

From the Editor

The Editor had a difficult issue taking the decision to publish this controversial article, after receiving nine totally different reviewers' opinions, including three negative. The final solution "yes, we will publish" was brought about by the statement that the main author was inspired by Professor Szosland, the creator of the new textile science branch, the Architecture of Textiles (as opposed to Textile Architecture), and for many years the director of the "Institute of Architecture of Textiles", as well as by other authors who are outstanding scientists of the Institute, all responsible for the direction of textile design at the university.

Dear reader, if you are interested in the issues discussed in the paper, please write to us and present your ideas.

We invite most warmly,

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Everlasting Design Thinking

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Abstract

The article presents an analysis of the design thinking process taking into consideration universal procedures and steps, starting from defining the problem, identifying needs, searching for solutions, prototyping and testing. There has recently been noticed the need to intensify the effectiveness of such proceedings – defined as Design Thinking. This method is intended for design in engineering, business and medicine - using concrete knowledge, leading to innovative solutions. This article also includes the Art of Design, with its specific features and much greater freedom of thinking. The main concern here are textiles as objects of design because of their direct contact with the human being, with his emotions, imagination and feelings, and therefore, in the analysis, the importance of these elements was stressed. Their awareness allows a more complete understanding of the thinking processes that occur in design, leading to the easier achievement of original innovative solutions.

Key words: textiles, design, design thinking, art of design, creativeness, innovations, development.

■ Introduction

The book Design Thinking [1] was published in 2011. This term has recently gained a significant increase in popularity in such areas as engineering, business, medicine, the humanities and team working education. The authors recall the main question: "What do designers and engineers actually think and do when they try to create innovative solutions, products, services etc.?" and "How to increase the final effect of their activities?" They have to create new tools and ways of thinking that improve individual and

team abilities to create innovative solutions. This pursuit has been known since ancient times but there is no precise guidance on how to meet such requirements. In recent years, other books related to the analysis of creative thinking were published such as Smart Thinking [2], where the author tries to analyse, among other things, the relationships between intelligence, thinking and the effects of creative activities. In the subsequent book Visual Thinking [3], the author analyses the relationships between aesthetic, perception and thinking. The basic characteristics of the most common types of creativity are also known: scientific, technical and fine arts. The purpose of each of them are as follows: science - the understanding of nature and the system of building knowledge, technical - more useful products and life creating conditions, Art-visual beauty, and the development of visual culture. The freedom of action in each type is as follows: science- limited by the current state of knowledge and resources, technical-limited by the state of scientific recognition of nature, technology and possibilities of realization, and art-unlimited. The concept of scientific creativity may be questionable because the human has no ability to create anything in nature and may only understand and describe the phenomenon, and analyse elements

of materials that can be used in technical and artistic creativity. Hence scientific creation concerns formulating and describing recognized phenomena and elements of nature and their mutual cooperation. The main difference between these two types of creativeness is found in the freedom of creative activity, which is limited for science and technical and unlimited for art.

In our development of civilization at least three epochs [4] can be mentioned:

1. The agrarian epoch, lasting for many millennia, during which there were no significant scientific or technical achievements.
2. The technical epoch, lasting about three centuries, which started with the science-industrial revolution in the eighteenth century and was dominated by technical creativity.
3. the epoch of creators and inventors, which has begun to be developed in the last decades, where there appeared a general understanding that inventors and creators are the most valuable group, ensuring the development and position of any country. Without them a country would be subject to degradation.



Figure 1. Carpet from Pazyryk (V century BC) [5].

