FACULTY OF DESIGN
Associated Member of University of Primorska

GoingGreenGlobal International Design Week

6th INTERNATIONAL SCIENTIFIC CONFERENCE A.L.I.C.E.

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KEYNOTE SPEAKER
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CEO and Acting Dean of the Faculty of Design,
Associated member of the University of Primorska

OUR VISION - INNOVATIVE DESIGN FOR BETTER WORLD

If we look back, we have to admit that the year 2020 was the most challenging and unpredictable year in many decades. The corona virus pandemic that is still ongoing, has brought enormous social and economic changes around the globe, the changes that in most cases will take years to overcome. Because of implemented restrictions, the economic activities were held back, in many countries unemployment occurred and the economic, social costs have risen. According to data provided by the United Nations − in less than 12 months nearly 70 million people have been infected because of the coronavirus pandemic.

But all in all − we have to add that the pandemic has also affirmed the value of science as a reliable instrument to understand and to overcome natural threats. Under the guidance of academic and professional bodies, the local and national strategies for fighting the virus have been developed. Reliable scientific and technical advice in parallel with cooperation have been proved as the only way to address challenges that go beyond the borders.

As part of the European Union's coronavirus recovery plan, the European Commission has announced plans to create a new European Bauhaus modelled on the influential design school to kickstart a cultural and sustainable movement in European Union. It is imagined as a new cultural project for Europe, a co-creation space where architects, artists, students, engineers and designers are meant to work together. The new European Bauhaus is planned to become a driving force to bring the European Green Deal to life in an attractive, innovative and human-centred way. It will be a movement based on sustainability, inclusiveness and aesthetics.

In the light of these events, the Faculty of Design is organizing the 6th international, scientific conference A.L.I.C.E. 2021 in order to invite national and international experts in the field of culture of design. We strongly believe that design is fundamental to all human activity and designers have the potential to act as trans-disciplinary integrators and facilitators. The essence of the design process is to envision novel solutions in order to meet certain needs and express a certain intention through novel interactions and relationships. Design tends to focus on how the world could be in the future and proposes feasible pathways to create such a future.

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THE COMPARISON OF BEST EUROPEAN CORPORATE DESIGN MANAGEMENT PRACTICIES WITH SLOVENE DESIGN MANAGEMENT COMPANIES

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Abstract: This paper is presenting the comparison of some top European corporate design management practices with the best Slovene corporate practices from the field. For this purpose, it was accomplished the analysis of best corporate design management practices from the EU comparing with the latest Slovene successful design management practices. In today's saturated market, design management represents one of the key business disciplines which supports corporate competitiveness and business advantages. Technology-oriented innovative companies integrate into its business strategies design management function as a culture and use design's full potential. By using design and design thinking methodologies, companies identify and explore new market's demands, and they develop innovative human-centered and UX solutions. We have researched key factors and ways of implementing design and design management throughout Staircase model within the company's strategy and business model.

1. INTRODUCTION

For many years, design management has been the intermediary between design as a strategic resource or as a driver of innovation and other business functions such as marketing, engineering, and product design (Borja de Mozota, 2003). Design and design thinking (Brown, 2008 and Martin, 2009) is becoming a necessity for the survival of SME's (Best, 2015). A Design Management Absorption Model (DMAM) (Zahra & George, 2002) integrates several disciplines from innovation, strategic management, and design management studies. It offers a multidisciplinary view on a complex phenomenon such as organizational learning as well as embeds design and design management as distinct activities emphasizing the specific contribution design and design management can make to absorption and – ultimately to innovation processes. In previous research (Acklin, 2011) has made a conclusion that SMEs with little or no prior design knowledge are more able to cope with designers and the challenges of absorbing new design knowledge if they themselves build up the design management process and capabilities to successfully integrate the new knowledge that might diverge from their usual way of looking at their creative and innovative business solutions.

European companies that consider themselves as very good at design do often also turn in a high level of design management rating. This means that the design management Staircase model (Kootstra, 2009) is indeed a suitable model for the assessment of the design management capability of companies, and in the future also to assist SMEs to perform their own self evaluation of design management in their business practice. The most critical success factor here is the awareness of benefits of incorporating design management into business process at all levels.

Design management develops and maintains a business environment in which the organization, through design and the establishment of an efficient and powerful system that manages the resources needed for an effective process of im-

plementing innovations in the market and achieving competitiveness and business success, achieves strategic goals. In the process of design management, design, design thinking, innovation, entrepreneurial process, technologies, management and attitude are connected communication with consumers (Martin 2009). For a better understanding of the term, we researched the definition of design management of Slovenian and foreign authors and organizations and classified some key ones by year of origin of the definition in the table below.

Author (year)	Definition
DMI (1975)	Design management encompasses the ongoing processes, business decisions, and strategies that enable innovation and create effectively-designed products, services, communications, environments, and brands that enhance our quality of life and provide organizational success.
KCDM (2013)	Design management is a business activity that manages the creative process, business strategy and supply chain by project management of design projects, supports the culture of creativity and builds the structure of the organization capable of achieving the highest business goals.
Best (2015)	Design management is about managing design projects; projects paid for by a client, a business o an organization, and carried out by a designer, a design team or a design consultancy. For some, this is where design management stops, but for others it is more than just a form of project management. Design management as an approach has myriad of other uses.

Figure 2. Energy Efficient House with recycled wood exteriors and Interiors by Inaki Leite , Spain

Numerous authors (Fernandez-Mesa, Chira-Gomez, Gutierra Garcia, 2012) prove that companies that manage design effectively and self-sufficiently develop more successful products and innovations. Recent research demonstrates the effectiveness and profitability of design thinking practices. Companies are increasingly using the design of managerial practices and methodologies of design thinking, as this encourages innovation in the organization, while improving competitiveness and business performance in the market. Design is a challenge for all those organizations that strive for success in the wider social context and are not only interested in short-term financial gain. Design is an approach that takes into account several views on the same problem, so it makes it easier to focus on all those impacts that determine the long-term business success and better competitiveness of the company (Borja de Mozota 2019). Companies that systematically establish design as their main competence over the years of their business must go through various types of stages in the development of the field of design. The key factors in this are the education and training of employees and management, which enable the company a sustainable competitive advantage (Joziasse 2020, KCDM 2019).

2. METHODS

In the review article, we summarized and compared case studies from Slovenia and European countries, which offer us an insight into the case of good practice in implementing design management in the company's business strategy and the result through their business success and market competitiveness. The research methodology is based on qualitative research methods (method of description or description, method of comparison or comparison, method of summary or compilation, comparative analysis, case study method and synthesis method). We included an analysis of various printed and digital texts in the research. We took 5 companies as a sample, of which two are Slovenian Adria Mobil and Intra Lighting and three European companies Bang & Olufsen (Denmark), Dyson (England) and Zalando (Germany).

2.1. ANALYSIS OF BEST DESIGN MANAGEMENT PRACTICESS

In addition to two Slovenian companies, we selected three companies from Denmark, Germany and the United Kingdom as examples of good practice from European countries, which according to Koostra (2009) are considered "leading innovators" in the business world. The economic situation and business environment in these countries is very fertile and promising. They have a sensibly defined design policy and are aware that design is a process and not just the final form of products, which improves the business performance and competitiveness of companies. In such business environments, companies are eager to take risks and be bold, which in turn affects innovation and market success. In these countries, there is the promotion of innovative companies, as they are aware that the state benefits greatly from such companies. Most of these companies work with government organizations such as ministries, institutes, universities... In these countries, companies have great support from various institutions that promote and educate organizations in the field of design and management design, such as Danish Desgin Center (Denmark), UK Design Council (England) and the German Design Council (Germany).

We notice that in Slovenia a similar symbiosis between government institutions and companies is very rare. Slovenian politics pays too little attention to design policy and innovation strategy promotion. As a result, the Slovenian business environment is still too traditional and companies are left to their own resources in terms of design and innovation. The Slovenian business environment is mostly traditional, as it has the mentality that competitiveness is achieved only through technological and process improvements. The often ingrained model of development followers and imitators and the predominant sales through intermediaries represent an obstacle for most Slovenian companies to timely identify the level of market saturation and adapt to new conditions (KCDM 2019). The reason that design management as a business discipline in the Slovenian business environment is underused is also in the inadequate education system and regulatory environment (SMK 2018).

In Slovenia, design management is a relatively young business discipline. Nevertheless, there are a few companies that actively incorporate design management into their practices, with which they have significantly increased competitiveness and business performance. The KCDM project revived the need for design and design management in Slovenia. This and similar projects further increase awareness and the need to implement design and management design in the operation of Slovenian companies. Primarily, it is necessary to help companies develop a design management strategy. The fact is that companies that implement design into their strategy are more innovative, competitive and business successful. Companies acquire certain competencies and knowledge through partnerships and mentorship from organizations, and they also exchange experiences with other companies at the international level. At the same time, these organizations generate all the knowledge contributed by the partner companies through their practices and references.

Adria Mobil is one of the leading companies in the caravanning industry, whose core business is the production and sale of caravans, motorhomes and mobile homes. With its wide range of products, the Adria Mobil brand has been present for more than 50 years in 30 markets across Europe, Asia and Australia, and the Adria Mobil Group employs more than 1,200 people. The brand is distinguished by a wide sales network, recognizable product design and high perceived quality, which is a reflection of state-of-the-art production and innovative product design. In ensuring the required and expected level of quality and the desire to perform in a period of rapid technological innovation and strong competition, they take into account various standards of quality and sustainable development, such as: ISO 9000, ISO 9001: 2000, SIST EN ISO 14001: 2005 (Adria Mobil 2020) .

Intra lighting company has been manufacturing architectural lighting for more than 30 years and offers complete lighting solutions tailored to the customer. The company is one of the leading manufacturers of smart lighting in Southeast Europe, and is present in more than 60 different markets around the world. They collaborate with many renowned domestic and foreign designers and experts in the development of intelligent lighting solutions. In this way, they successfully increase brand recognition and market share in demanding global markets. Intra architectural lighting illuminates the premises of many reputable companies, hotels and stores around the world, such as: Ferrari, Microsoft, Facebook, Oracle, Volvo, Huawei... (Intra lighting 2020, KCDM 2019, Strmole 2011). The company is committed to design management strategy and sustainable approaches in its operations. They handle natural and human resources responsibly. They have obtained numerous standards and certificates, domestic and foreign awards and recognitions (Intra lighting 2020) for their high-quality products.
The Danish company Bang & Olufsen produces a wide range of high-tech exclusive audio-video products, such as televisions, audio systems, speakers, telephones and other multimedia products, which combine technological perfection with a perfect look. The company is headquartered in Struer, Denmark, with several production facilities around the world and a marketing and creative center close to Copenhagen. The company has a 95-year tradition in the market, and today it is present with its products in more than 70 markets around the world (Bang & Olufsen 2020). The B&O and B&O Play brand products are distinguished by clear sound, timeless design and unsurpassed craftsmanship (Bang & Olufsen 2020a). The company's vision is to become the most desirable brand in the electronics sector in the world.

Dyson Ltd. is a British technology company that develops and manufactures electrical household appliances such as vacuum cleaners, air purifiers, dryers and heaters. Dyson is one of the most recognizable British brands in the world. The company is headquartered in Malmesbury and has a presence in more than 100 markets. They use a variety of skills, from acoustics, robotics, software, and electronics, to solve problems that the competition ignores (Dyson 2020).

Zalando is the leading online platform in Europe, offering clothing, footwear and accessories for men, women and children. In addition to online shopping, it offers a combination of quality services with free delivery and free returns of up to 100 days. They offer products from more than 2,500 international brands, including street brands and high fashion brands. From a small Berlin start-up, they have grown into the large international company Zalando SE. They are present in 17 European markets and employ around 14,000 people. At Zalando, they believe that by combining fashion, operational excellence and advanced online technologies, they offer added value to customers, brands and business partners. Internet business has transformed the shopping experience and social media has democratized an industry that was once exclusive (Coester 2016, Ideo 2020, Zalando 2020).

2.2. RESULTS COMPARISON

The following are the final results of the analysis summarized after Kumelj (2020).
According to the DMS (Design Management Staircase) model, domestic surveyed companies can be assessed as very mature. We estimate that all companies are at the highest, 4th level, where design as a culture is a strong driver and guide in the operation of the company, with the exception of Adria Mobil, which is still at the 3rd level of the DMS model. However, Adria also strives to introduce design as a culture into its operations.
All selected companies have a high level of awareness of design as a process. In the described companies, design managers, product managers and design managers who are responsible for the implementation of the project have a strong role. In addition to individuals or departments, senior management is also involved in the design process. Slovenian companies also work closely with external consulting companies to help them develop design oriented projects. For their success, consider all the competencies necessary for the successful implementation of design management practices in the operation of the company. They are aware of the benefits of design and design management, which enables easier implementation of processes and greater involvement of various departments. This improves the development process and the implementation of the final product. The design is systematically included in the company's strategy and systematically follows the set goals and plans. The company provides conditions for the development of the necessary competencies, designates project design and planning the necessary resources. The company provides available resources for the development of design projects from the initial to the final stage, including salaries for employees, their further training, providing the necessary infrastructure, technologies and tools, intellectual property protection, patenting, collaboration with external designers and consultants and investing in creative environment . At the same time, the company's employees are constantly trained and educated in the fields of science, technology, marketing, design thinking, user experiences design and other fields.

3. CONCLUSION AND DISCUSSIONS

This paper examines design management practicies of EU in Slovene companies in design management. Ccompanies involved in benchmarking have a user-oriented process to develop their products and services. In solving user-oriented problems, multidisciplinary teams include various profiles: professional designers, design managers, product managers, project managers and senior management. By practicing methodologies of design thinking and interdisciplinary collaboration, they make the right decisions, upgrade ideas and achieve quality results, and master design processes.
Companies value employee dedication and passion for designing new products, which is related to design thinking. Most of the described examples of good practice work with both in-house and external designers (Adria Mobil, Intra Lighting, Dyson), with the exception of Bang & Olufsen, which emphasizes collaboration with external designers, and Zalanda, which has an in-house design team. All the companies described are recipients of numerous recognized awards at home and around the world. In this way, they further improve their market position, competitiveness and justify the quality and price of their products and services.
The selected companies are technology-oriented production companies that offer high-quality technological solutions. To develop their products, they have set up their own research laboratories and research departments, where they test new technology, tools, software, prototype, conduct workshops and train employees. In the research and development of Bang & Olufsen and Dyson, special programs involve young talent and students from different fields from universities around the world. Such a symbiosis is more than welcome, as young talents gain competences and insight into the process of development and research in reality, and companies encourage innovation among young people and promote innovation. A company like Dyson has also set up a special foundation for this purpose, through which they award the prize for the most innovative product every year. What all companies have in common is that they have thoughtfully designed visible and invisible elements of the brand, which enhance their visibility. All processed companies have their own brand through which they express corporate values. Companies master design communication and marketing. Presented companies also include sustainable development and corporate social responsibility in their strategy. They aim to reduce CO2 emissions, reduce waste, use recycled materials, use renewable energy sources, shorten the supply chain and other environmental measures. Companies are committed to workers' rights, consumer rights, support sports and culture, and are involved in the development of the community and society (Kumelj 2020).

In the end, it would also be particularly interesting to run longitudinal research whether and how the design management capability of the European SME sector grow and evolves in diffrent sectors of the industry and which sector shows more results than other.

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BIEN, TEXTILE ART BIENNIAL FOR A NEW ERA

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ABSTRACT
BIEN, Textile Art Biennial for a New Era – The contributing paper highlights the ideas behind the new biennial in the making. Conceptualized as a textile art biennial, BIEN is emerging in the city where the textile industry played a crucial role in the forming of the urban landscape in the 20th century. With its strong bonds to the educational sector, the biennial features invited and emerging student artists. Apart from the textile heritage interpretations, important themes covered by the event are sustainability, preservation, and innovation. BIEN wants to be a part social and environmental changes and wants to make sure that the materialism of the past era becomes a reflection on the materials of the new age. Program clusters are explained in detail, with a special focus on how the new post-pandemic era is affecting the standards and norms of art production and organization.

KEY WORDS
Textile Art / Textile Design / Art management / Post-pandemic

1. INTRODUCTION

BIEN is a new biennial taking place in the spring and summer of 2021 in Kranj, Slovenia, and in the parallel as a hybrid event. Faced with the new reality after the outbreak of Covid-19, the organizers are forming new ways of making the experience for visitors and the involved artists as favorable as possible. Transforming challenges into possibilities the biennial is changing focus to the installations and art in public space as well as presenting art and artists online. The pilot version of the event has been carried out in June 2020 when 136 students of textile and design presented their artworks, and few of the BIEN key projects were established. BIEN is organized by Carnica Institute with close collaboration of Faculty of Design, Associated member of University of Primorska, and Faculty of Natural Sciences and Engineering, which is an integral part of University of Ljubljana. Conceptualised as a textile art biennial, BIEN is emerging in the city where the textile industry played a crucial role in the forming of the urban landscape in the 20th century. The interpretation of heritage integrated into the artworks of BIEN 2020 is not lost in nostalgia. Mainly due to the connection with the field of education, BIEN is looking to the future and manages to oppose the textile industry. Societal trends that have evolved around the fashion trends have led nature to severe pollution. As sustainability becomes a new fashion, clothing and interior design manufacturers are already looking for more ethical ways of designing, producing, and exploiting resources. Designers are exploring new materials and processes that would reduce the negative impacts of the textile industry pollution. BIEN wants to be a part of these changes and wants to make sure that the materialism of the past era becomes a reflection on the materials of the new age.

2. INSPIRATION

Where does the inspiration for creating a new biennial of textile art come from? With our small team, we believe that the textile heritage is something we need to highlight. We were intrigued by the fact that the textile industry of the 20th century is romanticized, one should think only of women empowerment and socialistic well-being. Past industry woven in the identities of their workers is not even close to the processes we call the textile industry today.
The world today is facing a crisis of natural resources, climate, food and waste. Fashion is the second-largest pollutant in the world after oil. Approximately 20% of the world's water pollution is the result of the textile industry (Islam, 2020), and biodiversity is disappearing with excessive chemical treatment of the soil and other environmental pressures. Today textile art and design cannot escape the notions of sustainable, preservation and innovation. Within those, we have incorporated cultural heritage. We connected the past and future. And we thought we are onto something.
Just think about it. The textile is the crucial element in the circular economy and what is needed is the social innovation related to how consumers interact and share (Manshoven et al. 2019). The textile alone might be the next thing travelling in the vast space, the cosmos. As the times appear fertile for the textile industry, the timing for establishment of a novel textile biennale seemed about right.
Unlike clothing, textiles raise eyebrows. We know clothes, we wear them every day, and without them, we cannot even step out from the private to the public spaces. Textiles, on the other hand, arouse curiosity. What else can emerge from researching them? What is their artistic or industrial value?

3. GEOGRAPHY

Slovenia is strongly decentralized. Majority of cultural and artistic production is concentrated in the capital city Ljubljana. With our biennial event, we wish to connect regions with strong affiliation to the past industry, since the plan of former Yugoslavia was to industrialize smaller cities to establish regional development and guaranteed jobs.
Industry of Gorenjska region had leaned towards iron, electronics and textile production in the past. The textile was present in Kranj and around it even before from the 16th until the late 19th century. Manufacturers were producing sieves, canvases, and ropes before the investors started to build factories. Another city in Gorenjska with a strong tie to the textile industry includes Tržič, Škofja Loka, Radovljica, and Bled.
Further west there is another region that was industrialized with textile in mind, Goriška. And today we are connecting those two neighboring regions, Goriška and Gorenjska, which were in the 90ties significantly affected by the collapse of the textile industry and the reorientation of production to Asian markets for cheap labor.
BIEN pays tribute to the traditional textile industry, which will connect with contemporary artists in a participatory program with the ambitious goal of changing the mind-set from the materiality of the past era to the sustainability of the new generation. Identification with past events plays a crucial role in the regions which are less urban and have less understanding of art and its production. This is our access point for our communities and the public.

4. EDUCATION

To develop an interest in these regions, we have connected to faculties educating new generations of textile designers and artists. Keeping in mind that young people apply to study textile because they wish to become fashion designers, the biennial is seeking ways to introduce different focuses.
With the interdisciplinary approach, we tend to broaden the views of textile and particularly fashion. What impact does fashion have in the age of Slow Fashion, Anti-Fashion, and even No Fashion? The ideas of one of the leading trend forecasters Edelkoort (2017) come to mind when she explains the ideas on the future of the fashion industry. We are in the midst of a slow revolution of making, where smaller cities and new ways of producing are highlighting the "less". The great simplicity is taking over, and without the understanding of the end consumer self-awareness, the fashion designer cannot succeed.
Research, innovation, and collaboration between science, industry, education, and entrepreneurship can help us find new ways of making and understanding textiles. That includes the new ways that will be less harmful to the environment. Materials in sustainable clothing design projects vary from traditional paper, fibers from bioengineering of living organisms, to plant roots (Eherman et al. 2018). Is there anything more exciting for young designers?

5. ENVIRONMENTAL IMPACT

When highlighting textile, we cannot pass the issues stemming from the industry and mass production. We need to address the human and animal welfare, climate change and its global consequences, modern slavery, especially present

in industries of underpaid labor such as the textile industry of east Asia. There is also undeniable overuse of soil and biodiversification and habitat loss, chemical pollution, water stress, lack of natural resources, consumption and waste. (ibid.)
All of these phenomena have a noticeable environmental impact. There is another factor present in our world of today we cannot overlook. The process that might accelerate the good changes away from the aforementioned issues. The virus struck our world in the spring of 2020. Not only has the outbreak of Covid-19 stopped the production and brought down some of the environmental impacts, it has also made a significant number of people ask themselves why consume as much as they do, and why to worry how we dress and present ourselves in the public space. The private sphere became the place where we were stuck.

6. NEW EXPERIENCES

Faced with the new reality after the outbreak of Covid-19, the organizers of cultural events are forming new ways of making the experience for visitors and the involved emerging and invited artists as favorable as possible. Even if the culture venues and workers come out in the post-epidemic world without a scratch we have to overthink the ways how to interact with our public who were stuck inside and who were told mass events are to be avoided.
Transforming challenges into possibilities, the BIEN biennial is focusing on four aspects: remote collaborations, public space presentations, virtual meetings, and hybrid exhibitions. In the following paragraphs, I wish to present six programs of the biennial in detail.

6.1. BIEN ROOTS

The large wall tapestry is a centerpiece of the biennial. It is hung on the visible space in the main exhibition venue. More importantly, it is turned outdoors to communicate also with the public who are not primarily intended to visit the exhibitions. Tapestry is a collaborative project of five textile artists. It is created as a work of art, connecting the contemporary practices of textile arts and crafts. And following the leading curator's idea, it presents the main thematic focus of the event.
The first pilot project in 2020 was a tribute to the textile heritage and contemporary creativity. The tapestry 2021 made by five Slovenian artists is showcasing their work in the field of sustainable textile and new materials: fishing nets, fruit pulp, organic fibers. The process of making the tapestry is video and photo recorded and presented on the social media channels.
Remote work is not an activity waiting for us in the future. It is already here, and the model of group and collaborative artist-in-residency programs must adapt to the new reality. The "residency" support program must envision new tools, such as the promotion of the work in process, encourage and explain the use of technological solutions available, insistent but patient communication, and lots of involvement of the public within the preparation and execution phase. Public must feel they are a part of the process to engage in the final product/final artwork. Residencies must open towards the end-users – the viewers and collectors of art.

6.2. BIEN GROW

Learning platform for textile art and design BIEN Grow is a platform for promotion and distribution of textile art and

design toolkits. The platform reinforces online activities together with artists and designers themselves. Together with contemporary artists working in the field of art and technology, we identified a recent problem which arose as the collateral damage during the pandemic of Covid-19: the live workshops are made impossible.
BIEN Grow is an online platform where artists can realize remote workshops. The biennial becomes a mediator between artists and the public. The idea follows a simple process: distributing the toolkits for individual workshops among applicants, recording video tutorials and organizing online video sessions where artists become mentors and teach participants their skills. The network is specialized for textile art and design and can become international as well as more varied - we could in the next phase invite artists from different backgrounds. Together with recorded tutorials, an online meet-up session of all the participants and the mentor is necessary. The meet-up gives all involved a needed sense of belonging.
As for now, we have divided the remote workshops into two sections. First is intended to cover a broader group of textile lovers. They will be able to work on the home-style macrame and DIY accessories for home and family. The other group is more specific. Connecting textile and electronics, the program is innovative and talks to the ones who feel the need to dive into more technical handwork. In this program, the participants make their e-textile MP3 player and e-textile speaker.

6.3. BIEN WALK

Sound is an important media we would like to feature in the BIEN biennial. Not only optical and haptic, two senses most connected to textile, but also acoustic understanding is in place. We are developing a series of podcasts, interviews and short verbal descriptions related to industrial heritage of the city and the region and joining them in an open library with heritage content allocation: textile, electronics, natural, architecture, design, art, middle ages, 20. century etc. Together with a group of artists, we are organizing group audio walks with special performances and making the content also usable for individual exploration. The content creators vary from professional ethnographers and artists, but we are opening the doors to students and communities to upload their content into the library. The content is deployed on those as mentioned above, e-textile MP3 players as well as all smartphones with maps. The initial idea is that a user can - along with a premade content - designs his/her hardware (within the e-textile MP3 player workshop) and his/her content for others to listen. Even though the content is localized, the person listening to it does not need to be.

