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Trend report:

# Future of sustainable fashion

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accenture



#M FOUNDATION

Global Change Award

AN INNOVATION CHALLENGE  
BY H&M FOUNDATION



# LET'S RE-INVENT FASHION

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# Executive Summary

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## What can we learn about the future of sustainable fashion by looking at disruptive ideas from 130 different countries?

The Global Change Award is one of the world's largest innovation challenges founded by the H&M Foundation, in collaboration with Accenture and the KTH Royal Institute of Technology, aiming to catalyze early innovations that can accelerate the shift from a linear to a circular fashion industry.

In this report, we will outline some interesting findings and trends within circular fashion and open innovation, based on analytics performed on the close to 3000 applications submitted for the Global Change Award in 2016.



Global Change Award

AN INNOVATION CHALLENGE  
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## Key Conclusions

**A**

There are five megatrends shaping the future of circular fashion;

#powerofnature #innovativerecycling  
#rentacloset #connectedclothes  
#longliefashion

**B**

Our surrounding and environment influence our innovation

**C**

Funding is the main barrier for applicants from the Africa region, more so than for other geographic locations

**D**

Women tend to grade their ideas as less market-ready than men

**E**

To find disruptive innovation, you must allow yourself to look in unexpected places

**F**

The typical Global Change Award Innovator embodies one of these five personas;

1. The Environmentalist 4. The Scientist  
2. The Businessman 5. The Millennial  
3. The Fashionista

**G**

To make a circular fashion industry a reality, all four types of waste in the value chain must be addressed:

1. Wasted Resources 3. Wasted Life-Cycles  
2. Wasted Capacity 4. Wasted Embedded Values



# 01

## Introduction to GCA

About the Global Change Award and the Trend Report

**T**he Global Change Award is an innovation challenge, initiated in 2015 by the H&M Foundation in collaboration with Accenture and the KTH Royal Institute of Technology in Stockholm. By catalyzing early innovations that can accelerate the shift from a linear to a circular fashion industry, the aim is to protect the planet and our living conditions.

An international expert panel annually selects five winners, and the global public is invited to distribute the €1,000,000 grant between the five winning innovations through an online vote. In addition, the winners are

granted access to a one-year innovation accelerator program provided by the H&M Foundation, Accenture and the KTH Royal Institute of Technology. The accelerator offers the winners tailor-made support and access to the fashion industry. It is designed to ensure that the innovations can stand on their own as quickly as possible, and to maximize their impact on the industry.

The Global Change Award is one of the world's biggest challenges for early stage innovation and the first initiative of its kind within fashion. It takes on one of the biggest challenges facing today's

fashion industry – creating fashion for a growing population, while having a positive impact on the environment.

In 2016, the Global Change Award received 2885 applications from 130 countries. By leveraging Accenture's capabilities in analytics and data visualization on this large data set, we were able to identify interesting insights on future trends within sustainable fashion.

The intent of this trend report is to provide valuable guidance on the transformative journey towards a circular fashion industry.



# 02

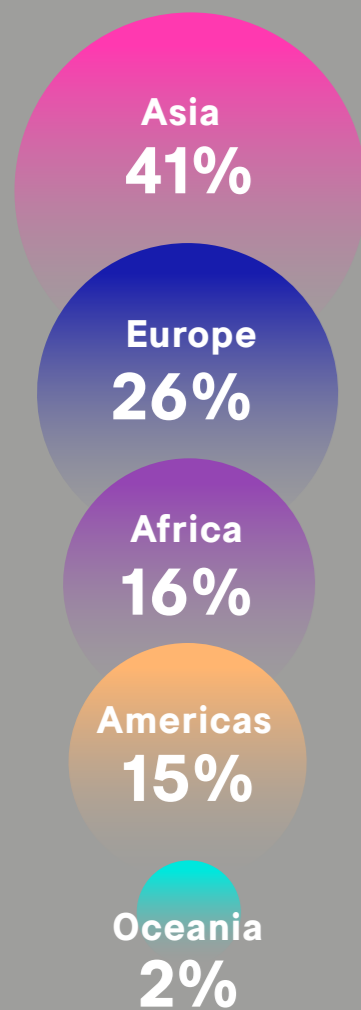
## Global Change Award

2885 entries from 130 countries

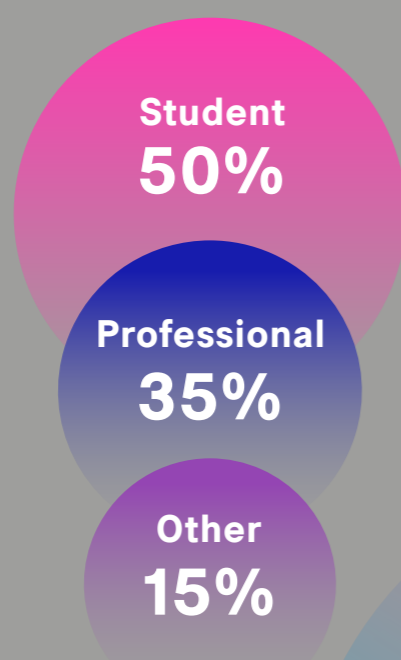
### Applicant's demographics

The Global Change Award gather disruptive ideas from all over the world on how to make the fashion industry circular

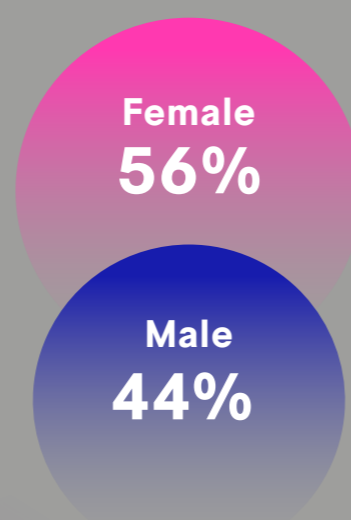
#### Continent



#### Occupation



#### Gender

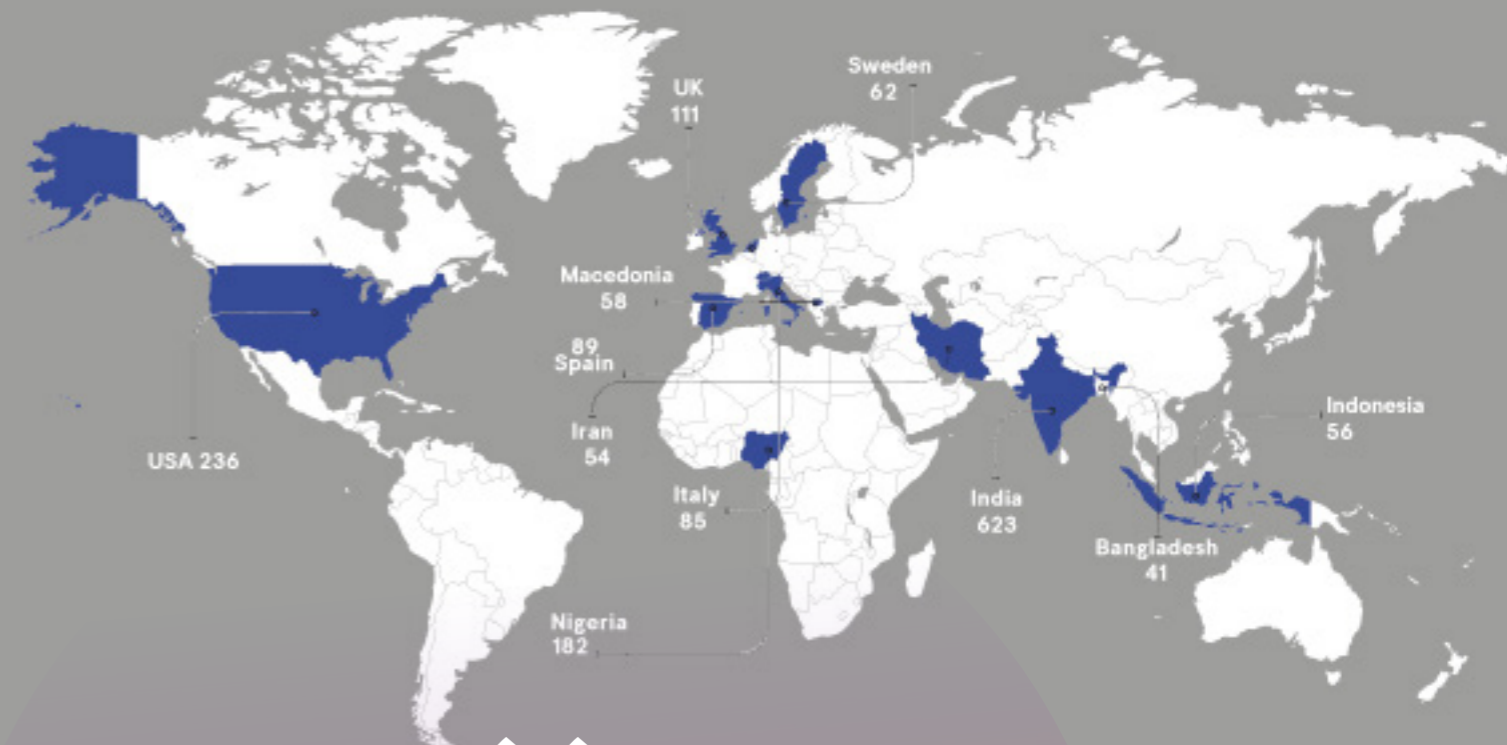


“

As the population of our planet heads towards close to 10 billion 2050, every industry will need to innovate at the edge of their current imagination to safeguard both people and planet. The Global Change Award's mission is to help find the required game changers for the entire fashion industry.

