CAMILLA CARRARA
CEO

0/100

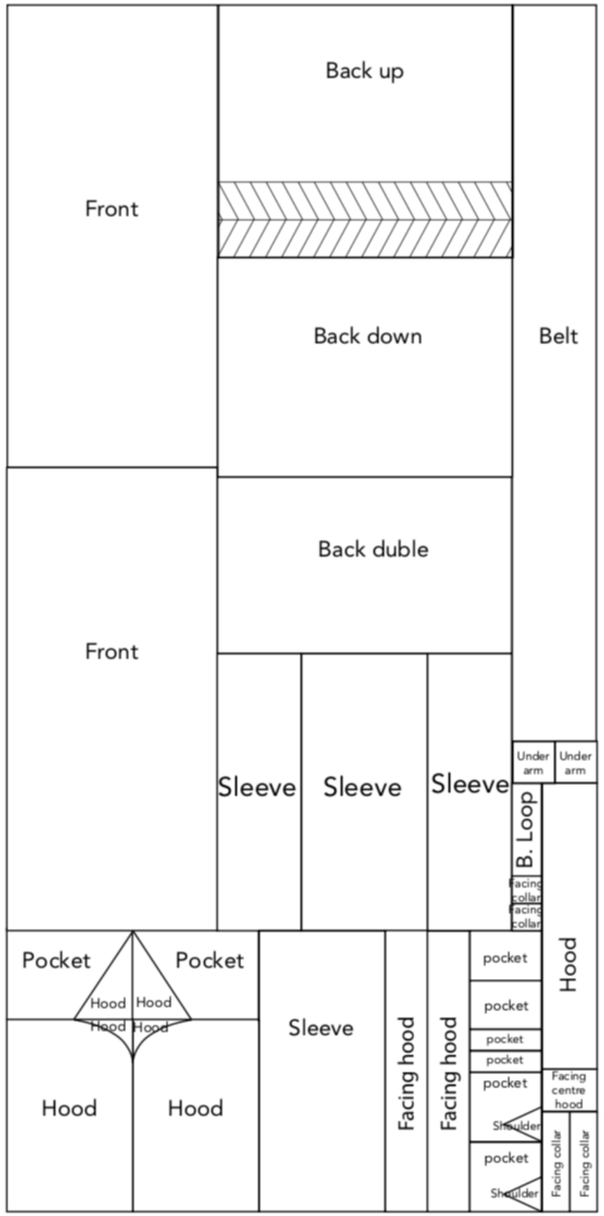
Z.W.A.F.M.
(ZERO WASTE AUTOMATED FASHION MANUFACTURING)