From the very beginning to the present day, textiles have played a very important role in human lives. Beginning with the basic needs of protection against external influences such as cold, heat or moisture, thereby ensuring the basic quality of life, textiles are used to create an atmosphere of splendour and spectacle, hence increasing the comfort and emotions of people. The most famous carpet from Pazyryk (**Figure 1**) can serve as an example of the features mentioned, but there are also elements of sadness. The carpet was found by Soviet archaeologists in 1949 in Pazyryk. Now it is in the Hermitage in St. Petersburg, Russia. Its current state permits to evaluate its artistic and technical value. It is an example of the highest state of art of

hand weaving. Each of the above mentioned requires a different way of creative thinking and activities. The carpet had a very important role during the funeral ceremony of a prince. That is why so many ornamental motifs had symbolic meanings highly characteristic for the funeral rites of Scythians. These many features created the atmosphere of the whole celebration and showed that the designer paid great attention to each detail. Understanding the user's needs by the designer was very important, and it was easier to do because they lived very close to users. Currently the designer has a problem with the identification of users. For example, actually users generation X born: 1965 - 1976, generation Y born: 1978 - 1994 and generation Z born: 1995 - 2012 are known as totally different groups of them [6]. In design thinking it is extremely important accurate knowledge of the characteristics of users. In fashion design this knowledge is without doubt necessary. Differences between the characteristic of Pazyryk generations and today's are so huge that it is impossible to discuss them in detail in this article. Especially in the textile industry, when we try to define the characteristics (not only antropometric) of some groups of users big problems appeared. In the agrarian epoch, without developed science and technology the greatest possibilities of

creative activities without limitations were possessed by artists. Moreover this creativity existed without limits and accretions. This period was the longest one and therefore left the greatest number of wonderful artefacts, requiring a well-developed imagination and awareness of its mission and understanding the message of design.

Given below are more details introducing the genesis and design thinking of the first designers who in their own activities did not feel such clear limitations as they are nowadays. However, today we possess a considerably greater supply of knowledge, skill, and competence in scientific, technical, technological, computer science and art creativity significantly expands our ability for realisation. As an example, our work from 1991 can be mentioned, where together with Jacek Dutkiewicz we decided to use textile material as a carrier of anti-psoriasis medicine to enlarge the comfort of therapy. This was a solution highly innovative at that time and suggested the possibility of wider usage in medicine [7].

In this situation, scientific and technical creativity does not act as a limitation but can help to find a new inspiration and a new solution, and the emerging awareness of the treatment of textiles as something natural in the human environment allows us to change design thinking. It underlined the huge role textiles have played from the dawn of civilisation to this day. Today we are beginning to use the term 'fashion industry' as an extension of the existing area associated with textiles. Clothing designers have from the beginning taken into account the needs and expectations of users. It is one of the most important and right elements of design thinking. Therefore analysing occurring changes in design thinking well entails the use of the experiences designers of textiles, because they must use all the main procedures and items occurring in the design process in close contact with users, that is, defining the problem and the need to look for analyses conducted of the comparative considerations of users, testing the prototype. In this activity a huge role is played by the designer's imagination, understanding the mission of design and its message

■ Imagination

In the beginning people lived in a world full of mysteries, not understanding the world's environment (**Figure 2**). They had no clues to follow, thus they



Figure 2. The beginning of the living world (Józef Masajtis).

