



**POLITECNICO**  
MILANO 1863

SCUOLA DEL DESIGN  
Laurea Magistrale in Design for the Fashion System

**A Guide on How to use Material Culture  
& Fashion-Tech as tools to Enhance  
Consumer Engagement: A Study with the  
Costume Museum in Viana do Castelo**

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# Abstract (en)

This thesis explores the challenges and opportunities facing the fashion industry in a rapidly changing world shaped by the forces of globalization and technology.

The cultural landscape is undergoing significant transformations that affect the fashion industry, a prominent cultural artefact that reflects society's changing attitudes and values. As designers and companies strive to reach a global audience, they face the unique challenge of also appealing to the local sensitivities and cultural identities of individual communities.

To achieve a delicate balance between these competing objectives, designers and companies need a deep understanding of consumer psychology, and cultural trends, and the ability to translate these insights into impactful designs. This requires an interdisciplinary approach drawing upon knowledge from sociology, psychology, cultural studies, and design, among other fields.

In particular, this study will concentrate on the difficulties and opportunities that the fashion industry must overcome in a world that is changing quickly, with a focus on the Portuguese city of Viana do Castelo. The study aims to determine how the fashion industry can balance the desire for global reach while also appealing to the local sensitivities and cultural identities of specific communities. It does this by looking at the local fashion market, consumer behaviours, and cultural values.

This thesis aims to provide insights into what fashion-tech and material culture can achieve when put together through a review of literature, empirical research, and case studies. This knowledge will allow designers and business owners to implement technology and culture to boost their consumer engagement.

Key words: Fashion-Tech; Material Culture; Consumer Engagement



# Abstract (it)

Questa tesi esplora le sfide e le opportunità che l'industria della moda deve affrontare in un mondo in rapida evoluzione plasmato dalle forze della globalizzazione e della tecnologia.

Il panorama culturale sta subendo trasformazioni significative che interessano l'industria della moda, un importante artefatto culturale che riflette gli atteggiamenti e i valori mutevoli della società. Mentre i designer e le aziende si sforzano di raggiungere un pubblico globale, affrontano la sfida unica di fare appello anche alle sensibilità locali e alle identità culturali delle singole comunità.

Per raggiungere un delicato equilibrio tra questi obiettivi in competizione, i designer e le aziende hanno bisogno di una profonda comprensione della psicologia del consumatore e delle tendenze culturali e della capacità di tradurre queste intuizioni in progetti di grande impatto. Ciò richiede un approccio interdisciplinare che attinga alla conoscenza di sociologia, psicologia, studi culturali e design, tra gli altri campi.

In particolare, questo studio si concentrerà sulle difficoltà e le opportunità che l'industria della moda deve superare in un mondo che sta cambiando velocemente, con un focus sulla città portoghese di Viana do Castelo. Lo studio mira a determinare in che modo l'industria della moda può bilanciare il desiderio di portata globale facendo appello anche alle sensibilità locali e alle identità culturali di comunità specifiche. Lo fa guardando al mercato della moda locale, ai comportamenti dei consumatori e ai valori culturali.

Questa tesi mira a fornire un quadro e approfondimenti su ciò che la tecnologia della moda e la cultura materiale possono ottenere quando vengono utilizzate come strumenti all'interno del coinvolgimento del consumatore. Attraverso una revisione della letteratura, della ricerca empirica e dei casi di studio, questa conoscenza consentirà a designer e imprenditori di implementare tecnologia e cultura per aumentare il coinvolgimento dei consumatori.

Parole chiave: Moda-Tecnologia, Cultura materiale; Coinvolgimento dei consumatori





# Introduction

The fashion industry is a prominent cultural artefact that reflects society's changing attitudes and values. However, the cultural landscape is undergoing significant transformations that affect the industry in a rapidly changing world shaped by the forces of globalization and technology. As designers and companies strive to reach a global audience, they face the unique challenge of also appealing to the local sensitivities and cultural identities of individual communities. This presents a delicate balance between these competing objectives that designers and companies must navigate to succeed in the industry.

To achieve this balance, designers and companies need a deep understanding of consumer psychology and cultural trends, as well as the ability to translate these insights into impactful designs. This requires an interdisciplinary approach drawing upon knowledge from sociology, psychology, cultural studies, and design, among other fields. The present study endeavours to investigate the challenges and opportunities confronting the fashion industry in the face of globalization and tech-

nological advancement. Against this backdrop of rapidly changing cultural landscapes, the fashion industry has become an important cultural artefact reflecting evolving societal attitudes and values. The objective of this thesis is to shed light on how the fashion industry can navigate these complex challenges, particularly in the context of the Portuguese city of Viana do Castelo.

In this context, this study aims to identify the challenges and opportunities facing the fashion industry in Viana do Castelo, a small but culturally significant city in Portugal. By focusing on the local fashion market, consumer behaviours, and cultural values, the study seeks to provide a deeper understanding of how the fashion industry can achieve a balance between global reach and local specificity.

This study aims to create a thorough understanding of how technology and culture can be used to accomplish this goal by analyzing the pertinent literature, conducting empirical research, and reviewing case studies.

Designers and business owners will ultimately be able to use this information to create strategies that improve consumer engagement, which is crucial for long-term success in the fashion industry.

With the research, the aim is to provide practical insights for designers and business owners to implement technology and cultural trends in their practices, ultimately leading to better outcomes for their careers and businesses. The study will contribute to a better understanding of the challenges and opportunities facing the fashion industry in a rapidly changing world, and provide a framework for designers and business owners to thrive in this dynamic environment.

In summary, this thesis will explore the challenges and opportunities facing the fashion industry in a rapidly changing world shaped by globalization and technology. Ultimately, this thesis provides insights into how fashion-tech and material culture can be leveraged to enhance consumer engagement, ultimately leading to better outcomes for designers and business owners in the industry.





**PART I**  
**LITERATURE REVIEW**



## Chapter 01.0

# The current Fashion view

“Fashion is a complex and multifaceted social process that is influenced by society, culture, history, and politics; it is, therefore, a rich site for cultural analysis.” (Kaiser, 2012, p. 1)

This chapter delves into the typology of fashion trends, including mega-trends, macro-trends, micro-trends, and fads, drawing insights from industry experts and thought leaders. Understanding the various types of fashion trends is crucial for brands that want to stay ahead of the curve and meet the changing needs and expectations of their customers.

Furthermore, the current state of the fashion industry will be examined, which is undergoing significant changes as a result of shifting consumer behaviour, technological advancements, and the growing importance of sustainability and ethics.





## 01.1 Understanding Fashion

Understanding Fashion is a multifaceted, intricate process that draws on many facets of society, culture, and history. In their book *Fashion History: A Global View*, Welters and Lillethun (2018) point out that fashion is not just about clothing but also about the social, economic, and political context in which it exists. Similarly, Kaiser (2012) contends that fashion is a cultural practice that involves the creation, consumption, and interpretation of clothing in Fashion and Cultural Studies.

Fashion is not a thing or an essence. Rather, it is a social process of negotiation and navigation through the murky and yet-hopeful waters of what is to come. Fashion involves becoming collectively with others. When and where does this happen, and who gets to decide what constitutes fashion? Fashion materializes as bodies move through time and space. (Kaiser, 2014, p.1)

Focusing on fashion's history can assist with comprehending it better. Welters and Lillethun (2018) investigate fashion from prehistoric times to the present day through a global lens. They demonstrate how colonialism, globalisation, and technological advancements have influenced fashion. They note, for example, how European colonialism in the nineteenth and twentieth centuries spread European fashion styles to other parts of the world, and how the rise of the internet has transformed the way we consume and produce fashion.

Kaiser (2012) approaches fashion from a cultural studies perspective, examining how fashion operates as a form of communication and a site for the construction and negotiation of identities. She argues that fashion is not just a matter of personal taste or preference, but is deeply embedded in cultural norms and values. Kaiser also explores the relationship between fashion and power, noting how fashion has been used to reinforce social hierarchies and inequalities.

In conclusion, fashion is a reflection of the social, economic, and political context in which it exists, an ever-changing phenomenon that reflects individuals' and communities' changing needs, desires, and values.

## 01.2 Trend's typology

At its most basic, a trend can be defined as the direction in which something (and that something can be anything) tends to move and has a consequential impact on the culture, society or business sector through which it moves. (Raymond, 2010, p. 14)

Trends are patterns of behaviour or preferences that emerge and become popular over time. In fashion, trends are fundamental since they can refer to styles, colours, materials, and silhouettes that are favoured by consumers and design-

ners alike. This chapter used insights from “Trend-Driven Innovation: Beat Accelerating Customer Expectations” by Henry Mason, David Mattin, and Maxwell Luthy, and “The Trend Forecaster’s Handbook” by Martin Raymond to explain this topic.

There are several types of trends, each with its characteristics and lifespan. To stay relevant and meet the needs of consumers, fashion brands must stay abreast of these trends and adapt their products and marketing strategies accordingly.

Mega-trends are long-term trends that shape the broader cultural and societal landscape. These trends are driven by changes in technology, demographics, and global events, and have a significant impact on consumer behaviour and preferences. In the fashion industry, mega-trends can manifest as shifts in cultural norms and values, such as a growing focus on sustainability and ethical production.

Macro-trends are medium-term trends that are influenced by mega-trends but are more specific to particular industries or subcultures. These trends can last for several years and are often characterized by their relevance to a particular group of consumers or a specific geographic region. Examples of macro-trends in the fashion industry include the rise of streetwear and the popularity of retro or vintage styles.

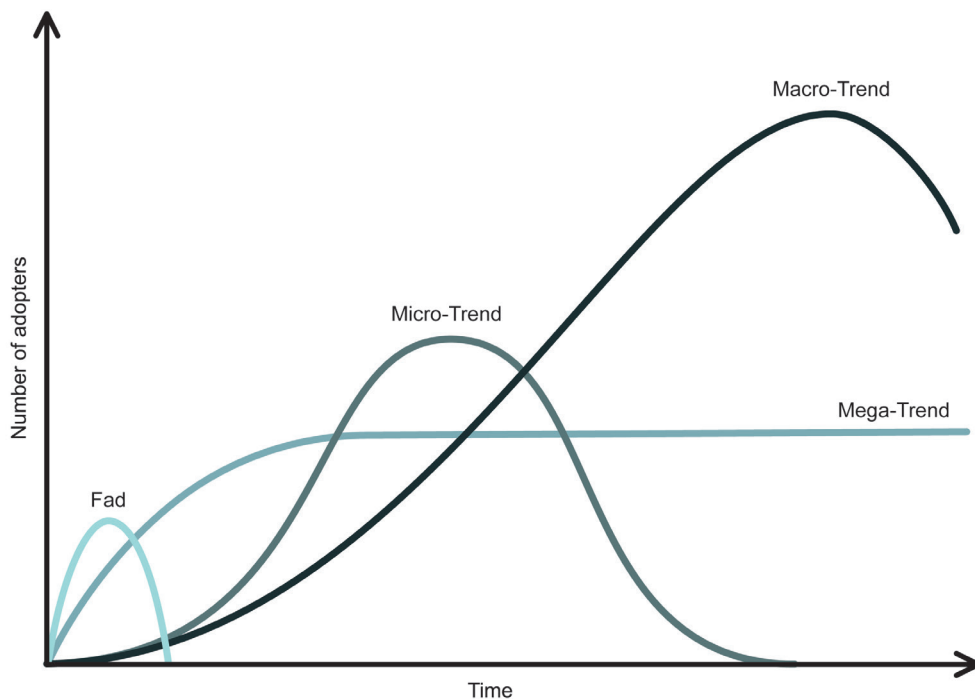


Figure 01: Trend's Typology and Lifespan

Micro-trends are short-term trends that emerge quickly and often disappear just as quickly. These trends are driven by specific events or cultural phenomena and can be very specific in terms of their style or design elements. Examples of micro-trends in the fashion industry include the rise of particular colour palettes or the popularity of specific fabrics or textures.

Fads are trends that are driven by hype and often lack any substantial cultural or societal impact. These trends can emerge quickly and disappear just as quickly, driven by social media, celebrity endorsement, or other forms of marketing. In the fashion industry, fads can take the form of specific items of clothing or accessories, such as a particular style of sneaker or a certain type of handbag.

Understanding the typology of fashion trends is essential for brands that want to stay ahead of the curve and meet the changing needs and expectations of their customers. By identifying mega-trends, macro-trends, micro-trends, and fads, fashion brands can develop products and marketing strategies that are relevant and appealing to their target audience. By incorporating insights from “Trend-Driven Innovation” by Mason, Mattin, and Luthy and “The Trend Forecaster’s Handbook” by Raymond, fashion brands can stay at the forefront of the industry and ensure their long-term success.

### 01.3 Fashion of today

As stated by The State of Fashion 2023, a comprehensive analysis that gives insights into the global fashion business and its prospects for the following years.

One of the report’s main conclusions is that the fashion industry is going through a period of upheaval, owing to shifting customer perceptions and technological advancements. This report shows the growing relevance of sustainability and social responsibility in the fashion industry and how customers become more conscious of the impact of fashion on the environment and workers in the supply chain.

One of the growing trends is the ongoing development of e-commerce, which is anticipated to contribute a larger percentage of fashion retail sales in the coming years. Influencer marketing and social media will remain crucial in promoting consumer engagement and brand loyalty.

The report also predicts that as firms employ technology to understand customer preferences and behaviour, the fashion sector will become more data-driven. Companies will be able to develop more individualised and targeted marketing campaigns as a result, as well as optimise their supply chains and inventory management.

## Literature Review - The Current Fashion View

The study also emphasises the importance of diversity and inclusivity in the fashion industry, in both the staff and the models and brand ambassadors that the businesses use. The report invites firms to take aggressive steps to address issues of inequality and bias since it sees this as a crucial area for development.

The State of Fashion 2023 provides a thorough analysis of the global fashion industry and its prospects. It highlights the need for companies to address issues of sustainability, social responsibility, and diversity while also reacting to changing consumer preferences and technological improvements.





## Chapter 02.0

# Fashion-Tech

“Fashion tech is an interdisciplinary field that merges traditional fashion and textiles with modern electronics, software, and other technologies.” (Horvath et al., 2016, p. 3)

Fashion-Tech involves the use of innovative tools such as 3D printing, virtual reality, augmented reality, artificial intelligence (AI), blockchain technology, and more. These technologies are revolutionizing the way people shop for clothing and accessories by making it easier to find what they are looking for.

Additionally, they are also making it possible to create unique designs that can be quickly produced at scale. The possibilities with fashion-tech seem endless as more advancements are made each day.

