Supply Chain Technology Enablers

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2.3 billion people of the Global population have NO Access to essential medicines.

FACTS

UNAFFORDABLE

UNAVAILABLE

UNREACHABLE

LOW QUALITY

UN-Acceptable
Geographical accessibility

- UHC laws in making essential medicines accessible (Perehudoff et al. (2019): laws toward medicines frequently lack principles of good governance and miss details on technical implementation.
TECHNICAL IMPLEMENTATION IS OFTEN THE ELEPHANT IN THE ROOM BECAUSE OF RESOURCES & MINDSET
Efficient integration of different vertical supply chain methodologies from an end-to-end linear model to a full integrated logistics ecosystem.

Increase predictability, transparency and traceability.

SMART SUPPLY CHAIN MANAGEMENT 4.0

Smart, sustainable and affordable First, Middle, Last Mile distribution.

Robust and resilient future value chains for Life Science & MEDtech.
WORK PACKAGE 1:
exploring the competitive positioning of UAV in relation with other transportation modes, the regulatory framework for UAV operations and applications of UAV in the pharma and humanitarian air cargo sector. All findings of WP1 were presented in the White Paper that was shared with the industry, in August 2021.

WORK PACKAGE 2:
presenting the technical aspects of the drone systems through a 360° interactive video (drone lab, type of drones, drone operation, etc.). The video is available for Pharma.Aero members and associate partners only.

WORK PACKAGE 3:
documenting an industry case to observe the use of drones as part of a multimodal supply chain in real life.

"64% claimed that their organization struggle with the lack of infrastructure."

"58,3% see a medium-term horizon (1-5 years) for drone deployment in their organization."

Pharma.Aero & HLA UAV Project
Pharma.Aero – HLA Use case
UAV Vaccine Deliveries in Malawi

• Why:
  • emergency health situations caused by natural disasters, war & conflict zones and topographical poor infrastructured zones

• Technology
  • enables if the human brain lets it happen... MINDSET makes the difference as we will proof

• Conflict:
  • Fast technology development versus slow human integration
Investigating the use of drones as part of an interconnected multi-modal distribution network

Increase access, speed and efficiency

Provide unprecedented insights by mapping the vaccine journey to heard-to-reach areas creating the value chain including UAV’s

The Use of Drones in transporting vaccines from factory to patient

Use of Drones (UAV’s) and its potential as part of the pharma logistics chain interconnecting different existing modes of transport
The transport comprises 4 phases:

**PHASE 1**: Factory in Belgium → Airport in Malawi

**PHASE 2**: Airport in Malawi (Lilongwe) → National Warehouse (Lilongwe)

**PHASE 3**: National Warehouse → District Warehouses

**PHASE 4**: District Warehouses → 800+ Health Facilities / Vaccination Centers

*or remaining time before expiry.*
Integrating use of drones in the last mile: the local health facility

use of drones in 8 of the 28 districts

significantly shortening the delivery times

- 90 minutes truck to 9 min UAV
- 3hr boat to 12 min UAV

bi-directional use of drones with vertical take-off and landing resulted in

- easy infrastructure to operate
- low human resources needed
- bi-directional use can ensure delivery medication and health supplies and pick-up lab samples for urgent analysis
- regulatory support enables the test case
Integrating use of drones middle mile segment

- Technology: a series of challenges especially to the type of drone (fixed wing etc.)
- Regulations: more authorization processes and flight regulations
- Sustainability: affordable operations and use can only be reached by creating an integrated multiple health program with additional network design and combined use of drones
Integrated Drone Transport

Products Suited for Drone Delivery:
- Light Weight
- Cold Chain Dependent
- Short Shelf Life
- High Cost

Hard-to-Reach and Remote Facilities
- Frequent & On-Demand

Products Suited for Land-Based Delivery:
- Bulky
- Not Cold Chain Dependent
- Long Shelf Life
- Low Cost

Less Frequent & Scheduled

*for hard-to-reach facilities only
From vertical segments (emergency, on-demand or deliveries) focused in public health, to full applicability to enable affordable drone operations

Focus on efficiency failure of land-based transportation modalities both in hard-to-reach remote areas as metropolitan dense cities

Conclusions

From stand-alone to fully integrated use needs more research

A different market penetration is necessary combining different modes and commodities, similar to all other existing logistics methods in place
DRONE (UAV) is one of the technical enablers in an entire ecosystem of Innovative supply chain management

- Continuous improvement of road networks and connected air hubs
- Regional and local pharma production and diagnostic centers
- Integrated supply chain modes and methods
- Integrated next generation of digital technologies