APPAREL MANUFACTURING INNOVATION

ULTIMATE SUSTAINABILITY: PERFECT FIT WITH CIRCULAR LOGIC

FIT— IMPACT

KEY APPAREL INNOVATION 2026/27

This is not an optimisation of an inefficient system – it is a transformational approach that eliminates inefficiencies at their source.

PATENTED CORRELATION METHOD

RESTRUCTURING EFFICIENCY THROUGH PRECISION

STREAMLINED RECYCLING → *PRE-PROGRAMMED FIT*

OPTIMISATION

BUILT-IN RESALE VALUE ← *SMART DESIGN & DEVELOPMENT*

ENGINEERING & COMPUTER SCIENCE
APPAREL & TEXTILE ENGINEERING

EXTENDED GARMENT LONGEVITY ← *FULLY AUTOMATED PRODUCTION*

SYSTEMATISATION:
Moving the industry: From → Reactive & Fragmented To → Predictive & Structured

CARE-FREE MAINTENANCE ← *SIMPLIFIED LOGISTICS*

VERSATILITY OF APPLICATION

—Already Resolved™

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Limitations & Context of Data Used:

The specific parameters and comparative data presented in this document reflect real-world of both **the Patented Correlation Method** *(HtK)* and traditional **Tailored Cut-and-Sew Production Methods**.

However, exact figures may vary depending on:

- Selected fibre characteristics (yarn, material, fabric)
- Production allocation and sizing
- Sustainable practices beyond those considered in this document
- Exact garment styles, finishing details or other specific design elements that affect cost

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Current Invention

*This invention redefines garment engineering by integrating **elongate reinforcement structures** into three-dimensional knit garments, achieving a unique combination of **structural stability and adaptability**. Unlike conventional methods that rely on a single rigid reinforcement area (e.g., soles in footwear), this invention distributes stability throughout the garment, ensuring a tailored fit while maintaining flexibility.*

Core Innovation

*The key innovation is the seamless incorporation **of reinforcement structures** into the knitting process. These **elongate reinforcement structures** provide targeted support, reinforcing areas that typically lack stability. By strategically placing them alongside the adaptive knit panels, the garment achieves both contour alignment and dynamic fit without the need for additional construction steps or external details. The result is **a self-adjusting, structured design** that moves with the body while maintaining a sleek silhouette.*

Distinction from Prior Art

*Existing solutions, such as those in the footwear patents, rely on a rigid base to maintain shape, whereas this invention achieves stability through **integrated reinforcing elements woven directly into the knit fabric**. Unlike traditional tailoring, which relies on layered interfacing and stitching, this approach **combines tailored aesthetics with programmable knitting technology** to create garments with a structured yet flexible construction.*

Advanced Systemisation: Process Transformation

The patented Correlation Method transforms reactive production into predictive control.
The logic-driven programming transforms every stage of development and production into a controlled system – from initial design to final reuse.** By replacing rigid sizing with intelligent structural logic, the system eliminates fit uncertainty and outdated sizing models. Three self-adjusting sizes replace eight conventional ones, enabling a market expansion coefficient of **2.67.

***The result is a fully scalable, digitally controlled foundation for mass-personalised garments – produced without customisation or manual input.** By removing inefficiencies at the source, the method cuts unsold inventory, returns, overproduction, and waste – establishing a new standard for predictive, circular manufacturing at scale.*

Rooted in engineering, computer science, textile and apparel technology**, the Method remains the only viable pathway for scalable, self-adjusting garments – including future hybrid systems of high-tech knit with 3D print. It is not just a Method, but a **new standard for engineered fit – laying the foundation for full lifecycle coordination and the emergence of Predictive Apparel Systems.

Responsive Tailoring Through Dynamic Fit Adjustment—

The Perfect Harmony Between Tailoring Precision And Functional Adaptability

The patented Correlation Method for Programmable High-tech Knitwear *(HtK)* represents a **structural breakthrough** in garment engineering**.** This truly disruptive technology harnesses the potential of **high-tech programmable knitwear** and **advanced engineering** to fundamentally transform the apparel industry. By merging mechanical precision with programmable adaptability, it establishes a new foundation for how garments are constructed, scaled, and sustained.

This Method is built on two key innovations: **Responsive Tailoring and Dynamic Fit Adjustment.** Together, they enable garments **to self-adjust in real time to the wearer's movement, shape, and posture –** while maintaining the visual sharpness and structure of traditional tailoring. It combines the flexibility of knitwear with the precision of bespoke tailoring in a single-layer dynamic design. Made from a single type of yarn on programmable fully-fashioned knitting machines, it reduces the number of sizes needed – delivering **perfect fit at industrial scale.**

What is Responsive Tailoring?

The Correlation Method leverages the **interaction between dynamic panels and reinforcement structures**. This allows any garment to **continually shape and support itself in motion.** Reinforcements are seamlessly embedded to provide an optimal balance of **flexibility and structure.**

The patented Method enables the production of an **unlimited variety of perfectly fitting garments without:**

- Personalised fittings
- 3D body scans
- Structural elements (like darts or belts)
- Fasteners
- Or even seams

Rooted in **engineering, computer science, textile and apparel technology, the patented Method** introduces not just a new method, but a **new standard for engineered fit – redefining how garments are constructed, scaled, and produced for precision at any volume.**

PREFACE: ENGINEERING-DRIVEN APPAREL OPTIMISATION

Sustainability in the apparel industry cannot be based on guesswork alone - it requires precision, predictability and engineering-led solutions. Generalised estimates, trial-and-error decision-making and fragmented workflows cannot cope with the complexities of modern production, logistics and material use.

Why a programme-based approach is essential

The industry's reliance on static estimates and subjective decision-making has led to inefficiencies, miscalculations and excessive resource consumption. A structured, data-driven model shifts sustainability from an estimate to a measurable, repeatable and scalable outcome through:

- **Predictability & Accuracy** → Every aspect of production (fit, energy use, logistics, CO_2 impact) can be pre-calculated, eliminating uncertainty.
- **Automated optimisation** → Real-time computational models dynamically adjust parameters before production even begins, ensuring efficiency.
- **Scalability & practical implementation** → A standardised framework can be applied across any plant, site or supply chain for consistent results.
- **AI-driven decision making** → AI analyses historical data to predict demand, reduce waste and optimise machine settings in real time.
- **From estimates to proven results** → Rather than vague sustainability claims, a programme-based model provides verifiable figures for CO_2 reduction, energy savings and production efficiency.

Beyond CO_2: A New Standard for Precision Apparel Production

While CO_2 reduction is just one outcome, the impact of a data-driven, programmatic approach goes far beyond emissions.

It fundamentally redefines efficiency at every stage of apparel production:

- **Perfect Fit & Adaptive Sizing** → Eliminates returns, waste and unsold inventory.
- **Resource Allocation Modelling** → Minimises fibre and material waste at the pre-design stage.
- **Energy Efficiency Optimisation** → Reduces energy consumption at scale.
- **Intelligent supply chain planning** → Optimises logistics, reducing excess emissions and costs.
- **End-of-Life & Recycling Automation** → Creates a structured path for circularity and reuse.

This approach goes beyond static assessments and sets a new standard for precision, sustainability and efficiency in apparel production.

WHY GENERALISED SUMMARIES ARE INSUFFICIENT

For decades, the fashion industry has relied on traditional production models that, while effective in the past, have struggled to keep pace with modern challenges. Traditional apparel assessment models are based on static assumptions that do not take into account real-time production changes, logistical complexities and unpredictable/fluctuating market demand.

Key Limitations of Traditional Production Planning

- **Limited real-time data integration** → Most apparel production still relies on historical sales data rather than dynamically adapting to real-time consumer demand, leading to inefficiencies and missed opportunities.
- **Static forecasting models** → Market shifts, regional preferences and demand fluctuations make it difficult to predict the right size mix, often resulting in overproduction of less popular sizes and shortages of in-demand sizes.
- **Slow decision-making & limited flexibility** → Production models are often inflexible, making it difficult to adapt quickly to changing trends, resulting in delays, unsold stock and markdowns.

Inventory Forecasting Challenges:

- **Sizing Complexity** → Particularly for tailored, well-fitting garments, brands struggle to balance production, often over-producing less popular sizes and under-producing in-demand sizes.
- **Inventory inefficiencies** → Incorrect size distribution leads to excess unsold inventory, high return rates and missed sales opportunities.
- **Supply chain fragmentation** → Sourcing, production and distribution operate independently, making it difficult to align inventory levels with actual market demand. This lack of coordination can lead to high return rates, excess inventory and unnecessary resource consumption.

The Hidden Variables in Apparel Sustainability Metrics

Sustainability assessments in fashion often overlook critical variables, leading to misleading conclusions: the industry's environmental impact is far more complex than broad carbon footprint estimates suggest, influenced by regional differences, production methods, supply chain logistics and end-of-life scenarios - all of which introduce significant variability. The true footprint of a garment depends on many interrelated factors beyond production alone.

Factors That Distort Sustainability Metrics

- **Production Variability** → CO_2 emissions vary depending on factory efficiency, energy sources and production methods. The same garment can have a very different footprint depending on where and how it is produced.
- **Logistics Complexity** → Transport emissions vary according to distance, frequency of shipments and packaging. Bulk shipments by sea have a lower unit impact than frequent small air deliveries.
- **Material Sourcing & Processing** → The CO_2 impact of fibres depends on origin, dyeing and finishing methods, making broad sustainability claims unreliable.
- **End-of-life Considerations** → The lifespan of a garment, its recyclability and disposal methods have a significant impact on total CO_2 emissions. A long-lasting, recyclable product has a much smaller footprint than one with a short life cycle.

Without real-world scenario modelling, generalised sustainability assessments remain incomplete. To overcome these limitations, the industry needs a dynamic, data-driven approach to accurately measure and optimise industry's true environmental impact.

PREVAILING INDUSTRY STRATEGIES: PROGRESS OR FALSE SOLUTIONS?

As the fashion industry struggles with demand unpredictability, sizing inefficiencies, and excessive waste, various 'solutions' have been proposed to mitigate these challenges. However, most of these approaches fail to deliver true efficiency, either because they introduce new complexities, fail at scale, or only partially address the problem.

1. Mass Customisation – Unsustainable & Inefficient

Mass customisation has been widely promoted as a way to solve sizing inefficiencies, allowing consumers to personalise garments before production. While this model theoretically reduces sizing errors, it introduces new **operational inefficiencies,** including:

- **Higher production costs** due to personalised garment adjustments.
- **Longer lead times** and slower fulfillment due to custom orders.
- **Supply chain complexity** – brands must manage micro-scale production, eliminating the benefits of mass production.
- **No guarantee of a perfect fit** – customers still rely on pre-production measurements, which may not translate to real- world wear.

Mass customisation may appear innovative, but in reality, it is a high-cost, low-efficiency model that cannot be sustained at scale. It does not eliminate overproduction, returns, or sizing fragmentation – it merely shifts the inefficiency elsewhere.

2. AI-Driven Sizing Tools – Refining Guesswork, Not Solving the Problem

Brands increasingly rely on AI-powered sizing recommendations to reduce return rates, but these tools do not address the fundamental issue: **rigid, static garment structures that fail to adapt to real body variations.**

- **AI sizing tools refine selection within a flawed system** – they match consumers to the closest available size but cannot change the garment's ability to adjust dynamically to the wearer.
- **They reduce, but do not eliminate, returns** – even with improved recommendations, customers still face discomfort, inconsistent fit, and dissatisfaction in everyday wear.
- **They do not fix production inefficiencies** – the need for multiple fixed sizes remains, so overproduction, mismatches and overstocking remain perennial problems.

Rather than solving the core issue, AI sizing tools fine-tune an inherently rigid system – one that still relies on multiple static sizes, leaving fundamental fit challenges unresolved.

3. Made-to-Order Models – Reduced Waste, But Completely Impractical at Scale

Some brands have attempted to minimise unsold stock by switching to made-to-order manufacturing, where garments are only produced after a purchase is made. However, this model is **too slow and too costly** to serve mass-market demand:

- **Lead times increase significantly**, making it impossible for customers to receive garments on demand.
- **Batch production benefits are lost**, increasing labour costs and reducing scalability.
- **Higher price points** make this approach inaccessible for mainstream markets.

While made-to-order may work for small-scale luxury businesses, it is not a viable mass market solution as it simply shifts inventory risk from brands to consumers by forcing them to commit in advance without trying the garment.

4. Excessive Sizing Expansion – More Sizes, More Waste

In response to size inconsistencies, many brands have expanded their sizing range – offering more options to increase accessibility. However, this approach only **exacerbates overproduction** by increasing the number of SKUs, requiring:

- **More warehouse space**, which increases logistics inefficiencies.
- **More unsold merchandise,** as each additional size has unpredictable demand.
- **Higher return rates**, as the expanded range does not solve the core sizing challenges.

Adding more sizes is a reactive, not a proactive solution – it increases inefficiencies rather than eliminating them.

Systematic Efficiency from the Outset: How it is Done

The Power of Restructuring from the Start:

Traditional apparel production *relies on reactive adjustments - pattern trials, manual alterations and AI-driven predictions based on an inherently inefficient system.*

The Patented Method eliminates *this uncertainty at the outset by structuring fit, production and material use with precision from the outset.*

Optimisation is Built into the Structure Itself

Every stage - materials, production, logistics, inventory - is efficient from the outset.

Patented Principle of Panel Movement

This is not only about fit; it enables system-wide efficiency, seamlessly integrating production, distribution and sustainability.

What This Means in Practice

- ***Garments fit themselves within four sizes,*** *eliminating mass customisation and excess SKUs.*
- ***Production is pre-programmed****, ensuring precision in material usage, timing and logistics before manufacturing even begins.*
- ***The entire lifecycle - from fibre sourcing to resale and recycling -*** *is fully aligned, ensuring predictable, measurable efficiency. This pre-defined precision transforms apparel into a structured, program-driven system - where every step is optimised, measurable and scalable.*

THE PATENTED METHOD: RESTRUCTURING EFFICIENCY THROUGH PRECISION

The Patented Method represents a fundamental shift - transforming apparel production by making efficiency measurable, programmable and predictable to an unprecedented level. The industry's inefficiencies stem from unpredictable fit, over-sizing and reactive production, all of which create waste at every level - from raw materials to logistics, inventory and resale. Rather than simply 'tweaking' an existing system, this method completely restructures the foundation so that efficiency is an inherent, pre-programmed characteristic of every garment produced. Instead of relying on trial and error adjustments, efficiency is built in from the start. Unlike the limited improvements offered by traditional methods, this is a paradigm shift, introducing a structurally superior framework that eliminates guesswork through real-time, scenario-based decision making. **Every variable, including fit, material usage, logistics and sustainability metrics, is strategically defined in advance, ensuring that all levels of production are linked in a fully optimised matrix of efficiency.**

The Method redefines sizing itself as a variable rather than a fixed constraint. The breakthrough lies in the dynamic self-adjustment that simultaneously tailors the garment to the wearer's body - eliminating the need for additional sizes, alterations or returns. Crucially, **the Method's ability to fit up to four adjacent sizes dramatically reduces the unsold rate - minimising overproduction and ensuring significantly less fibre waste per garment sold.** This further improves material predictability and optimises overall resource efficiency. This precision is programmed in from the outset, ensuring predictability in fit, production methods, timing and fibre selection before a garment is even designed. **The process achieves this using a single fibre type, eliminating the need for fasteners or stretch fibres.**

The 3-size model replaces eight rigid sizes, with garments self-adjusting rather than being constrained by traditional size structures. This shift eliminates unnecessary size fragmentation while maintaining full availability and market coverage. By integrating precision into every stage, from fit to logistics, the Method addresses the challenges posed by demand volatility in an industry that has historically lacked sustainability and efficiency. This approach enables the measurement and control of outcomes, contributing to enhanced predictability and business efficiency.

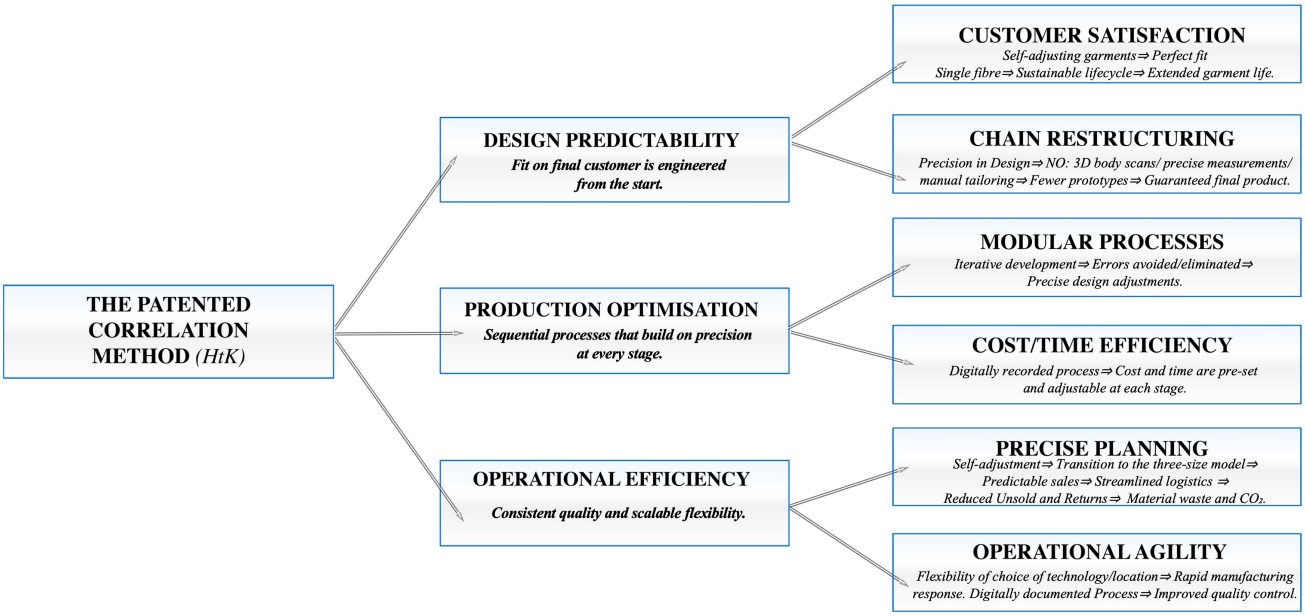
Key Advances:

- **No need for mass customisation →** Eliminates sizing inefficiencies at the source.
- **Three sizes replace eight →** Reduces excess stock without slow made-to-order processes.
- **Garments self-adjust →** Delivers precision fit without without relying on AI-driven ‘best guesses’.
- **No excessive SKU expansion →** Prevents waste before it happens, not after.