Karl-Johan Persson,  
Board member of H&M Foundation  
and CEO H & M Hennes & Mauritz AB

#### Top 10 countries by number of entries



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Global Change Award is a proof-of-concept that cross-sector collaboration and open innovation empowered by digital, truly works as drivers for sustainable innovation

Jennie Perzon, Accenture Strategy



# 03

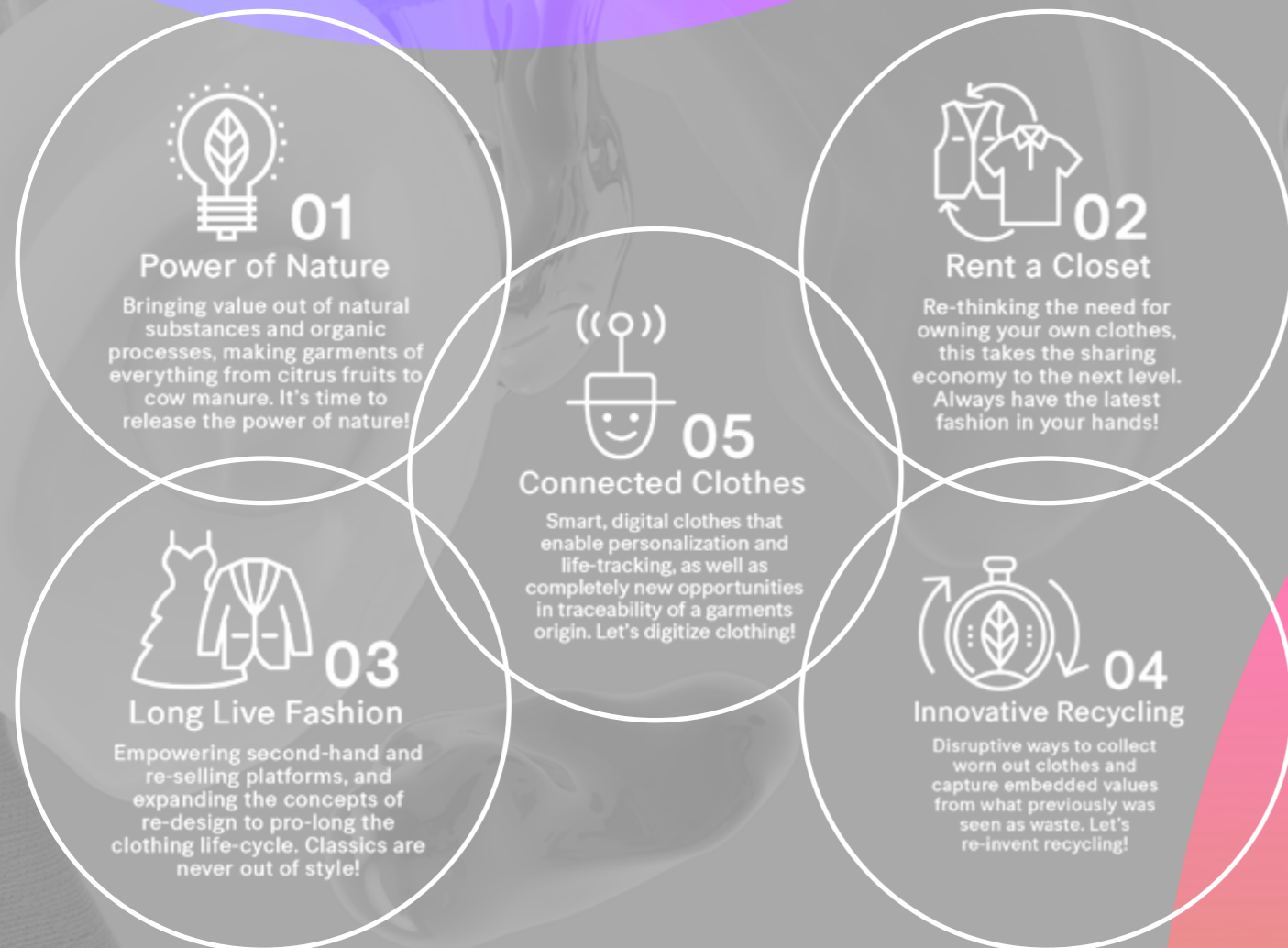
## Five megatrends shaping sustainable fashion

The megatrends that distinguish themselves as particularly strong

**C**reating fashion for a growing population, while decreasing its impact on the environment is not an easy challenge. The need for advancement of circular, sustainable fashion has never been stronger in

addressing the urgent environmental challenges the world is facing. The Global Change Award gathers disruptive ideas from all over the world on how to push the fashion industry forward and reach the next level of circularity.

Looking at key-words commonly used in the applications and applying analytics to identify patterns and clusters, five megatrends stand out:



“  
Consumers, particularly Millennials and Gen Z's, are becoming increasingly attuned to sustainability challenges, leading to changing shopping habits and expectations for better, more sustainable products and new ways of consuming fashion.  
This is putting an emphasis to fundamentally re-examine the entire fashion value chain, opening up for game-changing circular business models

- Jill Standish, Senior Managing Director, Accenture Retail

Number of submitted ideas that contains key word clusters linked to each megatrend.

**812**  
#connectedclothes

**673**  
#innovativerecycling

**363**  
#rentacloset

**314**  
#longlivefashion

**472**  
#powerofnature





## Megatrend I: Power of Nature

The megatrends that distinguish themselves as particularly strong

**P**lanet earth has many hidden resources and making the most out of the value that natural materials and substances constitute is an important element to reach a circular supply-chain.

This will require a complete re-thinking of what a fabric is and can be - making clothes from anything from citrus fruits to cow manure.

This trend focuses on enriching materials from the nature, previously seen as waste, to be able to draw value from organic mechanisms earlier thought of as un-useful.

To make this work at a larger scale, it requires a shift in consumer mind-set of what a quality fabric is, but also new ways of measuring quality.

With open minded millennials entering the market, this trend could not be better positioned - it's time to release the power of nature!

### Key words

Forest, fruit, earth, wood, plant, nature, natural, organic, vegetable, flower, biological, grass, sun, solar, vegan

### Case Example

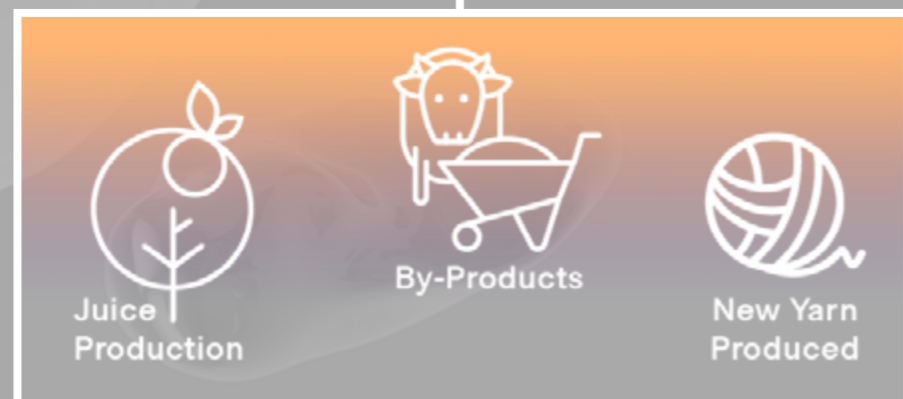
**Orange Fiber - Winner of Global Change Award 2015**

"A new textile out of by-products from citrus juice production, instead of growing a dedicated crop like cotton or bamboo. The yarn produced from the by-products can be used to create different types of textiles, from making dresses to shirts or scarves."

