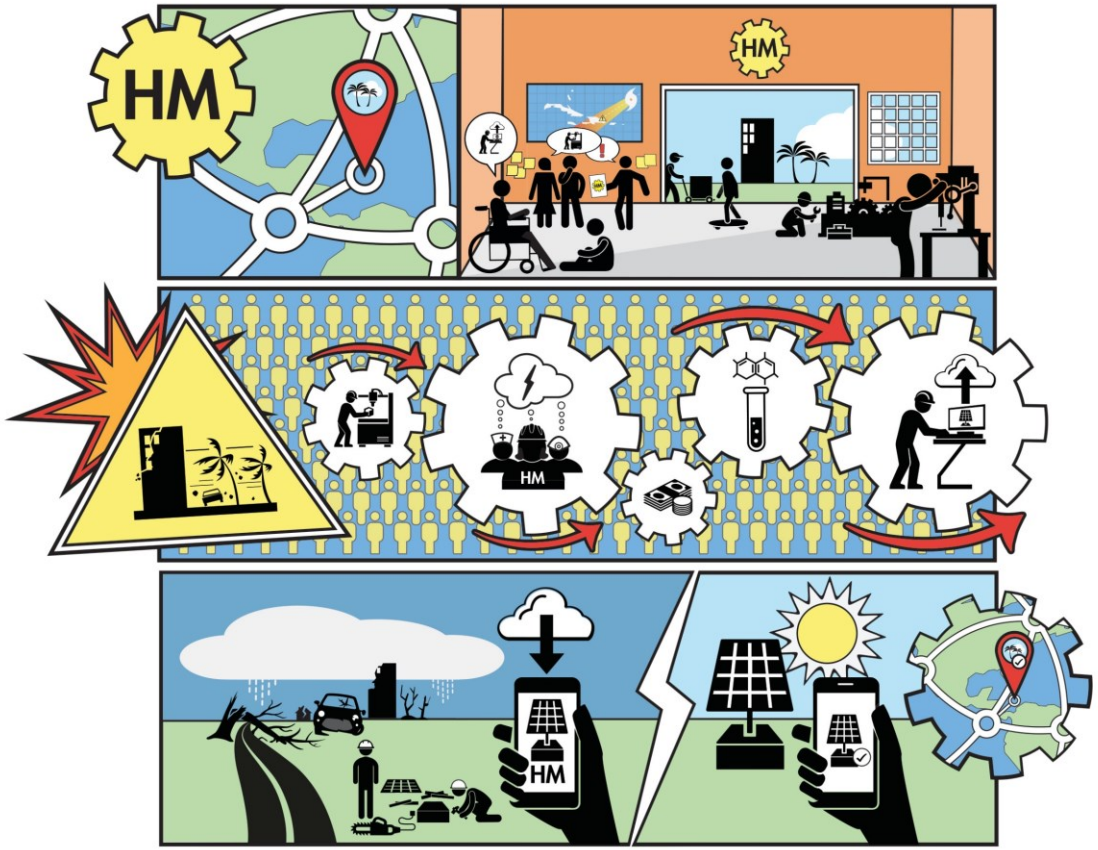
Injection Mould for Medical Kit

Presented by Andrew Lamb

HUMANITARIAN MAKERS

UNITING TO SUPPORT DISASTER RESPONSE



www.humanitarianmakers.org
@H_Makers

https://www.humanitarianmakers.org/

Field Ready

Humanitarian supplies made-in-the-field

Field Ready meets humanitarian and reconstruction aid needs by transforming logistics through technology, design and engaging people in new ways. We make useful items where they are needed to solve problems locally. We pass on these skills to others through training and capacity-building. We are pioneering innovative approaches to the toughest challenges regardless of the sector. The impact of this is dramatically improved efficiency making aid faster, cheaper and better.