The efficiency gains come from guaranteed fit accuracy**,** not just SKU reduction. The 3-size model is a consequence of this capability, but the real benefit is the guaranteed fit made possible by dynamic self-adjustment. Instead of relying on reactive adjustments, companies can now operate with pre-defined accuracy, ensuring that every stage of production and distribution is aligned with actual demand.

A NEW STANDARD FOR PRECISION AND EFFICIENCY

- **From Approximation to Controlled Predictability** – Every garment meets real demand, eliminating excess inventory and misallocation of resources.
- **From Inefficiency to Optimisation** – Decision-making becomes proactive, maximising resource efficiency at every level.
- **From Fragmented Execution to Integrated Control** – Production, logistics, and sustainability tracking become fully integrated, allowing brands to fine-tune every operational variable with measurable, repeatable precision.



This is not an **incremental improvement** — it is a structural transformation. Every garment is now designed for demand, fit and sustainability with an unprecedented level of precision.

A SOLUTION TO FOUR KEY MANUFACTURING ISSUES: *Fit • Waste • Stability • Deformation*

The Patented Correlation Method *(HtK)* **addresses major industry challenges: Fit and Waste in Woven garments, and the Lack of Stability and Deformation in Knitwear.** By leveraging interactive panel movement, this pioneering design, development, and production approach significantly reduces material use, production costs, and logistical demands, while utilising zero-waste high-tech knit. The extended garment life, resulting from reduced stretch and tear, enhances sustainability. The Method eliminates the need for 3D body scans, personalised measurements, made-to-measure patterns, or customised programming. Furthermore, it eliminates the need for fastenings and reduces size variations, with three sizes covering an eight-size range, thereby reducing overproduction and inventory costs.

The Patented Method ensures **total predictability** of fit, material usage, production timing and efficiency by programming precision **before** manufacturing begins. **The process involves two levels of programming:**

- **Fit Engineered from the Start →** Fit precision is not an afterthought but is pre-programmed at the **Initial Stage**, before the garment is even designed. This eliminates size mismatches and pre-defines material use, ensuring dynamic fit across four adjacent sizes, reducing unsold stock and waste.
- **Fully Programmed Manufacturing →** Digital execution ensures exact material usage, minimising errors, eliminating unnecessary iterations and inefficiencies.

The Method's pre-defined structure ensures seamless adaptability across materials, energy, logistics, and demand forecasting. By removing the guesswork, every stage of production and distribution operates with quantifiable, optimised efficiency - delivering unprecedented sustainability and profitability gains. Reducing 8 rigid sizes to 3 self-adjusting sizes significantly reduces energy consumption while enabling the first large-scale implementation of perfect fit.

This is How:

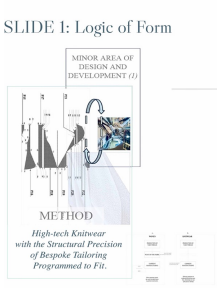
- **Perfect Dynamic Fit**: Self-adjusting garments eliminate sizing issues in mass production by dynamically responding to movement, shape, and posture. Each construction covers with perfect fit up to four adjacent sizes, replacing eight conventional ones with just three programmable designs, achieving mass-scale precision with minimal configuration.
- **Material Waste Minimisation**: Pre-programmed logic eliminates iterative prototyping by embedding predictability from the start. Combined with 3D programmable knitwear technology, this results in exceptionally low production waste. The reduced sizing model also cuts unsold inventory by up to ***78.6%***.
- **Structural Reinforcement in Knitwear**: The Method integrates reinforcement within the garment itself – overcoming knitwear's traditional limitations in form retention and enabling tailored-like precision without secondary components or finishing stages.
- **Deformation Resistance and Longevity**: By coordinating structural logic with the garment's mechanical behaviour, the product maintains fit and form throughout wear. This engineered resilience ensures reduced degradation, extending product life and supporting circularity at scale.

PRE-PROGRAMMING. DESIGN.DEVELOPMENT. PRODUCTION.

Modular design and development allows each stage of the process to be perfected before moving on to the next, ensuring that nothing is overlooked. This structured, step-by-step approach to testing ensures that problems are identified and resolved early, which can lead to more efficient product development and less waste in the design - development phase.

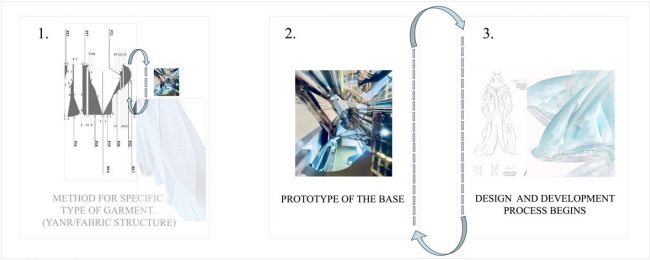
SLIDE 1. PRE-PROGRAMMING

Pre-programmed constructions achieve a calculated balance between movement and control, embedding self-adapting panels and reinforcement zones directly into the garment's structure, therefore the perfect fit for mass market customer is guaranteed from the outset.



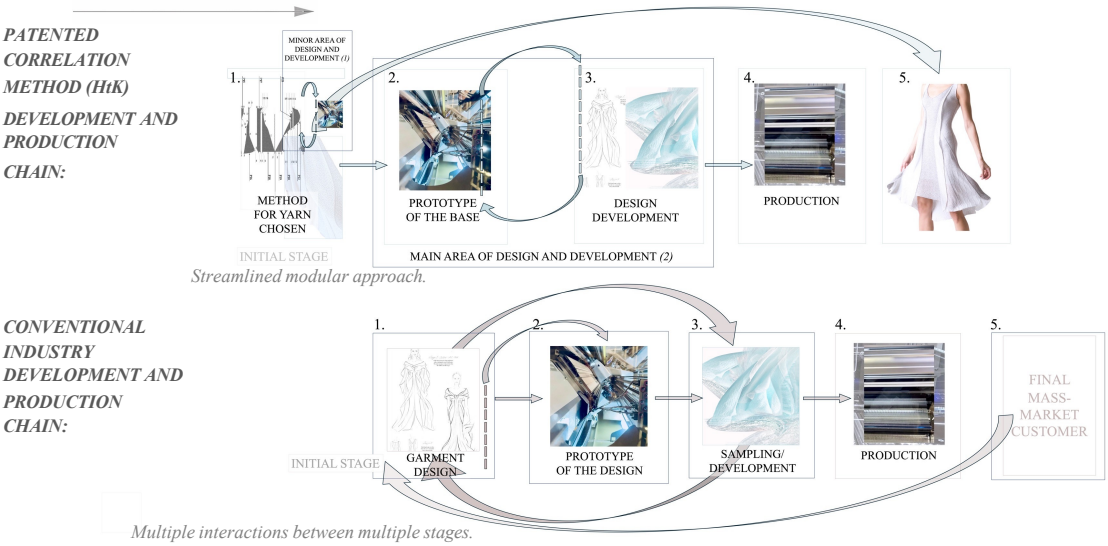
SLIDE 2. SEQUENTIAL REFINEMENT

Design begins on the basis of such a pre-programmed design, allowing designers to look ahead to their future creations and eliminating the need for multiple prototypes and fittings.



SLIDE 3. THE RESULT IS A RESTRUCTURED PROCESS

This restructured approach ensures that the final product remains consistent in both form and fit at **any scale**.



Streamlined modular approach.

Multiple interactions between multiple stages.

ADVANCED FIT LOGIC

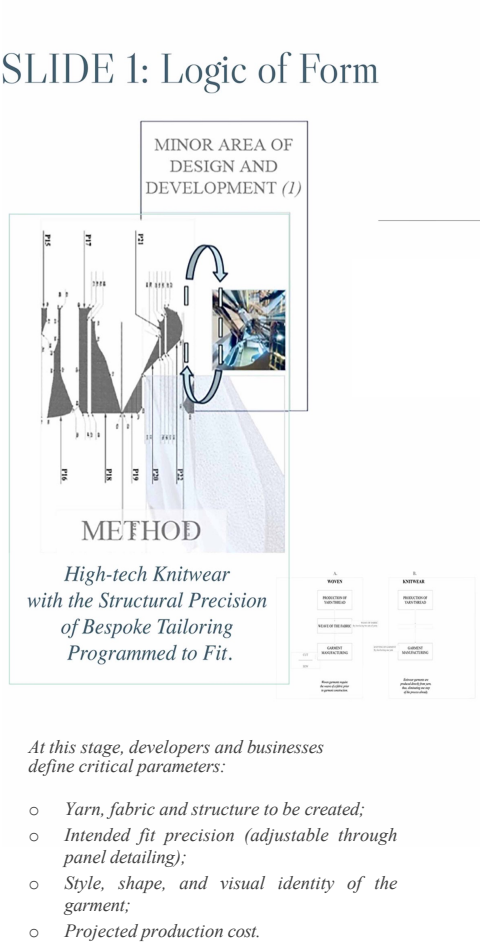
INITIAL STAGE: Pre-programming

The perfect harmony between self-adaptation and structure is achieved through a precise correlation between dynamic panel movements and stable reinforcement zones on **Pre-programmed constructions**.

The process begins with the selection of a **Pre-programmed construction** for a future garment type. Guided by the principles of the **Patented Correlation Method** *(HtK)*, these pre-programmed constructions achieve a calculated balance between movement and control, embedding self-adapting panels and reinforcement zones directly into the garment's structure.

Each panel interacts at defined angles, triggering directional stretch and stabilisation. These responses are not reactive - they are pre-engineered to ensure the garment adapts in motion while maintaining its precise shape, fit, and integrity over time.

At this stage, the Method already addresses the industry's key challenges of fit, stability and deformation - enabling modular development, zero waste production and, through self-adaptation, guaranteed extended market coverage.



At this stage, developers and businesses define critical parameters:

- *Yarn, fabric and structure to be created;*
- *Intended fit precision (adjustable through panel detailing);*
- *Style, shape, and visual identity of the garment;*
- *Projected production cost.*

While all fabrics exhibit some degree of stretch and directional behaviour, the Patented Method transforms this variability into **engineered, predictable responses** - ensuring that the fit is not just adaptable, but **structurally intelligent.**

The greater the number and specificity of panels, the more refined and localised the fit - bringing couture-level precision to mass-produced garments.

The Method eliminates the need for 3D body scans, individual measurements, bespoke patterns, or customised programming. It also removes reliance on fasteners and reduces size fragmentation - allowing **three sizes to cover an eight-size standard range**, significantly reducing overproduction and inventory costs.

- This is the **only process** capable of creating an **unlimited combination of self-adjusting structures**, making it a breakthrough solution. It integrates innovative mechanical principles with advanced manufacturing capabilities to enable scalable, precise, and reliable production of self-adjusting tailored garments.

The **Pre-programmed Principle** of such a process is more than just technical preparation - it is the real canvas for the entire design and development process. **Every decision made determines the performance of the future garment, the precision of the final mass-market fit and the feel, right from the start.**

Garments designed with the Patented Method to fit between two adjacent sizes - for example, a size Small between 38 IT and 40 IT - can also accommodate 36 IT (with a slight looser fit) and 42 IT (with a slight tighter fit), thereby providing a perfect fit. With this adaptive system, just three programmed sizes can effectively cover the eight traditional sizes that are typically produced using cut-and-sew methods. For example, the 3-size production engineered with the Method, may fully cover the following 8 sizes: 36 IT, 38 IT, 40 IT, 42 IT, 44 IT, 46 IT, 48 IT, and 50 IT. The **Pre-programmed Principle** of such a process is more than just technical preparation - it is the real canvas for the entire design and development process. **Every decision made determines the performance of the future garment, the precision of the final mass-market fit and the feel, right from the start.**

While bespoke woven garments (*see Table 1*), offer the best fit, they are costly and require manual adjustments. Bespoke knitwear offers the best personalized tailoring experience for custom-made garments (*see Table 1*) when combined with a personalised 3D body scan of the customer, alongside tailored programming and production. In contrast to bespoke, mass-produced woven garments lack flexibility (*see Table 2*). Mass-produced knitwear, available at various price points, offers a better fit due to its inherent stretch. However, it cannot be adjusted to fit different body types and does not retain its shape over time. High-tech programmable knitwear, when designed with precision, provides the most structurally intelligent solution for mass-produced garments - offering adaptability across a wide range of body types while maintaining fit over time (*see Table 2*).

TABLE 1: METHODS FOR ACHIEVING PERFECT FIT

No.	Action	√=1. THE PATENTED METHOD HIGH-TECH Knitting Programming Production	2. BESPOKE MADE TO MEASURE Woven Production	3. BESPOKE HIGH-TECH WITH 3D BODY SCAN Knitting Programming Production
1.	**Perfect Fit** without individual measurements or individual 3D body scan	√=	–	–
2.	Perfect fit with individual measurements	–	√	*Alternative*
3.	Perfect fit with individual 3D body scan	–	*Alternative*	√
4.	Prerequisite for a personalised pattern	–	√	√
5.	Prerequisite for personalised programming	–	–	√
6.	Requirements for the fittings and modifications	–	√	√
7.	Built-in self-adjustment	√=	–	–
8.	**Scalability for Mass production**	√=	–	–

1. √= *Perfect Fit achieved without individual measurements, 3D body scan, personalised pattern, fittings and modifications. Suitable for the mass production.*

2. and 3. *3-4 steps required for bespoke custom made garments.*

TABLE 2: COMPARISON OF PRODUCTION METHODS WITH REGARDS TO FIT & SCALABILITY

METHODS	FIT	SELF-ADJUSTABILITY	STABILITY/ STRUCTURE	DISTORTION	COMFORT	WASTE	PRODUCTION COST	PRICE	SCALABILITY LITY
1. BESPOKE MADE-TO-MEASURE WOVEN GARMENTS	**Perfect**	Variable	Stable	Minimal	Comfortable	Variable	Very High	Very High	—
2. BESPOKE HIGH-TECH KNITWEAR WITH 3D SCAN	**Perfect**	Variable	Stable	Minimal	Very Comfortable	Minimal	Very High	Very High	—
3. MASS-PRODUCED WOVEN GARMENTS	Sub-Optimal**	—	Variable	Variable	Sub-Optimal**	High	Low- Medium	Variable	Unlimited
4. MASS-PRODUCED KNITWEAR:									
4.1. MASS PRODUCED LOW-MEDIUM-HIGH PRICES	Sub-Optimal**	—	Low	High	Sub-Optimal**	Variable	Low	Variable	Unlimited
4.2. HIGH-TECH PROGRAMMABLE KNITWEAR (ADVANCED TECHNOLOGY) WHOLEGARMENT, 3D KNIT AND SEAMLESS	Good	—	Variable	Variable	Very Comfortable	—	Moderate	Moderate	Unlimited
5. RESPONSIVE TAILORING THROUGH DYNAMIC FIT ADJUSTMENTS PATENTED CORRELATION METHOD *(HtK)*	**Perfect**	√=	Stable	Minimal	Very Comfortable	—	Moderate	Variable	√= Unlimited

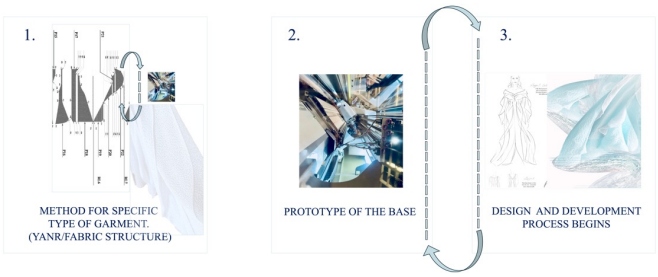
Variable: The variability depends on specific factors such as the shape and style of the garment, the choice of yarn and the application of optimisation processes at different stages of production.*
*Sub-Optimal**: Unless the wearer's measurements are the same as the size for which the original prototypes were made, it is not easy to achieve a perfect fit. Or a very comfortable or a very good fit.*

PROCESS OPTIMISATION

The Method introduces a modular, sequential structure that builds precision at every stage. By applying the **Pre-programmed Principle** as a foundation, the **digitally controlled development process** enables continuous production with minimal external input. Issues are resolved in real time, streamlining the path from concept to outcome - ensuring precision of fit for mass-market customers while significantly reducing resource consumption, external dependencies and guesswork.

