



## THE ANALYSIS OF THE SYSTEM "HUMAN–CLOTHING– ENVIRONMENT" WITH APPLICATION IN THE DESIGN OF FUNCTIONAL ADAPTIVE PRODUCTS

FLOREA-BURDUJA Elena<sup>1,3</sup>, RARU Aliona<sup>2,3</sup>,  
FARÎMA Daniela<sup>3</sup>, IROVAN Marcela<sup>1</sup>

<sup>1</sup> Technical University of Moldova, Faculty of Textile and Polygraphy, 4 Sergiu Radautan Street, Chisinau MD-2019, Republic of Moldova

<sup>2</sup> Technical University of Moldova, Direction of Academic Management and Quality Assurance, 168 Stefan cel Mare Street, Chisinau MD-2004, Republic of Moldova

<sup>3</sup> Gheorghe Asachi Technical University of Iasi, Faculty of Industrial Design and Business, 29 Mangeron Street, Iasi 700050, Romania

Corresponding author: Florea-Burduja Elena, E-mail: [elena.florea@mctt.utm.md](mailto:elena.florea@mctt.utm.md)

**Abstract:** *Increasing the life quality for persons with disabilities represents an important problem for the whole society, locally and even globally. This group of people is the most vulnerable and the less protected, as they are limited in movements, actions and independence. Those require constant support, a lot of familial and social care, and a period to adapt, in order to begin a new life. This study presents the results of the research based on the interaction of several elements, that define the system: "persons with amputated inferior limbs-functional clothing-environment", achieving by that a database, that would eventually allow the solving of the main problem: social reintegration of this group. The aim of this study consists in determining the most important factors that describe each element of the above-mentioned system. The interaction of these factors allow us to identify several problems: disability problems, social-economic breaches, psychologic barriers, recovery processes, problems that concern the creation and the exploitation of multifunctional clothing, etc. Functional clothing is designed to ensure the needs for the potential customers with disabilities. Also, following the studies were established the factors that have a negative influence on social integration and personal rehabilitation. These appear as a list of restrictions related to the environment in which the person with locomotor disabilities lives.*

**Key words:** *clothes for people with disabilities, adaptive clothing, functional clothing, design, confort.*

### 1. INTRODUCTION

Everywhere in the world disabled persons achieve weaker results when it comes out about health, modest achievements in education, contribute less in economic life and are generally poorer than totally healthy persons. This is because disabled persons confront barriers, when accessing services, which that are totally normal for healthy persons, such as health, education, employment, transport and access to information [1].

One of tree problems that a disabled face is social integration. To help a disabled integrate in the social community, it is necessary to offer them psychological comfort, which lacks, due to their lower self-confidence. This self-confidence depends a lot on physical and psychological state of the person, and of course: on the way they look.

Clothing meant for disabled shall be ergonomic and shall allow the disabled to perform all their locomotor actions, that will ensure their day to day life. Also, clothes shall wipe out the difference between social needs persons and normal persons, and to ensure psychological comfort. All of these shall help increasing the quality of life of the disabled by giving the opportunities to participate on diverse social events.

The design of adaptive-functional clothing shall correspond to the requirements of the disabled, which is a complex procedure that needs constant research, with knowledge from vast domains. The sophistication of those clothes intended for the disabled are based on two main factors. Firstly, the clothing shall have an esthetic aspect. Clothing shall correspond to the esthetic needs of the disabled and not to highlight their impairments. Clothing shall ensure psychological balance, chromatic harmony and help camouflage the disabilities. Secondly, the clothing shall correspond to the exterior aspect of the disabled, in statics and dynamics, to age, health state, and other factors. Clothing shall be comfortable when dressing up and getting undressed and shall imply minimum activity of the human factor, as less as possible.

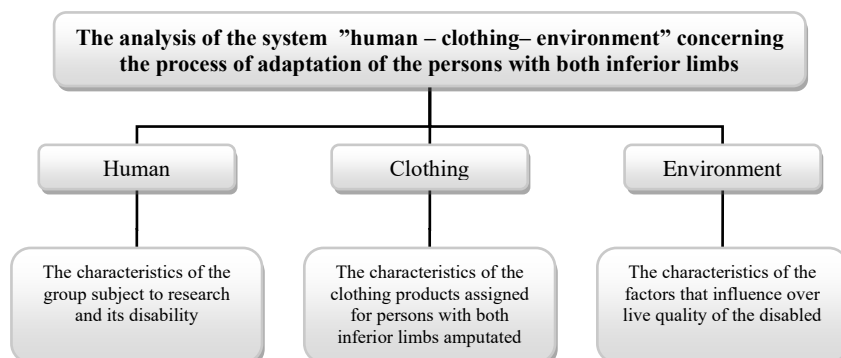
## 2. THE ANALYSIS OF THE SYSTEM "HUMAN – CLOTHING– ENVIRONMENT" CONCERNING THE PROCESS OF ADAPTATION OF THE PERSONS WITH BOTH INFERIOR LIMBS AMPUTATED

Clothing covers more than 80% of the human body, and form together the system "human-clothing-environment". Whiting this system, the product is found in continuous contact with human body and interacts with it. For this reason, products shall satisfy the disabled, offering him psychological and physical comfort [2].

