GoingGreenGlobal International Design Week

5th INTERNATIONAL SCIENTIFIC CONFERENCE A.L.I.C.E.

FACULTY OF DESIGN
Associated Member of University of Primorska

GoingGreenGlobal International Design Week

-

5TH INTERNATIONAL SCIENTIFIC CONFERENCE A.L.I.C.E.

-

City of DesignLjubljana, Slovenia
17.10.2018

OPENING SPEECH
-

KEYNOTE SPEAKER
Prof. Nada Matičič
CEO and Vice Dean of the Faculty of Design,
associated member of the University of Primorska,
Member of the Board of DME

SUSTAINABLE CITIES AND COMMUNITIES
– Design and Design Management Strategies towards Sustainable Future

The A.L.I.C.E. (Architecture | Landscape | Interiors | Culture | Emotions) platform, association of international design educational institutions, was established in 2010 by the former Academy of Design, today Faculty of Design Ljubljana to form a stable and reliable network of partners working on common projects with the aim to raise design awareness in the partner countries.

The principal goal of the platform consist of the exchange of knowledge, sharing good practices, presenting different teaching approaches, ideas and new professional knowledge. The platform is dedicated to professors, mentors, tutors, as well as students.

Annual activities of the platform consist of working on projects according to the designated A.L.I.C.E. topic, presenting selected projects on the annual international competition and exhibition, and an international scientific conference.

National and International science and art met and shared the latest knowledge, research in Sustainable cities and communities, more specific in Innovative Design and Design Management Strategies towards sustainable future.

The conference was a unique opportunity for academics, researchers, designers, architects, and professionals to meet and share the latest knowledge, research in Sustainable cities and communities, more specific in Innovative Design and Design Management Strategies towards sustainable future.

The conference focuses on sustainable design, green design innovations, building energy planning of neighborhoods and cities, emphasizing a balanced approach to environmental, socio-economic and technical aspects of sustainability. The topics include innovative approaches for education and training on sustainability in design innovations. The conference will raise awareness concerning state of the design strategies and best practice across the world of integrating sustainable development approaches in design innovations. The conference will include keynote speakers and to promote the knowledge exchange on the conference themes.

CONTENTS

-

GREEN ARCHITECTURE, SUSTAINABLE DESIGN AND RAPID URBANIZATION DM STRATEGIES TOWARDS SUSTAINABLE FUTURE

–

Prof. ROŽMANEC MATIČIČ Nada
Faculty of Design,
Associated Member of University of Primorska

Abstract: The 2030 Agenda for Sustainable Development speaks about greatest global challenges, so I believe that every human being can do something for better future, better environment, better human rights, water and food for everybody. The 17 sustainable development goals and 169 targets are very ambitious plans for social, economic and environmental issues.

The United Nations has designated the First Monday of October of every year as WORLD HABITAT DAY. The purpose of World Habitat day is to reflect on the state of our towns and cities, and on the basic right of all to adequate shelter. It is also intended to remind the world that we all have the power and the responsibility to shape the future of our cities, towns and our lives.

Green architecture / Sustainable design / Rapid urbanization / Sustainable future

1. INTRODUCTION

This day and age, you hear everyone talking about going green. Whether you want to admit it or not, at some point everyone will have to follow with the green movement.
This is because at the rate we are going, the earth is simply not sustainable.
That means that over the years, we will begin to run out of certain natural resources that are needed in order for us to survive. The thought of this issue can be frightening for most people and the main reason they choose to build green or sustainable.

2. GREEN ARCHITECTURE

Every day a new building, skyscraper, home or any architecture is built. To choose to make it sustainable and as green as possible, is an important choice that we, as designers and architects are able to make. This choice reflects on the future path our descendants are going to walk on. It is highly important that we realize the effects of our actions today.

Green architecture, or green design, is an approach to building that minimizes harmful effects on human health and the environment. The "green" architect or designer attempts to safeguard air, water, and earth by choosing eco-friendly building materials and construction practices.
Green building design challenges designers and architects to go beyond our perspectives, to improve building performances and minimize the environmental impact.

To implement a green roof or a vertical green garden on the building is not enough to call it a green architecture. Designers and architects have to ask themselves, what can the building give back to the community it is put into. Or how can the people and the surrounding environment benefit from it. Maybe we can also think of the building as a living thing that can co-exist with the people; and like us, can give something back

to the nature. The process is much more complicated and it all begins in the construction of the building itself. Things like dredging waterways, strict sourcing of building materials, recycling concrete, and using rail and water to deliver materials are just one of the elements of creating a green architecture.

Figure 1. Bosco Verticale – Milano

The connection between living spaces – indoor and outdoor spaces is highly important for human beings, although we might not realize it. The reason architects remade some of the skyscrapers terraces, was to make this exact connection.

As John Hitchcox said: " Gardens and outdoor space encourage conscious living and being more aware of the wider environment around you." To reflect about this sentence; it is exactly what green and sustainable architecture is trying to achieve. Once we understand this aspect, not only educated architects and designers, but all people, because at the end we all share one home, that is called earth and it would be a shame to neglect it.

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

Figure 3. H3 House, Mar Azul, Argentina

3. RAPID URBANIZATION

Rapid urbanization generally refers to quick shift of population from rural to urban areas due to many different reasons.

