

VTT, the University of Vaasa and Finnish companies are developing a new user-friendly collection solution for used clothing

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VTT is developing, together with the University of Vaasa, Pääkaupunkiseudun kierrätyskeskus and Emmy Clothing Company, the TexMat deposit-return solution for textile collection that rewards consumers for returning their used clothes.

The TexMat solution sorts garments brought in by consumers, either for resale or for textile recycling, if they no longer have any resale value.

“VTT is developing AI-based imaging and data-processing technology for the TexMat deposit-return solution, using digital product passport data to assess garment condition and suitability for resale,” says **Elina Ilén**, Principal Scientist at VTT and coordinator of the project.

A digital product passport, offering more comprehensive product information than current care labels, will be introduced in the EU in the near future. The product passport includes details such as the brand, materials used, product category, size and date of manufacture - in other words, all the information that affects the resale value of the product.

The aim is to revolutionise clothing collection and resale in Europe

The research and development work carried out at the University of Vaasa is to ensure that the business model is profitable for operators and that consumers have an interest in bringing their clothes to collection machines.

“The TexMat deposit-return solution can improve business profitability, as different types of second-hand retailers can receive products through the system that their customers want, for example based on brand, product category, size or even colour,” says Senior Researcher **Erwan Mouazan** from the University of Vaasa.

Manual sorting into products for resale and recycling will be eliminated with the introduction of the TexMat solution.

“For consumers, the process is effortless: there's no need to sort clothes based on their condition or the appropriate resale channel. All garments can be brought at once to a single location - the TexMat solution - after which they are distributed to different operators for resale, using digital technology. Once a product is sold, the proceeds are automatically credited to the consumer. This is unprecedented and makes it possible to increase textile collection rates while also growing the resale market,” Ilén says.

Emmy Clothing Company and Pääkaupunkiseudun Kierrätyskeskus represent the end users, participating in the development of the business model and in validating the TexMat deposit-return solution in its real-life operating environment.

“TexMat represents the kind of systemic innovation Europe needs. By making textile circulation easy for consumers, and commercially viable for businesses, it becomes possible to move from good intentions to real impact. Emmy is proud to contribute its practical expertise in resale and circular economy business models to help build a future in which every garment is given a second life,” says **Sienna Kruk**, CEO of Emmy Clothing Company.

Textile waste is a huge problem in Europe

There is a growing problem with textile waste collection in Europe. Each citizen produces around 16 kg of textile waste per year, of which only 4 kg ends up in material recycling or reuse. The remaining 11 kg ends up in landfill or incinerated with mixed waste.

The separate collection requirement for textile waste that came into force in the EU last year is expected to increase the collection rate, but it has no direct impact on increasing the reuse and sale of clothing.

"The TexMat solution aims to ensure that a majority of textiles are collected for reuse or recycling. This strongly supports the upcoming EU Extended Producer Responsibility Directive, which will make clothing manufacturers, importers and distributors responsible for the collection, sorting, reuse, recycling and waste management of products," Ilén says.

"This is a great opportunity for the Pääkaupunkiseudun Kierrätyskeskus to continue contributing to the development of textile circularity across Europe. We have been involved in second-hand retail for more than 30 years and have witnessed both the growth of the sector and, particularly, the increasing challenges related to textiles. Through the TexMat project, we are able to exchange ideas with leading European actors and bring our expertise to support the future development of textile circularity," says **Sami Leppänen**, Account Manager at Pääkaupunkiseudun Kierrätyskeskus.

Alongside Finland, pilot trials of the international TexMat project will also be conducted in Spain to validate the system's performance across Europe. The TexMat solution is being developed by 14 partners from seven EU countries, with €6.25 million in funding from the EU's Horizon Europe programme through spring 2029.

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