Zero-waste automated cutting

in partnership with

ZANECOM
Innovative Projects

0% waste by matching three different technologies with a common goal

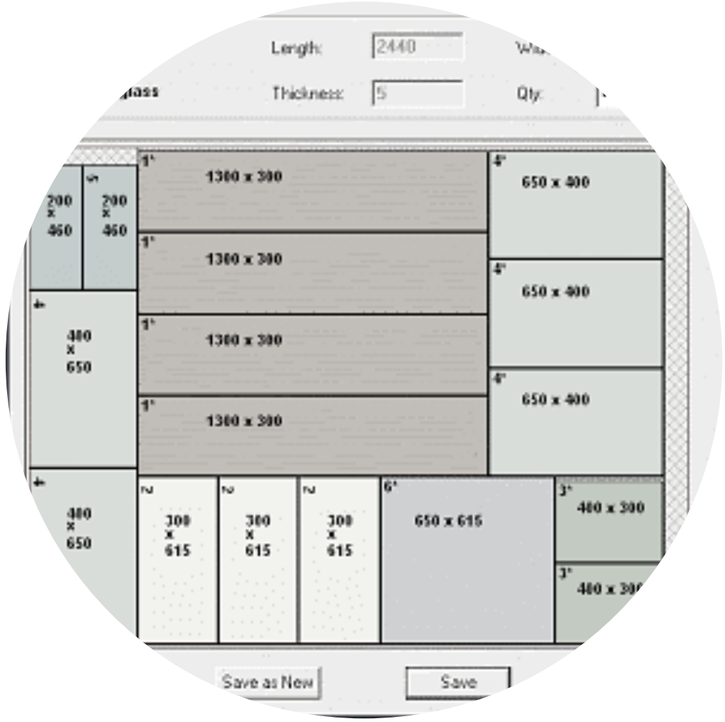


Coat with hood
286cmx140cm

DESIGN TECHNIQUE

How Z.W.A.F.M. works

spreading + cam

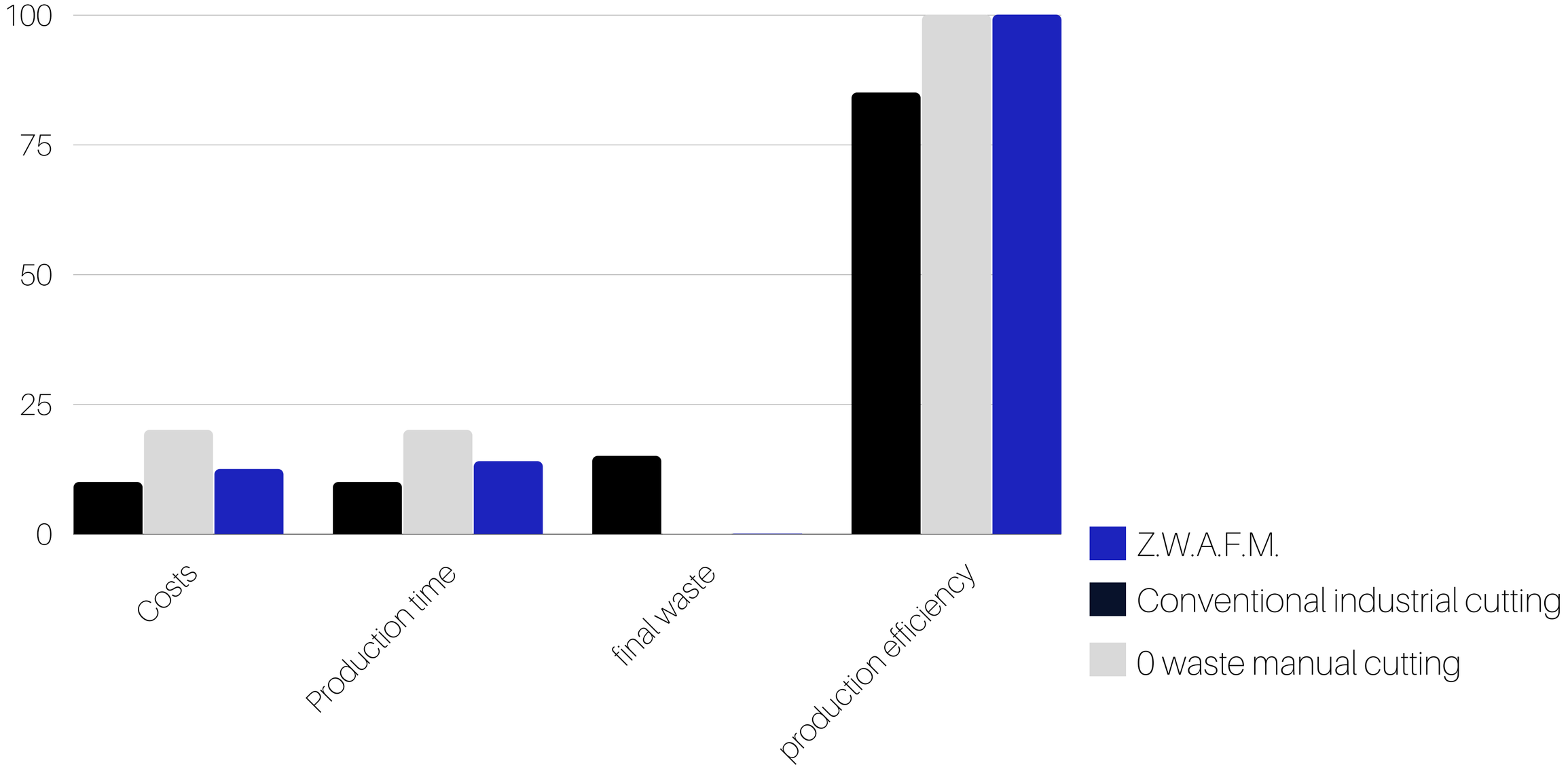


nesting

cutting

Competitors

How we will make the difference!