Figure 4. Rapid urbanization

One of these reasons is globalization, climate changes and consequently rise of sea level. Words such as globalization and climate change had been surrounding us for several years now. Their meaning is more important than we think. Because of these two definitions, the rise of sea level is becoming a big problem that is facing our future life. Especially for the population living in the cities next to the sea, or the cities that are aligned with the sea water level, for example Miami. It is now a known fact that great part of the population will be forced to move towards cities that are inside the country. The level of sea water will rise and consequently flood many peoples homes.

We may not realize this now, but it might be too late when the problem actually occurs. That is why the acknowledgment is important. And it is up to us, as designers and architects to start to think about providing solutions.

One of the ideas is to build so called smart cities. A smart city is a framework, predominantly composed of Information and Communication Technologies (ICT), to develop, deploy and promote sustainable development practices to address growing urbanization challenges.

Figure 5. Smart city

Urbanization is non-ending phenomenon. Today, 54% of people worldwide live in cities, a proportion that's expected to reach 66% by 20501. Combined with the overall population growth, urbanization will add another 2.5 billion people to cities over the next three decades. Environmental, social and economic sustainability is a must to keep pace with this rapid expansion.

Figure 6. European Green Capital 2016

Figure 7. Ljubljana

5. CONCLUSIONS

Thankfully, more than 190 countries have agreed upon goals for sustainable growth - smart city technology is paramount to success and meeting these goals. Successful smart cities of the future will combine the best aspects of technology infrastructure while making the most of the growing potential of 'collaborative technologies', technologies that enable greater collaboration between urban communities.

It is our mission to achieve positive sustainable city growth around the world by spreading the word and talking about these problems with younger generations. Because we are our future and we have to start building it today.

REFERENCES:

Piciga D. (2012). Slovenia as a Model of Integral, Low – Carbon Economy and Society? In: Hrast, A., Mulej, M. & Kojc, S(eds.), 7th IRDO International Conference – Social Responsibility and Current Challenges 2012, Maribor, Slovenia, March 2012. Maribor

IRDO: http://www.irdo.si/skupni-cd/cdji/cd-irdo-2014/referati/d-piciga.pdf
(Accessed: 12 Januar 2017.)

Piciga, D., Shieffer, a. & R. Lessem (eds.). (2016). Integral Green Slovenia. London and New York. Routledge.

Rožmanec Matičič, N., Hajdu, T., Rožmanec, J. (2016). Going-GreenGlobal. Trzin. Faculty of Design, Associated Member of University of Primorska

Bridges between Design and Management (2014). 3rd International Scientific Conference A.L.I.C.E. Ljubljana: Faculty of Design.

BIO CLIMATIC PRINCIPLES OF THE ORIENTAL-TYPE TOWNHOUSE IN KOSOVO

-

Dr.Techn. Bujar Demjaha
Kosovo

1. INTRODUCTION

The experience of ancient masters transferred from generation to generation has resulted in special achievements in the domain of architecture. These results are often neglected by young modern architects who have looked at great world architects by ignoring the environment and its direct influence on architectural conceptualization and materialization.

The selected case study for the Old Town House in Pristina, registered as the "Residential Complex" house at "Ethnological Museum" is a copy that sublimates the knowledge and experience of the generations of masters who managed to build a house that uses remarkably what was found around and besides hands: the sun, nature, river, mountain, materials taken nearby and their own minds and experience to put it all together in a unique functional organism.

"Bioclimatic architecture is the basic parallel name of self-sustaining architecture; while the acceptable solutions of self-sustaining architecture can come through science (theory and experiment), so far the bioclimatic approach at the start requires analogies with examples of living things in nature using already acquired experiences of traditional (autochthonous) architecture". Old masters did not have scientific knowledge that construction engineers have today and neither the technology has been developed. But there were tendencies which we can consider the concept of racialization and energy efficiency of the then architecture was the first step towards the idea of sustainable architectural design.

Global warming and the global financial crisis are two very important and acute issues that worry the world and impact directly on architecture. "Energy efficiency and rational use of energy resources are the most important tasks of long-term energy policy. For the construction and exploitation of buildings, approximately half the total primary energy consumption is required, and increasing attention to the energy efficiency of this sector is given increasing attention."
In addition to saving energy, the proper choice of materials for the purpose of less polluting the environment is also very important for the future of architecture and its materialization. The way of selecting materials that do not devastate nature and have the possibility of recycling is one of the goals of this paper.

The subject of the research of this scientific paper is the proclamation of an Archetonically Defined Space (ADS) as a framework of life, as well as in its location, and its adaptation to the environment both to the natural and the social, and to man. Functional adjustment, through the example of a strait house in Pristina, should be connected with the basic principles of energy efficiency of architectural facilities, possible measures for improving energy efficiency and general recommendations for increasing the energy efficiency of existing and buildings of cultural heritage.

The ADS concept through strong relations between Environment, Man, Border and Perspective gives the best answer to the above topic by treating a comprehensive architectural conceptualization and materialization linking the past, the present and the future of the building. Time contextuality with its structure, function, location, environment and culture of man as an individual but also as a social being indicates not the fact of compulsory Holistic approach. Such an approach, by treating each question in itself, but also in the context of a whole in old houses, finds much more rational and efficient solutions that can help architects in the architectural design of buildings.

The purpose and basic goal of this research is to determine through the town house in Prishtina that, the traditional dwelling architecture in Kosovo sublimates the knowledge and experience of many generations of masters who managed to build a house that uses remarkable things found around and beside the hand: the sun, the nature, the river, the mountain, the materials taken nearby and their own wisdom and experience to put it all together in one unique functional organism.

Defining a different approach in the conceptualization and materialization of a town house of an oriental type and its surroundings can contribute to the development of the architecture from a scientific point of view by applying the experiences and principles of ancient masters.