6.4. BIEN TALK

A part of the biennial will be a virtual symposium, and all of the artist talks will be screened online. The virtual symposium is, in principle, organized as a virtual event. The artists' talks, however, might be scheduled as physical events streamed online as well.
The virtual symposium is taking place on the 2nd and 3rd of June and is divided into three sections focusing on "Creative territories", "Backgrounds", and "Alternative sustainable materials". Each section will feature three lectures or moderated talks.
Following the idea of the biennial to focus not only on the invited star artists but more importantly on the emerging artists and students, we wish to give them as much space in the program as possible. Faced with a chance that not many visitors will be able to see the artworks live, we wish to photo and video document their works and present them through streamed video talks. Soon the portfolios might change from a primary folder with featured artworks and printed catalogues to a multimedia conglomerate.

6.5. BIEN OUTDOORS

One of the most critical changes in the art world in the post-pandemic times should be the shift from indoors to

outdoors. It is an important shift and needs to be done in collaboration with art galleries, urban planners, communities and municipalities. The transition should not only be visible in the urban sphere of city life. Still, it must address the open space in neighborhoods, around community buildings, walking paths, parks, and even in the great outdoors, such as woods and nature reserves. The latter must be executed with great care for natural habitats or even with biological factors in mind.
The installations in public space as well as presenting art online is an inevitable consequence of the new era. BIEN will feature all of them, indoor exhibition, outdoor exhibition, and hybrid exhibitions. Hybrid exhibitions will present art projects partly in public space and partly in the virtual one. The mixed exhibitions will feature groups of artists and for the most part groups of students around Europe. Designated street gallery in the old town of Kranj will change its contents every month in the year 2021, thus prolonging the time of the biennial from the 8th of February until the 31st of December 2021.
The open call for hybrid exhibitions is addressing the moment in time. "When the whole world is facing a new social reality, in which the space for social contacts, for free movement, touch and closeness, is reduced, where there are so many restrictions that it may not make sense to talk about what is forbidden, to what is even allowed, we ask you: How have you been breathing lately? What suffocates you?"
Not only individuals are suffocating, also ideas are strangling, movements are suffocating, the economy is suffocating, education is suffocating, cities are suffocating, the whole world is suffocating ... And when something stifles, then what is left? Could this space potentially mean an opportunity for something new? Perhaps we are thinking about suffocation as a natural process that requires a new adaptation in the search for new solutions?

6.6. BIEN TIME

Lastly, the biennial in the time of new reality must not be dead serious only. We wish to take a step further and again inspire ourselves from the heritage surrounding us. BIEN wishes to be sustainable, and with that in mind, it is quite a challenge to think in a "normal" event merchandise. We wish to give our participants and visitors something physical, something to hang on their walls in their private spheres and usable at least for a year.
We are presenting textile calendars. The same was made in the second half of the 20. century in the textile factory Textilindus. We are printing patterns made by students inspired by the designs made in this factory. There is a twist. The calendars start in June 2021 and end in May 2022. The new perception of a year is in place. The coronavirus divided the year in the "stay at home" time and few months of ordinary living, socializing and traveling. And why not mix with the old and neve changing standards a little bit?

7. CONCLUSION

Innovation and tradition are never out of fashion. Fashion is a cyclical phenomenon and has been like this since the avant-garde periodically returning to the tradition. Today, fashion is dominated by the fast fashion model. Rapid reversals in clothing trends are influencing consumer behavior and their demands for an increasingly efficient production and supply chain. Aggravating circumstances are free to trade agreements that allow companies to hire a cheaper contractor and ever new consumer groups. E-commerce and the expansion of one-click online shopping have accelerated the growth rate of the clothing store. The fashion industry is one of the biggest polluters in the world. There is no uniform and straightforward solution.
The challenges of the future are many, but human creativity, activity and determination have successfully changed old views and practices many times in history. With simple measures such as reduction, reuse and careful selection, each individual can be fashionable. Nature equips us with practical, colorful and magical materials and inspires our designers. The interpretation of textile heritage, significantly marked in pilot BIEN 2020, and patterns driven from the urban texture and the city processes forecast new ideas for BIEN 2021. Curators, artists, and students recognize the solutions for sustainable practices. BIEN is on the way to highlight social and urban changes, to connect them and to make sure that the materialism of the past era becomes a reflection on the materials of the new age.

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FASHION AND SUSTAINABILITY

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ABSTRACT
The global concern for sustainability is increasing and gradually also finding resonance in modified approaches of fashion industry. Sustainable fashion today is a growing philosophy worldwide and is part of an integrated concept of sustainable development, and a broad concept covering many different forms of sustainable fashion. The paper describes the principles, forms and models (concepts) of sustainable fashion. Moreover, the basic strategies to reduce the negative impact of the textile and fashion industry on the environment are presented. The paper also highlights the sustainable design projects of Textile and Fashion Design Department of the Faculty of Design, which shows us that sustainable products can be very well designed, and that our purchasing decisions are not limited to the selection between beautiful and environmentally friendly items.

KEYWORDS:
Sustainable Fashion, Sustainable Development, Sustainable Design, Sustainable Strategies, Fashion, Textile

1.INTRODUCTION

The fashion industry has become faster and cheaper, thus, it is important to realize that at the same time it has become the industry with the greatest exploitation of people and natural resources. Frequent changes in fashion trends and the affordability of fashion products, which encourage rapid change of clothing and mass production and consumption, lead to market oversaturation, which is reflected in the accumulation of textile waste and the negative impact on the environment and society. All this places the fashion industry among the biggest polluters of the environment, so we need to look back and consider the quality and slowdown of fashion, sustainable approaches, strategies and technological innovations that will contribute to more long-term environmental and human impact (CELCAR, 2020).

Day by day, we find out that we live in a time when the end of fashion as we knew it has come. Fast fashion has transformed the fashion industry, which is constantly facing new challenges and is among the important drivers of the world economy and is one of the three most polluting industries in the world. That is why the fashion industry has recently been talking about sustainable development and design, sustainable fashion, sustainable, ecological, organic and biodegradable materials, recycling, reuse, design and tailoring without waste, striving for more responsible production, moderate consumption and quality life (CELCAR, 2020).

The paper describes the strategies, principles, forms and models (concepts) of sustainable fashion. It also defines the term sustainable fashion and other related terms (e.g. eco, organic and ethical fashion). The paper also highlights the sustainable design projects of Textile and Fashion Design Department of the Faculty of Design, which shows us that sustainable products can be very well designed, and that our

purchasing decisions are not limited to the selection between beautiful and environmentally friendly items.

2. SUSTAINABLE DEVELOPMENT AND STRATEGIES FOR DEVELOPING SUSTAINABLE FASHION

Sustainable fashion is a part of an integrated concept of sustainable development, and a broad concept covering many different forms of sustainable fashion. Sustainable development (SD) is a multidimensional concept that has been present almost everywhere lately, as we are more aware than ever of the negative impacts and consequences that mass production has on the environment and society. There are several definitions of SD, and the most vivid and frequently cited is the definition of the World Commission on Environment and Development, also known as the Brundtland Commission (WCED, 1987). The common values of SD are a prosperous economy, quality of social life and preservation of the environment. This means that SD takes into account social and economic aspects in addition to environmental issues. The strategy of SD requires the products and services of high quality which are environmentally friendly, meeting the needs of the market and not neglecting the needs of consumers. It is necessary to reduce the negative environmental impacts of all business activities in the integrated supply chain (SADAR, 2014).

Recently, we have seen an increase in sustainable clothing and fashion brands in the fashion industry, which operate in accordance with the principles of SD. We often talk about sustainable, eco, green, fair (responsible) and ethical fashion, which is seemingly contradictory to (fast) fashion. But modern projects of fashion designers and brands show that the principles of SD can also be applied in the fashion industry. The concept of sustainable fashion is very broad, as there are several forms of sustainable (ethical, eco, fair etc.) fashion or "fashion with conscience", as called by C. Joergens (JOERGENS, 2006). The new approach of fashion with conscience related to the development of ethical textile and fashion companies, whose key purpose is the production of attractive and consumer-friendly clothing while ensuring good working conditions, and providing a sustainable business model of the origin of clothing, reducing the impact of production on the environment by using organic materials (JOERGENS, 2006). At the same time, the fashion industry is facing sustainable production and the complete sustainable manufacturing process, green marketing, green information dissemination, and green attitudes and education in order to achieve sustainability and sustainable development within the company (SHEN et al., 2014), including fair trade and the preservation of traditional handicraft techniques (CELCAR, 2020).

Speaking of sustainable fashion, we soon realize that there are several forms and strategies of sustainable fashion. Dr. Brismar from Green Strategy states that sustainable fashion means manufacturing, marketing and using clothes, shoes and accessories in the most sustainable manner possible, taking into account both environmental and socio-economic aspects (BRISMAR, 2019). In practice, this implies continuous work to improve all stages of the product's life cycle, from design, raw material production, manufacturing, transport, storage, marketing and final sale, to use, reuse, repair, remake and recycling of the product and its components. From an environmental perspective, the aim should be to minimize any undesirable environmental effect of the product's life cycle by: ensuring efficient and careful use of natural resources (water, energy, land, soil, animals, plants, biodiversity, ecosystems, etc); selecting renewable energy sources (wind, solar, etc.) at every stage, and maximizing repair, remake, reuse, and recycling of the product and its components. From a socio-economic perspective, all stakeholders should work to improve present working conditions for workers on the field, in the factories, transportation chain, and stores, by aligning with good ethics, best practice and international codes of conduct. In addition, fashion companies should contribute to encourage more sustainable consumption patterns, caring and washing practices, and overall attitudes to fashion (BRISMAR, 2019).

Some actors and individuals argue that sustainable fashion means making clothes, shoes and accessories in an environmentally friendly way (i.e. eco fashion), from organic and biodegradable materials (i.e. organic fashion) or recycled materials (i.e. recycled fashion), in appropriate and healthy working conditions and with fair play for workers and the prevention of the exploitation of labour and child labour (i.e. ethical fashion), while others advocate the redesign, reuse and repair of used clothing and textiles (up-cycle), the sale of second-hand and vintage clothing or underline the benefits of swapping, renting or borrowing clothes as opposed to purchasing newly produced clothes (BRISMAR, 2019; ŠTRUKELJ, 2010, CELCAR, 2020). It is therefore characteristic for sustainable fashion that clothes are worn for as long as possible and that they are made of organic and biodegradable materials using methods that do not harm the environment and people.

2.1. PRINCIPLES, FORMS AND CONCEPTS (MODELS) OF SUSTAINABLE FASHION

Sustainable fashion design principles and concepts (models) are based on a combination of ecological and ethical principles, with an emphasis on innovative, long-lasting collections (SADAR, 2014). Design that takes into account the entire product life-cycle is therefore the fundamental strategy of sustainable fashion. Eco-conscious designers strive to reduce negative environmental impacts at all stages: from production, distribution, use and disposal (ŠTRUKELJ, 2010). Contemporary fashion designers are introducing new, eco-friendly methods and concepts that reduce the negative environmental impact of industry by applying eco-friendly practices and socially responsible work (SADAR, 2014). The contemporary concepts and models that reflect differ-

ent sustainable fashion strategies are listed on Figure 1 and described below.

One of the fundamental strategies is designing that takes into account the entire product life-cycle. Designing sustainable collections takes into account the entire product life-cycle, using certified organic, sustainable and/or recycled materials, environmentally friendly processes and technologies, ethical principles, fair trade guidelines, etc. There are many designers, brands and companies working on this principle, but there is still space for new solutions, innovative collections and ideas. Figure 2a shows sustainable fashion collection of Slovenian luxury brand Benedetti Life (BENEDETTI.LIFE, 2020).

Figure 1. Several concepts and models of sustainable fashion that reflect different sustainable fashion strategies

Zero waste fashion design and pattern cutting strategy take into account the whole product life cycle, where inputs − materials and energy, and outputs − emissions and waste, are minimal. The design is based on the assumption that all material can be used and nothing can be thrown away (SADAR, 2014). One principle of zero waste fashion design refers to fashion design that wastes no fabric, by integrating pattern cutting into the design process, as presented by Rissanen and McQuillan (RISSANEN and McQUILLAN, 2016). Figure 2b shows an example of garments (hoodie and jeans) made of zero waste fashion design and following the pattern cutting principle, as developed by Timo Rissanen (RISSANEN and McQUILLAN, 2016), while Figure 2c shows another zero waste design principle by Scandinavian designer Eunsuk Hur who develops clothes, fashion and home accessories from modular particles and zero waste cutting so that the pieces are assembled together without sewing (EUNSUKHUR, 2020).

Recycling and reusing of waste materials (such as textiles and clothing, as well as other waste materials) through various processes allows the production of new materials and products for different purposes. Reusing of raw materials (such as textile materials, clothing and other materials) and designing of new products for a different purpose. Given the fact that garments are also quickly discarded due to rapidly changing fashion trends, many designers extend the life of garments by reusing and redesigning them. Up-cycling of textile materials and clothes into high quality products – products of higher value or quality than the original is thus a very important concept that extends the products' life-cycle and reduces the amount of waste etc. Figure 2e shows an example of recycled and up-cycled shoes, named Ballerinas Walk the Talk made from recycled soles and old used jeans by Slovenian sustainable brand Destilator (DESTILATOR, 2020). Figure 2f shows the results of redesigning and repairing of textiles and clothing by Slovenian company/brand Reinkarmika (REINKARMIKA, 2020).

Designing multifunctional clothing is a sustainable concept that allows the use of clothing in different circumstances and thereby extending the life of the products (SADAR, 2014). For example, one piece of clothing with accessories allows for a variety of attires throughout the year. Figure 2d shows an example of multifunctional garments – capsule OMDANNE by Solve Studio which consists of three pieces of clothing (T, R and E) that can each transform into over 10 different styles. All three pieces are also 100 % biodegradable and compostable (made of 100% lyocell Tencel ® fibres; thus they become nutrients to the soil instead of polluting textile waste (SOLVE, 2020).

Figure 2. Examples of sustainable fashion brands and designers which use different fashion sustainable strategies (a-Benedetti.Life, b-Timo Rissanen, c-Eunsuk Hur, d-Solve, e-Destilator Solutions, f-Reinkarmika, g-Kreativnice)

Products that promote the local economy and crafts are also very important concepts of sustainable development and fashion. Promoting the local economy and crafts is not only important for preserving jobs, but also for preserving traditional knowledge of individual cultures (SADAR, 2014). Figure 2g shows Slovenian creative centre KreativNice of Škofja Loka, which brings together local textile designers and creators. Designing fair trade products that highlight environmental and social issues is a concept that should not be neglected in the fashion industry. Many fashion brands today are also striving for fair pay and good working conditions for all those involved in the industry and take care of the proximity of production processes, and promotion of fair trade, local economy and hand crafts. Promoting the "use" of second hand and vintage clothing and borrowing (renting) clothes are not new concepts, but they are very important for the environment as well as for society and circular economy.

Developing of new sustainable, biodegradable, renewable materials, technologies and processes has been gaining value in the last decade. Nowadays, a lot of research is being performed on the development of biodegradable materials and polymers, which can "vanish" from the Earth surface after being used. Revolutionary innovations are to be expected for the next decade on the interface between biology and technology, for example the materials derived from plants and processed using naturally occurring organisms or enzymes. Biodegradable textiles from microorganisms (e.g. bacterial leather from kombucha, fermented vine etc.) or mushroom mycelium have already been developed, which are certainly more sustainable in the processes of production and decomposition. Bacterial bioengineered pigments are also under development, which can be an alternative to the classic textile dyeing and printing processes. An increasing number of projects are aimed in the development of materials from the residues of other industries, e.g. food industry (vegan leather from leftover apples, pineapple and other fruits, soya etc.) (CELCAR, 2017; 2020).

3. SUSTAINABLE FASHION AND TEXTILE DESIGN PROJECTS OF FACULTY OF DESIGN

Aware of the importance of sustainable development, and the desire to develop the Textiles and Fashion study programme at the Faculty of Design, we devoted ourselves to the study of various principles and sustainable design concepts. Figures 3−6 show some sustainable fashion design projects presented in the article below.
Using industrial waste material from Goodyear Dunlop Sava Tires from Kranj (Slovenia), a company that produces car tires, students developed original creations that reflect a sustainable approach in design, Figure 3. By using waste material of the company, students design forms, develop technological processes of treatment of waste material, search for new methods of construction and develop harmonious visual compositions of new structures under mentorship of

Figure 3. Clothing forms and creations made from waste materials of the car tire company Goodyear Dunlop Sava Tires presented in several galleries and museum in Slovenia, Croatia and Serbia (photo: Domen Lo)

In the project "Between history, modern times and waste" the reproduction of historical clothing with modern materials as waste, leads to new forms, structures, details, and the inventions of different techniques. The most frequently used waste material is not just a textile, but encompasses many various types of materials. It may be an old punctured rubber, video cassette, old paper or plastic etc. Figure 4a shows a recycled folk costume, presented at RiscARTI festival in Italy, in Slovene Ethnographic Museum and other galleries in Serbia and Croatia, developed under the mentorship of Assoc. Prof. Mateja Benedetti. Automobile seat belts were used to create the vest, and used bicycle inner tubes were used to make the apron. Discarded medical linen and linen textiles were used to make the blouse, skirt and undercoat. The accessories are also recycled as the socks are woven from a combination of yarn made from plastic bags and wool from an old wool sweater and the belt is made from a seatbelt, decorated with fasteners, nuts and washers found in the depots of various workshops.

Figure 4. Reproduction of historical clothing-Slovene folk costume (a-photo: Murovec Andrej, VSŠ Sežana) and recycled couture garments (b-d, photo: Domen Lo)

The students created recycled couture garments made from waste materials and old used textiles, which were converted into new material through various techniques. Using these materials, the students designed clothing forms and developed technological processes for recycling materials under mentorship of Assoc. Prof. Mateja Benedetti. Clothing as sculpture is a reproduction of a well-known fashion designer, while textiles and non-textiles are inspired by motifs of painters from different periods, from Jackson Pollock to Monet. The recycled garments (Figure 4b-d) were presented at the 10th International Green Fest Festival in Belgrade and in Slovenian galleries.

Figure 5. Two-color creations based on the Subtraction Cutting method (a) and 0=ALL creations (b) (photo: Domen Lo)

Together with an internationally recognized designer and lecturer at the Royal College of Art in London, Julian Roberts from the United Kingdom, who was our guest during the GoingGreenGlobal project, we explored creative cutting of his Subtraction Cutting method (ROBERTS, 2020). He presented his experimental method of designing with patterns, which is derived from two pieces of textile, composed in the form of "a roller" and cut-out parts of clothing (e.g. upper part of the dress, sleeves, etc.) that are connected in an interesting way thus, forming new creations. As Figure 5a shows, the students developed original two-color creations based on the Subtraction Cutting method. In the project "0=ALL" the students explored the possibilities of clothing design using a zero waste tailoring principle. By laying, modelling and manipulating the surface of elastic jersey material, they made functional clothing using quilting, sewing and hand techniques, Figure 5b. This assignment was designed in cooperation with the textile company Predilnica Škofja Loka from Slovenia under mentorship of senior lecturer Martina Šušteršič.

Using the zero-waste principle, our students developed NAME 100% WASTE 0% experimental footwear (Figure 6), which are partly presented at the bosi. obuti. sezuti (My Feet. My Shoes. My Way) exhibition in the Slovenian Ethnographic Museum. This project was set as a research experimental process of shaping footwear in the context of forming a sculptural object, which in its design incorporates the principle of zero waste and the search for the student's own identity. The project resulted in the use of variety of techniques and materials under mentorship of Assoc. Prof. Tanja Devetak.

Figure 6. Name 100% Waste 0% experimental footwear (photo: Tanja Devetak)

We launched a Zero Waste Fashion Design Competition in 2018, and in 2019 organized a Design Talk on Sustainable Design in Fashion with the exhibition "Sustainability and Fashion", where we presented some sustainable fashion design approaches. The results of the competition and other sustainable projects are presented in the publication Start, which is published by the Faculty of Design (START, 2020; 2018).

4. CONCLUSIONS

In recent years, fast fashion has had a great influence on clothing production and shopping behaviour of consumers. Fast production of clothing and their cheap, affordable prices have increased their consumption that has many negative effects on environment and society. Fashion industry and consumers are well aware of those problems, but it's their availability and their good prices, that convince them to still buy the fast fashion products. Sustainable development fights against negative effect of fast fashion, by trying to achieve more sustainable production and consequently reducing the consumption. We believe that sustainable fashion is much more than just a current fashion trend, it is a challenge and something urgently needed.

In summary we can conclude that all forms and strategies which promote more environmentally friendly production and consumption are socially and ethically important steps towards a more sustainable fashion industry and "slow" fashion. Slow fashion, mentioned by Kate Fletcher and Lynda Grose (FLETCHER and GROSE, 2012) as an alternative to fast fashion, began to develop with the desire for sustainable development in the fashion industry, and is based on a combination of ecological and ethical principles with slow production, slow purchases and a long use of fashion products made of quality materials and requiring minimal maintenance. At the same time, slow fashion aims at changing the mindset of consumers and tries to direct them from the constant consumption of low-quality fast fashion products to smaller purchases of high-quality and design-perfect products that are wearable and versatile as well as durable, so that they can be combined in various ways and worn for many years.

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PROJECT RINF - RECYCLE IN FASHION

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ABSTRACT
The paper reports on a project RinF − Recycle in Fashion, supported by Anne Lindh Foundation. The aim of the project is to promote the exchange of knowledge among Euro-Mediterranean partners through the selection of different recycling, upcycling, or any other sustainable methods, practices or models in fashion with special attention made to the integration of handcraft techniques. The partners are the Head of the project ComeUnaMarea (Italy), the Centre for Design Research (Slovenia) and the Gozoor from Egypt. In this regard, the project reflects the cultural richness of the region with an emphasis on sustainability in the fashion sector. After the definition of joint research methodologies, and criteria, the research about creative solutions in the fashion sector in each partner country has been conducted. Methodologies used were based on qualitative and quantitative analysis of the gathered data. They were collected through reviews of official statistics, data archives, interviews and questionnaires (consumers and fashion practices). In the research, the descriptive method was used as well as numerical evaluation, where the data collected allow it. The results showed differently developed fashion systems across the region. It was the foundation of sustainable fashion strategies that have been perceived as the most appropriate for the researched areas.

KEY WORDS:
Recycle / Fashion / Sustainable / Euro-Mediterranean region / Handicraft techniques.

1. INTRODUCTION

Fashion or clothing as an everyday object and activity holds an important role both in an individual and collective life. It is a social, economic and aesthetic force (FINKELSTEIN, 1996). The formation of individual and collective identities through clothing images is a reflection of the emergence of a particular clothing and fashion trend. Clothing is a collection of aesthetic (visual) values of an object and symbolic meanings, which are defined by values developed in each environment and can be interpreted with the help of sociology, history, psychology, economics, ethnology and/or anthropology. Fashion is a reflection of a time-specific social space, but it is also a lens through which we look at society from different angles; history of clothing culture, history of body decoration, language of signs and meanings, sexual expression, economic activity and urban/environmental experience (IBID: 7). The space relevant to fashion and clothing is perceived and arranged in three sizes and meanings: personal space, social space and public space. The notion of space has expanded in modern times to questions of identity and affiliation, thus reflecting social, cultural, geographical, political, historical, economic and environmental contexts. Therefore, the value of space in fashion can be explored in relationships between human-clothing, human-human, and clothing-clothing.
The general definition of sustainable fashion reflects those

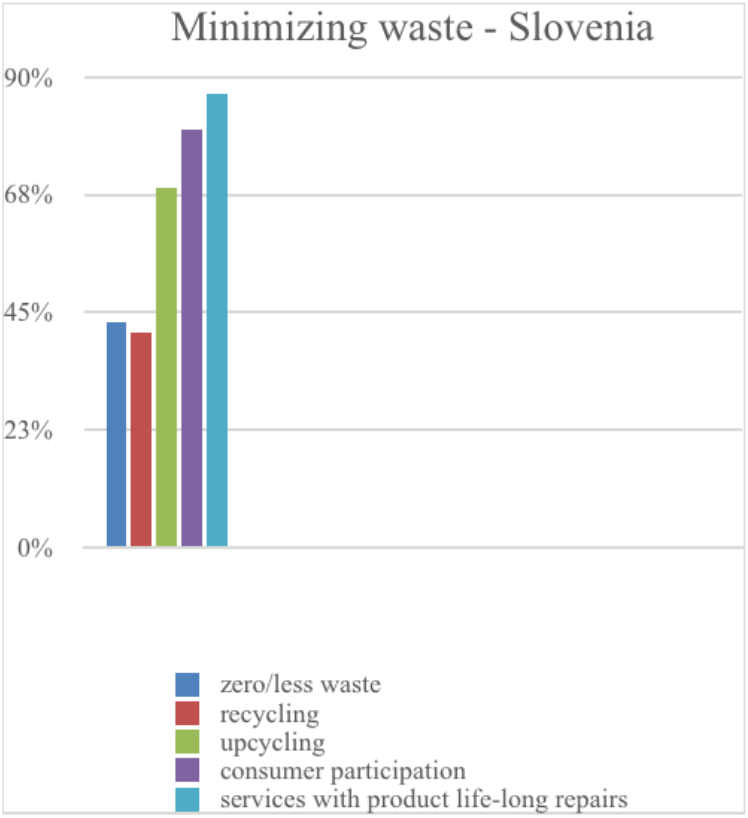
relationships in economic development that follows current needs by taking into account minimazing the impact on the environment and reducing the use of natural resources in the future as well as caring for the people and communities involved in the overall process. Within the design process, a sustainable fashion system can positively impact the ecosystems of our natural and social space. A circular economy, waste management, ethical and regional production chain and responsible resourcing have to be a dynamic intertwine of key factors in the direction of developing a more sustainable fashion. The latter is currently responding to some challenges of sustainable development and in some cases involves the composition and consideration of individual elements of sustainable development. Social aspects take into account the awareness of cultural inequality or exclusion, work justification and poverty, and explore the concepts that derive from the way and context of the world in which we live. The technological aspect has a great influence on sustainable fashion design, which relates to the production processes of textile and clothing design. The most prominent segments in sustainable fashion design are the basic life cycle of clothing (production, use and end of use) and social aspects of fashion design (prevalence and nature of consumption, user and local environment participation, craftsmanship, speed of production and delivery). Elements of social responsibility, economic profitability and protection of the natural environment should be taken into account throughout the life cycle of clothing. Sustainable fashion combines elements of systemic concept and reflection, actual human needs, local products, knowledge of materials and collaborative design. Sustainable design is not a time category but a category of space quality, with a different, more responsible approach by designers, retailers and consumers (FLATCHER − GROSSE, 2011). It is important to be aware of the impact that the product has on the wider spaces with an emphasis on social communities and ecosystems.