During this chapter, the three different fields within Fashion-Tech will be explained and illustrated by the best practiced case studies.





### 02.1 Understanding Fashion-Tech

Fashion-Tech is described as “the use of technology in fashion design, production, and retail” in the book Genova, A. and Moriwaki, K. (2014) *Fashion and Technology: A Guide to Materials and Applications*. London: Laurence King Publishing, p. 9.

Materials that can be manipulated or controlled by technology are known as smart materials. These materials can have sensors or other electronic components embedded in them, making them responsive and interactive. (Genova & Moriwaki, 2016) The colour or texture of a smart fabric, for instance, may alter in response to changes in temperature or light.

Another area of fashion technology that has seen significant growth in recent years is wearable technology. Electronic devices worn on the body, such as smartwatches or fitness trackers, are referred to as wearable technology. These gadgets can track the wearer’s heart rate, steps taken, and calories burned, among other health-related metrics. (Genova & Moriwaki, 2016)

The fashion industry has also adopted a lot of digital fabrication methods like 3D printing and laser cutting. With the aid of these methods, designers are now able to produce intricate and complex designs that were previously impossible to manufacture using conventional manufacturing techniques. Particularly 3D printing has completely changed the way fashion products are made, enabling mass customization and personalization. (Genova & Moriwaki, 2016)

Finally, fashion-tech is more than just combining fashion and technology; it is also about providing new experiences to customers. Using cutting-edge technologies, fashion brands can create one-of-a-kind and personalised products that reflect their customers’ preferences and style.

### 02.2 The Industry

The fashion industry has seen considerable change in recent years as a result of the rise of fashion technology. Fashion-Tech is a fusion of technology and fashion that opens up new potential for designers, merchants, and consumers. It makes use of cutting-edge technologies such as 3D printing, virtual reality, augmented reality, artificial intelligence (AI) and blockchain technology. (Horvath et al., 2016)

Virtual and augmented reality are key technologies driving growth in the fashion-tech industry. These technologies have been used to provide consumers with immersive experiences such as interactive fashion shows and dressing rooms. Virtual reality has enabled fashion brands to provide customers with a unique and engaging way to experience their products, whereas augmented reality has enabled customers to virtually “try on” clothing before purchasing.



Figure 02: Augmented Reality Garment, developed by The Fabricant Studio.  
Figure 03: 3D Printed Dress, developed by Boston-based design studio Nervous System, led by Jessica Rosenkrantz and Jesse Louis-Rosenberg.  
Figure 04: Wearable Product, Smartwatch developed by Apple Inc.

These technologies have the potential to transform the way consumers interact with fashion products, with significant implications for the fashion industry's future. (Genova & Moriwaki, 2016)

"Another innovation that has found widespread use in the fashion-tech sector is 3D printing. Innovative designs and specialised goods, like distinctive jewellery and custom-made shoes, have been produced using 3D printing. Fashion brands can now produce items that were previously unattainable thanks to technology, which also gives designers and producers new opportunities."(Genova & Moriwaki, 2016)

"Wearable technology is another area of the fashion-tech industry that has seen significant growth in recent years. Smartwatches and fitness trackers are just a few examples of wearable technology that have become increasingly popular among consumers. Fashion brands have begun incorporating wearable technology into their products, such as smart fabrics that can monitor the wearer's health or track their movements." (Genova and Moriwaki, 2014, p.17)

"As wearable technology becomes more advanced and ubiquitous, it has the potential to change the way consumers interact with fashion products and could create new opportunities for fashion brands." (Genova and Moriwaki, 2014, p.17) Understanding the role of technology in the fashion industry requires case studies like the Apple Watch, Levi's and Google Jacquard, Suntex, The Fabricant, and Burberry x Minecraft, among others (Genova and Moriwaki, 2014, pp. 47-72). These examples show how virtual fashion experiences, Smart Textiles, Wearables and Digital Manufacturing technology alter how consumers interact with fashion products and how fashion brands respond to market demands.

Genova and Moriwaki's "Fashion and Technology: A Guide to Materials and Applications" provides a detailed analysis of several case studies that demonstrate the use of technology in the fashion industry. The Apple Watch is one such case study, which the book describes as a prime example of wearable technology in fashion (Genova and Moriwaki, 2014, p. 65). The book also discusses Levi's and Google's collaboration to develop a jacket with Smart Textile technology that allows wearers to control their mobile devices using gestures on the jacket's fabric (Genova and Moriwaki, 2014, p. 58).

Suntex's work with Smart Textiles which can change colour or display patterns based on the wearer's movements is another case study covered in the book (Genova and Moriwaki, 2014, p. 111). The Fabricant, a company that creates virtual fashion experiences using virtual reality and digital design, is also mentioned in the book (Genova and Moriwaki, 2014, p. 121). Finally, the book investigates Burberry's use of Minecraft to create a virtual fashion experience and how this innovative marketing approach demonstrates the potential for virtual fashion experiences to reach new audiences (Genova and Moriwaki, 2014, p. 127).

By studying these case studies, this chapter provides insight into the various

## Literature Review - Fashion-Tech

ways technology is being used in the fashion industry and its impact on the production, design, marketing, and consumption of fashion products.

In conclusion, the fashion-tech industry is a rapidly evolving and dynamic field that is changing the way consumers interact with fashion products. With the emergence of new technologies and the increasing demand for innovation and sustainability in the fashion industry, the industry is poised for significant growth and transformation in the years to come. By staying ahead of the curve and incorporating new technologies and sustainable practices into their business models, fashion brands can remain competitive and provide customers with exciting and innovative experiences.





Literature Review - Fashion-Tech



Figure 05, 06, 07: Apple Watch Ultra campaign photos

### 02.2.1 Wearables

“Wearable technology refers to clothing and footwear that incorporate advanced electronic and computing technologies for the fashion industry.” (Sun & Vaidogaite, 2019)

Wearables are reaching all areas of society. The market around this sector is expanding, and many firms have specialised workshops, prototype spaces, and Research and development facilities. Partners from the medical, sports, and safety industries have joined the demand for meaningful wearables. To design effective wearables, it is critical to adjust skill sets to incorporate prototyping ability and a thorough grasp of the process. This entails incorporating electronics into clothes, as well as comprehending what wearables are and how their distinct qualities might be included. (FARION, 2022)

To better understand wearables and their presence within the industry, is important to know about these two case studies, the worldwide known, Apple Watch, developed by Apple Inc. and first released in 2015 and the Levi's and Google Jacquard, developed in 2017.

#### The Apple Watch

Since its debut in 2015, has grown in popularity among fashion and design enthusiasts. The device combines traditional watch features with a variety of smart ones, such as fitness tracking, messaging, and mobile payments, making it an adaptable addition to any outfit (Vogue, 2020).

A new generation of smartwatches from Apple called the Apple Watch Ultra was designed to focus on fitness and health features (“Apple Watch Ultra”, n.d.). According to Vogue, the device has a variety of sophisticated sensors and features that enable users to monitor their health metrics in real-time and offer a variety of fitness tools and apps (“Apple Watch Ultra: What You Need to Know”, 2022). Key health metrics, such as heart rate, blood oxygen levels, and sleep patterns, can be measured and tracked by a variety of cutting-edge sensors found in the Watch (“Apple Watch Ultra”, n.d.). This wearable also has several fitness features, like GPS tracking and an activity tracker, so users can keep track of their workouts and set goals (“Apple Watch Ultra: What You Need to Know”, 2022).

In addition to its health and fitness features, the Apple Watch Ultra also features a range of communication and entertainment functions, including cellular connectivity and streaming capabilities (“Apple Watch Ultra”, n.d.). Users can access their favourite music and podcasts, as well as make calls and send messages directly from their watch (“Apple Watch Ultra: What You Need to Know”, 2022).

The Apple Watch Ultra, which offers a variety of health, fitness, communication,



Figure 08, 09: Levi's Commuter Trucker Jacket



and entertainment features in a fashionable and practical package, represents an overall significant advancement in the field of smartwatches (“Apple Watch Ultra”, n.d.; “Apple Watch Ultra: What You Need to Know”, 2022). It is anticipated that the product will be well-liked by both technology and fitness enthusiasts, making it a major competitor in the smartwatch market for years to come.

### The Levi’s Commuter Trucker Jacket

The Levi’s Commuter Trucker Jacket, a successful collaboration between a fashion brand and a technology company, was developed in partnership with Google’s Advanced Technology and Projects (ATAP) division, which created the Jacquard platform (ATAP, n.d.). Jacquard allows for the integration of technology into textiles and enabled the creation of innovative features in the Commuter Trucker Jacket designed for cyclists (ATAP, n.d.).

The jacket features touch-sensitive areas on the left cuff that allow wearers to control their music, answer phone calls, and receive directions from their phone without removing it from their pocket (ATAP, n.d.). This is made possible by Jacquard’s conductive yarn, woven into the fabric of the jacket, which is connected to a small tag attached to the cuff, communicating with the wearer’s phone via Bluetooth (ATAP, n.d.).

In addition to the touch-sensitive areas, the Commuter Trucker Jacket includes other features for cyclists, such as a dropped back hem for extra coverage, reflective accents for visibility, and a water-resistant coating for protection from the rain (ATAP, n.d.). The jacket’s functionality, combined with its style, demonstrates the potential for technology to enhance fashion and create products tailored to specific target audiences.



Figure 10, 11: The Suntex, Smart Textile, yarn by the Studio Pauline van Dongen

### 02.2.2 Smart Textiles

Smart textiles are a type of textile that uses electronic components and technology to perform a variety of functions, including sensing, monitoring, communication, and actuation. They are frequently designed to be wearables and can be used in a wide range of applications, including fashion and sportswear, as well as healthcare and industrial settings.

According to Horvath, Hoge, and Cameron's book "Fashion Tech," smart textiles are classified into three types: sensing textiles, actuating textiles, and communicating textiles. Sensing textiles detect and measure physical and environmental factors like temperature, humidity, and light. In response to a stimulus, actuating textiles use technology to produce a physical response, such as changing shape or colour. Wireless communication devices, such as Bluetooth or Wi-Fi, are used in communicating textiles to transmit data or connect with other devices.

Genova and Moriwaki's book "Fashion and Technology: A Guide to Materials and Applications" goes into greater detail about the various types of smart textiles and the technologies used to create them. According to the authors, smart textiles can include a variety of materials, ranging from conductive yarns and fibres to shape memory alloys and piezoelectric materials. They also emphasise the significance of integrating technology and textile design in the development of smart textiles, as well as providing examples of successful collaborations between textile designers and engineers.

Finally, smart textiles provide a plethora of exciting opportunities for designers, engineers, and consumers alike, and are expected to become more prevalent in the fashion and technology industries in the coming years.

To better understand smart textiles and their presence within the industry, it is important to know about these two case studies, The Levi's Commuter Trucker Jacket, presented in the previous chapter and the Suntex developed in collaboration with Tentech by Studio Pauline van Dongen.

### The Suntex

Suntex is a smart textile Studio Pauline van Dongen developed that integrates solar panels into textiles for architectural and wearable applications (van Dongen, 2021). The technology aims to enable energy harvesting in textiles, allowing users to generate electricity while on the move or within an architectural environment. The smart textile is designed with seamless integration of solar panels into the textile structure, allowing it to be flexible and adaptable to different shapes and forms.

The Suntex smart textile technology is the result of a collaboration between Studio Pauline van Dongen and Texfor, a manufacturer of technical textiles (Ha-



rwood, 2022). The textile is composed of a conductive textile substrate, on top of which a thin layer of photovoltaic cells is applied. The conductive textile allows for the transfer of electricity generated by the photovoltaic cells, which can then be stored or used to power devices.

Numerous architectural projects have used Suntext technology, including a Netherlands building's shading system (van Dongen, 2021). Suntext panels that are integrated into the building's facade make up the shading system, which provides shade for the interior spaces as well as the ability to generate energy. The panels are simply installed onto the building facade and are made to be self-supporting, which means they don't need any additional structural support. The technology has also been applied to wearable applications, such as a smart jacket that uses the Suntext textile to generate electricity (van Dongen, 2021).

The jacket is designed for outdoor enthusiasts, allowing them to generate electricity while hiking or camping. The Suntext technology allows for the jacket to be lightweight and flexible, making it comfortable to wear while also providing functionality.

Overall, the Suntext smart textile Studio Pauline van Dongen developed represents an innovative approach to integrating solar panels into textiles (Harwood, 2022). The technology has been applied to both architectural and wearable applications, showcasing its versatility and adaptability. As renewable energy becomes increasingly important, Suntext technology offers a unique solution for energy generation that is both functional and aesthetically pleasing.





Figure 12: Pearl Tears - AR filter accessory developed by The Fabricant Studio  
Figure 13, 14: Digital Manufacturing by The Fabricant Studio

### 02.2.3 Digital Manufacturing

“Digital manufacturing has grown in popularity in a variety of industries, including fashion and apparel, in recent years.” (Genova & Moriwaki, 2016) “The fashion industry has begun to adopt digital manufacturing processes to streamline production and create unique products with the advent of new digital technologies and the growing demand for customisation and personalization.” (Genova & Moriwaki, 2016)

“One of the most significant advantages of digital manufacturing is the ability to produce products on demand rather than relying on traditional mass production methods.” (Horvath et al., 2016) This allows fashion companies to create personalised, one-of-a-kind products for customers, which can increase sales and brand loyalty. Digital manufacturing allows fashion companies to reduce waste, lower costs, and increase efficiency because products can be produced quickly and with minimal waste. (Horvath et al., 2016)

“Another advantage of digital manufacturing is the ability to create intricate patterns and designs that would be difficult or impossible to produce using traditional manufacturing techniques.” (Horvath et al., 2016) With the help of automated tools such as digital cutting machines, 3D modelling software, and other tools, designers can easily create complex patterns and designs. (Horvath et al., 2016)

Ultimately, digital manufacturing is a promising new approach to fashion production that is expected to grow in popularity as more businesses adopt it. Fashion companies can create unique and innovative products that meet the needs and preferences of today’s consumers by leveraging the power of digital technologies.

To better understand digital manufacturing and its current presence within the industry, is important to know about these two case studies, The Fabricant, a digital fashion house founded in 2018 and Burberry x Minecraft, a collaboration that happened in 2020.

#### The Fabricant

The Fabricant is a digital fashion house that uses computer-generated imagery (CGI) and 3D design to create virtual clothing and experiences. Founded in 2018 by Kerry Murphy, Amber Jae Slooten, and Ronen Wasserman, the company aims to challenge the traditional fashion industry’s wastefulness and environmental impact through digital manufacturing (The Fabricant, n.d.).