2. ENVIRONMENT

2.1. NATURAL ENVIRONMENT

2.1.1. GEOGRAPHICAL POSITION

Kosovo is the youngest country in Europe that emerged from the former Yugoslavia after the armed conflict in 1999 and the declaration of independence on February 17th, 2008. It is located in South-East Europe coordinates: North-latitude 43 ° 16 ', South-latitude 41 ° 53', 21 ° East length 16 ', West 19 ° 59', area: total 10,908 km² and with Pristina Capital City 42 ° 40 ° 10 N 21 E / 42,667, 21,167 (Government of the Republic of Kosovo, Pristina, 2013). Kosovo is bounded with Albania to the southwest and with three countries that also derived from the former Yugoslavia - Montenegro to the Northwest, Serbia to the north and the Northeast and Macedonia to the Southeast.

Pristina is the capital city and is located in the center of Kosovo in the coordinates 42 ° 39'49.55 "N 21 ° 9'51.22" E, with an altitude of 600 meters in altitude.

The number of citizens in the Pristina is controversial. The census shows that the Municipality of Pristina has 198,897 inhabitants while the study of the World Bank indicates 471,630 inhabitants. But, "based on the data for the use of drinking water, the volume of urban waste generated in Pristina, then the number of hours of electricity, to the registers of property

taxes, etc., shows that the Municipality of Pristina has about 450 thousand inhabitants."

2.1.2. GEOMORPHOLOGY

Pristina extends into a valley that can be considered as the beginning of the Kosovska dolina, surrounded by hills on three sides. Developed morphology with mild hills gives the town a dynamic look that has imposed amphitheatic development from the center towards the nearby hills. Two rivers of Prishtevka and Velusha gave life to public areas in Old Prishtina and family houses with large courtyards in Old Prishtina.

2.1.3. CLIMATE

In Kosovo, the continental climate prevails with warm summers and cold winters and similar climate prevails in Pristina. In the southern part of Kosovo, the effects of the Mediterranean climate are felt while the western part, besides Albanian Alps, also finds the influence of the Alpine climate. The average temperatures range from + 30 ° C to -10 ° C in winter periods. Depending on the individual differences in altitudes of individual areas, there are temperature differences in precipitation and in Pristina there is a similar climate. "The climate is continental, with cold winter and warm summer, with an average precipitation of about 600 mm per year."

2.2. SOCIAL ENVIRONMENT

2.2.1. HISTORY OF PRISTINA

Several archaeological sites in the Pristina region confirm the existence of the dwelling since prehistoric times. In the time of the Roman Empire, Pristina was a crossroads of significant corridors connecting Central with the South, South East and Southwest Europe. As with other urban centers of the Roman Empire, Pristina had developed urban infrastructure, water supply system, sewage system, road infrastructure, squares, monuments, theater, basilics, etc. During the reign of the Ottoman Empire, Evelya Celebi confirmed that in 1660, "The city has 2060 houses built of hard ceramic material. These are large houses with yards and vineyards and fruit trees." Pristina records a considerable development in the 19th century when it had 12,000 inhabitants which was similar with the inhabitants of other cities in the region. Developments continued in the second half of the 19th century, regardless of the fire or the struggle against the Ottoman Empire (1877-78). The end of the XIX century is remembered by a special development, where the influx of European culture arises, mainly from Italy and Austria. Railway, printing and other social and economic activities made Pristina a significant city in Kosovo and in the region, and at the beginning of the 20th century. During the conflicts in 1998-1999, Pristina was partially destroyed, but in a few years this city has become the largest "building site" on the Balkan Peninsula. This trend of construction continues though not in the same intensity..

2.2.2. HISTORICAL SIGNIFICANCE OF CULTURAL HERITAGE WITHIN THE "HISTORICAL CENTER" IN PRISHTINA

The rapid and uncontrolled urban development in this part of Pristina has had a significant impact on the destruction of the heritage and what has remained largely devastated. More or less what remains from this cultural heritage is located in the "Historic Center" of the Historic Zone of Pristina. Three mosques, the Mosque of Fatih Mehmeda II, Jashar Pasha mosque and Carshi mosque, with lushness and dimensions, especially its minarets, dominate the Old city. "Several protected monuments of different sight - three mosques, two Turkish baths (Hammams), a public fountain (shadervan), a clock tower, a representative building (the former Academy of Sciences and Arts of Kosovo) and a monumental building of the Turkish barracks (now the Kosovo Museum) define the historical center of Pristina developed for several centuries in the spirit of Ottoman space planning."

2.2.3. SOCIAL AND ECONOMIC RELATIONS

According to the rating institutions, the dominant age group in Kosovo is 15-64 (60%) and 0-14 years (33%). Based on this data, Kosovo has the youngest population in Europe. The demographic and social changes that have taken place in Kosovo in recent years are thought to have contributed to the weakening of traditional familial relationships. The distribution or separation of family households is as follows: 18.5%, family households with more than 7 members, 34.9% are with 5-6 members, 42.4% are with 2-4 members and the rest of 4.2% are only one lonely member.

The unemployment rate in Kosovo is very high, according to many studies carried out to date about 45% while Pristina unemployment makes up 7% of Kosovo's unemployment. There is a high demand for employment by unskilled workers (60% to 69%) who only completed secondary education. This still makes the situation even worse over a longer period of time. The age group of 25-30 years makes about 60% of the unemployed in Pristina Municipality.

