



كلية الهندسة  
College of Engineering  
QATAR UNIVERSITY جامعة قطر

# Procurement and Supply Chain Management

**Dr. Tarek ElMekkawy**

Dept. of Mech. & Industrial Engineering

“Bridging the Gap” - A Special Workshop for Industry and Academics, 17<sup>th</sup> December, W Hotel, Doha, Qatar



# Supply Chain definitions



- A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers (Chopra and Meindl, 2007).
- A supply chain may be defined as the set of parties and agents (such as suppliers, manufacturers, transporters, retailers, etc.) involved, directly or indirectly, in fulfilling a customer's request (Sarmah et al., 1993).

# What Is Supply Chain Management (SCM)?

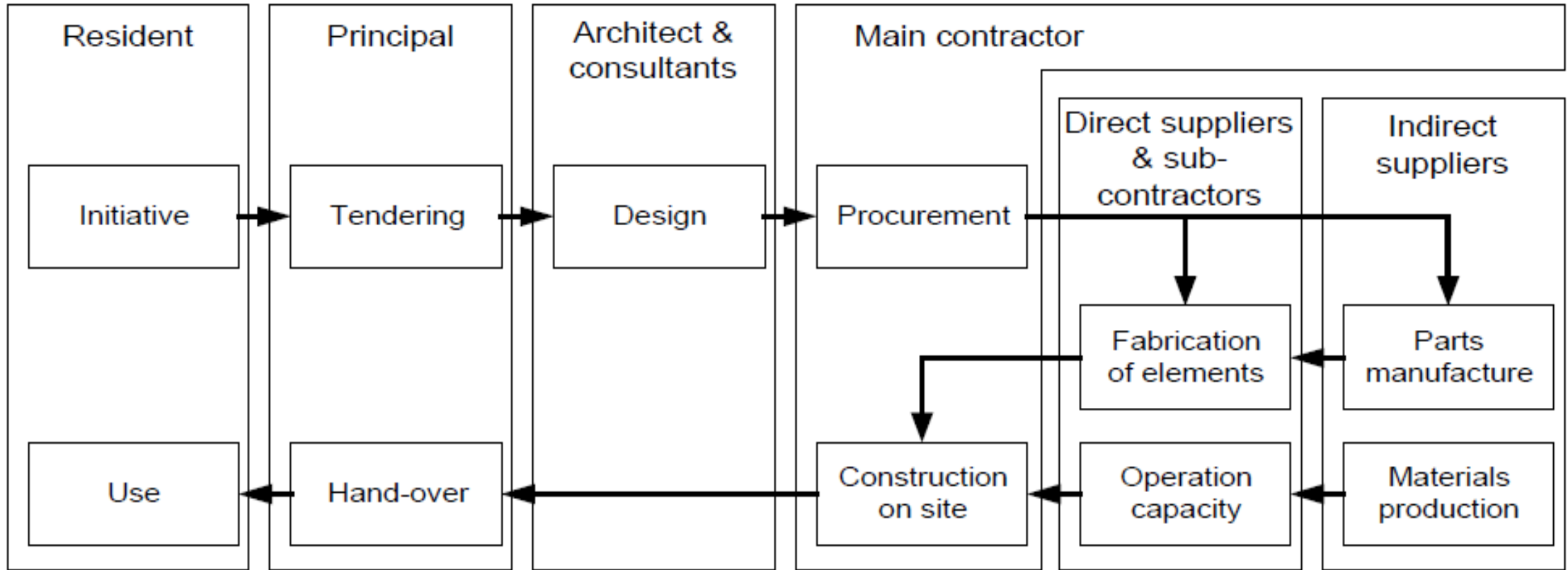


كلية الهندسة  
College of Engineering  
QATAR UNIVERSITY جامعة قطر

- A set of approaches used to efficiently integrate
  - Suppliers, Manufacturers, Warehouses, and Distribution centers
- So that the product is produced and distributed
  - In the right quantities, To the right locations, and at the right time
- In order to
  - Minimize total system cost, and Satisfy customer service requirements



# Supply chain flows in construction



Information flow (orders, schedules, forecasts, etc.)