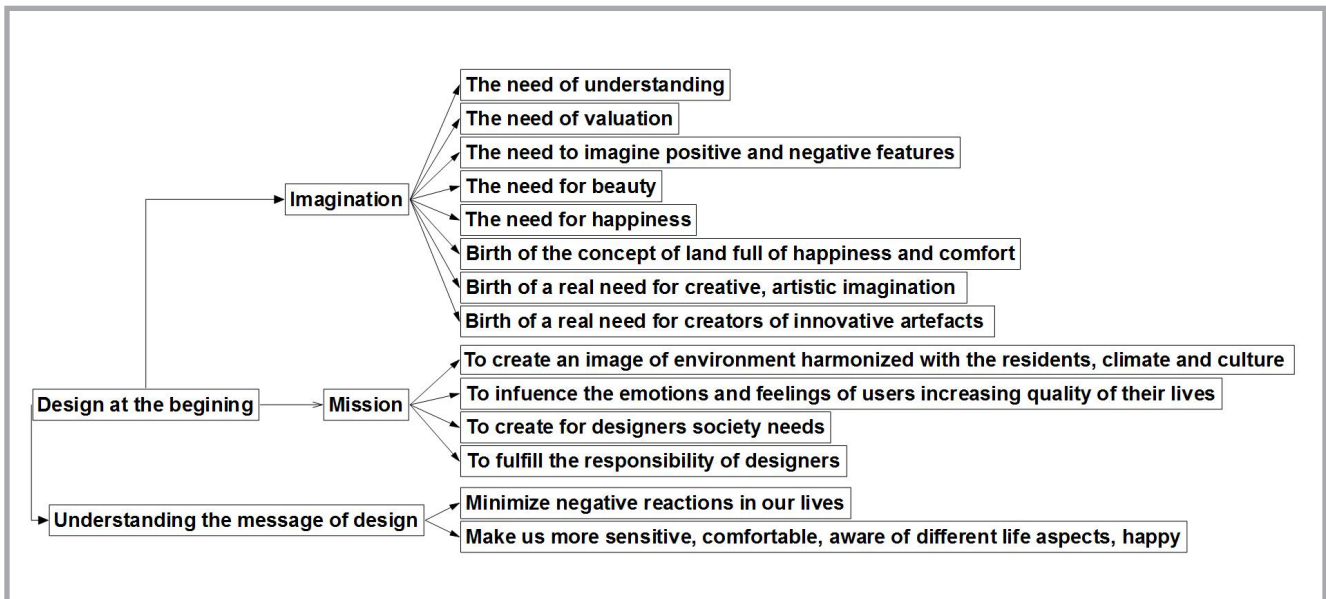


Figure 3. Three parts of design.

had to start the process of understanding using only their own imagination. It required large and continuous effort.

The next element was the need for valuation based on observed phenomena and looking for unknown dependences, the need to seek and imagine the most positive and negative thing, the need for beauty and the need for happiness. It was then that the concept of paradise as a land full of happiness was born. It was the time of the birth of a real need for a creative, artistic and surprising imagination. The birth of a real need for creators of practical artefacts, the most important people in the community, provided an atmosphere of paradise and happiness. A group of creative people with technical and artistic sensitivity whose job was, and still is, to make beautiful things and symbols. It was then that mystery was formed and the creators of practical artefacts were more and more respected and supported. Mainly visual communication developed, but also promoting, convincing, and reappraisal. At that time improving the imagination lay exclusively with the designer without external interference from the environment or other people. In such conditions the creators had to be as innovative as today's designers, but then such a concept as cognitive science or prompting ideas did not exist. Their imagination was based on direct contact with users only, and the community developed without any external limitations. They felt the atmosphere and emotions, and recognised the need for practical and technological achievements. The creators had to begin to understand all the charac-

teristic elements of situations and the environment. Such was the beginning of design thinking. The concept of a problem did not exist yet i.e. the creators had to deal with positive, negative or neutral life situations. It was particularly important to analyse problem situations but not 'the problem'. It can be assumed that this analysis had the nature of a diagnosis of the situation and did not seek and identify a specific problem. The creators understood that the problem was a narrow-minded image of the situation and could be the reason to make a wrong diagnosis of the situation. A spectacular example may be the catastrophic government decision concerning the existences of the Aral Sea. The analysis forced the creators to develop their own imagination, which was the basis for creating man's own vision of the structure and functioning of the human environment. It was aided by the human creating their own images, often based on faith and imagination. A natural consequence of such an approach was the subjectivity and diversity of ideas accompanying the design from the beginning. Free imagination without any limitations was the basis for understanding and analysing problematic situations. This allowed people to create an image of reality based on the natural environment, human nature, as well as excellent knowledge of the needs and expectations of users. The role of imagination in this process is difficult to overestimate. The desire to manipulate people is the limiting factor in the creativity and harmonization of the product with the user.