Z.W.A.F.M.

Zero Waste Automated Fashion Manufacturing

By

ZEROBARRACENTO & ZANECOM TEKSTİL MAKİNALARI SANAYİ VE TİCARET LİMİTED ŞİRKETİ

1. TECHNICAL DESCRIPTION OF THE PROJECT AND ITS IMPACT - Concept and Objectives

MAKING GARMENT IS MAKING WASTE, with the zero-waste pattern making technique, we can bring this waste to zero. Unfortunately the impact of this technique is small if we can not access automated industrial production due to instability of the fabric width in the same roll (a roll can be of 25/50 metres and the variation of the fabric width can be of 1 cm). That's why we are working to develop a technology to allow automated cutting, this must be able to:
1. Perceive the variation of the fabric width during industrial cutting meter after meter
2. rethink the pattern placement to adapt to the new width, preserving the zero-waste.
3. Transmit the new pattern placement to the cutting machine in real time.
Indeed, this system involves both hardware and software and needs high expertise in developing a proper solution.
The final commercial objective is not only about scaling up the ZEROBARRACENTO's production by using this system but also presenting it to brands that are looking for new sustainable strategies to integrate in their daily work. And this market is huge, just to give an example the U.S. sustainability market is projected to reach $150 billion in sales by 2021, according to Nielsen. While the coronavirus pandemic captured the world's attention in 2020, the climate crisis was also massively destructive, with ramifications including an extended wildfire season in California and tens of thousands of deaths from air pollution and rising temperatures in the United States alone.

The global response to the climate crisis has been muted and insufficient according to international scientists and regulatory agencies, but with revenues and bottom lines at stake, businesses are increasingly changing their ways to adjust for the climate crisis.

More than half of consumers — 57% — say they are willing to change their purchasing behavior "to help reduce negative environmental impact," according to a study of 18,980 consumers in 29 countries conducted by the National Retail Federation with the IBM Institute for Business Value (IBV) and published in 2020.

Through the support of WORTH we will finalize the set up the system and in the meanwhile we will try to get additional fundings/supports to:

1. *Be able to make an LCA(Life Cycle Assessment) in order to clearly show the savings of this production process in comparison to the conventional one.*
2. *Patent the process*
3. *Organize a commercial force to present the technology to targeted potential customers.*
4. *Work with a PR office to spread this innovation as much as possible especially through specialized international trade media within the textile and fashion sector.*

2 Partner's role

ZEROBARRACENTO's expertise is related to zero-waste pattern making and responsible sourcing and will be the guide of this project both defining the objectives and planning and managing the activities as well as testing the outcomes by adopting the developed system in its supply chain. Moreover, ZEROBARRACENTO will define target brands to present the Z.W.A.F.M. to, and prepare a commercial presentation to show the potential of adopting this methodology at best. Zanecom is a company with professionals with over 40 years of experience in the sector of machinery for the clothing industry. They don't just build machines, they develop innovative solutions and products to provide customers with a technological and functional increase in their company. In this project, they will bring their expertise into the following areas: Numerical control machines for cutting fabrics,

Spreading machines, CAD for clothing: drawing and planning, size development, automatic nesting, RFID technology for the management of the cutting room and production processes, Image database management software for quality control and professional product archiving, Technical assistance and professional and qualified consultancy to develop and choose the best solutions for our joint objectives.

3. Market Potential

According to sustainable fashion industry statistics, the market is expected to grow to $9.81 billion in 2025 and $15.17 billion in 2030 at a CAGR of 9.1%." (The Business Research Company, 2020) The ethical fashion industry is currently worth over $6.35 billion USD, and is predicted to almost triple in less than a decade. "The growth", says the report, "is mainly due to the growing awareness about using ethical fashion for sustainability." Once our zero-waste system will be ready, we will not only adopt it but we will propose it as "ready to use solution" for other major fashion brands, making a real impact on the fashion industry. Nowadays, brands are mainly focusing on sustainable sourcing but there are already companies testing responsible design strategies, and the zero-waste design and production can definitely be their next step. Moreover, we calculated our technology to be ready to be offered to the market at the really competitive price, this means that potentially it will be accessible to the majority of companies, this is completely in line with ourinclusivity and sustainability dna.

