AN INTEGRATED MEDICAL LOGISTICS DISTRIBUTED SYSTEM

BACKGROUND/INTRODUCTION

Rapid distribution of medical supplies plays a critical role in ensuring the effectiveness and efficiency of the healthcare system. The medical supply distribution involves the movement of a large volume of different items that usually must be delivered rapidly. It is more complex compared to the supply chains for other products, particularly when considering the strict deadline and sufficiency requirements. Currently, if a healthcare facility needs certain medical supplies, the Collective purchasing Agent contacts the distributors who then connect with the wholesalers or suppliers/manufacturers. The ICT systems supporting these entities serve well on their own merits independently; however, the sharing of information among them in a responsive fashion is limited. They need a single point of contact for coordinating with alternative suppliers for a more rapid response and easy accessibility even in times of crisis. The advent of a distributed system provides a distinct possibility for efficiently sharing of information and integration between all partners in the medical supply chain. This paper is prepared to address the logistics and inventory control issues in the medical supply chain.

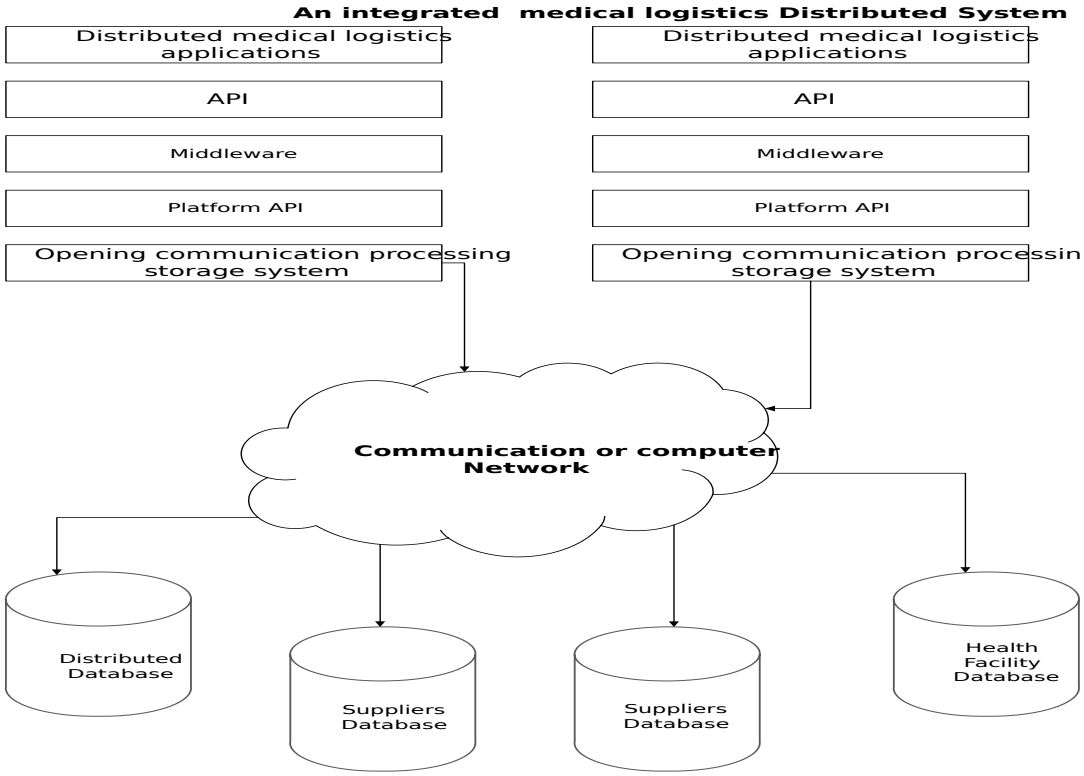
PROBLEM Too much isolated logistics paper records often result in jumbled logistics, unclear accountability and untraceable logistics due to lack of an integrated real time distributed system for data sharing.

PROPOSED SOLUTION In order to optimize medical supply distribution, we are proposing a cost effective, sustainable Integrated Medical Logistics Distributed System that can help reduce the paper records and allow for real time data sharing for the top responsible Medical Supply and Distribution authorities to harmonize their logistics with clear real time accountability.

COMPONENTS OF THE PROPOSED SYSTEM

- Medical Supplies distributed database to track supplies from government, manufacturers/suppliers and donors as well.
- Medical Suppliers distributed database to track suppliers according to their locations.
- Medical Supply Distributors distributed database to track available distributors of medical supplies in a given location
- Distributed Medical Logistics Application: Real time processing control system to share necessary information among the different partners/entities.

SYSTEM FLOW



Independent autonomous computers/hosts are linked by a network and equipped with a Distributed application and middleware service.

How the proposed system works

1. Every Host on the network works towards a common goal and the end-user that is; either a health facility, distributor, supplier or responsible body (for instance the Ministry of Health) views results as one cohesive unit.

2. Each Host has its own end-user and the distributed system facilitates sharing resources or communication services. The supplier can share their stock, the health facility can make orders and the distributor can share procurement and delivery information.

IMPACT OF THE PROPOSED SOLUTION

- Since Suppliers, Distributors and Health facilities are connected to each other, they can easily share data. This real-time information sharing offers a big picture in the product planning and delivery system and also enables the organizational managers to distribute the right resources at the right place and the right time.
- More suppliers can easily be added to the system, that is; it can be scaled as required.
- Failure of one node does not lead to the failure of the entire system. Other nodes can still communicate with each other.

POTENTIAL CHALLENGES OF THE PROPOSED DISTRIBUTED SYSTEM

- It may be difficult to provide adequate security in the system because both client nodes and connections need to be secured.
- Some messages and data can be lost in the network while moving from one node to another.
- The databases connected to this system may be quite complicated and difficult to handle as compared to a single user system.
- Network saturation as a result of all the nodes of the distributed system trying to send data at once may cause a hurdle in data transfer.

CONCLUSION

Logistics is an important issue in designing the medical supply distribution system, particularly for large-scale.Figure1 shows how the proposed distributed system can be used to allow real time sharing of logistics information for rapid medical supply distribution. This will health facilities get the right medical supplies right on time, offer same-day delivery service to more customers, give clear accountability and allow for scalability.