and ABC’s, now understand how we exchange data and why?
- Lets now focus on efficiency and speed of data flow!

Hub Networks



User Interface does not see all this only the screen in front of them.

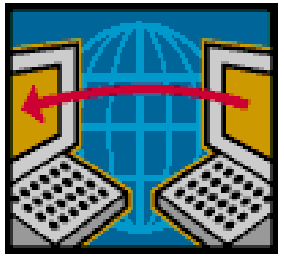


Why is it all too hard! Will paper exchange continue to be efficient?

- That is not to say that the process of implementation will not come without its own challenges which will be addressed through the approaches cited below:
  - Common issues and challenges faced by industry;
  - Different solution options and best practice approaches that may address these challenges;
  - An approach to gain support to such solutions to these challenges; and,
  - A typical trading platform model that could be developed.

Industrial vs. Network Economy Business

Network Economy



- Changing and Shifting Environment
- New Technology and Opportunities
- Big & Small and decentralized
- Extern Network Economies of Scale
- Extern Network Economies of Scope
- Business Development in only a few years
- Focus on Distribution
- Creation of Value develops Exponential

Singapore can now offer “Complementary Services”

Singapore are now securing Port Waters

- Prohibited areas around sensitive installations
- Monitoring movements of sensitive vessels
- Designated routes for certain types of vessels
- Designated landing points to facilitate ship's crewmembers going through customs and immigration

They are exploring Multi-Agency Approach to Maritime Security

MPA adopts a multi-agency approach for smooth implementation of various security measures

Works closely with Home Teams, RSN and the stakeholders

Task Forces, Committees, Working Groups formed to look at different aspects of maritime security

Their approach works well
Maritime Security

Development and implementation of security measures require high degree of multi-level co-ordination and close working partnership

MPA will continue to work with the security agencies and stake-holders to ensure that the security measures for the port and its ships are continually reviewed and best practices adopted

Maritime security is not an issue one country can address on its own and requires co-operation and concerted efforts from all countries

Singapore VENTURES

- Keppel Distripark – provided logistics, distribution and inventory management
- PSA BoxCare – provided repair, servicing, maintenance, cleaning, painting, and inventory management
- PSA ReeferCare – provided specialized care perishable goods
- PSA ProCare - provided specialized care for unmarked cargo
- PSA ChemCare – provided safe handling of hazardous cargo

Their technology is in “neutral” grounds PROTNET.COM

- Subsidiary of PSA Corporation
- Leveraging PSA’s operational and IT expertise
- Provided Web-based IT software and a “community network”

3 KEY PROCESSES addressed that provided immediate success

- Pre-arrival process for vessels and trucks
- Vessel loading, unloading, and yard storage
- “Flow-Through” gate process

Benefits from IT based Infrastructure

- Pre-arrival Process for Vessels and Trucks
- Vessel Loading, Unloading, and Yard Storage
- Flow-Through Gate Process

Benefits from IT based Infrastructure (cont.)

- Pre-arrival Process for Vessels and Trucks
  - Enable subscribers to conduct business at a rate of 69 million transactions per year
  - Minimize waiting time

  - Achieve optimal deployment of port space and resources

Benefits from IT based Infrastructure (cont.)

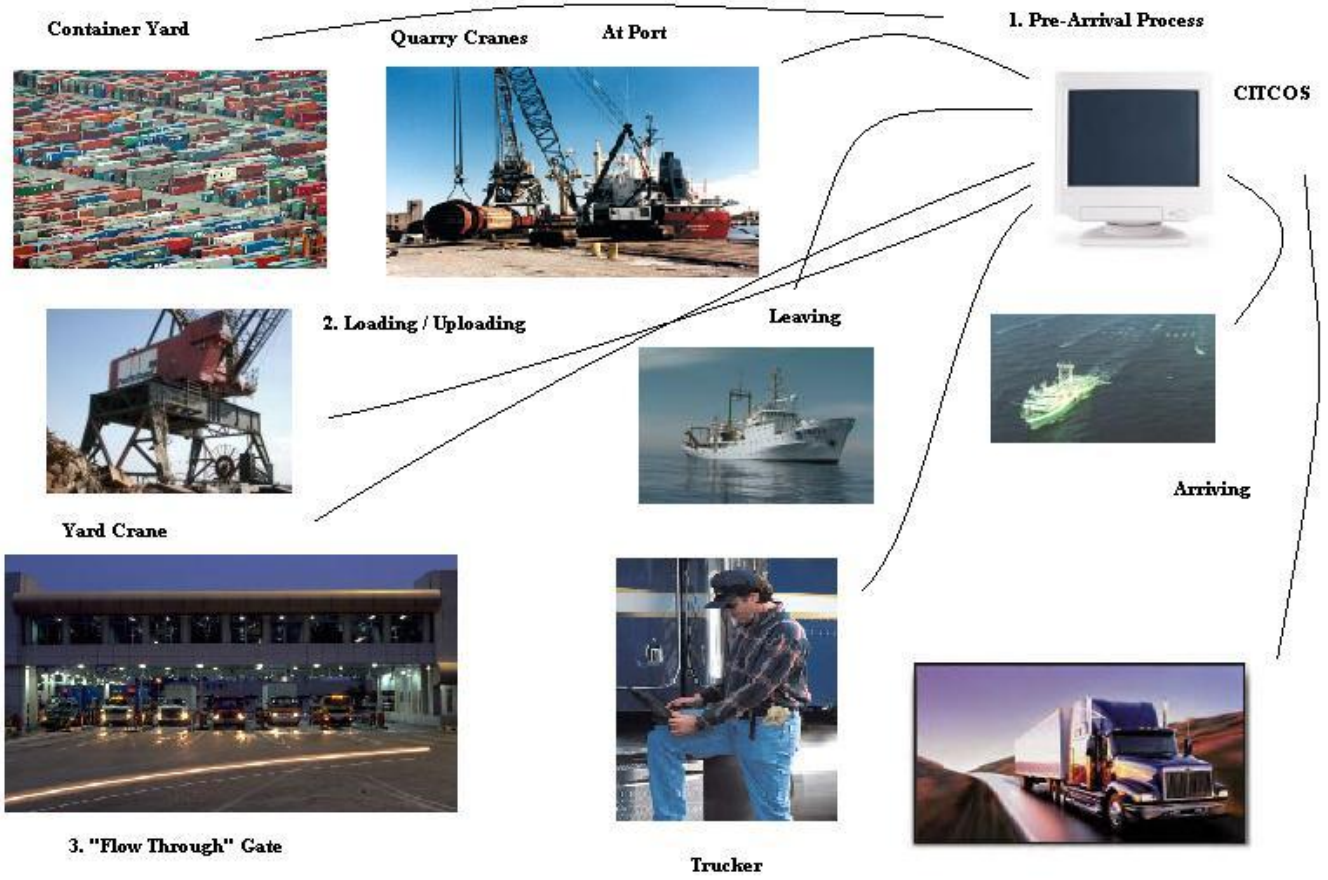
- Vessel Loading, Unloading, and Yard Storage
  - Enable a ship to make up for delays
  - Fast speed for loading and unloading
  - Help operate cranes and vehicles
  - Provide real time operator information
  - Enable online management reporting and decision support

Benefits from IT based Infrastructure (cont.)