2. CONDITIONS AND DEVELOPMENT RESEARCH

RinF − Recycle in Fashion is a project of three partners in Euro-Mediterranean region; the leading partner ComeUnaMarea from Palermo in Italy, the Gozoor from Cairo in Egypt and the Centre for Design Research from Ljubljana in Slovenia and is supported by Anne Lindh Foundation. The project includes the research on fashion sector in three partner countries regarding the sustainable solutions and practices as well as implementation of local or regional craft techniques in fashion design process. In partner countries, fashion is very differently developed and thus represents an industry with different economic power. According to the Statista.com (2021), Italy is estimated to be ranked 15th worldwide in terms of revenue in the fashion industry, while Egypt is 45th and Slovenia ranking 76th globally. The same statistical survey has shown that in Italy most common way to get rid of the clothes no longer worn is giving them to charity, 82% responded they would rent clothes and 66% of the respondents believed that manufacturers should be obliged by law to consider ethical aspects in production. Therefore, the challenge of fashion in the modern world is how to reduce waste and incorporate already used products, offcuts or excess material into the new design process; fashion has to be challenged by the need to make and consume less. Users have to play a key role in this process.

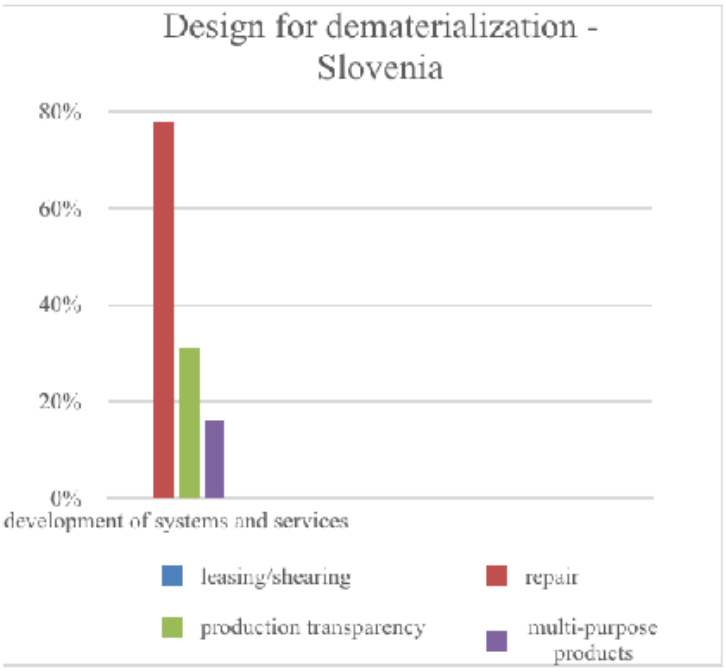
According to the different starting points of fashion development in the partner countries, the general criteria of the research methodology were first defined, in a way that it was applicable in all three environments. Methodologies used were based on qualitative and quantitative analysis of the gathered data, collected through reviews of official statistics, data archives, interviews, and questionnaires (consumer and fashion practices). In the research, the descriptive method was used as well as numerical evaluation, where the data collected allows it. In determining the criteria, the following fashion segments were included, which will have to change in the future, namely (FLETCHER − GROSE, 2011):

- Products (materials, processes, distribution, maintenance of the products and their disposal);
- Fashion system (speed, costumer's needs, inclusion of customers, services of sharing/renting, local production and supply chain, life cycle optimization);
- Design practices (communicator/educator, facilitator, activist and entrepreneur).



The first step included the mapping of the fashion practices which includes the definition of fashion practices (scale, infrastructure and specialization e.g. sport wear, men wear, women wear, luxury) and the legal forms of businesses e.g. independent designers, private sector, investors, fashion recycling projects, NGO's, cooperatives and initiatives. In Slovenia, 45 brands were detected, most of them micro-scale businesses (more like one-man-band units). The criteria according to which they were selected were that they have been operating for several years in a row, that they include some dimension of fashion design in their production of clothing and successively design regular collections. The legal forms of businesses are very different: self-employed workers in culture, types of corporate structure or sole proprietors. They are geographically dispersed throughout the entire territory of Slovenia. Regarding the area of activity, fashion designers in Slovenia are mostly applying their skills in private sector, contrary to the requirements of sustainable fashion in which designers should be active across economic areas, e.g. public sector, non-profit sector and research (IBID: 156). Given the size of the fashion industry in Italy and its reputation in the world, mapping in Italy included a review of brands that implement some aspect of sustainable development. The review showed that various sustainable fashion initiatives involving different economic forms of action have already been developed in Italy. In comparison with Egypt, where there are several non-governmental initiatives in the field of sustainable fashion, non-governmental organizations in the field of sustainable fashion and fashion design do not operate continuously in Slovenia. A comparison of all three surveys shows that textile production in Slovenia is poorly developed and even less sustainably innovative. Unlike Italy and Egypt, where they have larger production units, some of them with distinctly sustainable solutions, e.g. Orange Fiber in Italy.

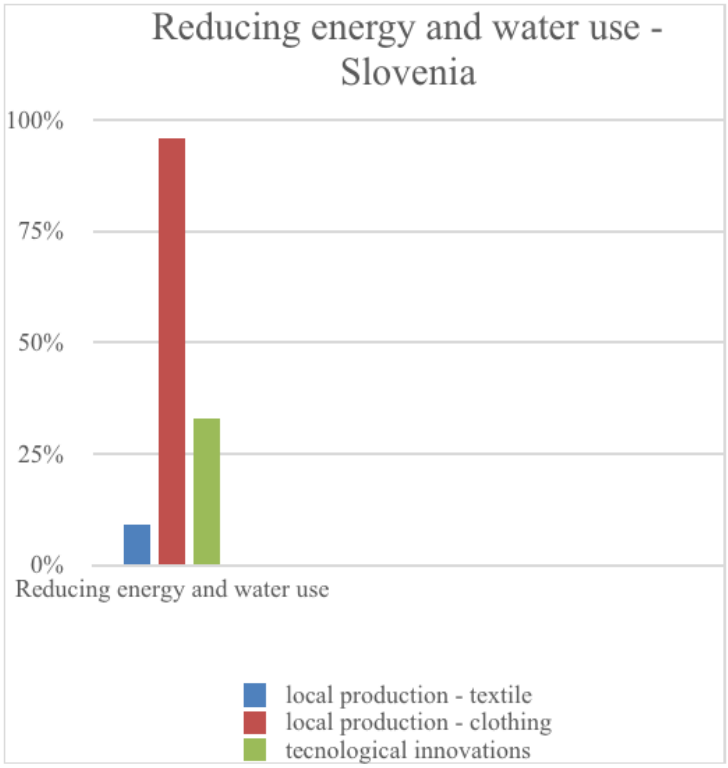
The mapped business entities were then analysed from the point of view of waste reduction, both in the production process and after the users discard it. The activities we considered in the analysis included zero-waste or less-waste tailoring, recycling and upcycling, the focus on the design and production of products that adapt and improve over the years, consumer participation in the design process, using social media (as a tool to educate about sustainable fashion as well to share brand stories) and the development of fashion communities by fashion brands themselves. The review also includes services with product life-long repairs as one of the options to slow the fashion consumption and overcome the current clothing metabolism (IBID: 89). Due to the micro scale size of the brands in Slovenia, most of them have a service with product life-long repairs (87%) as well as consumer participation (80%). In this context, Slovenia has an advantage due to the size of the businesses and should promote this as an important activity of sustainable fashion among users and as brand management. Slovenian fashion brands are less successful in including zero waste or less waste design (47%). In the field of recycling, this is mainly present in knitting-based brands (42%) and in some cases in using textiles made out of recycling material. In Egypt, the integration of recycling or upcycling strategies is more widespread, while in Italy, given the status of Italian fashion in society and its size, the share of any form of reuse or lifelong repairs is lower. In reducing the impact of the fashion industry on the environment, it is important to reduce energy and water consumption. Thus, in the further analysis of the selected mapped fashion brands, the data on technological or production innovations that require minimal energy and water consumption (e.g. clothes that require minimal cleaning, technical coatings to reduce washing, innovative and informative clothing labelling) as well as localization and the use of natural energy systems were collected. In addition, data on the local and/or regional supply and production chain were reviewed. In Slovenia, most brands use textiles that are not locally produced (only 9% of them use locally produced textiles). Unlike clothing production, which is almost entirely local (96%). Technological or production innovations, which are key in reducing resources, are poorly represented in Slovenian fashion brands (only a third of them use some elements of technological or production innovations within the clothing production and even then, innovations are not tied to reducing the energy consumption due to clothing maintenance). If we compare the data with Egypt and Italy, they differ. Most technological innovations can be detected in Italy, while Egypt is more comparable to Slovenia in this area.



In the need to reduce the fashion loop size, we reviewed the situation regarding the existence of ideas that contribute to less production and dematerialization. This strategy introduces service concepts such as leasing, sharing and repair services that support the existing products. It also promotes multi-purpose products (modular clothing). In this context, a transparent supply and production chain is extremely im-

portant, as is the formation of local/regional or online communities within these chains. It is necessary to emphasize the importance of the use of digital media tools of communication, which enable all the interested users' traceability and transparency of the entire design and production process. In the context of sustainable fashion, we consider this as one of the key factors, as it also enables the democratization of information within fashion industry. With these communication channels, fashion can become better connected with its users, while at the same time using them as a tool to spread positive activist messages about the importance of sustainable fashion. In Slovenia and in Egypt, the various services concepts are not evenly developed. Forms of leasing or sharing are not developed enough (the resellers of wedding and formal dresses were not included in the analysis) in comparison to repairs which are implemented as their core activities in almost three quarters of brands in Slovenia. They rarely use publicly verifiable data in their supply and production chain, therefore production transparency is very poor (31%). Similar results are also in Italy and Egypt. In the latter, digital communication channels are very poorly developed, so the data cannot even be widely available. According to the data gathered in Italy, the leasing company Dress You Can based in Milan, already offers clothing for different occasions (e.g. sport wear, daytime wear, accessories) and by different fashion brands.

In the project RinF − Recycle in Fashion, inclusiveness of craft techniques into fashion design was one of the core activities within sustainable and durable fashion, with respect to cultural heritage. Sustainable fashion design must respect the cultural and historical specifics of individual geographical areas. There is the so-called fashion colonialism, within which the existence of local fashion specifics is not possible or allowed. Therefore, there is a 'universal' fashion that enforces the voluntary global uniformity of communities and individuals. Decolonization of fashion means not only the actual geographical elimination of the dominance of fashion centres and their superiority, but also a change in the acceptance of one's own fashion activity by the community in which fashion originates (JANSEN, 2020). We should not associate decolonization of fashion exclusively with the exploitation of the natural environment and labour force, but also with the establishment of a democratic image of confident fashion, which arises from the specifics of a particular geographical space in which fashion originates and not only as copying universal fashion trends set by established fashion centres. In developing a more sustainable fashion industry, the integration of traditional handicraft techniques is crucial. The latter are upgraded by designers with modern technological innovations. Creation of the products combines design and handicraft processes as a single indivisible whole. The importance of handicrafts is recognized as an important step in preserving the collective and individual cultural identity, while contributing to local production and waste reduction.
According to the results of the research, handicrafts, which originate as part of the cultural heritage in Euro-Mediterranean region, are more strongly represented in Egypt and partly in Slovenia and to a very small extent in Italy. This, of course, stems from the above mentioned fact that Italy as a fashion centre (one of the four big ones), is definitely considered as a fashion trendsetter of the universal fashion. In the analysis of the data related to the use of handicraft techniques, we took into account the data on the type of technique used, the prevalence of use and whether it is regularly included in the design processes. The main handicraft techniques used by Slovenian fashion brands are knitting (13%), handmade screen printing (13%) and less embroidery. When reviewing the fashion situation in the three partner countries, we also took into account the analysis of the data related to labour rights and working conditions.



3. CONCLUSION

In the field of fashion in the countries of the Euro-Mediterranean area, the results of the research showed some similarities, differences and also the possibilities of regional cooperation in the context of the development of sustainable fashion. The difference is in the size range and diversity of fashion development between individual areas. Italy is undoubtedly a fashion superpower compared to Egypt and Slovenia, not only in economic terms, but also in meaning and symbolism. However, in understanding fashion as an expression of identity, this should not be an obstacle to the development of sustainable fashion principles. The possibility of developing regional supply chains is one of the possibilities of mutual or bilateral cooperation, e.g. Egypt has

23 major cotton production and processing companies. Slovenia is very poorly developed in the production of natural fibres for textiles. Mutual cooperation would lead to shorter supply chains, smaller stocks, the Euro-Mediterranean region development and the possibility of developing further development of joint projects in the field of sustainable fashion. A direct consequence of the geographical origin of the appearance of clothing is also the existence of fashion inequality. Considering the requirements of establishing the elements of the circular economy, the relationship between the mode of production and consumption plays a key role. Technologically outdated production processes and disrespect for labour rights and sustainable environmental development in fashion production, as well as the exclusion of cultural specifics of a particular field, can be crucial in these relationships.

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MATHEMATICAL VISION IN TEXTILE SURFACE PATTERN DESIGN

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ABSTRACT
This paper focuses on the creative interdisciplinary process of designing repetitive patterns stemming from periodic functions with two variables. By using Wolfram Mathematica, a computer algebra system, we generated contour maps based on pre-set mathematical functions with linear combination of powers of sinusoidal functions. With a digital translation of abstract mathematical values onto a visual media, a visual image based on aesthetic concepts and the creative criteria was created. Colour combinations and contour lines were then applied to corresponding contour maps by means of optional parameters, thus creating one-layered repetitive patterns. An even greater diversity of composition was achieved by layering and combining planes into multi-layered configurations. Since the result of this research was to design a mathematical collection with one- and multi-layered repetitive digital patterns, a systematic structural analysis allowed us to define wallpaper groups based on planar distribution, disposition of modular structure units and symmetric operations. The potential of the mathematical formula is applicative for use in textile practice, allowing us to realize the sustainable aspects of the future.

KEYWORDS:
Repetitive patterns / Contour line / Contour map / Symmetry / Wallpaper group

1. INTRODUCTION

Mathematics is a rich imaginary space of abstract and complex ideas, where each individual has a complete freedom of expression and creation within the formulated rules, however, one needs to abide by mathematical language and use mathematical tools and mathematical methods of work. Since the creative component of mathematics is very strong, but at the same time it possesses its own inner beauty and creativity, it can enter various areas of human activity and provides new ways of thinking with major progress for society. Its contribution provides completely different conceptual frameworks that did not exist before, so we can create inconceivable changes in the future, we can realize our visions in research and gradually expand the boundaries of human creativity and focus on sustainability.

In the last twenty years, we have been following a great rise in the mutual interaction between mathematics and various artistic disciplines. Numerous interdisciplinary conferences promote scientific research, new practices, and interests to connect mathematics with art, architecture, design, music, education, and culture. One of such examples is the international Bridges Conference (SARHANGI, 2009), where mathematicians and creators from different fields gather every year, with the aim of presenting new mathematical connections in art, music and science. We could say this is a brilliant highlight of mathematical art and artistic mathematics (LAMB, 2012), which is derived from combining an individu-

al's primary research or artistic work with a secondary field.

The versatile applicability of mathematics has also promoted the interest for interdisciplinary connections and the study of prospective guidelines in the field of textiles, the ones that enable creative thinking, the development of mathematical approaches and the integration of scientific work methods into design practice. Doing so, it focuses on the vision of the future and the preservation of the ecological, social and economic resources. The use of modern digital technologies, which direct their development with their extraordinary potential, has become an indispensable part of the general trend in design. They open up opportunities for exploring new concepts in textiles, based on multi-layered inspiration, original ideas and unique content, taking into account the coherence between functionality, aesthetics and technological processes. It should be emphasized that the expansion of scientific ideas into new interdisciplinary knowledge upgrades professional knowledge, which brings conceptual innovations, innovative solutions and added value to the creative design process, while enabling and contributing to a longer product life.

2. GEOMETRY OF PATTERNS

The patterns have a wide range of applications in textile and fashion design, architecture, contemporary art, advertising and graphic, web, product and interior design. The formal definition of a pattern as an infinite periodic configuration in which the multiplied basic unit of the motif is repeated indefinitely on the surface, in orderly sequences and regular intervals. Through repetitive variations patterns create a composite art structure that has geometric and abstract content. When repetitive forms are orderly, simple, and correct, their perception is clear and simple, however, when perceiving random, more complex, and less correct forms, finding meaning is more difficult, requiring more mental effort (BUTINA, 1997).

The visual surface of the pattern is defined by the core unit of the motif, the type of repetition, and the system of organization. The general feature of patterns is to evoke a perceptual feeling in the observer, while establishing a mutual effect that attracts attention and creates a response in aesthetic satisfaction, which emanates from the visual perception of diverse surfaces of patterns both in nature (STEWART, 2003) and in creations of human civilization (WASHBURN – CROWE, 1988). Throughout the history of arts, crafts and design, we can trace systems of using patterns to decorate a variety of surfaces in different cultural settings. The structure of the samples was based on elementary mathematical laws that allowed the elements to be repeated at regular intervals and influenced the internal geometric order. With the created logical order, attractive symmetry and visual harmony were established.

The first important and influential research study of world ornaments and patterns was conducted by JONES (1856), where he comprehensively addressed historical categorization, while at the same time presenting the general principles of visual pattern arrangement in thirty-seven statements. A few decades later, individual authors began to study the structure of patterns from a geometric standpoint. MEYER (1894) found that the patterns in the background have a certain distribution in the virtual grid structure, according to which the elements are repeated in sequence, which affects the visual character of the patterns. DAY (1897) presented the geometric construction of patterns and illustrated it with a system of organizing the motif according to various network structures, where the cells are in the shape of a square, parallelogram, rhomb or hexagon.

In the early 20th century, the development of pattern analysis and pattern classification was focused on symmetry, which later became a central theme in the study of various researchers through the prism of crystallography, chemistry, mathematics, and art, as evidenced by numerous scientific articles and books. KAPPRAFF (2001) defined symmetry as an abstract concept that encourages the creative work of artists and scientists, while at the same time serving as a basis for artistic and scientific endeavours. From an aesthetic perspective, symmetry evokes a subjective sense of visual balance, order, harmony, and the proper proportion of individual parts to the whole. In contrast, the concept of symmetry in mathematics and science requires an exact and systematic definition, which can make the mathematical configuration of symmetry seem less flexible than the intuitive sense of the designer.

Scientific research in the field of crystals at the end of the 19th century formed the basis for the study of the symmetries of wallpaper patterns and their classification into symmetrical groups. The basic feature of wallpaper patterns is repetition in two independent directions and coverage of the surface, where the structure and shape of the pattern are preserved by isometries − translation, rotation, reflection or glide reflection. The classification of groups was first defined by FEDOROV (1891) and later mathematically independently proved by PÓLYA (1924). Fedorov proved that there are exactly 17 different planar and 230 spatial crystallographic groups.

A visionary work in the field of textile design was presented by WOODS (1935 pp. 197–210, 1935 pp. 293–308, 1935 pp. 341–357, 1936 pp. 305–320) who published the first geometric starting points for the design of repeating patterns, a comprehensive study of pattern symmetries and classification of two-colour patterns. A milestone in the mathematical field of tilling and patterns research is the extensive monograph (GRÜNBAUM – SHEPHARD, 1987), which focuses on the basic geometry of plane tilling, the internal structure of patterns, the study of symmetry, and colour tilling.

New perspective discussions of symmetry continued with a

visual analysis of the symmetries of various decorative surfaces from the history of mankind. A methodical flowchart diagram in the form of questions and answers has been developed, allowing various researchers to easily determine and classify the types of symmetries in the studied patterns (WASHBURN – CROWE, 1988). SCHATTSCHNEIDER (1990) studied the works of graphic art by M. C. Escher, whose extensive works were also devoted to the creation of periodic compositions with diverse motifs. Distinctly symmetrical drawings represent the foundation of mathematical art, in which the creative potential of the artist's expression is combined with the mathematical theory of tilling in the Euclidean plane and symmetrical groups.

3. PROCESS OF DESIGNING REPETITIVE PATTERNS

The process of planning and designing textile surfaces is based on the development of an interdisciplinary concept with a system of means of expression, which includes a mathematical way of working. Doing so, the role of the designer, who uses creativity, intuition, aesthetic judgment, and takes into account the design principles, thus participating in the process of creating repetitive patterns, is initially replaced by abstract mathematical formulas. Despite the use of digital technologies, mathematical content and scientific work methods, the creative interpretation of the designer is crucial, choosing between many parameters and revealing the internal structure of abstract symbolic notation by visualizing mathematical formulas.

For designing repetitive patterns, we have developed a system flowchart diagram (Figure 1), which shows an interdisciplinary design strategy in which mathematical and artistic starting points are intertwined and connected. The algorithm illustrates the process of generating and designing repetitive patterns. Expression through mathematical functions is reflected in the process of generating through input mathematical parameters in the visual results of contour maps, which simultaneously become artistic prototype configurations. With the transition from the visual to the artistic field, we set aesthetic requirements and criteria, which include the artistic potential of the periodic configuration, the expressiveness of the elements of structural building blocks, their mutual connections and harmony of relations and meaningful order within the composition. The artistic result is obtained when colour compositions are defined for the corresponding prototype configurations, thus creating one-layer or multi-layer repetitive patterns.

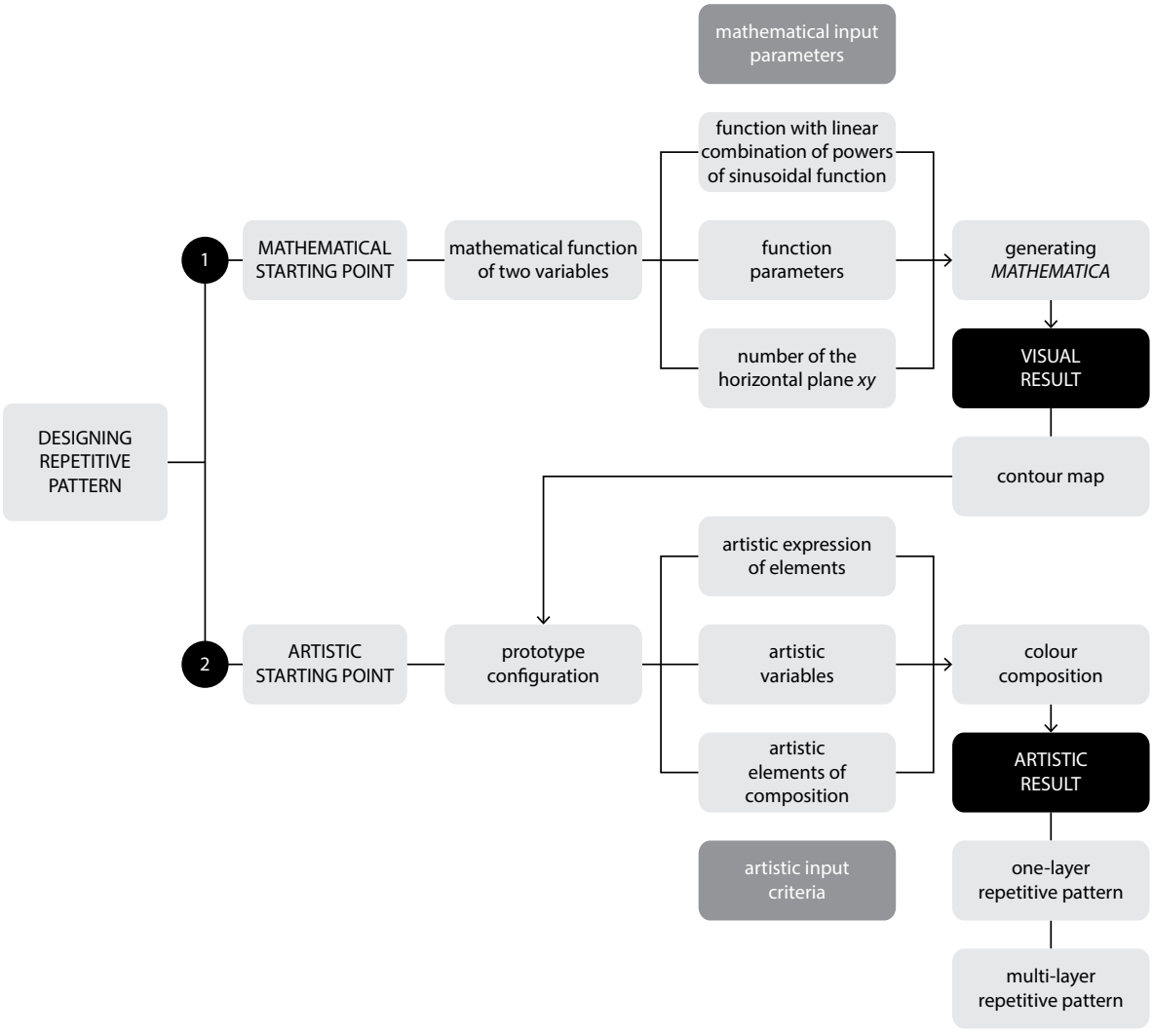

Figure 1. Flowchart diagram of designing repetitive pattern.