### Sustainable Impact

Production of textiles made from natural materials is resource-efficient and environmental friendly.

Decomposing clothes made from organic textiles is a lot easier than that of synthetic materials.



## Megatrend II: Rent a Closet

The megatrends that distinguish themselves as particularly strong

**B**y re-thinking the need for owning your own clothes, a wide range of opportunities opens up in the circular ecosystem. Enabling digital platforms and the concept of a sharing economy as a foundation, gives rise to new business models with a game-changing, collaborative

approach to consuming clothes without owning them.

Why own clothes you are using just a few times a year when you can rent them and at the same time make sure you always have the latest fashion at your hands?

Through renting and subscription concepts, the utilization rate of clothing increases, resulting in a more efficient system for consuming clothes. Now you can have a new trendy dress at every party!

### Key words

Sharing, collaborative, ecosystem, rent, re-use, platform, leasing, subscription, borrow, lend, rental, hire, common, ownership

### Case Example

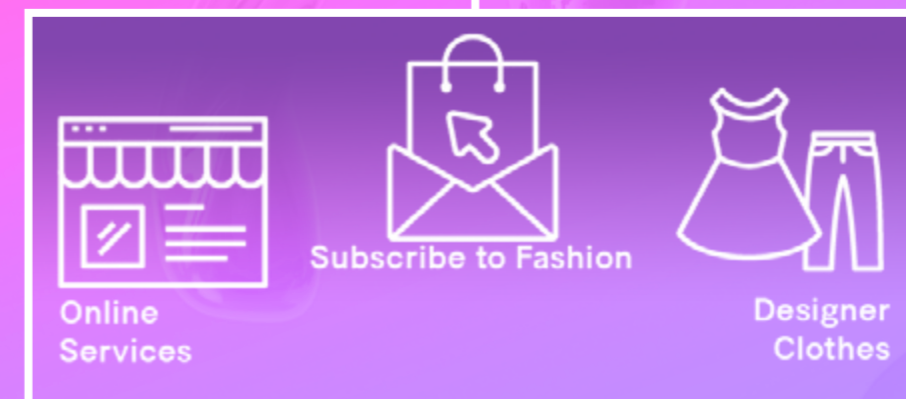
**Rent the Runway**

"An online service that provides designer dress and accessory rentals. A subscription to fashion that gives women access to designer clothes and accessories for a monthly fee."

### Sustainable Impact

Increased utilization rate of each clothing item will eliminate wasted capacity in the clothing industry.

Decreased need to buy new clothes for every new occasion or trend, minimizing what gets thrown away.







## Megatrend III: Long Live Fashion

The megatrends that distinguish themselves as particularly strong

Second-hand has never been more stylish and even though fashion trends come and go, there are classics that will always be in style.

Using platforms to re-sell clothes you no longer want in an innovative way and to give those old clothes a new life, is definitely the way to go in prolonging the clothing lifecycle and reaching a circular fashion industry.

Other ways to prolong the lifecycle of clothing includes leveraging repair, re-design and re-style concepts to make old, out-of-style clothes feel like new again. Long live fashion!



## Megatrend IV: Innovative Recycling

The megatrends that distinguish themselves as particularly strong

Looking at disruptive ways to collect, extract and capture embedded values in clothing and textile materials previously thrown away, is a key aspect of closing the loop for fashion.

Statistics show that most of the clothes that currently are thrown away as waste, could have been recycled, but the current recycling market for clothes is very immature and faces several technical challenges.

This trend recognizes circular processes for extracting value out of what earlier was thought of as waste and highlights innovative business models, re-thinking how to create incentives for collecting worn-out clothing – reinventing recycling!

### Key words

Repair, lifecycle expansion, redesign, resell, second hand, previously owned, marketplace, flea market, street sale, restyle

### Case Example

Etsy

“A peer-to-peer e-commerce website focused on handmade or vintage items, as well as unique factory-manufactured items. Shop outside the big box, with unique items for redesigned clothes from thousands of independent designers and vintage collectors.”

### Sustainable Impact

Having multiple-owners of each clothing item, the need for buying new clothes decreases and you don't waste clothing life-cycles.

Repairing an old clothing item instead of producing a new one, is less resource-consuming.

### Key words

Recycling, collect, recover, embedded value, waste, regain, reclaim, extract, decompose, garbage, by-products, salvage, reprocess

### Case Example

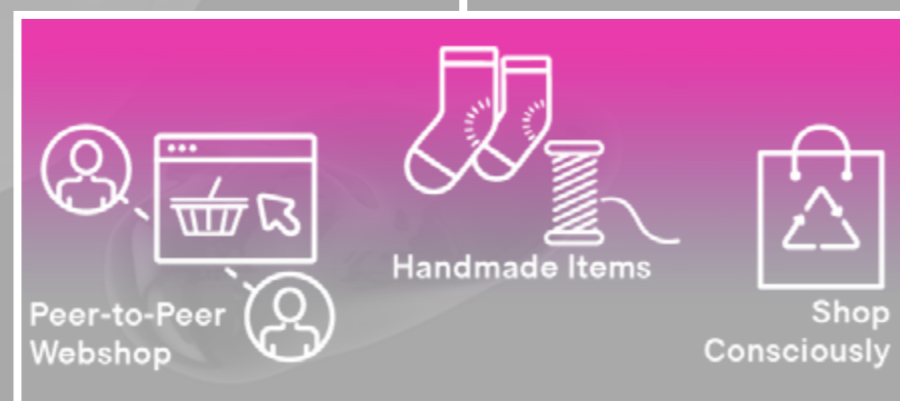
Ambercycle – Winner of Global Change Award 2015

“A new method where microbes eat polyester and break it down into its most basic substances. The raw material can then be sold to polyester manufacturers that use them to produce new textiles.”

### Sustainable Impact

With more efficient methods of collecting old clothes, larger volumes will be collected, resulting in more value being brought back to the system.

With more efficient methods off capturing embedded values in the recycling process, more value will be brought back to the system from each clothing item







## Megatrend V: Connected Clothes

The megatrends that distinguish themselves as particularly strong

The fashion industry is just at the beginning of the journey to unleash the full potential of digital. Smart, connected clothing is opening up completely new opportunities for hyper-personalization and making clothes an even more integrated part of your lifestyle. Furthermore, connected clothing has a fundamental

impact when it comes to garment traceability and automated material sorting in the textile recycling process.

This trend is no longer only about wearable gadgets, but about connected garments monitoring and enhancing large parts of your life.

It is also a way to achieve transparency in the fashion value chain from sourcing and production to recycling. Let's digitize clothing!

### Key words

Digital, wearable tech, apps, connected, internet of things, data, smart, artificial intelligence, web, online, virtual reality

### Case Example

Coded Couture - IvyRevel & Google

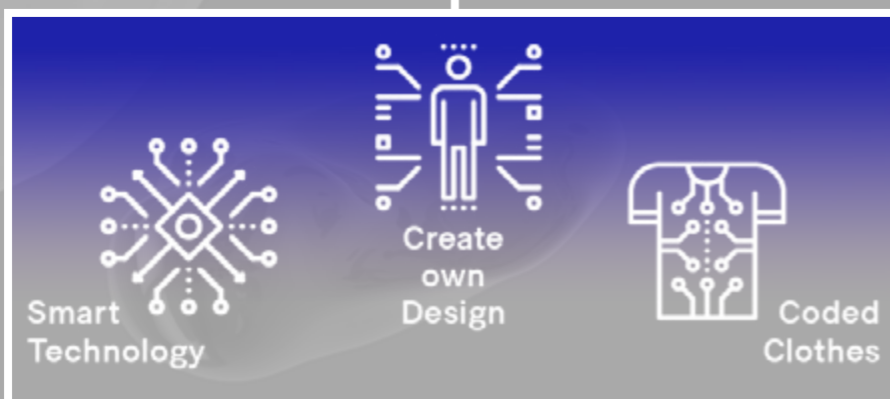
"Developed a technology that allows you to create one of a kind designs based on how you live your life. Data Dress - a personalized dress designed using a smartphone app."

### Sustainable Impact

Increase the ability to track the source of materials to be used in production (e.g. provide traceability).

Increase utilization rate and decrease the risk of throwing away clothes after minimal use (personalized clothing is based on your individual needs and preferences).

