MADE SMARTER

CASE STUDY

Bulky Bob's Transforming waste into welfare through automation

A social enterprise is adopting smart, connectable automation technology to ultraclean unwanted mattresses and prevent them from going to landfill.

> *"Bulky Bob's vision for a circular economy is one in which we shift from being a throwaway society to one which eliminates waste entirely."*

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Bulky Bob's collects around 15,000 used mattresses a year through its household waste collection service and reuses around 40%.

The Liverpool-based organisation has developed a manual system to clean the mattresses so they can be sold to low-income families cheaply and given away to those most in need.

Working with technology advisors at Made Smarter, Bulky Bob's has designed a smart conveyor and carousel system that will completely automate the cleaning process.

It believes the solution will speed up production from one mattress per hour to 20, creating significantly greater capacity to clean more. It also has ambitions to roll out the system nationally and subsequently prevent millions of reusable mattresses from being thrown away.

Shaun Doran, chief executive of Bulky Bob's, said: *"Our automated system will enable us to increase the number of mattresses we can reuse. Made Smarter has helped us take that to the next level by adopting technologies to optimise the system, capture vital data and connect it. This will allow us to help more people out of furniture poverty and prevent the staggering number of mattresses which are going to landfill unnecessarily."*

The Challenge

Each year in the UK around 7.5 million mattresses are thrown away, with 75% going straight to landfill, while the remainder are dismantled for parts and recycled or incinerated.

If those mattresses were stacked on top of each other the pile would be 155 times taller than The Shard in London, the UK's tallest building. What is more, it is estimated that the planet-heating CO_2 generated in the production of those mattresses is around 600,000 tonnes, the equivalent to driving to the moon and back more than 4,000 times.

Bulky Bob's has developed a manual cleaning process using UV light and infra-red heat. Operated by up to six staff, it cleans around 4,000 mattresses each year, which are sold at Bulky Bob's furniture shop and other distributors or given away as charitable donations.

Over the last three years, Bulky Bob's estimates that it has diverted thousands of mattresses from landfill and into the homes of people who need them.

Shaun said: *"We are confident that by combining treatments and technologies we can produce mattresses that are of exceptionally quality. However, it takes a clunky manual process to clean them which means we only do a fraction of what we could. We recognised the need to automate it."*

The Solution

Automation using modular robotics and control technologies will transport the mattresses along the stages of the cleaning process including a steam clean, ultra-violet irradiation, ozone, and infrared drying.

Meanwhile an imaging system will assess and monitor the effectiveness and whether there is any viable biological material still contaminating the mattress, before it is approved or passed through the cleaning process again.

A barcode system will ensure inventory control all the way along the supply chain.

Ultimately a large data set will be created for analysis for continual process improvement, quality management and process optimisation.

As the system is rolled out to other locations, a network will be created with cloud-based central control and monitoring. Data can then be analysed to maintain quality, improve processes, and run predictive maintenance scheduling to reduce operational failures.

The Benefits

The productivity gain will be significant. The automated system will enable Bulky Bob's to ultraclean about 150 mattresses per day – taking it from 4,000 a year to 80,000.

The system will divert staff from the manual cleaning roles to collecting more furniture, and upskill staff to quality management and machine operation.

Data capture will add a level of quality management and stock tracking not currently in place. It will also create a data set whereby Bulky Bob's can refine processing requirements for different makes of mattress, different degrees of soiling and different contaminants.

By reducing the number of mattresses in circulation Bulky Bob's is contributing to a significant potential reduction in the CO_2 emissions produced in the manufacturing process. The 80,000 mattresses Bulky Bob's could process per year is the equivalent of enough CO_2 to fill Wembley Stadium 40 times.

The Future

Bulky Bob's have a striking vision of the future which includes rolling its solution out to anywhere there is a need - internationally. After Liverpool, the next goal is to roll it out to Bulky Bob's other UK sites, which could result in processing thousands more mattresses a year.

The larger the network of machines, the larger the revenue, and the more likely Bulky Bob's are to achieve their mission to end furniture poverty.

With new data Bulky Bob's can inform the mattress manufacturing sector how their products perform in their second life, a potentially valuable resource to assist design improvements or the beginnings of a new service provider model with a circular economy.

"This process will work in any city, in any country, where people are getting rid of mattresses, and where there's a need for quality, pre-used mattresses," Shaun said. "Bulky Bob's vision for a circular economy is one in which we shift from being a throwaway society to one which eliminates waste entirely."

BULKY BOB'S