Pristina as the capital is also the main administrative center of Kosovo where the state administration is the largest "employer" in the city. But besides, Pristina remains the strongest business center in Kosovo, with 24.6% of registered businesses. "In 2011, the Municipality of Pristina had about 28,000 registered businesses, which shows a common sense of entrepreneurship, of which 2,545 in rural areas, or only 10%."

In the post-war period Kosovo was slow and inefficient in the process of privatizing social enterprises and as a result of this delay, Pristina faced the phenomenon of de-industrialization. Most of the extensions in Pristina experienced degradation by losing the market, reducing employment or experiencing total collapse or bankruptcy. Currently, a small number of companies in the manufacturing sector (9.1% to 7.1%) are present in registered businesses. The share of agriculture is

1.2%, which is low, taking into account the forest and rural potential and the land owned by the municipality. Recently there has been a shift in the organization of rural tourism. This will affect the improvement or repair of rural infrastructure in general.

Diverse consciousness

Religion as a system of ideas and feelings that tries to explain the existence of the world as a supernatural and irrational is an inevitable factor of today's society of everywhere in the world. The Kosovo Albanian population is mostly Muslim (94.7%) and a very small percentage of Catholics.

The Serb population is most orthodox and reaches 3.9% of the total number of religious people. The disadvantage of the former Yugoslavia towards religion has led several generations to a moral crisis and a confusing relationship with religion. For the last decades in Kosovo, there have been quite large attempts to "recruit" new to "true faiths" which has led to extreme forms of religion with negative consequences for society. One such experience is considered to be events related to the ISIS organization engaging in the 'Islamic State' in Iraq and Syria and acting through militant groups based on the Sharia law. Similar tendencies are found in other modes of religion in Kosovo.

Moral as a form of social consciousness is the backbone of sustainable development in long-term paths. The Kosovar Albanian population is often combined with this form of consciousness, and with religion it has succeeded in building a local system of understanding-based rules or norms that have been able to regulate the relations of man as an individual with society. The pursuit of independence has resulted in positive relationships between the individual and the other people, with which they adhere, regardless of sanctions. The culmination of such a mental state led to the direct armed confrontation of the Jashari family in Prekaz, where on March 5, 1998, they faced numerous police forces, wounding everyone for the ideal of independence.

3. MEN

3.1. DEFINING THE HUMAN AREA: SOCIAL AND PHILOSOPHICAL ASPECTS

To ensure a favorable environment for rest, stay, leisure or work in a residential building, it is necessary to meet certain technical, sanitary and aesthetic requirements. The Kosovar families were often diverse and big by the number, age and gender of its members, and besides them there are guests who can be of different origins and backgrounds making the situation more complicated in terms of their accommodation during a short visit or for a few days. It is therefore necessary to create all the conditions so that everyone can feel comfortable in it and with pleasure, regardless of which group they belong to.

Living is an initial function that exists from the very existence of the human being. This fundamental human function is a complex and synergistic set of impacts on the common development of the family as a whole and the personality of an individual is directly related to a man of varying age and closely related to the environment in the narrower and wider sense. "Housing" that can be considered the same as "life" consists of all the components that life requires: sleep, rest, food storage and preparation, socializing and leisure, work, etc. All the necessary housing functions are the same, but in most cases, each family has its own specific requirements that depend on a variety of factors. Affordable living conditions in a housing house affect the positive development of personality, not just children but also young adults and adults. Good living conditions directly affect a better and better quality of life based on basic standards for comfortable accommodation and a healthy environment.

3.2. DEFINITION OF HUMAN AREA: TECHNICAL ASPECT

3.2.1. GENERAL CHARACTERISTICS OF THE ORIENTAL TYPE TOWN HOUSE IN KOSOVO

The content of an oriental type of town house depended much on the social position and economic status of the family that lived in it. Unfortunately, a small number of families had the opportunity to have enough space to accommodate all the necessary functions for a quality life. Rich families have indulged themselves in having several buildings with ripped Content on their estate: family house, guest house, cattle building, etc. Depending on the size of the house and its typology, the oriental type town in Kosovo had as many room as it was necessary to have married couples and a couple of children's rooms. The bedrooms for married couples had a bath - "hamamxhik" (place for washing the body).

A favorable orientation with good insulation was a feature of the oriental type house. Wherever possible, sunken hills with a small slope were selected, allowing enough sunshine to each house. The interior rooms are also positioned in a favorable position on the basis of the house. Common living rooms are often placed on the floor due to sunbathing and visuals. The desire for fresh air was taken into account from the site's location phase. For the construction of houses, it was aimed at "healthy" locations with good sunshine, without moisture where there was enough natural natural air flow. Each room had a window that allowed controlled ventilation.

The oriental-type townhouse in winter was almost always warmed with wood. Taking into account the sufficient thickness of the walls (over 50 cm) and the good insulation characterstics of the material used (unbleached clay), it required very little wood to heat the house. In the richer houses, there were cases where the furnace was built between two rooms in order to heat the two rooms with one fireplace from the same place.