We could imagine a doctor who is trying to diagnose a patient and never knows at the beginning whether the case analysed is a typical one or not. The doctor needs to be educated enough to have sufficient imagination to be able to make a correct diagnosis, even in a situation where skills, knowledge and competences fail. A well-developed imagination allows us to see much more, which is a characteristic feature of an art designer. A lot of experience may imply using known procedures, which is a serious error limiting creative activity. If we apply known procedures, it is difficult to talk about the design, in which case we usually use process optimisation. The designer must include situations in which there are at least partially customized areas that require an innovative approach. The designer can also look for non-standard methods of diagnosis and analysis of the situation by introducing innovative elements of the action. It is clearly visible in the works of creators working in the field of art, where they look for a way to achieve solutions not paying attention to the apparent limitations, which in most cases are possible to overcome.

The good example of ancient carpets brings us closer to the image of happiness. The creators of rugs knew that if they did not find ways to catch a good solution, other artists would do it. *Figure 3* shows the three parts of design elements which were perceived at the beginning by ancient creative designers (craftsmen): imagination, mission, and understanding the message of design. It can be simply assumed that initially the creator had the personality of an artist combined with that of an engineer, and this is how the concept of Design Thinking was

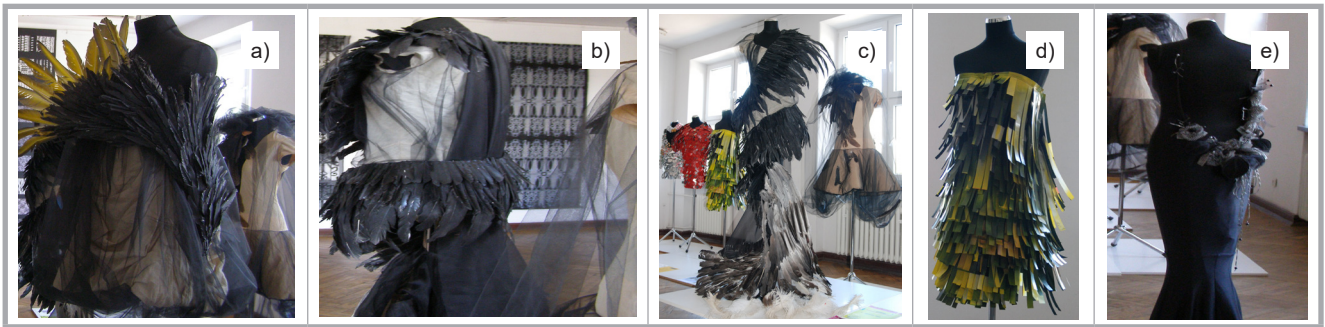


Figure 4.a - 4.e. Students' works directed by Piotr Mastalerz.