Enabling easier recycling and automated sorting of clothing based on textile components (e.g. easier to separate polyester clothes from cotton clothes).



“Smart clothing will change the customer experience of fashion significantly, where clothing will be individualized based on your personal taste, measurements and needs. Another game-changing advantage is the transparency - always knowing where your clothes have been produced and the origin of the material.”

- Sara Sjöberg, Accenture Interactive





# 04

## Five innovator personas

The typical Global Change Award innovators

The best ideas often come from the most surprising people. To innovate you must have the ability to look at things differently and take on board multiple perspectives. The Global Change Award is a case example of

the degree of disruptive innovation that you can find if you let yourself look in unexpected places.

The average applicant to the Global Change Award 2016 is a 27-year-old female from Mumbai,

India. Her main motivation is the circular business model with a digital focus on enhancements within the areas of water and natural resources. Further, she considers her idea to be applicable in several areas outside of the fashion industry.



The Environmentalist



The Fashionista



The Millennial



The Businessman



The Scientist





## The Environmentalist

**GEOGRAPHY:** Moscow, Russia

**AGE:** 25

**GENDER:** Male

### CHARACTERISTICS:

- Wants to preserve the nature by eliminating the hazardous materials and processes currently used in the fashion industry.

- Key focus is on minimizing the environmental impact.

- Has deep knowledge of organic materials, but needs guidance on design-thinking



## The Millennial

**GEOGRAPHY:** Paris, France

**AGE:** 21

**GENDER:** Female

### CHARACTERISTICS:

- Raised in a digital, connected world, with a smart-phone always in her hand, she's a natural talent when it comes to new technologies.

- Her dream is to come up with a brilliant, once-in-a-lifetime app idea.

- Recognizes data as an asset, but has difficulties understanding the older generations way of looking at personal data and the issue of digital trust.



## The Businessman

**GEOGRAPHY:** Los Angeles, USA

**AGE:** 17

**GENDER:** Male

### CHARACTERISTICS:

- A born sales man and entrepreneur, who at just 17 years of age already founded four different start-ups.

- His idea is a game-changing circular business model with high revenue potential.

- He already has a funding plan and a well-developed sales pitch in place, but needs coaching on how to turn his idea into a solid and long-term business.



## The Scientist

**GEOGRAPHY:** Sydney, Australia

**AGE:** 35

**GENDER:** Male

### CHARACTERISTICS:

- Researcher with long academic background in the fields of textile and design.

- Based his idea on a scientific breakthrough consisting of a new technical solution for recycling fabric.

- Lacks ideas around business model and go-to-market strategy.





## The Fashionista

**GEOGRAPHY:** Oslo, Norway

**AGE:** 30

**GENDER:** Female

### CHARACTERISTICS:

- Devoted to high fashion and follows trends obsessively.
- Plans her whole year around Milan Fashion Week (her favorite city).
- Wants to make it easier for people to have easy access to the latest fashion trends, but needs some coaching on how to make her ideas scalable.

“

Brilliant ideas are made at the intersection of different perspectives. In the Global Change Award, the rocket scientist meets the fashion model – imagine the impact!

-Josefine Olsson - Accenture Strategy

“

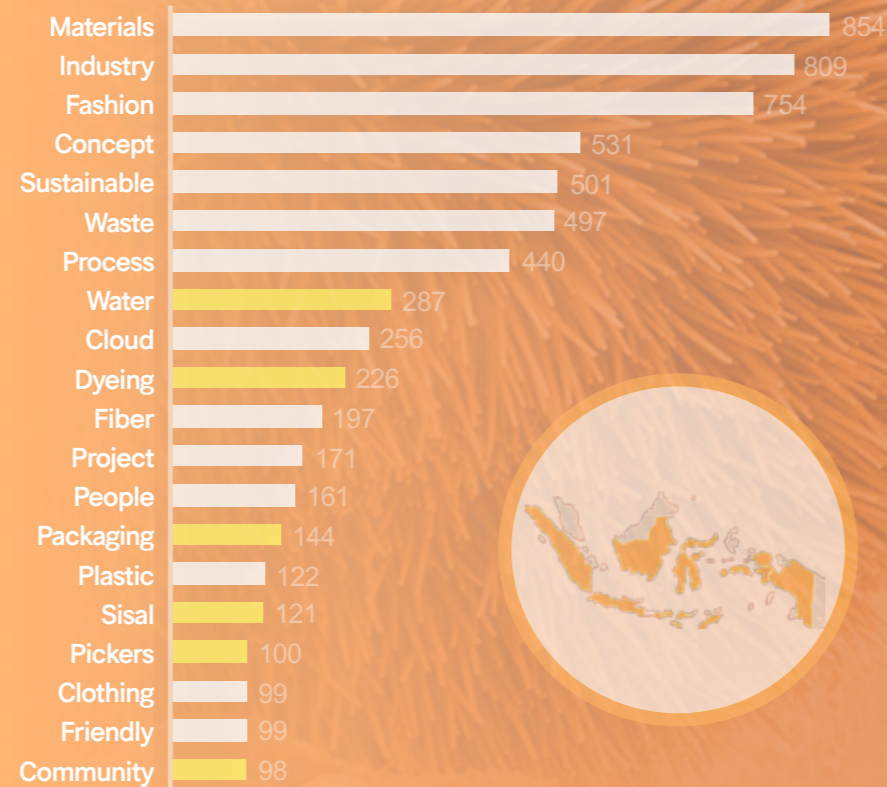
We have already seen tremendous innovation come from cross-sectoral collaboration. We need to support entrepreneurs in learning how to create and maintain partnerships with people who think differently and see things from a different perspective. This is the key to producing materials, models and mindsets for a more sustainable future.

- Rebecca Earley, Professor in Sustainable Fashion Textile Design and Director of the Textile Futures Research Centre at University of the Arts, London



# 05

## INDONESIA WORD CLOUD



## We are innovative based on our surroundings

Innovation starts with a challenge

Innovation does not start with an idea but a challenge. Looking at the themes of the Global Change Award applications some conclusions can be drawn on the way the human mind comes up with new ideas and how creativity is fostered.

It is safe to say: "The way we approach innovation is influenced by our surroundings and environment." We tend to look at what we see around us and use that in our imagination.

Some innovation themes are more commonly seen in certain geographies and there is a connection between these themes and the elements that are characteristic for that specific geographical area.

We also see the environmental challenges that are closest to ourselves and try to address those with solutions.

### Indonesia more commonly submits ideas around water and sisal

The word **Sisal** appears in the applications from Indonesia more than in other countries. **Sisal** is a common local plant and is used in textiles, paper and footwear.

Moreover, since Indonesia is one of the world's most polluted countries, there is a large number of ideas involving water. (The Citarum River in Jakarta is one of the world's most polluted rivers.)

### INDONESIA TOP 3 TOPICS

**1** fiber  
sisal  
tofu  
biodegradable  
farmers system  
adult

**2** dyeable  
people  
azolla  
contribute  
cyanobacteria  
cycle

**3** cloth  
concept  
year  
hyacinth  
must reskill  
structure

### Nigeria more commonly submits ideas around raffia and garri

Applications from Nigeria more commonly include ideas around **raffia** and **garri**, compared to other geographies.

**Raffia** is a type of palm that is used in twine, ropes and baskets. **Garri** is a popular West African food made from cassava tubers.