- Flow-Through Gate Process
  - Automatic information registration in less than 25 seconds
  - Handle 8,000 container truck daily with a peak volume of 700 trucks per hour
  - Fast process for trucker, 30 minutes

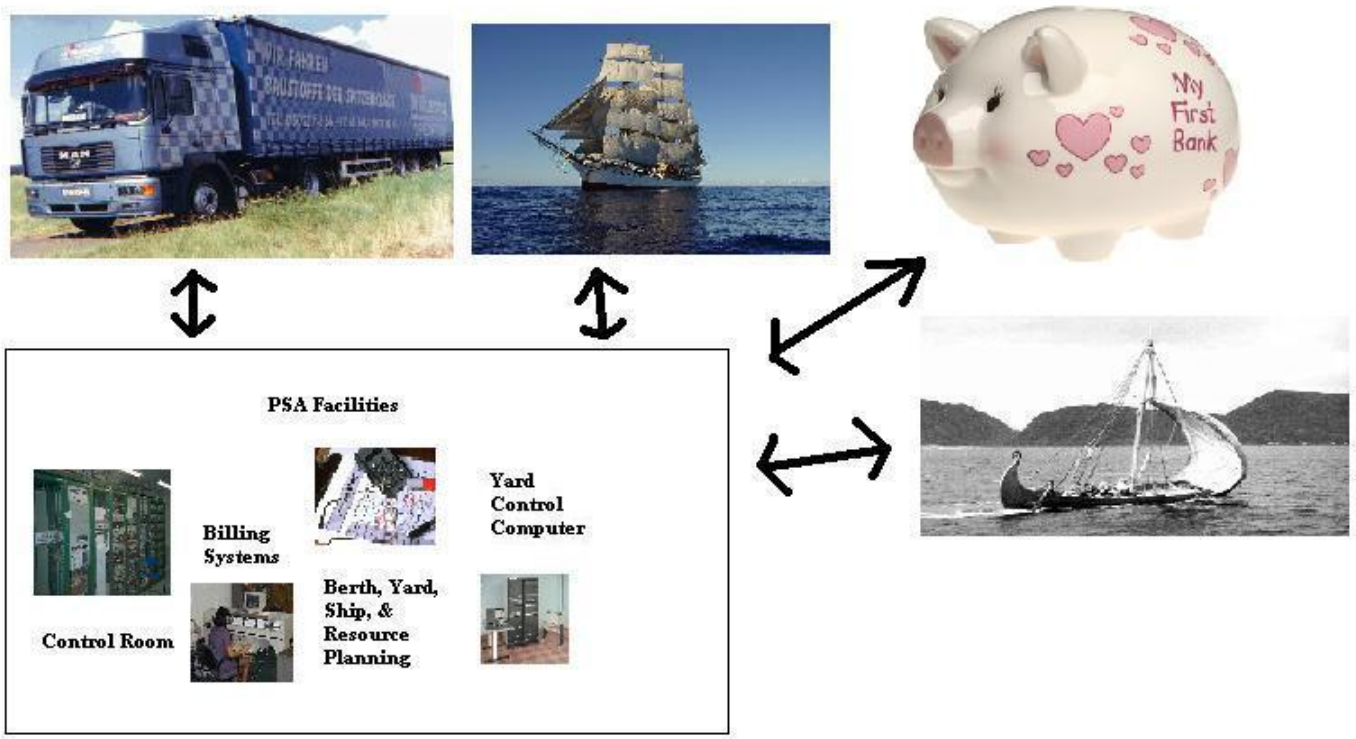
Business Infrastructure

- Standard Operations



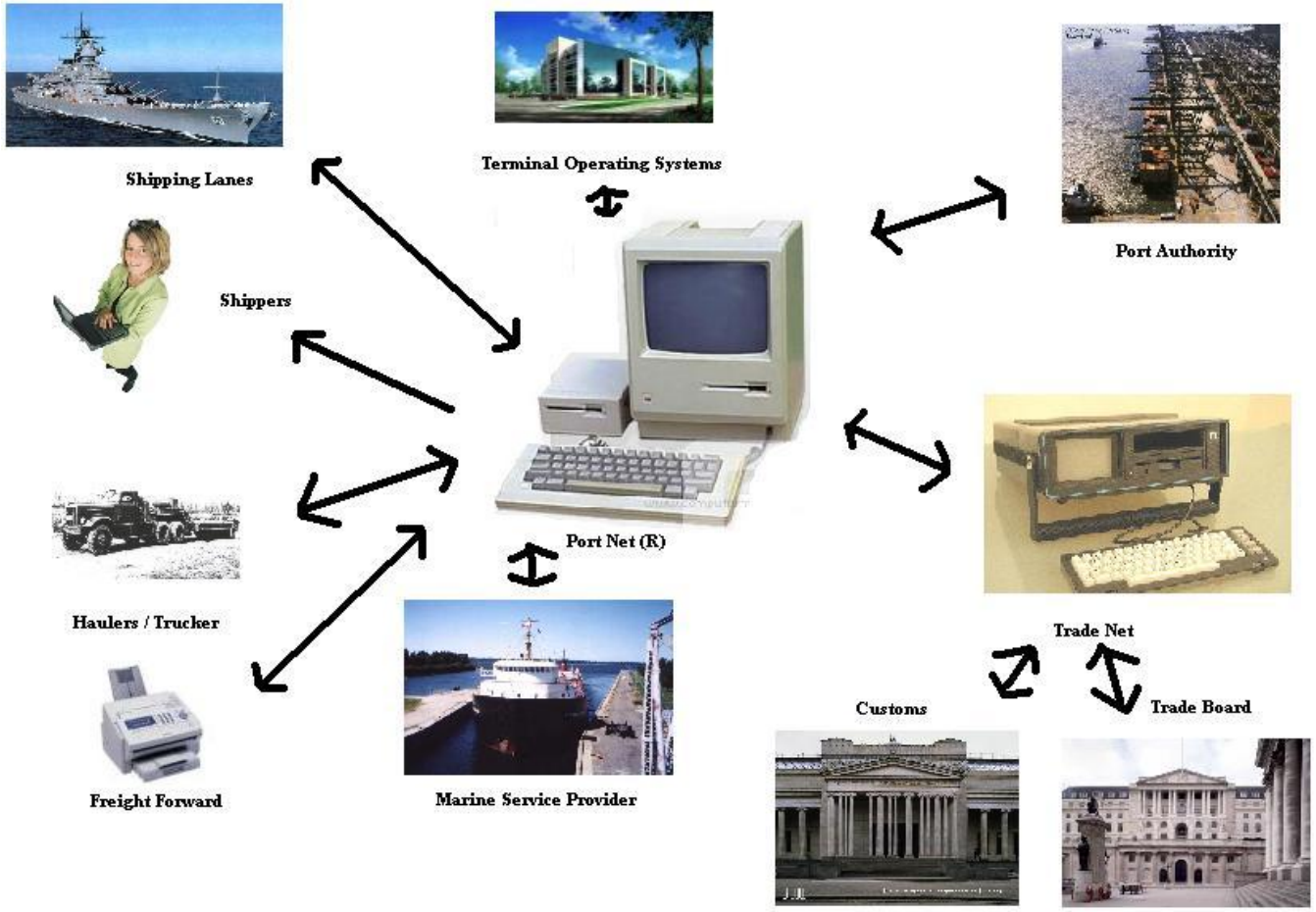
Business Infrastructure