1. Immediate Fit Validation

The invention is based on the correlation of the structures for both stability and flexibility. Once the overall garment type and shape are selected, the yarn and future fabric for the garment are tested on a pre-set structural base. This process provisionally ensures a self-adjusting fit for the end customer - **before** the design phase begins (1).



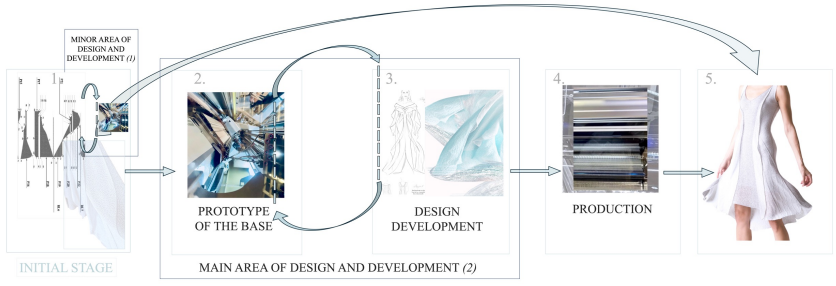
- *High level of precision and foresight*
- *Guaranteed fit at an early stage*
- *Clear direction for designers*
- *Quality control built into the system*

- *Consistency of fit and appearance*
- *Efficient testing and development*
- *Final product remains accurate, even when scaled*

2. Design Becomes Real from the Start

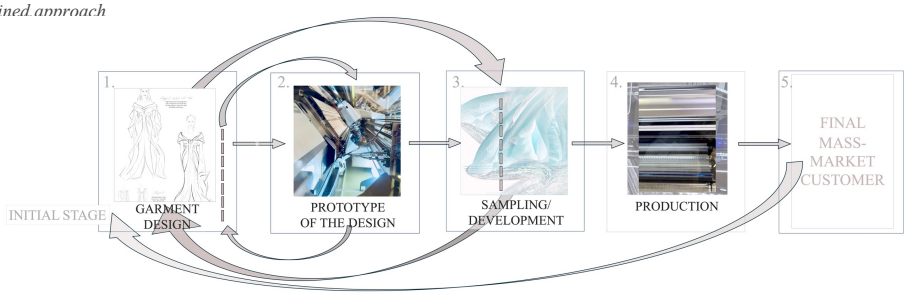
Designers and developers begin their creative process with a verified structural foundation already in place (2), enabling true design development on a "real canvas in motion" (3). This restructured approach ensures that the final product remains consistent in both form and fit (4–5), at **any scale**.

PATENTED CORRELATION METHOD (HtK) DEVELOPMENT AND PRODUCTION CHAIN:



Streamlined approach

CONVENTIONAL INDUSTRY DEVELOPMENT AND PRODUCTION CHAIN:



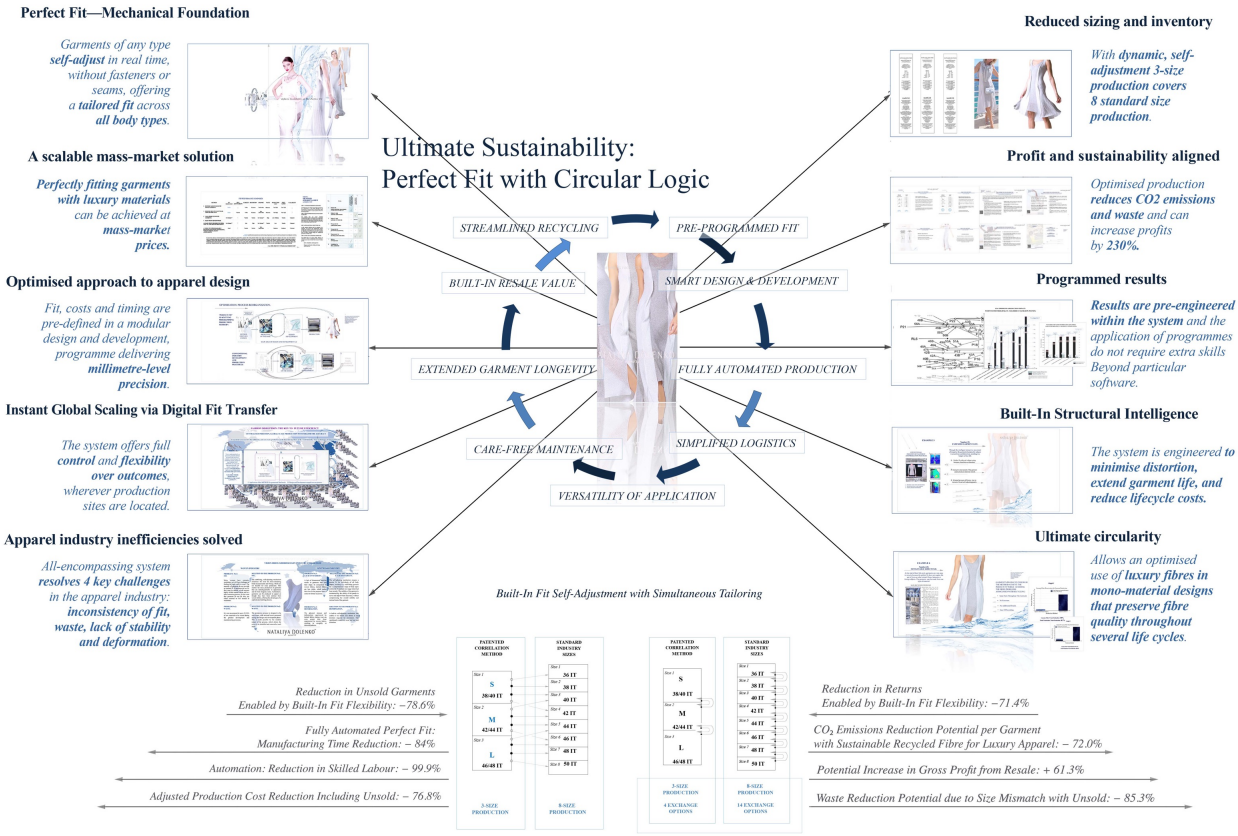
Multiple interactions between multiple stages

RESULTS:

- **Production Efficiency**: Faster (84.0% reduction of manufacturing time), more precise development with fewer errors and less waste.
- **Manufacturing Flexibility**: Works on all programmable high-tech knitwear platforms (Seamless, 3D knit, WholeGarment).
- **Creative Control**: High-tech precision supports couture-level of fit and production accuracy.
- **Supply Chain Resilience**: 1,368 times less reliance on highly skilled labour compared to tailored cut-and-sew, rigid supply networks, or localised production facilities.
- **Customer-Centric Agility**: Enables on-demand or scaled production with full consistency.
- **Continuous Output**: Machines can run 24/7 with digital program files.
- **Traceable and Transparent**: Digitally documented at every stage for control and accountability.

SCALABLE PRECISION IN APPAREL

A unified System transforms the fragmented reality of apparel manufacturing into a structured, **repeatable model of scalable precision** – linking fit, development, production, and circularity into one cohesive framework. This visual structure outlines how each programmable step interconnects to deliver consistency, predictability, and high-value outcomes at scale.



The patented Correlation Method enables couture-level garments to be produced at mass-market scale and cost – making luxury fit, quality and construction precision universally accessible. It creates a radically more efficient and sustainable production model that outperforms traditional cut-and-sew methods in **all key metrics**: fit accuracy, garment longevity and production efficiency – exceeding profitability benchmarks ***by over 200%***.

By optimising every stage of the process - from production to operations – the system eliminates excess waste and reduces unsold inventory by *up to 78.6%*, while directly addressing persistent inefficiencies in material usage and sizing. Garments are made using only the exact amount of material required, ensuring precision and eliminating overproduction. **Additionally**, a unified circular model allows ***up to 90%*** of the value of luxury fibres to be retained for reuse – unlocking the full economic and environmental potential of delivering premium-quality garments to the mass market **with unprecedented sustainability and profitability**.

APPAREL MANUFACTURING INNOVATION: ENGINEERING & COMPUTER SCIENCE/APPAREL & TEXTILE ENGINEERING/GARMENTS

SYSTEMS FOR SCALABLE PRECISION IN APPAREL

SLIDE 1: Perfect Fit— Mechanical Foundation

At the core of the invention is a **mechanical movement principle** that leverages the interaction between reinforcement structures and dynamic panel movements—transforming the garment into a self-adjusting, adaptive construction.

SLIDE 2: A Scalable Mass-market Solution

Perfectly fitting garments can now be produced at mass-market prices. The system merges the precision and stability of woven tailoring with the scalability of high-tech knitwear—delivering perfectly fitting garments to scale without fittings, 3D body scans, fasteners or seams. Core principles:

- **Panel interaction**: Adapts dynamically to body movement while shaping in real time.
- **Structured balance**: Flexible zones maintain tailored form.
- **Advanced programming**: Enables structural adaptability beyond standard logic.
- **Scalable precision**: Fully programmed to provide repeatable accuracy on any scale.

SLIDE 3: Optimised Approach to Apparel Design

Fit, materials, and timing are **defined in a modular development flow**— ensuring precision down to the millimetre. Each stage is perfected before the next allowing problems to be identified early and waste to be reduced. The streamlined, digitally controlled process ensures consistent, high-quality output with minimal external dependency.

SLIDE 4: Instant Global Scaling via Digital Fit Transfer

Modular architecture delivers **precisely engineered, perfect fit and quality at any scale**—instantly and consistently—via digital file transfer to any compatible facility worldwide.

SLIDE 5: Apparel Industry Inefficiencies Solved

The system resolves four of the industry's most persistent challenges:

- **Inconsistent Fit and high Waste in Woven apparel.**
- **Instability and Deformation in Knitwear apparel.**

The patented correlation of movement and reinforcement **enables one** garment to cover **up to four sizes**—dramatically reducing unsold inventory and returns. Through seamless mono-material construction and zero-waste production, the system redefines fit, longevity and sustainability at scale.

SLIDE 6: Reduced Sizing and Inventory

With dynamic, self-adjusting garments, **only three sizes** are needed to replace eight fixed sizes—reducing returns ***by 71.4%*** and unsold inventory ***by up to 78.6%.***

In the photos: One garment, one size, worn by two customers with over 20 cm height difference—standard sizes 38IT and 42IT.

SLIDE 7: Profit and Sustainability Aligned

The restructured production model:

- Net profit ↑ ***up to 240%***
- Production cost ↓ ***by 73.7%***
- Material waste ↓ ***by 84.9%***
- CO_2 emissions ↓ ***by 72%***
- Production time ↓ ***by 84.0%***
- Skilled Labour ↓ ***by 99.9%***

Luxury-level garments can now be delivered at scale without compromising on fit, quality, or environmental standards.

SLIDE 8: Programmed Results

Fit and behaviour are pre-engineered into the garment. Programmes require only standard software knowledge—no specialised skills— regardless of production scale.

SLIDE 9: Built-In Structural Intelligence

Reinforcement and adaptability are **embedded directly** into the engineering design, eliminating the need for external mapping software. The system ensures long-lasting fit and performance across all programmable platforms.

SLIDE 10: Ultimate Circularity

Mono-material construction enables potentially ***up to 91.2%*** luxury fibre recovery while preserving premium fibre quality across multiple lifecycles. Blockchain integration—if incorporated into the garment's structure—**supporting scalable circular systems**—and **redefining fibre longevity** in apparel.

Introducing Real-world Applications Of an Optimised System

Beyond AI: *Defining The Future Of Precision-Driven Fashion*

AI has transformed many industries by refining predictions, optimising choices, and improving digital processes — but it remains confined to the virtual realm.

In contrast, **the Patented Method** achieves real-world transformation by redefining the very structure of garment production.

Instead of relying on AI to navigate inefficiencies

within a flawed system

— this breakthrough eliminates inefficiencies altogether.

AI fine-tunes static sizing

— this Method makes size constraints obsolete.

AI predicts demand

— this Method aligns production with real-world adaptability.

AI analyses consumer behaviour

— this Method ensures garments actively conform to the wearer instead of forcing consumers to adapt to fixed sizes.

By combining advanced engineering with digital precision, the result is not just improved forecasting, but a completely restructured, self- optimising production model that sets a new industry standard —

— Not predictive, but **Active**.

— Not theoretical, but **Structural**.

— Not just digital, but **Real**.

COST AND AFFORDABILITY

The Patented Correlation Method *(HtK)* proves that sustainability and affordability are not conflicting forces – they are an integrated coherent whole. By eliminating inefficiencies at every level, the Method ensures that premium-quality, perfectly fitting garments are ***over 230% more cost-effective*** to produce, distribute, and sell than any conventional method. This is achieved through efficiency pre-programmed from the outset by the Method, simultaneously maximising profitability, eliminating waste, and streamlining logistics.

Core Cost-Saving Advantages

Key Cost-Saving Factors → How the Method Eliminates Cost Inefficiencies

The Method transforms cost reduction into a structured, measurable advantage – eliminating inefficiencies at every level while ensuring premium garment quality at scale. For industry leaders, this means a shift from unpredictable cost structures to a **fully transparent, data-driven framework**, where profitability and efficiency are pre-programmed rather than left to chance.

Strategic Cost-Saving Advantages

1. Faster Production Time → Reduced Skilled Workforce & Manufacturing Costs

- **Fully automated knitting process eliminates cutting, sewing and assembly, removing inefficiencies.**
- **Production time reduced by up to 84%** compared to cut-and-sew.
- **Skilled workforce requirements reduced by 99%,** dramatically lowering operating costs.
- **Overall production cost reduction: 73%,** a direct efficiency gain.

2. Fewer SKUs → Reduced Inventory Risks

- **3 size production replaces 8 traditional sizes**, drastically minimising overproduction.
- **Eliminates redundant inventory**, reducing storage costs and unsold inventory losses.
- **Production cost reduction per garment sold: up to 76%** (due to minimised unsold inventory).

3. Minimal Returns → Significant Logistics Savings

- **Self-adjusting fit eliminates size mismatches**, reducing exchanges by over 70%.
- **Potential reduction in unsold garments:** by over 78%, optimising inventory turns.
- **Dramatic reduction in restocking, returns and reverse logistics costs.**

4. Material Efficiency → Near-Zero Waste Production

- **Single-fibre structure eliminates fasteners, blends and extra trims**, simplifying recycling.
- **Up to 85% fibre recovery** → Reduced raw material dependency and direct savings in fibre sourcing.

Proof Through Data → Quantifiable Efficiency & Cost Savings

- **Self-adjusting sizing reduces unsold stock by up to 78.6%** → Direct cost savings in production, warehousing & markdowns.
- **Eliminating excess production cuts material costs by up to 40%** → More garments sold per kg of fibre.
- **Return rates reduced by over 70%** → Significant savings in logistics, reverse supply chain and returns management.

Unlocking Future Efficiency: From Fit To Function

HOW THE METHOD OUTPERFORMS TRADITIONAL PRODUCTION

The Patented Correlation Method *(HtK)* introduces a **system-wide redefinition** – not just a process improvement. It enables a new logic in design creation where fit, lifecycle and circularity are programmable, not reactive. It is a redesign of how the apparel system works – digitally, operationally, and commercially.

The Method creates an entirely new category of scalable, precision-controlled apparel manufacturing that delivers both technological and environmental differentiation that no existing method can match. It eliminates the need for 3D body scans, precise measurements or manual tailoring, replacing them with self-adjusting structural zones that deliver a perfect fit in real time.

For the first time, two previously incomparable systems can be evaluated head-to-head:

- **Self-adjusting, perfectly tailored garments** engineered with the Patented Method.
- **High-end tailored garments** produced by traditional cut-and-sew.

The Method achieves what was once considered unattainable: **mass-produced, luxury quality garments with perfect fit**, structural elegance and extended wear – without compromise. It streamlines production into a fully optimised system – eliminating size fragmentation, maximising material usage and minimising waste at every stage.

This is more than an alternative – it is a new mechanical standard by which the industry will be measured.

STRUCTURAL SHIFT

Real-World Functional Change Beyond Percentages

Fit Consistency	**Self-adjusting structures ensure precise fit across 4 adjacent sizes. 3 size production replaces 8 rigid* size production. Coefficient of market expansion: 2.67**
Returns Reduction	Predictable fit outcome due to self-adjusting structures - takes the uncertainty out of mass sizing.
Design Efficiency	Streamlined development with pre-engineered guaranteed fit.
Production Speed	Pre-programmed construction reduces complexity in high-tech knitwear. Seamless output. Minimal manual intervention.
Inventory Optimisation	Reduced size range optimises SKU complexity and eliminates overproduction.
Waste Reduction	Material waste is drastically reduced through precision programming and no trimming waste to achieve a perfect fit.
Fibre Preservation	85%+ fibre recovery with mono-material use. Suitable for re-use in high quality garments.
Circular Design	Seamless, single-fibre garments enable second-life use, resale, and recycling without disassembly.
CO_2 Impact	Reduced material use, minimised returns and shipping - combined system significantly reduce CO_2 emissions.
Scalability	High-quality, tailored garments can now be mass-produced combining perfect fit, quality and sustainability criteria.
Economic Gains	Returns, resale, waste, and development costs are no longer variables - predictable fit and engineered outcomes unlock scalable profitability.
Chain Restructuring	Modular programming replaces fragmented processes. Designers begin with pre-validated structures; all stages are aligned for speed, precision, and consistency.
Predictive System Logic	Adds a programmable layer to apparel development - transforming the industry from reactive production to predictable system architecture that reshapes how apparel functions at scale.