The Fabricant’s use of digital manufacturing and CGI, “Computer Generated Imagery,” which refers to the use of computer software to create visual content such as images, animations, and special effects in films, video games, and other media, allowing for more sustainable production and eliminates the need for physical materials, reducing waste and carbon emissions (The Fabricant, n.d.).





Figure 15, 16, 17: Gamification and Digital Manufacturing by Burberry x Minecraft



Additionally, the virtual nature of their products allows for greater creative freedom and flexibility in design, without the limitations of physical materials and production processes. In 2021, The Fabricant raised \$4 million in seed funding, which will be used to develop their metaverse platform, which allows users to create, wear, and trade digital fashion and accessories in a virtual world (Vogue Singapore, 2021). This platform aims to revolutionize the fashion industry by providing a more sustainable and inclusive alternative to traditional manufacturing and consumption practices.

In conclusion, The Fabricant's innovative use of digital manufacturing and CGI has led to a more sustainable and creative approach to fashion design. Their success in collaborating with high-profile brands and selling virtual products has demonstrated the potential for virtual fashion to revolutionize the industry. The development of their metaverse platform signals a new era in fashion, where virtual experiences and products will play an increasingly important role in creating a more sustainable and inclusive future

### The Burberry x Minecraft

Burberry, the British luxury fashion house, has been at the forefront of digital innovation in the fashion industry. In addition to partnering with Unity Technologies to streamline its design process using digital manufacturing technology, Burberry has also teamed up with the popular game Minecraft to engage with a younger, tech-savvy audience.

Furthermore, as reported by Gustafsson (2021), Burberry has partnered with Minecraft to create a virtual world within the game that allows players to explore a virtual Burberry store and purchase digital versions of its products. This move has enabled the company to tap into the booming gaming market and connect with younger consumers who are increasingly interested in digital experiences. By partnering with Minecraft, Burberry has expanded its digital reach and established itself as an innovative and forward-thinking brand.

The fashion industry is changing rapidly, and technology is playing an increasingly important role in our lives," said Marco Gobbetti, CEO of Burberry, in a statement highlighting the significance of digitalization in the fashion sector (Burberry plc, 2020). Burberry has been able to stay ahead of the curve and keep its position as a leader in the fashion industry by adopting new technologies like digital manufacturing and gaming platforms.

In conclusion, Burberry has been able to streamline its design process, reduce waste, experiment with new materials, and engage a younger audience thanks to the use of digital manufacturing technology and partnerships with gaming companies like Minecraft. More businesses will probably follow Burberry's example and adopt digital manufacturing and other cutting-edge technologies as the fashion industry develops.



## Chapter 03.0

# The Importance of Culture

“Culture is the collective programming of the mind that distinguishes the members of one group or category of people from others” (Hofstede, 2011, p.3)

This chapter investigates various approaches to comprehending and analysing culture. It begins by considering Raymond Williams’ definition of culture as “a whole way of life,” which includes creative and intellectual pursuits and customs and values observed in daily life. Lastly, considers Vincent Miller’s understanding of culture as a dynamic and evolving process influenced by social and technological advancements.



### 03.1 Understanding Culture

Culture is a complex, multifaceted concept that can be viewed from different perspectives. According to Raymond Williams, culture can be understood as “a whole way of life” (McGuigan, 2019, p. 22). This includes not only artistic, literary and intellectual activities, but also the everyday practices, customs and beliefs of a given society or community. Culture shapes the way people think, feel and behave and is passed on from generation to generation through socialization and education.

Hofstede (2011) takes a more culturally specific approach and proposes a set of dimensions that can be used to compare and contrast different national cultures. These dimensions include power distance, individualism versus collectivism, masculinity versus femininity, uncertainty avoidance, and long-term versus short-term orientation. Each of these dimensions reflects a different aspect of cultural values and beliefs, such as the degree of hierarchy and inequality accepted in a society, the importance of individual autonomy versus group harmony, and the level of tolerance for ambiguity and risk.

According to Vincent Miller (2011), culture is not a fixed and static entity shaped by social and technological change, but a dynamic and evolving process. For example, the digital age has seen the emergence of new forms of cultural expression that transcend traditional boundaries between local and global culture, or high and low culture. Digital culture is characterized by high levels of engagement, collaboration, and innovation, as well as original expressions of identity, community, and expressions that violate social norms.

Despite its complexity and diversity, culture is an essential part of human existence, with a major impact on many different social, economic and political outcomes. A thorough understanding of various cultures, values, and practices is necessary for effective communication, collaboration, and conflict resolution in today’s globalised world. Hofstede (2011) asserts that “culture is more often a source of conflict than of synergy” (p. 5). However, it can also be a source of creativity, diversity, and enrichment if approached with openness and respect.

In conclusion, culture is a dynamic and multifaceted concept that encompasses a range of social, cognitive, and symbolic practices. Culture reveals the ingrained beliefs, values, and norms that influence how people behave and interact, whether it is examined through the lenses of anthropology, sociology, psychology, or other fields. Understanding and appreciating various cultures is more crucial than ever in a world that is changing quickly because it enables us to forge bridges of understanding and cooperation between various contexts and communities.



## 04.0

# Material Culture

Material is a word we associate with base and pragmatic things; culture is a word we associate with lofty, intellectual, abstract things.

Material culture is the study through artifacts of the beliefs-values, ideas, attitudes, and assumptions-of a particular community or society at a given time. This study is based upon the obvious fact that the existence of a man-made object is concrete evidence of the presence of a human intelligence operating at the time of fabrication. (Prown, 1982, p. 2)

This chapter will explain the definition of Material culture, its value and the its current state.





## 04.1 Understanding Material Culture

Material culture refers to the physical objects that humans create, use, and value in their daily lives, such as clothing, tools, art, and architecture. According to Prown (1982), material culture is a reflection of the values, beliefs, and behaviours of society, as well as a means of transmitting cultural knowledge and communicating social meaning.

Prown (1982) argues that material objects are not simply utilitarian tools, but rather are complex systems of signs and symbols that convey cultural significance. Material objects can be understood as a language that conveys messages about social status, identity, and cultural values. For example, clothing can communicate information about occupation, and social class, while architecture can communicate information about power, authority, and cultural identity.

Material culture is also a means of preserving cultural memory and transmitting knowledge across generations. Prown (1982) notes that objects serve as “repositories of cultural memory” (p. 8), allowing individuals and societies to maintain a sense of continuity and connection to the past. Family heirlooms, for example, are physical objects that are passed down from generation to generation and serve as a link to ancestral traditions and cultural heritage.

Finally, material culture can be a source of inspiration for creativity and innovation. Prown (1982) suggests that objects can provide a basis for new designs, ideas, and inventions. By studying the forms, materials, and techniques used in past objects, artists, designers, and inventors can develop new and innovative approaches.

In conclusion, material culture is a fundamental aspect of human society, serving as a means of communicating social meaning, preserving cultural memory, and inspiring creativity and innovation. Material objects are not simply functional tools but are complex systems of signs and symbols that reflect and shape cultural values and beliefs.

## 04.2 The Value of Matter

“The most obvious cultural belief associated with material objects has to do with value” (Prown, 1982)

Material culture refers to the material objects that humans create, use, and value, including everything from clothing and tools to architecture and art. According to Prown (1982), material culture can be understood as a system of signs and symbols that reflect and shape social values, beliefs, and behavior.

One of the values of material culture is its ability to convey meaning and communicate ideas. As Prown (1982) pointed out, “material objects... are potent commu-

nicators of cultural meanings and values” (Prown, 1982, p. 7). Because the physical properties of an object, such as its shape, color, and texture, can convey information about its use, meaning, and cultural context. For example, traditional Native American headdresses communicated not only the wearer’s social status and tribal affiliation, but also their spiritual beliefs and connection to the natural world.

Another value of material culture is its ability to convey a sense of continuity and connection to the past. Prown (1982) argued that material objects serve as “stores of cultural memory” (Prown, 1982, p. 8) and can help individuals and societies maintain a sense of identity and tradition over time. For example, family heirlooms such as wedding rings passed down from generation to generation can help individuals feel connected to their ancestors and cultural heritage.

A third value of material culture is its potential to inspire creativity and innovation. Prown (1982) suggested that objects can serve as a source of inspiration for artists, designers, and inventors who can use shapes, materials, and techniques from previous objects to create new and innovative designs. Mid-century modern furniture, for example, was inspired by the streamlined shapes and innovative materials used in industrial design at the time.

By studying the value of objects, Prown seeks to move beyond traditional approaches to the study of material culture, which tend to focus solely on the physical properties of objects. Instead, he emphasizes the importance of studying the cultural and symbolic meaning of objects, including how they are used, displayed, and perceived by their makers and users.

In summary, Prown’s study of material value is crucial to the study of material culture. Prown’s approach goes beyond traditional object analysis, emphasizing the value of examining the cultural and symbolic meaning of objects to gain a more thorough understanding of material culture. Emphasizes the meaning and considerations of the context in which objects are made and used to provide insightful information about the societies that made and used them. The Value of Matter continues to be a useful framework for academics seeking to comprehend material culture and its importance in the modern world.

### 04.3 Current View of Material Culture

A crucial component of human societies, material culture includes the tangible items made by individuals and groups that have special cultural meaning. Studying objects and their cultural connotations, how they are produced, consumed, and circulated, as well as the social, political, and economic contexts in which they are found, are all part of the interdisciplinary field of material culture. The book “Cultural Heritage and the Future” by Cornelius Holtorf and Anders Högberg and the article “State of the Field: Material Culture” by Serena Dyer both provide insightful analyses of the state of material culture today.

Material culture, according to Dyer (2019), is constantly changing and expanding, incorporating new theoretical approaches and methodologies that reflect the changing nature of human societies. She has noticed an increase in interest in the study of global material culture, particularly cultural exchange between different parts of the world. Furthermore, Dyer emphasises that contemporary material culture studies are increasingly focusing on the creation and consumption of digital objects and virtual spaces.

According to Holtorf and Högberg (2018), the study of material culture has practical implications for the preservation and conservation of cultural heritage in addition to being a purely academic endeavour. They contend that contemporary objects and practices will be valued and preserved in specific ways and that the material culture of the present is an important component of the cultural heritage of the future. Furthermore, they assert that because it promotes a critical assessment of our interactions with the material world, the study of material culture can contribute to more general discussions of sustainability.

The works of Dyer and Holtorf and Högberg provide valuable insights into the current state of material culture and stress the importance of interdisciplinary collaboration in its study. The study of material culture not only contributes to academic pursuits but also has practical implications for the preservation and conservation of cultural heritage and broader discussions of sustainability. Overall, the study of material culture plays a crucial role in understanding our relationships with the material world and preserving our cultural heritage for future generations.

In conclusion, material culture is a critical aspect of human societies that encompasses physical objects and their cultural significance. The study of material culture is an interdisciplinary field that involves examining objects, their meanings, production, consumption, and circulation, and the social, political, and economic contexts in which they exist.

### 04.3.1 Challenges and Opportunities

According to Holtorf and Högberg's (2018) book, "Cultural Heritage and the Future," the study and preservation of material culture face numerous challenges and opportunities in today's world. One significant challenge is the rapid pace of technological advancement, which has led to the creation of digital objects and virtual spaces. As Holtorf and Högberg (2018, p. 7) note, "digital objects and virtual spaces have become an integral part of contemporary material culture, and their production, consumption, and preservation pose new challenges for heritage professionals."

Another challenge is the increasing global interconnectedness of societies, which has led to the exchange of cultural practices and objects across borders. Holtorf and Högberg (2018, p. 6) state that “the globalization of cultural exchange poses new challenges for the preservation and interpretation of cultural heritage,” as it requires a deeper understanding of the diverse cultural contexts in which objects are produced and consumed.

However, these challenges also present opportunities for the study and preservation of material culture. For instance, the increasing digitization of material culture has made it possible to preserve and share cultural heritage with a broader audience. According to Holtorf and Högberg (2018, p. 10), “digital technologies offer new opportunities for the dissemination and democratization of cultural heritage, allowing people from diverse backgrounds to engage with and learn about different cultures.”

Moreover, the study of material culture can contribute to broader discussions of sustainability and environmentalism. Holtorf and Högberg (2018, p. 11) argue that “the examination of material culture can encourage critical reflection on our relationships with the material world and promote sustainable practices that benefit both present and future generations.”

In conclusion, the study and preservation of material culture face both challenges and opportunities in today’s world. The rapid pace of technological advancement and increasing global interconnectedness of societies present new challenges for heritage professionals. However, digitization and the exchange of cultural practices also offer opportunities to preserve and share cultural heritage with a broader audience. Moreover, the study of material culture can contribute to discussions of sustainability and environmentalism, promoting sustainable practices for future generations. As such, heritage professionals must adapt to these challenges and seize the opportunities presented by contemporary material culture.





05.0

# Consumer Engagement

“the process of encouraging people to be interested in a company and its products or services” (Hornby & Lea, Oxford Advanced Learner’s Dictionary of current English 2020)

Consumer engagement has emerged as a critical marketing concept. It refers to consumers’ level of interaction and connection with brands, products, or services. In today’s digital age, social media platforms have emerged as powerful tools for marketers to engage with consumers in a more personalised and interactive manner. On the other hand, is a multifaceted concept influenced by multiple factors such as cultural differences and social norms.

In this context, this chapter investigates the concept of consumer engagement and its relationship to social media, cultural factors, and consumer culture. It will also consider the implications of these factors for marketers and how they can engage with customers effectively to achieve business success.





## 05.1 Understanding Consumer Engagement

The level of interaction and connection between consumers and brands, products, or services is referred to as consumer engagement. This concept is critical for marketers who want to establish long-term relationships with their customers and achieve business success.

According to Bianchi (2015), social media platforms offer marketers a unique opportunity to engage with consumers in a more personalised and interactive manner. Consumers can use social media to share their thoughts, experiences, and recommendations with a larger audience, potentially reaching people who would not have heard of the product or service otherwise. One of the primary benefits of using social media as a tool for consumer engagement is that it enables two-way communication between brands and consumers. Brands can respond to consumer feedback, address concerns, and cultivate customer relationships. This level of interaction and responsiveness can lead to increased consumer trust and loyalty.