The creative process of designing repetitive patterns is based on generating contour maps with a computer algebraic system Wolfram Mathematica based on mathematical equations. When designing the mathematical functions of two variables, we stay focused on examining symmetric functions, asymmetric functions, and functions that are periodic in one variable. Since the basic property of repetitive patterns is repetition, it is the most appropriate choice for trigonometric functions as their basic characteristics is periodicity. The basic research study focuses on linear combinations of the exponents of a sinusoidal function in the variables x and y and examining the effects of changing functional parameters on the visual results of structural building blocks. The function of two variables is illustrated with a graph, which is presented as a two-dimensional base surface in a three-dimensional space. By intersecting the graph of the function with the selected horizontal planes, we get contour lines. When the cross sections, on which the contour lines are projected onto the plane of equation z = 0, a contour map is formed. The variability of structural building blocks is significantly influenced by the properties of functions, selected linear combinations of exponents of a sinusoidal function, functional parameters, and the number of horizontal planes xy which the three-dimensional graph of the function is intersected with. In the final phase, the areas between the contour lines are filled with colours.

In the artistic context, the mathematical formula is a mental abstraction and a visually invisible category of form, which is expressed in a digital image through the process of visualization (Figure 2). Aspects of the creation of generated configurations are mathematically conditioned, which is reflected in the design characteristics of the leading artistic elements of line and shape (MUHOVIČ, 2015), which determine the quality and properties of structural building blocks in the composition. Since the interdisciplinary process enables infinite possibilities and limitlessness in the creative process, we have set certain rules and some limitations. The criteria include the geometry of the structural building blocks, their interrelationships, the coherence of the relationships and the meaningful arrangement in the composition, the planar density, and the rhythmic variation in their period.

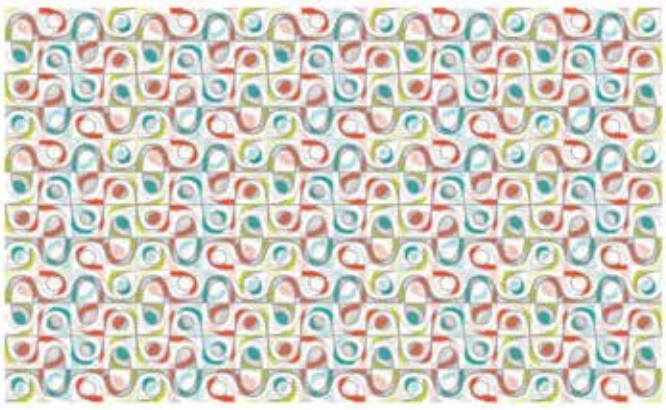

Figure 2. Visualisation of multi-layered repetitive pattern based on mathematical formula.

We have developed two ways of designing repetitive patterns, one-layered and multi-layered patterns. One-layered repetitive patterns are based on the concept of using only one contour map, while by assembling and overlapping a different number of previously generated contour maps, we create multi-layered repetitive patterns. The process is based on layering of selected layers, parallel movement along the horizontal axis, vertical axis or simultaneously in both directions, determining the order of layer composition and the method of overlapping. Layering increases the variability and compositional complexity of a repetitive pattern, while simultaneously breaking local symmetry and creating a new symmetry structure.

4. COLLECTION OF DIGITAL PATTERN DESIGN

The collection of mathematical digital patterns consists of one-layer and multi-layer repetitive patterns designed from generated contour maps of selected symmetric and asymmetric functions of two variables. Based on the artistic analysis of the visual elements of the structural building blocks of contour maps and their design potentials, we designed a collection of digital patterns.

The selection of contour maps were based on some properties of mathematical functions and applied functional parameters, where the graphs of the function reflect the domain, codomain, increasing, decreasing and extremes, periodicity, parity (even, odd), and symmetry. Criteria for determining visual elements included geometry of lines, curves, and shapes, their planar density, raster diversity, and size, while compositional parameters included variation of intervals, rhythms of repetition, and coverage of plane.

The collection presents different surfaces of repetitive patterns (Figure 3), comprising simple and more complex compositional structures, effective colour compositions, and some dynamic elements that manifest in detail. The structure of repetitive patterns is based on the laws of mathematical functions which allow the repetition of structural building blocks at certain intervals and affect the internal geometric order. With the created order, an attractive harmony for senses and overall coordination within the compositions is established.

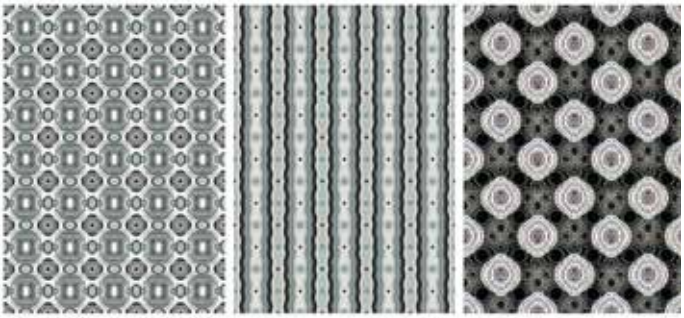

Figure 3. Collection of different textile surface pattern design.

The degree and type of symmetry in individual samples were checked on the basis of planar organization and arrangement of modular structural building blocks, and then wallpaper groups were used to classify symmetrical characteristics. The analysis process involves the internal study of the compositional structure and the definition of the smallest symmetrical unit of the motif, which is repeated with parallel movement at regular intervals in two independent directions. With a systematic study of the geometric construction of the lattice structure, we obtained an asymmetric cell and its basic generators, on the basis of which we defined the wallpaper group.

Typical wallpaper groups for one-layer and multi-layer repetitive patterns of symmetrical functions are p4m and p4g. In most cases, the p4m wallpaper group is present (Figure 4), which is not influenced by the one-layer or multi-layer design of the pattern, but is influenced by the characteristics of trigonometric functions that have a well-defined degree of symmetry. The p4m group is also obtained in the case of multi-layer repetitive patterns, where three contour maps of one symmetric and two asymmetric functions are layered.

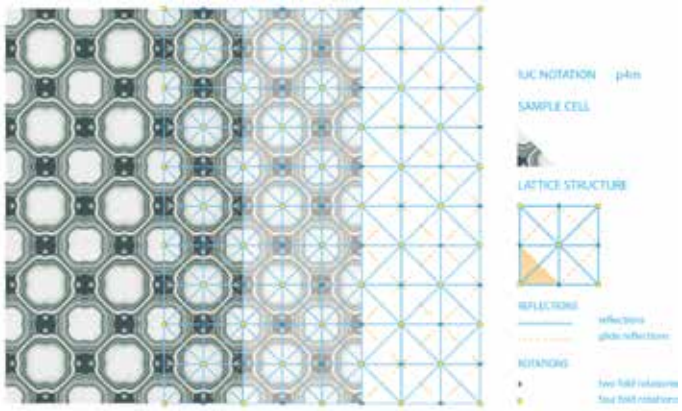

Figure 4. Graphical representation of the p4m wallpaper group.

The basic generators of the p4m wallpaper group are translation, rotations and reflections. The centres of a four-fold rotation lie at the vertices of the base square of the lattice structure and its centre, while the centres of the two-fold rotation lie at half of each side of the square, and at the intersection of the perpendicular axes of glide reflection. Inside the square there are four more reflection axes, running in vertical, horizontal, and two diagonal directions, dividing the square into eight equal parts.

5. CONCLUSIONS

The developed interdisciplinary process of designing repetitive patterns is applicable for use in textile practice. Due to the potential of the mathematical formula which enables a combination of rational and logical thinking in the creative process and is at the same time intertwined with intuitive and artistic thinking, it brings us unlimited possibilities in expression. Digital technologies play a key role, enabling us to achieve greater complexity, continuity of work without intermediate processes and immediate visualization. The advantage of digital patterns is achieving diversity in the complexity of compositions with many details in the characteristic of base surface and visual illusions of space when creating layers. In the technological process of applying patterns to textile surfaces, we get the possibility of larger dimensions, better efficiency in the consumption of material with less waste and greater control in printing a shape. The contribution to textile design is a mathematically structured creative algorithm that takes us through a generative process of decoding a mathematical formula to achieve an artistic result in the form of an original repetitive pattern.

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ON THE WAY DOWN FROM LJUBLJANA CASTLE

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Four years ago, I had the pleasure of participating – for the first time – in the 4th INTERNATIONAL SCIENTIFIC CONFERENCE A.L.I.C.E. 2016 – after having submitted my paper; "The Unsustainability of Solving the Wrong Problems" - based on my first book "INNOLITERCY – From Design Thinking to Tangible Change". While in Ljubljana, I was also asked to do a workshop based on the same theme, and while this was my first collaboration with Faculty of Design, I'm pleased to say that it was not the last. Since then, I've been back to lecture and do workshops in 2017, twice in 2018, in 2019 and – well – in a way also in 2020, even though this time, it had to be done at a distance. And I already look forward to next time, which will be in February 2021 – hopefully in flesh and blood.

Back to that first time, in fall 2016 – during the gala event at Ljubljana Castle, I had the pleasure of meeting some old colleagues from around Europe – as well as (as always) making new friends over invigorating discussions about the state of design. We discussed in particular the paradox of how the focus on design thinking had changed – perhaps even distorted the entire discourse related to design and design management. We also couldn't help discussing the role of both the European and the international design community, and how they to some extent seemed to have failed at facilitating an understanding about design's untapped potential, and instead had left the discussion to other and more verbal actors, however not always to design's advantage. Wonderful discussion, and the kind of professional and academic refueling that seems to only happen during circumstances and under perfect conditions like that.

One of those old acquaintances – from several APCI conferences in Paris, as well as DMI events – was Brigitte Borja de Mozota, and we continued the discussion during our walk down from the castle to the hotel, and I asked Brigitte if she had ever considered writing an updated version of her book from 2003 - "Design Management: Using Design to Build Brand Value and Corporate Innovation" – a book that still serves as a standard textbook at design schools and business schools all over the world. But, let's face it – much has happened to design since 2003. We chatted a little about why that hadn't been a priority for her, I said quite casually that perhaps we could do it together, and then we didn't really discuss the issue much further – until the next evening, during dinner, when Brigitte came over to me during dessert, and just said; "Steinar – let's write that book".

That was the beginning of a long and very rewarding collaboration between us. We started by meeting for a day's workshop in Paris in early February 2017, where we mapped our thoughts and ideas and concerns, and where the core concept of our joint project was developed. We realized that there were several bridges to be built; first of all, between research and consultancy, theory and practice – Brigitte coming from the first and I from the latter. But, also between design science and business science, between design thinking and business thinking – and not least, as the lack of such

a bridge was one of the starting points of our discussion; between design making, design management and design thinking.

During the two years following our decision to go into the bridge-building industry, we worked remotely, and yet closely together to develop our thinking, to challenge and sharpen it, to underpin and document our ideas and to unfold a canvas of shades and nuances; angles on the discourse that we had missed from our own professional communities – both the academic design management community and the community of design practice, design promotion and design support. In the beginning of 2019, we felt that we were close to having written a coherent and meaningful "business case" for design and its potential – provided the bridges mentioned were built and maintained. And then – just as if we had sown the idea in each other without knowing it, we agreed almost without any discussion at all; We didn't really feel like starting a round of talking to publishers, "selling" our thinking and ideas, and risking to see the discourse taking some unforeseen turns while we were at it. So, we decided to cut our work into a seven-course meal of food for thoughts, and from February and until Easter 2019, we published seven articles on LinkedIn, encouraging a discussion to start and following up on the people, who contacted us to have the articles sent directly and so on. During two months, amongst us, the articles accumulated more than 200.000 views, and we established direct communications with more than 500 design, design management and design thinking professionals from around the world. We were amazed, and we were humble…

Then, right after summer 2019, my US publisher of "INNOLITERCY – From Design Thinking to Tangible Change" contacted me to ask me if I would like to write an updated version of the book, integrating some of the new thinking and new trends that had emerged since the book was first published in 2016. I thought about it for about three seconds and then I decided to say no, thank you. The book was written very much as a series of reflections on how applying design thinking and working with proven design methods and tools from the very early phases of a project, and how building iterations and continuous prototyping, engaging stakeholders and inviting them into the design process from as early on as possible would benefit not only "traditional" design projects like new products and services, but also organizational development and society at large…. Adding a few chapters on new trends and ideas would not have done it any good… However, I responded, together with Brigitte Borja de Mozota – one of the world's leading voices within design management research – I wrote these seven articles; did he think that they might be interested in publishing what was originally conceived as a book? I sent him the articles, and at the same time, I consulted Brigitte to make sure that she approved of the idea, and less than a week later, we got the response. Provided we put a little work into some editing work, and provided we were prepared to add a few chapters on this and that – they were very interested in publishing it, indeed, under the title; "Design: A Business Case - Thinking, Leading, and Managing by Design". That's what can happen when you participate in ALICE…

The introductory chapter of the book might also serve as an introduction to the objectives of our work:

Introduction

How a global crisis released a wealth of tacit design thinking
While conscious about the need to tread carefully, not to be accused of profiteering on the crisis that the world found itself in earlier this year, and for which we will all have to change our outlook for the near and distant future, we cannot but share a few observations we've made in the last six months. One of the most encouraging was how agile and adaptable thousands of companies around the world proved in response to the situation. The COVID crisis has evidenced how design activity flourishes – on at least three different levels – when extreme disruption of "business as usual", external constraints and sudden, dire needs drive innovation.

Influencing outputs; Coming from high-tech as well as traditional manufacturing industries, companies – multinationals and SMEs alike, as well as individual professionals coming from design and engineering, business and the arts – took on the challenge of addressing and to give tangible answers to a series of unarticulated, yet universally understood briefs. They developed new products, new production lines, new assembly methods – even new materials – to serve a global market in need of protective gear, respiratory products and other items of which the world experienced a sudden and life-threatening shortage, but clearly also to survive a situation, where traditional markets collapsed and supply-chain vanished. Such adaptiveness and agility have never been seen before, and it only proves what an untapped potential of design thinking and design that actually exists out there.

Influencing organisations and institutions; At the same time, we've seen a mind-blowing civic engagement and creativity. New grass-root movements have emerged, developed services, established distribution channels and filled unmet needs. Mostly on a volunteer basis, but still a manifestation of the spare capacity out there. And for those, who were lucky enough to hold on to their jobs, new ways of working grew out of needs and accumulated, however often scattered experience; ways, which overnight became the rule rather than the exception. Never before have digital capabilities been boosted as fast and as effectively among baseline users as during spring 2020.

Influencing frameworks; Perhaps less overt, and yet possibly with a both more significant and more lasting effect, are some of the discourses emerging in the wake of the crisis. People are starting to question whether capitalism as we

know it needs reinventing and whether the values and structures on which we build our societies are resilient enough to withstand crises of such magnitude. And whether new forms of leadership are needed; more systemic and more collaborative narratives – across borders and in recognition of the mutual dependence that globalization imposes on us. In the aftermath of crises, great visions are born, new stories and new identities.

All this tells us that disruption and despair are catalysts for creativity and hidden talents. It also tells us that lateral thinking has become a premise, rather than frosting on the cake.

The design process is a convenient format for developing the idea of lateral thinking. The emphasis is on the different ways of doing things, the different ways of looking at things and the escape from cliché concepts, the challenging of assumptions.

Never before were challenging assumptions more appropriate – more important. And never before did design capture as many agendas simultaneously.

Design as a bridge between mind and matter, image and identity

Design; A Business Case challenges you to stimulate innovation in your own organization – not only in times of crisis or when disruption forces you to do so, but to make design an ongoing and integral dialogue between complementary skills, to see design as a bridge between mind and matter, image and identity. It is conceived – not only as a business case for design, but just as much an appeal to use design as a business case format for all the other ventures, changes and challenges you – as a business leader – stand face to face with.

Bridging design and business is a challenge that calls for the courage to transcend a series of stereotypes, and to fight against numerous and often extremely well-built silos. It requires that bridges are built between the siloes of academic research and the silos of consultancy, between different takes on management and between different takes on design, as well as between the many siloes surrounding design management research. And, not least – between the ignorant and the informed, of the value of design. Building bridges is the main objective of 'Design; A Business Case '.

It is a conversation and a project, co-designed by two individuals; one coming from academia and one from the world of business consultancy and organizational development. We have both – for give or take 30 years – engaged in building theoretical knowledge and empirical evidence on the subject of design in business. From time to time, we met in European and international design meetings, often invited as experts, representing our own countries or our own ideas, parallel with pursuing our separate international careers, with different tools and with different mind-sets. However, as a pair representing the domains of both business, practice, education and research, we found ourselves resembling a "T-shaped profile" , being experts in our own domains, while horizontally exploring each other's expertise of and approach to design. This book comes out of a shared vision of creating a better understanding of the common space, existing between design and business, triggered by a series of joint experiences with, and reflections about why it has proven so difficult for business and design to build trust in each other.

Design management researchers that publish and deliver conferences both in design and in management circles are very rare. One of this book's authors has done that in an attempt, but in the end failed, to develop an independent and common space for design management research. A fundamental reason for that is the structural organization of academic research. Design management is a topic that interests researchers in both design and in management, but on both sides, they look at it through the lenses of their own respective backgrounds of either design science or business science.

Researchers tend to communicate with other researchers within the same domain; the same professional interest, the same research objective or the same geographical area, and the homogeneity continues downstream. Design researchers reproduce the siloes of design; service design, fashion design, industrial design, graphic design, UX or experience design. That might be one of the reasons why the red thread of design science remains invisible to people outside of the design community. When design is portrayed project by project, design management is limited to managing that project better; better processes, better teams and better performance.

Business researchers reproduce the siloes of organizations. They specialize in finances, strategy, HR, R&D, marketing, supply chain, communications or any other specific field of business performance. They publish in research journals that replicate exactly the same silos in order to have a career in academia.

This structure does not exactly help to promote neither trans-, cross and interdisciplinarity, nor the transfer of best practices between industries. Because of the structures of academic research, design science is interesting to business scientists only if it fits into existing business concepts and into their field of expertise, such as innovation, organizational creativity, branding, customer behaviour or whatever, and even then, they only focus on the contents in design science that fits into their silo. In this structure of vertical siloes with rigorous institutional constraints for researchers – at least if they are career minded – the global picture is missed and the potential of applying approaches inspired by design remains unexplored. Our objective is to discuss design, design management and design thinking as part of the big picture;

beyond all siloes.

Let's admit, though, that the situation has improved a little lately. Business journals are now open to design management as a theme, and will even get a dedicated issue of Journal of Product innovation management in 2020. Design schools, traditionally tending to prefer design professionals as teachers now open up for PhD researchers and academics from other fields. So, there is actually hope that a virtuous circle from research to pedagogy might start both in business and design education. But still, the role of design in business schools is selective and fragmented and does not contribute to mitigate the cultural difference between the two educational systems. Design might be mentioned in some courses – entrepreneurship, innovation and marketing, but still rarely in key management subjects like performance, finances, operations or knowledge management.

Finally, we also recognize the silos of the "convinced". Design management thrives in siloes consisting of companies convinced of the value of design, benchmarking between themselves, in networks such as national design promotion centres and the Design Management Institute, celebrating each other at conferences and awards ceremonies. The same companies are quoted again and again, which might limit the interest for design to the business community at large.

A shared vision of design as business performance

By sharing information originating in all the above-mentioned siloes, we hope that a vision of design for business will emerge and hopefully be shared. A vision of design that would foster an understanding of why design – why giving form to societal interfaces – is an economic, managerial, political and financial act that fits into a multitude of strategic conversations.

Every time designers draw an artefact they make a statement about the direction the world ought to take. It is now admitted that the design profession contributes to the success of national economies on a number of levels: reputation, creative industries, IP, innovation, exports, and revitalization of territories. Just as much as there is a correlation between design and company performance and strategy, and just like the economic competitiveness of a country is measured by its capacity to innovate and to undertake research. The next step will be to embrace design, design management and design thinking in the pursuit of meeting the needs of tomorrow; not only our own needs for material and immaterial well-being, but for the needs of future generations. Design is no longer a sectorial craft nor merely a matter of competitive advantage and differentiation, no longer – if it ever were – a board-room issue.

Design; A Business Case challenges you to stimulate innovation in your own organization, to make design a dialogue between complementary skills, to see design as a bridge between mind and matter, image and identity. It is conceived – not only as a business case for design, but just as much an appeal to use design as a business case format for all the other ventures, changes and challenges you – as a business leader – stand face to face with.

To add to that, I want to quote Philip Battin, who is Head of Seed Studio at Google, and who wrote the foreword to the book;
This book serves as a good refresher for any design professional, but also as a great intro for just anybody with a design curiosity; about the past, present, but also potential futures of design in the face of new global challenges.
After less than two months out, we have received some very interesting feedback – confirming that what we thought was missing in the discourse, has also been missed by others. Then, perhaps not everyone agrees with everything that we claim – that's good. We need a vibrant discussion between ourselves and with all those, for whom design is a potentially powerful tool for change, and I think that Brigitte agrees with me when saying that it is truly a privilege to have had such a unique chance to contribute to that discussion.

RETHINKING DESIGN: A CONTRIBUTION TO A NEW CRITICAL DESIGN THEORY

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ABSTRACT:
One of the central questions of critical design theory must be the examination of the ways, degrees and processes by which ideology transforms aesthetic value in this field of artistic activity. Forms of artistic activity, the emergence of which is largely conditioned by changes in taste and cultural movements, as is the case with design, by their nature, are largely close to ideologically organized approaches to producing and receiving works. And as these approaches imply certain procedures of aestheticization, they influence the dimensions of the aesthetic. In that sense, the new critical theory of design, in its quest to reveal ideological influences on the realization of the dimensions of the aesthetic in creative practice, encounters an incredibly wide field of possible manifestation of this problem. In the hypertrophied exchange of representations, which represents one of the central features of our time, the critical theory of design finds a space for perceiving prototypical forms of ideological transformation of the aesthetic. It is important to point out that the observed creative practice is more widely understood, that is, it is not limited only to those achievements to which we would undoubtedly attribute artistic value. In addition, this creative practice does not include only those forms of action that are objectified in the process of producing images / objects and their reception, but also those that are objectified in the construction of an aesthetic environment, and which are realized as a result of a specific total design, produced through media work.

KEY WORDS:
AESTHETICS, CRITICAL THEORY, DESIGN, POPULAR CULTURE, THEORY OF ART.

Since contemporary culture, in its diversity of forms, includes special forms of design, the analysis of ideological influences on the realization of the dimensions of aesthetics in this domain of creative work is imposed as one of the important tasks of theoretical thinking. One of the features of design is the distinct degree of obsolescence of the artistic value that we recognize in it. The obsolescence of artistic value is certainly not something that should be considered specific to design, just as this process should not be considered as one-sided or specific factor, but rather conditioned by a complex process, which in many ways can produce a decline in artistic value (Ranković 1964: 209-229). Due to its involvement in everyday practices, and a certain permeation with life activities and processes, but also due to a specific connection with the daily vision of life, design is especially open to the process of obsolescence of artistic value. One of the reasons for this is the pronounced openness of design to absorb the various ideological assumptions that guided the realization of the artistic idea. This is not only conditioned by the imposition of practical tasks that a design achievement should fulfil, but also by the more pronounced dynamics of its cultural change.