3.2.2. COMPOSITION UNITS AND FUNCTIONAL ELEMENTS OF A CITY-HOUSE ORIENTAL TYPE IN KOSOVO

Composite units and functional elements together create the conditions for creating a home for housing. The specific requirements and way of life in the 18th and 19th centuries in this region often required a complex approach to functional problem solving in several buildings, and the buildings themselves had original architectural elements. In that regard, it should be noted:
- Guest house
- Auxiliary building in the yard as standing with a tribe, storage, chateau, kitchen ("mutfak")
- Porch
- Balcony
- Oda (living room, dining, sleeping, reception guests, etc.)
- Outside gate
- Doors
- Windows
- Ceilings
- Chimney
- Flanik (pantry)

3.2.3. DEVELOPMENT OF BIOCLIMATIC PRINCIPLES IN ARCHITECTURAL DESIGN

The bioclimatic architececture has evolved from when a man exists, though not in today's approach. Ancient masters carefully selected locations for settlements and built up always leaning on the experience with nature and respecting its legality. In modern times, all schools of architecture in the former Yugoslavia have made significant designs in their plans and programs in the context of nature, climate, sunshine, thermal and sound isolation, etc. Even in the 80's, then young architect Vladimir Lovric from Belgrade published several projects based on Solar Energy and its use in the Nas Stan magazine. In the area of former Yugoslavia, architects Hadrovic, Pucar, etc. also made a very significant contribution. improving the issues of sustainable architecture, green architecture, low energy houses, smart homes, energy efficiency and renewable energies, recyclable building materials, etc. Today it is inconceivable to design and plan in the world without taking into consideration the above mantioned principles.

3.3. DEFINITION AREA OF MAN: PSYCHOLOGICAL-AESTHETIC

The most important component in terms of quality of life for man is the psychological-aesthetic aspect. A man spends most of his time at home anywhere. This fact points to the importance of a house that always adapts to the needs of man in the process of transformation, striving to transform a "house" in "home" and "building" in the "hearth". A traditional house tended to maximize the benefits, taking into account all the components that were then there. Functional connection of rooms, suitable temperatures during flights and winters, sunny rooms, extraordinary views, attractive façades and "warm" interiors were the characteristics of a city house

of oriental type in Kosovo. The unavoidable technical requirements (Chapter 3.2) are firmly connected with the subtle integration of a house with urban landscape, location and yard, but also with intimate measurements and prophesities of the building, its rooms and furniture that are adapted to all ages, which made the old house a psychologically comfortable and aesthetically appealing to all.

4. BOUNDARIES

The Ethnological Museum building, which according to typology is a house of oriental type, is located in the complex of several architectural objects registered as "Residential complex" Emin Gjiku "- Ethnological Museum", and it was introduced under the protection of 1955 and today it is kept under the unique number 003087. "Ensemble 'Emin Điku' was built at the beginning of the 19th century and was owned by the famous Đinoli family. Today, the Emin Điku complex is owned by the Kosovo Museum, which has access to the ethnographic collection of domestic and foreign tourists, and there are various programs and services for all visitors. The nickname Emin Gjinolija was a "little man", or in Turkish Emingjik, which was later transformed into Emin Gjik, from where the complex got its name."

The current energy situation in Kosovo and wider, technological development and scientific knowledge about bioclimatic architecture can not be compared. But, on the other hand, the mistake would be biger if the knowledge gathered by centuries of old masters is ignored with the approach of "everything that is old (and domestic) doesn't worth it". If this house is carefully analyzed (and not only this), we can discover some of the bioclimatic elements that great global and domestic experts consider unavoidable in the approach to sustainable planning and design.

4.1. LOCATION

Spontaneous development of the city without dilemma was based on the topography of the terrain, on the flow of two rivers (Prishtevka and Velusha) and on two main east-west arteries known as "divanjol" and north-south (Figure 1).

The residential complex "Emin gjiku" is located in the northeast of the city center, more precise in the center of the city of Prishtina with the coordinates 42 ° 40'7.28 "N 21 ° 10'4.55" E and above sea level 598.32 m.

The location makes it more attractive and the fact that this complex is located near the Sultan Mosque of Mehmet Fatih, which is considered the most popular monument in Pristina. The entire complex consists of a yard that is divided into two parts, one of which is at the entrance, and it is built a stable and one stone building. In the courtyard there is a family house and a house of guests, which currently serves as an ethnological museum. Thiscomplex is surrounded by high walls up to 2 meters, 55 cm thick, built of baked clay and

wooden beams. Despite the many changes that the complex has suffered for various reasons "as a whole, the "Emin Gjiku"complex remains one of the best examples of the city home of the beginning of the 19th century.

The natural environment, taking into account natural resources, solar radiation, water, biomass and traditional energy sources, is an initial issue in the choice of location. In correlation with the social environment, with socio-economic relations and types of consciousness, they give a clear picture in the selection location criteria.
Looking at the climate in Pristina and the location itself, we can find that this house and other housing facilities have a good location as well.

- Favorable ambient temperatures
- No strong winds
- Sufficient sun radiation
- Clean and unpolluted environment