*. * 8 rigid size production: refers to predefined shaping based on static sizes.*

HARD DATA

PREREQUISITE PARAMETERS

Metric	The Method	Traditional (Cut-and-Sew)	Cost Reduction
Production Time *(Hours/Garment)*	2.4h	15h	**84.0%**
Production Cost *(€/Garment)*	€100	€380	**73.0%**
Adjusted Cost *(Considering Unsold)*	€104	€447	**76.8%**
Waste per Sold Garment *(g)*	24g	159g	**84.9%**
Recycling Cost *(€/kg)*	€1.49	€6.71	**77.8%**

IMPACT

1. **Production Time Reduction: − 84.0%**
2. **Production Cost Reduction: − 73.7%**
3. **Skilled Workforce Reduction: − 99.9%**
4. **Space Efficiency: + 99%**
5. **Unsold Rate Reduction Potential : − 78.6%**
6. **Inventory Reduction Potential: − 62.5%**
7. **Return Rate Reduction Potential: − 71.4%**
8. **Adjusted Production Cost Reduction Including Unsold: − 76.8%**
9. **Waste Reduction Including Unsold Garments: − 82.4%**
10. **Waste Reduction per Garment Sold: − 84.9%**
11. **Waste Reduction Potential due to Size Mismatch with Unsold Garments*: − 85.3%**
12. **Waste Reduction Enabled by Expanded Customer Reach: − 85.3%**
13. **Electricity Use Reduction: − 66.7%**
14. **CO_2 Emissions Reduction per Garment Produced: − 68.4%**
15. **CO_2 Emissions Reduction per Garment with Sustainable Recycled Fibre for Luxury Apparel: − 72.0%**
16. **Warehousing Space Reduction Potential: − 80%**
17. **Warehousing Emissions Reduction: − 81.6%**
18. **Fibre Recovery with an Increased Efficiency: 54.5% +**
19. **Luxury Fibre Waste Reduction: 91.2%**
20. **Recycling Efficiency: +54.5%**
21. **Reduced Recycling Costs: − 77.8%**
22. **Projected Increase in Gross Profit from Resale: + 61.3%**
23. **Increase in Net Profit: + 235%**
24. **Potential CO_2 Emissions Avoided: − 22.6 million tonnes of CO_2**

** Both metrics derive from the patented 3-to-8 sizing model.*

STRATEGIC ADVANTAGE: A NEW INDUSTRY COST MODEL

The Patented Method shifts from reactive cost cutting to pre-programmed efficiency, eliminating risk and replacing uncertainty with a data-driven framework. Sustainability and affordability are no longer trade-offs – the most efficient solution is also the most financially viable.

By structuring cost parameters from the outset, the Method maximises profitability, eliminates waste and streamlines logistics – without compromising quality. Its modular, pre-programmed precision ensures full optimisation of fit, material use and energy consumption at every stage.

In addition to built-in efficiencies, the Method enables the creation of advanced monitoring and forecasting programs to be able to provide complete transparency, cost control and real-time tracking from fibre selection to end-of-life recycling. These programs are to be designed to reinforce the industry-transforming impact of the Method by providing a structured system for cost optimisation at scale:

Key Data Management Programs for Cost & Affordability Optimisation

1. **Material & Production Efficiency Tracking**

   Optimising the use of materials, production time and energy consumption, maximum cost savings can be achieved while maintaining the highest standards of quality and sustainability.

- **High-Tech Knitwear Profitability Calculator** → to quantify cost savings from transitioning to high-tech knitwear vs. cut-and-sew.
- **Adaptive Sizing Impact Model** → to measure cost reductions from self-adjusting garments, reducing SKU numbers and return rates.
- **Raw Material Cost-Benefit Analysis** → to track fibre price fluctuations, comparing sustainability with cost-effectiveness.
- **Production Energy Optimisation Model** → to evaluate energy consumption per unit, identifying efficiency gains.
- **Automated Process CO_2 & Cost Monitoring System** → to provide real-time tracking of CO_2 emissions & cost per garment produced.

2. **Logistics, Supply Chain, & Distribution Optimisation**

   Streamlining logistics and inventory management reduces costs, lowers emissions and ensures that production and distribution are aligned with actual demand – minimising waste, unnecessary transportation and operational inefficiencies while maximising cost-effectiveness.

- **Supply Chain CO_2 & Cost Tracker** → to pinpoint inefficiencies in sourcing & logistics, reducing unnecessary expenses.
- **Dynamic Stock Allocation Model** → to optimise inventory placement, cutting excess transfers & warehousing costs.
- **Reverse Logistics & Returns Cost Impact System** → to simultaneously compare the efficiency of the Method with tailored cut-and-sew models, quantifying return rate reductions & logistics savings.

3. **Circular Economy & End-of-Life Profitability**

   Turn sustainability into a financial advantage by extending the value of each garment far beyond its first use: maximising garment life, recyclability and resale value ensures long-term profitability while reducing waste.

- **Extended Garment Lifecycle Profitability Model** → to evaluate long-term cost savings from increased durability & fewer replacements.
- **Recycling & Fiber Recovery Profit Model** → to measure fibre recovery savings (85% vs. conventional ~30%).
- **Resale & Second-Life Revenue Simulator** → to predict second-hand revenue impact, ensuring profitability in circular models.

4. Performance Benchmarking & Predictive Business Intelligence

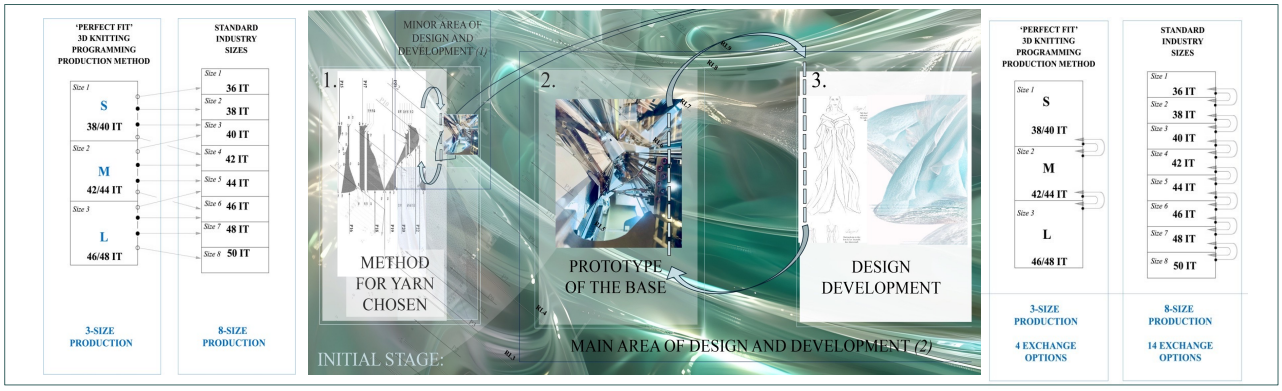
A data-driven approach to sustainability and profitability that makes cost efficiencies measurable, predictable and scalable: turning raw data into strategic insights to ensure that every decision is backed by quantifiable metrics, enabling organisations to predict, optimise and maximise profitability while reducing environmental impact.

- **CO_2 & Cost Benchmarking Tool** → to compare emissions & cost savings across different production models (Method vs. cut-and-sew).
- **Scenario-Based Profitability Calculator** → to run simulations to predict revenue, cost reduction & CO_2 savings.
- **AI-Powered Business Optimisation Dashboard** → this dashboard to serve as a centralised system for real-time
  profitability & sustainability tracking.

5. AI & Automation for Affordability Optimisation

Automation turns optimisation into a continuous, real-time process – ensuring maximum affordability without sacrificing quality or sustainability. Leveraging AI and automation ensures cost reduction, energy efficiency, and smarter decision-making at every stage of production and logistics.

- **AI-Powered CO_2 & Cost Reduction Assistant** → to provide instant recommendations for cutting production & logistics costs.
- **Smart Factory CO_2 & Cost Monitoring System** → to track real-time energy use & CO_2 footprint per factory, ensuring cost efficiency.
- **Automated Production Location Optimisation Model** → to calculate the most suitable production location based on cost, logistics, and emissions.



COST, RESALE, AND RECYCLING CASE STUDIES: COMPARATIVE FINANCIAL IMPACT OF THE PATENTED CORRELATION METHOD *(HtK) VS* TAILORED CUT-AND-SEW

These verified outcomes reflect the real-world implementation of the Patented Method at scale. Each metric represents a core area of operational and financial efficiency made possible through the system's structural precision, fibre preservation, and self-adjusting design logic. 197 million garments annually may be produced using only 60,000 high-tech programmable machines and just 1,200 operators—replacing over 1.6 million traditional skilled tailors' work.

Recycling Efficiency

The Patented Method ensures garments are made from a single fibre, with no fastenings or mixed materials—making them inherently recyclable by design.

- Fibre Recovery Rate: 85%
- Waste Reduction (Fibre):
  - Up to 91.2% in the Max Circularity model (X1)
  - 84.9% in the Business-Optimised model (X2)

These high recovery rates reduce the need for virgin fibre and support both sustainability and profit—without added labour or processing steps.

Full recycling logic is covered in the dedicated circularity document. This section highlights only the key outcomes relevant to cost modelling.

Note on Fibre Type Comparison

While the Patented Method uses the highest-quality fibre with built-in recyclability and structural integrity, traditional cut-and-sew production is rarely compatible with the same sustainable fibre at scale. Therefore, comparisons in this document use conventional, commonly available materials as the cut-and-sew baseline.

This ensures a realistic reference point:
→ *If sustainable fibre were used in cut-and-sew, costs would increase disproportionately and circular recovery would remain inefficient due to construction limitations (seams, fasteners, mixed materials).*

Patented Correlation Method *(HtK)*: Full-Cost Model *(Case 1) and* Cost-Recovery Model *(Case 2)*

Both models demonstrate an exceptionally sustainable and efficient production system, making the distinction between them more about strategic priorities than necessity. The **Case 1: Full-Cost Model** *(Maximum Sustainability Approach)* **ensures a maximum circular approach**, which is beneficial for brands that emphasise sustainability as a core value, while the **Case 2: Cost-Recovery Model** *(Business-Optimised Model)* **balances sustainability with marginally higher profitability**.

However, the financial difference between the two is so minimal that it questions whether fully new recycled yarn is even necessary for in-house operations. Outsourcing the recycling process, effectively purchasing a closed-loop system, could simplify operations while maintaining the same level of circularity, reducing internal management complexity. The Patented Method ensures unparalleled sustainability, regardless of whether a brand opts for direct fibre reintegration or external sourcing.

RECYCLING EFFICIENCY

RECOVERED FIBRE

ENGINEERED WITH THE PATENTED METHOD *HtK* (X):
85%

TAILORED WITH CUT-AND-SEW, *Woven* (Y):
55%

54.5% More Efficient

High-quality fibres, suitable for reuse in luxury garments

Lower-quality fibres downgraded for non-luxury use. Higher sorting and pre-processing costs due to fasteners, adhesives, and blends.

RECYCLING EFFICIENCY:

ENGINEERED WITH THE PATENTED METHOD, *HtK* (X):

Recovery Rate: Up to 85-90% of fibre is recoverable due to single-fibre construction.

Cost Efficiency: Lower sorting and pre-processing costs. Recycling costs focus on processing and cleaning the fibre.

Output: High-quality fibres suitable for reuse in luxury garments.

TAILORED WITH CUT-AND-SEW, *Woven* (Y):

Recovery Rate: 50-60% due to mixed materials and contamination.

Cost Efficiency: Higher sorting and pre-processing costs due to fasteners, adhesives, and multi-material blends.

Output: Lower-quality fibres often downgraded for non-luxury use.

Key Assumptions:

ENGINEERED WITH THE PATENTED METHOD, *HtK* (X):

- **Sorting:** €0.05 per item (minimal effort)
- **Processing:** €1.20/kg (single fiber)
- **Fibre Recovery Rate:** 85%

TAILORED WITH CUT-AND-SEW, *Woven* (Y):

- **Sorting:** €0.50 per item (higher complexity)
- **Processing:** €2.50/kg (multiple materials)
- **Fibre Recovery Rate:** 55%

RECYCLING COSTS

ENGINEERED WITH THE PATENTED METHOD *HtK* (X):	**TAILORED WITH CUT-AND-SEW, *Woven* (Y):**
X = 0.22Y	**Y**
€1.49/kg	***€6.71/kg***

Cost Reduction: 77.8%

ENGINEERED WITH THE PATENTED METHOD, *HtK* (X):

- **Recovery Rate**: Up to 85-90% of fibre is recoverable due to single-fibre construction.
- **Cost Efficiency**: Lower sorting and pre-processing costs. Recycling costs focus on processing and cleaning the fibre.
- **Output**: High-quality fibres suitable for reuse in luxury garments.

Key Assumptions:

1. **Original Fibre Cost**:
   - €110/kg reflects a premium price for the highest quality, long-fibre yarn
2. **Recycling Efficiency**:
   - Recovery Rate: 85-90%.
   - Recycled Fiber Quality: Comparable to the original due to the clean, single-fibre design
3. **Recycled Fibre Usage**:
   - Recycled fibre can make up 25–30% of the total material without compromising quality
4. **Processing:** €1.20/kg (single fibre)

Recycling Cost Calculations:

- **Handling Postage etc Fees**: €50 (buffer for handling, quality checks, minor adjustments, etc.)
- **Recycling Cost Per Garment: €0.47**
  - Sorting: €0.05
  - Processing: 0.35 kg × €1.20/kg = €0.42
- **Recovered Fibre**: 0.35 kg × 90% = 0.315 kg
- **Cost Per Recovered Kg**: €0.47 ÷ 0.315 kg = **€1.49/kg**

TAILORED WITH CUT-AND-SEW, *Woven* (Y):

- **Recovery Rate**: 50-60% due to mixed materials and contamination.
- **Cost Efficiency**: Higher sorting and pre-processing costs due to fasteners, adhesives, and multi-material blends.
- **Output**: Lower-quality fibres often downgraded for non-luxury use.

Key Assumptions:

1. **Original Material Cost per Garment**:
   - €90 reflects a premium price for the highest quality
2. **Recycling Efficiency**:
   - Recovery Rate: 55%.
   - Recycled Fibre Quality: not suitable for luxury use at high rate due to mixed dyes, fragile original fibres.
3. **Processing:** €2.50/kg

Recycling Cost Calculations:

- **Handling Postage etc Fees:** €50 (buffer for handling, quality checks, minor adjustments, etc.)
- **Recycling Cost Per Garment:** €1.55
  - Sorting: €0.50
  - Processing: 0.42 kg × €2.50/kg = €1.05
- **Recovered Fibre**: 0.42 kg × 55% = 0.231 kg
- **Cost Per Recovered Kg**: €1.55 ÷ 0.231 kg = **€6.71/kg**

RESALE

(Net Profit per Garment)

ENGINEERED WITH THE PATENTED METHOD *HtK* (X):

Case Study 1: Maximum Sustainability Approach: X1 = €423.6 = 3.39Y

Case Study 2: Business-Optimised Model X2 = €425.9 = 3.41Y

TAILORED WITH CUT-AND-SEW, *Woven* (Y):

Y = €125.00

Increase in Net Profit: 235-240%

The Patented Method (HtK) delivers 235-245% higher net profit per garment (€424-426 vs. €125.00) compared to cut-and-sew garments, which have high production and resale costs, making multiple resale cycles financially unviable. A high-end cut-and-sew garment incurs resale costs of €150 - including handling, repairs and logistics - while the patented process reduces this to around €79-€89. In addition, the production cost of a premium made-to-measure garment is €380 per garment, while the patented process achieves the same high quality output for just €100 per garment.

Unlike traditional garments, which lose value with each resale, the self-adjusting structure of garments produced using the patented process ensures consistent fit and integrity, eliminating the need for alterations.

By eliminating size fragmentation, reducing unsold inventory and enabling continuous resale, the Patented Method transforms circularity into a scalable, high-margin business model. By comparison, traditional high-end cut-and-sew methods cannot compete due to costly alterations and rigid sizing structures that create a resale bottleneck, ultimately limiting profitability.

For a detailed financial breakdown, please refer to the **Two Case Studies** following the **TAILORED WITH CUT-AND-SEW** *(Woven)* section, which outline different approaches to recycling and resale of garments **ENGINEERED WITH THE PATENTED METHOD** *(HtK)*.

TAILORED WITH CUT-AND-SEW *Woven* (Y):

There are critical differences to consider: **Resale Costs €150 per Resold Item**:

- Handling & Quality Checks – €50 per returned per garment
- Refurbishment & Repairs – €60 (*mending, alterations, pressing*)
- Repackaging & Logistics – €20 (*re-tagging, folding, pressing, and repackaging*)
- Storage & Inventory Management – €20 (*size-based storage, increased logistics costs*)

Key Assumptions:

- **First Sale Revenue**: €700 × (*70% of garments sold directly*) = **€490** per garment
- **Resale Revenue**: €250 × (*30% of garments returned × 50% of garments resold*) = **€37.5** per garment
- **Recycling Fibre Contribution**: Negligible due to mixed materials and inefficiencies. Assume €0
- **Production Cost**: **€380** per garment (*including materials*)

Net Profit per Garment:

- **Resale Cost Allocation: €150** × (*30% of garments returned × 50% of garments resold*) = €22.5 per garment (*averaged across total production*)
- **Total Cost per Garment**: €380 + €22.5 = **€403**
- **Net Profit per Garment**: €528 (*revenue*) − €403 (*costs*) = **€125.00**

CASE STUDIES

THE PATENTED CORRELATION METHOD *(HtK)*

Case Study 1 (X1): Maximum Sustainability Approach (Full Cost Applied)

- **Objective:** Prioritise sustainability and circularity, regardless of cost efficiency.
- **Recycled Fibre Cost:** Considered as a new material purchase (€111.5/kg).
- **Material Cost per Garment:** €38.7 per garment.
- **Financial Impact:** Slight cost increase (+€0.16 per garment).
- **Justification:** This model ensures maximum **circular fibre use**, eliminating reliance on virgin fibre as much as possible.