- Real-Time Management, Coordination, and Control



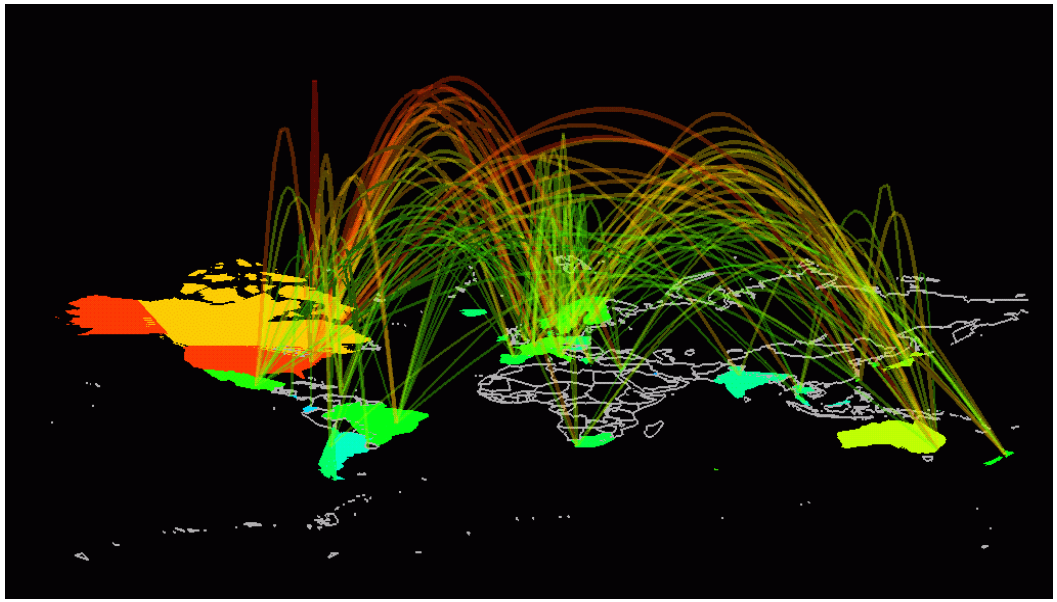
Business Infrastructure

- Portnet Community Linkages



New Ventures

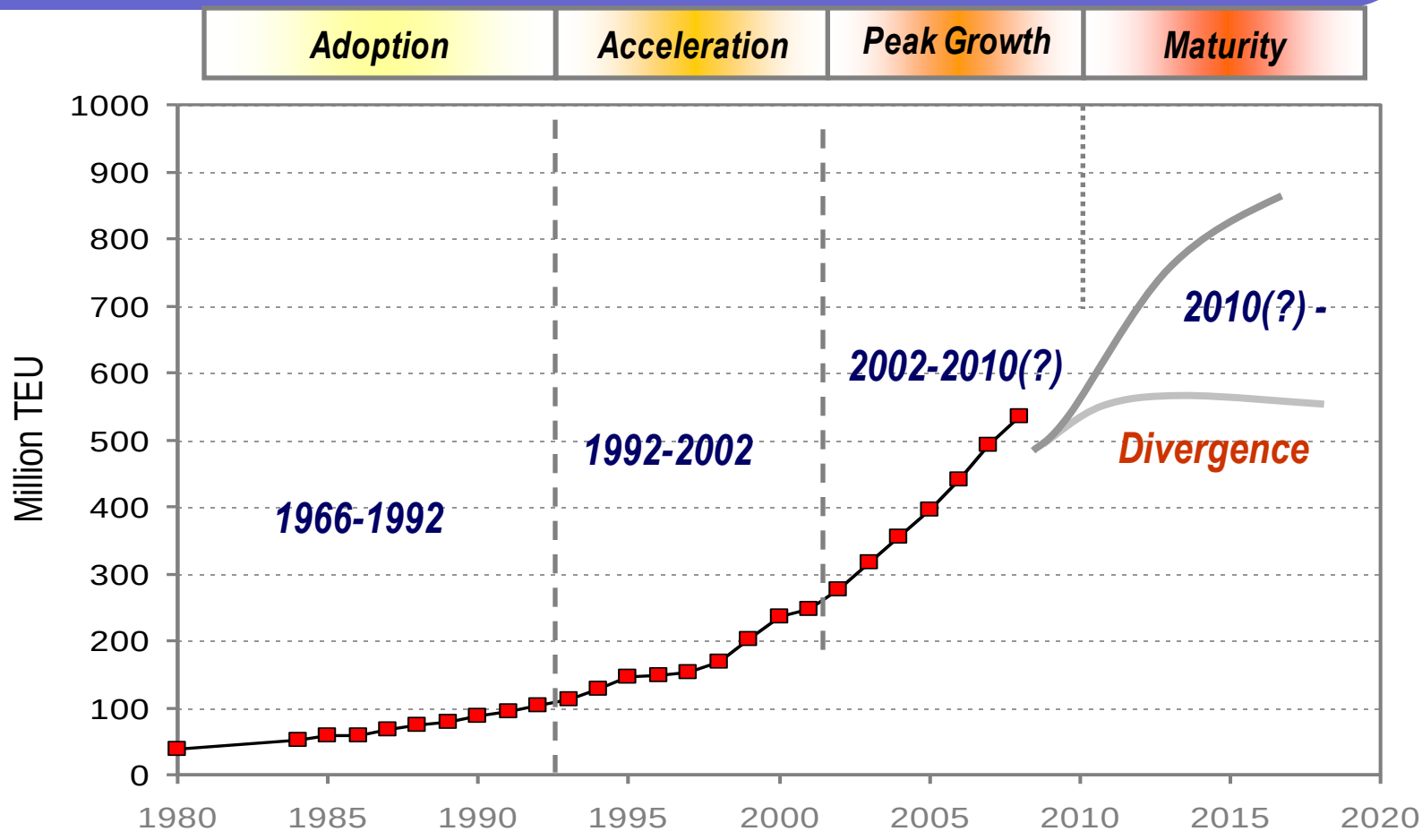
- PSA Port Care Services
  - Box Care
  - Reefer Case
  - Pro Care
  - Chem Care
- Portnet.com
  - P-Commerce
  - eMart
  - eSolutions
  - Infohub