It would be wrong to assume that a true work of art must necessarily be indifferent to ideological influences. However, the more these elements fit in, that is, the more subordinate they are to its aesthetic properties, the more artistically long such a work will be. Precisely in this, critically based design thinking finds a reason to initiate an intellectual effort in order to separate the ideological influence on the development and shaping of the aesthetic in creative practice. Hence, one of the central questions of critical design theory must be the examination of the ways, degrees and processes by which ideology transforms aesthetic value in this field of artistic activity. Certainly, this is not an attempt to deny any possibility of achieving lasting artistic value through the achievements of design work. On the contrary, since they are a result of a particular creative practice, these forms encompass the dimensions of the aesthetic, and may have a high artistic value, which as such does not necessarily have to be time-related exclusively to the historical period of the work's creation. However, as these forms of artistic work originate within a particular industrial production, they are the least free, and as such the most susceptible to ideological influence.

Hence, one of the directions of critical thinking in design should be the disclosure of ideological influences on the realization of the dimensions of the aesthetic in design work. This still does not mean that critical design theory neglects the reflection of the artistic as well as the aesthetic in design, but that such an intellectual orientation must not neglect the disclosure of ideological influences on the realization of the dimensions of the aesthetic in design. In order to give a closer reference to the direction of the proposed thinking, it is important to note that the notion of aesthetic, in the proposed approach, is understood as a special property for which one sensory phenomenon attracts our attention and causes a certain feeling of a higher kind. The notion of the aesthetic, therefore, should be understood as a broader notion than the notion of the artistic, which is why the critical theory of contemporary design is given the opportunity to focus on rethinking creative practice which does not always have to be understood as artistic. It is objectified in the process of mediating everyday practices.

The importance of initiating a new critical theory of design lies in the growing social influence that design had during the twentieth century, which continues today, and in the direct connection of design work with the functions of economic activity. The far-reaching consequences of the influence of the cultural industry on art, and within this primarily in the field of film, were pointed out by Horkheimer and Adorno at the beginning of the twentieth century, emphasizing that due to such tendencies, film no longer has to appear as art (Horkheimer, Adorno 2002). It is the permeation of economic activity and design, which, despite the expansion of the cultural industry to the domain of film and music, is most pronounced in this area of artistic expression that imposes the need to establish a new critical theory of design. The reason for such intellectual work should not be sought only in the social significance of design during the twentieth and twenty-first centuries, nor in insufficient theoretical thinking of design within the theory of art and aesthetics, but above all, in the need to redefine the understanding of design. Setting the goal of revealing ideological influences on the realization of the dimensions of the aesthetic in design, the new critical theory of design finds an inexhaustible source of material in different economic demands and theoretical interpretations, which guided the development of design. The central focus of the new critical design theory does not remain at the level of deconstructing ideological models of representation, nor (only) in the domain of discovering ideologically based meanings that are transmitted through design, but (not neglecting the previous two) at the problem of ideological influence on the realization of aesthetic dimensions. This is an effort to determine the ways in which the aesthetic is reshaped in creative practice (by ideological influence). Hence, within the wide field of artistic creation, special attention within such a sated intellectual orientation is attracted by design, which, according to its utilitarian dimension, is most strongly open to the influences of the economy and the demands of economic interests.

The theoretical justification for this research request can be found in Benjamin's famous essay "A work of art in the age of its technical reproduction". Considering the consequences of the influence of the development of technology, primarily in the field of photography and film, Benjamin on many levels considers the far-reaching consequences of the influence of technology on the understanding of art. For us, at this point, the position on the double reception of a work of art is especially important − through use and perception, that is, tactilely and optically. As he states, tactile reception occurs less through attention, than through habit, and it, by its nature, is much more realized through incidental perception. To a certain extent, Benjamin prefers tactile reception to optical, stating that the tasks that are set for human perception in historical milestones cannot be solved only by bare optics, i.e. contemplation, but are gradually mastered according to the instructions of tactile reception, through habit (Benjamin 2007:146). In the domain of film, Benjamin recognizes a specific reception through entertainment, considering it a symptom of far-reaching changes in the reception of the work of art. According to Benjamin, the film suppresses the cult value not only by leading the audience to take an evaluative position, but also by the fact that taking a position in the film does not involve attention, and it is at this point, following Benjamin's understanding, that the illusion of the autonomy of art is abolished, whereby it assumes other functions in the process of its connection with politics.

The process that Benjamin paradigmatically recognizes in the domain of film, requires no less theoretical attention to its consideration in the field of contemporary design. It is precisely the strong permeation of design with cultural practices on the one hand, and economic demands on the other,

that gives a strong impetus to the tendency towards tactile reception of works belonging to this field of artistic work. Although taking Benjamin's position, this could be seen as a significant stimulus to wider awareness of ideological action through art, and finally as the introduction of a different understanding of the concept of art itself, it seems that the results of this process, without critical theoretical action, would be left to unequal struggle for freedom. Hence, the task of the new critical theory of design is not only to point out the ideological transformation of the aesthetic, but also to point out new possibilities for the development of design itself, its position in culture, and finally understanding what design should be.

Reception through habit, which Benjamin talks about, is actually a disciplined reception, which causes pleasure, and even fun, if applied in its perfect practice without effort. As such, it is ideologically oriented, because it is ideology that acts as a strong disciplining force, which includes the area of creative practice in the scope of its own influence. And while in those artistic fields of work that manage to gain a certain political and economic independence, there can still be a certain resistance, in the field of design this influence is met with almost no resistance. Forms of artistic activity, the emergence of which is largely conditioned by changes in taste and cultural movements, as is the case with design, by their nature, are largely close to ideologically organized approaches to producing and receiving works. And as these approaches imply certain procedures of aestheticization, they influence the dimensions of the aesthetic. In that sense, the new critical theory of design, in its quest to reveal ideological influences on the realization of the dimensions of the aesthetic in creative practice, encounters an incredibly wide field of possible manifestation of this problem.

One of the important features of the modern society seems to be the establishment of a continuous flow of presentation that is realized through the mass media. Whether the spread of these depictions is achieved through institutional mediation, or through non-institutionalized action, the practice of affirming the exposition of the work, which was also pointed out by Benjamin and Laszlo Moholi Nagy, indicates a specific spirit of the time characterized by intensifying participation in symbolic exchange. In that sense, the new critical design theory focuses its special attention on the understanding of exhibition and symbolic-exchange practices. Ever since, such action can be seen as part of a broader work on the production of the real (relying on postmodern theoretical practice), the actions by which such cultural action is provided we can see as actions grown on established principles of reproducing the aesthetic in the reality.

In that sense, in the hypertrophied exchange of representations, which represents one of the central features of our time, the critical theory of design finds a space for perceiving prototypical forms of ideological transformation of the aesthetic. It is important to point out that the observed creative practice is more widely understood, that is, it is not limited only to those achievements to which we would undoubtedly attribute artistic value. In addition, this creative practice does not include only those forms of action that are objectified in the process of producing images / objects and their reception, but also those that are objectified in the construction of an aesthetic environment, and which realization as a result of a specific total design, produced through media work.

Based on this developed practice, another form of the use of design is emerging that equally attracts the attention of researchers, who, in their search for knowledge, have embarked on a path that opens up before one possible conception of critical theoretical thinking. It is about the popular use of design. The various forms of incorporating design into popular culture, in these circumstances, have been recognized as particular forms of creative practice that, to some extent, encompass the dimensions of the aesthetic.

New possibilities of popular use of design, opened by new practices of cultural use, development of software for graphic processing of image and sound, and the growing importance of social media, in the modern age, are gaining more and more social significance. Transforming the existing aesthetic / aestheticized material, recontextualizing works of art, as well as parodying, copying or destroying certain works, should certainly, within the current perspective of the development of this practice, be seen as a special form of creative activity, which does not have the status of art, but the degree of which acceptance should not be neglected.

The inclusion of these forms of creative practice in the field of design thinking presupposes a double orientation. On the one hand, the new critical design theory focuses on rethinking creative practice that encompasses the dimensions of the aesthetic, which is objectified in the process of producing and receiving messages through design achievements that become part of popular culture (dimension of reading), while on the other hand it focuses on various forms of popular use of aesthetic / aestheticized material, i.e. selected parts that in such form enter popular culture, as a kind of popular creative practices that encompasses the dimensions of the aesthetic (dimension of production).

What the design theorist, within this orientation, seeks to discover, are the forms of ideological distortion of the aesthetic and the ways of their realization within popular culture. In this sense, the critically oriented design theorist pays special attention to the analysis of the text production. Explaining the notion of a producerly text, Fiske states that it is a popular writerly text, whose reading is not necessarily (intellectually) demanding (Fiske 1989). Like readerly texts, producerly texts are popular and easy to read, but they also have the openness of writerly texts. Offered to a popular production, this text reveals the vulnerabilities, limitations and weaknesses of its meanings, pointing out the cracks in which it is possible to produce whole new texts.

Following Fiske's understanding, the producerly text contains the forces of domination, but also the possibilities to speak against them, that is, the possibilities to oppose them. In that sense, one realized design achievement, created in close connection with economic activity, is, to a greater or lesser extent, the bearer of centralizing forces that reflect the dominant ideology. However, by becoming involved in popular culture, its basic meanings are transformed, that is, involved in a specific process of struggle over the meaning. And just as the scholar of popular culture in this negotiation of meaning finds material that captures his/her attention, so the critic of design in this process seeks to discover the forms of ideologically negotiated transformation of the aesthetic.

The realization, as well as the transformation, of the aesthetic dimension in the popular use of design, within the critical theory of design, is not seen as a result of constant antagonism, which is realized in the process of shaping the popular in relation to the influence of the dominant ideology. Namely, the ideological influence on the realization of the dimensions of the aesthetic in the broader context of the popular use of design is always negotiated. It is an active process of transforming the aesthetic, which presupposes the establishment of a compromise between opposing parties. In that sense, the acceptance of ideological influences on the realization of the dimensions of the aesthetic in contemporary design, which realizes its reception within popular culture (Fiske's term), should be understood as a constant process of redefining, renewing, modifying, and in relation to the pressure of industrial production. And since this process can be seen as a constant establishment of an ideologically transformed aesthetic, it is necessary to include in the field of critical thinking the creative practice that is objectified in this process.

Another question that the new critical design theory raises is its participation in the realization of a specific total-design, which is established on a planetary level. The process of producing, receiving and using various design achievements that participate in planetary total-design should be understood as a specific creative practice in the context of the action of the forces of the popular, which participates in the process of aestheticization of social reality. In this sense, equal attention should be paid to the achievements of artistic design and various forms of creative (design) activity, which do not belong to the field of artistic work, but which influence the development of, or participate in, planetary total design. These works, although often of marginal artistic significance, or often rightly marked as separate from any form of artistic activity, are mostly created in accordance with the established principles of shaping industrialized cultural material, which are self-founded in the process of reproducing ideologically based matrices of aestheticization.

The approach proposed by the new critical design theory, therefore, assumes the disclosure of the processes, functions and cultural activities of contemporary (artistic) design, ways of its use in popular culture and non-artistic or semi-artistic production of aesthetic / aestheticized material that participate in shaping contemporary cultural context. The question to be asked here is not only to reveal the design-mediated meanings that strengthen the dominant ideology, but also to think about ideologically based forms of aesthetic transformation, which are realized in a prototypical way in the spread of planetary total design. Such an intellectual effort, understood from a humanistic position, cannot be separated from the perception of its social perspective, but must seek a new rethinking of design, as a scene of confrontation of economic interests and industries on the one hand, and a creative response to social context on the other.

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THE ROLE OF SUSTAINABILTY -BASED APPROACH TO RENOVATION OF BUILT ENVIRONMENT

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ABSTRACT
The paper reports exploring the role of built environment and sustainable approaches to its renovation. The construction industry, as one of the biggest pollutants of the natural environment, represents an important opportunity for implementation of actual sustainable solutions. Sustainability does not necessarily mean limitation and deprivation, but creation while keeping in mind the entire life cycle of a service or a product, keeping in mind the origin of materials, keeping in mind the energy and the water that is needed for their production and use. An important aspect of sustainability is the fact that waste does not exist, that it always ends up in the earth or in the atmosphere, which requires a different, more responsible approach to creating products and their destiny after they are used. This approach is preferably to be rooted in the concept 'Cradle to Cradle', which is based on nature's processes that every material is to be returned into the cycle of use − either through the biological or the technical system. Most sustainable solutions in the built environment are passive, conditioned by the laws of nature and supported by efficient energy and water use, use of sustainable materials and responsible management after they are seen as waste. It is vital for the future development and civilisation's survival for the balance to be found between the built and the natural. It is vital for the notion of fairness in relation to natural environment, humans or animals to be addressed every step of the way.

Key words: sustainability, renovation, built environment, architecture, cradle to cradle.

1. INTRODUCTION

Political and economic regimes of the recent decades, overly anthropocentric worldview, industrialization, market boom and expanding consumerism have led the modern society to face burning consequences, including overheating, lack of drinking water, drowning in piles of waste, ocean acidification, reducing biodiversity, etc. One of the main polluters of the environment is the construction industry; according to some data responsible for as much as 35% of global material consumption (GXN Innovation and 3XN Architects et al. 2015, p. 21). If we continue with intensive mining, stocks of lead, zinc and copper will be depleted in the next 50 years (Moxon 2012, p. 84).

Built environment is supposed to be responsible for as much as 30% of global greenhouse gas emissions (Moxon 2012, p. 13). In the US, the existing facilities are expected to consume 40% of all energy consumed in the country (Gelfand and Duncan 2012, p. 201). According to some estimates, there will be 15% more housing needs in Europe in the next 50 years than are currently available. Therefore, it is crucial that construction industry begins to solve problems and implement sustainable solutions in the existing built environment.

2. SUSTAINBILITY

The United Nations World Commission on Environment and Development generally describes sustainability as meeting the needs of the current generation without compromising the abilities of future generations to meet their own. (Leonard and Conrad 2011, p. XXXVVII).

Despite this definition, this is not true nowadays since we perceive sustainability as milder, cautious, transitional measures, such as recycling. To some extent, of course, this is a good thing, as it at least delays the moment the material becomes unusable waste, but it is problematic to recycle products that were not originally designed for really efficient and sustainable recycling. In addition, a huge amount of additives need to be added to recycled materials to make them suitable for further use, like durability, flexibility, strength. (McDonough and Braungart 2009a, p. 58)

What is the solution? The solution is in the claim that there is no waste. There is a closed system of functioning of our planet, what we have, we have. "Nothing goes out or enters our planetary system, with the exception of light, heat, and the occasional meteorite" (McDonough and Braungart 2009b, p. 103). The supply of elements we have on Earth is finite, it is all we have. If we want to develop as a society and succeed, we must learn that waste simply does not exist, and create everything with the thought that all things created need to be returned to the environment or nature in one way or another. Everything we "throw away" actually does not go anywhere − it stays in our environment and directly or indirectly affects our future existence.

In their book titled Cradle to Cradle, Michael Braungart and William McDonough highlight two metabolic systems of the planet (Figure 1) that are key to achieving successful and optimal progress of society: biological and technical cycles (McDonough and Braungart 2009a, p. 104).
unnamed.png
Figure 1: Biological and technical metabolic system (Coevolve 2019)
This means that we must base our production and consumption on the concept of "cradle to cradle" where there is no waste. Everything we produce and consume must be biodegradable to feed the biological system or that can be dismantled and returned to industry, thus feeding the technical system. (McDonough and Braungart 2009c)

3. POSSIBILITIES OF IMPLEMENTING SUSTAINABLE SOLUTIONS

The aim of the research was to find the opportunities in order to implement sustainable solutions in construction. The article only presents them generally. In every renovation of a building, there are four factors that play the key role, depending on how the building will actually affect the environment and how we undertake the renovation. These factors are:
- method of energy production and consumption,
- method of water production and consumption,
- choice of materials,
- method of execution of construction works.

3.1 ENERGY

When we talk about energy inside an object, we talk about operational and embodied energy. Operational is the energy that the facility needs for its operation, and embodied is the energy used to obtain, produce and transport individual materials to the location of the facility.

In terms of energy source consumption, of all the above listed factors, energy is the most burdensome for the environment. We all know that conventional energy sources such as fossil fuels are unsustainable, as they release greenhouse gases into the atmosphere during combustion and at the same time deplete the reserves of natural resources, which are replenished too slowly to meet our needs. Mankind in the current economic system needs 1.75 of the planet Earth consuming natural resources, therefore, the economic system has greatly exceeded the limits of the ecosystem (L. L. 2019).

Sustainable construction argues that the energy the facility needs to operate is generated locally, on a small scale, on site, and from renewable sources such as solar and wind energy. This also means no consumption of energy for distribution, which is used to transfer electricity to a certain facility.

How much energy we will need for the operation of the facility largely depends on its cover, i.e. external walls, roof, windows, doors, so the more efficient these are, the less operational energy we consume. In general, a building with additional insulation gains in energy efficiency, but it should not be sealed, as this can cause moisture in the walls and the formation of mould. (Gelfand and Duncan 2012, p. 81)

By operational energy we have in mind the energy that powers operating systems such as heating, cooling, ventilation and lighting. It is important that they are powered by renewable energy, which can be wood biomass, photovoltaic and thermal collectors, heat pump, etc. At the same time, operating systems are combined with passive interventions in the building that will reduce the need for operating systems. In heating and cooling, this can mean improving the heat mass in the walls, smart glazing, deep canopies, glazing the south wall. When ventilating, we use the air travel from the windward to the leeward side of the building or the rising of hot air to the top of the building, where it can be released through the opening. When lighting, the most passive is the use of solar energy through either reflective surfaces on window sills, glass doors, glass surfaces along interior walls, bright colours, or with energy-saving light bulbs, automatic switches and sensors. (Moxon 2012)

3.2 WATER

Water appears in the building in two forms. The first is external water, i.e. precipitation, rivers, groundwater, which can be collected through passive interventions and used for the operation of the facility. The second form is water for the operating systems of the facility, where we are mostly concerned with how to obtain it and what energy source to use for its distribution throughout the facility. Because we want to use as little energy source as possible, we try to use as little fresh drinking water as possible and use it more than once. This means reusing waste or grey water for toilet flushing, underfloor heating, watering plants, thus replacing the use of clean drinking water that has high embodied energy.
Grey water represents as much as 80% of all wastewater in a building (Gelfand and Duncan 2012, p. 220), so systems for its collection and treatment are even more important and crucial for a sustainable approach to construction.

3.3. MATERIALS

The choice of material is extremely important, as it influences to what extent a material with its embodied energy will affect the climate change and the depletion of natural resources. As an example, we can cite energy consumption for steel and aluminium. We need about 22.7 GJ of energy to produce one ton of steel, and we need as much as 211 GJ of energy to produce one ton of aluminium (Brooks 2012).

The choice is a complex process, it depends on many factors, but in general we can say that, as a rule, sustainable construction opts for: natural, local materials with low embodied energy, the ones that are degradable or can be returned to industry, that can be easily disassembled and recycled or that can be used for more than just one purpose and are not problematic as waste, that can be easily maintained and that have come from undisputed sources. Gypsum boards (drywall 'Knauf boards') are, for example, one of the most commonly used building materials due to their favourable price and thermal insulation, and they also have relatively low embodied energy. However, they represent one of the more problematic wastes in construction and in general, as they often contain toxic sulphates (Moxon 2012, p. 103). A good choice is certainly the use of local wood from controlled woodcutting, glass, steel, which can be recycled in its pure form countless times, hemp, bricks made of the clay in the local area, etc.

3.4 CONSTRUCTION WORK PROCEDURES

Construction work procedures are extremely connected to the choice of materials which determine how they will be brought to the construction site, how they will be assembled and what will happen to them during demolition or renovation. Naturally, the sustainable implementation of construction works strives for the lowest possible consumption of energy, water and packaging during the construction process. (Gelfand and Duncan 2012, Moxon 2012)

4. CONCLUSION

The world economy is built on the premise that we need to buy as much as possible, consume more, spend more and throw away more, which is at odds with the logic of the sustainability perspective. As a result, new theories of sustainability are emerging that call for a reduction in consumption, which is in contrast to the product economies of the industrialized countries. The fact is that the artificial world we have created throughout history suffocates and destroys the natural world which we, humans, are part of.

Changes in the construction industry will be increasingly inevitable in all sectors, including interior design. Most of them will probably continue to take place in the field of energy efficiency of buildings. Operational energy, i.e. the energy that an object uses for its existence and operation, represents 80% of the energy that an object actually needs in its life cycle (Gelfand and Duncan 2012, p. 239). Besides, it is crucial to think about the remaining, embodied energy: the energy of materials, construction processes, the energy we use for transport and the energy needed to handle waste material when a building is demolished. We need to think about a design for reusable and flexible use that adapts to different types of environment and different purposes, about the options for simple disassembling of products and building elements instead of destroying them and replacing them with new ones. We need to think about all this when designing a product, especially when choosing materials and combining them with one another. These are some of the strategies that will further contribute to reducing the use of energy in the construction sector and, consequently, to a smaller footprint that it leaves in the natural environment.

We believe that more attention needs to be paid to changes in the production of materials and products, where we should start from the 'cradle to cradle' concept, as only circulating processes are truly sustainable.

The desired long-term sustainable changes in the construction sector will be mostly achieved by awareness-raising and motivating people, educating about problems and possible solutions, ambitious regulations, laws and standards, exercising control and economic pressure will lead to (Gelfand and Duncan 2012, pgs. 250–251).

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THE PSYCHOLOGICAL EVOLUTION OF CONSCIOUSNESS TOWARDS DIGITALIZATION AND SUSTAINABILITY

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ABSTRACT
The paper reports on psychological evolution of human consciousness through analytical approach to history of art. It suggests our consciousness has not evolved linearly but circularly, corresponding with recent theories of quantum vs. Newtonian physics, where realities with different law dynamic coexist. I hypothesize human consciousness develops with new perspectives next to previous ones (mythological, religious, ideological...), moving from herd drives towards more individualized, emphatic and wider perspective consciousness. The foundation of this process is empathy, evolving from egocentric to societal.

Creative design solutions based on empathy, acknowledgment of different perspectives and consequently deeper sense of self are where I see challenges in further evolution of design. A break of new consciousness has always come with coexisting crisis. One of the conflicts concerning design innovations is between digital and bio-sustainable. Digitalization (augmented reality, 3D data learning) has potential of acquiring new information through which we can learn about new perspectives manage empathy experiences and its development. Bio-spherical consciousness lining up with digital reality in contrast/or accordance to preserve nature is where creativity bears directly on our survival, and it is part of what has been lost in education on standardized testing as well as understanding the dynamic of life.

KEY WORDS:
Psychological / Development / Consciousness / Empathy / Sustainability / Digitalization

Human consciousness consists of conscious part of human psyche, although it is enormously affected by its unconscious counterpart.

1. THE EVOLUTION OF HUMAN CONSCIOUSNESS

Human consciousness has been the main compass of our behavior, thoughts, and feelings from the very beginning of our existence.

In psychoanalytical terms, we are talking about human psyche. Conscious and unconscious parts are constantly interacting with each other, each trying to get the main role in managing “the existing reality”. A complex dynamical structure is defined by three main structures, id, ego and superego.

1.1. ID, EGO AND SUPEREGO

Id is the raw energy without structure, ego is the structure without energy and superego the moral compass of our personality. These three main characters are constantly in conflict that is pressuring ego to build up a strong integrated structure in order to manage reality in the most efficient way.

Id is defined by biological traits and has an important role in our survival. It strives for instant gratification of our needs regardless of reality context. If basic needs are not satisfied, one becomes anxious and tense. It operates within 1-0 system, a life or death conflict, existing in id in its most direct form. It consists of sexual instincts, the need to survive and thus represents the energy to create. On the other hand, it is the source of all aggressive impulses, aiming for destruction and death. Its outlook on reality is black or white.

Ego is reality-based and is responsible for satisfying the needs of id according to reality principle or social context. It strives for gratification as well but uses reality strategies in the process of acquiring goals. Therefore, ego is capable of postponing the satisfaction of needs, according to reality principles. It mediates among id, superego and reality.

Ego, as the most common subject in everyday psychology, is often misunderstood for egoism. But it is the dynamic between id and ego structure that is responsible for egoistic behavior. Id overflows the week structure of ego with its instant needs, not including the context of reality or society. We can compare the structure of ego to a highway, organized in a way that driving is safe for everybody. Traffic signs, speed limits and its construction are planned to deliver safety. Some don't consider its limitations, due to the pressure of time or aggressive impulses of dominance and overpowering. It is id and its primal impulses pressuring weaker ego to submit and therefore the dynamics between the two is responsible for egoistic behavior.

Superego is the moral aspect of our personality, guiding us towards what is right and wrong from the moral point of view. It sets the moral compass in individual and group relations. It lies in authorities. The external rules are gradually internalized and later enabling a wider moral perspective, replacing a single perspective view.

1.2 THE EVOLUTION OF CONSCIOUSNESS AND PSYCHOANALYTICAL APPROACH OF ID, EGO AND SUPEREGO THROUGH THE HISTORY OF ART AND CREATIVITY

Looking at the very beginning of human history, when tribes and first social structures started to form, psychological view of the world seemed to be quite different.

We often share an idealized perspective about how previous societies had lived their lives in greater coexistence with nature. But was living in ancient societies really better in terms of longevity and quality of life then what we are experiencing today?