4. Impact on the Partnership members

Definitely this project will have a huge impact at reputation level for both parties. This project is a "first to market" and showing the achievements of the partnership will shed light on the two partners at international level. Moreover, considering the not easy moment of the fashion industry, it is definitely the right moment to dedicate time to research and development preparing for the moment in which normality will be back and being ready to differentiate the offer with a solution that focuses on new generation values that are fundamental for the contemporary consumers. As for the MC KINSEY - THE STATE OF FASHION 2020 CORONAVIRUS UPDATE, the pandemic is browning values around sustainability into sharp focus, intensifying discussions and further polarising views around materialism, over-production and irresponsible production/business practices.
ZEROBARRACENTO will have the chance to add new commercial activities to the conventional product selling, while Zanecom will have the chance to directly start working with brands that are looking for sustainable solutions.

5. IPR Strategy

The technologies involved in this process include:

- *Zcut Universal T3 - Automatic cutting robot with fix table MAXIMUM HIGH OF COMPRESSED MATERIAL: 3 cm CUTTING AREA WIDTH: 180 cm CUTTING AREA LENGHT: 450 cm*
- *Zspreader - Automatic spreading machine MAXIMUM FABRIC ROLL WIEGHT LOAD UP: 120 Kg (264 Lbs) SPREADING ROLL WIDTH: 180 cm SPREADING AREA LENGHT: 450 cm*
- *Znest - Nesting software*

And will follow this workflow

1) SPREADING PROCESS The operator loads the roll of fabric into the spreader's cradle. The operator starts to spread the various layers of fabric (also automatically after setting the length of the marker).

2) NESTING PROCESS: The software uses a camera to capture a photo of the fabric spread on the cutting table and automatically recognize the shape of the fabric, including any unusable parts of the fabric (e.g. holes or damaged parts) if present.

The acquired image is then projected on the fabric through a projector.

Option 1) The operator can launch the automatic nesting and the software arranges automatically the various pieces of the garment (previously created with software cad) optimizing the space of the fabric excluding (if present) those parts that cannot be used.

Option 2) The operator can arrange manually the various pieces of the garment (previously created with software cad) displaying these various pieces (through the projector) directly on the fabric spreadon the cutting table and arranging them in order to optimize the space.

2) CUTTING PROCESS The marker file created with the nesting software is sent to the Cutting Robot (either using option 1 or option 2 as written above) and the robot starts cutting the various pieces.

IMPORTANT) It is no longer necessary to print the marked with a plotter, thus also saving paper consumption.

The total cost of this development and for acquiring and installing this complete technology system is worth 150.000. Zanecom will also instruct the ZEROBARRACENTO team on how to use this technology.

2. EXCELLENCE AND INNOVATION LEVE - Technology readiness level

The three technologies are TRL 9 – actual systems proven in an operational environment (competitive manufacturing in the case of key enabling technologies; or in space). What we need to experiment is to add the NESTING software (which works of its own) in this "integrated system" (CUTTING MACHINE+SPREADER+SOFTWARE) that we are proposing. But they are mostly small technical adjustments absolutely feasible. Moreover, The Zcut Universal cutting robot has been conceived and developed to be modular, that is composed of modules of 1.5 meters that can be added even after the purchase of the machine and also be able to divide the cutting table into two separate areas so as to increase productivity. This will allow us to create a system that is ready for scalability and, indeed, suitable for different businesses sizes.

Zspreader: Simplified, easy to use and intuitive graphic display Stores 50different fabric configuration files for quick data retrieval and speed up future spreading work

MULTIFUNCTION HANDLE WITH PRECISE CONTROL Rewinding of the fabric Start & Stop of the spreader with one hand

CRADLE FEEDING SYSTEM Tension-free spreading even for difficult fabrics Eliminates the use of aroll bar for the fabric roll

SYSTEM FEATURES Electronic control with variable speed Automatic stop with safety sensors in case of emergency Multi-length automatic spreading mode Automatic pre-centering of the material Variable speed control in forward / reverse spreading «Saves time» No tension / tearing of the material fabric Automatic counter of the number of sheets (also folded) Programmable spreading length settings Four. wheel drive with 4 wheels .Automatic cutting device

Nesting: The program can work simultaneously with one or more pieces, or with one or more complete models.