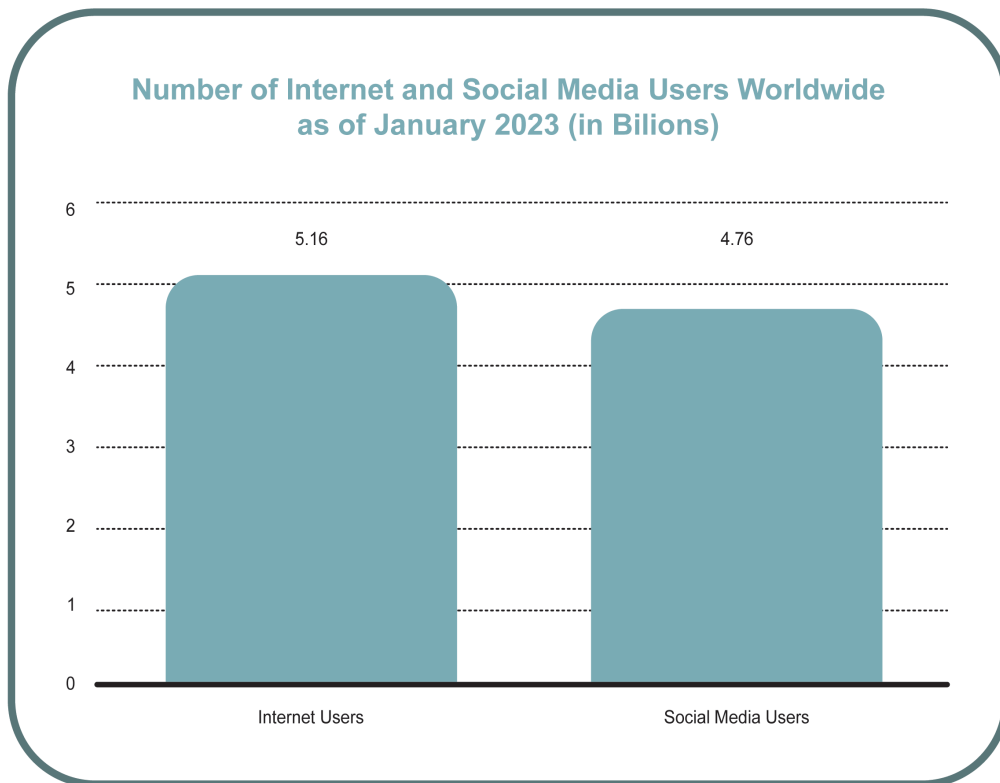


Figure 18: Number of Internet and Social Media Users Worldwide; Worldwide; DataReportal; January 2023 Information sourced from Statista 2023

## Literature Review - Consumer Engagement

Furthermore, social media allows brands to showcase their personality and values, allowing customers to connect with them on a more emotional level. Brands can increase the likelihood of eWOM by creating engaging and shareable content that appeals to consumers' desire for entertainment and social connection. eWOM stands for the electronic word of mouth, which refers to the sharing of opinions, experiences, and recommendations about products and services through digital platforms such as social media, review websites, blogs, and forums. eWOM can have a significant impact on consumer behaviour, as people tend to trust the opinions of their peers more than traditional advertising or promotional messages.

However, it is important to note that consumer engagement through social media can also have negative consequences. Negative feedback or reviews can quickly spread through social media, potentially damaging a brand's reputation. Therefore, marketers must monitor and respond to consumer feedback in a timely and appropriate manner.

Overall, social media provides a powerful tool for consumer engagement through eWOM. By creating engaging content and fostering two-way communication with consumers, brands can build strong relationships with their customers and drive business success.

De Mooij (2018) emphasises the importance of cultural factors in understanding consumer engagement and behaviour. Cultural differences between countries can have a significant impact on consumers' attitudes towards brands and products, as well as their decision-making processes. Individualistic cultures, for example, prioritise personal freedom and autonomy, whereas collectivistic cultures value group harmony and conformity. These cultural differences can influence how consumers perceive and respond to marketing messages.

Furthermore, cultural differences can impact the effectiveness of marketing strategies. To effectively engage with consumers, marketers must understand and adapt to cultural differences. For example, in some cultures, direct and explicit advertising messages may be more effective, whereas, in others, more subtle and indirect messaging may be required.

Ultimately, cultural factors influence consumer engagement and behaviour. Marketers must consider cultural differences when developing marketing strategies and engaging with customers. Marketers can build stronger relationships with their customers and achieve business success by understanding and adapting to cultural differences.

According to Arnould and Thompson (2005). Consumer culture is the result of societal norms, values, and practices, and it influences how people interact with products, services, and brands. Consumer culture is not a static concept; it evolves and is influenced by a variety of factors such as technology, globalisation, and social movements.

Understanding the diverse and dynamic nature of consumer identities is one of the key implications of consumer culture for marketers. Consumer identities are fluid and shaped by a variety of social, cultural, and personal factors. Marketers must consider these multiple and fluid identities when engaging with customers, and they must recognise the importance of cultural diversity and inclusion in their marketing strategies.

Moreover, consumer culture influences consumer expectations and preferences for goods and services. Customers frequently seek products and services that reflect their values and beliefs, and they expect brands to reflect these values in their marketing messages and practices. Marketers must understand the cultural meanings and symbols associated with various products and services to build authentic and meaningful relationships with consumers.

Finally, Arnould and Thompson (2005) claim that consumer engagement is a product of consumer culture and that to build meaningful relationships with customers, marketers must understand the complex and dynamic nature of consumer culture. Recognizing the importance of cultural diversity and inclusion, as well as understanding the cultural meanings and symbols associated with various products and services, allows marketers to engage with consumers more effectively and achieve business success.

To summarise, consumer engagement is a critical concept for marketers seeking to develop strong relationships with their customers while also achieving business success. Social media platforms offer unparalleled opportunities for two-way communication, eWOM, and displaying brand personality and values. Marketers, on the other hand, must be aware of the potential negative consequences of social media participation and monitor and respond to feedback appropriately. To effectively engage customers, marketers must adapt their strategies to cultural differences. Recognizing the importance of cultural diversity and inclusion, as well as understanding the cultural meanings and symbols associated with various products and services, allows marketers to engage customers more effectively and achieve business success.

### 05.2 Consumer Typology

Understanding consumer behaviour is a critical aspect of marketing, and identifying different types of consumers is essential for developing effective marketing strategies.

The concept of consumer typology refers to the classification of consumers into distinct groups based on their behaviours, attitudes, and values towards products or services. In this regard, several researchers have proposed different typologies to categorize consumers based on various characteristics.

## Literature Review - Consumer Engagement

One such typology was proposed by de Mooij (2019), who identified six different types of consumers based on their cultural orientations. These include the individualist consumer, the collectivist consumer, the low-context consumer, the high-context consumer, the monochronic consumer, and the polychronic consumer.

The individualist consumer values independence and personal preferences, whereas the collectivist consumer values group harmony and conformity. The low-context consumer prefers explicit information, whereas the high-context consumer relies on implicit messages and nonverbal cues. The monochronic consumer prioritizes time management, while the polychronic consumer is more flexible with time.

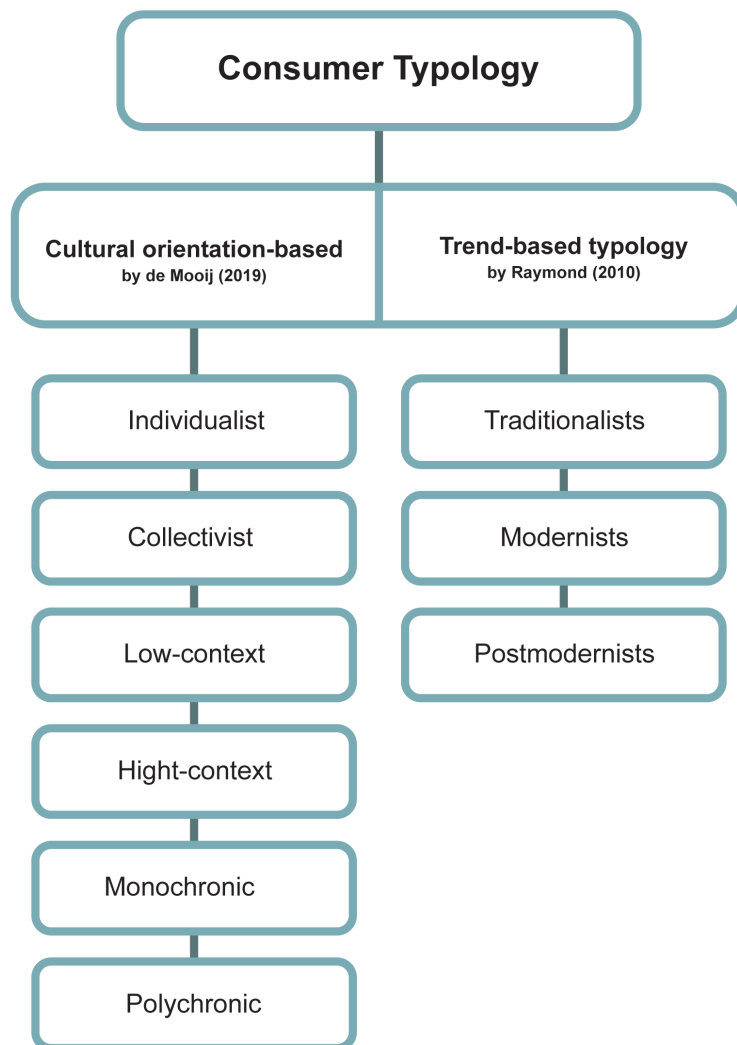


Figure 19: Consumer typology by Mooji and Raymond

Another approach to consumer typology was proposed by Raymond (2010), who focuses on consumer trends and tribes. He identified three different types of consumer tribes, including Traditionalists, Modernists, and Postmodernists. Traditionalists value tradition, history, and heritage, whereas Modernists value innovation, progress, and novelty. Postmodernists reject traditional norms and value diversity, irony, and self-expression.

Both de Mooij and Raymond's typologies provide valuable insights into understanding different types of consumers, which can inform the development of marketing strategies that target specific consumer groups. By tailoring marketing messages and products to the needs and preferences of different consumer types, businesses can increase the effectiveness of their marketing campaigns and improve their overall performance.

In conclusion, consumer typology is a critical concept in marketing that helps businesses understand the behaviours, attitudes, and values of different consumer groups. By identifying and categorizing different types of consumers, marketers can develop targeted marketing strategies that resonate with specific consumer groups.

### 05.3 Consumption

Consumption is a ubiquitous feature of modern society, and it is frequently regarded as a key driver of economic growth and social progress (Warde, 2014). Consumption, on the other hand, is a deeply social and cultural phenomenon with important implications for identity formation, social inequality, and political power, as Alan Warde argues in "Consumption: A Sociological Analysis" (Warde, 2014).

Warde contends that consumption is shaped by larger social and cultural forces rather than individual choice and preference. Advertising, media, and social norms are among the forces that influence what we consume, how much we consume, and how we consume it (Warde, 2014).

Advertising is one of the most powerful forces influencing consumer behaviour. It promotes specific products and lifestyles, as well as creates consumer desires and aspirations (Warde, 2014). Companies create brand identities and images that appeal to specific segments of the population through advertising. These images are frequently associated with social standing, cultural values, and personal identity.

The media also has a significant impact on consumer behaviour. Product placements and endorsements are frequently featured in television shows, movies, and magazines, and they can influence what we buy and how we use products (Warde, 2014). As influencers and celebrities use their platforms to promote products and lifestyles to their followers, social media has emerged as a powerful force in shaping consumption (Warde, 2014).

Consumption practices are also influenced by social norms. Cultural expectations about appropriate behaviour, as well as social pressures to conform to certain standards of dress, behaviour, and consumption, are examples of these norms. Wearing revealing clothing, for example, is considered inappropriate in some cultures, while it is seen as a sign of confidence and empowerment in others (Warde, 2014). The products we consume frequently reflect our social status, cultural values, and personal identities, so consumption and identity formation are closely related (Warde, 2014). This connection between consumption and identity is especially strong among young people, who use fashion and music to build their identities and express their uniqueness (Warde, 2014).

However, the connection between consumption and identity is not simple. Consumers, as Warde points out, are not passive recipients of cultural messages; rather, they actively interpret and negotiate the meanings of the products they buy (Warde, 2014). Consumers may use products to construct their identities, but they may also use their purchasing habits to reject or subvert dominant cultural messages. Consumption practices are also closely linked to social inequality (Warde, 2014).

Consumption is not a universal phenomenon but is shaped by social class, gender, and ethnicity. People from different social backgrounds have different access to resources, and therefore different patterns of consumption (Warde, 2014). For example, people from higher social classes may have more disposable income to spend on luxury goods and experiences, while those from lower social classes may prioritize spending on necessities such as food, housing, and healthcare (Warde, 2014). Gender also plays a role in consumption patterns, as men and women are often targeted differently by advertisers and have different expectations placed upon them in terms of dress and behaviour. Ethnicity also influences consumption practices, as cultural traditions and values may shape preferences for certain products and experiences (Warde, 2014).

In conclusion, Consumption is not just a matter of personal choice but has important political implications (Warde, 2014). Consumption patterns can reflect and reinforce power imbalances in society. For example, companies may exploit workers and resources to produce cheap goods for mass consumption, contributing to global inequality and environmental degradation (Warde, 2014).

### 05.4 The Consumer of Today

The fashion industry is renowned for its dynamism, characterized by frequent changes in trends and styles. In this vein, the evolution of the fashion industry is attributed to the shifting preferences and needs of consumers. In particular, The Business of Fashion's (BOF) State of Fashion 2023 report identifies five key values and interests that are increasingly important to fashion industry consumers.

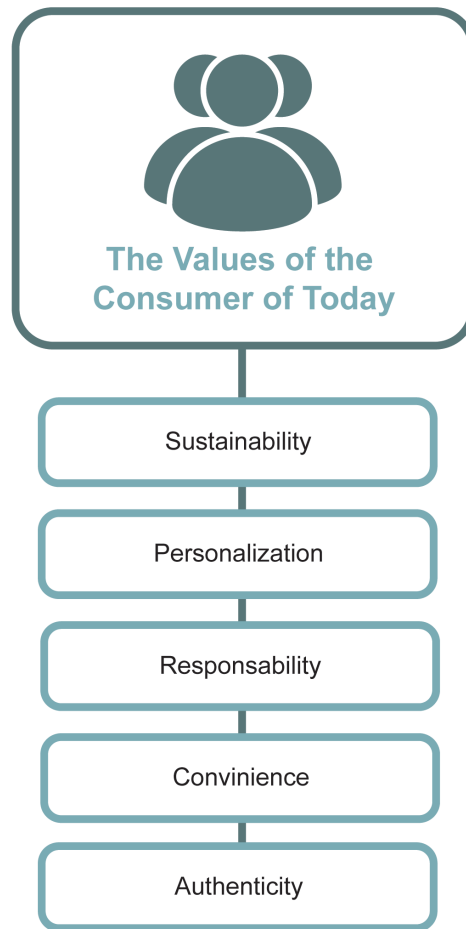


Figure 20: The five most important values and interests of fashion industry consumers.