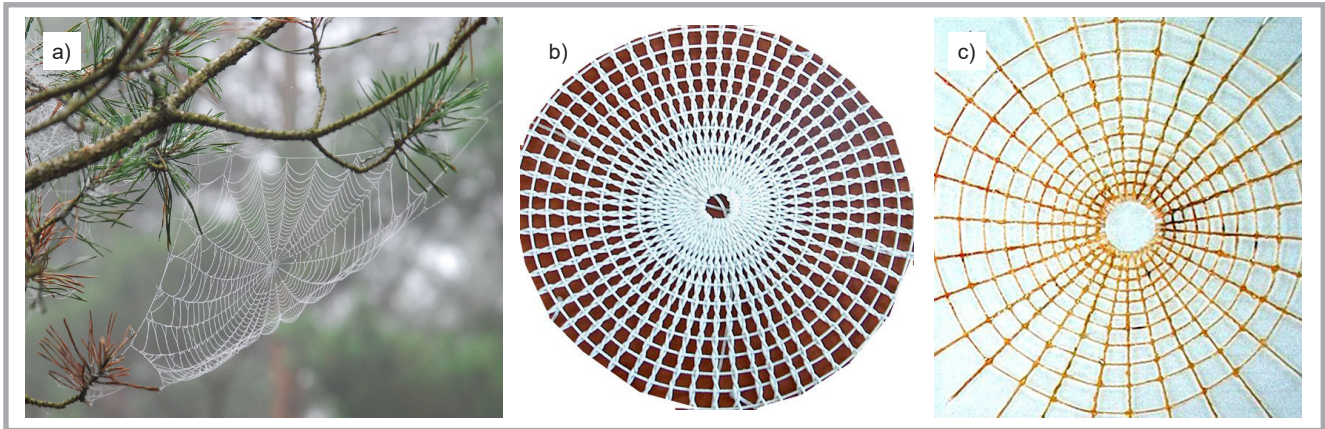


Figure 5. Spider's web (a), textile designs by Marek Snycerski (b, c).

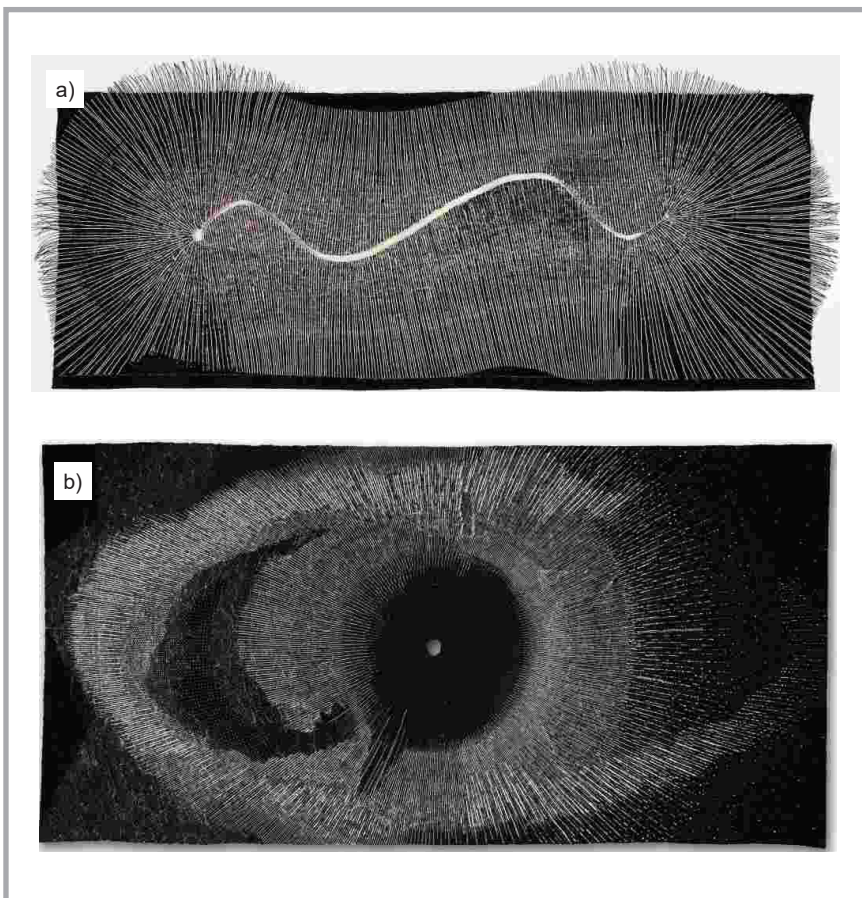


Figure 6. Artist's works by Włodzimierz Cygan (a - Orbitrek – 100 × 300 cm, wool sisal, 2007, b - Fireworks 175 × 350 cm, wool sisal, 2011).

given birth to. With time, technologies developed so much that craftsmen were divided into two groups: designers – creating artistic forms of artefacts, and trying to influence human senses and evoke subjective feelings, and engineers – specialist of technology.