Material flow (supplies, production, deliveries, etc.)



# SCM Stakeholders (construction)



كلية الهندسة  
College of Engineering  
QATAR UNIVERSITY جامعة قطر

- Owners
- Engineering firms
- Contractors
- Subcontractors
- Equipment and material suppliers
- Raw material suppliers
- Lenders and insurers

## Manufacturing SCM

High degree of design and part  
**standardization**

---

**Reliable demand forecast** and  
planning capability

---

Rationalized supply base, set  
distribution network

---

**Controlled** environment

---

**Customer** not involved

## Construction SCM

**Project-unique** design and materials  
specifications

---

**Uncertain demand forecast** and  
inadequate tools

---

Project-specific supply chains

---

**Unpredictable** environment

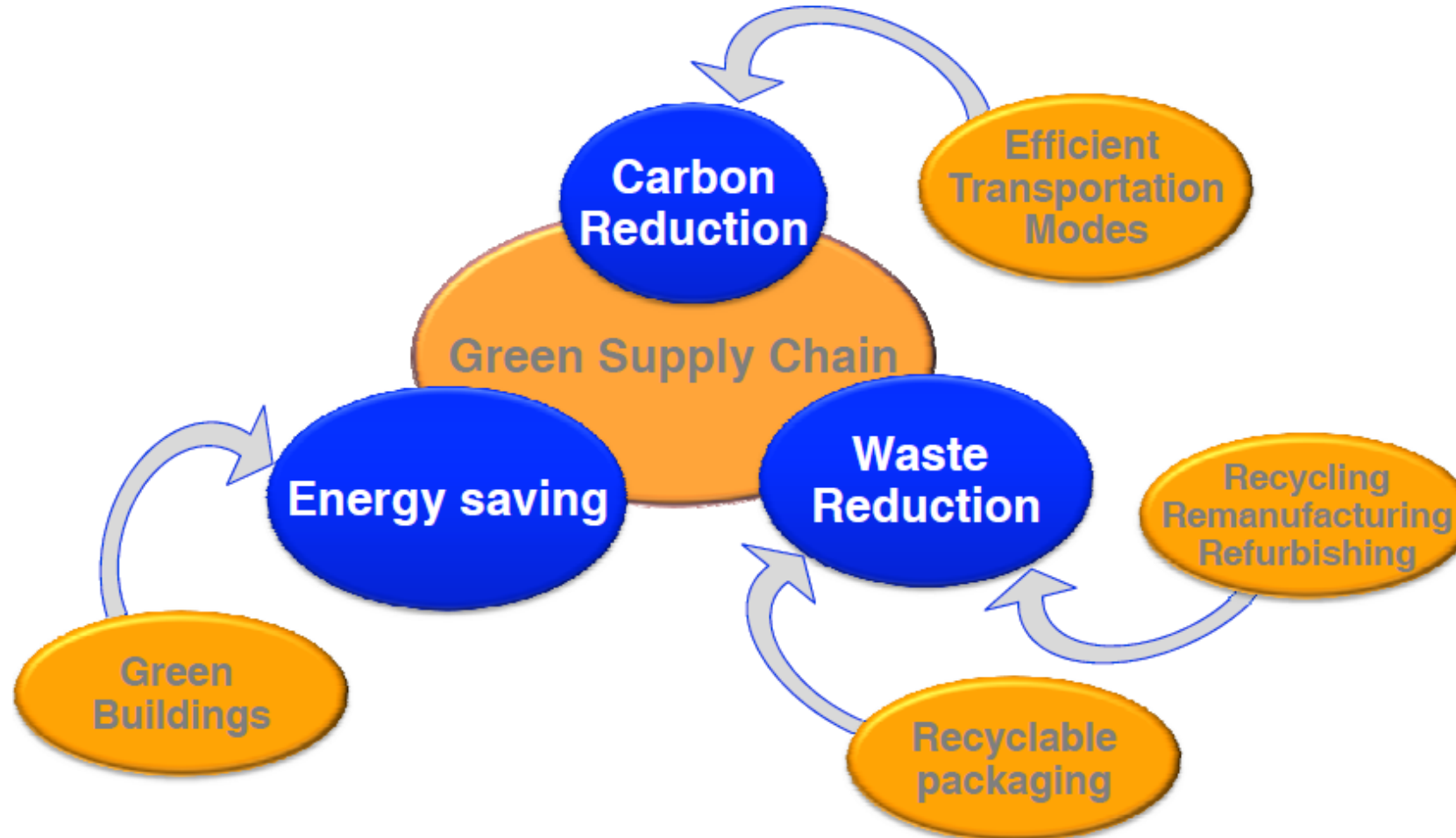
---

**Client** intimately involved

# Supply chain contribution to overall business financial performance

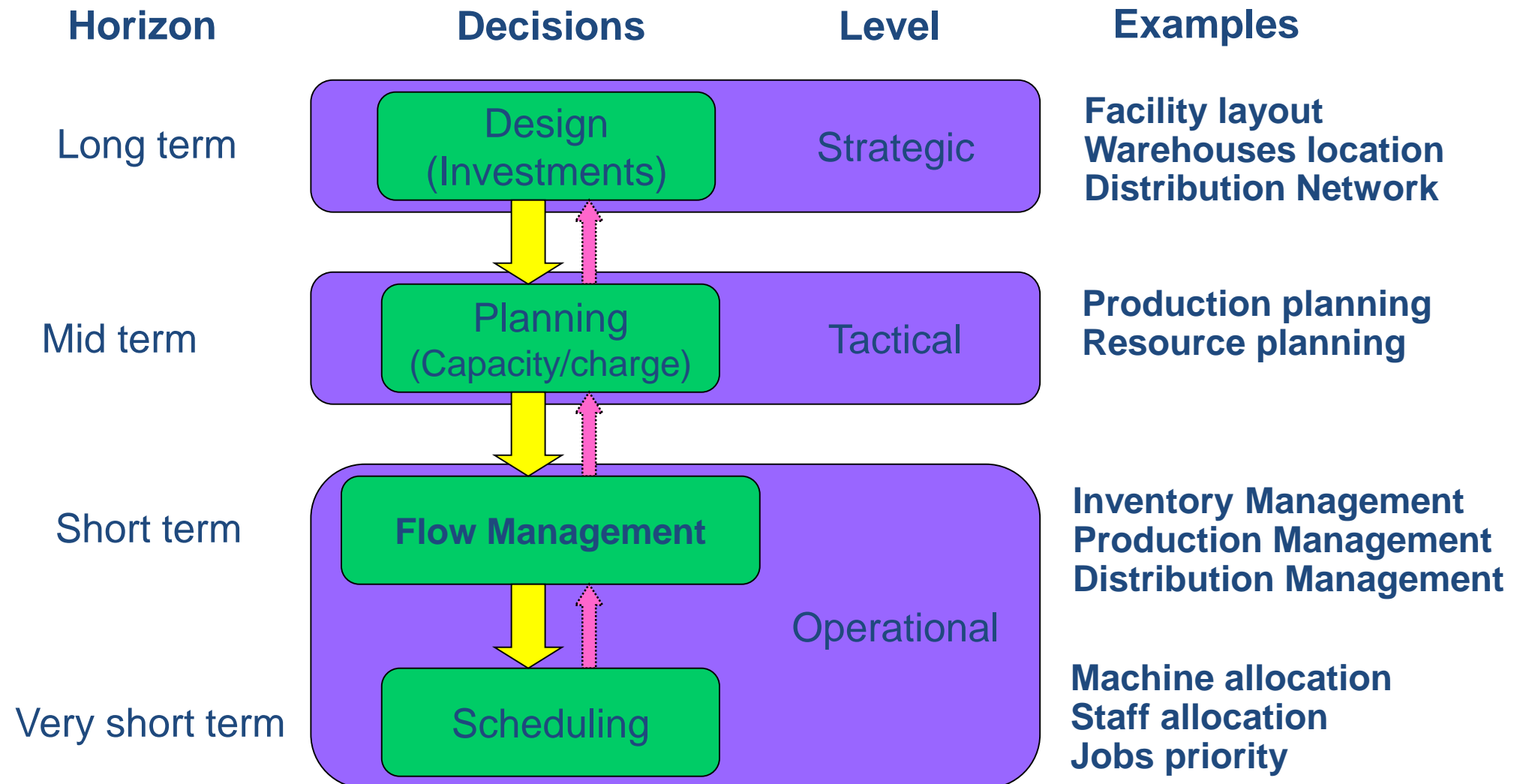


# Supply chain also contributes to sustainable development





# Decision Levels and Horizons in the Supply Chain



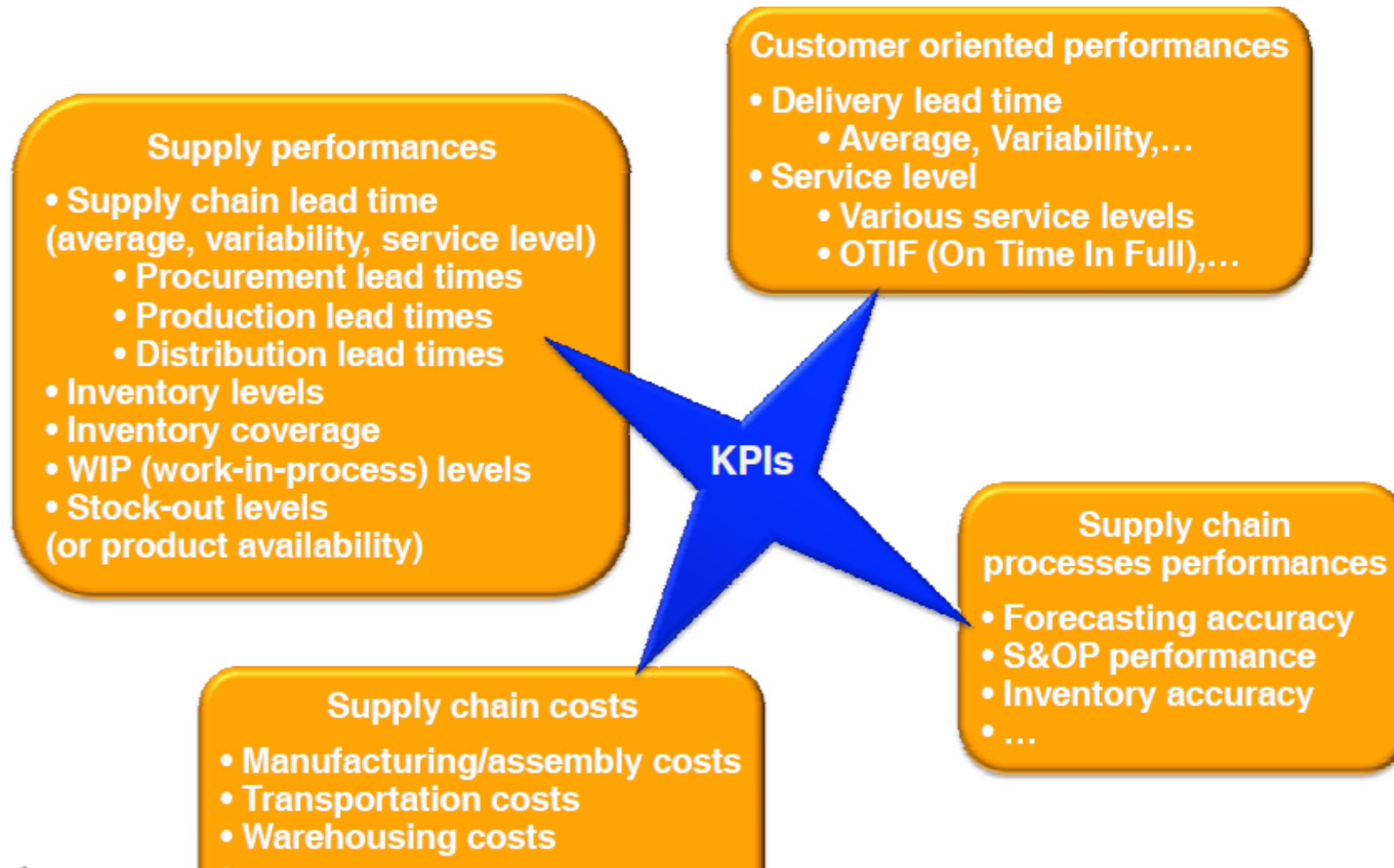
# Key Issues on SCM



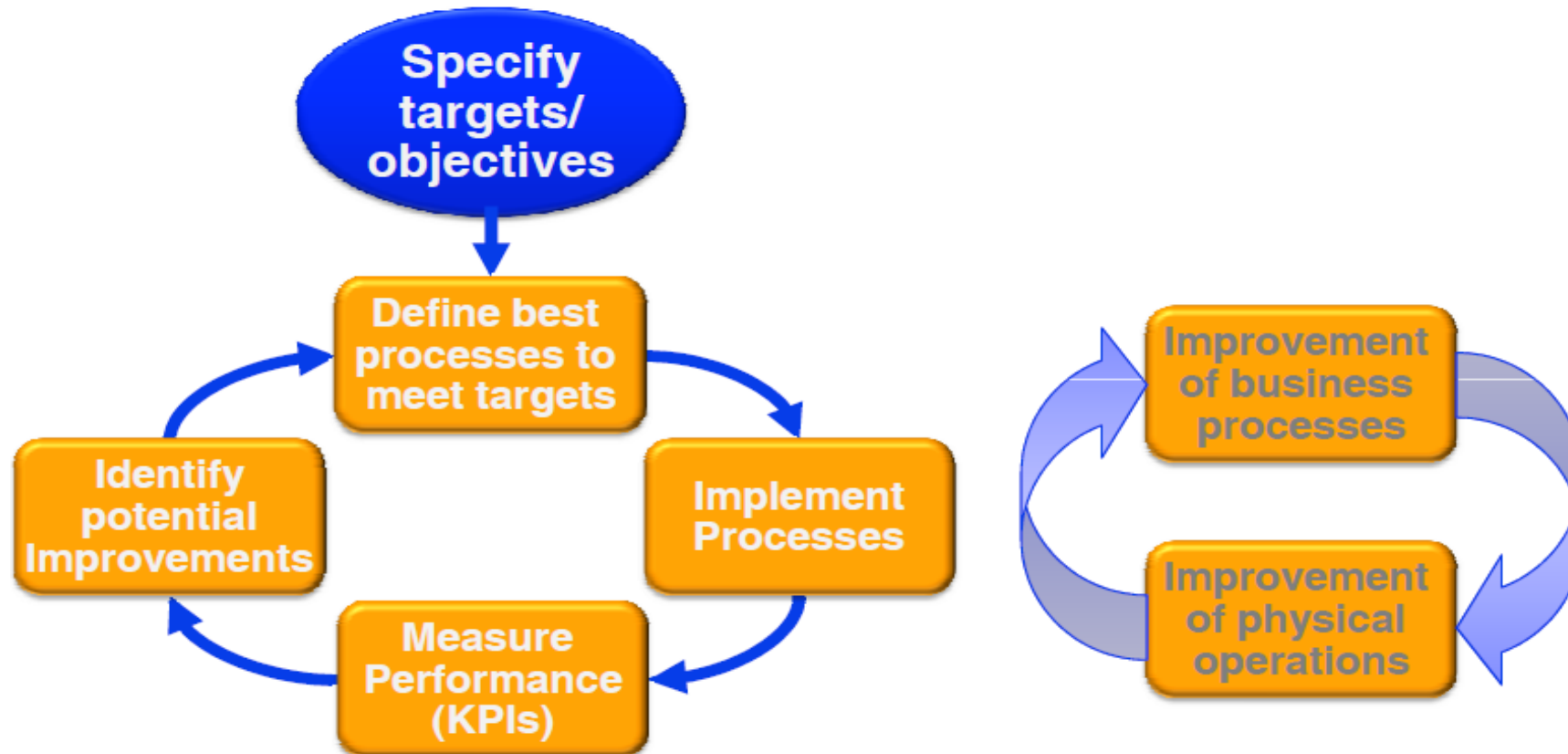
- Location
- Inventory control
- Transportation and logistics
- Information technology and decision support systems
- Strategic alliances and Partnerships
- Supply contracts
- Configuration of distribution network
- Reverse logistics and green issues
- Product design
- Customer value
- Distribution strategy
- Sourcing and supplier management
- Global issues