The first of these values is sustainability, reflecting consumers' growing concerns regarding the ecological footprint of the fashion industry. Consumers are increasingly seeking brands that prioritize sustainable and eco-friendly practices, such as utilizing recycled or organic materials, minimizing waste and emissions, and guaranteeing ethical labour practices.

The second value is personalization, indicating consumers' aspirations for tailored experiences that cater to their unique preferences and tastes. This includes customized product offerings, personalized recommendations, and interactive shopping experiences.

The third value is social responsibility, indicating consumers' interest in brands that demonstrate a commitment to social responsibility by supporting local communities and charitable causes and promoting diversity and inclusivity in their marketing and hiring practices.

## Literature Review - Consumer Engagement

The fourth value is convenience, reflecting consumers' preference for swift and effortless shopping experiences. This includes fast shipping and delivery options, seamless online and offline shopping experiences, and convenient return policies.

The fifth value is authenticity, signalling consumers' inclination towards authentic and transparent brands that exhibit honesty and openness in their practices and messaging. Showcasing genuine individuals and narratives behind the brand and being upfront and transparent about the brand's values and business practices.

In sum, BOF's report identifies the values and interests that hold significant importance to fashion industry consumers. These values and interests are anticipated to remain crucial in the coming years, and brands that can fulfil these needs are more likely to engender customer engagement and retention. Therefore, the fashion industry must remain agile and adapt to the evolving preferences of consumers to remain competitive and relevant.







**PART II**  
**CLOSING THE FOCUS**



06.0

# Fashion-tech Meets Material Culture

“Fashion, like culture, is both an embodied social process and a material practice. Both fashion and culture simultaneously undergo continual change and continuity.” (Kaiser and Green, 2021)

According to Kaiser and Green (2012) in their book *Fashion and Cultural Studies*, the fashion industry cannot be understood separately from the culture industry as they are mutually constitutive and interconnected. The fashion industry contributes to the production and circulation of cultural values and meanings, while the culture industry provides a context for it.

By explaining the current scenario and presenting existing case studies, this chapter provides insight and information about the benefits and potential drawbacks of this interrelationship.



Figure 21, 22, 23: The exhibition "From Pattern to Polygon" at the Centraal Museum in Utrecht, Netherlands.

### 06.1 The Present Scenario

As stated in the literature review, Fashion-Tech is more than just a combination of fashion and technology; it is a tool that provides new experiences to customers and creates one-of-a-kind and personalised products that reflect their customers' preferences and styles. Material Culture is the preservation of cultural memory which leads to creativity and innovation, allowing individuals and societies to maintain a sense of continuity and connection to the past. Consumer Engagement is an important concept for marketers who want to build strong relationships with their customers while also succeeding in business.

In order to understand the current state of this interrelationship, it is necessary to learn the case studies that have implemented Fashion-tech and Material Culture in their brand. However, the truth is that only the Central Museum in Utrecht, Netherlands, has fully implemented fashion-tech and material culture. This number may rise surprise and a few questions, such as why isn't this strategy being used by others?; why is the fashion industry only implementing fashion-tech and not implementing Material Culture?; Are there high risks resulting from the implementation of these tools? Before addressing these issues, it is important to understand and learn from the case study, understanding not only the creative process but also the concept behind it and the results obtained.

#### From Pattern to Polygon

From Pattern to Polygon at the Centraal Museum, was an exhibition that pushed the boundaries of both, Fashion-Tech and Material Culture. Developed by the Studio PMS, an Utrecht-based fashion collective composed by Puck Martens, Merle Kroezen and Suzanne Mulder. The exhibition's goal was to open the conversation about what opportunities can digital techniques bring to cultural collections and craftsmanship.

This exhibition was divided into three parts. Behind the Scenes, Step by Step and Adaptable. Divided into three distinct parts, the exhibition provided visitors with an immersive experience that showcased the design process behind the project, digitalized historical pieces, and a digital fashion archive resulting from collaborations between Studio PMS and other designers.

The first part of the exhibition, titled "Behind the Scenes," was a fascinating glimpse into the design process behind the project. Visitors were able to see how the designers at Studio PMS worked, from the initial concept stage to the final product. The interactive exhibit allowed visitors to engage with the design process, ask questions, and get a better understanding of the complex and creative work that goes into creating digital fashion.

The second part of the exhibition, "Step by Step," was a digitalized presentation of numerous historical pieces. These pieces were brought to life in the digital



## Closing the Focus -Tech Meets Material Culture

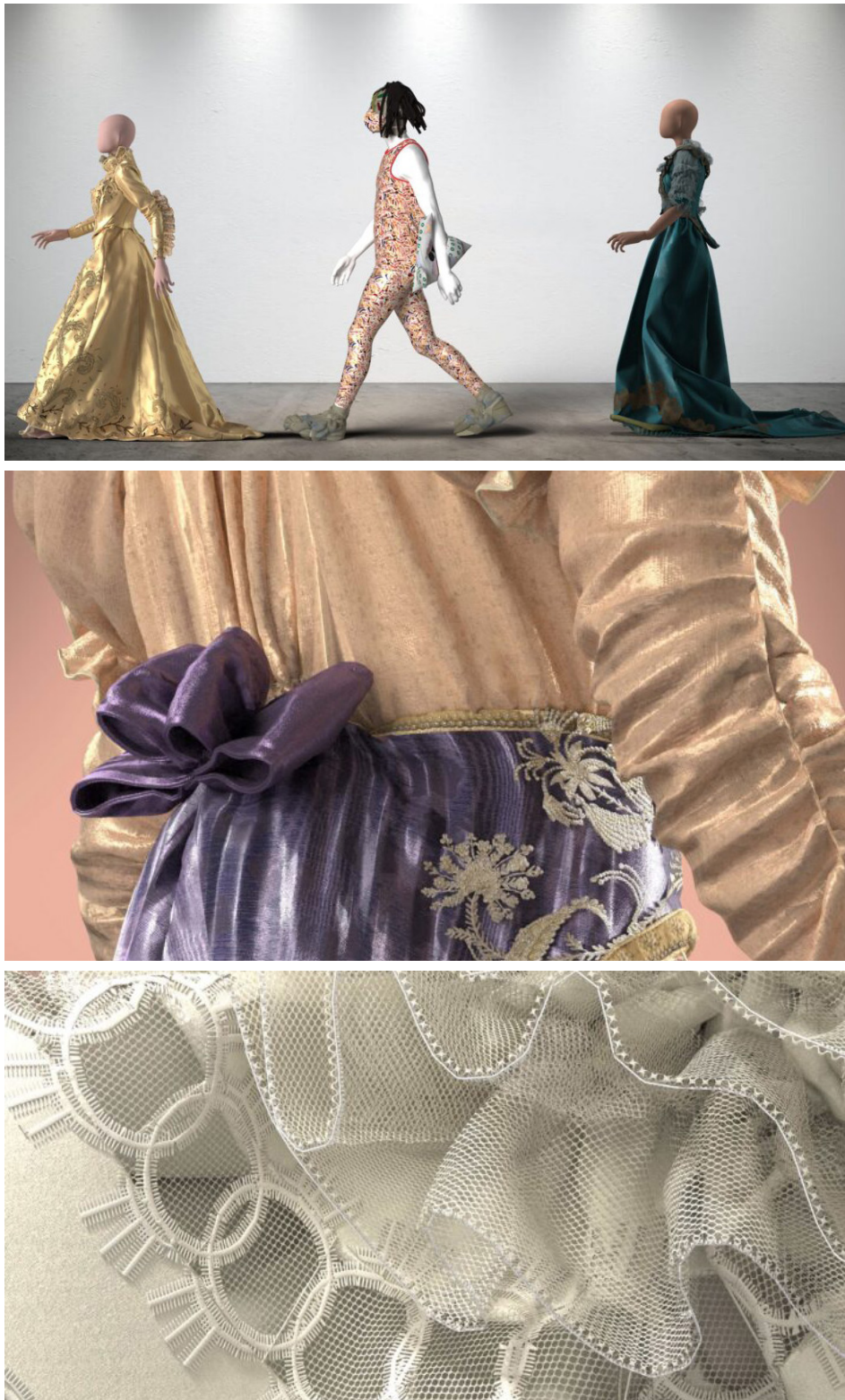


Figure 24, 25, 26: Digital Manufacturing garments at the exhibition From Pattern to Polygon, developed by Studio PMS.



## Closing the Focus - Fashion-Tech Meets Material Culture

world, allowing visitors to see them in a new and innovative way. The exhibit was a true testament to the power of technology, showcasing how it can be used to bridge the gap between the past and present. By digitally preserving historical pieces, the exhibition offered a unique perspective on the evolution of fashion and design.

The third and final part of the exhibition, “Adaptable,” showcased the collaboration between Studio PMS and other designers. These collaborations resulted in the creation of the first-ever Dutch digital fashion archive. This archive is a testament to the importance of collaboration in the fashion industry, showcasing how designers can come together to create something truly innovative and groundbreaking.

Overall, the “From Pattern to Polygon” exhibition was a thought-provoking and inspiring exploration of the intersection between fashion, history, and technology. The cultural side of the exhibition is augmented, becoming more visually interesting, communicating progress and innovation to the spectator and, simultaneously, fashion is perceived as valuable, enlightened and full of meaning.

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As stated in the article “Get Ready for the Great Fashion Tech Acceleration” by Business of Fashion (2022) Technology is changing the game for fashion when it comes to consumer engagement. The article explains that brands are using technology to create more personalized experiences for their customers, including virtual try-on tools and augmented reality experiences. These tools are helping to bridge the gap between the physical and digital worlds, creating a more seamless and immersive shopping experience for consumers.

To conclude, most businesses are choosing technologies as a solo tool for consumer engagement. Technology provides a sense of convenience and personalization, by making it possible to connect with the consumer through many different omnichannel and optimizing those connections. However, with no cultural presence, this approach can't appeal to other values, such as authenticity, creating a superficial relationship with the consumer. Since most of the fashion industry is choosing technology, Fashion-tech will be a common and even an essential tool, businesses that will implement material culture will stand-out, creating the opportunity to represent history, heritage and values.



07.0

# The Scenario: The Costume Museum in Viana do Castelo

Viana do Castelo, a historic city full of tradition and memory. This northern Portuguese city is shaped by its rich culture and traditional crafts.

In this chapter, the scenario, where the empirical study will take place, will be presented. Its history, material culture, eventual technologies and its current consumer engagement, which will lead to the empirical study.

Closing the Focus - The Scenario



Figure 27: County of Viana do Castelo

Figure 28: Catalog of the Costume Museum made by Rui Carvalho

## 07.1 The Cultural Scenario

The Viana do Castelo's Costume Museum, which was integrated into the Portuguese Museum Network (in 2004), is a permanent, non-profit institution at the service of society and its development. Housed in a building built in Estado Novo, the museum is located in Praça da Republica and houses a collection of costumes and traditional jewellery, promoting, valuing and recovering a valuable county heritage and becoming a major icon of the Vianese identity. (Vareiro et al., 2020)

O Museu do Traje or The Costume Museum of Viana do Castelo is reflected as an institution part of the organisation of the Municipality of Viana do Castelo, remaining at the service of society and progress. In terms of its mission, this museum intends to materialise its cultural assets by valuing them through research, inventory, conservation, exhibition, and dissemination of Alto Minho and the municipality of Viana's cultural identity.

According to the "Costume Museum Regulations" (2005:1-2), in Chapter I-Provisions, Article 4: Objectives, the museum works on, pursuing a policy of aggregating cultural assets according to their disposition, giving logic, follow-up and enrichment of the respective collection, especially Costumes and the its accessories; developing an educational policy pointing to target audiences, namely with the general public school, with the aim of promoting greater affluence and knowledge of the collections; playing an active role, increasingly closer to the community, raising awareness of the museological reality and involving it in the process of enriching the museum's collections; and presenting the museum's history in its sociocultural context.

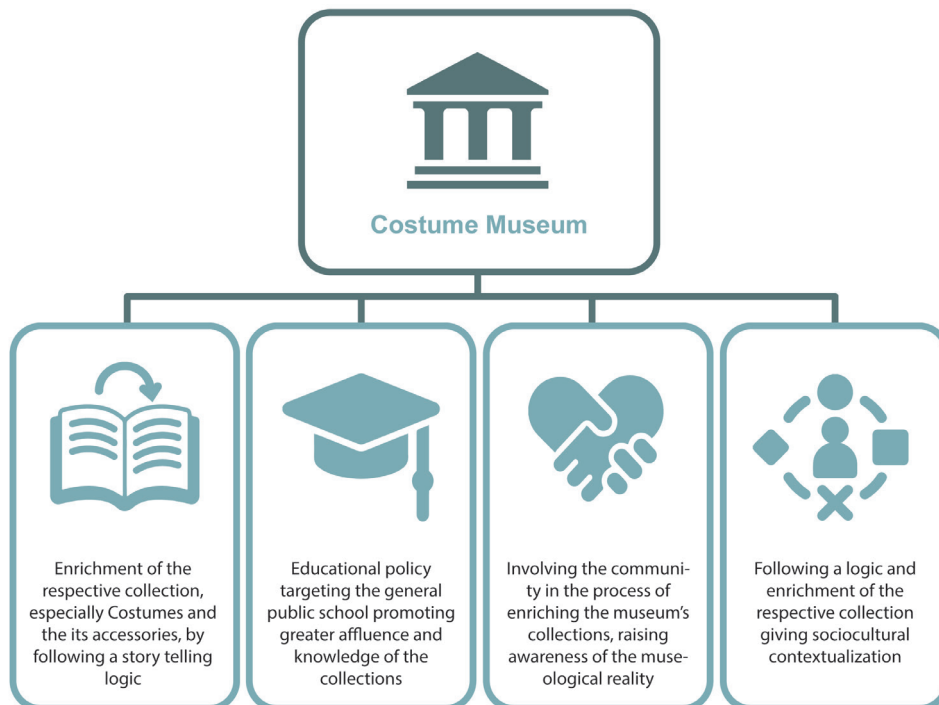


Figure 29: The mission of the Costume Museum





Figure 30: Main collection at the Costume Museum

Figure 31: Traditional Scarf the Costume of Viana do Castelo

### 07.1.1 The Local Material Culture

The museum's main collection consists of a set of popular rural costumes from the municipality of Viana do Castelo (namely Sunday, party, work, pity, and bride) that translate a unique culture identified with Alto Minho through their originality, creativity, and diversity of techniques and raw materials used in their production.