The interaction of the locomotor disabled persons and clothing shall be researched within the ergonomic factor at a psychological level.

In the process of exploitation of the product, the disabled may feel either comfortable either uncomfortable, heat or cold, pressure over some body parts, etc. All those sensations mark an impact over the general state of the disabled and its activity performance. Consequently, when creating and designing adaptive clothing, shall be taken in consideration a more complex anthropometric harmonization of the product of the human body, in conformity with its ergonomic requirements.

With this aim, we will further analyses the system "human-clothing-environment", where, the main role is assigned to the person with both inferior limbs amputated (figure 1).



*Fig. 1: Elements of the system "human-clothing-environment"*

When we analyses the system "human-clothing-environment", it is necessary to approach every single element of the system. This will allow us to understand better the problem and to establish specific solutions.

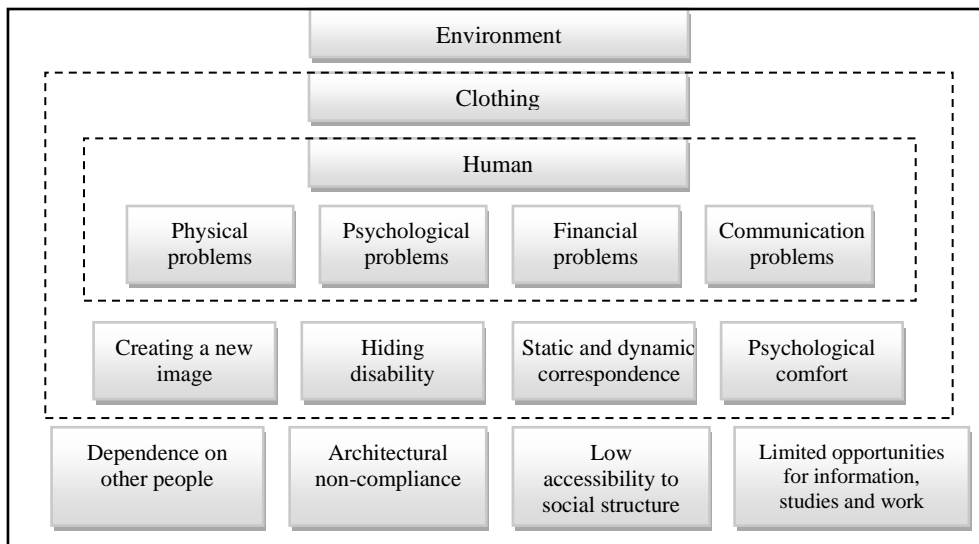
The element "person with both inferior amputated limbs" represents the first component of the system, and the most important one. This group reflects the physical state whether is just one limb amputated, or several amputations [3]. Firstly, patients need to adapt to the new physical condition, and the psychological one, by adapting to the feeling of a loss of a limb. They have to adapt to the loss of its function, their new body image and other's acceptance [4].

Most of the disabled that suffered amputations, may be classified into two categories [5,6]. First category includes the young healthy persons, which, suffer from any diseases or tumors, as a result of any accidents. The second category includes the elderly, that suffer from chronic diseases, which lead to other major problems, that eventually require amputation, in order to save the life.

Amputation of the inferior limbs are mainly caused by cardiovascular chronic diseases, diabetes, severe trauma. Most of the studies show that 90% of the amputations strictly refer to the inferior limbs [ 4, 7 - 10].

The second element of the system concerns the clothing assigned for the disabled. For those persons, right clothing is a way of minimizing the effort lodged by the disabled, to live a normal life. It is necessary to take in count not just the clothing, but also the accessories and other tools. Also, it is necessary to keep in mind the type of the prosthesis, its muffs and racks that ensures movement.

The third element of the system is the environment. Over decades, resorting to such extreme surgery as amputation, represent a well-thought decision, in the favor of the patient and its family. Actually, everything is completely different. As it is important for the state to prioritize the expenses of the state budget, gradually, disabled persons were taken off evidence and surveillance. From this moment, a breakage between disabled patients and medical healthcare service happened, which affected mostly the disabled and their families. All those register an impact over the whole society and a gradual segregation of the disabled.



**Fig. 2:** *The interaction of the elements of the system "human-clothing-environment"*

Figure 2 shows us a strong interaction of the elements of this system. The system registers result only when all those micro-elements work perfectly among each other, and are headed on to solve the same common problem- adaptation of the persons with both inferior limbs amputated, throughout adaptive designed products.



### 3. CONCLUSION

The analysis of the system "human-clothing-environment" allowed us to determine some factors that can be used at the designing some adaptive-functional products. Eventually, those will allow the settlement of a few problems:

- insurance psychological comfort, by wiping out the difference between the healthy persons and the persons with special needs.
- quality life enhancement of the disabled, within socialization, especially study graduation, well payed jobs, etc.
- independence generation at home and in the society.
- removing bans and barriers that obstruct the disabled to participate in different social life activities
- acceleration of social adaptation, as effect, attitude and mindset change.

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