Strategic Advantages:

- Strengthens brand sustainability credentials.
- **Fully circular,** minimising reliance on raw fibre extraction.
- Ideal for **luxury & premium brands** where sustainability outweighs minor cost concerns.

Case Study 2 (X2): Business-Optimised Model (Cost Offset Applied)

- **Objective:** Leverage fibre recovery to optimise costs while maintaining sustainability.
- **Recycled Fiber Cost Adjustment:** Instead of repurchasing, recovered fibre (€93.5/kg) offsets the original cost.
- **True Additional Cost per kg of Recycled Fibre:** €18/kg (only the processing cost + small loss from fibre breakdown).
- **Material Cost per Garment (Adjusted):** €28.9 per garment (vs. €38.7 in Case Study 1).
- **Financial Impact:** Significantly lower per-unit cost while keeping circularity intact.

Strategic Advantages:

- Maximises profitability without compromising sustainability.
- Reduces cost per garment**, improving pricing competitiveness.**
- Scalable for mid-to-large production volumes **without financial burden.**

NOTE**: All calculations are performed with full precision, but for consistency in presentation, values are generally rounded to one decimal place. For minor figures (e.g., below €1), rounding is applied to two decimal places where necessary to ensure accuracy in cumulative totals. For larger financial values, rounding is maintained to one decimal place unless greater precision is required. **Summed totals are only adjusted at the final stage to avoid discrepancies caused by intermediate rounding.

STEP 1: FIBRE COMPOSITION		
Total Fibre Required per Garment:	0.35 kg	0.35 kg
Recycled Fibre Contribution:	30% (*0.105 kg*)	30% (*0.105 kg*)
Virgin Fibre Contribution:	70% (*0.245 kg*)	70% (*0.245 kg*)
STEP 2: MATERIAL COSTS		
Virgin Fibre Cost:	**€110/kg** (*reflects a premium price for the highest quality, long-fibre yarn*)	**€110/kg** (*reflects a premium price for the highest quality, long-fibre yarn*)
Recovery Rate:	**85%** of fibre is retained after recycling	**85%** of fibre is retained after recycling
Recycling Processing Cost:	€1.49/kg	€1.49/kg
Cost of Recycled Fibre per Kg:	€110/kg + €1.49/kg = €111.5/kg	**Recovered Value:** 0.85% × €110/kg = €93.5/kg
True Additional Cost of Recycled Fiber:	**€111.5/kg (*considered as new fibre purchase*)**	(€110 +€1.49) − €93.5/kg = **€18/kg**
Virgin Fibre Cost per Garment:	0.245 kg × €110/kg = **€26.9**	0.245 kg × €110/kg = **€27**
Recycled Fibre Cost per Garment:	0.105 kg × €111.5/kg = **€11.7**	0.105 kg × €18/kg = **€1.9**
Total Material Cost per Garment:	€11.7 + €27 = **€38.7**	€1.9 + €27 = **€28.9**
STEP 3: COST IMPACT OF WITH RECYCLED FIBRE		
Original Fibre Cost (*100% virgin*):	0.35 kg × €110/kg = **€38.5**	0.35 kg × €110/kg = **€38.5**
New Fibre Cost (*30% recycled*):	**€38.7**	**€28.8**
Cost Impact Due to Recycled Fibre:	€38.7 - €38.5 = **€0.16** (*slight increase in cost*)	€38.5 - €28.8 = **€9.7** (*significant savings*)
STEP 4: ASSUMPTIONS FOR COMPARISON		
Retail Price:	**€700** first sale	**€700** first sale
Original Production Costs with Virgin Fibre:	**n/a**	**n/a**

Resale Price:	**€250**	**€250**
Return Rates & Split:	30% of all garments returned: 50% for resale and 50% for recycling	30% of all garments returned: 50% for resale and 50% for recycling
Resale Costs*:	€50 + €33.7 = **€88.7**	€50+€28.8 = **€78.8**
Recycling Costs & Contribution:	**€11.7** value per garment (*recycled fibre*)	**€1.9** value per garment (*recycled fibre*)
STEP 5: REVENUE & COST ANALYSIS PER GARMENT		
First Sale Revenue:	€700 × (*70% of garments sold directly*) = **€490**	€700 × (*70% of garments sold directly*) = **€490**
Resale Revenue:	€250 × (*30% of garments returned × 50% of garments resold*) = **€37.5**	€250 × (*30% of garments returned × 50% of garments resold*) = **€37.5**
Recycling Contribution:	€11.7 × (*30% of garments returned × 50% of garments recycled*) = **€1.8**	€1.9 × (*30% of garments returned × 50% of garments recycled*) = **€0.28**
Total Revenue per Garment:	€490 + €37.5 + €1.8 = **€529.3**	€490 + €37.5 + €0.28 + €1.9 = **€529.4**
Resale Cost Allocation:**	€88.7 × (*30% of garments returned × 50% of garments resold*) = **€13.3** per garment (*averaged across total production*)	€78.9 × (*30% of garments returned × 50% of garments resold*) = **€11.8** per garment (*averaged across total production*)
Total Cost per Garment:	€100 + €13.3 − €1.8 = **€111.5**	€100 + €11.8− €0.28 − €9.7 = **€101.9**
Net Profit per Garment:	€529.3 − €111.5 = **€417.7**	€529.4 − €101.9 = **€427.5**
STEP 6: INCORPORATING RECYCLED FIBRE		
Return Rate:	30% of garments returned × 50% of garments recycled = **15% of total garments recycled annually**	30% of garments returned × 50% of garments recycled = **15% of total garments recycled annually**
Average per Production: **Distributed Across Production:**	0.35 kg per garment × 15% of garments recycled = **0.0525 kg** of recycled yarn per garment produced	0.35 kg per garment × 15% of garments recycled = **0.0525 kg** of recycled yarn per garment produced
Value of Recycled Fibre:	0.0525 kg × €111.5/kg = **€5.9** of recycled yarn value per garment	0.0525 kg × €18/kg = **€0.94** of recycled yarn value per garment
STEP 7: COST PER GARMENT		
Original Production Cost: €100/Garment:	**n/a**	**n/a**
Resale Costs Averaged Across Production:	**€13.3**	**€11.8**
Recycling Contribution Deduction:	**– €1.8** (*offsets cost*)	**– €0.28** (*offsets cost*)
Future Fibre Contribution Deduction:	**– €5.9** (*from recovered fibre*)	**– €9.7** (*from recovered fibre*)
Total Adjusted Cost per Garment*:**	€100 + €13.3 − €1.8 − €5.9 = **€105.7**	€100 + €11.8 − €0.28 − €9.7 = **€101.9**
STEP 8: NET PROFIT PER GARMENT		
Total Revenue per Garment:	€490 + €37.5 + €1.8 = **€529.3**	€490 + €37.5 + €0.28 = **€527.8**
NET Profit:	€529.3 − €105.7 = **€423.6**	€527.8 − €101.9 = **€425.9**

*** UNDERSTANDING THE COST BREAKDOWN IN THE RESALE & RECYCLING MODEL**

1. **Handling & Processing Returns (€50 per returned item):** This applies **every time a return happens**, whether for resale or recycling. Since the model assumes multiple resale cycles, these costs continue to apply for every resale. The €88.7 figure reflects the long-term resale processing costs for garments that continue through multiple returns and resales over time. Each time a garment is returned, it incurs a **fixed handling fee of €50**, covering:
    - Quality checks
    - Minor adjustments
    - Packaging & postage

2. **Material Cost Per New Garment €38.7 per item,** *(Case 1):* Each new garment to be produced with the Patented Method composition: **30% recycled fiber and 70% virgin fibre**, reducing reliance on virgin materials to ensure that returns and recycling actively reduce future material costs.
   The cost breakdown:
    - **Recycled Fibre Cost:** €11.7 per garment
    - **Virgin Fibre Cost:** €27 per garment
    - **Total Material Cost:** €38.7 per garment

3. **Resale Costs €88.7 per Resold Garment:** When a returned garment is deemed fit for resale, additional costs apply to **prepare it for a second sale**:
    - Handling, cleaning, and quality checks
    - Storage & logistics for resale
    - Repackaging and remarketing

Why This Matters

- **Circular Efficiency:** This model allows garments to be **resold multiple times** before they eventually go into recycling.
- **Lower Long-Term Costs:** Each resale cycle **reduces the need for new materials**, leading to greater cost savings over time.
- **Sustainability & Profitability Combined:** The structured returns, resale, and recycling system **balances sustainability with financial efficiency**.

**** RESALE COST ALLOCATION**: €13.3 per garment averaged across total production *(Case 1)*

The **€13.3 per garment** is an **averaged cost applied across all garments in the system**, regardless of whether they are sold, resold, or never returned. It represents the overall impact of resale costs across the entire production volume.

1. **Total Returns & Resale Rate:**

- 30% of all garments sold are returned.
- Of those returned garments, 50% are resold, and 50% are recycled.
- This means only 15% of all garments sold are resold: 30% × 50% = 15%

2. **The Actual Resale Cost:**

- Each resold garment incurs a cost of €88.7.
- Since only 15% of garments in circulation go through resale, the total resale cost is spread across all garments.
- The formula used: €88.7 × 15% = €13.3

What This Means

- The €13.3 cost applies to every garment produced not just those resold.
- It is part of the overall business model, not tied to individual sales cycles or how often resale happens.

Even if a specific garment is never returned or resold, it still carries this cost as part of the company's operational structure.

***** TOTAL ADJUSTED COST PER GARMENT -**€9.7.

The €9.7 deduction in Case 2 reflects the total cost offset from recovered fibre, including the €0.94 material value per garment. This figure represents the full saving achieved by fibre reuse and processing cost avoidance.

OPTIMISED RECYCLED FIBRE STRATEGY

Although garments can maintain an authentic look with up to **30% recycled fibre**, this level is reserved for future scalability. In the initial stages, with **30% of garments returned (15% for resale, 15% for recycling)**, the most viable approach is to **incorporate 12.75% recycled fibre** across all garments.

Strategic Benefits of Incorporating 12.75% Recycled Fibre:

- **Immediate Circularity** – Enables full production coverage from the first cycle, eliminating virgin fibre reliance once returns reach 15%.
- **Scalable Model** – As return rates grow, recycled fibre incorporation can gradually increase to **30%**.
- **Consumer Engagement** – Encourages garment returns, reducing waste while enhancing sustainability.
- **Balanced Efficiency & Quality** – Ensures product integrity with minimal cost impact (0.41% increase at 30%).

Long-Term Cost Stability & Business Advantages:

1. **Predictable Material Costs** – Stable fibre pricing minimises exposure to market fluctuations.
2. **Inflation & Supply Chain Protection** – Reduces dependence on virgin materials, mitigating risk.
3. **Stronger Profit Margins** – Scaling recycled fibre use keeps costs low without affecting profitability.
4. **Efficient Circular Flow** – Prevents material shortages while ensuring continuous production.

This model ensures a **future-proof, sustainable production system** with minimal financial risk while maintaining high-quality, scalable operations.

How The Patented Correlation Method *(HtK)* Is Financially and Sustainably Superior To Traditional Tailored Cut-and-Sew *(Woven)* Production Methods.

1. COST STABILITY & PREDICTABILITY

- **ENGINEERED WITH THE PATENTED METHOD, *HtK* (X):**
  - **Efficient production time:** 2,4h, fully automated process.
  - **Streamlined production costs:** €100.
  - **Material costs remain stable**: €38.5 - €28.8 per garment, even with up to 30% recycled fibre.
  - **Case 1 – Minimal cost increase:** only €0.16 per garment, (+0.41%), **ensuring long-term cost stability**.
  - **Case 2 – Significant savings**: €9.7 per garment saved (−25.2%), **ensuring profitability while maintaining sustainability.**
  - **Self-adjustment:** Enables predictably lower sales returns and size-related inefficiencies.
  - **Predictable pricing**: Shields production from market volatility in raw material costs.
  - **Recycled fibre maintains luxury quality**: Maintains luxury standards, avoiding degradation and the volatility of mixed-material waste.
- **TAILORED WITH CUT-AND-SEW, *Woven* (Y):**
  - **High production time:** 15h per garment.
  - **High production costs:** €380 per garment, driven by fabric inefficiencies and labour-intensive production.
  - **No stable recycling model**: Increases cost uncertainty.
  - **Highly dependent on skilled labour**: Skilled workforce required, adding operational and cost volatility.

2. PROFITABILITY:

- **ENGINEERED WITH THE PATENTED METHOD, *HtK* (X):**
  - **First Sale Revenue per Garment:** €490 (after factoring in 70% direct sales).
  - **Resale Revenue per Garment:** €37.5 (after factoring in 30% returns, 50% resold).
  - **Recycling Contribution:** €1.8 per garment, *Case Study 1* (30% returns × 50% recycled).
  - **Total Revenue per Garment: ≈ €528**
  - **Final Cost per Garment: €102- €106** (factoring in resale costs and the recycling contribution).
  - **Net Profit per Garment:** ≈ €425 (average between Case Studies)
- **TAILORED WITH CUT-AND-SEW, *Woven* (Y):**
  - **First Sale Revenue per Garment:** €490.0
  - **Resale Revenue per Garment:** €37.5
  - **Recycling Contribution: €0 (negligible due to mixed materials)**
  - **Total Cost per Garment: €403**
  - **Net Profit per Garment: €125**

The production of tailored garments engineered with **THE PATENTED METHOD, *HtK* (X)** generates ***235%-245%* higher profit per garment** (≈ €425 vs. €125). Production of tailored garments **TAILORED WITH CUT-AND-SEW, *Woven* (Y)** runs on lower margins and is not financially scalable due to high production and refurbishment costs.

3. SUSTAINABILITY & CIRCULAR MODEL EFFICIENCY

- **ENGINEERED WITH THE PATENTED METHOD, *HtK* (X): A Closed-Loop Model**
    - **30% recycled fibre incorporation is cost-neutral** (€0.16 increase per garment, *Case Study 1*).
    - **Up to 85-90% material recovery** ensures minimal waste.
    - **15% of garments returned annually support long-term recycling goals.**
    - **No mixed materials → High-quality fibre retention** for future production.
    - **Each resale cycle extends the life of the garment without adding major costs.**

- **TAILORED WITH CUT-AND-SEW, *Woven* (Y): Limited Sustainability**
    - **High material waste** from cutting patterns.
    - **Difficult to recycle** due to **mixed fibre blends**.
    - **Shorter garment lifecycle**, requiring costly repairs or rework for resale.
    - **No structured recycling contribution**, meaning future costs do not decrease.

4. FEASIBILITY AT SCALE

- **ENGINEERED WITH THE PATENTED METHOD, *HtK* (X):**
    - **Low production labour requirements** – Only machine programming and finishing required.
    - **Scalable to mass production** without increased labour costs.
    - **Minimal material waste (single-fibre design supports near 100% recyclability).**
    - **Higher resale efficiency and sustainable production flow.**

- **TAILORED WITH CUT-AND-SEW, *Woven* (Y):**
    - **High labour dependency** – Skilled tailors are required for every step in the production process.
    - **Longer production times** – High-end tailored garments require multiple processes.
    - **Lower recycling efficiency** – **Cannot scale circularity at a viable cost.**

5. LONG-TERM BUSINESS CASE FOR THE PATENTED CORRELATION METHOD (*HtK)* MODEL

- **Stable long-term production costs** – Even with up to **30% recycled fibre, and adoption of a Maximum Sustainability Approach (Case 1) cost increase remains negligible** (€0.16 per garment, 0.41%).
- **Highly profitable resale system** – Efficient handling of returns minimises financial loss.
- **Scalability without waste** – The system runs efficiently **at scale**, with **predictable fibre recovery ensuring long-term cost savings**.
- **Environmental compliance & brand advantage** – A strong circularity model that meets growing sustainability.
- **Stronger customer engagement** – Encourages customers to return garments, improving return rates and increasing future recycled fibre usage.

TABLE 1: Final Comparison Case 1 And Case 2 Cost Models Patented Correlation Method *(HtK)*

METRIC	CASE STUDY 1 (X1) MAXIMUM SUSTAINABILITY	CASE STUDY 2 (X2) BUSINESS-OPTIMISED
Objective:	Full circularity, sustainability first	Maximise profit while maintaining circularity
Recycled Fibre Handling:	Treated as a new material purchase (€111.5/kg)	Recovery offset applied (€18/kg true cost)
Virgin Fibre Use:	70% (0.245 kg)	70% (0.245 kg)
Recycled Fibre Use:	30% (0.105 kg)	30% (0.105 kg)
Material Cost per Garment:	€38.7	€28.9
Compared to 100% Virgin Fibre:	+ €0.16 per garment	- €9.7 per garment
Strategic Advantage:	Ideal for luxury/premium positioning	Ideal for large-scale, cost-sensitive models
Fibre Recovery Efficiency:	85%	85%
Fibre Waste Reduction:	Up to 91.2%	Up to 84.9%

TABLE 2: Final Comparison Patented Correlation Method *(HtK)* vs Tailored With Cut-And-Sew *(Woven)*

METRIC	PATENTED CORRELATION METHOD, *HtK* (X)	TAILORED CUT-AND-SEW, *Woven* (Y)
Production Cost per Garment:	€105.7 (with resale/recycling)	€402.50
Net Profit per Garment:	**€423.6-€425.9**	**€125.00**
Material Waste:	Minimal (single-fibre, 85% recovery)	High (cutting waste, mixed fibres)
Recycling Efficiency:	Closed-loop, 30% incorporation possible	Difficult, limited fibre recovery
Resale Model:	Efficient, €88.66 per item processing cost	Expensive, €150 per item processing cost
Labour Dependency:	Low, machine-based production	High, requires skilled tailors
Scalability:	Easily scalable without cost spikes	Difficult due to labour and inefficiency

Conclusion

The Patented Correlation Method *(HtK)* **outperforms Tailored Cut-and-Sew** *(Woven)* model for fitted apparel production at mass scale **across every key metric** evaluated. This comparison covered all critical aspects of production, material use, scalability, resale, and recycling.