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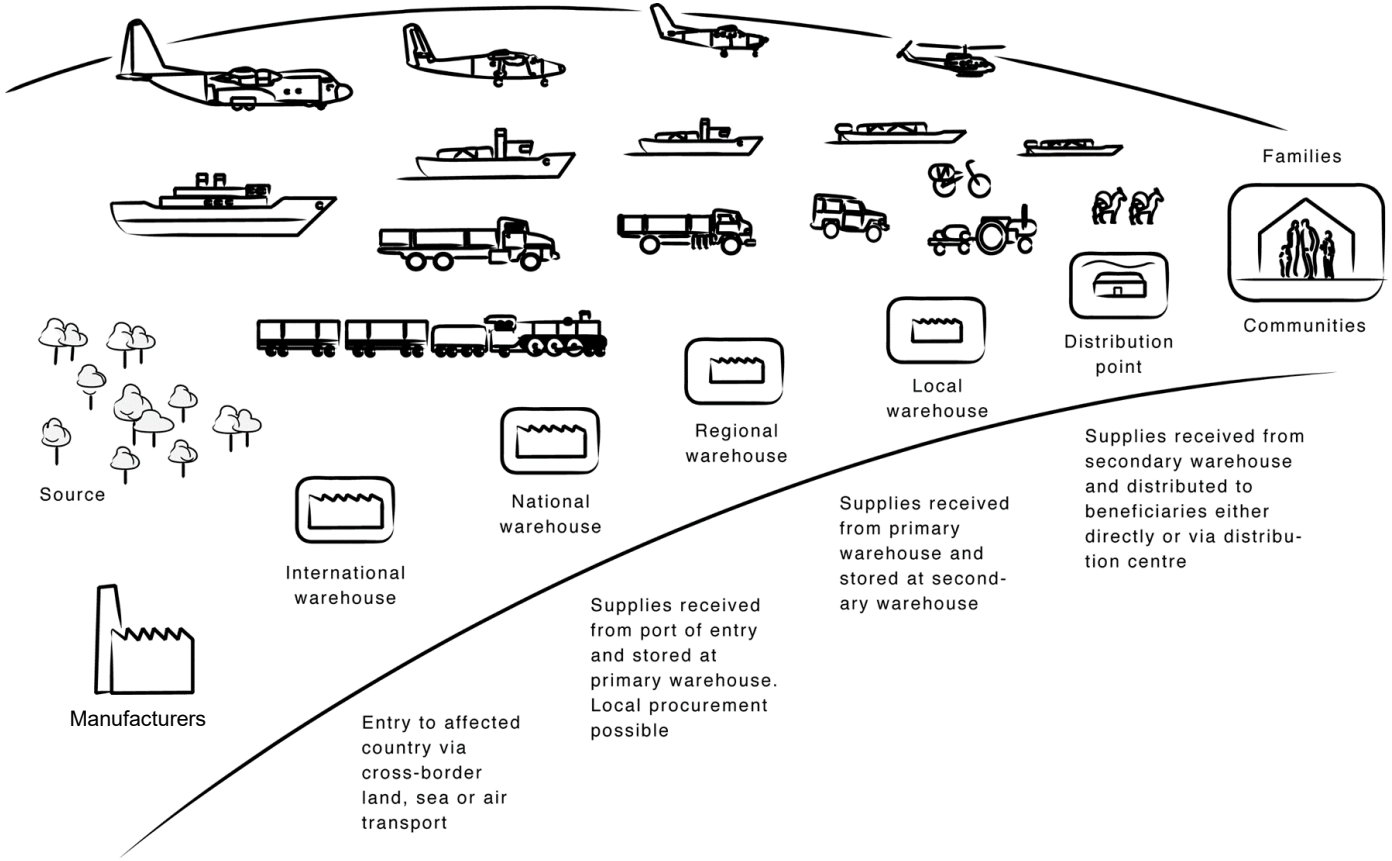
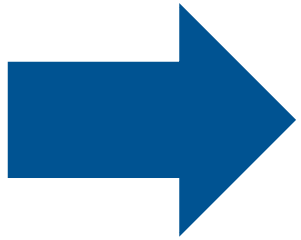
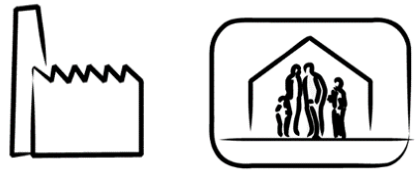
Our Approach