Why has this been achieved.

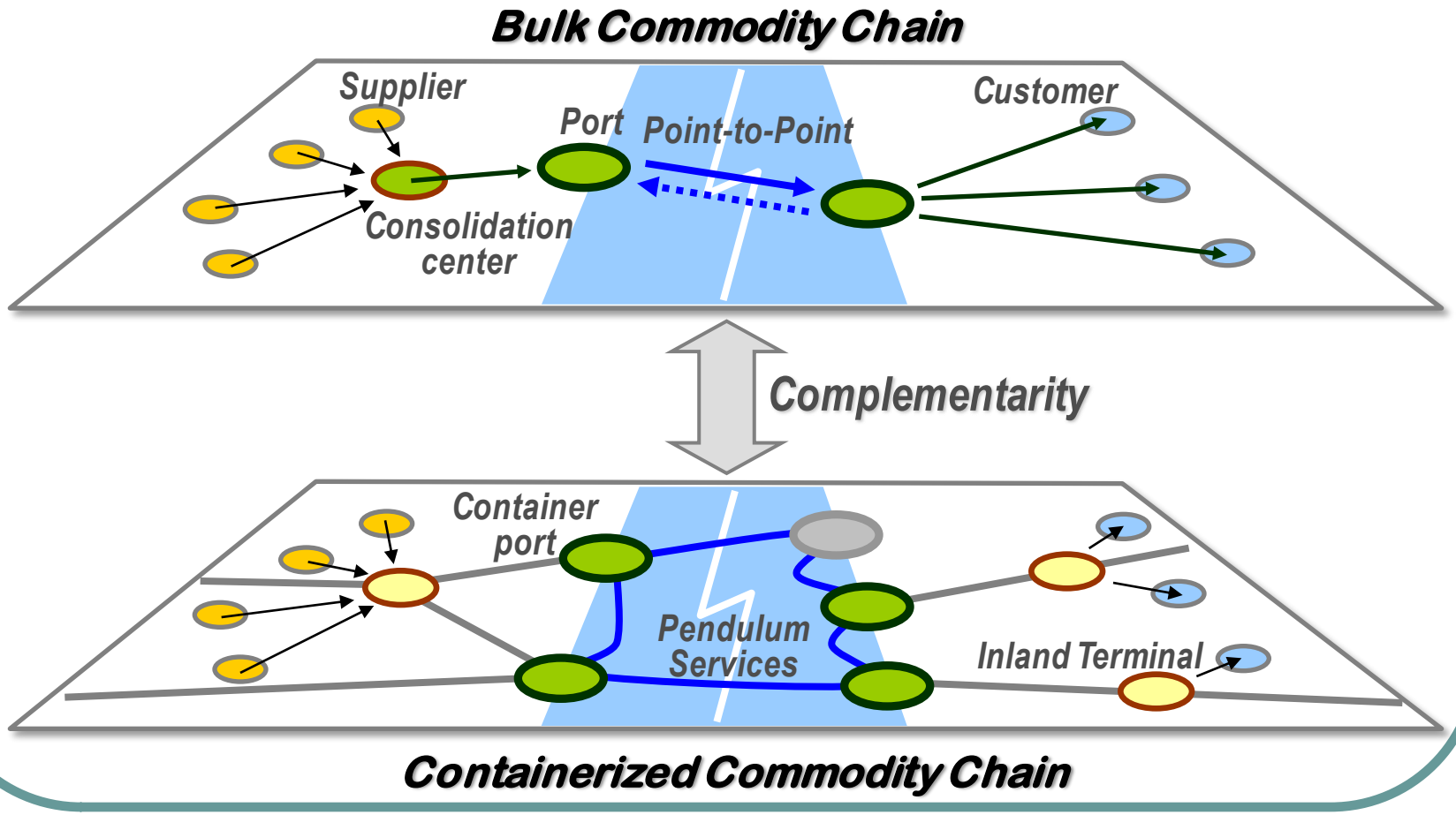
- No need to initially look at all processes only the key processes
- ICT is now centralised and co-ordinated
- Common portal for all to access
- Multiple feeds with the data saving time and money
- Multiple industries can access as well as government authorities

World Container Traffic, 1980-2008. Reaching Peak Growth?

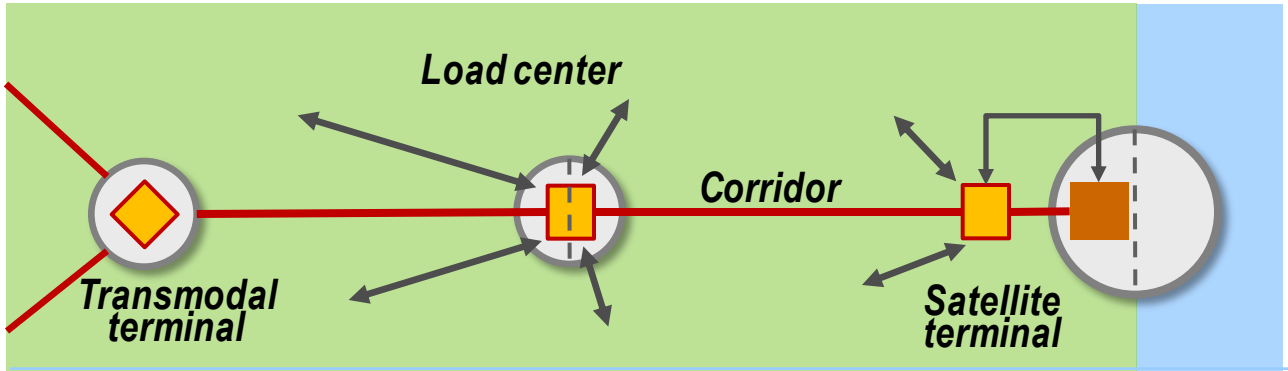


Global Bulk and Container Fleet Partially Immobilized (Singapore, January 2009)