The selected location of the house Emin Gjiku makes even more favorable its position in relation to the Taukbashqe Park and the Forest of Grmija, which enables the flow of clean air. This facility fits perfectly into the surrounding terrain, which is one of the most important elements of bioclimatic planning. Vegetation in a wider context (Taukbashqe Park and the Forest of Grmija), in the context of the yard, is an important element in the conceptualization of this house. The selection of vegetation is oriented in high vegetation, which besides the decorative function they contribute in local microclimate.
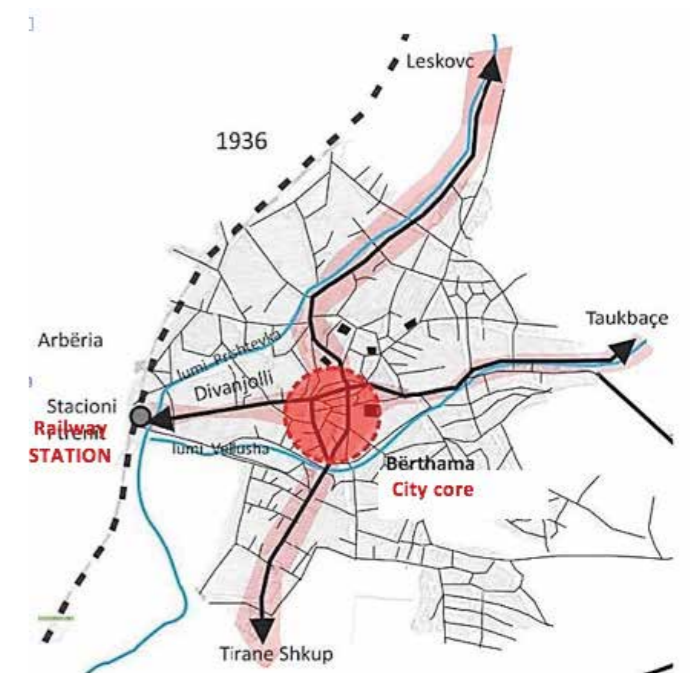

Figure 1. The main development axes of Pristina and the emergence of the historical core.
Source: ONUPS (http://onupks.com/wp-content/uploads/2012/07/harta_vh1.jpg)

4.2. CLASIFICATION OF CONCEPTUALIZATION AND MATERIALIZATION OF A CITY-HOUSE

Big socio-economic and cultural differences and the geographical and climatic differences in the relatively small territory of Kosovo make it difficult to precisely classify a town-type house of oriental type in Kosovo. A correct systematization of a city house type in Kosovo can be considered as a study by two architects Emin Riza and Njazi Haliti "The Town House of the Oriental type of Kosovo from 18th -19th century" which presents the typology of the house on the diagram shown in Figure 1.
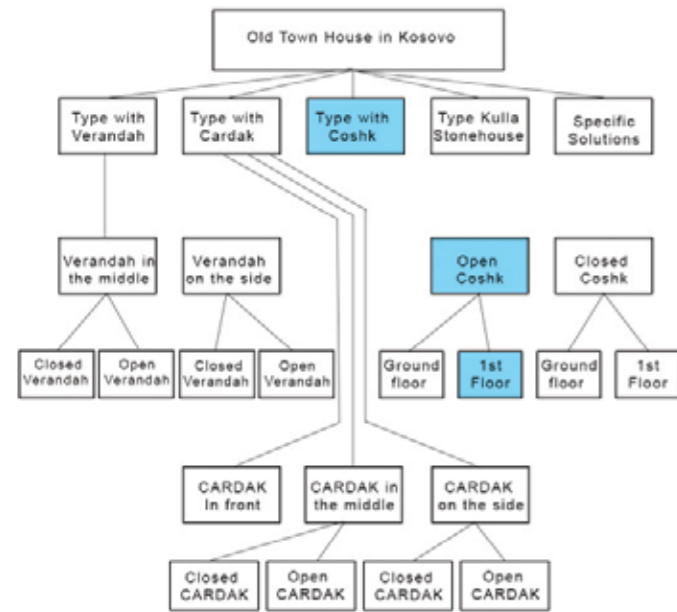

*Figure 2. Dijagram tipologije starogradske kuce na Kosocu
Izvor: Riza E. i Haliti N. "Starogradska kuca Kosova 18.-19. stolje-ca", doteran od autora*

Traditional architecture in Kosovo was mainly built with local materials: stone, wood, unpainted clay, lime while in small quantities metal, glass and porcelain. The stone was used more in capital buildings like Mosque, Church, and so on. Stone is the updok of the residential architecture of stone is played mainly for walls and for the construction of streets and paths. Whenever possible, at least the foundations and wall clogs are made of stone. In the residential architecture of a stone house we find ourselves in the Dukagjini Valley while in the southern parts of Kosovo we find houses covered with stone slabs. The wood was used for the roof structure and curving of the walls in the form of "hatula". Wood was widely used for wooden joinery (doors and windows) and for interior (floors and ceilings) and for furniture. Untreated clay was used either in the natural state in the form of "shells" and plaster or prepared and later baked in the form of bricks and in particular in the form of tiles - "ceramides".
Metal was used more for hardware and safety grids. The glass was mainly used for windows and some way for decorative chandeliers. Imported porcelain was used very rarely in very rich houses for central heating boiler.

4.3. SPATIAL-DESIGN CONCEPT, DESIGN AND MATERIALIZATION OF A CITY HOUSE ORIENTAL TYPE

Proper orientation to the sides of the world is important criteria we find in buildings built by old autochthonous masters in other regions as well. In this case, the South orientation of the main room of the residence with a slight deviation and verandah (Coshkua) enables excellent insolation and visions towards the garden. On the other hand, a flexible approach to the transformations of the building proves that the issue of orientation has not been impeded in later situations. The loss of the kitchen during the division of the house and the building of new kitchen on the north side of the house indicates the importance of orienation aplied from the old masters.

The old building of houses Emin Gjiku in Pristina belongs to the type of "two-storey house with opened 'Coshk'" (Figure 2). In the present situation, it is clear that the building suffered considerable changes. In spite of the changes in the houses, it is still statically stable but also architectonic original, bearing in itself significant values of the architectural autocon heritage. According to its architectural characteristics, aesthetic and technical details, materials and technology were built to appear at the beginning of the 19th century. The two-story building with a four-water ridge roof covered with traditional tiles "ceramide", with deep crests and steep slope, make this architectural object special. Windows with two covers on the windows (one opens up and the other descends downwards) seems to have had the function of glazed windows that were probably built later. Domonates a coherent façade with intimate measurements and natural materials (wood, clay and stone).