Transforming disaster relief







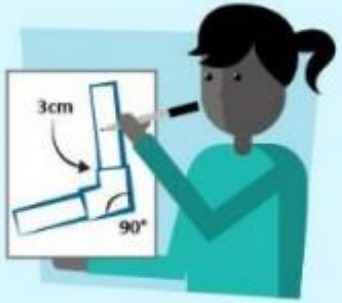
Today's approach:
make aid supplies far away & ship

Tomorrow's approach:
make aid supplies in-the-field

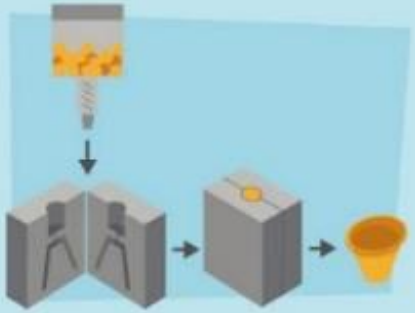
How we work at Field Ready

Assess
Look, listen & understand

Design
Ideate & develop concepts



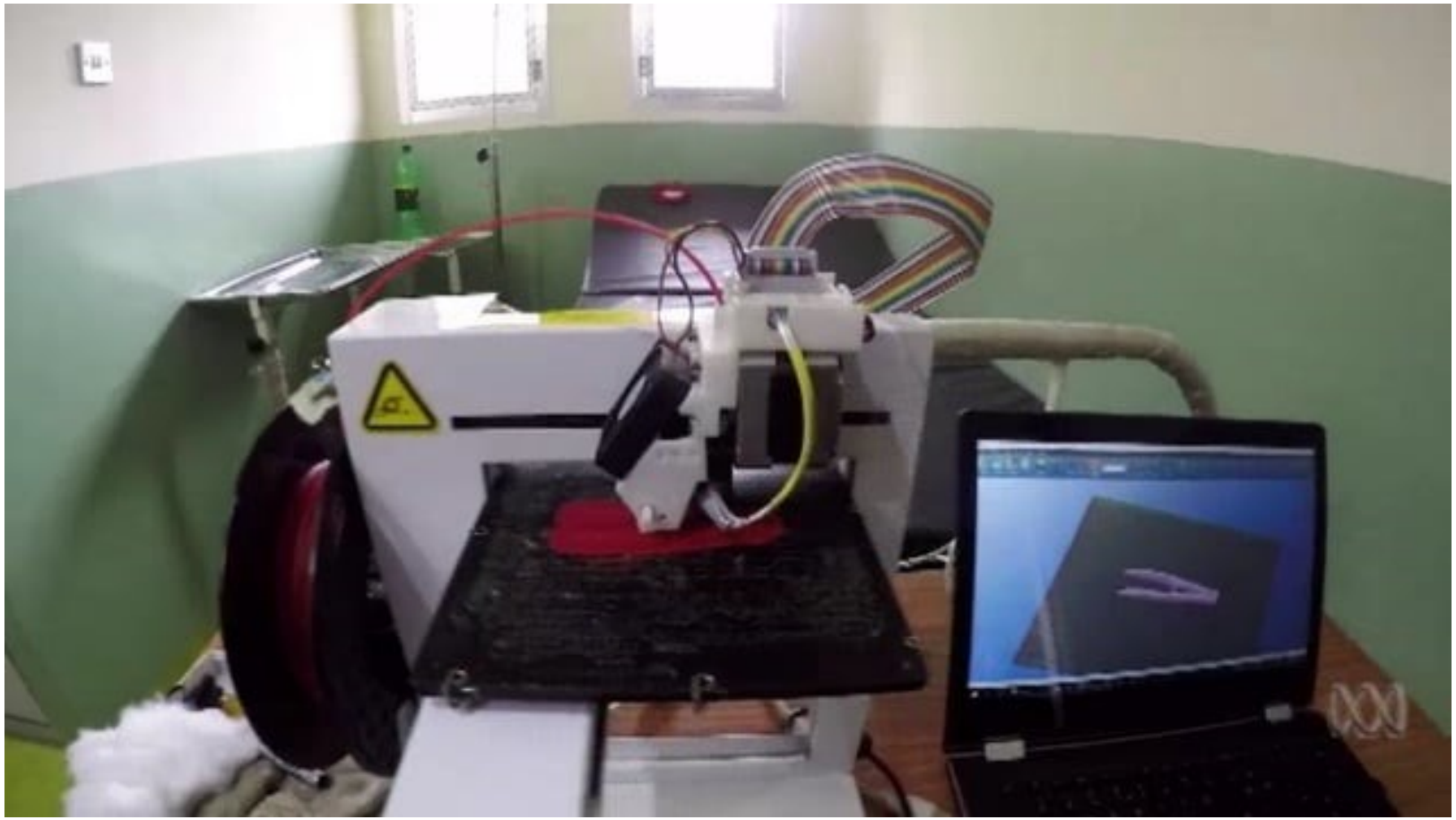
Make
Manufacture useful things



Share
Test, distribute & train others

Lead
Replicate where there is need

FIELD READ



News Doctors turn to 3D printing to source medical supplies in earthquake-recovering Nepal_Mar 2017

Problem

3D printing is slow; it requires a high level of skill, and the quality can change every time.

Making medical implement on a 3D printer is very difficult for local people or aid workers.

Even if the design is ready, people will have to know how to use the machine, print correctly, and deal with plastics.