Consider now Australia's Bulk and Containerized Commodity Chains

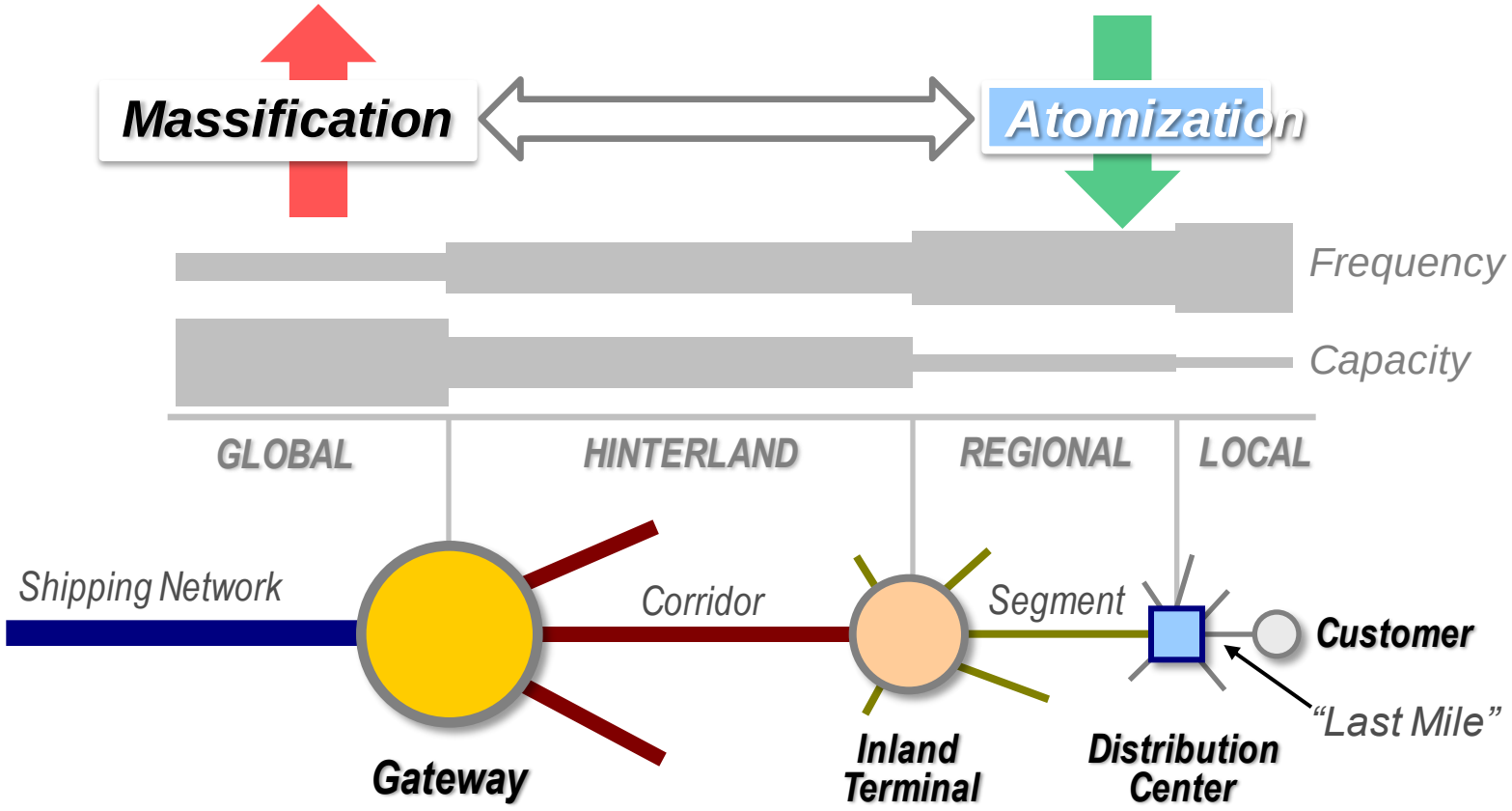


Imagine and ICT Type and Function required between Terminals



Type	Function
Satellite terminal	Close to a port facility. Accommodate additional traffic and serve functions that have become too expensive at the port. Container transloading.
Freight distribution cluster / load center	Access regional markets (production and consumption). Intermodal, warehousing, and logistics functions. Linked with logistics parks and free trade zones.
Intermodal / Transmodal facility	Link large systems of freight circulation either through the same mode (e.g. rail-to-rail) or through intermodalism (e.g. rail-to-truck).

