Supply Chain Drug Delivery

Work in Progress

IIIT-H/TalentSprint – Team 4 Lab session

Use case given: Supply Chain interaction among Business entities involved in Drug Industry

Goals:

1. Supply Chain Traceability

Unintended benefits:

1. Vibrant and Competitive Eco-system for products and services on top of this DLT
2. Identify Counterfeit drugs
3. Supply-demand matching among Wholesalers and Retailers

Market Size and Growth:

The Indian pharma market now stands at $30 billion, with the highest number of sites approved by the US Food and Drug Administration (FDA) after the United States itself—a clear indicator of the pivotal role Indian companies play in both local and global markets and the growing appetite to invest in the country.

India’s generic market continues to expand; after growing by 22 percent in the past decade, Indian exports now have a 20 percent share of global exports by volume. By 2020, India is expected to capture 6 to 7% of a $760 billion global generics market. India’s pharmaceutical industry is poised to exceed $55 billion by 2020, according to estimates by the Associated Chambers of Commerce of India (ASSOCHAM).

The country’s pharmaceutical market is the world’s third largest in terms of volume, but the thirteenth largest in value. However, counterfeiting is pervasive, with an estimated 20 per cent ($4.3 billion in 2013-14) of India’s drug market comprised of counterfeit drugs. While counterfeiting is a global issue, it is much more prevalent in low and middle income countries with an estimated 10 to 30 per cent of medicines in these countries being counterfeit, compared to just one per cent of medicines in high-income countries.

Current Key Challenges in the India Pharma Sector:

1. Operational Parameters
   1. Service Level Agreements
   2. Cost to Deliver
   3. Pressure on Drug Costs
2. Quality and Regulatory issues (With 600 to 700 FDA-approved sites in India, global regulatory agencies are inspecting sites more often. In the past eight years, the FDA has identified more than 800 issues. In 2015 alone, 10 companies were issued warning letters—a 25 percent increase from 2014 with 95% of the observations related to deficiencies in drug quality assurance.)
3. Product Proliferation (Leading Indian players launch anywhere from 15 to 30 products/SKUs a year. This has several implications for the supply chain, including higher manufacturing and distribution costs, more inventory, and a larger supplier base)
4. Supply Chain fragmentation
5. Infrastructure Gaps (the lack of a robust cold chain network to support the supply chain represents a significant gap in today’s pharma infrastructure. Drugs have varying storage requirements to ensure that potency is maintained throughout their shelf life.

Interaction among Business Entities

Players/Entities/Nodes

1. Suppliers (Raw Materials)
2. Manufacturer (Large Pharma Producer) with R&D
3. Logistics & Distribution:
   1. Clearing & Forwarding Agent
   2. Super Stockist
   3. Wholesaler/Stockist
   4. Distributors
4. Retailer/Pharmacy
5. Customer

Check UML use case diagram at: <https://github.com/yogi8091/hyperledger_supply_chain_demo>