### NIGERIA TOP 3 TOPICS

**1** design  
feature  
online  
raffia  
world young  
african

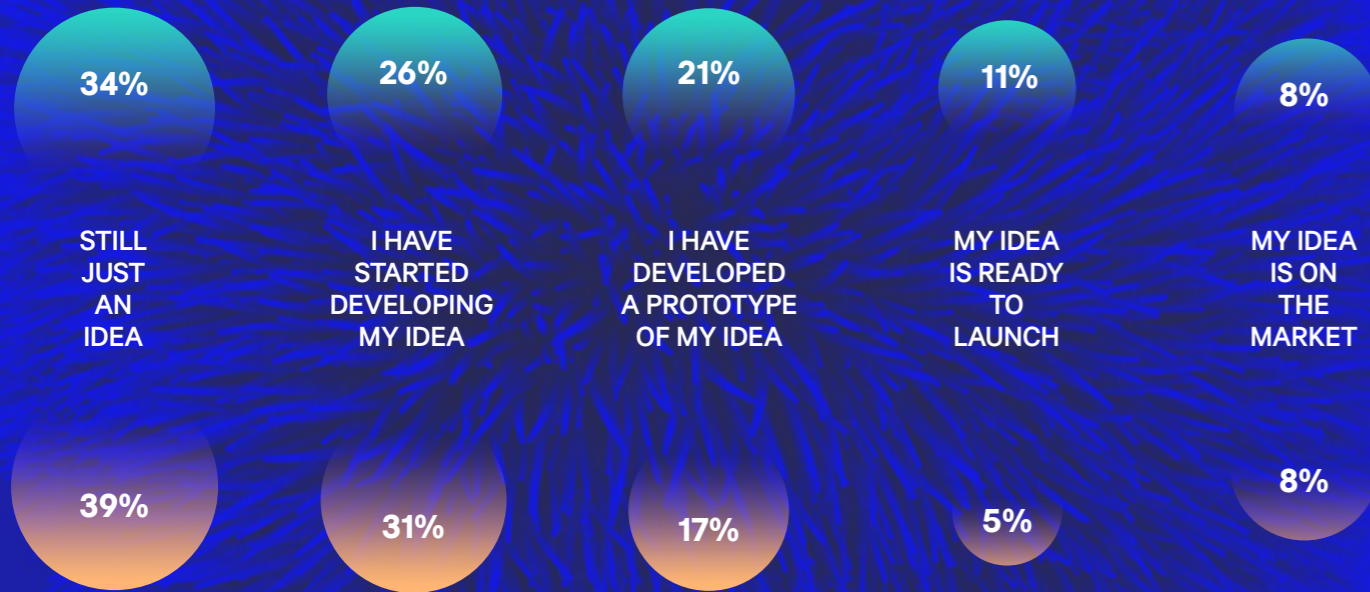
**2** idea  
textile  
footwear  
industry custom  
world

**3** clothes  
waste  
quality creation  
garri  
globally

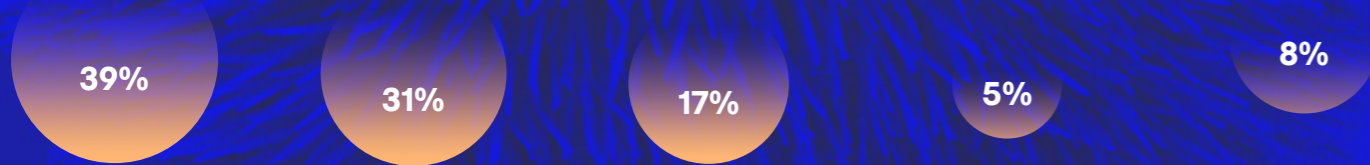


# 06

## MALE



## FEMALE



## What can we learn from the Global Change Award on how to bridge and overcome challenges hindering innovation?

How to bridge and overcome challenges hindering innovation

### Females tend to grade their ideas as less market-ready than men

As a part of the application process there is a step where the applicants get to grade the market readiness of their ideas from “still just an idea” to “my idea is ready to launch/on the market.”

Looking more deeply into this data, you can see a difference between male and female applicants.

Females tend to grade their ideas as less market-ready than men.

This could of course mean that the ideas submitted by women actually were less market-ready.

However, when evaluating the true quality and readiness of the submitted ideas, we clearly saw an issue with females underestimating the value and readiness of their ideas.

If not acted up on, this systematic issue could result in brilliant female ideas being kept in the dark and remaining unexploited.

To make innovation flourish, it is an important task to strengthen women’s beliefs in their ideas and show that there is a great deal of support available to take the idea to the next level.

### Biggest challenges hindering innovation

A common definition used to describe innovation is that it is “the process of translating an idea or invention into a product or service that creates value.”

This means that innovation is a lot more than just an idea. For an idea to become an innovation with true market impact, it takes a lot of effort and resources.

The Global Change Award applicants are asked to highlight

what they perceive to be the biggest challenges to realizing their idea and making it market ready.

The answers received are everything from technical challenges, lack of funding and difficulties in finding business partners to the market itself not being ready.

Some of the reasons stand out and constitute important learnings for what we need to overcome to enable innovation and decrease obstacles.

### Need for idea acceleration

The Global Change Award Accelerator Program is designed to accelerate early-stage ideas and help the innovators overcome the major challenges.

The GCA program provides the winners with the necessary funding, the skills, coaching and network required to realize their ideas and impact an entire industry.



## Funding is the main barrier for applicants from the Africa region, more so than for other geographic locations

Lack of funding is the single most cited challenge that is hindering the Global Change Award applicants from realizing their ideas. Africa stands out as the geography that has most issues with funding.

More than half of the applicants in Africa cite funding issues as their most pressing challenge.

Europeans are having a harder time finding business partners/

suppliers/resellers than other continents. Less openness to making new connections and poorer skills within networking and selling might explain why we see this trend.

“

By bringing together innovators to develop positive solutions, the Global Change Award is a great example of the approach needed to create change, and help shift the fashion industry towards a restorative and regenerative circular economy. I am excited to join the expert panel to help find the next five innovations that can be truly game-changing.

- Dame Ellen MacArthur,  
Founder of the Ellen MacArthur  
Foundation





# 07

## Circular Fashion – so much more than just recycling!

More than half of the applicants categorize their idea as Circular Business Model

“  
We can see an increasing maturity when it comes to the global understanding of what circular really means – from people only thinking about recycling to a complete view on minimizing all types of waste in the value chain.

Tomas Haglund-Flemström, Accenture Strategy

“  
The demand for more - everything from clothes, food and energy - continues to put an enormous strain on both planet and people. We know that this voracious consumption - buy, use and dispose - is not sustainable. We need a shift into a circular model, particularly in fashion, where innovation and style - from design to “end of use” - meet to solve these problems. Last years, Global Change Award winners are already making tremendous progress. I can't wait to see what new ideas are coming next.

Amber Valletta, Supermodel, actress and sustainability influencer

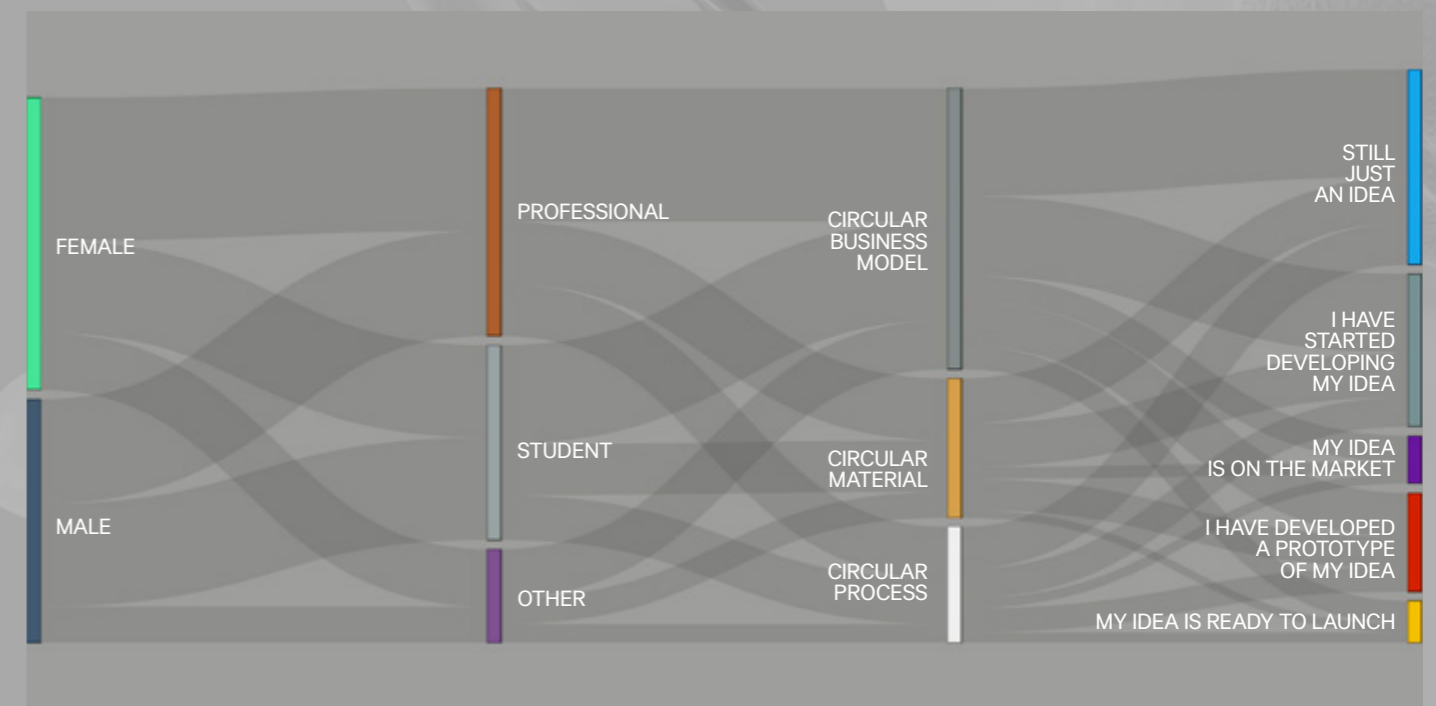
A common misunderstanding of circular economy is that it is all about recycling. The broad spectrum of the applications to the Global Change Award, shows that this could not be more wrong.

