Covid-19: Volunteers coming together across Malaysia to produce PPE for frontliners

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By **Qishin Tariq**

Stem4all Makerspace volunteer Miranda Tan putting together face shields fabricated using a 3D printer. — Bernama

Volunteers across Malaysia are leveraging technology to ramp up production of personal protective equipment (PPE) for frontliners, and also ensure that the protective gear goes to the right people as quickly as possible.

One such initiative, the Open Source Community Fight Against Covid-19, is a Facebook group of tech enthusiasts who are using 3D printers, laser cutters and plastic injection moulding machines to produce safety gear.

Around 200 active volunteers have armed themselves with more than 500 3D printers, some of which were loaned to them by businesses that wanted to help out.

One of its coordinators, Wan Cheng Huat, said the effort was kickstarted by the 3D printing community, but others with injection moulding machines have joined the cause, tremendously increasing the production speed.

The 3D printers take about 40 minutes to make one unit of PPE, needing more than a week to produce more than 20,000 units.

In comparison, the eight injection moulding facilities are able to produce more than 22,000 units in just a single day!

“News spread like wildfire and soon varsities started joining in to help contribute where they could,” he said.

Varsities that have joined the fray include Universiti Teknologi Mara (UiTM) and Universiti Teknikal Malaysia Melaka (Utem).

Most volunteer groups started by using 3D printers but some have managed to secure injection moulding machines to speed up the process of making PPE. — AFP

While the volunteers are able to mass produce basic types of PPE, most are unable to make complex devices like ventilators, powered air-purifying respirators (PAPRs) or continuous positive airway pressure (CPAP) machines.

This is due to them not having access to CNC (Computer Numerical Control) routers and other industrial machines.

Wan joked that you would have to be Tony Stark to actually have them lying around the house.

Quality control was also a challenge, but was mitigated by following standardised designs adapted from the international open source community.

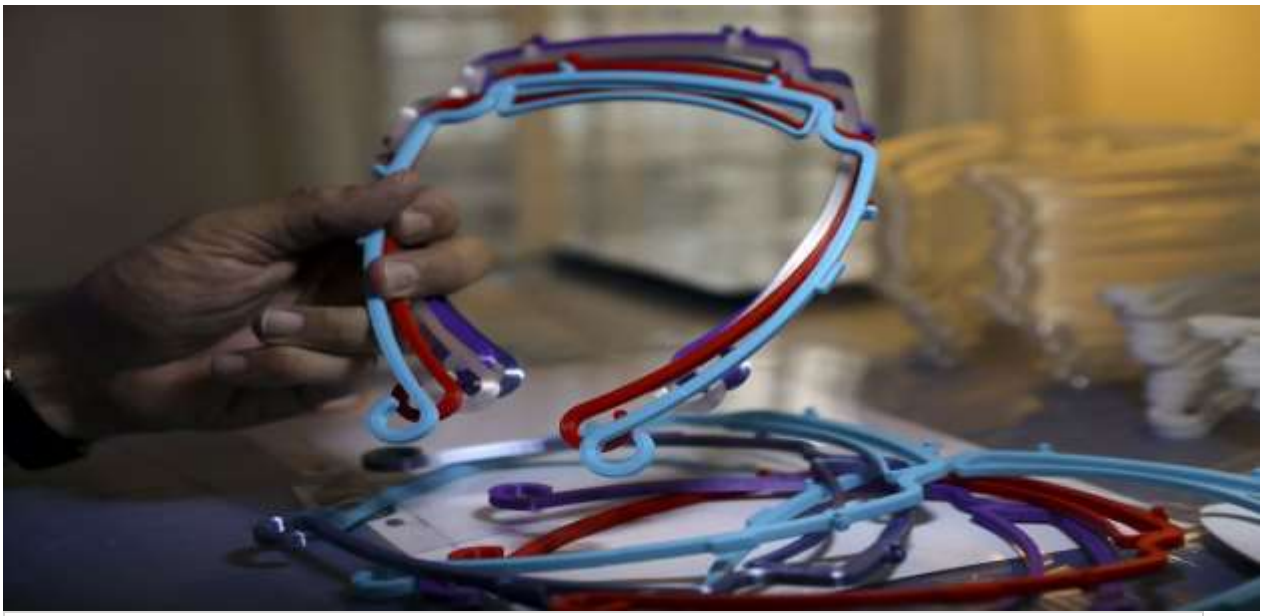
The group also streamlined the production processes, drawing up guidelines not only for producing PPE safely and hygienically, but also organising and distributing them.

“It’s very hard to coordinate with everyone. It’s important to follow the 3Cs: coordinate, communicate and consolidate,” Wan said, which he learned from working as an occupational safety and health consultant in emergency preparedness, prevention and response for a decade.

“In the early days of the MCO (movement control order), we had Zoom sessions every night at 8pm or 9pm to connect with new parties and get more people involved,” he said.

“We had help all the way from Sabah, Sarawak and the east coast.”

However, the group soon realised that there were other large collectives that were also working along the same lines, so the volunteers used Facebook groups to share their work and communicate with each other’s team leader.



