# 3-D printer makes peacekeeping missions cheaper and repair of defense systems faster

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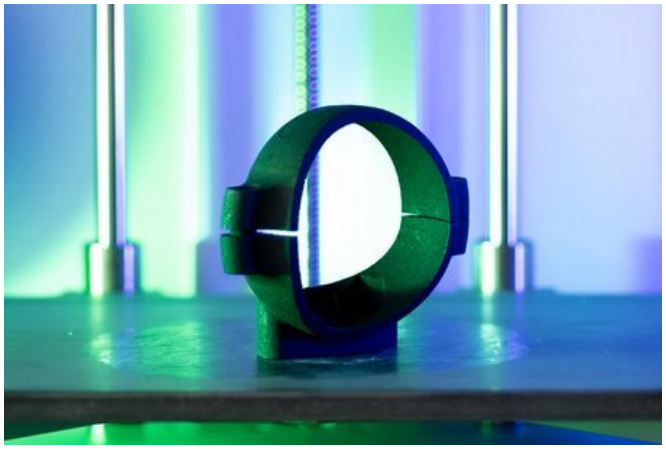

A camera mount for an army vehicle, produced with a 3-D-printer. Credit: Herman Zonderland/Media Centrum Defensie

Peacekeeping missions often take place at remote locations, requiring the army to have a large supply of spare parts on site to keep everything running. Dutch researcher Bram Westerweel comes to the conclusion that taking a 3-D printer on a mission to print parts can save hundreds of thousands of euros and, at the same time, reduce the downtime of defense equipment. The savings on operational costs sometimes total more than half. The findings of Westerweel, who received his Ph.D. yesterday, can also be applied to industries with remote locations, such as the offshore industry.

**Quick return on investment**

The army's systems have many thousands of types of spare parts. Based on his research, Westerweel expects that a total of 10-20 percent of the components of the armed forces can be made by additive manufacturing, also known as 3-D printing. The total savings by 3-D printing on relatively large peacekeeping missions like the ones in Mali and Sudan, could then run up to hundreds of thousands. The printer itself costs a one-off €25,000, making for a quick return on investment. The Dutch army is already experimenting with such a printer in Mali.

**Simply too expensive**

Westerweel's research took a broader perspective of the possibilities of including 3-D printers in the logistics chain of supplying spare parts. Such logistics are not easy, especially for complex technical systems on remote locations. 3-D printers are sometimes seen as the definitive solution: zero stock, just a printer that makes parts on demand. However, Westerweel's work shows that this is often not feasible. In many cases it is simply too expensive to shut down a technical system until a new part has been printed. In these cases, parts must be 'on the shelf' so that they can be replaced immediately.

**Printing hubs**

Far-reaching efficiency does seem possible via a new business model, which Westerweel also investigated. This business model is based on equipment builders shifting from selling and shipping physical parts, to selling licenses for digital design files that allow others, anywhere in the world, to print parts locally. Such licensing of intellectual property also allows the supply chain to completely decentralize, with traditional mass-manufacturing facilities being replaced by local printing hubs that can simply download component designs from central servers.

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