Applicants can choose to apply in three different categories, namely; circular business models, circular materials and circular processes.

The competition has strong representation in all three categories with an application range from complete new ways of designing, producing, buying, owning, consuming, re-consuming and recycling fashion.

The Global Change Award's broad representation of what a circular idea can be, indicates a shift from focusing only on recycling to increased circular maturity.

In all parts of the world and across demographics there is an increased understanding of the many opportunities within the circular economy. But the journey continues and the circular revolution is just getting started!





## If you want to spot tomorrow's fashion disruption – find where the waste is today

One of the ways in which Accenture approaches circularity is by looking at the different types of waste in today's linear value chains and examining how the circular economy might address them through innovative business models and digital technologies.

In a rapidly digitized world, exploring these types of waste in your value chain could give a good indication as to where disruption might take place.

Accenture's analysis has identified four key categories of waste that must be addressed to be able to

achieve a circular fashion industry.

The five trends we have identified as the future of circular fashion, are powerful enablers of addressing these four types of waste.

### Wasted Resources

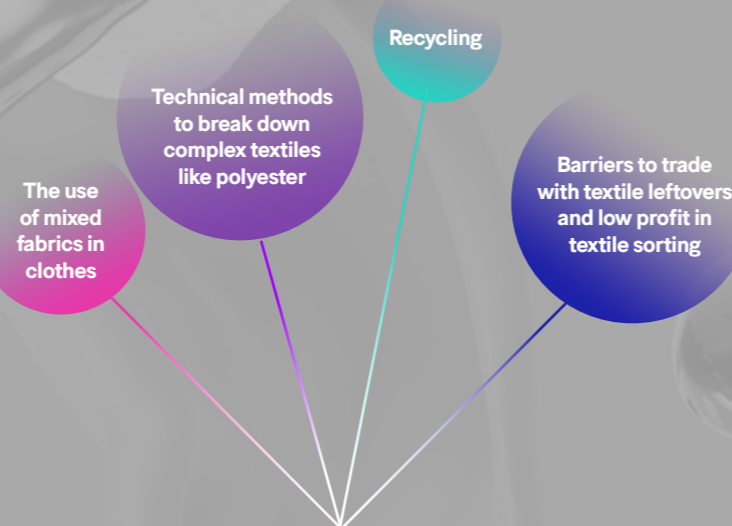
The production of clothes consumes a significant amount of resources, such as water and energy as well as creates large amounts of material spill. This huge waste is ripe for technology disruption over the next decade and is a foundation to enable a circular fashion industry.

Average footprint per ton of fibre in clothing:

FIBRE TYPE	CARBON (TCO <sub>2</sub> E)	WATER (M <sup>3</sup> )	WASTE (T)
COTTON	28	3100	1,6
POLYESTER	21	80	1,4
VISCOSE	30	3800	1,6
ACRYLIC	38	130	1,4
WOOL	46	2200	1,6
POLYAMIDE	24	80	1,4

#### TREND ENABLER:

"Power of Nature" and "Connected Clothes"



### Wasted Embedded Values

There are significant material values at the end of a product's life currently being wasted in the fashion industry. These values must be captured to close the loop for fashion.

More than 100 billion garments are produced every year and 15 percent of the materials produced in the process go to waste.

There are several major challenges in the recycling process of textiles that must be addressed to enable capturing all embedded values.

#### TREND ENABLER:

"Innovative Recycling" and "Connected Clothes"

### Wasted Capacity

The utilization rate of most clothing items is often low and to reach circularity it is imperative to avoid having un-used clothes in the wardrobe for most of their lifetime.

The average UK household owns around £4,000 worth of clothes – but in the average wardrobe around 30% of clothing has not been worn for at least a year, most commonly because it no longer fits.

#### TREND ENABLER:

"Rent a Closet" and "Connected Clothes"

### Wasted Life-Cycles

An efficient second-hand market matches buyers and sellers and helps to prevent clothes being thrown away before their full life-cycle has been fulfilled.

As much as 95% of clothes thrown away could have been re-worn or recycled.

#### TREND ENABLER:

"Long Live Fashion" and "Connected Clothes"



# 09

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## Winning ideas of Global Change Award 2016

This years' winners

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## Manure couture

Making cow manure-based fabric

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**M**anure is seen by many as one of the most disgusting forms of waste, and due to intensive farming it causes an urgent environmental crisis.

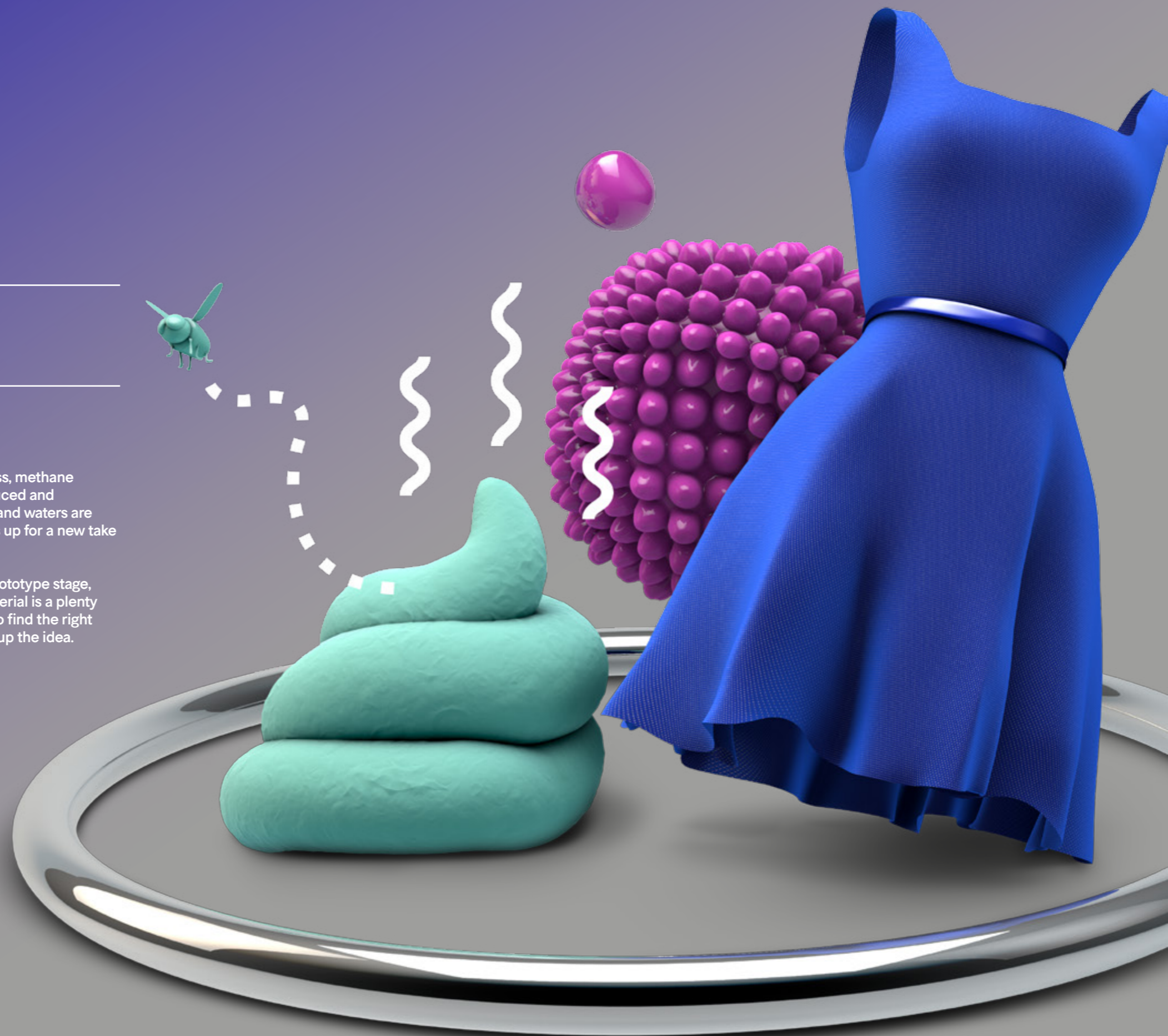
Yet, with this innovation manure is transformed into valuable new material.