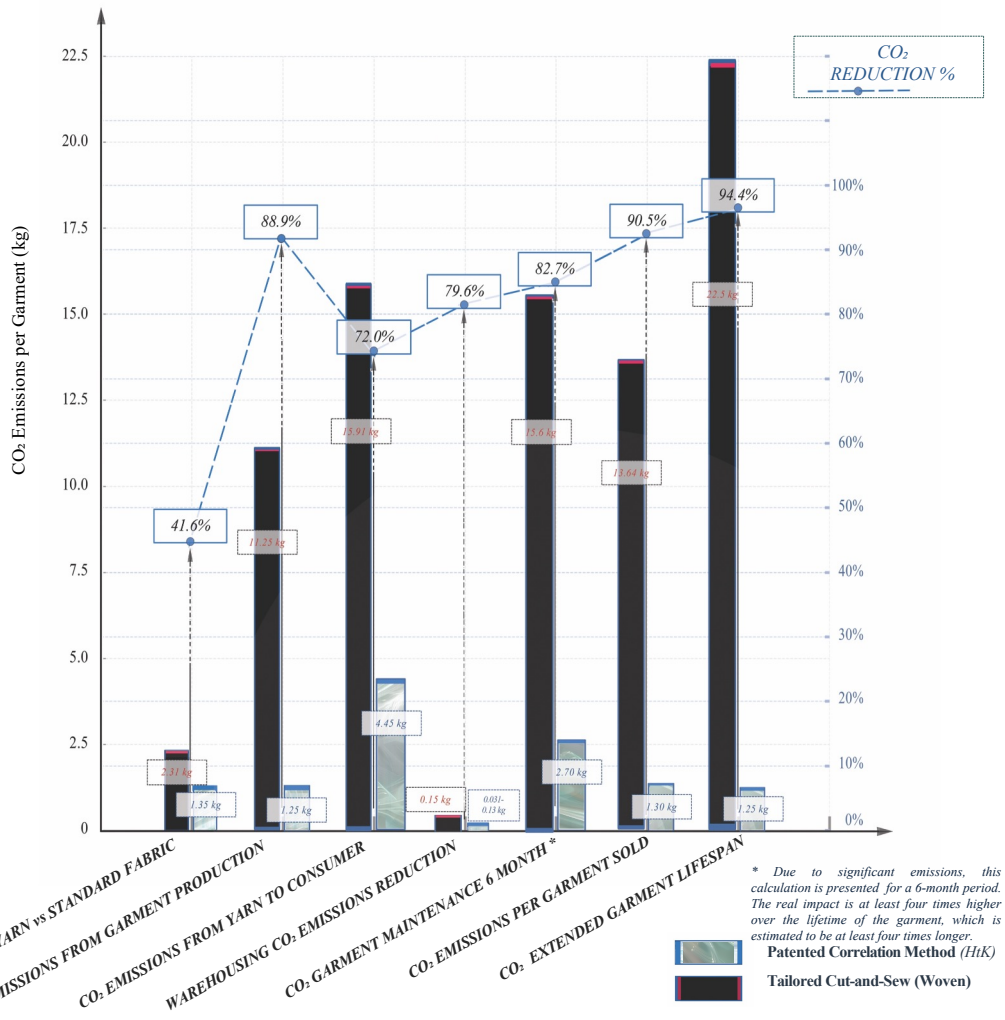
The Patented Method is the only proven system that combines perfect fit, mass-market scalability, and circular profitability—establishing a future-proof resale model unmatched by any existing production method.

CO_2 REDUCTION THROUGH PERFECT FIT

Sustainable innovation is no longer optional – it is essential. **The Patented Method** *(HtK)* is revolutionising garment production by enabling perfectly fitting, self-adjusting garments at scale, while reducing CO_2 emissions ***by up to 94.4%***. Unlike traditional woven garments, which rely on excessive processing, long production times and bulk storage, this Method streamlines the entire lifecycle. By replacing high-emission woven fabric (10 kg CO_2/kg) with optimised sustainable yarn (5.84 kg CO_2/kg), emissions are reduced by ***41.6%*** before production even begins. Production emissions are reduced ***by 88.9%*** as the process takes just 2.4 hours per garment compared to 15 hours for cut-and-sew, using ***90%*** less energy.

The efficiency extends far beyond manufacturing. Lightweight direct-to-consumer shipping cuts logistics emissions ***by 85-91.3%***, while dynamic inventory management reduces warehousing CO_2 by ***up to 79.6%***. Garment maintenance is no longer a hidden polluter – halving wash cycles, reducing ironing and eliminating dry cleaning cuts CO_2 ***by 82.7%*** over six months – a fourfold impact over the full life cycle. Unsold stock is minimised, ensuring ***90.5%*** fewer emissions per garment actually worn. One of the biggest breakthroughs is in longevity – while traditional garments wear out twice as fast, the Patented Method's structural resilience with self-adjusting panels doubles the life of the garment, reducing lifetime CO_2 ***by 94.4%***.

CO_2 EMISSIONS & REDUCTION IMPACT: PATENTED METHOD *(HtK)* VS. TAILORED CUT-AND-SEW *(Woven)*



1. CO_2 Emission Reduction per Garment Sustainable Yarn vs. Standard Fabric: *41.6%*

Unlike knitted fabrics, which generally require an additional complete processing step, the weaving of the fibre itself, for garments made directly from yarn (fibre). Luxury woven fabrics require multiple finishing treatments, increasing CO_2 emissions. **The Patented Method** *(HtK),* providing perfect and stable fit, reduces CO_2 emissions per kg of fibre by **41.6%.** Due to significant cost increase, mass production of sustainable luxury fabrics is not an option for the time being, considering a minor reduction in the total CO_2 emissions per garment*.

- **Standard Tailored** *(Woven)*: 10 kg CO_2
- **Sustainable Yarn with Patented Method**: 5.84 kg CO_2
- **CO_2 Reduction**: **41.6%**

2. CO_2 Emission Reduction from Garment Production: *88.9%*

Traditional cut-and-sew requires 15 hours per garment, consumes 22.5 kWh of energy and emits 11.25 kg CO_2 per garment. Patented Method completes production in 2.4 hours, using only 2.5 kWh and emitting 1.25 kg of CO_2 per garment.

- **Tailored** *(Woven)*: 15 hours × 1.5 kWh/hour = 11.25 kg CO_2
- **Patented Method**: 2.4 hours × 1.04 kWh/hour = 1.25 kg CO_2
- **CO_2 Reduction**: **88.9%**

3. CO_2 Emission Reduction from Fibre to Consumer: *72.0%*

The Patented Method integrates fibre (yarn)-to-garment production to achieve perfect fit, eliminating intermediate processes for woven such as weaving, dyeing, cutting waste, and multiple transport steps.

- **Tailored** *(Woven)* **Industry Baseline for CO_2**: 8.94 kg CO_2
- **Patented Method**: 2.5 kg CO_2
- **CO_2 Reduction**: **72.0% CO_2**

4. CO_2 Emission Reduction Warehousing: *13.3% - 79.6%*

Warehousing emissions depend on stock levels, storage duration, and energy usage.
The Patented Method reduces CO_2 from dynamic inventory control, reduced stock levels, and real-time manufacturing.

- **Tailored Cut-and-Sew** *(Woven):* Emissions: 0.15 kg CO_2 per garment.
- **Stock Level**: 100%

A. Minimum CO_2 Reduction Scenario, Patented Method:

- **Stock reduction:** 3.75% - 25%
- **Storage time:** 3-5 months (vs. 6 months for woven)
- **CO_2 per garment:** 0.075 - 0.13 kg CO_2
- **Reduction: 13.3% - 50%**

B. Maximum CO_2 Reduction Scenario, Patented Method:

- **Stock reduction:** 25% - 50%
- **Storage time:** 3 months or less
- **CO_2 per garment**: 0.031 - 0.090 kg CO_2
- **Reduction: Up to 79.6%**

5. CO_2 Reduction from Garment Maintenance, 6-Month Representation: *82.7%*

Ironing, dry cleaning, and frequent washing account for 15.6 kg CO_2 per garment *(Woven)* vs. 2.7 kg CO_2 *(Patented Method)* over six months. Over two years of average garment use, the impact is four times higher. 6 Months:

- **Tailored Cut-and-Sew** *(Woven):* Dry Cleaning: 6 times → 12.0 kg CO_2 + Ironing:12 times → 3.6 kg CO_2 = **Total CO_2 Impact**:15.6 kg CO_2 per garment
- **Patented Method**: Regular Washing: 3 times → 1.8 kg CO_2 + Ironing: 3 times → 0.9 kg CO_2 = **Total CO_2 Impact**: 2.7kg CO_2 per garment
- **Patented Method Savings**: No dry cleaning needed. Ironing reduced by 90%. Fewer washes (2x less frequent).
- **CO_2 Reduction**: **82.7%**

6. CO_2 Reduction per Garment Sold: *90.5%*

Unsold garments inflate emissions. Adjusting for unsold stock 17.5% *(Woven)* vs. 3.75% *(Patented Method)* reveals a **90.5%** CO_2 reduction per garment actually worn.

- **Tailored Cut-and-Sew per Garment Sold**: 13.64 kg CO_2
- **Patented Method per Garment Sold**: 1.30 kg CO_2
- **CO_2 Reduction**: **90.5%**

7. CO_2 Reduction from Extended Garment Lifespan: *94.4%*

Woven garments often need early replacement due to wear and repair. The Patented Method's panel movement resists tearing and deformation, doubling garment lifespan and reducing CO_2 impact by **94.4%**.

- **Woven Lifespan Emissions**: 11.25 × 2 = 22.5 kg CO_2
- **Patented Method Lifespan Emissions:** 1.25 kg CO_2
- **CO_2 Reduction**: **94.4%**

*

- *Standard fabric emissions: 2.31 kg CO_2/garment*
- *Sustainable fabric emissions: 1.62 kg CO_2/garment*
- *Reduction achieved: 0.69 kg CO_2/garment*
- *This reduction constitutes: (0.69 kg CO_2) ÷ (15.22 kg CO_2) × 100 = 4.3%*

For full methodology, calculations, and future scaling models, the complete Warehousing emissions and Circularity White Paper will be made available online.

OPTIMISING WAREHOUSING & STORAGE CO_2 EMISSIONS: A TIERED APPROACH

Warehousing emissions are not static - they vary according to stock levels, storage time and material flexibility. In contrast to cut-and-sew garments, which require pre-produced stock and longer storage periods, the M ethod allows for real-time adaptability, reducing overproduction, unnecessary production of less popular sizes (e.g. 36 IT and 50 IT) for the same customer base, and optimising storage space. The following three tables illustrate the minimum, medium and maximum CO_2 reduction scenarios, showing how strategic inventory management and flexible storage solutions can progressively reduce emissions.

1. Minimum CO_2 Reduction Scenario: *Baseline Impact Without Full Adaptation*

For this estimate, we do not drastically reduce the starting inventory, but rather adjust within a range of 3.75% to 25%, eliminating only 36 IT and 50 IT. This approach maintains operational flexibility while delivering significant environmental benefits. Even with minor optimisation, the CO_2 emissions from warehousing are reduced due to reduced pre-production and improved adaptability.

Parameter	Cut-and-Sew *(Woven)*	Patented Method *(HtK)*	Reduction *(%)*
Inventory Reduction	0% *(Full pre-production)*	3.75% to 25% *(Real-time adaptability)*	Up to 25%
Storage Duration (Months)	6 months	3–5 months	16.7% to 50%
Warehouse CO_2 per Garment	0.15 kg	0.075–0.13 kg	13.3% to 50%

2. Mid-Range CO_2 Reduction Scenario: *Progressive Optimisation Through Dynamic Stocking*

For this estimate, we do not drastically reduce the starting inventory, but rather adjust within a range of 3.75% to 25%, eliminating only 36 IT and 50 IT. This approach maintains operational flexibility while delivering significant environmental benefits. Even with minor tweaks, CO_2 emissions from warehousing are reduced due to reduced pre-production and improved adaptability.

Parameter	Cut-and-Sew *(Woven)*	Patented Method *(HtK)*	Reduction *(%)*
Inventory Reduction	0%	10% to 35% *(Adaptive stock control)*	Up to 35%
Storage Duration (Months)	6 months	3–4 months	33.3% to 50%
Warehouse CO_2 per Garment	0.15 kg	0.060–0.11 kg	26.7% to 60%

3. Maximum CO_2 Reduction Scenario: *Full Utilisation the Method's Storage & Stocking Capabilities*

Unlike cut-and-sew, where slow, batch-based production requires bulk stockpiling months in advance, the Patented Method *(HtK)* enables real-time, on-demand production. This fundamentally changes the inventory dynamic - reducing both inventory time and emissions. Traditional cut-and-sew requires brands to forecast demand months in advance, resulting in high inventory emissions, markdowns and unsold inventory waste. Warehouses remain full for more than 6 months, contributing to higher CO_2 emissions per garment. The Patented Method eliminates these inefficiencies. Fast, size-flexible production reduces the need for large pre-production inventory, allowing dynamic inventory adjustments based on real-time sales data. The impact is measurable: By optimising each storage parameter, emissions are significantly reduced. Storage CO_2 per garment is reduced by ***up to 79.6%,*** and storage time is reduced from 6 months to 3 months or less. The lower the inventory levels, the lower the CO_2 footprint - ensuring peak efficiency through the flexibility of real-time manufacturing.

Parameter	Cut-and-Sew *(Woven)*	Patented Method *(HtK)*	Reduction *(%)*
Inventory Reduction	0%	25% to 50% *(in part on-demand production)*	Up to 50%
Storage Duration (Months)	6 months	3 months or less	50%+
Warehouse CO_2 per Garment	0.15 kg	0.031–0.090 kg	79.6%

Digital Management for Full Optimisation

While the Patented Method *(HtK)* eliminates inefficiencies at the design and production, true CO_2 optimisation requires continuous tracking, real-time adjustments and system-wide integration. Unlike traditional inventory systems, where inventory is static and pre-produced in bulk, the Method's flexibility allows for real-time production, significantly reducing warehousing time and emissions. These programs ensure transparent, quantifiable CO_2 reduction while maximising efficiency.

A. Essential Programs for Fully Optimised Warehousing. By integrating these programs, brands can transform storage from a CO_2-heavy necessity into an adaptive, emissions-reducing system.

- **Dynamic Stock Allocation Model** → to adjust inventory based on demand, minimising storage time and emissions.
- **Warehouse Energy & Space Utilisation Model** → to optimise space efficiency and CO_2 impact in storage operations.
- **Inventory Forecasting & Overproduction Reduction Program** → to Prevent excess inventory buildup, reducing unnecessary emissions.

B. Advanced Digital Management for CO_2 Reduction. The Advanced Systematisation Model may provide a comprehensive set of predictive programs. References to the main list of programs that enable structured CO_2 tracking, reduction and real-time optimisation at every stage, from raw material supply to end-of-life recycling, are as follows: ***CATEGORY 1****: IMMEDIATE SSENTIAL PROGRAMS For Direct Business Efficiency* ***CATEGORY 2:*** *Circular Economy Integration.*

WASTE REDUCTION THROUGH PERFECT FIT

Waste Reduction Through Fit Intelligence

The chart illustrates the waste reduction potential made possible through the **Patented Method** *(HtK)* structural efficiency and built-in fit adaptability. These results are based on production-tested principles and real-world development logic, applied through scalable system modelling.