Currently it is known that a designer's training should include the theory of view, and the development of a subjective imagination, unlimited and free, as opposed to the education of engineers, who apply the objective laws, parameters and known rules of action. That is why a statement exists that the education of both a designer's and engineer's abilities together is impossible because their personalities differ so much. This way of education was started in 1992 at the Faculty of Textiles of Lodz University of Technology, Poland, on the basis of a specialisation called the Architecture of Textiles, proposed by Janusz Szosland in 1989 [8], and it was found that it was possible to get good results using special procedures and conditions taking into consideration the complexity of the situation. The education of technical design should be conducted separately but simultaneously with art design, and not mixed, to make easier to understand specific ideas. After that it is possible to try a mixed version

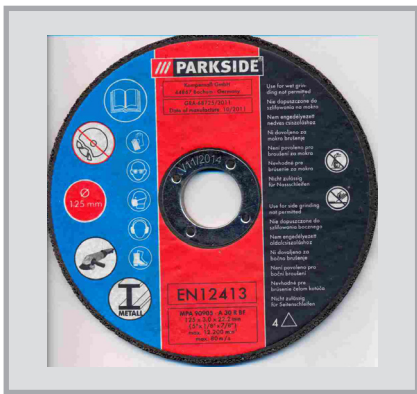


Figure 7. Whirl composition for abrasive discs.

of the design process. The next five Figures (Figures 4.a – 4.e. Students' works directed by Piotr Mastalerz) show the effects of students' works of imagination in fashion recycling, where any materials can be used and there are no concept restrictions. It is a visible course strating from chaos to an orderly situation.

Figure 5.a shows a spider's web as a perfect textile material. Figures 5.b and 5.c present a precise technical design on the basis of a spider's web as new invented textile structures proposed by Marek Snycerski. These two figures are described in [9]. Figures 6.a and 6.b are works of art by Włodzimierz Cygan not exactly connected with a spider's web but perfectly presenting finesse, artistic features and atmosphere which stimulate our emotions, making us feel better. They allow to see the power of artistic imagination and visual communication, which has always been one of the best tools to make our life more pleasant, interesting and personal.

Whirl composites (Figure 7) for abrasive discs for cutting different materials are one of the possible applications because of amazing excellent mechanical features of the new material. But the traditional proposition of abrasive discs puts some restriction on our mind. The images of disks shown have no finesse, art, positive or personal emotions, nor any encouragement for users. We see just solid material, a precise technical design, without the art of design. Are the products shown harmonised with the user's psyche? The same situation is seen all over the world. We do not feel any personal features which try to say something to us. Maybe this type of need is not necessary in this case. If we see a product with an additional element which is addressed exclusively to us, it makes us more excited and increases our interest. It is possible to figure out

an external form of disks of spider's web texture which would be more intriguing, making the image of the disk more natural and friendly. Despite the description placed on the product being very simple, it is without the power of impact; hence to find a mode or style and way to catch the user's eye, brain and emotions is a challenge for the designer. This action exacts from the designer additional skill and understanding which allow to develop the art of design with better commercial effect. Thus it is extremely vital to train the designer's imagination freely (Figure 8).

■ Mission

Designers have a very important task to fulfil. For all communities and environments they have created images harmonised with the residents, climate, culture and traditions. They have formed the identity of each community. On the basis of their images each part of the world has its own very well-known image. Groups of creators have done it according to their vision. If these groups consisted of a variety of humans, the effects of their work could differ. Designers have high possibilities to influence users' emotions and feelings, meaning that they can influence our process of thinking, increase the quality of our lives and make us happier. Designers' possibilities are very likely to play an important role in our lives, as is clearly seen during carnivals, for example in Rio. We take part in the happiness of the Brazilian people, admire it, and look forward to the event. But there is more to it than that: it gives more possibilities. For example, during the carnival in Nice it is possible to see Brazilian dancers with their amazing national costumes and see how images of the environment of the two countries give a combination of attractive elements of the two countries. It gives also possibilities to show new material, structures, and features of textiles. Moreover there is something that could be said about the mission of design and the responsibility of designers. They are able to change the way of our thinking, add some innovations to culture, traditions etc. The emotions we see in fashion shows prove it, which is evident when children grow up and observe their involvement in analysing a designer's proposition for educational works. Designers affect people as well as change and enrich their imagination, trying to make them happier. All this leads to the fact that their responsibility is huge, because they can create a lot of



Figure 8. Train your imagination (Andrzej Buszka).

changes in our lives that make our lives easier, more comfortable and better. Beyond the positive effects, designers can also affect people in a negative way and thus impair the quality of our lives.