Looking at nomad social structures that started formulating over ten thousand years ago (Hollingsworth, 1993), it seems that an individual was fighting a direct battle with quite relentless nature, giving little or no space for safety. The struggle to survive was on everyday menu, with life and death battle round the clock. This immediacy required great amounts of physical and psychological energy, thus constantly reflecting in bad health and low survival rate.

There was little knowledge about nature and life in general and in order to survive, survival and aggressive instincts were on a constant run. These primal social structures seemed to be directly bound to nature and from a psychoanalytical point of view it leads to assumption that id structure was predominant in human behavior.

From the creative point of view, their first creative objects were representational, not abstract. Venus of Willendorf (Hollingsworth, 1993) portrays the main focus on sexual attributes, accentuating fertility and survival. The face is not explicit and we assume they were not focusing on personality traits or other parts that didn't promote fertility. Legs are not finished as well, thus not grounding the statue (reality principle). Cave paintings show motifs of animals, hunting and survival and seemed to be the main subjects that occupied the existence (Hollingsworth, 1993).

As id structure seemed to be predominant over less integrated ego, it seems it was dominating the reality principle as well. There was little understanding of how nature works and about the dynamics of its processes. We assume that consciousness had just begun to develop and that it was mainly through learning principle of trial and errors. Successful and creative solutions were setting the base to gradually take control over unknown and terrifying. Greater control over outer natural processes satisfied safety needs along the strictly physical. In the evolution of human consciousness Rifkin (2011) defined mythological, religious, ideological and bio-spherical consciousness.

1.3 MYTHOLOGICAL CONSCIOUSNESS

With relatively little understanding of reality in order to satisfy the need of safety to a greater extent, the attempts were based on mysticism. In order to feel safe, one had to deny some of the danger imposed by nature. Similar to ostrich putting its head in the sand, the aim was to deny some of the dangers that take up large amount of energy supplies. As denied contents still exist, they have to be projected in the outer world usually in the object we perceive we have a relative control over it. In psychoanalytical terms we are

talking about projective identification, a defense mechanism used to deny unacceptable and project it out. Some of the focus to control reality thus shifted on mythological beings, presenting them with power over life and nature. Mythological beings powerful and relentless could be controlled through rituals and sacrifices, providing additional feelings of safety.

Social structures began to appear as well and some level of organization was proposed: the role of authority and other members of the tribe, as well as their relations to commandments imposed by mythological beings. This organizational platform was another source of satisfying safety needs, as living under tribes and their rules was safer then confronting powerful forces of nature alone.

Ancient civilizations, Mesopotamia, Egypt, Ancient Greece and Rome continued worshipping mythological beings and plural gods. Commandments were projected through leaders requiring rituals to maintain peace, bringing good fortune and harvest. These civilizations evolved on many levels through time. Some form of science and abstract art already began in Mesopotamia, which invented first font (Hollingsworth, 1993). Harvest by the rivers was so lucrative they could afford a non-producer class of society, which invested time in research and art.

Science and stylistic forms of art were gradually evolving through Egypt and it was Ancient Greece and its intellectual revolution that established first vision through philosophy and art, starting to question about democracy and freedom and concerning philosophers with ideal society. Artistic approach flourishing in Athens set the grounds to explore life through art, channeling personal stories and future vision. Ego first envisioned ego ideal, for example Plato wrote about Ideal State, Socrates about the truth. Ego was not only capable of coping with id and its immediate life and death conflict but also saved some extra energy to set its first moral compass.

1.4 RELIGIOUS CONSCIOUSNESS

The collapse of Roman Empire set the crisis that took its toll on many lives physically but also a challenge to reorganized ego and its newly acquired powers. Illness, lack of safety, stardom and poverty forced the poor to search for the meaning of their suffering and to see vision of the future. Roman Empire was still allowing worshiping different gods and among them Jesus Christ was promoting salvation through suffering (Hollingsworth, 1993). Christianity began to spread along with the perspective of focusing on what is moral and not, leading either to salvation and good living or destruction and tragedy. It was through Holy Bible that the new perspective was capturing commandments by which a moral individual should be living their life. Ego was relatively integrated, and superego could enhance the dynamics even more.

Moral compass sets its evolution on the societal scale, doing its second big step in renaissance, where external authority had been gradually turning inwards, to individual and its feelings, its perspective and its judgment. Art and creativity played important roles. It captured inner feeling and interpersonal relationships realistically through just discovered third perspective (Hollingsworth, 1993). Intellectual guidelines were replacing the luxury gold. An artist acquired status and the artist's ideas were replacing the importance of craft skills (Hollingsworth, 1993).

The rise of urban population in Italian city-states gave opportunity for moral contents to development through secular art as well. It portrayed motifs of everyday life, exploring its meaning and universal truth. Science and art began to intertwine producing more knowledge and creativity. Figurative art reached its highest levels of craftsmanship. Moral ideas behind works of art began to formulate, along with creative approach and intellectual content. Introspection reached its peak through the era of romanticism and later realism, that both focused on inward psyche dynamics, along with outer conflicts portrayed through aesthetic of art.

Ego had an opportunity to integrate through introspection or the exploration of the inner world along with the outer. It focused even more on contents, coming from within and an individual relation to nature and society. Social and economic circumstances were challenging further evolution of ego and superego up to the point where universal laws could be understood.

Social conflicts of freedom, equality and human rights ignited with French Revolution, leaving its grand impact, along with the first and the second industrial revolutions in need of social and economic reorganization. Ideologies of good and bad values versus real life started to attract artist's focus. An abstract approach to life set the base in art and society to further evolve ideals of what is right and wrong in relation to others and the society as a whole. Individual responsibility towards their community and in inner responsibility for the existence of society emerged, as one had come to terms that the survival of the race is above individual.

1.5 IDEOLOGICAL CONSCIOUSNESS

Abstract approach to life, searching for universal laws and the truth about human existence inspired modern art. The main focus was reality after reality, the one surpassing our senses.

Artists had neglected all traditional art forms and turned within their own world to find ultimate truth and what exists behind natural laws. Art searched beyond our consciousness to explore the transformation of time and place, mainly

through spontaneity in impressionism and relativity of reality especially our senses in abstract expressionism. Pablo Picasso and other cubists turned to primitive art to bring forth issues of human imperfections, ugliness and relations among objects that exist beyond our senses (Britt, 2002). The focus was to acknowledge other possible perspectives of reality and reach transformation of consciousness. Picasso was a master of surpassing traditional techniques of 3D rendering and shading and instead tried to expose different relations among existing objects, relations that come from different perspectives on reality, transcending time and space (Britt, 2002).

Other ideologies, such as Futurism in Italy, Constructivism in Russia and Dadaism emerged at the beginning of twentieth century, also exploring universal laws of reality existing beyond our senses. Mondrian saw painting as a model or exemplar of universal harmony or true beauty, believing that his verticals and horizontals did in fact express a perfect harmony and contain all other relations (Britt, 2002). Marinetti and other artists in futurism not only dismissed traditional ideals – the very notion of the Ideal – but despised rationality promoting action as the only value (Britt, 2002).

Freud wrote The Interpretation of Dreams at the beginning of twentieth century and with his revelations about the dynamics of human psyche a more conscious approach to unconsciousness could emerge in art as well. Artists like Salvador Dali and other surrealists participated in discoveries of conscious barrier separating the unconscious contents. They focused on dreams, associations, object relations and psychoanalytical approach to humans psyche in their works of art. Ego reinforced by superego and its moral compass seemed to have had enough structure to consciously explore what is unconscious and translate the language of unconsciousness into forms of art. Merging different areas of science with artistic expression was very present in the modern era, aiming at discovering universal laws and reality principles after reality existing within our senses.

Ideal principles like harmony, truth, moral relationships, and ideal society among others seemed to have guided the exploration of human psyche in art even further, beyond the principles of psychoanalysis into philosophical movements like Theosophy and the existence of multiple realities (Britt, 2002).

As we function in the world on a rudimentary level, we are in much agreement about what we see (Fineberg, 2015). It seems like we are all sharing one reality and the difference in opinions comes from the lack of available data or information. But as we address things with greater nuance, our perceptions begin to diverge, and we formulate interpretations that are increasingly individualized (Fineberg, 2015). We can acknowledge the existence of different realities, perceptions and opinions and therefore accept the ambiguity of existing reality.

In postmodernism artists tried to surpass the ideologies of modernism that promoted universal truth and objective reality. Their focus shifted on self – consciousness and "skepticism of explanations which claim to be valid for all groups, cultures, traditions, or races," and describe truth as relative. In essence, it stems from a recognition that reality is not simply mirrored in human understanding of it, but rather is constructed as the mind tries to understand its own particular and personal reality.

Our brain cannot visualize or comprehend an objective reality. Once the data from our senses is transmitted, each individual's brain makes a creative leap, resembling the mass of data into a visual experience Our brains draw on memory and sense experience retrieved from different experience and areas. The web of connections in the frontal cortex plays an important role as the brain assembles the data into a thought or an impression (Fineberg, 2015).

Neurobiologist Marcus Raichle has written (Fineberg, 2015) that the balance between what is evoked by the senses and what we construct through the intrinsic connections in the brain is something like 60% to 80% implying "that intrinsic activity may be far more significant than evoked activity in terms of overall brain function" supporting the idea of relative reality and the existence of multiple realities in different individuals (Fineberg, 2015, p.131)

Quantum mechanics in physics implicate the idea that there can be multiple overlapping universes of truth. Quantum mechanics on a subatomic level and Newtonian physics in the macro world have fundamentally different rules that cannot be reconciled (Fineberg, 2015).

Considering these observations and conclusions the dynamics of our further evolution and adaptation is challenging us to embrace ambiguity that teaches us to adapt and to manage complexity (Fineberg, 2015).

Ego and superego have acquired enough strength not only to be able to consciously research suppressed and unconscious contents of our psyche, the id but to have developed to the point to be able to accept and embrace the idea of ambiguity and uncertainty of life, enabling us to manage complexity, multiple perspectives, approaches, challenges, and realities. A duality of present ideologies and social conflicts seems to be just a starting point of our further mental and emotional evolution and it seems the co-existence of different approaches will lead to creative and effective solutions.

The strength of ego with its moral counterpart superego may be powerful enough to merge with different realities like digital reality, AR, VR and machine reality, considering the moral value (superego) and ideal outlook (ideal ego) of merging.

Thus, creative design solutions based on empathy, acknowledgment of different perspectives and realities and therefore a deeper sense of self is where we see further challenges in evolution of design as well.

According to Hoffman's (1996) stages of empathy development true understanding of relations and outer world doesn't come from one unified perspective but with understanding that there are different co-existing perspectives that people have, based on their own experiences with the world and different situations they have found themselves in. It's not just "stepping in another person's shoes" and viewing their own thoughts, feelings, and behaviour from the other person's perspective, but to be able to keep multiple perspectives in mind at the same time. One does not see from this perspective and then from the other –one looks at the entire big picture and understands that different people are having different perspectives (Hoffman, 1996).

Others' feelings may not just be due to the immediate situation but stem from their more lasting life situation. Empathy practising comes with respect to entire groups of people (the oppressed, the poor, etc.) and be able to transcend immediate experience (Hoffman, 1996).

Creative fields are already trying to merge scientific approaches through Empathic Computing that aims to use technologies such as Augmented Reality (AR) and Virtual Reality (VR) to create deeper shared understanding between people (Piumsomboon, 2017). 3D visualizations and virtual environments of historical sites can be used as pedagogical tools to support historical empathy and how the digital restoration process is applied (Sweeney, 2018).

Design is fundamental to all human activity and designers have the potential to act as trans-disciplinary integrators, thus creating holistic technical and conceptual solutions that promote interdisciplinary, inter-generational and inter-perspective approach, where each individual is responsible for their creative process but as well for the networking and therefore social progress.

Current conflict concerning design innovations is between digital and bio-sustainable. Referring to the break of new consciousness that will demand multiple perspective understanding we assume the answer is not in dominance one over another. It is in accepting the ambiguity and co-existence of both through the process of creativity, consciously managing the breaks of unknown and monitoring them with an acquired moral system and ego ideals within the process. Our consciousness evolution will enable us to manage these conflicts if we start searching for their solutions.

Throughout history of art the analytical approach signifies the evolution of consciousness was not linear but might be circular instead. As we developed from mythological to religious consciousness and ideological afterwards it did not mean the first one vanished and the second replaced it, it seems the latter diminished instead, leaving some space for new upcoming perspectives.

Today, with the upcoming crisis on many areas of our existence the challenge seems not to be about deriving information from our memory and senses but putting information into relation with other perspectives.

The first and second industrial revolutions at the end of nineteenth century liberated individuals from physical work and enabled them to invest extra energy in acquiring information. Steam machines supported the innovation of printer (Hollingsworth, 1993) and electric power modern communication network (Hollingsworth, 1993). Invention of computer and digitalization liberated us from memory-based information and is challenging us to interrelate and put different perspective into relations.

Thus, spherical consciousness and network-based society toward an organizational style that is more distributed, collaborative, and lateral is where the future challenges might lie. Bio-spherical consciousness (Rifkin, 2011) lining up with digital reality in contrast/or accordance to preserve nature is where creativity bears directly on our survival. It is part of what has been lost in education on standardized testing as well as understanding the dynamic of life (Fineberg, 2015).

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FENG SHUI – AN ANTHROPOLOGICAL OVERVIEW

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ABSTRACT
Feng shui is a traditional Chinese art of designing the environment that incorporates both rational and irrational (mystical) paradigms. In a unified concept, it connects the physical environment, psychology, social relations and the world of the spiritual. The core of the paper analyses the historical and the contemporary fengshui anthropological research. Feng shui is viewed by most researchers through the perceptual (rational − logical) perspective of an independent external observer, with descriptions ranging from highly critical (a hindering of development or pseudo-natural science) to more lenient (popular religion, cultural geography or cosmology in practice). Only a few people seek to experience fengshui levels of space personally, through apperception or more artistic expression. Feng shui is more than just an example of successful cultural globalization. It is an example of combining both rational and irrational reality concepts into a unified worldview.

Feng Shui / Anthropology / Apperception

1. INTRODUCTION

Feng shui is a traditional Chinese art of designing an environment that is supposed to support the user as much as possible. It is grounded in traditional Chinese philosophy and is closely embedded in the Chinese cultural-historical framework. Two aspects that most distinguish this traditional art from modern design practices are the concept of the life force qi and the belief that the well-being of the individual is also significantly influenced by the spirits of deceased relatives. The life force qi is supposed to permeate everything that exists. In feng shui, both nature and landscape formations, and of course cities and objects, are treated as living beings. Also, the orientation of the building in relation to the compass directions, the time of construction of the building and the user's date of birth should create a specific qi pattern that is reflected in the space. Qi, however, is not the only intangible force in feng shui that is supposed to co-create the quality of living. An important role is also played by the spirits of deceased relatives, for whom the descendants are supposed to take proper care through the cult of ancestral worship, with the help of feng shui. Paton sums up the words of Feng Shui master from the 65th generation of Taiwanese feng shui practitioners He Jinzong, claiming that "feng shui depends 50% on the position of the ancestral grave, 35% on the position of the house or workplace in relation to the external manifestation of the life force qi and only 15% on the internal arrangement of the house or workplace in relation to the internal flow of the life force qi "(Paton in Mak et al., 2009, 46). From this brief outline, it can be concluded that feng shui operates with concepts that are foreign to modern science. It reaches into the realm of rational perception (when describing the laws of natural phenomena and recommending how to build dwellings to make the most what is given) and irrational apperception

(when defining the energy structure of the landscape or the connection between the world of the living and the dead). It is this connecting aspect, which in a single concept combines the physical environment, psychology, social relations as well as the world of the spiritual that is one of its essential characteristics.

2. A HISTORICAL ANTHROPOLOGICAL APPROACH TO FENG SHUI RESEARCH

Anthropological research into feng shui throughout history is mostly perceptual, that is, as neutral and objective as possible. The beginnings of Western European study of Chinese geomantics or feng shui can be traced to the end of the 19th century, when Eitel's book (1873) Feng shui or the Rudiments of the Natural Science in China was published. Eitel, a Protestant missionary in China, saw feng shui primarily as an excuse for local authorities and residents to oppose the construction of new roads and railways, the erection of telegraph poles, or the construction of new settlements. For Eitel, feng shui is nothing but the science of nature, a collection of recommendations, to which we are led by our natural instincts and reason, which the Chinese have surrounded with mystery or turned them into black magic. Eitel (2015) finds that the Chinese are similar to the ancient Greeks and many Renaissance thinkers, namely that nature is a living organism, where every part of both living and dead nature is imbued with spirit or life.

In 1892, the Dutch sinologist De Groot began publishing his monumental work The religious System of China (1897), which also includes an in-depth analysis of feng shui based on fieldwork and the study of classical writings. It highlights two origins of feng shui, namely the cult of ancestral worship and the cult of worshiping nature as a living being. For De Groot, feng shui is a collection of childish absurdities and sophisticated mysticism held together by an elaborate system of understanding, which, however, is merely a ridiculous caricature of science (De Groot in Bruun, 2008, 43). De Groot's contemporary Boerschmann spent three years in China and is more forgiving of feng shui in his book Picturesque China: Architecture and Landscape (Boerschmann in Parkes, 2003, 190). He is particularly impressed by the wisdom and aesthetic qualities of the use of the landscape and the way in which architecture is harmoniously integrated into the surroundings through the use of soft lines.

Interest in anthropological research on feng shui continued in the post-war period. Feng shui is mentioned in an extensive work by Needham Mathematics and the Sciences of the Heavens and Earth (Needham, 1962). For Needham, feng shui is a pseudoscience that carries rational grains of understanding of natural laws (Needham in Freedman, 1968). Although Needham does not pay much attention to feng shui, he paves the way for more lenient assessments of feng shui with a focus on ecology.

The British structural functionalist M. Freedman (1968) defines feng shui as a mystical ecology or ritualization of the elements of time and space. Feng shui is perceived as determining, as it implements the entire complexity of the functioning of the universe on the problem of appropriate spatial (and temporal) adaptation of man. In contrast to Needham, Freedman characterizes it as a form of Chinese religion that is characterized by not relating to a single religion, church, or priest, but changing them according to current personal needs (Yang in Bruun, 2008, 87). The social role of feng shui as a stabilizer of relationships and at the same time a facilitator of competition in the community is also highlighted for the first time. For example, by clearly setting rules as to where a house can be built and how high a house can be, envy and jealousy are also indirectly regulated. And when an accident occurs, it is the fault of bad feng shui or supernatural forces. In this context, the feng shui practitioner is primarily a mediator between the physical and supernatural worlds (Potter in Bruun, 2008).

In An Appreciation of Chinese Geomancy (1968), March offers a fresh and different view of feng shui, which, unlike its predecessors, also derives from apperception. For March, the most important thing is the feeling of space, the intertwining of psyche and landscape, with direct personal experience being extremely important. Feng shui is therefore supposed to enable an individual to directly feel the life breath of the landscape, its liveliness and diversity, which, among other things, stems from the intertwining of female yin and male yang forms and from the flow of landscape life lines. A real feng shui location can be experienced by a person as very special, which is supposed to be difficult to describe in words. The sense of space is crucial for March, although the article also touches on other aspects of feng shui, which have already been pointed out by predecessors (for example, the motivational aspect, which encourages an individual to pull out and succeed despite an unpromising situation). He also highlights the synchronistic nature of feng shui, with which he relates to Jung, where incredible but important coincidences that do not arise from causality (cause-and-effect connection) often take place in space. For March, feng shui is an example of a system through which the will of heaven is supposed to be realized.

A few years later, Feuchtwang published the oft-cited work An Anthropological Analysis of Chinese Geomancy (Feuchtwang, 1974), in which he performed a comprehensive analysis of feng shui based on twenty-four traditional texts. In the analytical work, he identifies four roles in which feng shui appears: classification in feng shui is supposed to reflect the social divisions of society, imagination is expressed in feng shui through symbolism and psychological projections, feng shui can be understood as a divination technique, and the fourth is feng shui as a specific way of perceiving reality. For Feuchtwang, feng shui is a way of self-determining (identifying) a person or group (family) through choosing a location in the field, where the location also becomes a centre of personal interests. It highlights the activist role of feng shui, whose basic tool is a metaphor used to explain the fate of an individual (Feuchtwang in Bruun, 2008, 90).

Of the Chinese anthropologists of this period, Yang and his

work Religion in Chinese Society (Yang in Bruun, 2008, 90) are highlighted, emphasizing the political aspect of popular Chinese religion and the importance of the cult of ancestral worship. Yang explains that in Chinese society, religiously motivated uprisings have always taken place in periods of severe social strife (e.g. political unrest and oppression), economic decline (e.g. times of severe famine), and social disintegration. Pressures have reawakened faith in supernatural forces, powers, and miracles. Otherwise, there are only few articles covering field anthropological research on feng shui in the 1970s and 1980s, most likely due to the closure of the People's Republic of China (Watson, 1976). Most research is therefore conducted outside China's borders: in Hong Kong, Taiwan, and other Chinese communities in Southeast Asia.

3. A MODERN ANTHROPOLOGICAL APPROACH TO FENG SHUI RESEARCH

Even in the last twenty years, interest in the scientific study of feng shui has not waned. For Hwangbo (1999, 191), feng shui is "an ancient architectural theory, /... / a mixture of art and science". It highlights the political, religious, and philosophical subordination of architecture in Chinese culture, as it never developed as a stand-alone profession suitable for a Confucian scholar. Therefore, in rural areas where there was a shortage of intellectuals, the role of planners and coordinators of construction was taken over by Feng Shui practitioners. Hwangbo's focus is on the useful aspect of feng shui. Its essence is in creating order in the built environment, which is in accordance with the supposed, through feng shui techniques perceived order in life. He points out that there are many pragmatic elements in feng shui that can also be found in modern architecture (e.g., good sunshine, wind protection, and negative influences). Therefore, the study of feng shui should also be viewed not only as a rediscovery of tradition, but primarily as a way of creating new paradigms (Hwangbo, 2002).

Paton (2007) focuses on the original concepts of feng shui, as can be deduced from the original texts from the period of early, middle, and late imperialist China. He is the author of the book Five Classics of Feng Shui (Paton, 2013), which in the first part offers an in-depth review of classical and modern literature in the field of feng shui and in the second part a translation of five basic classical feng shui texts. It focuses on the scientific nature of the feng shui school of form, which has changed throughout the history and development of feng shui. Paton is critical of the modern use of feng shui and its association with modern content, such as: energy cleansing of physical spaces, radiesthesia, holistic health techniques, mysticism, etc., although at the same time he notes that this type of layering is not only characteristic of modern times, but has always been one of the key properties of feng shui (Paton, 2007, 432). He is also critical of excessive generalization through which feng shui is easily transferred to other cultures, without understanding the essence and basics.

The German sinologist Kubny (2008, 270) points out that the use of the term Chinese metaphysics is inappropriate for traditional Chinese knowledge, as the term suggests that the focus of understanding should be behind the physically explicable world. Feng shui, on the other hand, is primarily about describing the influences of the power of nature (described by the term heaven and earth - tiandi) on man, which is itself a small reflection of this same heaven and earth (xiao tiandi). It is thus supposed to be an attempt to describe the structure of the physical world, but in a different way than we are accustomed to in modern science.

One of the most interesting modern anthropologists studying feng shui is the Danish researcher Ole Bruun. In Feng Shui and China, Geomantic Divination between State Orthodoxy and Popular Religion (2003) he explores the social aspect of feng shui through a combined historical-anthropological aspect. It focuses on the period between 1850 and 1990 and summarizes the results of several of its field research in the Sichuan and Jiangsu areas conducted in the last ten years before the end of the millennium. He emphasizes the importance of 'in situ' study of feng shui, always taking into account the original cultural and historical environment. For him, feng shui is a form of putting Chinese cosmology into practice, where the geomancer seeks to discover in a concrete environment the ideal cosmological connections that are supposed to reign in the sky. For Bruun, traditional feng shui, where there would be only one theory and practice, does not exist at all, except perhaps in academic research. The nature of feng shui is distinctly composite, and at the same time there is a difference between the theory and practical implementation of both Chinese popular religion and feng shui. For Bruun, "feng shui is a living tradition that has a built-in ability to survive diverse social circumstances, as is evident from its many historical and local modifications (Bruun, 2003, 255)". Like Yang before him, Bruun also highlights the socio-political role of feng shui, which has acted as a counterweight to the local population against the pressures of China's ruling elite, especially in the last fifty years (and earlier in history). Feng shui can be seen as a reflection of the cosmologically justified resistance of the local population, with the divination of graves being the most religious element of feng shui. He repeatedly points to the dual attitude of the ruling elite towards ancestral worship and grave management, declaring such practices as superstition and backwardness on the one hand, and imposing sanctions on the local population by destroying traditional graves on the other. Ancestral worship is thus indirectly recognized as important. At the same time, the elite always used (at least to some extent) the services of feng shui practitioners at the funerals of their own family members. Images of the irrational from local culture and popular religion always reflect all the important social and political themes of the time. In a similar way, the modern rise of feng shui in the Western world can be argued to act as a counterweight to excessive political, economic, and worldview moulding which seeks to monopolize ways of thinking through the aspect of rationality. In An Introduc-

tion to Feng Shui (2008), Bruun upgrades his findings with a detailed analysis of the relationship between feng shui and ecology as well as past and present Feng Shui uses. Although the uneducated Feng Shui Westerner may find it unambiguous, the entire tradition of feng shui is historically based on the subjectivity of an individual feng shui practitioner or master. And it is this ability to adapt that has made feng shui so influential throughout Chinese history, as every element of everyday life in feng shui can be linked to individual elements of the Chinese tradition.