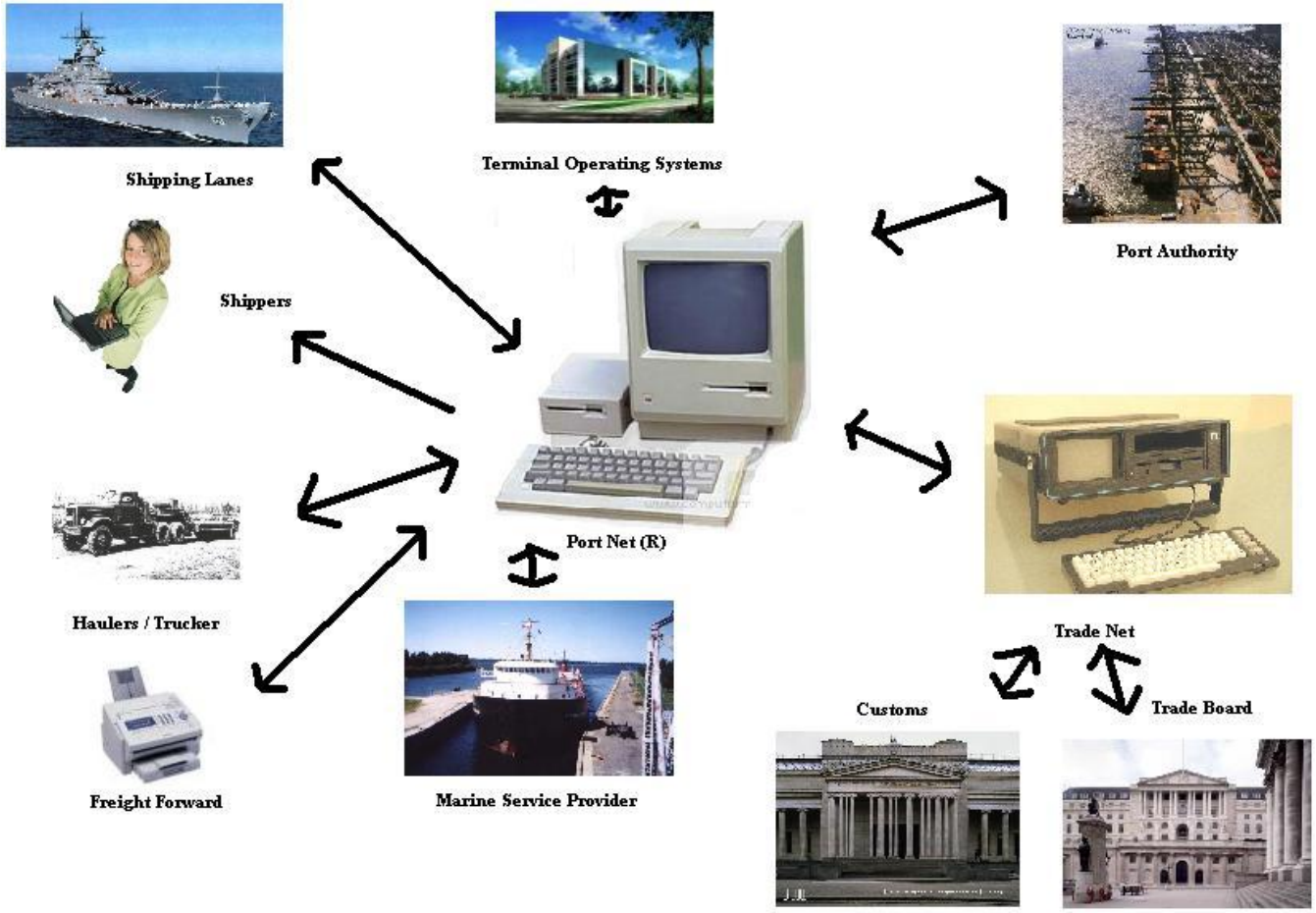
Think of the information Logistics: The Realm of the "Last Mile" (or the "First Mile")



Inland Terminals if automated are able to transfer data therefore enable Management Systems to talk to each other.

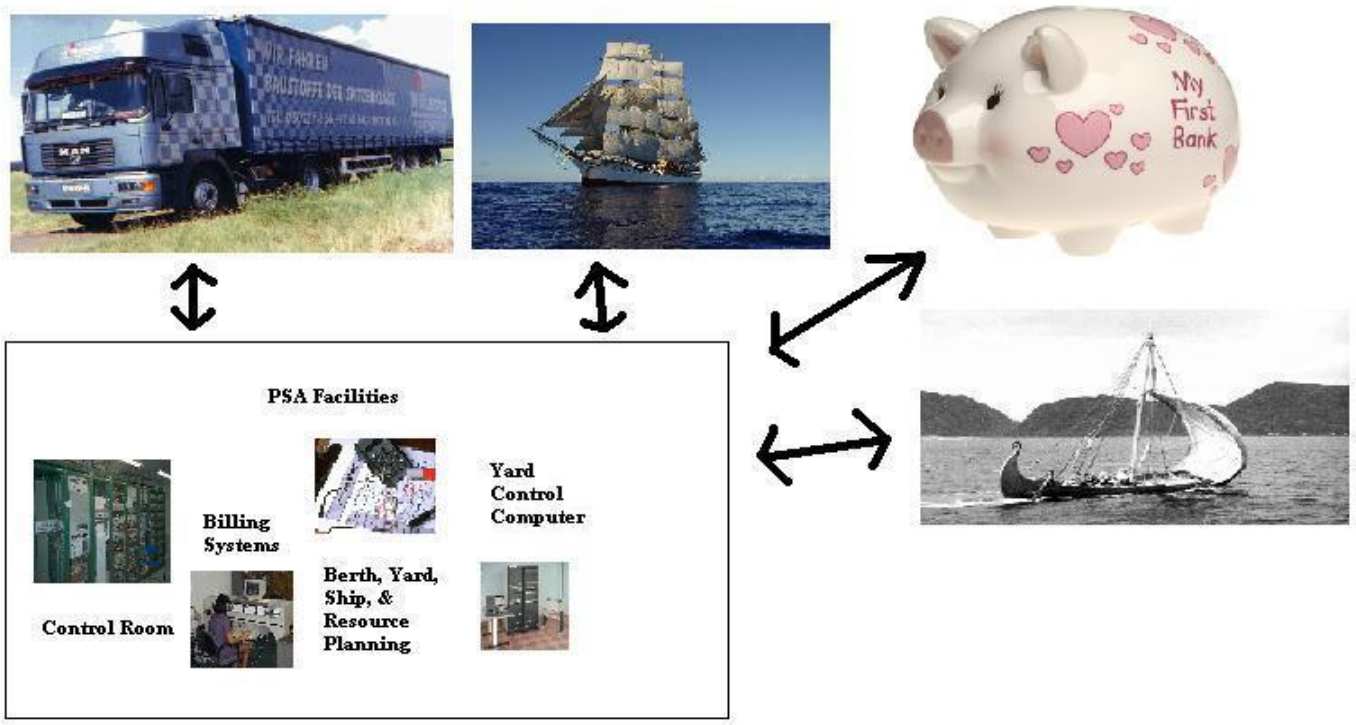
ICT Logistics can build business community Infrastructure