According to Cláudio Basto, author of the book "Traje à Vianesa" (1930), the general form of the Costume à Vianesa consists of a

short skirt (around the ankle), with vertical stripes, with a full circle, finely pleated at the waist, with a wide hem which they call "lining", an apron also creased at the top, white shirt with long sleeve; cropped vest that does not go down till the waist; scarf crossed on the chest and tightened at the back; scarf pierced over the back of the neck and tied at the top of the head; pocket in shape of a heart, visible between the skirt and the apron; white socks, handmade; slippers. (Ramos & Pires, 2017, p.29)

When one speaks on the Vianese Costume is referring to what is still more commonly known as Traje à Lavradeira or Festa, depending on the parishes of Viana do Castelo. These differences are approved by the respective folkloric and ethnographic groups that emerged from the 1920s. Because of the multitude of elements that the Vianese Costumes olds, not every piece will be presented. (Ramos & Pires, 2017)

### The Scarf

The scarves used in the Viennese costume are made of fine wool with branches and have long fringes, also made of wool and produced manually. They are worn both on the head and traced over the chest. These scarves are of exclusively industrial production and are known as "Austrian scarves". Although Portuguese merchants imported them from Austria, they actually originate in the Russian town of Pavlovo Posad, where production is said to have started in 1795 in a factory in Bogorodskiy county that later changed its name to Pavlovo Posad. Although they appeared in Viana perhaps in the 70s of the 19th century, it was only after a few years that they gained the predominance they have maintained ever since. The taste for handkerchiefs conditioned and limited the expression of the shirt in the suit, as the handkerchiefs covered the embroideries on the shoulders and shoulder pads and even the embroideries on the vest. (Ramos & Pires, 2017)

Currently, similar old scarfs are available in Viana, but they are made of synthetic fibres and do not have the same detail and delicacy of design. The old handkerchiefs that appear at flea markets or antique shops are highly sought after and expensive. The chromatic adequacy of the scarf is very important in





Figure 32: Women dressed with the Vianese Costume, showing the Scarf, the Shirt and the Vest

Figure 33: Shoulder embroidery on the Vianese Costume Shirt



relation to the other pieces of the costume, with scarves with a red background for the red costumes, a strong blue background for the blue costumes, a green background for Geraz do Lima's costume, orange and yellow on the Afife case and black, purple or dark blue background for the dark blue costume. (Ramos & Pires, 2017)

### The Shirt

The Vianesa Costume Shirt is decorated with embroidery in various parts of the garment. The embroidery is always monochrome and the use of strong blue predominates, but other colors are also accepted, such as white, light blue and green (in the case of Geraz do Lima). The embroidery thread corresponds to cotton thread, mercerized, nº 8. The typologies of the design must match the colors, with floral and vegetal designs for the strong blue and green cases, and small geometric organization designs in use white and light blue. (Ramos & Pires, 2017)

The cuffs of the *Camisa dos Trajes à Vianesa* are always embroidered and almost always finished with embroidery or small lace. The collar is always close to the neck and can be embroidered, but it may not even exist, being replaced by a round neckline finished off with a high buttonhole. The opening of the shirt is on the front and is also embroidered, and may or may not have a placket adorned with delicate lace. (Ramos & Pires, 2017)



Figure 34: The Back panel of the traditional Viennese Vest

Figure 35: Woman getting her Viennese Costume finalized, by having the Apron tied to her waist

### The Vest

The vest of the Vianesa costume is a short piece, which extends to the waist or a little above it. It is made from coloured woollen fabric, in shades such as red, blue or green, depending on the costume for which it is intended. The inside of the vest is lined with light cotton fabric. At the base of the vest, there is a black velvet bar or a dark colour, called a “rigour”. This bar rises in the centre of the back to provide more room for embroidery. The upper part of the hem is always underlined by an embroidered note that outlines and emphasizes it, made with narrow ribbons in a plain colour, feathered with braid, ribbon or sou-tache thread, beads and glass beads. (Ramos & Pires, 2017)

The bottom edge of the vest, close to the waist, is edged with the same colour as the hem or contrasting colour. In addition, the top part of the vest also has piping in master tape, in the same or contrasting colour. On the back of the vest, the top part is also embroidered, usually in white with small touches of colour. The neckline is wide and the vest closes with a ribbon or a silk cord that crosses between metallic eyelets, arranged in two rows, one on each side. (Ramos & Pires, 2017)

The vest’s embroidery is always done with floral motifs and may include the royal coat of arms in versions popularized in the 19th century. Nowadays, embroidery is mostly done with perlé cotton thread in bright colours and may include trimmings such as beads, beads or sequins. However, there are cases when embroidery is done almost entirely with coloured beads. The embroidered motifs are almost always the same, only the combination of colours in the various flowers that make up the design varies. The colours used are always vivid, including primary tones like yellow, blue and red, as well as secondary tones like sky blue, pink, orange, purple and various shades of green. (Ramos & Pires, 2017)





Figure 36: The Pocket of Viana do Castelo  
Figure 37: Woman wearing the Viennese Costume, showcasing the Apron and

### The Pocket

The pocket of Viana do Castelo is a traditional garment that is worn on the right side of the body, usually semi-covered by the apron. It is carved in red, blue, green or black flannel, with a “heart” shape. The “mouth” of the pocket is always made of black velvet and may have an interior pocket called the “secret”. The embroidery on the pocket is profusely decorated with beads, sequins and sometimes mercerized cotton thread, wool or natural silk thread. It is common to find words like “AMOR”, which means love or “VIANA”, letters or figures embroidered on the pocket. (Ramos & Pires, 2017)

The finish on the pocket is made with beadwork or ribbon embroidery, or with a reinforced ribbon. The top of the pocket is edged with *nastro* tape, which extends to the ties, which are used to tie it to the waist. It is an interchangeable piece, which means that it can be used interchangeably in all types of Vianese costumes, as long as the basic colour of the fabric in which it is made is respected. (Ramos & Pires, 2017)

### The Apron

The traditional apron part of the Vianese costume is an important element of traditional costume, made of natural wool or a mixture, woven in a manual loom and decorated with geometric or floral patterns, using pulls and strong colours. It is made of natural wool or a mixture, with a predominance of wool, woven in a manual loom. The apron features two different types of decoration, on the upper part with a striped pattern, and on the lower part, with a floral or geometric pattern embroidered in wool. The waistband of the apron is usually embroidered, with words such as *Amor*, *Viana*, initials, names or dates, as well as various motifs, such as royal crowns, crosses and flowers. (Ramos & Pires, 2017)



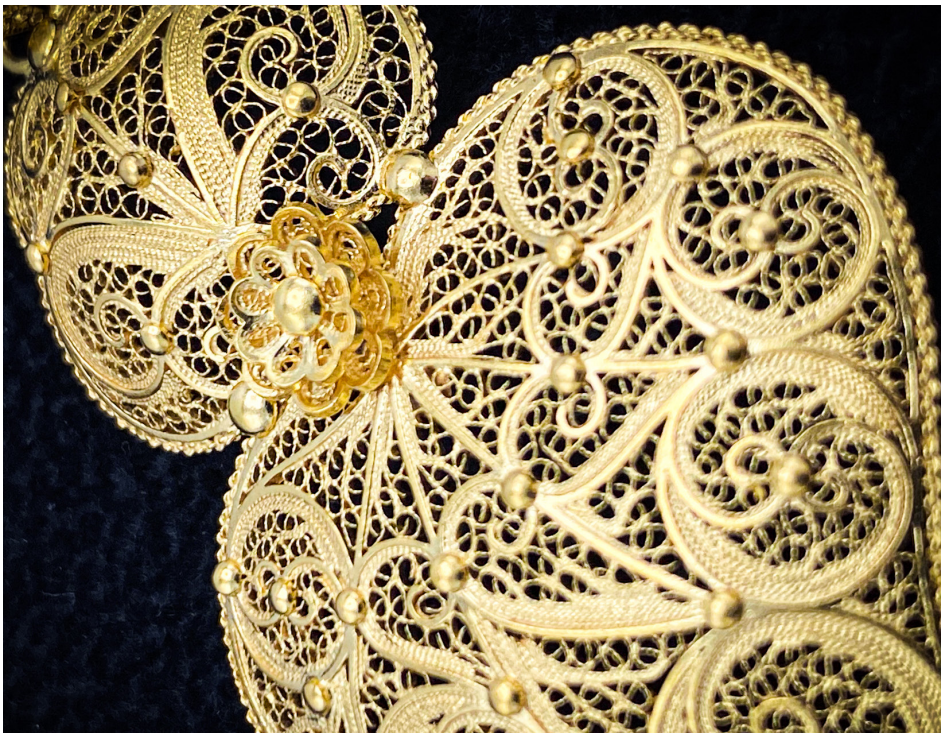


Figure 38: Woman proudly wearing her gold on top of the Vianese Costume  
Figure 39: The Heart of Viana, made of gold with the Filigree technique

### The Gold

According to the thesis “Museum and ethnography: construction of the local cultural identity of vianense: case study on the Museu do Traje de Viana do Castelo (Costume Museum of Viana do Castelo) “ by Inês Alexandra da Silva Pereira, the gold is appreciated as a noble metal, which over the centuries has been exploited, to be able to use for the construction of various pieces of jewellery and ornaments that have accompanied human evolution.

In the municipality of Viana, women bought filigree pieces to pledge when they lacked monetary liquidity, at critical times and when access to bank credit was not widespread in the villages. It is important to note that gold pieces were a synonym for savings and tradition, not only for the regime but also for Portuguese families, to preserve the economic and social value of the pieces that would be passed down from generation to generation as an inheritance. (Pereira, 2021) Of all the different pieces of jewellery worn in Viana, the Heart of Viana is the essential filigree piece, the one that embodies the culture of the county and the most common within the vianese families. (Pereira, 2021)



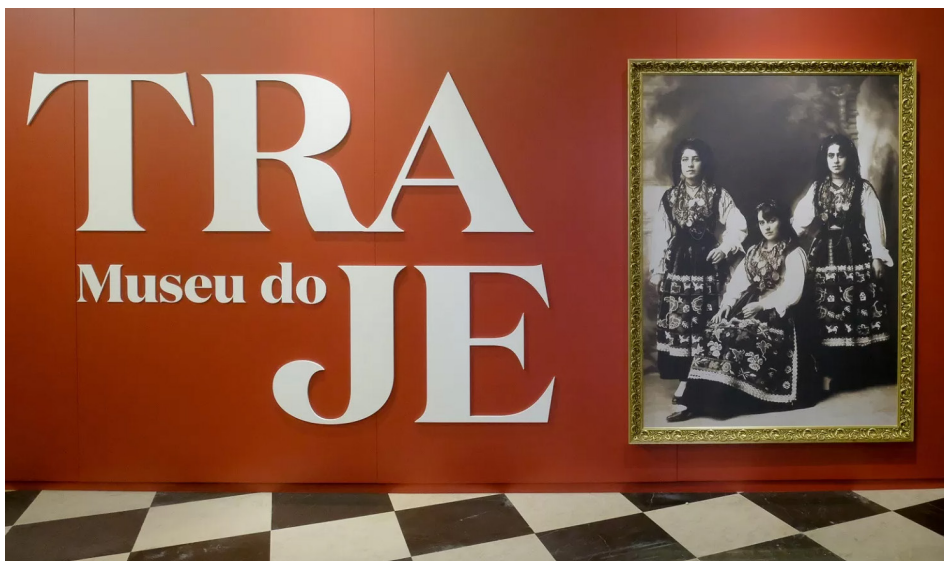


Figure 40: The Facade of the Costume Museum

Figure 41: One of the Panels, present in the costume exhibition



## 07.2 The Current Consumer Engagement Scenario

The Costume Museum is a cultural institution of great importance for the public interested in learning more about the history of the Viennese Costume. However, the lack of an adequate online presence can affect the museum's relationship with visitors and potential customers.

A study conducted by Vareiro, Bruno Barbosa Sousa and Sonia Sousa Silva revealed that most visitors of the Museu do Traje are children on study visits, mainly from elementary schools in the municipality of Viana do Castelo. This shows the importance of the museum as a source of learning and education for children but also highlights the need for a stronger marketing strategy to broaden the institution's reach.

The museum's accessibility suffers without a dedicated website and social media presence. Visitors from outside the region may struggle to find information about the museum. A well-organized website could provide details on collections, events, visiting hours, prices, and visitor-friendly tips.

In conclusion, investing in a stronger and more effective online presence would be an important way to improve the museum's accessibility and visibility, allowing the institution to reach a wider audience in addition to primary school study visits in the municipality of Viana do Castelo. The museum could expand its visitor base and potential customers with a more effective communication strategy and the use of digital platforms, increasing its cultural relevance and the financial support required to keep the institution running.



**PART III**  
**EMPIRICAL STUDY**



08.0

## The Proposal: Fashion-Tech and Material Culture as tools for consumer engagement, applied to the Costume Museum in Viana do Castelo

This final chapter proposes a framework for using fashion-tech and material culture as consumer engagement tools. Possible solutions are presented by exploring the potential implications of this approach. The Costume Museum in Viana do Castelo is used as an illustration of the framework in the empirical study.



## 08.1 Consumer Engagement Framework

According to the book *Customer Engagement Marketing* by Robert W. Palmatier, V. Kumar and Colleen M. Harmeling, “The initial relationship with the customer was restricted to purchases, ensuring long-term loyalty, and continued patronage. However, this has evolved with the developments in the marketplace based on the ever-evolving needs and interests of consumers.” (Palmatier et al., 2018, p.9) The relationship between consumers and businesses has changed dramatically. There is a growing trend towards developing a stronger bond between the two parties. Consumers want to feel connected with their favourite brands and businesses beyond just purchasing their products or services. They want to engage on a more personal level, sharing their experiences and providing feedback.

Despite this growing trend, there is still no clear conceptualisation of what consumer engagement means in academic literature. As such, this study seeks to fill this gap by creating a conceptual framework for consumer engagement, to better understand its key implications for both consumers and businesses.