1. *The Rules Table can foresee up to 32 SET of sizes.*
2. *Sizes can be numeric (38-40-42) or alphanumeric (SML)*
3. *A comment can be associated to each rule (useful for being able to search for it in the Table)*
4. *Development rules can foresee irregular developments.*
5. *The insertion of the development values for the various sizes provides for easy entry through the simultaneous selection of multiple boxes (similar to an Excel spreadsheet)*

3. IMPLEMENTATION

3.1. Workflow

WP (Number andName)	Description of work	Starting Month	Ending Month
1 planning and projectmanagement	definition of a detailed workflow with daily activities for both partners	**0**	**12**

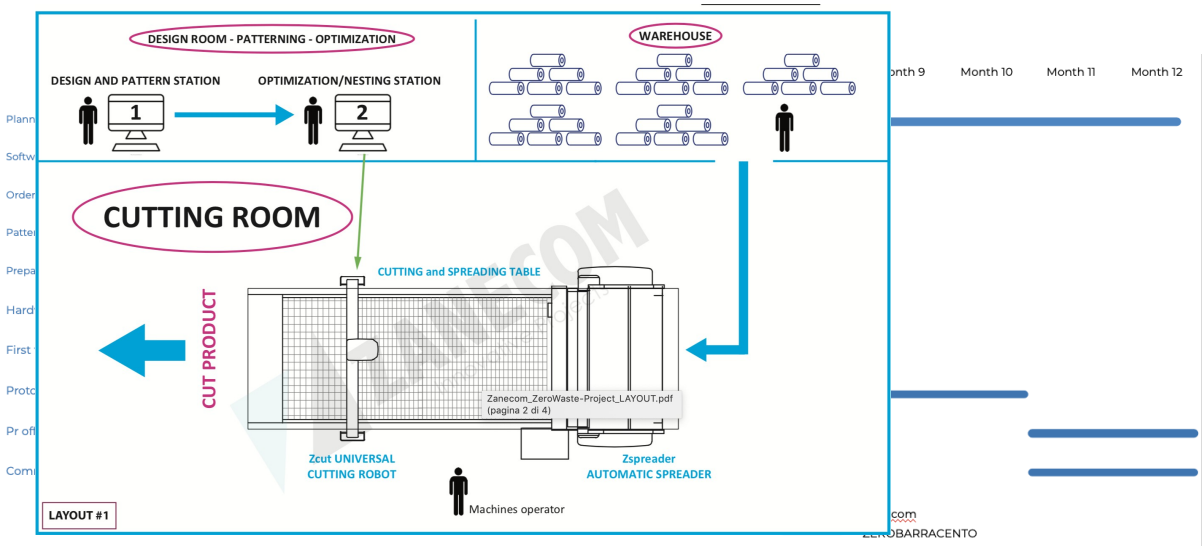
2 software acquisition	software acquisition	1	2
3 order hardware part	order some hardware parts from supplier	1	2
4 patterns developme nt	development of the zero-waste patterns of the protos	1	3
5 preparation of thehardware part	production of the hardware	2	4
6 hardwar e installati on	finalization of the hardware	4	6
7 first tests	testing the combination of hardware and software machines.	6	8
8 protos production	once the technology will be ready we will start cutting the protos and then producing them	8	10
9 pr office	press office activities towards international trade media for textiles, machineries and fashion	10	12
10 commercial presentation	definition of target potential customers and presentation of the Z.W.A.F.M.	10	12

