

# DESIGNING A SYSTEMS-ORIENTED STRATEGY TO UNLOCK THE POTENTIAL OF 3D WOVEN DENIM

## 1 / PROBLEM BACKGROUND

Today's fashion industry is characterised by a continuous cycle of rapid production, early disposal, low-quality materials, and pre- and post-consumer waste, with consequential environmental damage and social injustice. The production of denim involves a **resource-intensive and lengthy supply chain**, in which a **lack of evolution in design** over the past 150 years is coupled with significant **pre-consumer waste**.

## 2 / 3D WEAVING AS A CASE

This highlights the need to **reevaluate the design and manufacturing process**. Conventional pattern designs result in a significant portion of newly woven excess material, sent straight to incineration and landfill. 3D weaving presents an **innovative niche design-manufacturing technique**, allowing for the creation of multi-layered structures with interwoven 'seams'. This enables the production of nearly complete garments, while aiming for **zero waste** and reducing labour-intensive steps at the cut and sew stage.

## 3 / RESEARCH

To **unlock the potential of 3D woven denim** and demonstrate how such niche techniques can be utilised to achieve **systemic change**, a **Systems-Oriented design** approach was adopted. Field research at a denim mill in Pakistan provides insights formed the basis of a general ecosystem map, addressing various layers and interconnections of the complex system, from the final lens of the Dutch denim market. Further collaboration with 3D weaving experts, denim mills, designers, and user research supported the multifaceted approach.

## 4 / NEW-FASHIONED DENIM DIMENSIONS

The project concludes with a Systems-Oriented strategy to establish a **local Dutch eco-label for 3D woven denim**, alongside traditional denim: **New-Fashioned Denim Dimensions**. By involving relevant stakeholders, including major brands and suppliers, an initiative structure, visual manifestations and implementation roadmap were developed, outlining key actions towards the fully local supply chain. The ultimate aim is to create a **cascading effect**, inspiring denim brands to further explore transitions towards local and sustainable models in the broader fashion industry, extending **beyond the realm of 3D weaving**.

### HORIZON 1 2024

IGNITING COLLABORATION, UNLOCKING INNOVATION.

### HORIZON 2 2026

EMERGING PIONEERS.

### HORIZON 3 2028

EXPANDING THE LABEL.

### FUTURE VISION 2030...

CENTRAL & CRADLE-TO-CRADLE.



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