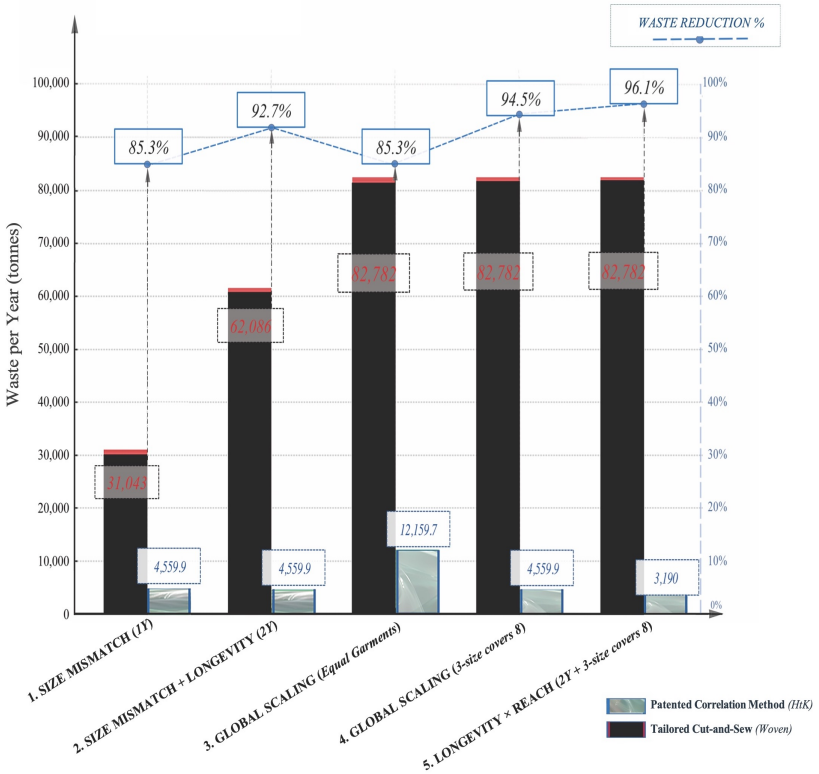
Prerequisite Parameters

METHOD/METRIC	Engineered with Patented Method:	Tailored with Cut-and-Sew:
Time Per Garment:	2.4h	15 h
Work Hours per Day:	24/7	8 hours *(250 work days/year)*
Specialists Required:	1 operator/50 machines	1 tailor per garment
Machine Efficiency:	90% *(24 hours/day × 90%)* = 21.6 effective hours/day	90% *(8 hours/day × 90%)* = 7.2 effective hours/day
Production Output from 60,000 machines:	197,100,000 garments/year	197,100,000 garments/year
Fibre per Garment:	350g	420g
Production Waste:	10g per garment produced → non-luxury fibre *(cast-off)*	70g *(20% waste)* → 100% luxury fibre
Unsold Stock Rate With/Without	3.75%	17.5%
Self-Adjustment:	Dynamic fit 3-size model	Traditional 8-size model

Waste Reduction Summary: Patented Correlation Method vs. Tailored Cut-and-Sew

1. **Size Mismatch** *(1-Year)*
   - Tailored Cut-and-Sew Waste: 31,043 tonnes/year
   - Patented Method Waste: 4,559 tonnes/year
   - Reduction: 26,483 tonnes/year
   - Waste Reduction %: **85.3%**
2. **Size Mismatch + Longevity** *(2-Year)*
   - Tailored Cut-and-Sew Waste: 62,086 tonnes/2 years
   - Patented Method Waste: 4,559 tonnes/year
   - Reduction: 57,527 tonnes/2 years
   - Waste Reduction %: **92.7%**
3. **Global Scaling** *(Equal Number of Garments)*
   - Tailored Cut-and-Sew Waste: 82,782 tonnes/year
   - Patented Method Waste: 12,160 tonnes/year
   - Reduction: 70,622 tonnes/year
   - Waste Reduction %: **85.3%**
4. **Global Scaling** *(3-Size Dynamic Fit Covers 8)*
   - Tailored Cut-and-Sew Waste: 82,782 tonnes/year
   - Patented Method Waste: 4,559 tonnes/year
   - Reduction: 78,223 tonnes/year
   - Waste Reduction %: **94.5%**
5. **Longevity + Reach** *(2Year × 3-Size Covers 8)*
   - Tailored Cut-and-Sew Waste: 165,564 tonnes/2 years
   - Patented Method Waste: 4,559 tonnes/year
   - Reduction: 160,996 tonnes/2 years
   - Waste Reduction %: **96.1%**

WASTE REDUCTION ACROSS METHODS AND SCALING MODELS
PATENTED METHOD (HTK) VS. TAILORED CUT-AND-SEW (WOVEN)



For full methodology, calculations, and future scaling models, the complete Waste and Circularity White Paper will be made available online.

SMART RECYCLING & CIRCULAR ECONOMY TRACKING

The biggest flaw in garment recycling is not the processes themselves – it is a fact that traditional garments were never designed for recycling from the start.

Main Traditional Garment Recycling Problems:

- **Removing Fasteners:** Zippers, buttons, and other fasteners must be manually removed before recycling, which is labour-intensive and time-consuming.
- **Separating Different Fabrics:** Garments made from multiple fabrics (e.g., blends of cotton and polyester) are difficult to recycle because the materials must be separated, and many recyclers can only process single-material textiles.
- **Different Structures in a Single Garment:** Variations in fabric structure (knit vs. woven, for example) within one garment complicate recycling processes, as different structures require different treatments.
- **Presence of Elastics and Padding:** Elastic bands, foam padding, and other non-textile components (e.g., in underwear, bras, or jackets) complicate the recycling process, as they often need to be removed or treated separately.
- **Coatings and Finishes:** Some garments have waterproof coatings, flame retardants, or other finishes that can interfere

  with recycling, requiring additional steps to remove these chemicals before the garment can be processed.
- **Blended Fibres:** Fibre blends (e.g., cotton-polyester) are difficult to recycle efficiently because the different fibre types often require separate recycling processes, it's difficult to reclaim pure fibres from blends.
- **Thread and Seams:** Garments sewn with different types of fibres (synthetic vs. natural) or reinforced seams can complicate the recycling process as these fibres may not be compatible with the recycling methods used for the fabric.

SOLUTIONS:

The Patented Method, by eliminating every major recycling barrier at the design and production level, ensuring that fibre can be fully recovered and reused without the inefficiencies of sorting, disassembly, or material loss. This is not an optimisation of an inefficient system – it is a revolutionary design approach that eliminates inefficiencies at their source. The unique opportunity enabled by the **Method's single-fibre structure**, no external details/materials, no fasteners allows for:

- **Seamless Recycling Without Pre-Sorting** → No need to remove zippers, buttons, or mixed materials before processing.
- **Elimination of Fibre Separation Challenges** → No blended fibers, stretch materials, or incompatible yarns that require chemical-intensive breakdown.
- **Up to 85% Fibre Recovery Rate** → Due to consistent, single-fibre garment structures that ensure high-quality reuse without degradation.
- **Lower Energy & CO_2 Footprint** → No need for harsh chemical separation or multi-stage recycling processes.
- **Effortless Consumer Participation** → Simple collection system with direct fiber reuse, removing barriers to circularity at scale.

This is not just an improvement – it is a fundamental shift in how circularity is built into production from the start. By programming **recyclability criteria** from the outset, the Method allows for **measurable proof of impact**—something impossible in cut-and-sew or garments containing lycra, blended fibres and multiple materials. Through real-time tracking and predictive modeling, the impact of the Method can be fully quantified – something impossible in conventional apparel production. Examples of how system-wide tracking further enhances the Method's built-in recyclability.

- AI-based textile-to-textile recycling programs that automate sorting and fibre repurposing.
- Digital garment passports tracking lifespan, wear conditions, and recycling viability.

The Method proves that a true circular economy model is no longer a concept – it is a measurable, programmable reality that sets a new industry benchmark, quantifying:

- **Precise fibre recovery rates** per garment – eliminating estimation errors.
- **Direct CO_2 and energy savings** compared to mixed-material garments.
- **The measurable impact** of switching from fixed sizing to dynamic self-adjusting structures on material conservation and lifecycle extension.

Circularity is not an afterthought but fully integrated from the start – eliminating waste at its source and ensuring nearly complete fibre recovery at scale, delivering system-wide efficiency.

PERFECT FIT WITH CIRCULAR LOGIC: RECYCLING EFFICIENCY

The Patented Correlation Method *(HtK)*, removes all major recycling barriers at the design and production level, ensuring that fibre can be fully recovered and reused without the inefficiencies of sorting, disassembly, or material loss. **Apparel can be made from one type of fibre, without the need for external materials, fasteners or elastic fibres.**

No Fasteners

No Additional Details

Can be Made with the Same Yarn Throughout The Garment

Up to 85% Luxury Fibre Recovery Rate

EFFICIENCY

Model	*Recovery Rate*	*Cost per kg Recycled Fibre*	*Fibre Reuse Quality*
Patented Method	*85%*	*€1.49*	*Reuse in luxury garments*
Tailored Cut-and-Sew	*55%*	*€6.71*	*Downgraded to non-luxury use*

MAIN RECYCLING PROBLEMS

Removing Fasteners: *Zippers, buttons, and other fasteners must be manually removed before recycling, which is labour-intensive and time-consuming.*

Separating Different Fabrics: *Garments made from multiple fabrics (e.g., blends of cotton and polyester) are difficult to recycle because the materials must be separated, and many recyclers can only process single-material textiles.*

Different Structures in a Single Garment: *Variations in fabric structure (knit vs. woven, for example) within one garment complicate recycling processes, as different structures require different treatments.*

Presence of Elastics and Padding: *Elastic bands, foam padding, and other non-textile components (e.g., in dresses or jackets) complicate the recycling process, as they often need to be removed or treated separately.*

Coatings and Finishes: *Some garments have coatings, or other finishings that can interfere with recycling, requiring additional steps to remove these chemicals before the garment can be processed.*

Blended Fibres: *Fibre blends (e.g., cotton-polyester) are difficult to recycle efficiently because the different fibre types often require separate recycling processes, it's difficult to reclaim pure fibres from blends.*

Thread and Seams: *Garments sewn with different types of thread (synthetic vs. natural) or reinforced seams can complicate the recycling process as these threads may not be compatible with the recycling methods used for the fabric.*

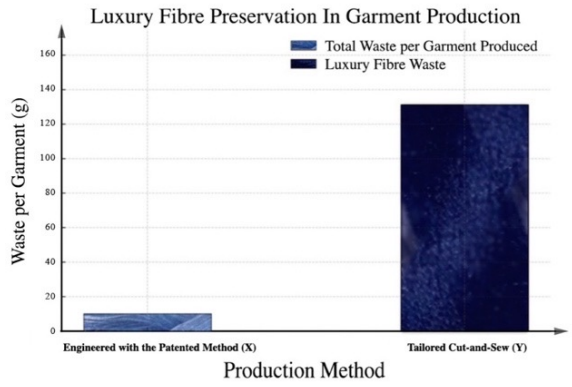
PERFECT FIT WITH CIRCULAR LOGIC: LUXURY FIBRE PRESERVATION

The Patented Correlation Method *(HtK)* developed for high-tech programmable knitwear, redefines garment production by combining precision-engineered adaptive fit with highly efficient fibre usage. Applying the principles of the Method extends the life of garments by minimising wear and tear, with panels that seamlessly adapt to the wearer's movements while naturally shaping the silhouette. By replacing the rigid eight-size system with a streamlined three-size model, the Method ensures a perfectly tailored fit across multiple standard sizes, reducing unsold garments and extending market reach while optimising material use. Traditional cut-and-sew woven production achieves a tailored look at a significant cost—not only in unsold stock, but in wasted luxury material. Approximately **20% of luxury fabrics are discarded** as offcuts—a direct loss of premium material. In addition, predefined static sizing systems leave little room for customers who do not fit standard sizes, creating further inefficiencies. **Unsold stock waste is reduced by *78.6%*** and entirely eliminating material waste from cutting (**0% luxury fibre waste production**), the mass luxury market can balance efficiency with sustainability - without compromising quality and precision.

METRIC	ENGINEERED WITH THE PATENTED METHOD, *HtK*	TAILORED WITH CUT-AND-SEW, *Woven*
1. **Fibre per Garment Required**	**350g**	**420g**
2. **Luxury Fibre per Garment Required**	**350g**	**350g**
3. **Luxury Fibre Waste during Production** *(%)*	**0%**	**20%**
4. **Overall Production Waste**	10g *(All non luxury fibre)*	70g *(20% of luxury fibre)*
5. **Luxury Fibre Waste during Production**	**0 g**	**70g**
6. **Unsold Stock Rate**	3.75%	17.5%
7. **Unsold Stock Fibre Waste**	350g × 3.75% = 13.125g	350g × 17.5% = 61.25g
8. **Total Waste per Garment Produced**	10g + 13.125g = 23.125g = **6.61%**	70g + 61.25g = 131.25g = **37.5%**
9. **Adjusted Waste per Sold Garment**	23.125g ÷ (1 − 0.0375) = **24.05g**	131.25g ÷ (1 − 0.175) = **159.12g**
10. **Luxury Fibre Waste per Garment Sold** *(%)*	100% − 42% = 58%	159.12g→ 100% Luxury Fibre
11. **Final Luxury Fibre Waste per Garment Sold**	**58% of 24.05g → 13.95g**	**100% of 159 g → 159 g**
Luxury Fibre Waste Reduction	**91.2%**	
Overall Production Waste Reduction	**84.9%**	

These two graphs visually confirm the magnitude of impact of the Patented Correlation Method over traditional cut-and-sew woven production to achieve a fully tailored appeal in terms of overall fibre waste reduction and **luxury fibre preservation in particular**. The move to the 3-size model with the Patented Method represents a revolutionary leap in material efficiency and waste reduction. Even when comparing identical garment production volumes, the Patented Method with high-tech knitwear demonstrates the potential for significant global savings, conserving luxury materials at an unprecedented level.

Graph 1



Luxury Fibre Waste Reduction: 100%
Total Production Waste Reduction: 85.7%

Graph 2

Luxury Fibre Waste Reduction: 91.2%
Total Production Waste Reduction: 84.9%

This demonstrates that the Patented Method is not only a sustainable alternative, but a transformational solution for the future of apparel manufacturing and accessibility of the luxury products for mass market.

ADVANCED SYSTEMATISATION MODEL

The apparel industry's operational inefficiency stems not from outdated assumptions alone, but from the fundamental unpredictability of customer behaviour – particularly around fit. Brands overproduce and overspend on marketing to compensate for inconsistent sizing outcomes and inventory mismatches.

The Correlation Method changes this dynamic: the innovation unlocks an entirely new approach to efficiency at scale. More than a technical breakthrough, it is a scalable, commercially viable solution for high-volume, high-efficiency production at mass-market costs. The patented Correlation Method transforms reactive production into predictive control. With fit, structure and fibre usage pre-engineered and programmable, it eliminates overproduction and misallocation from the outset. This **unlocks a data-driven future** where every garment is designed for real demand and every stage – from manufacture to recycling – is optimised for measurable results.

Predictive control, fibre efficiency, logistics, and circularity are embedded from the outset. By **pre-programming the initial construction** and eliminating inefficiencies at the source, every stage of the garment lifecycle becomes **measurable and predictable** – from design and development to production, resale, and recycling.

The structured system, based on predictable results, enables the creation of advanced monitoring and forecasting programmes to provide complete transparency, cost control and real-time tracking from fibre selection to end-of-life recycling. These programmes should be designed to reinforce the industry-transforming impact of such systematisation.

The Method enables each garment to fit up to four traditional sizes with Perfect Dynamic Fit, it reduces unsold inventory by up to *78.6%* – shrinking unpredictability to just *11.4%*. This shifts production from guesswork to precision, making operational planning far more reliable and cost-effective.

A data-driven approach to sustainability and profitability that makes cost efficiencies measurable, predictable and scalable. With fit accuracy, fibre usage and manufacturing fully programmed by the Patented Method, such system lays the foundation for industry-wide optimisation, making apparel production predictable, scalable and fully controlled from the outset. To fully optimise sustainability, efficiency, and profitability, structured Categories of Future Predictive Programs are:

- **CATEGORY 1: Immediate Essential Programs**
- **CATEGORY 2: Scalable System-Wide Predictability**
- **CATEGORY 3: Future Visionary Programs**

Turning raw data into strategic insights ensures that every decision is backed by quantifiable metrics, enabling organisations to predict, optimise and maximise profitability while reducing environmental impact.

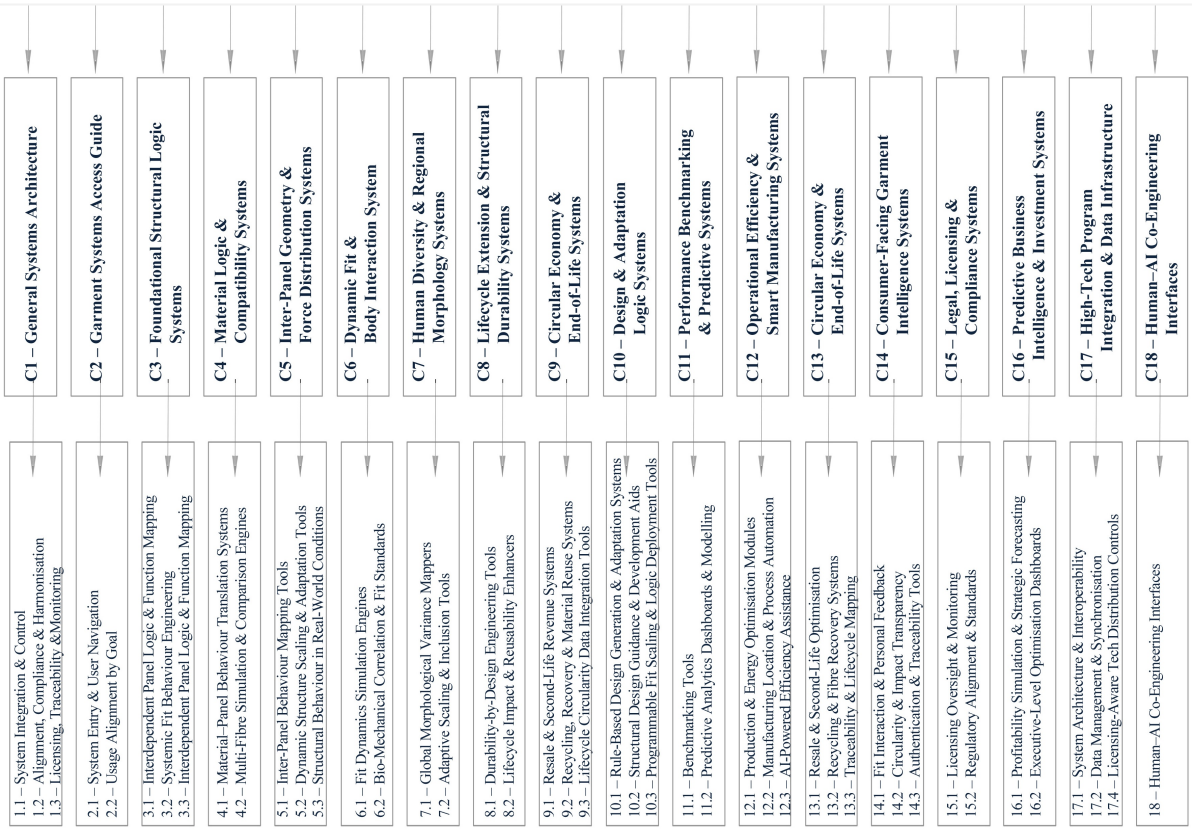
CASE STUDY PREVIEWS

Some examples of such a layered programmable approach to Advanced Predictive Programming are shown below, further information is available on request.