- Build the Port Community Linkages



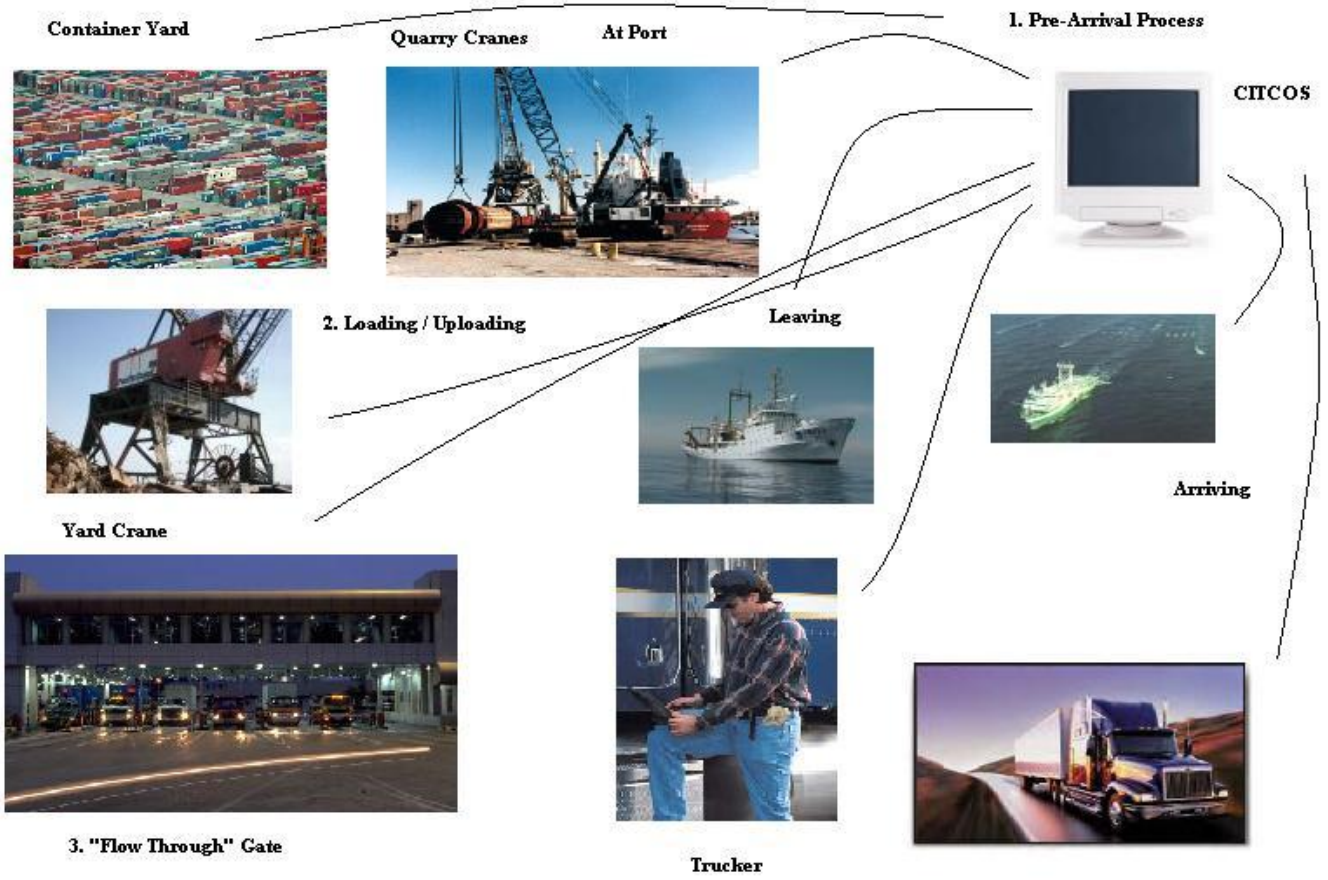
Industry Efficiencies will develop within the communities not just one operator

Real-Time Management, Coordination, and Control



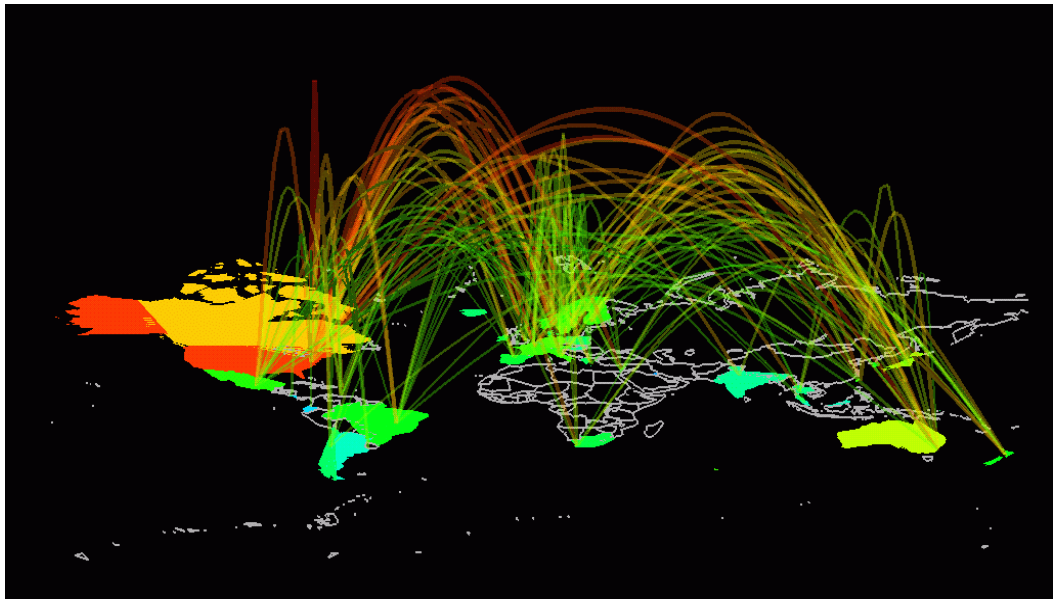
Business community enabled Infrastructure puts efficiency on the map

