

# Guidelines for upcycling from a perspective of design management applied in a small factory of women's clothes in Caruaru-PE (Brazil)

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**Keywords**— Sustainability, upcycling,  
design management.

**Abstract**— Objective: present the guidelines for upcycling from the perspective of design management to minimize the generation of solid waste and add value to the production line. Material and Methods: the research was defined as applied, qualitative, experimental, action-research and bibliographical. The protocol involved in loco research in a small manufacturing company located in Caruaru – PE (Brazil), in order to analyze the production line and propose alternatives for upcycling from textile waste. Results: From the experimentation and literature review, four guidelines are presented relating upcycling to design management: (1) Design Planning, (2) Collaborative Design, (3) Social Design and (4) Design for Education and Communication.

## I. INTRODUCTION

It is pertinent to expose the issue of solid waste generation, which presents itself as a serious problem prominent in the textile industry, especially in the clothing industry, the object of study of this research. In addition to the legal regulations that affect companies regarding the pollution generated, the awareness of a more sustainable fashion on the part of the consumer has been an incentive to rethink some industrial fashion practices. For Vezolli (2018) design can solve and create opportunities more sustainable life scenarios.

It is also necessary to have knowledge about how fashion product design management can validate upcycling as a sustainability and value strategy within the fashion market, especially in clothing. Environmental issues must be considered in the design involving the complete life cycle of the product (Vezolli, 2018).

Fashion product design management is the program that directs the design all these stages, ensuring that the objectives of a given project are achieved. Talking about

design management is dealing with the deployment of design within the company to help it develop its strategy (Mozota, 2011).

Palmieri & Figueredo (2018) claim that the purpose of design management is in the organizational strategy focused on innovation that drives constant improvements, that is, design management in addition to directing the stages of a project, it also ensures the continuity of innovation strategies so that the design project becomes timeless.

Notwithstanding what was discussed regarding the environmental impact and disposal of textile products, several garment factories in the local productive arrangement (APL) of clothing from Pernambuco go through the same reality. Data from SEBRAE (2012) indicate approximately 18,800 companies distributed across the 19 municipalities that make up the Pernambuco Clothing Pole, 77,2% of the polo companies are in the three main municipalities in the region: Caruaru, Toritama and Santa Cruz do Capibaribe.

There are ways to minimize the effects caused by the disposal of solid inputs in nature. "Reuse, restoration and recycling intercept resources destined for landfills and lead them back to the industrial process as raw materials (Fletcher & Grose, 2011, p.63).

Given the available alternatives, in the view of Paoliello & Souza (2015), upcycling is a concept that has become significant among sustainability strategies, it means the use of a certain material at the end of a product's useful life or waste, to develop new products of greater value, use or quality without expending more energy to recover raw material. In this way the material does not need to go through the chemical and physical recycling processes, the material remains with its previous appearance, but with the shape of a new product. Lucietti, et al. (2018) also claim that upcycling is a recovery process that transforms waste materials into products of better quality and environmental value.

In the fashion industry, upcycling is presented as an alternative for clothes that have reached end of their useful life and for textile materials accumulated in stocks. The result of this process is the design of parts that challenge the general tendency to decrease the value of materials already used (Fletcher & Grose, 2011, p.69). For Morelli & Ender (2017) upcycling acts without undervaluing the waste material, as it increases its yield, alters aesthetic and functional aspects, adds value, and extends its useful life cycle.

It is also worth highlighting the economic factor, as upcycling becomes an economic opportunity for several companies, since one of the upcycling is that the products generated from this tool can have a higher value than the product that served as raw material.

## II. MATERIAL AND METHODS

It is an Applied, experimental, and bibliographical research. It is also action research, as this type of research according to Gil (1991) is carried out with a very close combination of planned action towards the resolution of a social problem.

**Data Collection:** The research was conducted in a small factory of women's clothes located in the city of Caruaru-PE (Brazil) in 2017.

## III. RESULTS AND DISCUSSION

The first guideline is in relation to the fabric choices that the confection acquires: (1) **design planning** as a differential to minimize impact. It is proposed to acquire fabrics in a planned way, with potential visual harmony

between them so that the waste can be used together resulting in new unique products, differentiated and with the perspective of sustainability.

Furthermore, it is suggested to invest in (2) **social design**, since waste products can be developed by cooperatives located in the region of manufacture to promote the sustainability of needy communities, as well as not disturb the production line of the confection. The factory will be able to direct its residues to the cooperative, which will carry out production processes such as cutting patches, splicing threads, assembling parts and finishing. Involvement with social causes also contributes to a competitive advantage and to the company's purpose.

In this perspective, (3) **collaborative design** is also included. As cooperatives work on the products and request other complementary materials, they are directly influencing the design that will be thought of in the base pieces in the company, aiming at the remnants/inputs. Collaborative design and co-creating are trends that are much discussed nowadays.

And finally, we highlight (4) **design for education and communication**. The intention is to minimize the impact that clothes produce to the environment, promoting a longer shelf life even if it is for another purpose after being clothes. This practice is a great opportunity for consumers to also take their eyes off the common practices of disposing of clothes and start seeing possibilities for new products in their waste.

It is proposed to generate information for people through a company label or website that informs how the consumer can transform the garbage it also produces through simple alternatives. In this perspective, the company assumes the role of co-responsible for the disposal of the clothes, advising the consumer on how to expand its use before disposing of it. This can generate more value to the purchased product, as it gains more alternative use after being clothes.

Another opportunity is the fact that consumers are increasingly engaged and attentive to social and environmental issues, so digital media can be tools for the dissemination of content on social and environmental responsibility or even to affirm the responsible practices of companies in relation to their consumers.

## IV. FINAL CONSIDERATIONS

Upcycling in the fashion industry has become an increasingly recurrent practice, despite its recent emergence, this concept has transformed the way to generate fashion products. Through the assimilation of the

subject, we observe that upcycling in fashion reflects in a circular economy.

The upcycling propositions presented can be followed by other confections. These aim to promote sustainability practices inside and outside the manufacturing environment. It was also found that upcycling practices comprise not only the minimization of the disposal of inputs derived from clothing, but they also encourage companies and consumers to adopt more ethical environmental behavior.

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