*Ultimately, understanding how consumer engagement works can help unlock new opportunities for growth and innovation while also improving overall customer satisfaction levels – something that all businesses should strive towards if they wish to remain competitive in today’s ever-changing market landscape. (Bilro & Loureiro, 2020)*

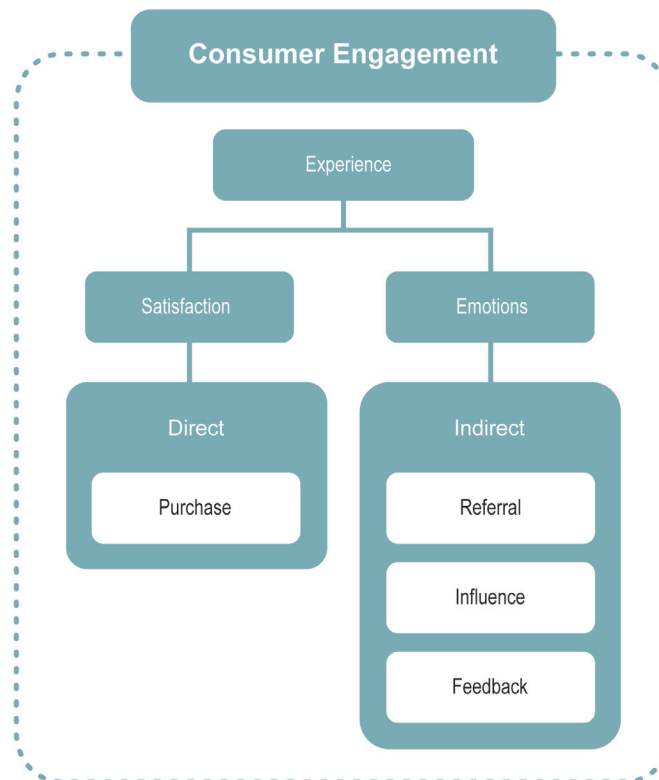


Figure 42: Consumer Engagement Framework

## 08.2 The Experience

As demonstrated in Figure 42, the consumer engagement framework relies on the experience given to the consumers. That experience will determine if the business is valuable enough to relate with its consumers and create a bond. After the experience, the consumer will feel either, what is called, Satisfaction, which will make them complete a purchase or will feel Emotions which will lead them to want to connect with the brand throughout the available platforms.

*In addition, rather than merely serving as a static diagram to connect components, the suggested framework should be a dynamic tool with a variety of variations and contexts. For example, consumers who act solely for a functional motive (such as purchasing) may find themselves enjoying the content created by the focal engagement object (i.e. product/brand), resulting in a higher expression of their behavioural engagement than those who act solely for a functional motive. (Bilro & Loureiro, 2020)*

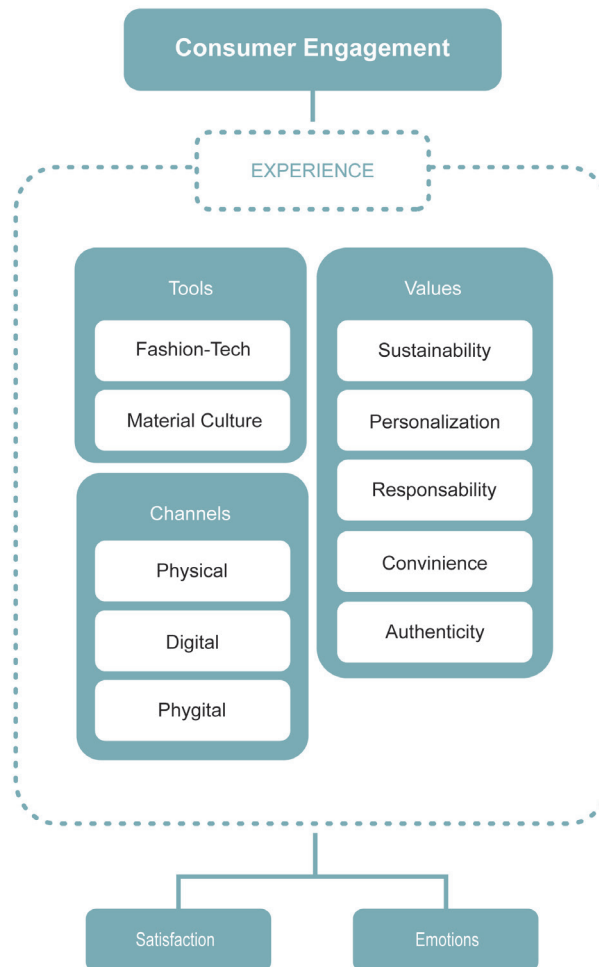


Figure 43: The Experience section of the Consumer Engagement Framework



## Empirical Study - The Proposal

Fashion-tech and Material Culture will be implemented in the experience section (as shown in Figure 43). These tools will collaborate with consumer values to create a better user experience. It is critical to understand which technology and material culture will be incorporated in order to create this experience, as well as what values will be transmitted through the experience. Depending on these choices, different processes, stages, investments, and tools may be required.

Designing a successful experience requires careful planning and consideration of various factors. The first step involves deciding on the channels of the experience, whether it will be physical, digital or phygital. This decision affects the use of technology and how it will be implemented to provide consumers with an immersive experience.

The second step is choosing consumer values that align with the brand's identity and mission. By identifying these values, businesses can set a clear path for creating an experience that resonates with their target audience. Following that, it is critical to choose Material Culture elements that will be incorporated into the design. Historical accuracy and precision are critical in this process because any misrepresentation can harm a company's reputation and consumer perception.

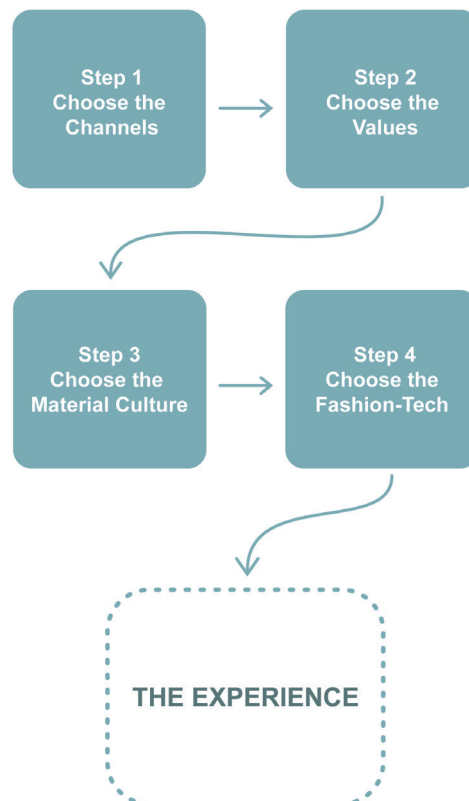


Figure 44: The four steps to build an Experience

## Empirical Study - The Proposal

Finally, understanding which technologies are available within budget constraints is essential in determining what tools can be applied to bring the vision to life. With all these steps considered thoughtfully, brands can create memorable experiences that connect with their customers on a deeper level.

Once the channels, consumer values, material culture elements and technologies have been identified, it is time to start designing the experience. This involves creating a storyboard or a blueprint of how the experience will unfold for the customer. It is important to consider every touchpoint in this process, from initial contact with the brand to post-purchase follow-up.

After completing the four steps, begins the building of the experience journey. This part can be overwhelming and confusing. To simplify the process, it is fundamental to complete a table with these categories: Channels, Consumer Actions, Experience Actions, and Support Processes. The different categories work together to help understand the necessary steps and tools for each part of the experience.

Starting with Channels, the different channels appear to divide the experience into multiple channels. Consumer Action is where every consumer action will be written; in other words, what is expected of the consumer throughout the experience. Experience Actions are what the experience provides to the consumer. For example, if a consumer sees an ad poster on the street, that poster is considered an Experience Action. The last category is Support Processes which includes all necessary equipment and technologies needed for each step of the experience. This helps ensure that everyone involved in creating and executing this project knows exactly what they need at each stage of development.

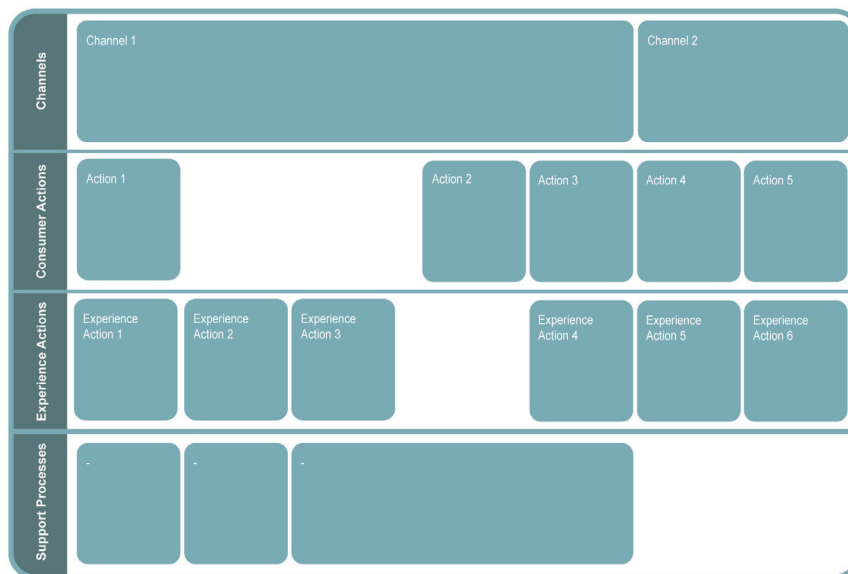


Figure 45: Frame of the Experience Journey

### 08.2.1 Possible Implications and Solutions

As part of my proposal on how to use fashion-tech and material culture as tools to improve consumer engagement, it is critical to consider both the positive outcomes but also the potential implications. Understanding the implications of each step and adhering to the appropriate rules are essential to preventing issues.

When it comes to creating an experience certain implications commonly apply to all of them. One such implication is the budget limit which can prove to be a significant constraint in terms of limiting the freedom and creativity needed to build an exceptional experience. However, when discussing technology in general, there still seems to be a stigma around it being expensive.

This notion often leads people to believe that they need large budgets and high-end equipment just to get started on their projects. But interestingly enough, this isn't always the case when it comes specifically to fashion-tech. In fact, within the realm of fashion-tech, there are many opportunities for creativity with minimal budgets and equipment. This means that even those without access to cutting-edge technology or vast financial resources can create innovative experiences that stand out from the crowd.

### Channels

When it comes to the first step of choosing channels, there are various options available for businesses. It's important to consider each one carefully as they all have different implications and limitations.

One option is physical experiences, which can be great for creating a memorable customer experience. However, managing rent and location can be challenging and costly. This is especially true if you want to create a physical storefront or pop-up shop in a high-traffic area.

Another option is digital experiences, which have become increasingly popular in recent years due to their convenience and accessibility. Unlike physical experiences, digital ones don't have these same limitations when it comes to managing rent or location. However, they may limit social contact with customers resulting in less visibility if the experience doesn't revolve around consumer interaction.

Lastly, phygital experiences (a combination of physical and digital) offers both benefits as well as challenges depending on how well managed or flowed your consumer journey is designed. You will need a clear strategy in place so that you can leverage each channel effectively without compromising on customer experience.

### Consumer Values

When it comes to consumer values, businesses must be careful not to fall into the trap of dishonesty. Companies must select values that are genuinely embraced and upheld by their organization rather than just choosing them because they're popular among consumers. One value that has gained a lot of attention in recent years is sustainability. While incorporating this value into experiences can be beneficial, it can also be controversial if not executed properly.

Unfortunately, some businesses have used sustainability as a mere marketing tool without actually implementing sustainable practices within their operations. This phenomenon is commonly referred to as "greenwashing," which refers to companies disproportionately focusing on their sustainability efforts over their responsible corporate practices (Vollero, 2022, p.16). To avoid these accusations is important to ensure that responsible corporate practices alongside any environmental initiatives are prioritized. By doing so, businesses can build credibility with consumers who are increasingly concerned about ethical and sustainable business practices.

### Tools

Regarding Fashion-tech, there are three main areas of focus: Wearables, Smart Textiles, and Digital Manufacturing. Wearables incorporate technology into clothing items, ranging from simple accessories like fitness trackers or smartwatches to more complex garments with integrated sensors or displays. Developing wearable technology requires technical knowledge such as coding and the use of equipment like Arduino; however, many online resources are available for those interested in learning more about these topics. Smart fabrics can be programmed to respond to various stimuli such as temperature changes or touch, allowing for a plethora of interactive possibilities. Smart textiles necessitate specialized knowledge and equipment but open up exciting opportunities for designers looking to push the boundaries of fashion-tech. Numerous open-source online forums allow projects to be shared from concept to final coding.

Smart Textiles can be programmed to respond to various stimuli such as temperature changes or touch, allowing for a plethora of interactive possibilities. Even though there are numerous open-source online forums where projects can be shared from concept to final coding. Smart textiles necessitate specialized knowledge and equipment, opening up exciting opportunities for designers looking to push the boundaries of what is possible in fashion-tech.

Digital Manufacturing is perhaps the most popular area of fashion-tech because it involves the digitalization of fashion through 3D modelling software on a computer. This allows designers to create virtual prototypes before moving on to physical ones thereby reducing costs associated with traditional manufacturing methods which often involve expensive materials and time-consuming production processes. Getting started with digital manufacturing can be challenging

especially since it requires knowledge of 3D modelling software and access to a 3D printer or other digital manufacturing equipment. However, there are many online resources available for those interested in learning more about this area, including tutorials and webinars that cover everything from the basics of 3D modelling to advanced techniques for creating complex designs.

To tackle these challenges, numerous free platforms and software are available. When it comes to wearables, open source platforms like Arduino Project Hub and Instructables provide multiple projects for learning. Instructables offers millions of projects ranging from 3D printing and modelling to engineering with detailed step-by-step instructions for easy replication. For digital manufacturing,

Blender is an excellent free program that enables high-speed and high-resolution 3D modelling for everything from solids to characters to textiles. Additionally, Cura is a free program that converts 3D models into printable objects for use in 3D printers.



Figure 46: Arduino logo

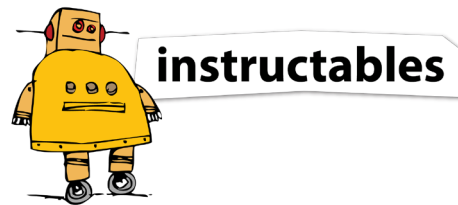


Figure 47: Instructables logo



Figure 48: Blender logo



Figure 49: Cura logo

In conclusion, fashion-tech is a rapidly growing field with endless possibilities for innovation and creativity. With the help of open-source online forums, designers can share their projects from concept to final coding, making it easier to connect and collaborate with other like-minded individuals. Smart textiles offer interactive possibilities while digital manufacturing allows for cost-effective virtual prototyping. Despite the challenges associated with these areas, there are many free resources available for those interested in learning more about them. Instructables provides millions of projects with detailed instructions, Blender enables high-speed 3D modelling, and Cura converts 3D models into printable objects. With the right tools and knowledge, anyone can create cutting-edge fashion-tech designs that push the boundaries of what is possible.