- Enabled Operations

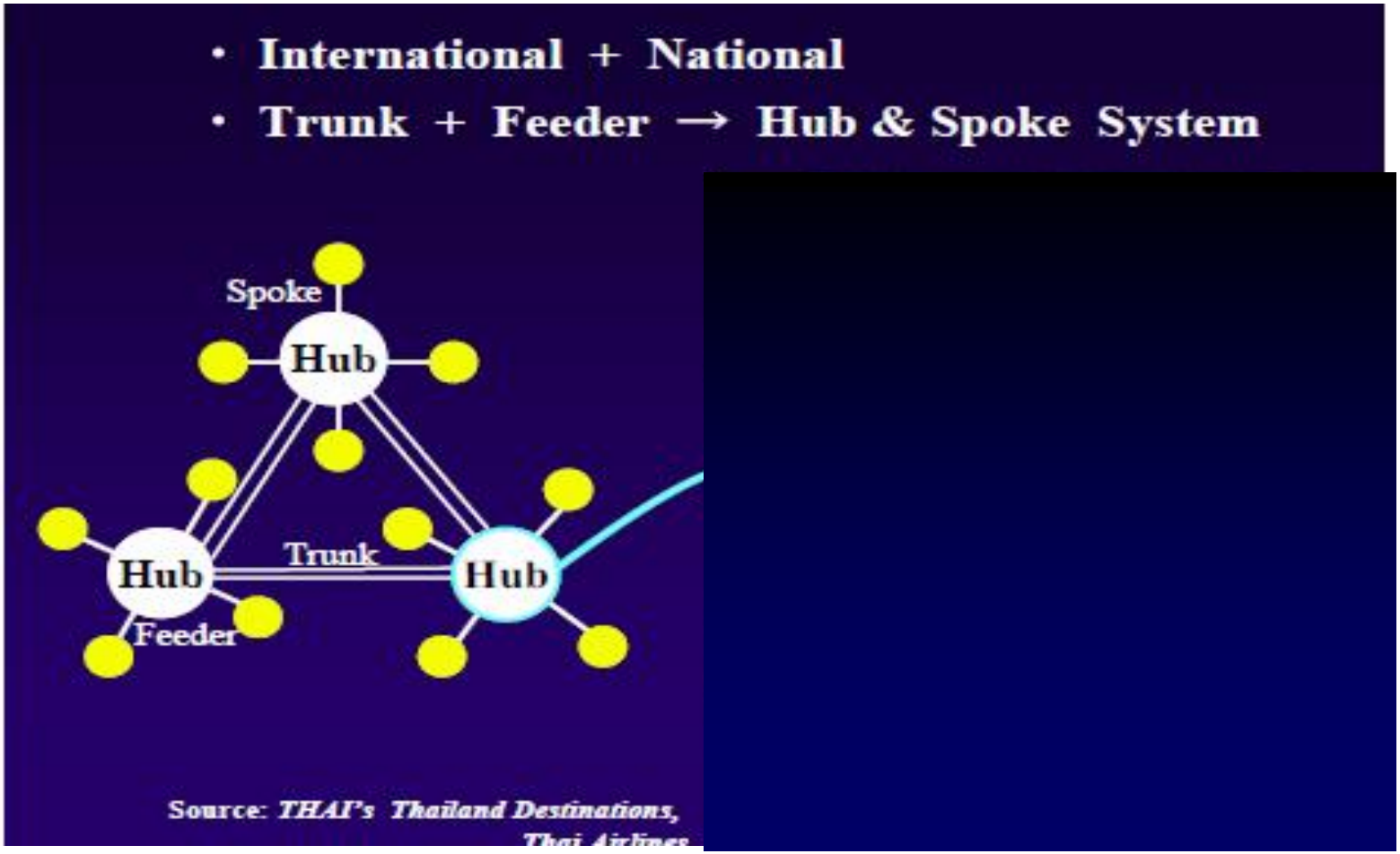


New Ventures may include Linking of Platforms - Australia and Singapore

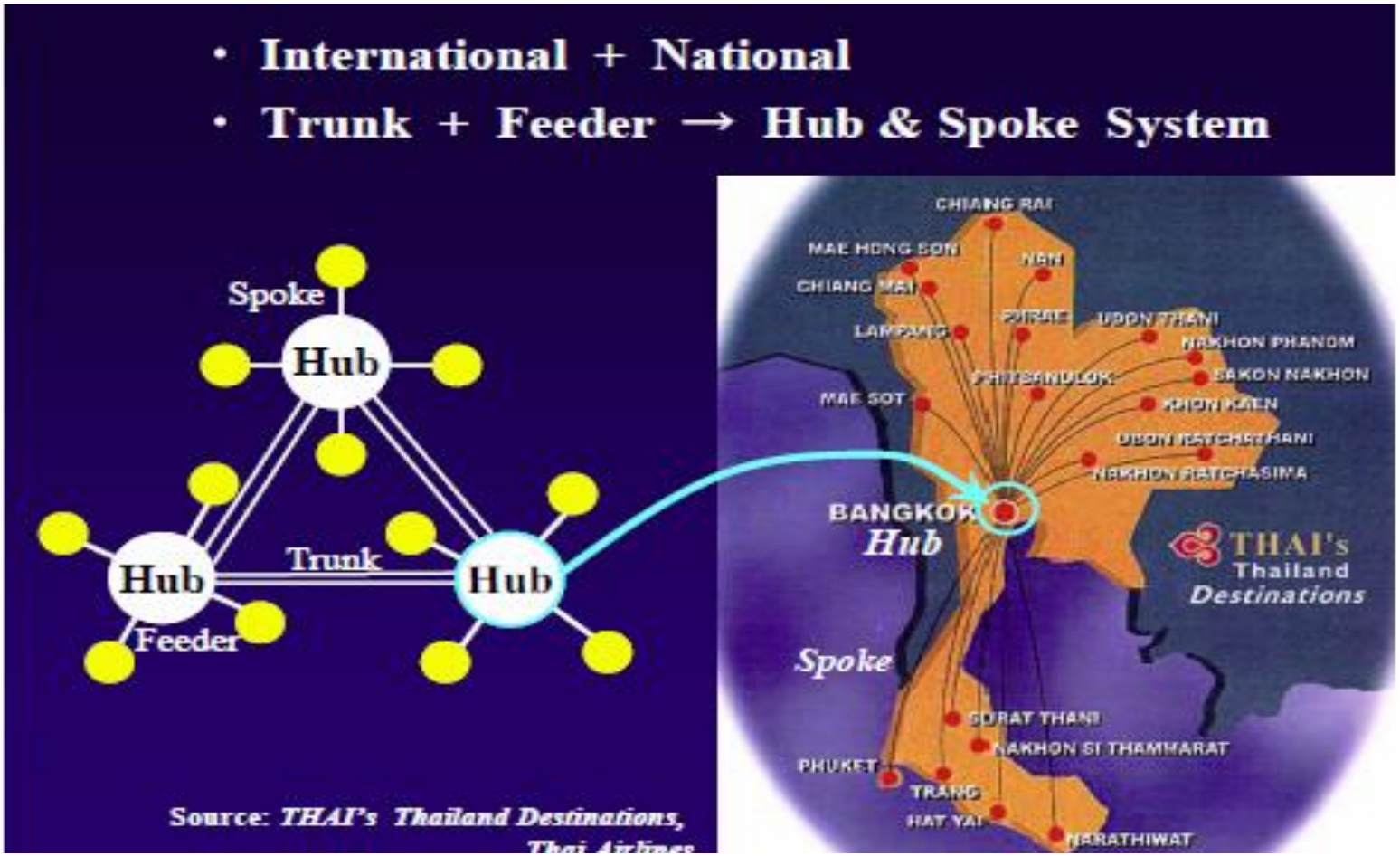
- Port Care Services
  - Box Care
  - Reefer Case
  - Pro Care
  - Chem Care
- Port4@ll.com
  - P-Commerce
  - eMart
  - eSolutions
  - Infohub



Extension of trade for Australia between Industry and Government



Extension of trade for Australia Industry with Asia and the world



Comments

Questions ?