Delivery of Cargo using Drones

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Example: Multicopter
Example: Hybrid
Case study 2 MSF Drone Delivery in Papua New Guinea

MSF using drones to transport Tuberculosis samples from villages to health centers. Main problem was getting diagnostic samples from remote health centers to an MSF laboratory in the shortest amount of time.

Photo: Matternet
Same distance covered in 55 minutes instead of 4hrs

Graphic: MSF
Battery swap

Photo: Matternet
Rwanda: Zipline
Today: Fully operational fleet makes daily deliveries

A Zip is a drone that provides rapid, on-demand aerial deliveries

- Flies autonomously
- Carries up to 1.5 kg of medicine
- Covers 10x range of quadcopter drones (150 km vs. ~10-20 km)
- Makes up to 15 deliveries/day

Zips operate from a hub, which is a modified shipping container

- Hubs are located next to governments’ existing medical warehouses
- Each hub has a service radius of 75 km
- 2-3 employees can operate a hub
Partnership with Rwanda

• Handling all blood deliveries to 21 transfusing facilities

• Ultimately will put all 11m citizens within 30 min delivery of any medical product
## State of the art

<table>
<thead>
<tr>
<th>Company</th>
<th>Type</th>
<th>Cargo</th>
<th>Range*</th>
<th>Power</th>
<th>Delivery</th>
<th>Hours Logged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amazon</td>
<td>Hybrid</td>
<td>25kg</td>
<td>16km</td>
<td>Battery</td>
<td>Land</td>
<td>1,000’s</td>
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<tr>
<td>DHL</td>
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<td>12km</td>
<td>Battery</td>
<td>Land</td>
<td>100’s</td>
</tr>
<tr>
<td>Drones for Development</td>
<td>Hybrid</td>
<td>?</td>
<td>?</td>
<td>Battery</td>
<td>Land</td>
<td>100’s</td>
</tr>
<tr>
<td>Flirtey</td>
<td>Multi-rotor</td>
<td>2.2kg</td>
<td>16km</td>
<td>Battery</td>
<td>Hover</td>
<td>Confidential</td>
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<tr>
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<td>16km</td>
<td>Battery</td>
<td>Land</td>
<td>1,000’s</td>
</tr>
<tr>
<td>Matternet</td>
<td>Multi-rotor</td>
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<td>20km</td>
<td>Battery</td>
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<tr>
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<td>Hybrid</td>
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<td>100km</td>
<td>Battery</td>
<td>Land</td>
<td>100’s</td>
</tr>
<tr>
<td>Wings for Aid</td>
<td>Fixed-wing</td>
<td>100kg</td>
<td>500km</td>
<td>Gas</td>
<td>Parachute</td>
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<tr>
<td>UAVaid</td>
<td>Fixed-wing</td>
<td>10kg</td>
<td>150km</td>
<td>Gas</td>
<td>Parachute</td>
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<tr>
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<td>Land</td>
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<tr>
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<td>150km</td>
<td>Battery</td>
<td>Parachute</td>
<td>1,000’s</td>
</tr>
</tbody>
</table>

Source: Drones in Humanitarian Action Report - unpublished
Cargo drone take-aways

• Rapid growth in the market will lead to commercial use of cargo drones
• At current state of technology use to humanitarians limited, except for small deliveries of essential items
• Most likely much use in health and development fields with potential for humanitarians to “borrow” infrastructure in emergencies