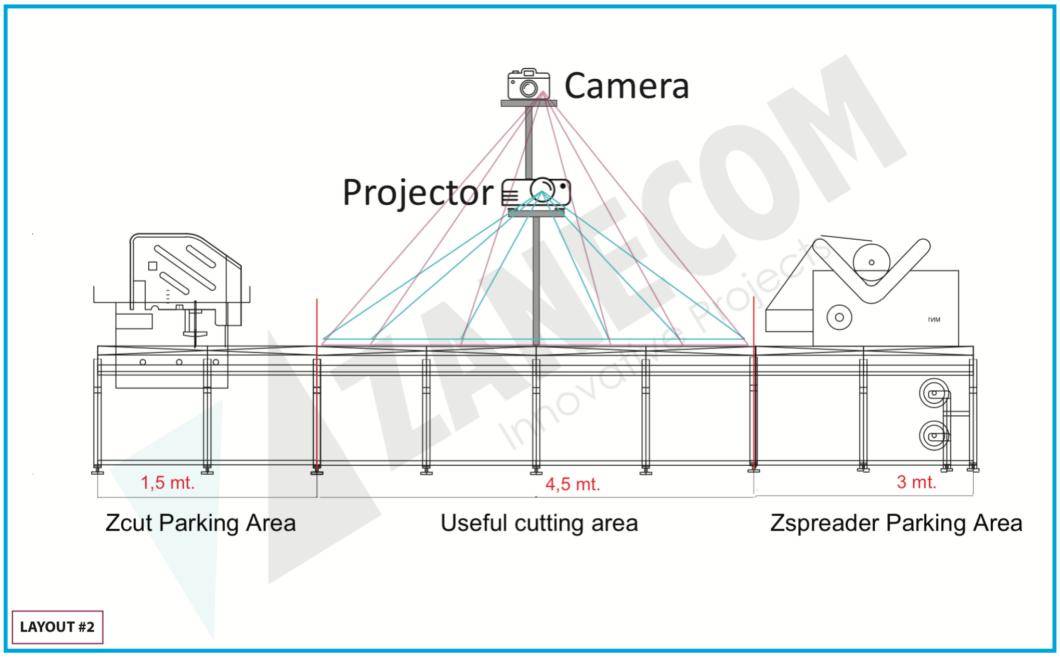
4. Mentoring needs and gaps (SME)

List of training Needs and Gaps	Rank ing
Business strategy	2
Patents, utility models or any protectable IP rights (including copyrights)	6
Platforms for challenges and innovation	8
Marketing and sales	4
Crowdfunding and investment	1
Internationalisation, buying and sourcing management	3
Circular economy	9
Testing, inspection and certification	5

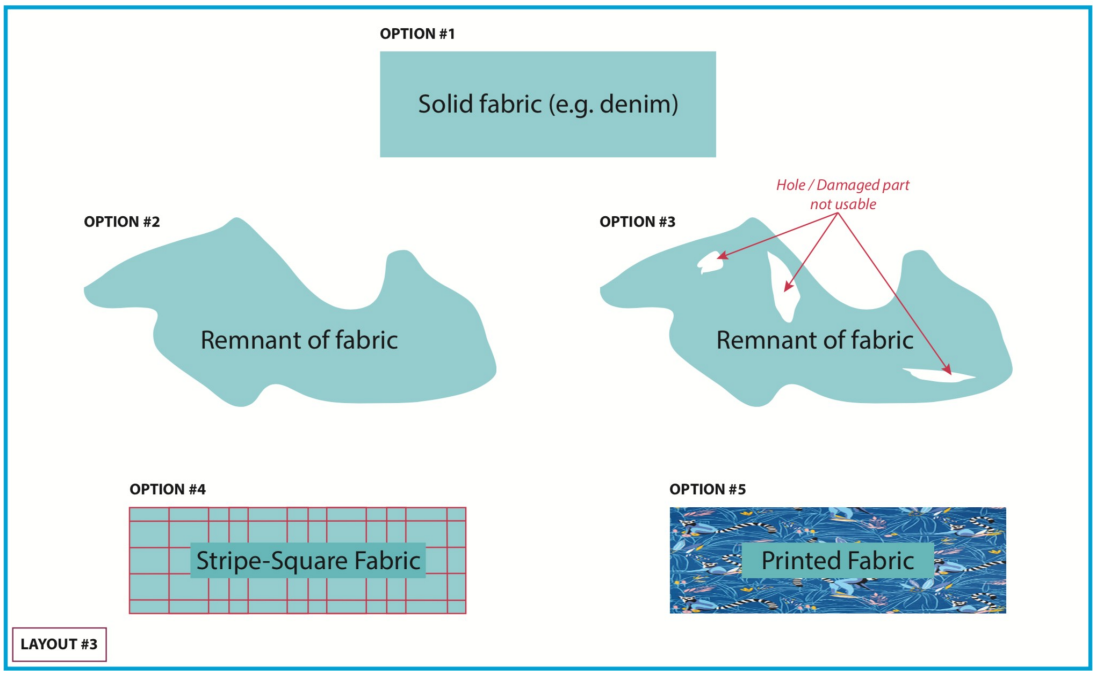
Others (please specify any technical interests): **LCA METHODOLOGY**	7