Instead of using new resources to produce textile we need to find ways of reusing existing resources - including all types of waste.

The amount of cattle that is raised around the globe creates pressure on the planet. Since cow manure contains cellulose, there is an opportunity to extract raw material from manure which can create a biodegradable textile.

Through this process, methane gas production is reduced and contamination of soil and waters are prevented. This opens up for a new take on textile production.

The idea is in the prototype stage, and since the raw material is a plenty the next step will be to find the right partnerships to scale up the idea.





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## Denim-dyed denim

Letting used denim give colour to new denim

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**J**eans are one of the most iconic styles in fashion. Therefore, it's no surprise that denim is one of the most widely used textiles in the fashion industry. Unfortunately, the traditional process of dyeing denim requires large amounts of water and energy, and produces substantial amounts of dye waste which can contaminate waterways.

However, through this innovation, old jeans can be broken down and used to colour new undyed jeans. This reduces both the water and energy used in production and dyeing, and reduces dye waste. By using old denim and breaking it down into fine particles, a colouring powder can be produced to colour new denim or make prints on other textiles.

This way the denim is recycled instead of going to landfills, and it also significantly reduces the amount of water and energy being used. The result is a cost saving eco-friendly production process.

Today, there is already a prototype of this process. Scaling up and finding denim producers and fashion brands that will adopt this idea on a large scale is the next step.







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## Solar textiles

Harvesting the sun's energy to make fashion fabrics

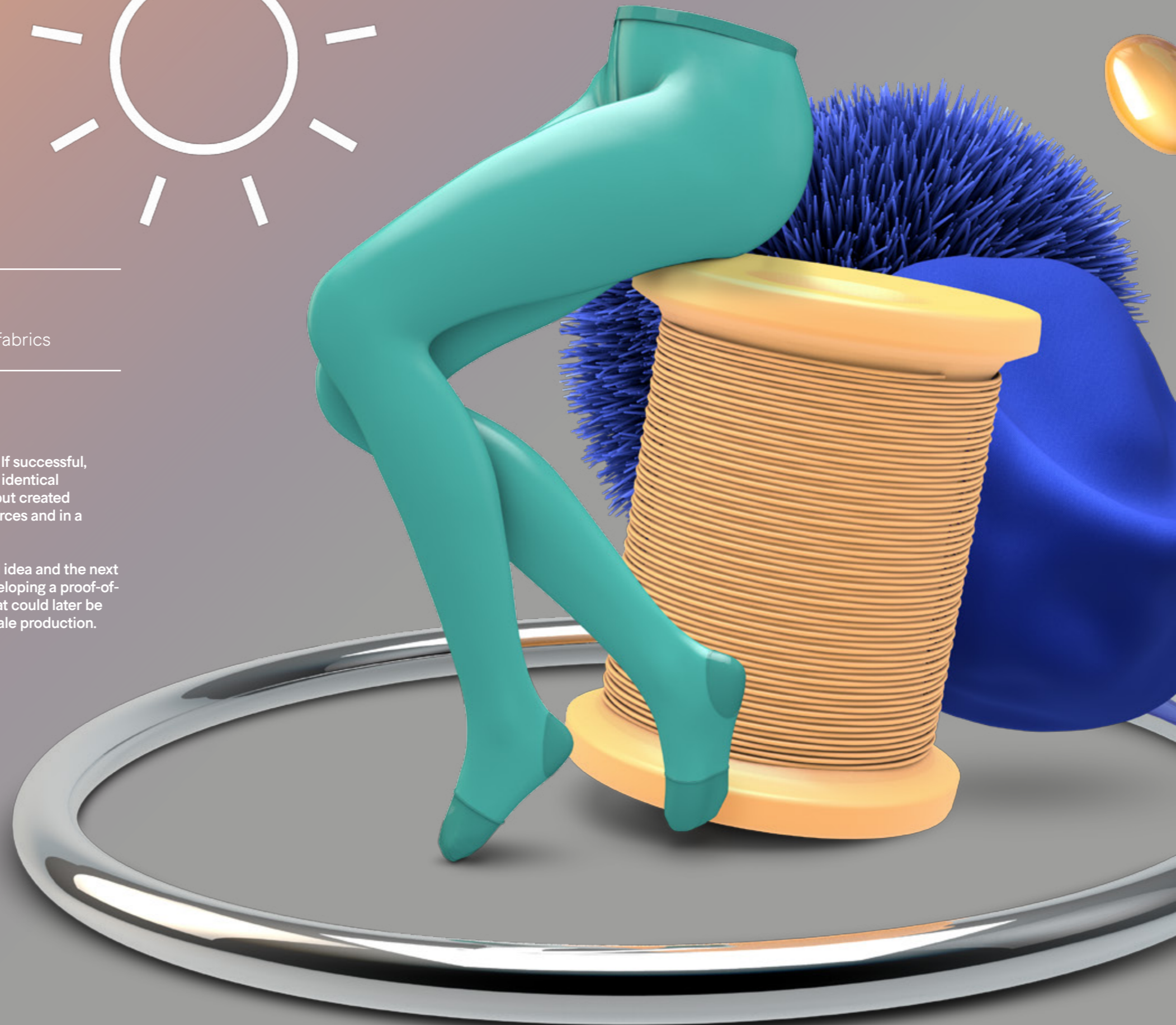
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**T**oday, many types of fabrics, such as nylon, are made from oil in processes that pollute the air, are energy intensive and emit greenhouse gases. It's unsustainable and there has to be another way.

What if your clothes could trap carbon from the environment and help clean up our planet instead? This innovation is all about that; a production process for nylon that only uses water, plant waste and solar energy. It also binds greenhouse gases into fashion fabrics, instead of releasing them into the air, contributing towards a

zero-emissions world. If successful, the material would be identical to the existing nylon, but created from renewable resources and in a sustainable way.

This is a conceptual idea and the next step will focus on developing a proof-of-concept prototype that could later be expanded for large scale production.





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## Content thread

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A digital thread that lets us know what we're wearing

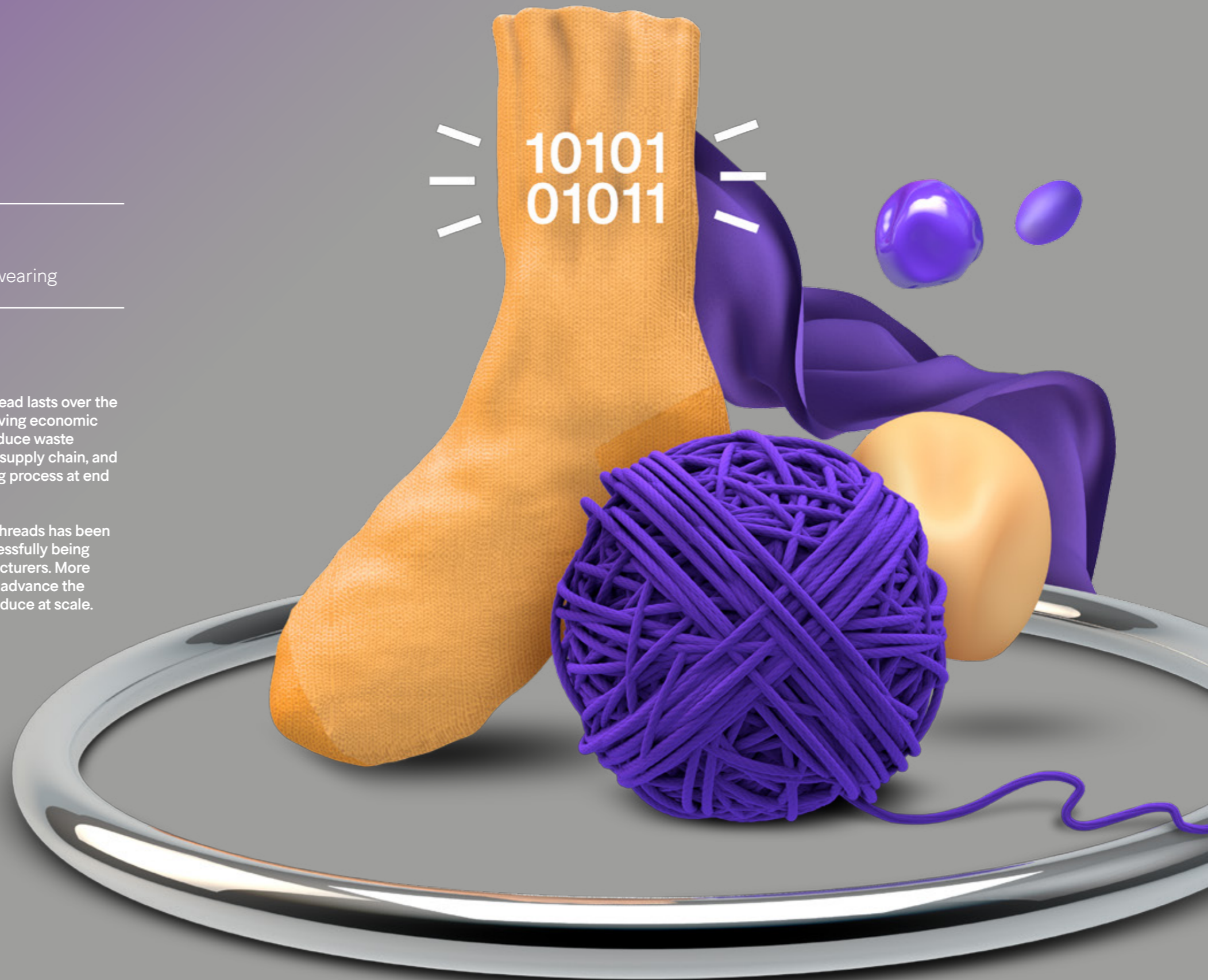
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One of the biggest barriers to textile recycling is that we often don't know what the clothes are made of. This makes it very difficult to recycle them correctly. Today, we have to guess what materials are in our clothes and when a garment is sorted incorrectly, it can obstruct the whole recycling process. So, things need to change.