■ Understanding the message of design

Associating with design, we feel that it is not only a purveyor of beautiful artefacts, as it allows us to feel something more sublime, more important, prestigious, better, and more comfortable; but it is the feeling of importance and satisfaction which make us happier, which often becomes the most important message of design, which takes us into a better world, and makes us more sensitive, comfortable, aware of different life aspects, and happy i.e. all the plans designers have been trying to realise from the beginning up to now. Currently they have to use cognitive science, psychology, technical aspects, etc. to perform their work well, but it is used consciously now, whereas in the past it was applied intuitively. Design should also minimize negative reactions in our lives and allow us to live

wisely. In all cases our happiness should increase. This process has lasted since the dawn of time.

■ Conclusions

Although it can be said that each design process has similar steps, the way of thinking can be different. Especially visible noticeable differences are between the engineering design - objective, concrete, based on parameters, constructions etc. and artistic design, where emotions, feelings, and subjectivism are dominant factors. Thus you cannot apply the same thinking in any design process. Design used in pharmacology can be very interesting to analyse design processes, including the restriction of freedom of imagination. The differences are necessary, eg. comparing the design of bullet-proof vest emotions, subjectivity should not be dominated by the design of clothing for a fashion show, where the aim is to influence the imagination of the user perception, where the emotions of the user can say that the work of the imagination and the thinking will differ. Therefore it is difficult to educate the engineer to be, at the same time, a good designer and educate a designer to be a good engineer. The paper attempts to present different ways of thinking, increasing emotions and imagination as innovative solutions easier to appear when restrictions of Imagination are reduced.



References

1. *Design Thinking, Understand-Improve-Apply* Ed. Hasso Plattner, Christoph Meinel z Hasso-Plattner-Institute für SoftwareSystemtechnik GmbH, Germany and Lary Leifer z Center for Design Research (CDE), Stanford University, USA, Springer – Verlag Berlin Heidelberg 2011.
2. *Smart Thinking*, Art. Markman, 2012.
3. *Visual Thinking*, Rudolf Arnheim, University of California Press, 1969, renewed 1969.
4. Dobrołowicz W, *Psychologia twórczości technicznej*, Warsaw 1993.
5. https://upload.wikimedia.org/wikipedia/commons/b/b1/Pazyryk_carpet.jpg.
6. <http://socialmarketing.org/archives/generations-xy-z-and-the-others/>
7. Masajtis J, Dutkiewicz J. *Textile Material as a Carrier of Bioactive Substances (in Polish)*. Proceeding of the Conference MedTextiles - Textile Material in Medicine, Łódź, 1992.
8. Masajtis J, Strzechowska-Ratajska H. *Textile Architecture, Five Years On. Fibres & Textiles in Eastern Europe* 1998; 2: 16-18.

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Commemorative plaque unveiling ceremony in tribute to Prof. Janusz Szosland

A commemorative plaque unveiling ceremony in tribute to Prof. Janusz Szosland, a great scientist, supporter of the Textile Industry in Lodz, as well as a friend and Member of the Scientific Board of our journal, took place on November 21st, 2016 at the Faculty of Material Technologies and Textile Design of Lodz University of Technology. The ceremony was attended by close family members and friends of the Professor, a large group of scientists from Lodz and also the representatives of the University and City of Lodz. A speech in tribute to the Professor was read by Prof. Marek Snyckerski, while the unveiling of the commemorative plaque was made by the wife of the late Prof. Szosland - Dr. Lidia Szosland.