5. Z.W.A.F.M. SKETCHES





No	DeliverableName	Description	Lead Partner	Delivery date (Month)
1	gant	detailed project managementplan with daily activities and partner	ZEROBARRACENTO	1
2	software technical sheetandpics	detailed software technical sheetand pics	Zanecom	2
3	technical sheets on hardware part and pics	detailed technical sheets on hardware part and pics	Zanecom	2
4	4 patterns development	zero-waste patterns in cad	ZEROBARRACENTO	3
5	set up ofthe hardwarepart	pictures of the process	Zanecom	4
6	video of thesystem	record the production steps	ZEROBARRACENTO + Zanecom	6
7	technical report ontests	analysis of tests	Zanecom	8
8	protos	zero-waste outerwear capsulecollection produced with the new technology	ZEROBARRACENTO + Zanecom	10
9	media coverage	press clippings overview +analysis by country and by media typology and value	ZEROBARRACENTO	12
10	report of commercial presentations	indication of: 1. companies to which wepresented Z.W.A.F.M. 2. statistics on positive andnegative feedbacks 3. commercial potentialdefinition	ZEROBARRACENTO + Zanecom	12



Zcut Universal T3 - Automatic cutting robot with fix table

MAXIMUM HIGH OF COMPRESSED MATERIAL: 3 cm
CUTTING AREA WIDTH: 180 cm
CUTTING AREA LENGHT: 450 cm

PROCESS AND FUNCTIONS

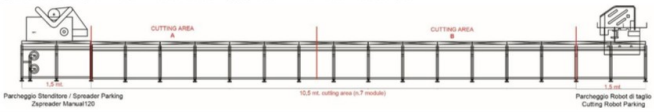
- ✓ Touch Smart All-In-One Desktop
- ✓ Compatible with all CAD systems
- ✓ Windows operating system monitoring of all parameters on display
- ✓ Software interface available in many languages
- ✓ Files can be controlled on display before cutting
- ✓ Possible cutting sequence change for optimization
- ✓ Selecting the pieces which are not to be cut before starting and bypass them during cutting
- ✓ Detecting the crossness of the spreaded fabric by laser and cutting it with the same cross angle
- ✓ Possibility to manage, convert and transform all kind of notches (normal, V notch and fly/T notch)
- ✓ When the pieces do not fit the width of spreaded fabrics, operator may change the scale of the pieces
- ✓ Operator may adjust the bite length
- ✓ Easily stores cutting setup files for quick retrieval to accelerate future cut jobs
- ✓ If preferred the knife does not pass through the cutted adjacent lines twice (no overcut)
- ✓ Blade monitoring system observes the abrasion of the blade and stops the machine automatically
- ✓ Ability to change the radius of patterns at corners
- ✓ Resume cutting by Hibernation if it is being disturbed
- ✓ Able to increase efficiency by adjusting speed ramps up/down according to fabric type
- ✓ Different Cutting Options (Butterfly, Clockwise and Anticlockwise)

PARAMETER DRIVEN STEPLESS ADJUSTABLE VACUUM

- ✓ Average power consumption 7-9 kW (*it depends of number of plies)

FEATURES

- ✓ **AUTOMATIC KNIFE OIL LUBRICATION**
- ✓ **AUTOMATIC KNIFE COOLER**
- ✓ **PLASTIC FOIL COVERING BLIND**
- ✓ **MOTION CONTROLLER, 4 AXIS (X, Y, Z AND C AXIS) CONTROLLED BY AC SERVO MOTORS**
- ✓ **AUTOMATIC KNIFE SHARPENING**
- ✓ **LONG LIFE BRISTLE with EASY LOCK System (Plug & Play)**
- ✓ **POSSIBILITY OF CREATING CUTTING PROFILES FOR EACH TYPE OF MATERIAL**
- ✓ **AUTOMATIC HOT DRILL WITH ADJUSTABLE TEMPERATURE**