The two storey house has 6 rooms and a "chaos" (veranda). On the ground floor there is a kitchen with a storage room, while on the first floor of the main room and hamadžika bathroom "hamamgjik", hall "gjysynti" and a corridor. An exquisite veranda is a conection between the garden and the lving-room and house (Figures 2 and 3).

FIRST FLOOR
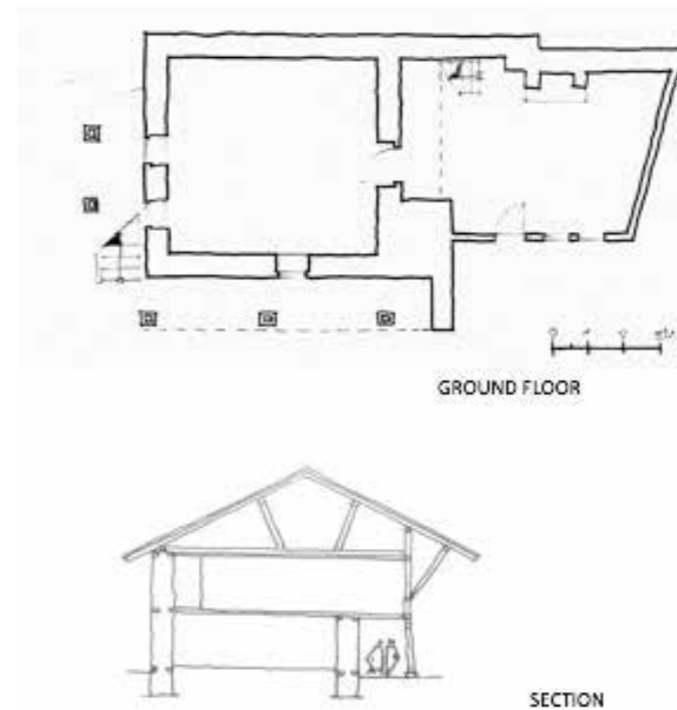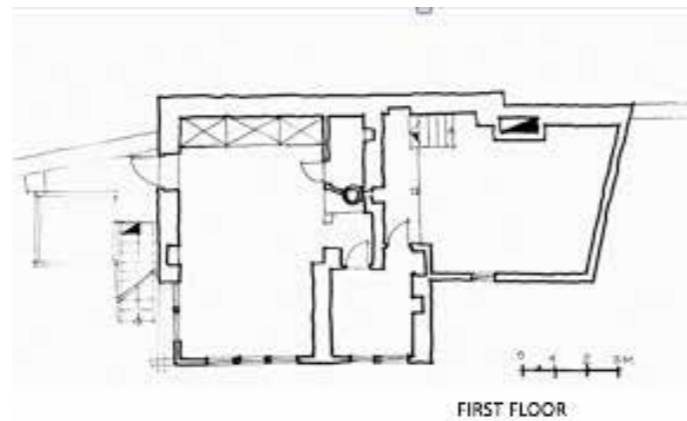

GROUND FLOOR

SECTION

*Figure 3. Old Town House "Emin Gjiku" in Pristina
Source: Author*

After the division of the family, the houses lost their left wing, which is confirmed by the partition wall next to the house . Consequently the house lost its kitchen, which was later added in an original way with thinner walls and a one-edge roof. This added room, located on the northern part of the building, has a large built-in fireplace for the kitchen needs. It has direct connection from the outside, a direct connection to a large food storage room, and through the stairs the kitchen has a connection with the rooms to stay on the floor. Stairs and gallery in the kitchen give one pleasant feeling of residential architecture.

*Figure 4. The view of the old house "Emin Gjiku" in Pristina
Source: Author*

Harmonized urban landscape (residential buildings, mosques, hamam, clock tower, etc.) is still delighting. The minaret as dominant and surrounding buildings P + 2 serves as a landmark in a perfectly harmonious urban landscape where is located the house Emin Điku.

*Figure 5. The view of the old house "Emin Gjiku" in Pristina
Source: Author*

4.3. ENERGY LOSSES AND WATER VAPOR TRANSPORT THROUGH ADS PERIPHERAL SURFACES

In the essential issue of the ADS - the materialization of its bounderies can provide the conditions for a pleasant stay of man, based on their experience, the old masters gave quite favorable solutions. In the given case, the calculation of heat losses through walls and roof meets the required requirements (Table 1).
"Air humidity is matter and an integral part of the air, both inside the ADS and the air of the environment." Having on consideration this fact, it is possible to decide on the importance of humidity for the benefit of the interior and for the age of the envelope of building (walls, decks and floors). As with thermal laws, it is also about humidity-it tends to balance humidity in the air. Earthen brick "Cerpic", as the most common building material used for masonry construction, is distinguished by two main characteristics: it is lightly damply permeable (which is positive) and very sensitive to humidity.