Sorting and separating our clothes by material type is an essential first step. By attaching a digital tag to each garment at manufacturing stage we can create a digitized 'ingredients list' that gives recyclers all the information needed to recycle the garment. This tag is in the form of an RFID thread, and looks and feels much like a normal

thread. This digital thread lasts over the garment's lifetime, driving economic improvements that reduce waste throughout the entire supply chain, and powering the recycling process at end of life.

A prototype of the threads has been produced and is successfully being introduced by manufacturers. More research is needed to advance the technology and to produce at scale.





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## Grape leather

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Using leftovers from winemaking to create fully vegetal leather

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**P**roducing animal and synthetic leather is water, chemical and energy consuming. But by using waste from wine production, such as grape skins and stalks, a new type of vegetal leather can be produced without the bad stuff.

Leather production is particularly straining on our planet as it demands a large amount of water and chemicals which pollute the air, land and ground. Synthetic leather uses oil as raw material which is also bad news. Both consumers and the fashion industry want a green and animal free alternative.

With this innovation, it can come in the form of grape skins and stalks. Using winemaking leftovers as a resource paves the way for a new type of vegetal leather. Instead of burning the leftovers from winemaking, which creates carbon dioxide, it becomes raw material in a process that doesn't need any harmful chemicals. The animals are happier and it even generates water as a bonus.

The idea is in its beginning stage and the next step will be to scale it, refining the process and creating partnerships within the fashion industry.





# 10

## Methodology and tools used in the analysis

Accenture analytics and data visualization methods

Accenture employed analytics and data visualization on the data set of the 2885 applications that were submitted to the Global Change Award in 2016 to produce this trend report. The analysis has been combined with Accenture's expertise in sustainability, innovation, digital and fashion, to enable the conclusions and interpretations presented.

The analytical work was hypothesis driven and by using different analytical methods and tools (e.g. QlikSense, Tableau and topic modeling with R), these hypotheses were investigated and

validated. This method enabled findings at both a detailed level and on a macro scale.

One analytical method that was applied on the data set was topic modeling. Topic modeling is a statistical method which allows sophisticated insights on latent constructions in large datasets. By using this method, it was possible to identify clusters of similar words often used together in applications per country. For example, for Nigeria the word "raffia" – a type of palm that is used in twine, ropes and baskets, was found in the same topic as online and African.

Another way of visualizing the essential of a large data set consisting of free text is Word Cloud. Word Cloud presents a visual representation of frequently occurring words in a text.

With such large data set, some submissions will miss certain information and become incomplete. These have therefore been removed to enhance the visualizations and the underlying analytical data set.

Qlik

Dashboards used for interactive data visualisation for insight and discovery

Tableau  
SOFTWARE

TOPIC  
MODELING  
AND  
CLUSTERING  
USING

R

Advanced analytical methodology using natural language processing



Understanding of applicants demographics

Discovering hidden topical patterns that are present across applicants ideas

In-depth analysis of submitted ideas



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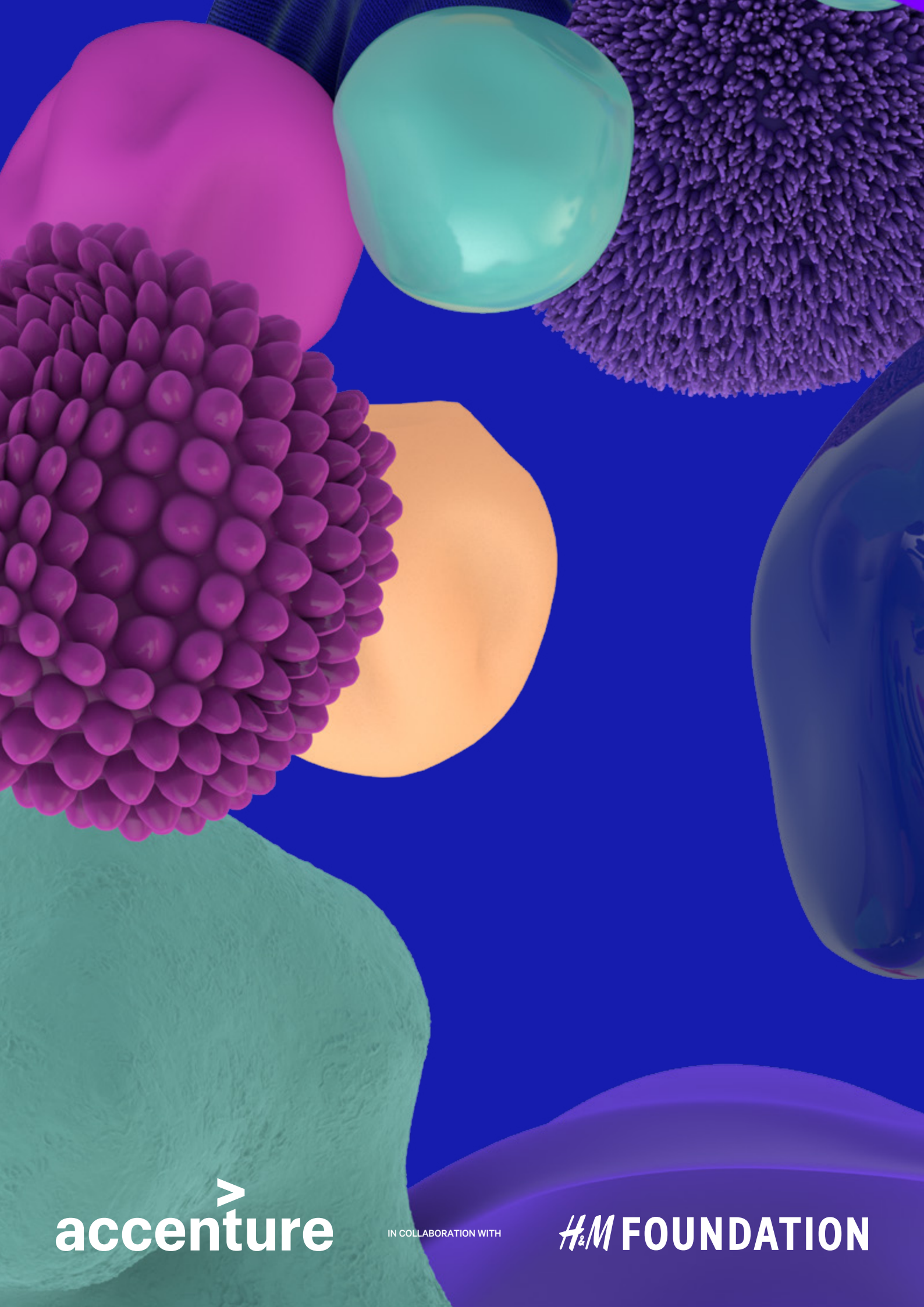


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