4. A LEAP FROM REJECTING CRITICISM TO MORE FORGIVING ASSESSMENTS

It is characteristic of all the contributions presented above that they try to observe feng shui from the position of an external observer, i.e. objectively and rationally. Nevertheless, it is obvious that the changing attitude towards feng shui is primarily due to changes in the structure of Western society and not so much to changes in feng shui practice. In the 19th century, initial curiosity was followed by a very rejecting reaction, in which feng shui was viewed primarily from the perspective of superstition, irrationality, and backwardness that inhibits development. We can find the names of feng shui as "funny caricatures of science" or "the confusion of absurdity (De Groot, 1897, 938)" or "the perverse use of physical and meteorological knowledge (Sarton in March, 1968)". There is an element of racism in which the Chinese way of thinking is inferior to Westerners and the Chinese are stubborn and resistant to change. These critics come from an imperialist society focused on economic exploitation and imbued with the Enlightenment philosophy and principles of Western science. In the first half of the 20th century, the relationship becomes more compassionate and less repulsive, with a sincere desire for a deeper understanding of the philosophical foundations. Porter (Porter in Mills, 1999, 73) defines feng shui as "a historical remnant that points to man's initial stages of the search for truth". For Needham (Needham in Mills, 1999, 73), feng shui is a pseudo-natural science. For modernists, feng shui is still irrational, unscientific, and backward, but it is no longer threatening. They perceive it as an interesting historical or cultural phenomenon that cannot be easily classified into known categories. They treat it from the perspective of mythology, folklore, popular religion or cultural geography. Feng Shui definitions become more neutral, e.g. "popular religion" (Freedman, 1968, 13) or "a belief system that shows where and how to erect a grave or a house so that future prosperity will be ensured" (Eitel in Froehling, 2015, 7). March (in Mills, 1999) certainly stands out among the authors, when he talks about "the connection between the psyche and the landscape and a deep sense of the landscape." He is the only one presented who gives his personal experiences about what feng shui talks and teaches.

"In the right location /... / there the light is magical. How magical? It can be understood intuitively, but its meaning is difficult to convey in words. The hills are beautiful, the waters are good, the sun is pleasant, the breeze is gentle, and the sky is illuminated with a special light: another world. There is peace in confusion, there is a festive feeling in peace. When you come into the presence of space, the eyes open, if a person sits down or lies down, the heart is filled with joy. Here the breath gathers and the essence focuses. The light shines from the middle and the magic spreads to all sides. /... / Try to understand this! It is difficult to put into words."(March, 1968, 259)

Forgiving definitions of feng shui have continued over the past two decades. Hwangbo (1999, 191) defines it from an applied point of view as an ancient architectural theory, and Bruun (2003, 2) as the realization of Chinese cosmology in practice.

5. CONCLUSION

Fengshui nature is distinctly dual, so we must use both the tools of perception and apperception to fully understand it. Precisely because of its dual nature, Paton (2007, 438) describes it as one of the attempts to humanize science. In the West, the feeling prevails that the magic and power of the individual have disappeared from life because large scientific conglomerates dominate science through dry statistics. Therefore, there is a growing need for modern humanistic scientific systems that would be able to incorporate both rational as well as emotional and spiritual aspects. It is the mystical element in feng shui that is probably most responsible for its popularity in the modern Western world.

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DEVELOPMENT OF HOUSING NEIGHBOURHOODS AND SUSTAINABLE RENOVATION OF THE STRING OF APARTMENT BUILDINGS WITH THEIR SURROUNDINGS ALONG THE ENDLIHARJEVA STREET IN THE HOUSING ESTATE SAVSKO NASELJE

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ABSTRACT
The goal of this work is to focus on revitalization of older residential buildings which need renovation, reviving and modernization. We aimed to enable the dwellers to develop a bond between the space and the individual as its user; to offer them the possibility to enjoy higher quality leisure time and relaxation, to feel comfortable, to engage in various (recreational or pastime) activities or explorations; to create a safe environment; to give the dwellers an opportunity for socializing and developing the sense of belonging. Our intention was to revive uninteresting residential neighbourhoods built after the World War II and thereby attract younger residents, which would curb further desurbanization of the city of Ljubljana. We were interested in the specific issues concerning open spaces and in the way of life within the neighbourhoods. Based on our research, we designed a sustainable renovation of an existing apartment building including the green spaces. For the interior spaces, we made designs and adaptations in order to update them to the needs of today as well as to the requirements and expectations of the users.

Housing neighbourhood/Settlement/Urbanism/Open spaces/Green areas/
Quality of living/Ljubljana

1. SOCIALIST NEIGHBOURHOODS AND DESCRIPTION OF THE PROBLEM TODAY

The most intensive urbanisation process in Ljubljana took place in the post-war period until approximately 1980, mainly due to internal migration from the Slovenian countryside. After the war, the number of inhabitants increased largely even in the city centre. New residents moved into nationalized bourgeois apartments and villas. During this time, the first large apartment buildings, the so-called Litostroj buildings, were built. The construction of apartment buildings outside the city centre continued and some surrounding settlements were also building up. Especially the Ljubljana districts of Bežigrad, Šiška and Moste, were developed with some very large residential neighbourhoods that gave a new character to the city. The surrounding area was also rapidly urbanized, and some of old settlements began to disappear. The process of cityzation has started and the number of inhabitants in the city has initially diminished and then began to reduce rapidly.
In twenty years, 100,000 new inhabitants moved to Ljubljana. This period is now characterized by the so-called socialist neighbourhoods with very small dwellings that solved many housing problems at the time but now we question ourselves about their future (Jakoš, 2006).
In Ljubljana, mostly owner-occupied dwellings have put the burden of maintenance onto an individual, therefore, our residential neighbourhoods are in decline or in very poor condition. As a result, housing prices within deteriorating, once impressive neighbourhoods with rich content are fall-

ing and they are becoming non-profit housing. Nevertheless, the maintenance of apartment buildings is not cheap. Many newcomers were unaware of this fact when buying an apartment. Some are now unable to pay the costs that increase as buildings are getting older, and some are simply not willing to cover these expenses. Quality renovation is therefore difficult to attain. Renovations of apartment buildings are limited to urgent construction and technical upgrades, energy-saving building renovation (thermal insulation, replacement of windows and renovation of facade walls) as well as ecological adjustments. The work is mostly led by housing managers and craftsmen, without engaging architects, urban planners, sociologists and economists, who could with their knowledge contribute to better results. This way, residential neighbourhoods are being transformed into multi-colour complexes with a pile of plastic with no added value nor in line with sustainable development. (Planinšek, 2012).

One of the consequences of unregulated and dispersed ownership lies in common premises that are neglected, in most cases still owned by investors or insolvent construction companies. Both greens and playgrounds are not maintained, as always, there are some inhabitants who take care of the surroundings and others who neglect it. Green areas and pavements have become parking lots for cars which have become a mandatory ingredient of human comfort, however, there is still lack of parking areas.

Nevertheless, the phenomenon of vandalism is on the increase. Numerous children's playgrounds in these neighbourhoods are mostly well equipped, but are becoming the target of violence. The rate of crime (drug trafficking, violence, theft...) is increasing and residents within neighbourhoods no longer feel safe.

The collective housing construction nowadays, however, generally does not follow the requirements of the present time. We are witnessing many technical and, above all, social changes that require new innovative solutions in housing construction. New buildings of poor quality that have been constructed all over our country in recent years and will burden our environment and society for decades are becoming a very serious problem. Many multi-apartment residential neighbourhoods and buildings from the 1950s and 1960s were of better quality than modern multi-apartment buildings. The price of a square meter of new construction exceeds all limits, and many young families or couples who plan a family find it unaffordable.

Due to higher costs of living and more expensive housing, counter-urbanization in the city of Ljubljana can also be described as an escape from the city, which means that the cost of urban services exceeded the effects of urban activities (Jakoš 2006). Such emigration of the working population consequently increases the financial deficit of Ljubljana, and personal income tax is collected by the surrounding municipalities with space for 'dormitory towns' (Uršič, Hočevar, 2007).

State housing policy, housing funds, pension and disability insurance, which are still owners in some dwellings, and all the professions related to urban planning (landscape and urban planners, architects, sociologists, economists, ecologists) should thoroughly undertake the renovation. Energy-saving building renovation of buildings alone will not be enough for concrete changes within neighbourhoods. The question of how to provide residents with better spatial organization in the apartment should be answered, as lifestyle is no longer the same as years ago. Solutions must be found for all traffic jams and the development of a new form of traffic must be encouraged. People should become aware that space is a common good and that we should all take care of it, not just a handful of individuals. The social problem should be addressed systematically and socio-economic issues should be replenished. And last but not least, the problem related to owner-occupied dwellings still remains unsolved. A funding strategy should be developed, helping people with lower incomes.

2. REVITALISATION AND GOOD PRACTICE ABROAD

We should look across our borders for examples of good practice. There are many examples to learn from or to apply to our situation. As an example, this article presents the renovation of a residential skyscraper on Bois le Pretre street in Paris, designed by architects Frederc Druot, Anne Lacaton and Philippe Vassal. The architects followed the principles of connecting energy, social, economic, architectural and urban factors. The G.P.R.U. Project (Grand Project de Renouvellement Urbain, the Great Project of Urban Renovation) is managed by the city of Paris in cooperation with state and regional institutions, a public investment company that invests in long-term social and sustainable projects, and a national agency for social cohesion with a single goal, which is to improve the living conditions of the two hundred thousand inhabitants of the eleven quarters of Paris. The programme itself covers the renovation of residential buildings, public spaces, green areas and transport infrastructure; development of social activities -−activities for children, youth and the elderly, as well as for people in need; economic development − promoting the development of business and trade activities, increasing employment; cooperation with neighbouring local communities. (Planinšek, 2012).

In the foreground there was the idea to demolish the skyscraper and build new multi-apartment buildings in its place, but the financial calculation was too high and the ecological damage due to construction waste would be too big according to the architects. They also wanted to avoid the process of gentrification, as the economically weak would not be able to pay higher rents in new buildings and would start moving out, and people of higher income class would start moving into new buildings.

The architects renovated the skyscraper by adding conservatories on the south, east and west sides, and so the dwellings were enlarged by 60%. The conservatories, which are glazed on the outside and inside, act as a passive energy envelope, which also further illuminates the interior and consequently reduces electricity consumption. Natural ventilation

is also provided. The additional space was named PLUS by the architects. This space is a response to modern changing lifestyle and the different needs of the people as they were designed together with the tenants. The renovation was carried out in such a way that the residents could stay in their homes during the construction works. (Planinšek, 2012). The project itself also included the addition of new housing units (on the roof or next to the building). Thus, they at least partially covered the renovation costs. The ground floor of the skyscraper was emptied and dedicated to the spacious entrance hall, which is also intended for social gatherings and joint activities (childcare activities, laundry and kitchenette...).

3. PRELIMINARY RENOVATION OF A STRING OF APARTMENT BUILDINGS WITH SURROUNDINGS IN ENDLIHAREVA STREET AT THE SETTLEMENT OF SAVSKO NASELJE

An example of the renovation of a residential neighbourhood is the Savsko naselje settlement, which is located at the Bežigrad district and is one of the greenest parts of Ljubljana. We took a closer look at five buildings on Endliharjeva Street and their surroundings. It is a two-storey building with a high ground-floor with four apartments per floor, a total of twelve apartments. There are two buildings in a row. The driveway is arranged from the main road from the north and south. The residential unit in the building is a classic two-bedroom apartment with a gross size of 60m2. The apartments do not have balconies or loggias. Ground floor apartments do not have atriums.

Figure 1. Current state of a string of apartment buildings with surroundings in Endlihareva street

As an example, we prepared a model of a façade element which would equip the respective buildings with various balcony modules. This would enable the resident to have a nicer and better quality stay within their own apartments. We would refresh the old facades, which are the most important element of the building, as they express its character and significance. The balconies are an important element of the facade composition which gives the building its character.

Figure 2. Model of a façade element

Open and green areas play an important role in terms of leisure, representing common interests, connecting residents and affecting their attitude towards the settlement. The open space in the neighbourhoods is also a place for various activities such as recreation, play, socializing, etc. (Polič, 1996). Today, however, we are mostly talking about poorly maintained areas that reduce the overall quality of living. Most of the places are untidy, unmaintained or weak in plan with traces of unwanted use visible in some parts. Urban equipment is old, damaged or removed. Green areas appear only in the form of lawns with trees, no other plantings can be encountered.

Figure 3. Visualisation of renovation of Endliharjeva street surroundings

By revitalizing older neighbourhoods that are currently not interesting for a modern man with contemporary lifestyle and needs, we would aim to improve quality of life, to provide residents with a connection between space and the user of the space, offer the possibility of quality leisure time, comfort, relaxation, active and inactive employment, research, greater security, socializing, and developed a sense of belonging.
By revitalizing the buildings, which need to be renovated, refreshed and modernized, we would promote the revival of old uninteresting neighbourhoods, which would become attractive for many young residents, which would have a positive effect on the urbanization process in the city.

4. CONCLUSION

Compared to other, more developed European countries, Slovenian apartments are smaller in size and unaffordable to many. Thus, the economic function of housing was replaced by the social function. Slovenians are solving the problem by scattered construction of individual houses on the outskirts of the cities, where the price of land and usually the construction is cheaper. The result is the counter-urbanization of the city and poorer living conditions. Old residential neighbourhoods are aging and mostly deteriorating, the construction of houses on the outskirts is on the increase, and new constructions are generally still not in line with the modern lifestyle. Many new apartments remain vacant, which is also due to the financial crisis on the Slovenian market, which hit the country in early 2012. Despite all the facts, the state has still not taken housing policy into its own hands. There are still no housing cooperatives in Slovenia despite the fact that are critically needed. (Abstract of the exhibition and lectures titled My home is in Ljubljana −Doma v Ljubljani, 2016).
The project of renovating old residential neighbourhoods should become a priority for both the state housing policy and the apartment owners. It is high time for our society to actually do something in this area.

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INTERDISCIPLINARY COOPERATION OF THE FACULTY OF DESIGN STUDENTS WITHIN THE INTERNATIONAL PROJECT GIDE 2020/FREEDOM -

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ABSTRACT
The Faculty of Design follows modern trends in higher education with international, interdisciplinary projects that take place every year within GIDE, the group for international education in design. Such projects allow students to experiment and think creatively and critically about a particular topic, and to integrate knowledge from two or more fields of study in order to create new knowledge and new experiences. It also enables them to connect internationally with students from other faculties. GIDE 2020 has created eight futuristic, forward-looking projects. Groups consisting of students of Visual Communication and the Department of Interior Design developed new concepts for mobile units during the pandemic. Such workshops allow students, academics, and researchers to explore together the cultural, social, and ethical dimensions of design. With such projects, the Faculty of Design wants to educate and raise critically thinking and creative individuals who know how to connect and cooperate, and whose creative work will have a positive impact on society.

KEY WORDS:
interdisciplinarity, higher education, sustainability, critical thinking, creativity

INTRODUCTION

GIDE - Group for International Design Education - is a network of eight partner academies and higher education institutions for international design education, consisting of:
- Thomas More Mechelen, University of Applied Sciences (Belgium - Mechelen)
- HS Magdeburg, University of Applied Sciences (Germany - Magdeburg)
- School of Design, Politecnico Di Milano (Italy - Milan)
- SUPSI - University of Applied Sciences and Arts of Southern Switzerland (Switzerland, Lugano)
- Duncan of Jordanstone College University of Dundee (Scotland, Dundee)
- MADEIRA Art and Design Department, University of Madeira (Portugal, Funchal)
- WUXI School of Design, Jiangnan University (China)
- Faculty of Design, Associated Member of the University of Primorska (Slovenia, Ljubljana)

GIDE, the Group for International Design Education, was formally established in 2003 and is a unique network of eight higher education art and design institutions, which evolved from an earlier inter-cultural network established in the nineties.
Every year the GIDE network organizes creative workshops. The International Workshop Week is organized by the host school, a member of the GIDE Group. In a typical workshop, students and lecturers from each of the eight schools in the network, which usually has 150 participants, are invited to participate interactively. The purpose of the workshop is to bring together international students, academics, research-

ers and regional companies as well as cultural community organizations, namely through an experimental topic in an intense and highly creative week, and to share intercultural experiences in collaboration with local sponsors, industry, designers, researchers, as well as creative and cultural organizations.
This week of intensive research and creative and interdisciplinary international work always begets excellent conceptual creative projects.
The results of the workshops and the experience itself act as a catalyst for a formal and joint project that is embedded in the learning process autonomously in the individual member schools of the GIDE Group.
This year, due to the global Covid situation, no international workshop week is being held at the host school.
As part of the interdisciplinary international project GIDE 2020, members of the GIDE organization chose a common title on the topic of FREEDOM.
Interdisciplinary cooperation of students within the GIDE project
Interdisciplinary cooperation/connections between different fields of study have long been a mainstay at the Faculty of Design. They are also encouraged by the latest guidelines in European and national documents. The goal and purpose of interdisciplinary student collaboration is to learn and consequently be able to integrate concepts and approaches from two or more fields of study in order to create new knowledge and new solutions.
Such a study approach leads to interdisciplinary results that would not be possible without such integration. This was shown inter alia by the excellent results of interdisciplinary cooperation among students of Interior Design and Visual Communications at the Faculty of Design within the GIDE 2020 project.
In the autumn semester, sixty-four students from two study programs at the Faculty of Design, namely Interior Design and Visual Communications, undertook an analysis of the selected interdisciplinary topic: FREEDOM.
In the working groups, students designed, analyzed, structured, and creatively molded concepts into tasks with the leading creative idea of MODULAR UNITS in freedom.
The conceptual design was based on the multi-purpose use of a modular unit (pre-fab), according to the concept of sustainability and innovation, with a possible different micro-location and intended for different age groups.
The groups wrote term papers with different modular units located in different environments, including natural, urban, rural, and even fictional environments.
Through the project, which was of a very open nature, students explored the possibilities that such modular units can offer. Above all, they connected disciplines and thus had the opportunity to integrate knowledge from two different fields of study through the GIDE project.
An additional task the students had was to explore their own creativity through creative and critical thinking. Creative thinking allows students several different and at the same time correct solutions, as it is open and multidirectional. It is based on a rich imagination, freedom, curiosity, and enthusiasm. Through critical reflection, the students upgraded their creative ideas. Critical thinking significantly complements creative thinking. Critical thinking means rational, free, responsible, and reasoned thought process as applied to solving and analyzing a particular problem. Its characteristics are clarity in formulating questions, perseverance in finding relevant information, and a systematic nature of designing solutions.
Students were given just 30 days to complete the project. They worked under the mentorship of Assist. Prof. Inge Kalan Lipar, BArch and Assist. Prof. Barbara Dovečar, MA. The final result of the interdisciplinary project was the presentation of eight futuristic projects, which are presented below:
Presentation of eight students' projects

GROUP 1: PROJECT AERIS – LUXURY IDYLL

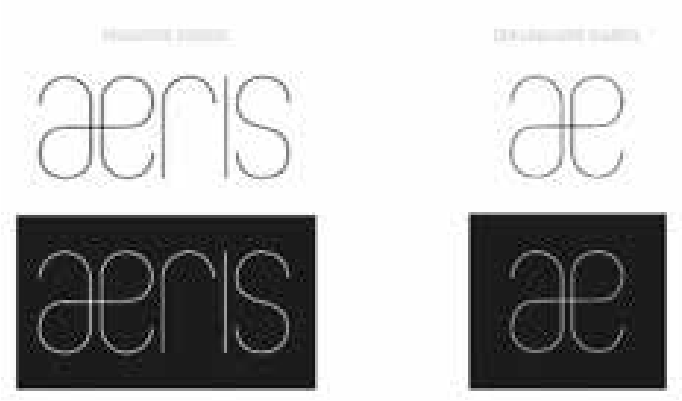
The Aeris project is a futuristically designed mobile unit that offers its residents the chance to travel and see various sights in a new and different way.
With the compact modern unit, the owner can change locations safely and easily, independent of traditional forms of transport, as a helicopter can move the accommodation unit wherever the heart desires.

Picture: Visualization of the mobile unit Aeris

Owners are provided the option several sites all over Slovenia, including the most beautiful and tourist-friendly spots. They can start at any of the locations on offer, and during their vacation they can change locations in an interesting and above all in a comfortable way. Aeris allows owners to enjoy Slovenia's myriad beauties in a pleasant and futuristic ambience. The unit is safe, clean, and independent, and therefore ideal for a break during the epidemic.

Aeris comes with an app that serves as a kind of tourist guide and travel diary. It provides information about the location of the mobile unit and serves as a source of inspiration for further exploring selected destinations. It can also be used as a holiday diary as well for overviews of other possible holiday locations in Slovenia.

The name Aeris comes from the Spanish word aire, meaning air. It evokes a sense of lightness and prestige, and also relates to the form of transport used to move the unit from one location to another. The slogan "luxury idyll" is added to the name Aeris, and relates to the image and experience that we achieve with this mobile unit. This allows owners to enjoy and discover the beauties of Slovenia through an idyllic journey in a luxurious and futuristic ambience.



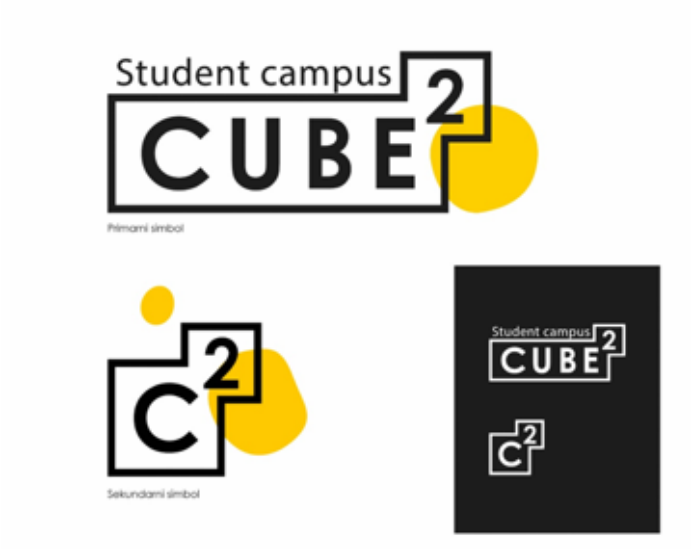
Pictures above: Corporate graphic image of mobile units Aeris, visualization of the interior, depiction of the transportation options, and presentation of the application
.

GROUP 2: PROJECT CUBE2 – STUDENTS' CAMPUS

Group 2 in its Project Cube2 focused on students and various options of improving their accommodation in student residences. They followed their initial decision that they wanted to design a simple and functional ambience that offered the residents more freedom than ordinary students' quarters. They envisioned a student campus consisting of shipping containers, rearranged to offer the tenants comfortable and high-quality accommodation. Shipping containers were therefore selected as the basic module, as they are simple and stackable. From the containers, individual accommodation units were assembled, containing everything a student needs. When planning, they followed the current guidelines in interior design and also designed the exterior – an environment that could offer numerous activities.

As part of the project, this group designed an accommodation module for one person as well as a module for two persons. All units have their own bathroom and kitchen, which provides tenants with a higher quality of living. The furniture in all units is suitable for students regardless of their field of studies. Each unit has access to a patio, where friends can socialize safely even during the pandemic.

The group also designed a visual image of the student campus and a guidance system, which also includes interactive direction boards. The overall graphic image is dynamic; the symbol is flexible and allows for many variations.



Figures above: Dynamic corporate image of Cube2, visualizations of mobile units (interior, exterior), display of an interactive information board and a typical floor plan.

GROUP 3: PROJECT FREE BUBB – VIRTUAL FREEDOM

As part of the Free Bubb project, Group 3 delved into the fact that we live in a world of many limitations, in a world of corona crisis in which we are forced to adhere to a variety of measures: from mandatory wearing of masks to restrictions of movement. All these measures restrict people who are deprived of the freedom they used to know. The students in this group asked themselves: "What is actually freedom and do we really live in a free world?" Based on the answers, they designed modular units that would be set up all over Slovenia, in the hearts of larger cities. They are reminiscent of bubbles, hence the derivative of the name: FREEDOM + BUBBLE = FREEBUBB. The shape of a bubble was chosen because a bubble gives a feeling of security. FreeBubb is a dome made of insulating thermopane, three-layer tempered glass and an iron frame. It is divided into four rooms separated by soundproof walls. The purpose of the units would be to serve as a point of refuge for all individuals who can no longer bear the pressure of the current crisis and would like to withdraw and feel free. The domes would allow an escape from reality, into the virtual "free" world. A robot would be installed in each room to serve as our therapist, conversation partner, "friend", or teammate. Everyone could talk freely with him, share problems, or listen to advice. Robots could also be used to play basketball or any other sport with, as all the equipment and paraphernalia would be stored in cupboards that would be placed in each bubble room. FreeBubb would operate via bookings through an app, where each interested individual could book an appointment.