## Empirical Study - The Proposal



Figure 50, 51: Exhibition at the Costume Museum

When it comes to the study and analysis of Material Culture, several important factors must be considered. One of the most important aspects is historical accuracy, which requires that all information presented about an object or artefact be supported by factual evidence and research. This contributes to a more complete understanding of the object's significance within its cultural context. Another crucial element when examining Material Culture is attention to detail. This means taking a closer look at every aspect of an object - from its physical characteristics to its symbolic meaning and gaining a deeper appreciation for its cultural value and importance.

Context also plays a significant role in understanding Material Culture. It's essential to consider how an object was used in its original setting, as well as how it has been interpreted and repurposed over time. By analyzing these various contexts, we can develop a more nuanced understanding of how objects functioned within their respective cultures.

Finally, ethics must always be kept top of mind when working with Material Culture. This includes being respectful towards the cultures from which these objects originate while also recognizing any potential issues around ownership or appropriation. By approaching this work with sensitivity and care, we can ensure that our analysis contributes positively towards advancing our knowledge of human history and culture. (Kawamura and Jong, 2022,)

*Before making a decision, it requires a close investigation and exploration of a relevant culture, its history, tradition, and artifacts. It also requires education and knowledge since no one is familiar with all the cultures that exist in this world, no matter how international and cosmopolitan a person may be. Even for an image that is obviously culturally offensive and insulting for insiders, for someone who only knows the surface of a culture may unknowingly and unintentionally offend others. (Kawamura and Jong, 2022, Conclusion section)*

In conclude, this background knowledge is crucial as it provides new insights into a culture and adds value to the project. It's clear that cultural elements are not just visual, so understanding them is important. Failing to do this work could result in accusations of cultural appropriation and harm the project's reputation.

### 08.3 The Costume Museum's Consumer Engagment Strategy

The Viana do Castelo's Costume Museum is an institution that showcases traditional costumes and jewellery to preserve the cultural identity of Alto Minho and the municipality of Viana. The museum's mission involves researching, inventorying, conserving, exhibiting, and disseminating cultural assets to promote greater knowledge among audiences. It aims to involve the community in enriching its collections and presenting history within a sociocultural context.

## Empirical Study - The Proposal

As presented in the framework, experiences should evoke satisfaction or emotions. Since this museum is a business that offers an experience, it's crucial to enhance it. Unfortunately, as mentioned in the "closing the focus" section, the exhibition lacks technological integration and is entirely physical. This leads to a dull and repetitive encounter that relies solely on material culture. Therefore, enhancing the exhibition through augmentation becomes vital for creating an enticing experience that encourages consumers to learn about and visit the museum.

As previously mentioned, the experience within the consumer engagement framework consists of four main steps. This project uses a phygital channel and focus on responsibility and authenticity as the consumer values. The material culture is the traditional costume of Viana, including the Heart of Viana. Lastly, digital manufacturing is the fashion-tech solution.



Figure 52: The four steps to build an Experience

In a more descriptive way, each step was filled according to the museum's needs and popularity. Starting with the first step - the channels - Phygital was chosen for its importance in real-life interaction and interaction with the digital world. As the exhibition is purely physical, it's important to understand how people will feel about elements that belong to the physical world being transported to the digital one. This gives consumers an opportunity to experience Viana's culture even if they're not physically present there.



## Empirical Study - The Proposal

For this step, the channels are two smart billboards and Instagram. These billboards will be at the center of Porto and Lisbon, one at each city to provide a phygital experience. Consumers can interact with these billboards digitally and share their created content online. We chose these locations because they are multicultural cities with strong tourist presence, especially in Porto and Lisbon. This makes them perfect locations for this kind of experience.

The second step, choosing the values that aligned with the main goal of the experience and institution. The chosen values were social responsibility and authenticity. Responsibility refers to brands that demonstrate a commitment to supporting local communities, and charitable causes, promoting diversity, and inclusivity in their marketing and hiring practices. Authenticity refers to brands that exhibit honesty and openness in their practices and messaging by showcasing genuine individuals and narratives behind the brand while being upfront about their values and business practices.

The third step, choosing the Material Culture, which was chosen Viana's Traditional Costume as a whole with special attention to Viana's Heart. We referred to the exhibition in the museum, which focuses on the costume as a whole, shown in figures 30 and 31. It only makes sense to keep that view with the experience. The choice of the Heart of Viana was because it is an essential filigree piece that embodies the culture of the county and is common within Vianese families (Pereira, 2021).

The fourth and final step is choosing the fashion-tech type. Digital manufacturing, was the chosen one, specifically 3D modelling and Augmented Reality (AR). We considered the popularity of digital manufacturing as a perfect starting point. Since this is our institution's first experience, it was important to choose significant elements and technologies that will be appreciated by general consumers.

For the Costume Museum, the experience revolves around incorporating technology into the physical exhibition. However, if this experience was only available inside the exhibition, it would limit access to those who purchase tickets. This limitation may make sense for a museum with high visitor numbers. Therefore, the experience allows the consumer to connect with the museum and the Traditional Costume without knowing about the museum and without being in Viana do Castelo. By being installed in the centre of Porto and Lisbon, the two most populated cities in Portugal with a high density of tourism, the experience will reach possible consumers that most likely wouldn't know about the museum and the cultural wonders that it has to give.

The experience starts when a consumer views a video advertisement on a street billboard (as shown in Figure 53). Once they look at the billboard, the device's camera recognizes a body and replaces the video with an AR filter of them wearing the traditional costume of Viana. This allows consumers to move and pose while enjoying their new look. A capture button appears on screen for con-

# Empirical Study - The Proposal

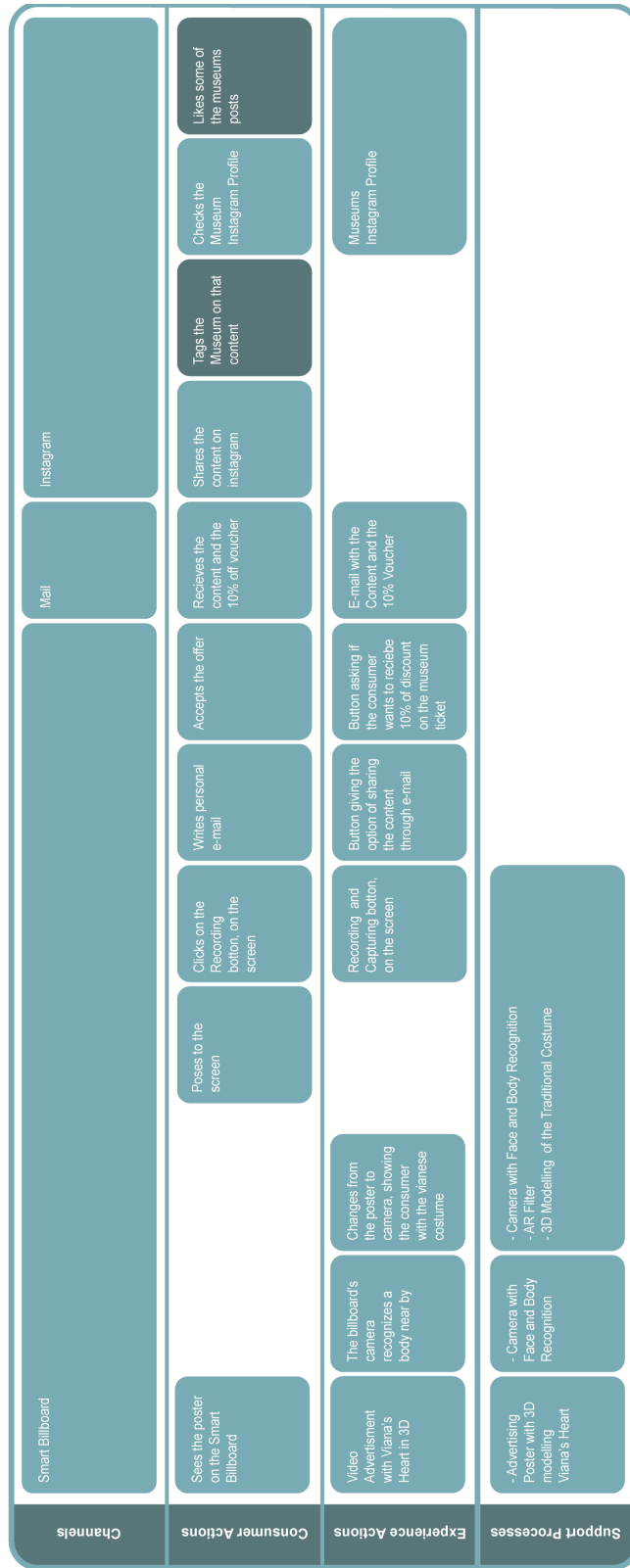


Figure 53: Costume Museum's Experience Journey

## Empirical Study - The Proposal

sumers to take pictures or create videos. After capturing content, another button offers a 10% discount on museum tickets if they enter their email address to receive it along with their captured content. Consumers can then share this content on social media and tag the museum before visiting its profile to see posts, highlights, and stories. They can like some of these posts as well as follow the museum - completing this consumer engagement strategy.

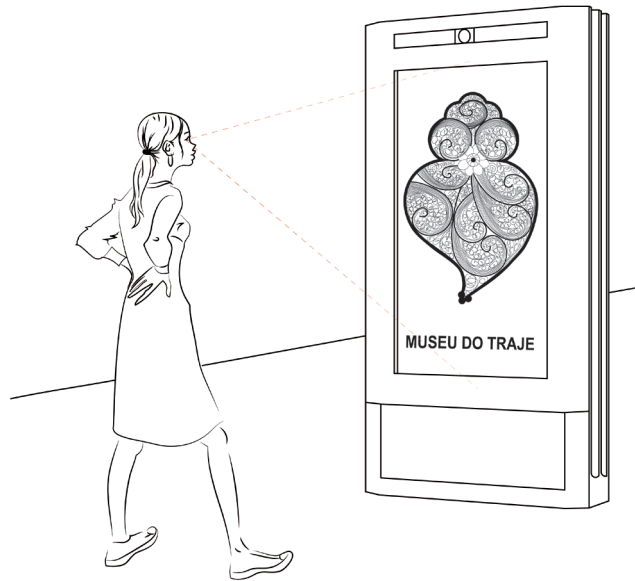


Figure 54: First Consumer Action

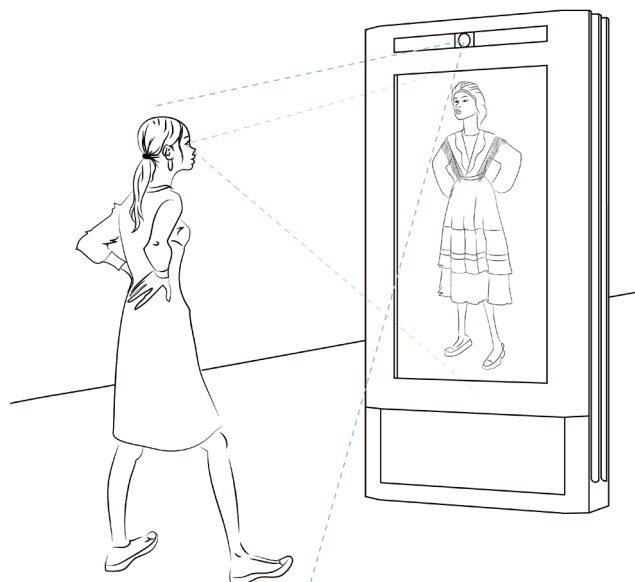


Figure 55: Second Experience Action



09.0

## Conclusion and Future Developments

In recent years, the fashion industry has undergone a significant transformation with the advance of Fashion-Tech. This innovative field is changing how people buy clothes and accessories. These technologies have given designers the opportunity to create unique pieces while reducing waste and costs.

However, fashion is not just about creating beautiful clothing and accessories, it's also deeply intertwined with culture. Culture shapes our thoughts, feelings, and actions - impacting social, economic, and political outcomes. Material culture studies artefacts to comprehend a society's values at any given time; it can spark creativity by offering fresh designs or ideas that reflect current cultural trends.

Moreover, consumer engagement plays a crucial role in shaping the fashion industry today. Consumers interact with brands or products through various channels like social media platforms providing marketers with powerful tools to engage them

## Conclusion and Future Developments

effectively. However, these interactions are influenced by cultural differences and social norms that vary from one region to another.

This thesis explores the relationship between Material Culture and Fashion-technology. It highlights their strong link and shows how they benefit each other.

To establish this mutually beneficial relationship, basic definitions were explained. The first, Fashion, is explained and presented, giving all context of the industry as well as the influential factors of this industry, like Trends and the Consumer. After Fashion, Fashion-tech is defined, being illustrated by famous and impactful case studies. Then, Culture is defined and its importance, giving the initial knowledge to understand the chapter which follows Material Culture. In this chapter, Material Culture is made clear, both its importance and implications. Closing the Literature Review is the chapter about Consumer Engagement, here this topic and made clear and established as being used within the fashion industry, by this thesis. The chapter also elucidates the two consumer typologies and the intricacies of consumption.

The second part, closing the focus, is established the current state of the interrelation of Fashion-tech and Material Culture and the Costume Museum of Viana do Castelo, which is the case used to illustrate the fra-

mework established by the thesis.

The findings are condensed and presented in the final part of the thesis, the Empirical Study. There the knowledge given in the Literature Review is gathered, giving the necessary tools for designers and businesses to develop valuable and up-to-date experiences to boost their consumer engagement.

As the project around the museum draws to a close, it is exciting to think about future developments. Continuing this project would be an interesting challenge and could provide remarkable educational value while benefiting the cause itself.

One idea that comes to mind is working with the actual Costume Museum and using the framework proposed by this thesis. This would allow us to augment a beautiful and important institution that protects and educates different audiences about an old and significant culture. If we decide to continue with this project, there are several steps we should take.

First, it needs to develop experiences similar to those presented in the empirical study. These experiences will help visitors engage more deeply with the exhibits, making their visit both entertaining and informative.

Another area where we can improve is the online presence of the museum.

## Conclusion and Future Developments

With so many people accessing information through digital channels these days, museums like ours need to have a strong online presence as well as a physical one.

Of course, cost control will always be a concern when developing new projects like this one. However, by limiting ourselves only to low-cost but high-quality programs or initiatives, we can get more out of a poor situation through creativity and proper working process goals.

Overall, continuing development around our museum offers exciting prospects for improving both its educational value and its reach into broader communities.





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**A Guide on How to use Material Culture  
& Fashion-Tech as tools to Enhance  
Consumer Engagement: A Study with the  
Costume Museum in Viana do Castelo**



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