At the same time, Field Ready wants to scale up medical implement, we have been using 3D on-demand, but other aid agencies such as Oxfam can’t adopt it on the same process because of the problems above.

Constrains

- It is difficult to produce detailed or intricate parts. This is mainly due to the fact that it is hand operated so doesn't create enough pressure to fill the mould.

- All other constraints are dependent on the specific location and budget/resources associated with the project.

- Hospitals has limited funds and staff time for procurement

Annapurna Neurological Institute in Nepal:

Challenge: budget – the hospital has limited funds available for fixes and staff time to develop prototype fixes and work on new projects.

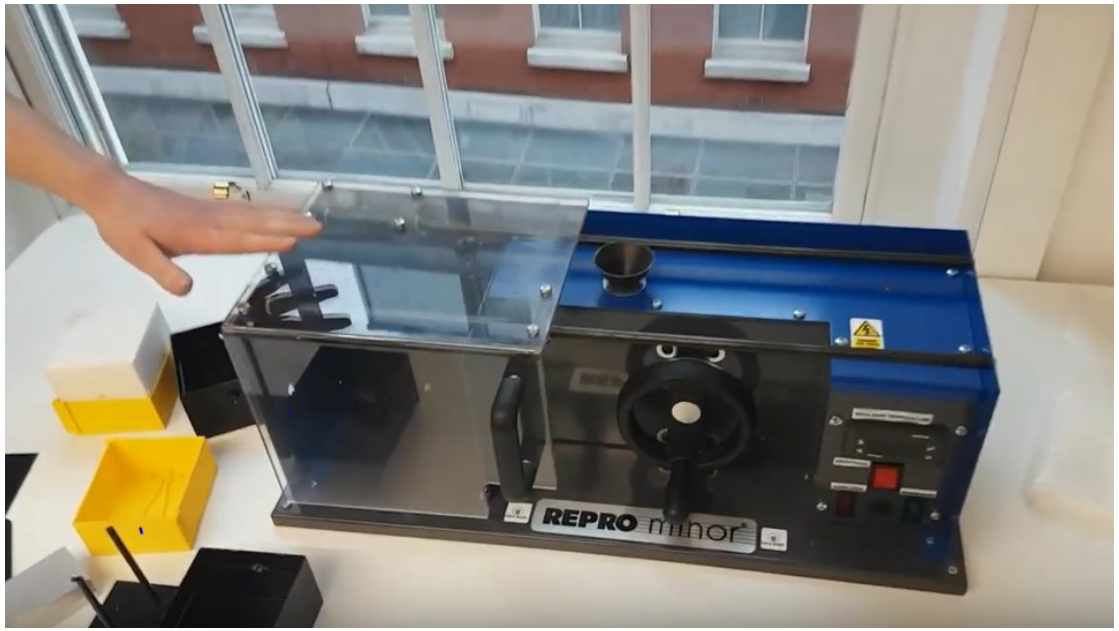
Challenge: The biomed team could not repair the electronics of a syringe pump driver unit which meant they had to dispose of it and purchase a new one. The team lack the capacity to address these kinds of fixes.