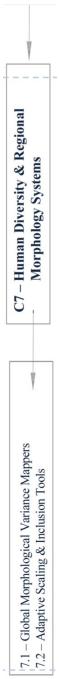
- **Inter-Panel Geometry & Force Distribution Systems → Inter-Panel Behaviour Mapping Tools** → Deformation Resilience Optimisation Tool: *Simulates the maximum threshold of deformation before panel integrity or intended fit is compromised.*
- **Dynamic Fit & Body Interaction System → Fit Dynamics Simulation Engines →** Wearer Mobility Optimisation Module: *Aligns garment logic with zones requiring mobility, avoiding over-restriction.*
- **Bio-Mechanical Correlation & Fit Standards →** Fit Retention Under Movement Validator
- **Rule-Based Design Generation & Adaptation Systems →** Algorithmic Garment Design Flow-builders
- **Recycling & Fibre Recovery Systems**
- **Resale & Second-Life Optimisation**
- **Human–AI Co-Engineering Interfaces**

SYSTEMATISATION:

Moving the industry: From → Reactive & Fragmented To → Predictive & Structured



PREDICTIVE PROGRAMMING FOR HUMAN MORPHOLOGY AT SCALE



Among the system's most forward-looking applications is its ability to anticipate morphological diversity across global markets – a key barrier to both fit and inclusivity in traditional sizing models. With the Correlation Method already ensuring garments adapt across four sizes, **the next step is refining these adaptations through predictive regional calibration**.

C7 – Human Diversity & Regional Morphology Systems

These systems map the anatomical diversity across regions, ethnicities, and populations—ensuring garments engineered with the patented method adapt optimally to morphological differences across global markets. They guide fit calibration, pattern logic, and scaling across demographically distinct body structures.

C7.1 – Global Morphological Variance Mappers

Capture and classify body shape differences by region, ethnicity, and demographic group, informing scalable garment engineering.

	SUBCATEGORY	L1	L2	L3	FUNCTION
1.	Regional Body Structure Database	v			*A foundational data set compiling anthropometric references by region, gender, and age.*
2.	Ethno-Anatomical Fit Adaptation Tool		v		*Translates key morphological distinctions into structural garment logic and pattern zone adjustments.*
3.	Population-Based Sizing Logic Simulator		v		*Simulates sizing needs across markets to optimise scalable design, reduce returns, and avoid overproduction.*
4.	Anatomical Zone Mapping Engine	v			*Digitally defines key zones (motion/stability/pressure) by body type.*
5.	Anthropometric Variation Integration System	v			*Builds adaptable body templates for true inclusivity in patterning logic.*

C7.2 – Adaptive Scaling & Inclusion Tools

Translate diverse morphology into adaptive design rules that preserve comfort, movement, and garment integrity across body types.

	SUBCATEGORY	L1	L2	L3	FUNCTION
1.	Inclusive Pattern Scaling Model	v			*Defines rules for pattern scaling that maintain self-adjusting integrity across a wide range of body shapes.*
2.	Global Morphotype Calibration Engine		v		*Aligns morphological data with garment engineering standards to calibrate panel behavior globally.*
3.	Cross-Population Fit Harmoniser			v	*A harmonisation engine that adjusts fit principles for intersectional inclusion (age, ability, ethnicity).*
4.	Human Shape Variability Visualisation Suite		v		*Enables interactive exploration of diverse body types and how garments self-adapt or scale across them. Supports education, simulation, and visual confirmation of inclusivity and logic compatibility.*
5.	Dynamic Torso Movement Interpreter		v		*Analyses upper-body rotation and bending patterns to stabilise adaptive zones and maintain garment structure and balance during movement.*
6.	Anatomical Fit Memory Recorder			v	*Captures habitual postures and gestures over time to inform garment fit consistency—helping garments adapt based on personal motion history.*

CATEGORY 1: IMMEDIATE ESSENTIAL PROGRAMS

For Direct Business Efficiency

Without these programs, a business operates in the dark – losing money, materials, and time. These tools ensure that everything is structured, tracked, and optimised. Such predictive models:

- → To enable any business to operate at peak efficiency from day one.
- → To monitor, measure and optimise key operational areas – cost, production, waste and logistics.
- → To transform sustainability from an aspiration into a fully traceable, measurable process.

Three Key Areas of Focus:

Key Area	Purpose & Impact	How It Translates into Action
Profitability & Cost Control	*To eliminate financial waste by optimising material use, production speed, and efficiency.*	○ **High-tech Knitwear Profitability Calculator** → To compare the financial benefits of the Method's application *(HtK)* vs. Tailored cut-and-sew *(Woven)*. ○ **Automated CO_2 & Cost Monitoring**→ To track unit-level sustainability & cost savings at the unit level. ○ **Raw Material Cost-Benefit Analysis** → To evaluate fibre price, performance, and long-term cost effectiveness. ○ **Scenario-Based Profitability Calculator** → To simulate production scenarios to determine optimal strategies.
Production & Resource Efficiency	*To reduce raw material waste, production errors and process inefficiencies.*	○ **Adaptive Sizing Impact Model** → To reduce SKUs, reduces overproduction and eliminates returns. ○ **Waste Reduction & Recycling Program** → To measure cost and CO_2 savings from material minimisation.
Logistics & Inventory Management	*To minimise inventory problems, return costs and storage inefficiencies.*	○ **Dynamic Stock Allocation Model** → To optimise stock flow in warehouses. ○ **Reverse Logistics Impact Tracker** → To quantify the cost of returns & recommend optimisations. ○ **Inventory Forecasting & Overproduction Reduction Program** → With the aid of AI to balance stock levels and reduce excess. ○ **Efficiency Tracker** → To reduce costs and mile distribution.

CATEGORY 2: SCALABLE SYSTEM-WIDE PREDICTABILITY

For Large-scale Optimisation

This category moves the entire industry from reactive to predictable. This category ensures that businesses and manufacturers eliminate inefficiencies before they happen, not after. Instead of relying on sustainability claims, trial-and-error manufacturing and inefficient logistics, these tools pre-determine costs, emissions and efficiency at scale – before manufacturing even begins. Such predictive models:

- **Extend beyond a single company** → Systematically optimise the entire apparel ecosystem.
- **Provide predictability across all areas** → Sourcing, manufacturing, logistics and sustainability.
- **No more guesswork** → Every business decision is based on real, measurable data.

Why This Category Matters:

- **To Move From General Claims → To Data-Driven Industry-wide Control.** This structure ensures that everything is trackable and quantifiable.
- **To Move From Fragmented Efforts → To Integrated Supply Chain Optimisation.** Today's supply chain inefficiencies (overproduction, excess transport, energy waste) compound losses. By implementing structured CO_2 tracking, predictive cost analysis and circular economy principles, the entire system becomes coordinated rather than reactionary.
- **Sustainability is No Longer a Guess → It is a Defined, Measured, and Optimised Process.** Businesses no longer need estimates – they want real-time insights into:
  - True CO_2 impact of every fibre & process;
  - Financial feasibility of switching materials;
  - The resale/recycling value of each product.

Four Key Areas of Focus

Key Area	Purpose & Impact	How It Translates into Action
Scalable Production Control	*To establish system-wide predictability by structuring fit, material usage and production logistics before manufacturing begins, ensuring that every step of production is calculated, cost effective and sustainable.*	○ **Scenario-Based Profitability Calculator** → To simulate strategies before committing resources. ○ **Material CO_2 Footprint Analyser** → To calculate emissions from fibre sourcing to material processing. ○ **Energy Optimisation Model** → To ensure factories use minimum energy per unit.
Logistics & Inventory Optimisation	*Optimisation of large-scale logistics without unnecessary costs or energy waste.*	○ **Warehouse Energy & Space Utilisation Model** → To reduce CO_2 impact, operational costs, and maximise efficiency in storage and distribution. ○ **On-Demand Manufacturing Efficiency Tracker** – To evaluate CO_2 and financial benefits of localised production. ○ **Dynamic Stock Allocation Model** → To prevent unnecessary warehousing by optimising real time stock flow. ○ **Reverse Logistics & Returns Impact Tracker** → To minimise storage space needed for returned goods.
Industry-Wide Predictability	*To move the industry away from guesswork and static sustainability claims by replacing them with verifiable claims that ensure a measurable impact.*	○ **CO_2 & Cost Benchmarking Tool** → To compare different production models. ○ **Automated CO_2 & Cost Monitoring** → To track sustainability & cost efficiency per unit produced.
Circular Economy Integration	*To ensure garment longevity, resale value and full recyclability, turning end-of-life waste into revenue.*	○ **Extended Garment Lifecycle Profitability Model** → To track real-time wearability & resale value. ○ **Recycling & Fibre Recovery Profit Model** → To ensure 85% fibre reuse.
Global Supply Chain Optimisation	*To minimise logistics inefficiencies, unnecessary transport emissions and inventory misallocation, ensuring cost- effective distribution.*	○ **Supply Chain CO_2 & Cost Tracker** → To map sourcing and manufacturing sustainability. ○ **Smart Factory Monitoring System** → To optimise energy and CO_2 on a production-wide level. ○ **Finishing Optimisation Program** → To reduce energy and chemical waste in textile processing.

CATEGORY 3: FUTURE VISIONARY PROGRAMS

For Total Industry-Wide Automation & AI Integration

Purpose: To ensure that the industry never falls back into inefficiency. Apparel becomes fully self-optimising, and businesses operate in real-time precision.

- Pushing the boundaries of what's possible – turning efficiency into an automated, self-adapting system.
- To use AI, predictive models and real-time adaptability to continuously optimise at scale.
- To ensure long-term resilience, future-proofing businesses against market changes.

Five Key Areas of Focus

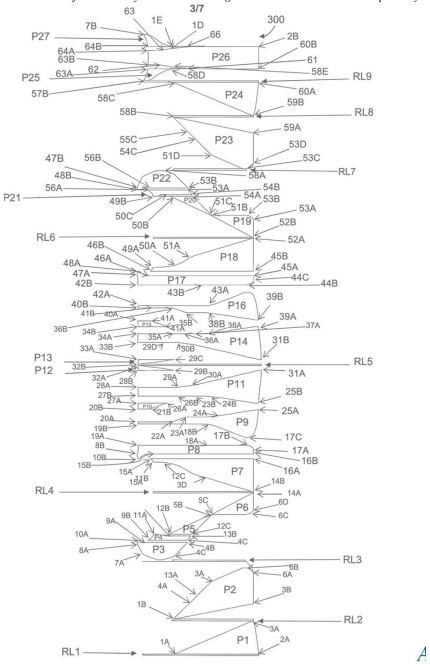
Key Area	Purpose & Impact	How It Translates into Action
AI & Digital Twin Technology	*The AI-powered system to ensure that businesses never operate blindly. Every decision is pre-tested, optimised and scaled for maximum impact before implementation.*	○ **AI-Powered CO_2 & Cost Reduction Assistant** → To automatically adjust factory & logistics efficiencies. ○ **Digital Twin for Profitability & CO_2** → To simulate business impact before real-world application. ○ **Automated Profitability & Sustainability Forecasting System** → To predict cost & emissions impact under different production models. ○ **AI-Powered Business Optimisation Dashboard** → To centralise data for financial and sustainability analysis.
End-to-End Industry Integration	*Ensure every aspect of apparel production and supply chain management is digitally connected. Eliminates inefficiencies before they happen.*	○ **Smart Factory CO_2 & Cost Monitoring System** → To track & optimise real-time factory operations. ○ **Fashion Industry CO_2 & Profit Impact Database** → A global system for benchmarking emissions & financial performance. ○ **Consumer Preference-Based Demand Forecasting** → With an integration of AI to predict purchasing behaviour, reducing misaligned production.
Autonomous Circular Economy Management	*Moving towards fully automated recovery, resale and reuse programs beyond basic recycling models.*	○ **Data-Driven Circular Economy Strategy** → To predict second-hand market growth, resale profitability & fibre reuse trends. ○ **AI-Based Textile-to-Textile Recycling Programs** → To achieve a fully automated sorting & fibre repurposing and to reduce manual waste processing. ○ **Consumer-Facing Sustainability & Cost Transparency Labeling Program** → To convert CO_2 & cost savings into consumer-friendly metrics, boosting awareness & brand trust.
Long-Term Industry Resilience	*Future-proofing businesses against supply chain disruptions & regulatory changes.*	○ **Risk & Resilience Planning Model** → To identify potential production or sourcing risks and propose mitigation strategies. ○ **Long-Term Sustainability Investment Model** → To predict the ROI of sustainable technologies.
Consumer-Centric AI Models	*To predict changes in consumer behaviour & eliminate unnecessary production.*	○ **Consumer Preference Demand Forecasting** → For AI to adjust production in real time. ○ **Sustainability-Driven Consumer Engagement** → To measure how branding sustainability impacts sales.
A Strategic Backup for Industry Accountability	*To protect against future regulatory gaps, weakened third-party benchmarks, or unreliable external audits and to ensure long-term transparency of ethical sourcing.*	○ **Ethical Sourcing & Fair Trade Profitability** → To measure sustainability and cost benefits of ethical production choices. ○ **Global Supplier Efficiency Benchmark** → To compare sustainability and financial performance of suppliers.

Further information is available on request.

APPAREL MANUFACTURING INNOVATION: ENGINEERING & COMPUTER SCIENCE/APPAREL & TEXTILE ENGINEERING/GARMENTS

Patented Correlation Method(HtK)

RESPONSIVE TAILORING THROUGH DYNAMIC FIT ADJUSTMENT—
The Perfect Harmony Between Tailoring Precision and Functional Adaptability



*RESPONSIVE TAILORING THROUGH DYNAMIC FIT ADJUSTMENT**

***Is a Patented Correlation Method** (HtK**) that allows single-fibre garments to dynamically adapt to the wearer's body shape and movements in real time, ensuring a perfect fit without the need for additional details or fasteners. This Method introduces a revolutionary approach to garment engineering, combining reinforcement structures and varying knit angles for both structural stability and dynamic adaptability. By leveraging the interplay between the reinforcement structures and the directional stretch properties of knit fabrics, this process enables garments to respond naturally to body movement and maintain a stable, perfect fit while being produced at scale. Its precision, adaptability, and mechanical foundation make it the only viable solution for mass-producing self-adjusting tailored garments for the foreseeable future.*

Transformational Impact:

- ***Unmatched Speed and Precision**: Delivers a perfect fit with consistent adaptability in real time across production scales.*
- ***Sustainability at Its Core:** Uses a single yarn type for easy recycling, with no seams or fasteners, reducing waste and promoting longevity.*
- ***Streamlined Production Chain**: Optimises design, development, and manufacturing, enabling scalable, accurate, high-quality production.*
- ***Universal Scalability**: Works seamlessly with any programmable knitting technology.*
- ***Dynamic and Static Fit Harmony:** Achieved through fibre behaviour and construction techniques that balance both flexibility and structure.*
- ***Long-Term Viability:** Due to its mechanical component, it remains the only viable solution for self-adjusting garments at scale, with no competition on the horizon for the next significant leap in garment manufacturing technology.*

WO2024094577 - AN AUTOMATED METHOD FOR KNITTING A TAILORED THREE-DIMENSIONAL GARMENT, AND A KNIT GARMENT

This innovation represents a groundbreaking development in the field of apparel technology. It enables garments to dynamically adjust to different body shapes, offering a level of fit and adaptability that was previously unattainable in mass-produced garments.

Technological Landscapes of:

- ***Engineering & Computer Science** (for programmable production)*
- ***Apparel and Textile Engineering** (for garment construction and mechanical movement)*
- ***Garments, including Outerwear***

'Abstract

(EN) The present invention provides for an automated process for producing knit garments having a tailored look when worn by wearers having different body shapes. Through a combination of woven fibre tailoring techniques, adapted to the domain of knit fabrics, and an innovative approach to programming a three-dimensional seamless garment knitting machine to knit the garment in a new way, a knit garment can be produced which adapts to fit different wearers having different body types while following the wearer's anatomy and providing support where required, thus allowing the same garment to provide a tailored look to different wearers having different body shapes.'

World Intellectual Property Organisation (WIPO) Application Number PCT/EP2023/08012

Publication Date: 10.05.2024

Link: *https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2024094577*

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