- Cost of SCM and Logistics (USA, 1998):
  - Transportation 58%
  - Inventory 38%
  - Management 4%
- Procter & Gamble estimates that it saved retail customers \$65 million through logistics gains over the past 18 months.

# Measuring Performance :KPIs (key Performance Indicators)



# The necessary steps towards achieving excellence in SCM

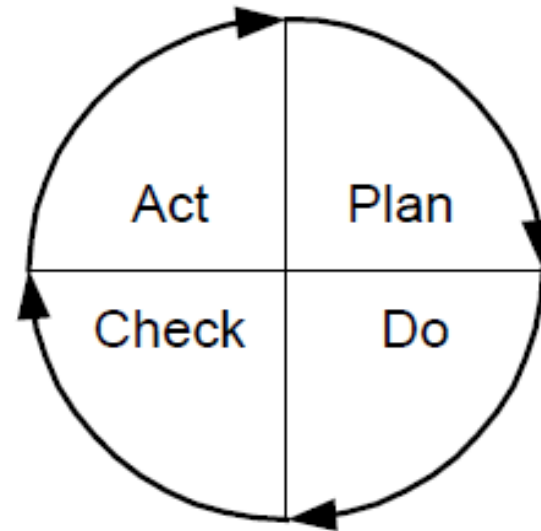
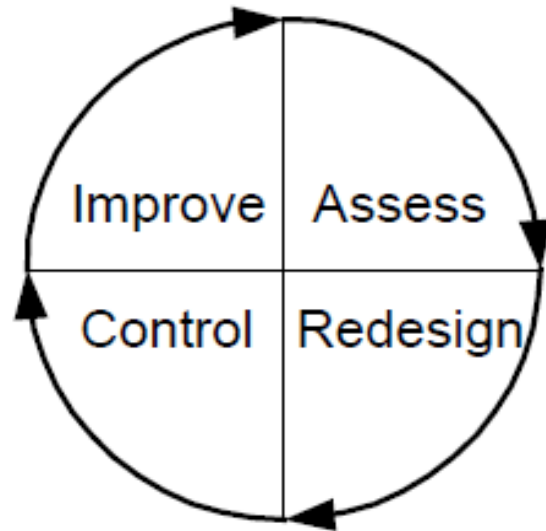


TPS : Toyota Production System  
PDCA: Plan-Do-Check-Act  
DMAIC : Define-Measure-Analyze-Implement-Control

# SCM and Deming Cycle



- Generically, the methodology of SCM consists of four main elements: (1) Supply chain assessment, (2) Supply chain redesign, (3) Supply chain control, and (4) Continuous supply chain improvement.



- In the chain, most actors (contractors, suppliers and clients) appear to be managing just their own parts, securing their own businesses.
- Many actors in the chain seem to be not able or interested to see the impact of their behavior on others (i.e. later) activities in the chain.
- Each actor of the supply chain adds a time buffer for himself in the schedule, and optimizing just his own activities.
- Most of the waste and problems are due to another (i.e. earlier) stage of the construction supply chain other than where they are found.
- The purchasing price is still the dominating criterion for supplier selection.

- An integrated supply chain using collaborative agreements between contractors, suppliers and clients is recommended.
- Mutual trust among cooperating partners is necessary.
- A balance of price and trust is necessary when designing a procurement mechanism.
- Central coordination among partners using decentralized task managements is important.
- Information technologies (IT) is necessary to link main contractors with their subcontractors.
- Effective management of the logistics can lead to significant savings and productivity gains.
- Lean construction have been proposed as solutions to poor performance of SCM.





كلية الهندسة  
College of Engineering  
QATAR UNIVERSITY جامعة قطر

**Thank you**