Proposed Solution

Background:
The majority of plastic products in the world today are manufactured by injection moulding. With affordable desktop 3D printers and injection moulding machines, it is possible to create moulds in-house to produce small, functional parts for final products. For low-volume production (approximately 10-100 parts), 3D printed moulds save time and money. (Reference: Formlabs whitepaper, 2016)

Proposed solution:
Instead of 3D printing, create a kit based on injection moulding. Specifically, small scale portable machine, with electric gas heated to melt the plastics, hand-operated.

The idea is to get these moulds into the machine, easy to use.



Project Briefs for Humanity Lab

Create a low cost, effective, reliable, robust kit that can make from 10 to 20 frequently-used small plastic medical implements for rural clinics.

Example deliverable for Humanity Lab:

- Research what are the most commonly-used medical devices (top 100), maybe 10 of them can be made in the moulding machines
- Make these moulds
- Provide the moulds to the entire world
- To provide for local hospitals: moulds and a machine For

‘Hacking’ medical equipment repair in war-torn Mosul

Following three years of occupation by ISIL and intense fighting to remove them, the healthcare system of the Northern Iraqi city of Mosul has been left in shambles. Many healthcare facilities were destroyed as they were used as safe havens, yet they face increasing demand as displaced population return to the region.

At the same time a community of young techies gathered to find ways to improve the lives of their compatriots through building the capacity for innovation and technology uptake, particularly among local youth. They have formed what is called Mosul Space,

Field Ready teamed up with Caritas Czech, which was looking for innovative projects in healthcare, to bring their experience fixing and making for healthcare systems in complex environments across the world to Mosul and Ninewah Governorate.

This project allowed Mosul Space to established a physical presence as the first makerspace in Mosul, not only proving immediate technical solutions to the healthcare sector, but also providing youth in Mosul with a safe place to gather, learn more about technology and innovation and to me like-minded people.

Field Ready worked closely with the young engineers of Mosul space to build their skills in 3D modeling and 3D printing through intensive, tailored training and mentorship. As the rest of the makerspace is equipped in conjunction with Caritas Czech, Mosul Space staff and volunteers are learning about the full-range of workshop tools.

Most crucially this training included how to sensitively carry-out assessments in a health-center a identify the key items to fix or make which have a real impact on staff and patients. Field Ready's team in Syria and the Caritas' bio-medical engineer in Mosul combined experience is a valuable combination in kicking off this program and ensuring it starts on the rights note.

Hospital visits have only just begun, but already a hinge, a door and a door lock have been made replace broken parts for a couple of different incubators (a common problem we have found acros the globe) and an axle wheel stand for an ECG cart is under development.

Over the coming weeks and months, more visits will be made to health centers to scale this assistance. As we build health worker confidence by providing quick solutions to the first problem they bring to us, we expect to have many more repairs and new supplies developed.

Moulding machine

- REPRO MINOR INJECTION MOULDING MACHINE

- University of Technology Sydney (UTS) is testing its feasibility for use in the field.

- https://www.plasticformingequipment.co.uk/products/repro-minor-injection-moulding-machine/

Resources

1 Funding

2 Knowledge

- Formlabs Study Injection Molding from 3D printed molds
- Addifab – moulding company
- Babyplast – moulding machines
- Abi Bush explaining how injection moulding machines work
- Localizing Aid: How Field Ready is Making a Difference

3 Contact

- Cecilia Ho, Innovation coordinator, Cecilia.ho@fieldready.org
- Brynmor John, Technical Advisor at Field Ready Nepal brynmor.john@fieldready.org
- Add rural clinics
- And who know what moulds would they need
- University of Technology Sydney (UTS) (Brynmor can help contact)

4 Partners

Oxfam
gig GLOBAL INNOVATION GATHERING
World Vision Building a better world for children
Save the Children
RESPONSE INNOVATION LAB

Thank you

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