Figures above: Corporate graphic image, printed materials and pictograms of FreeBubb; cross-sections of mobile units, visualization of the interior and exterior of units, interactive map.

GROUP 4: FREEDOM – SELF-SUFFICIENT, SUSTAINABLE LIVING

Within the framework of the project called FreeDom, students designed a concept of modular units, which together form a larger self-sufficient living unit. Students designed living spaces that offer users complete freedom. The modular units can be transported anywhere and are perfectly adapted to user needs. They are made entirely of organic, recycled materials.
Because we are living through a pandemic, the students decided to create a solution for mobile, flexible, simple, and most importantly affordable housing units. In the current (Covid) situation, these units would be intended for quarantining civilian individuals or for healthcare professionals who would like to withdraw from their families for preventive reasons. After the end of the pandemic, the buildings could then be used as student housing or turned into a hostel, but they could also be a great solution to the growing problem of overcrowding.

The accommodation units are very small, measuring merely 9m2. They are intended for one person. They have a kitchenette with a dining area, a separate bathroom and a bed that can be reached by ladder. The apartment has a large patio, where residents can breathe fresh air, exercise, do some gardening, etc. Such small spaces were chosen due to the unpredictability of the current situation and the economic situation in our country and worldwide. The need for quality isolation facilities is increasing on the daily basis, so it is necessary to manufacture as many such units are possible at the lowest possible cost.
The accommodation unit is self-sufficient and would not need external energy sources. This self-sufficiency also shows a form of freedom, as the inhabitants would be provided with energy, despite the unpredictable conditions in the present world. Solar panels would be installed on the roof to convert sunlight into electricity. Geothermal heating would be used to minimize heat loss, as stable earth temperatures help regulate heat. A high-performance heat pump would also be added, high-quality insulation from plant sources would be used as well as premium windows and doors that prevent heat loss. Rainwater would be collected and used for watering and rinsing. The rainwater would be purified in a constructed wetland wastewater treatment plant and therefore the building would not have to be connected to any public utility system. A green facade would be installed on the building, which has many positive effects on people's lives. Plants purify the air, contribute to well-being, and give us the feeling of being surrounded by nature even though we are in the city. In addition, they have an insulating effect, act as thermal insulation, and consequently reduce energy consumption.

Figures above: The dynamic corporate graphic image of FreeDom,
visualization of the interior and exterior of the units, the integration of mobile units that can be combined into a larger, sustainable, self-sufficient building.

GROUP 5: FLOAT- FUTURISTIC HOLIDAY

The students of the fifth group designed the FLOAT mobile unit in the shape of a ball, which resembles a bubble and is intended for everyone who wants a unique, futuristic vacation. The FLOAT mobile unit can be located in the mountains, by the beach, by and in lakes, in the desert, and more.
The ball-shaped mobile unit's diameter is 8.4 m and is designed for 2 adults, containing a bedroom, a bathroom, and a patio. The lower floor measures 70m2 and the patio 20m2. On the lower floor there is an elevator with a special system, which provides access to the terrace. The top dome can be opened. This offers the user access to fresh air and a view of the starry sky.
The bubble can be transported by truck. Moving it from water to land and vice versa would be possible with a new technology. There would be an anchor installed at the bottom of the unit, operated by hydraulics. The anchor would be dropped and anchored on the sea or lake floor.

Figures above: Cross-sections of mobile units, visualization of the interior and exterior of the units; corporate graphic image and other promotional materials.

GROUP 6: CLOUD-I

People's mental health, which is crucial for a good life, served as a focus point of group 6. As Covid has a negative impact on many people's mental health, the group created the Center Cloud-i, intended for relaxation, workshops, therapy, and socializing.
The name Cloud-i evokes the tranquility and softness of a cloud, and the letter i represents an individual.

Several experts in psychology and psychotherapy would concurrently run workshops and private therapies at the center, thus providing a professional approach and high level of expertise for the sessions carried out in the Centre.

The building, designed in the shape of a cloud, contains several halls and rooms with state-of-the-art equipment, intended for various types of therapies.

As part of the project, the students also designed a corporate graphic image, a website, interactive promotional posters and other materials. The website will also provide an online chat box and a telephone number people in need can use to contact the psychologist or psychotherapist on duty. The building is made of environmentally friendly materials. The exterior is made of reflective glass, which lets a lot of natural light in, contributing to well-being and at the same time maintaining a sense of privacy for visitors. Students envisioned a steel structure. The mobile unit will obtain the necessary energy from solar cells.

Figures above:. Visualization of the interior and exterior of the mobile unit;
the visual image of Cloud-i, which includes promotional materials, depiction of an interactive promotional board, promotion on social networks.

GROUP 7: FREETREE

Students in the seventh group created modular units designed for relaxation.
The planned location for the sustainably designed facility is Mt. Rogla. The building would be connected to the existing forest canopy walkway above the treetops. Modular units are actually located among the trees and more precisely among the treetops. As already mentioned, they are designed for people to relax and unwind.

Slovenians often forget how beautiful and richly forested the country they live in is. The students thought of unique units made specifically for rest and relaxation. The goal was to offer guests a space in harmony with nature, where they can relax from their busy and stressful everyday lives. The brand name is FREETREE, which means just that: to be free among the trees. The hexagonal units designed by the students are placed among the treetops and provide peace and tranquility to all their visitors.

Figures above: Visualization of the interior and exterior of mobile units and
display a visual image of FreeTree.

Group 8: Nature by Touch – the changing ambience/interior
When designing the modular unit Nature by Touch, the students imagined an interior whose ambience has the ability to be changed according to the user's wishes. Their inspiration for this project was the desire to create the holistic experience of an environment that is physically distant from us but could nonetheless be re-created by simulations. To achieve this goal, they would use modern technologies and special effects. The visual aspect of the simulation would be

achieved by projecting the desired environments (tropical world, winter idyll, mountains, cities, etc.) onto glass surfaces that would be positioned on most of the outer walls in the main living and sleeping area. The sound simulation would be achieved through multi-channel sound effects that would emit ambient sounds and music through a sound system, installed throughout the unit. Simulation of scents would be achieved by spraying scents and fragrances through the ventilation system of the modular unit. The simulation of sensory perceptions would be supported by warming the air by floor heating and cooling it by air conditioning.

On the inside of the glass walls, the students envisioned the use of modern technology employing transparent screens, also called smart or transparent LCD screens. On the outside, however, there would be blinds that could be closed during a simulation to prevent and limit the influx of natural light. All systems that allow a change to the ambience can be controlled and managed by an application that can be downloaded to your phone or tablet. The application already comes with preloaded features that allow you to simulate a mountain, tropical, Mediterranean, or any other climate. In addition, users can fine-tune the settings for a more personal experience. The system also enables the projection of cities, forests, the ocean, etc. on glass surfaces. The application turns on small, but efficient sound systems installed around the building, which surround the space with the sounds of birds, waves, raindrops, wind, crickets etc., which can be further customized.
In line with the choice of ambience, the application also disperses scents and fragrances through the ventilation systems (the smell of blueberries, the scent of the sea, the scent of the mountain breeze, etc.).
The application also enables temperature changes by switching on the heating or cooling systems.
The space is designed sensibly and meets the needs of two people. The building's simple shape, light weight, and small size make it easier to potentially move it. The building can be dismantled by separating the walls and the floor, which makes the weight more manageable during the transport.
As part of the project, the students also designed a corporate graphic image and an application.

Figures above: visualization of the interior and exterior of the mobile unit and floor plan, dynamic corporate graphic image of Nature by Touch, apps for tablets and phones.

CONCLUSION:

As part of the GIDE Freedom project, students of the Faculty of Design researched their own creativity, critical thinking, ability to interdisciplinary connect and integrate knowledge from several different fields of study (Interior Design and Visual Communications) to create new knowledge. As can be seen from the presented student projects, such a study approach leads to very creative, innovative and quality results that would not be possible without interdisciplinary (and international) cooperation. The project will end in March 2021 with an interactive (online) exhibition of all students' solutions of all faculties participating in the GIDE – Freedom project.

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POSITIONS OF DESIGN STUDENTS ON THE STIMULATORS (SOURCES) OF THEIR CREATIVITY

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ABSTRACT

In discussions about encouraging students' creativity, it seems reasonable to ask the question of what their main stimulators (sources) of creative inspiration are. We designed a questionnaire to answer that very question. A survey of research on approaches, models, and definitions of creativity, creative thinking, and the creative process informed the design of said questionnaire on possible stimulators of students' creativity.
In this paper, we present in more detail the sources of inspiration that students highlighted as the strongest stimulators of their creativity. Analysis of the answers obtained revealed that students' strongest stimulators of creativity include the following: nature, curiosity, imagination, freedom, music, relaxation, outdoor physical activity, thinking outside the box, humor, visualization, and peace. From these answers, we further established that students view relaxation (breaks) as important for generating new ideas, along with active participation in problem solving.

Key words: creativity, creative process, creative thinking, critical thinking, rational, intuitive, higher education, promoting creativity

1 INTRODUCTION

"Creativity requires the courage to let go of certainty." — Erich Fromm.

Rutar (2017) claims that human beings want to satisfy our natural tendencies towards creative actions and self-realization. Discussion of 21st-century students' basic skills, abilities, and capabilities certainly focuses on creativity and the capacity to explore problems (Egan, Magurie, & Rooney, 2017; Rutar, 2017). In every student lies creative potential as the sum and overlap of their cognitive and personality traits (Galewsky, 2019). Awakening latent creative potential and/or encouraging creativity is therefore becoming a key pedagogical principle and an important part of the learning process for all students (Gabrijelčič and Konrad, 2014).

Higher education should be developing towards an environment of critical thinking, which should be marked by the creativity of both students and teachers. Creativity can be stimulated through planned work and a conducive atmosphere (Jackson, 2006). With the right motivation and a stimulating environment, students will be more creative and better prepared to make the bold and risky decisions that are part of the creative process (Mynbayeva, Vishnevskay and Sadvakassova, 2016).
The Resolution on the National Higher Education Program 2011-2020 also confirms the above, stating that the University environment should be creative and innovative, and offer a suitable space for solving current challenges in addition to its fundamental mission of creating new knowledge. In

addition to specific competences, universities should ensure the provision of generic ones as well, in particular creativity, innovation, critical thinking, both independence and teamwork, and the ability to act internationally (Resolution on the National Higher Education Program 2011-2020 (ReN-PVŠ11-20) (Article 1.2)).
Encouraging student creativity is also strongly related to a number of indirect factors that affect students as people, such as their self-confidence, self-actualization, and self-image (Musek, 2000). Through creation, people realize their possibilities and potentials, which makes their lives more meaningful. Creativity is an ability that greatly enriches a person's life, as well as an important quality of an individual's personality.

From all of the above, it is clear how important it is for teachers in higher education to encourage and consciously develop students' creativity.

2 DEFINITION OF THE RESEARCH PROBLEM AND RESEARCH METHODOLOGY

The research problem at hand is how to effectively encourage or stimulate creativity among students and awaken their creative potential. We thus employed a questionnaire to ask students about their main sources of creative inspiration or key stimulators of creativity. The survey was conducted in November and December 2019. The study included 103 students majoring in Visual Communication and Interior Design at the first (Bachelor) level of design studies at the University of Ljubljana's Faculty of Design. Research was conducted using a descriptive and causal-non-experimental method. The data were processed using descriptive statistics, which was used to determine the degree of agreement with individual statements.

3 RESULTS AND INTERPRETATION OF STUDENTS VIEWS ON WHAT STIMULATES THEIR CREATIVITY

Table 1 shows students responses about the strongest stimulators of their creativity. The answers shown are those where more than 50% of the surveyed students agreed that the mentioned stimulator strongly influences their creativity.

Table 1: Actual number of responses (f) and percentager (f%) for each level of agreement with the statements on the impact of creativity.

STATEMENTS ON THE IMPACT ON CREATIVITY	RESPONSES						TOTAL	
	No impact		Impact		Strong impact			
	f	F %	F	F %	f	F %	f	F %
MY IMAGINATION	0	0	8	7.8%	95	**92.2%**	103	100.0%
FREEDOM	6	5.8%	5	4.9%	92	**89.3%**	103	100.0%
INQUISITIVENESS	4	3.9%	17	16.5%	82	**79.6%**	103	100.0%
THINKING OUTSIDE THE BOX	5	4.9%	16	15.5%	82	**79.6%**	103	100.0%
NATURE	4	3.9%	18	17.5%	81	**78.6%**	103	100.0%
POSITIVE ATTITUDE	4	3.9%	18	17.5%	81	**78.6%**	103	100.0%
MUSIC	5	4.9%	20	19.4%	78	**75.7%**	103	100.0%
CONVERSATIONS, DEBATES	5	4.9%	21	20.3%	77	**74.8%**	103	100.0%
LIFE ENERGY	11	10.6%	15	14.6%	77	**74.8%**	103	100.0%
MOTIVATION	6	5.8%	22	21.4	75	**72.8%**	103	100.0%
PERSONAL HAPPINESS	5	4.9%	25	24.2%	73	**70.9%**	103	100.0%
TRAVEL	15	14.6%	15	14.6%	73	**70.9%**	103	100.0%
SELF-CONFIDENCE	10	9.7%	24	23.3%	69	**67.0%**	103	100.0%
EXERCISE IN NATURE	13	12.6%	23	22.3%	67	**65.1%**	103	100.0%
WRITING DOWN IDEAS	15	14.6%	21	20.3%	67	**65.1%**	103	100.0%
PEACE, SILENCE	12	11.7%	26	25.2%	65	**63.1%**	103	100.0%
VISUALIZATION	4	3.9%	35	34.0%	64	**62.1%**	103	100.0%

3.1 ENCOURAGING CURIOSITY

"I have no special talent. I am only passionately curious." — Albert Einstein.

In the survey, students highlighted curiosity as a very important stimulator of their creativity. As many as 79.6% of them agreed that curiosity is a strong source of their creative inspiration.

The introduction to the creative process is actually curiosity. Kashdan and Fincham (2002) consider this to be a key trait for the development of elevated creativity.

Rutar (2017) claims that curiosity is innate. Curiosity and wonder are spontaneous and as such, they only need to be encouraged within the study process. Curiosity should be at the core of learning. Namely, it represents the desire for knowledge, the desire for new experiences, research and creation (Rutar, 2017).

Guillford (1968) also argues that curiosity is the driving force of creativity and the spontaneous inner motivation of an individual.

Kashadan (2018), who is utterly dedicated to researching curiosity, defined curiosity with five dimensions: (1) joyous exploration, (2) deprivation sensitivity, (3) stress tolerance, (4) social curiosity; and (5) thrill seeking.
Curiosity is usually accompanied by excitement and wonder. Enthusiasm and wonder are associated with feelings of joy

and eagerness. Curiosity is often the result of excitement and wonder at something. "Wonder and deep respect are such powerful experiences that they contribute significantly to a student's motivation and self-confidence, which in itself means cognitive action, with which students try to explain any experience to themselves. It is quite clear that the entire action described here is emotional, motivational, experiential and cognitive at one and the same time" (Rutar, 2017, p. 157).

Kagge (2018) claims that wonder is one of the purest forms of joy.

3.2 ENCOURAGING FREEDOM OF EXPRESSION

"Insanity is doing the same thing over and over and expecting different results." —Albert Einstein.

Freedom is a very important stimulus for students in the creative process. In the survey, as many as 89.3% of students agreed that freedom has a strong impact on their creativity. The freedom of independent creative and critical thinking is therefore fundamental to the creative process or creativity. Trstenjak (1981) argues that those who do not experience their existence as a free given will have difficulty reaching for statistically unusual, rare and original answers. Independence of opinion and non-conformist attitude are two qualities that are necessary for creative individuals to be able to open new perspectives that replace old ones.
Sagiv, L., Arieli, S., Goldenberg, J., and Goldschmidt, A. (2010) conducted a study on the impact of freedom on creativity and established, inter alia, that intuitive individuals are more creative than systematic individuals. They also establish that structured work does not necessarily inhibit creativity.

3.3 ENCOURAGING IMAGINATION

"Imagination is everything. It is the preview of life's coming attractions. Imagination is more important than knowledge." —Albert Einstein
Ranked highest on the scale of stimulators of creativity for design students is imagination. In the survey, students highlighted imagination as the most important stimulator of creativity. 92.2% of them agreed that imagination is the most important source of their creativity.

Imagination is the spiritual capacity of imagining a concept. Free and spontaneous expression of ideas is associated with the rich and original imagination of an individual. A characteristic of the imagination is that an individual, based on his experience, creates new combinations that have not yet been made (Tacol, 1999).

Vygotsky argued that the imagination develops throughout an individual's life. He found the origins of creative imagination in early manifestations of play, and explained that it goes through a process of integration and evolution following the development of concepts and reasoning during adolescence. It develops into mature creative imagination only in adulthood (Ayman-Nolley, 1992).

The value of mistakes
"Anyone who has never made a mistake has never tried anything new." —Albert Einstein
Mistakes need to be understood and appreciated as an important part of the creative process. Accordingly, mistakes must be allowed. It is very important that students feel that they are free to think and explore their own imagination and creativity and that they will not be criticized for their mistakes. The ethical component is the only limitation. Jackson (2006) emphasizes the importance of the evaluation of mistakes in the context of developing creativity. Mistakes should be understood as a part of the creative process and an opportunity to learn something new. In this context - when we give value and meaning to mistakes - students' mistakes will not deter them from further work; on the contrary, they will provide students with an incentive for further creative effort, the creative process (Jackson, 2006).
Rutar (2017) emphasizes the importance of relaxation and an atmosphere free of anxiety and fear in 21st century schools. Students need to be trained and encouraged to say more. All too often, they are afraid that something will go wrong if they express their own opinion.

3.4 ENCOURAGING PERSISTENCE AND MOTIVATION

"It's not that I'm so smart, it's just that I stay with problems longer." —Albert Einstein
In the survey, 72.81% of students described motivation as a strong stimulator of their creativity.
The teacher, as an external motivator, can play an important role in raising students' internal motivation and encouraging them in their creative exploration of problems. Rutar (2017) claims that teachers can change a student's life for the worse, or for the better. Teachers who change students' lives for the better are certainly people who know how to instil a passion for learning and creating in young people. It is not just about a passion for knowledge per se, but rather about the passion for learning that generates new knowledge and new ideas. Good teaching is thus when teachers and students together construct new ideas that have meaning, substance and inspire. Above all, the teacher shall teach a different and a more appropriate use of information and knowledge. A good teacher teaches how we can combine information and knowledge into new meaningful stories and new concepts. It is a way of learning and creating new knowledge that follows the latest insights into the functioning of the brain. (Rutar, 2017).
Initially, the external motivation was seen as detrimental to creativity. It was believed that with increased external motivation, one's own motivation actually decreases. It has, however, been established, over the course of several stud-

ies Amabile (1996), that external motivation is not always inversely proportional to internal motivation, and establishes that internal and external motivation can act additively. Amabile distinguishes between two types of external motivation - informational (e.g. constructive feedback information) and control (eg deadlines, restrictions). Informational external motivation does not undermine, but rather complements internal motivation. In contrast, control does undermine a sense of autonomy and disrupts the creative process (Steele, McIntosh, Higgs, 2017).

3.5 ENCOURAGING THINKING OUTSIDE THE BOX AND THE EXPRESSION OF UNUSUAL IDEAS

79.6% of students stressed the aspect of thinking outside the box and expressing unusual ideas as very important in generating new ideas and encouraging their creativity. Students love to think in this way about potential solutions to a particular problem.
It has been proven that creativity can be stimulated with various techniques that enable thinking outside the box (Pečjak, 2001). We know several such techniques. One of the most famous ones is Alex F. Osborn's Brainstorming technique as a means of a group looking for new ideas and solutions in a relaxed atmosphere. There are four rules that participants follow: there should be as many ideas as possible, and each new idea should not be criticized or evaluated, but connected in new ways (Pečjak, 1989).

Other techniques that can encourage thinking outside the box and thus creativity are: imitation - or how best to imitate; personification - role play; the Seven Hats technique, unfinished stories - script development; as well as writing ideas such as brain-writing and quizzes...

3.6 ENCOURAGING THE EXPERIENCE OF NATURE

In the survey, students ranked nature as an important stimulator of their creativity and on average ranked it as the fourth most important stimulator of creativity. 78.6% of students agreed that nature is a strong stimulator and an important source of inspiration in the creative process.

Nature is more mysterious and more complex than we believe, think, or imagine; as such, it is an inexhaustible source of inspiration. Faced with nature (e.g. when we admire the infinite starry sky) we sometimes have to admit that there are things we simply don't understand, things that we have no notion of; on occasions we find ourselves in front of something incomprehensible. When confronted with phenomena that cannot be put into known explanatory frameworks and concepts, an individual requires new ideas and concepts, as well as a new vocabulary to address that experience - this requires creativity (Rutar, 2017).
Trstenjak speaks of nature as an external injection of inspiration, which can trigger artistic or scientific endeavour (Trstenjak, 1981).

Students also indicate outdoor activities as a strong stimulator of their creativity (65.04%). Outdoor activities provide relaxation. Deep breathing, oxygen supply and relaxation raise the levels of endorphins (happiness hormones) in our body.

3.7 ENCOURAGING THE SEEKING OF REFUGE IN PEACE AND SILENCE

Silence has always been an important part of the creative experience. It is perhaps one of the most underrated tools of creativity. The survey reveals that students value peace and tranquillity highly; 63.1% evaluated it as a strong source of creativity.
We need to relax and eliminate the noises in our head in order to attain a tranquil state. Silence speaks its own language. New ideas and new thought patterns emerge as a consequence of silence. For millennia, monks, mystics and hermits have argued that the answers could be found in silence. Aristotle and Plato argued that where our vocabulary ends, there exists an openness to the possibility of getting to know answers and great truths (Kagge, 2018). Spending a certain amount of time in silence improves focus, productivity and creativity.
MINDFULNESS
We also encourage students to be mindful, as a means of experiencing the moment. Mindfulness is increasingly becoming the subject of scientific research. It is a state of calm, and open consciousness that does not judge. It is a state in which we pay full attention to what is happening right now, at that very moment. Mindfulness gradually eliminates our mental habits that force us to think over and over again using the same thought patterns and pathways. Habits and routine stifle creativity. Through mindfulness and meditation, we break free from the web of habits that control our lives. Creativity means perceiving the world in new ways (Penman, 2016).

3.8 ENCOURAGING RELAXATION AND CREATIVE BREAKS

Students' replies confirm that relaxation significantly affects their creativity, with as many as 52.5% replying that relaxation has a strong influence, and 28% that it has an influence.
Relaxation is our natural state; when we are relaxed, we are more creative than when plagued by states of stress, strain, and fear. Newman (2012) claims that, while we may know a variety of techniques for creative problem solving, but none is as effective per se as simply being in a relaxed state. Most epiphanies appear precisely during phases of relaxation (on walks, when daydreaming, in silence, etc.), when we turn our attention elsewhere and hear our inner voice (Newman 2012).

There are many types and techniques of relaxation, such as imaginary travel or visualization (62.1% highlighted visualization as a strong stimulator of their creativity), meditation,

relaxation through physical activity (e.g. walking, dancing, running, yoga), controlled breathing, music, etc.
"Many psychologists believe that the main characteristic of creative and satisfied people is, among other things, that they know how to enjoy silence and solitude, they know how to deal with themselves and draw from their own resources. They feel best in their natural environment, are closely connected with their emotions and know how to listen to their inner selves in their decisions" (Srebot, Menih, 1996, p. 12).

3.9 ENCOURAGING HUMOUR AND LAUGHTER

With 59.2%, humour and laughter are a strong stimulator of creativity in students. Teachers should take this fact into account much more and "let" laughter and humour into their lecture halls more often.
Pečjak (1987) points out the high correlation between creativity and witty answers. In her paper, Emma (2005) highlights a study by Loehrar and McLaughlin that examined the impact of laughter on creativity. They established that laughter stimulates the inflow of new ideas. They also established that ideas grow in proportion to the flow of laughter. When the laughter ended, ideas also began to decline. Laughter primarily reduces the inhibitory factors of creativity, as during laughter one is less focused on labelling one's ideas as being meaningless (Emma 2005). Laughter is a type of relaxation that frees us from tension and brings relaxation, joy, positivity and energy. Also, happiness hormones are released into our body during laughter.

Humour and laughter are great tools for relaxation that bring joy, playfulness and energy into our lives. Laughter reduces the fear of expressing unusual ideas, increases motivation, mutual trust, joy and a creative, relaxed and positive atmosphere - all of which have a positive effect on the creative process.

4 CONCLUSIONS

The strongest stimulators of creativity revealed in our survey are: imagination, nature, freedom, curiosity, thinking outside the box, positive attitude, music, conversations and debates, life energy, motivation, personal happiness, travel, self-confidence, outdoor activity, writing down ideas, peace and silence, visualization, knowledge, humour, asking questions and relaxing. The survey proved that it was both sensible and necessary to integrate the aforementioned stimulators of creative inspiration in the study processes. Encouraging creativity and critical thinking, as well as providing opportunity to experiment, make mistakes and learn from those mistakes – are all very important, because such educates and creates critical and creative individuals who will co-create the society of the future.

At the same time, research reveals that for these students, relaxation is just as important in generating new ideas as their being actively involved in problem solving.

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