Stem4all Makerspace has teamed up with others and collectively the group of 15 now has about 20 3D printers. The group has so far produced and donated about 2,500 face shields. — Bernama

“I am just doing my best to get everyone to consolidate efforts and not to do redundant work. But as the movement continues to grow, it’s really hard to control or monitor, so I just do what I can with whomever I’m in contact with,” he said.

Making it happen

Seeing that the non-governmental organisations (NGOs) and volunteer groups had the same goals but were not necessarily on the same page, volunteer Yeap Mei Yi felt the solution required something more elegant than just WhatsApp groups and Google Sheets.

“It’s quite disempowering to read how dire things are and not being able to do anything. When volunteering, I look for areas where I can be most helpful, but also I try not to replicate others’ work – if an initiative is already running that addresses a gap, I’d love to collaborate,” said Yeap.

She chose Airtable, a Cloud collaboration service that combines the features of spreadsheet with database, allowing everyone to view which hospitals are in need of supplies and if the requests are being fulfilled.

Yeap said she started by talking to the team members, analysing their work processes and finding out the info they required to work efficiently.

“It is useful for data entry. Various volunteers just input the info into a form and the data is transformed into a spreadsheet,” she said.

“And it’s also great for giving the public an overview, as the data is updated dynamically.”

The team also created the website Covid19relief.com.my for public transparency, which shows the supplies requested and fulfilled so far. However, a service like Airtable may not be familiar to many.

“My lesson is that in a volunteering environment, and at a time of urgent need, speed is crucial. Volunteers tend to rely on what they’re familiar with, since that gives them the highest level of efficiency,” she said.

The volunteers also realised that it was equally important to ensure the supplies went to the right people. — AZMAN GHANI/The Star

There was also a need to address a second concern – verification – as the volunteers realised that some people were requesting for face masks and hand sanitisers to resell at inflated prices.

To combat profiteering, the groups not only started verifying requests, ensuring that they came from hospitals, but also started partnering with logistics companies so the supplies would go directly to the medical institutions.

Beyond the peninsula

While much of the news about the pandemic appears to be centred around the Klang Valley, other states are also facing the widespread virus and have formed their own volunteer groups.

Compared to the Klang Valley, these groups are even more decentralised, having to be based out of cities and townships that are geographically remote from one another.

Sarawak Multimedia Authority (SMA) Digital Village head Hazwan Razak said decentralisation has not been much of an issue, as most volunteers are not working as one organisation but a movement comprising many subgroups and individuals with a similar purpose.

Hazwan (right), with other members of the Kuching-based group, assembling face shields. — SMA

“We’re mindful and accepting that we’re all doing this because we have the capacity to do something. We’re mindful to accept that the capacity could differ depending on groups and individuals, and that’s okay,” he said.

He described the overall initiative as a loose collaboration of various groups across the state, made up of about a thousand volunteers collectively.

The SMA coordinated with universities and STEM (science, technology, engineering and mathematics) trainers and even the Sarawak state library to kick off 3D printing, while social enterprise Tanoti Crafts and residents of the Puncak Borneo Prison in Kuching helped sew hospital coveralls.

Together they produced PPE like face shields with 3D printers and even assembled some with sponges, plastics and staplers, as well as disposable hoods and booties sewn out of sterilisation wrap.

Hazwan said the movement started in late March, at about the same time as other groups, and they started coordinating and dividing up tasks as they got to know each other.

They also received aid from groups in the peninsula – some sent filaments for 3D printing.

“The groups are very informal, we’re just focused on looking out for each other and getting through this. And though the groups are mostly self-contained, there’s a spirit of volunteerism among them,” he said.

Hazwan said the teams have been using WhatsApp and Google Sheets to coordinate when sending materials to hospitals so there isn’t an overlap.

Currently, the teams are based in Kuching, Sibu, Miri, Bintulu and more remote towns like Sarikei, Mukah and Kapit.

He estimated the group has produced more than 30,000 units of PPE so far, but the actual figure is unknown, as some volunteers were not meticulous in keeping track while others were more focussed on just responding to the needs of frontliners.

To raise funds, the community used crowdfunding platform PitchIn, accepting donations as low as RM2, roughly the cost of making a face shield.

The team exceeded its PitchIn target of RM7,000, receiving RM11,175 from 142 backers.

The group is also making intubation shields, hospital coveralls, and even doing R&D for building ventilators.

Meanwhile, a collective in Sabah, made up of groups and institutions volunteering 3D printers and skills, include the Universiti Malaysia Sabah, Sabah State Library, Malaysian Dental Association (MDA) and Petrosains Maker Studio.

Its community lead Edham Arief Dawillah said though they coordinate with each other, everyone is free to work towards their own goals.

The members hold a video conference at 11am daily over open-source video conferencing platform Jitsy and use a spreadsheet to keep track of progress, including the number of PPE completed and delivered, and number of filaments left.

Edham said MDA not only helped in collecting and delivering the PPE to hospitals and medical centres, but even sanitised the items and liaised with the Sabah health department.

“We established that for Kota Kinabalu, while volunteers everywhere else in Sabah are advised to liaise with clinics or hospitals in their locality,” he said.

“Requests keep coming in, due to the one-time use of PPE.”

He said he has heard of situations where face shields are being used more than once, which means they must be built to withstand being sanitised again.