Zspreader - Automatic spreading machine

MAXIMUM FABRIC ROLL WIEGHT LOAD UP: 120 Kg (264 Lbs)
SPREADING ROLL WIDTH: 180 cm
SPREADING AREA LENGHT: 450 cm

LCD TOUCH SCREEN DISPLAY WITH PLC UNIT
- ✓ Simplified graphical display that is easy to learn and easy to train new operators
- ✓ Stores 50 different fabric set up files for quick retrieval to accelerate future spreading jobs
- ✓ Available in many languages

MULTI FUNCTION THROTTLE ENABLES THE OPERATOR TO CONTROL
- ✓ Threading/Rewinding of fabric
- ✓ Start/Stop of spreading with one hand

OPERATOR PLATFORM
- ✓ Allows operator to ride alongside the table

CRADLE FEED SYSTEM PROVIDES
- ✓ Tension-free spreading even difficult fabrics
- ✓ Electric cradle for easy fabric roll loading/unloading
- ✓ Eliminates use of a fabric roll bar

SYSTEM FEATURES
- ✓ Electronic edge control responsive to variable speed
- ✓ Automatic stop with safety sensors in case of emergency
- ✓ Multi length spreading modes
- ✓ Automatic pre-centering of material begining during threading
- ✓ Variable speed control at forward/backward turns «Save Time»
- ✓ No cloth stop function
- ✓ Ply counter
- ✓ Programmable lay length and end allowance settings
- ✓ Four-wheel drive with wheels

ELECTRICAL POWER 3 KW / 220 V / 50 Hz

Znest - Nesting software

System for nesting of pieces on textile, synthetic and leather materials with possibility of direct output to cutting and drawing machines.

FEATURES
- ✓ Model data from UniPDS or import from other CAD system
- ✓ Adjustment of marker and parameters of pieces
- ✓ Cutting optimization
- ✓ Automatic nesting
- ✓ Interactive nesting
- ✓ Possibility to work with leather shapes and quality areas
- ✓ Stripe and plaid matching
- ✓ Plan checking
- ✓ Direct outputs for cutting and drawing machines

DETAILS
The software allows to create markers with use of interactive or automatic nesting of pieces on requested material size or shape. Markers can be also grouped by customer‘s order when particular number of requested models/products is entered
The software enables direct communication between computer and output devices, such as large format printers, plotters and CNC-cutters.

BENEFITS
- ✓ **MATERIAL SAVINGS**
- ✓ Improvement of productivity
- ✓ Easy-to-use

We are female led!

Procter & Gamble Italia
9,500 followers
1mo •

+ Follow

C'è anche l'Italia tra i 9 progetti scelti nella prima edizione del programma #WomenEntrepreneurs4Good il programma col quale P&G si impegna a sostenere le donne imprenditrici e a promuovere l'innovazione sostenibile, ideato insieme al Women's Forum for the Economy & Society e alla Business School HEC Paris Innovation & Entrepreneurship.

In Procter & Gamble Italia siamo incredibilmente orgogliosi che tra i tanti progetti proposti da start-up femminili nei tre Paesi europei partecipanti all'inziativa (Francia, Germania e Italia), il nostro Paese sia ben rappresentato da un progetto incentrato su una strategia sostenibile ad alto impatto ambientale!

Il progetto Z.W.A.F.M. (Zero Waste Automated Fashion Manufacturing) presentato da Camilla Carrara propone una tecnologia hardware e software per il taglio automatizzato. In altra parole: modellistica zero-waste, si potrà produrre abbigliamento senza generare rifiuti!

La fase finale del Women Entrepreneurs 4 Good darà il via a un programma di incubazione di 5 mesi articolato tra coaching, occasioni di networking, supporto tecnico e accesso a player e partner globali.

Fieri di essere al fianco di questa iniziativa!

ZEROBARRACENTO

See translation

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Grazie!