External wall					
Zone III	Wall Layers	Thickness (cm)	Thickness (m)	λ19	Resistance
$K_{max}=_{req}0,80$ W/m²K					1/Λ
ai				8	0.13
	Mortar (clay)	5	0.05	0.41	0.12
	Earthen brick "Cerpic"	50	0.5	0.41	1.22
	Mortar (clay)	5	0.05	0.41	0.12
ae				23	0.04
				Σ	1.63
Calculation	Formula: $1/K=1/_{ai}+Σ(tn/λn)+1/_{ae}$ $1/K = 1.63$ $K= 0.61 < K_{max}= 0.80$				
Conclusion	Wall meets thermal requirements				

Attic construction					
Zone III	Layers of attic construction	Thickness (cm)	Thickness (m)	λ20	Resistance
$K_e=_m=..0.70$ W/m/K					t/λ
ai				8	0.13
	Clay ("karatavan")	40	0.4	0.41	0.98
	Dagger floor	2.5	0.025	0.14	0.18
	Decorative wooden layer	2.5	0.025	0.14	0.18
ae				23	0.04
				Σ	1.50

Calculation	Formula: $1/K=1/ai+\Sigma(tn/\lambda n)+1/ae$ $1/K = 1,5$ $K= 0.66 < K_{max}= 0.70$
Conclusion	**Attic meets thermal requirements**

Table 1. Calculation of the heat transfer coefficient of the enclosure
Source: Author

5. HEATING OF THE TOWNHOUSE IN PRISHTINA

As in the whole region and in Kosovo, wood was the main heating unit. Controlled consumption in the capacity constraint for natural regeneration of forests has maintained a natural balance. In old-fashioned houses it was constantly trying to reduce the number of heating stoves heating from one point two rooms.

The heating system installed between two rooms and heating both simultaneously from the same built furnace, besides functional and aesthetic reasons, contains the element of rationalization and energy saving. Its installation in this position contributes to better efficiency in heating, and in the case of Emin's house, we find such an approach where the room for the bathroom and the bathroom are heated from one oven.

Such a solution is more efficient because it consumed less wood, but it was easier to use and maintain. In some cases, we also find an open flame fireplace with a dual function, heating the room and warming the water or the like. In the concrete case, in the kitchen, we have such an approach where the fireplace ("Oxhak") served for the preparation of food, but of course for the heating of the room also.

6. ADAPTING TO OUTSIDE TEMPERATURES BY CHANGING THE PLACE OF RESIDENCE

Adapting to outside temperatures by changing the place (room) was a very practical way for a pleasant stay in old houses and in the case of the townhouse of oriental type, the person changed his place of residence during the day (morning, afternoon and evening), but also in the season (spring, autumn and winter).

In this direction, the functional architectural element "chaos" plays a very important role, enabling it to stay in an open air during the sparse days. Movement of the stay was also happening towards the cohort which was located in the ground plan from the north side. Such a strategy for a more comfortable and cheerful stay in the apartment is also suggested by contemporary literature.

7. NATURAL MATERIALS FOR CONSTRUCTION USED FOR THE CONSTRUCTION AND FURNITURE OF THE TOWN HOUSE

Natural material for construction is considered to be material that can be used in unprocessed form, which is directly taken from its natural environment. Without a doubt, the main reason for the use of local natural materials for the construction of old buildings at that time was imposed due to the underdeveloped technology of materials construction. The old master was forced to use material that was at hand. Even sometimes some mateials installed on old buildings (in this case as well) it can be concluded that the old masters of old houses were maximally rational in selecting the type of material. The town house of oriental type in Pristina is built of natural local materials: stone, wood, unbaked clay, lime and in small quantities glass and metal.

CONCLUSION

Humanity needs to abandon irrational energy consumption and begin to approach more rationally in the future according to energy consumption. The world needs to turn to renewable clean energy sources with a completely new philosophy towards the environment. Planning and designing in the future must have a bioclimatic rational approach both in production and in energy consumption with the goal of development in the function of protecting existing potentials. With the construction of new architectural facilities, it is increasingly necessary to rely on the experiences of the national masters and less on expensive technologies and materials. "It remains a big question whether the construction of such facilities (even if it is the privilege of the richest ones) will unravel the global energy demand on Earth, and thus, contribute to the preservation of the natural environment"

In the case of the Municipal House of Oriental type in Kosovo, a person has an active role in terms of contribution in exploitation. To better live and save energy, the family moved throughout the day and in seasons, living in various parts of the same house. During the big festivities, the stay took place in open spaces (Čošk), even in the northern parts of the house.

In the Old Townhouse in Prishtina we have principles of bioclimatic architecture:
• Insisting on a location with a southern exposition
• Diligence of the horizontal and vertical plan in the part of the southern orientation
• Developing horizontal plans that the one above has perches (docks) in relation to the plan below, including the roof that protects the facade of the sun in the summer and precipitation in autumn and winter
• Mobility in the house depending on outside temperatures
• Choosing a favorable terrain configuration
• Use of vegetation for the purpose of balancing insolation with chips that fly the shadow while the sun's rays pass through the winter
• Specific (Concentrated) heating mode,
• Weighing the use of walls and ceilings with favorable thermal insulation characteristics
• The used building is natural and recyclable, which does not pollute the environment

The above principles found in this house prove the tendency of old masters to reconcile in the conceptualization and materialization of construction.
Factors studied in this scientific work - a man, a suitable location, configuration, orientation, vegetation, relations between buildings, heating, thermal insulation characteristics of the envelope of the house are the old residential house "Emin Gjiku" in Prishtina as a building favorable from the aspect of bioclimatic demands.

REFERENCES:

Hadrović A.: Arhitektonska fizika-Second edition, Faculty of Architecture in Sarajevu, Sarajevo, 2010

Hadrović A.: Hadre, evolucija bioklimatske arhitekture, Faculty of Architecture in Sarajevu, Sarajevo, 2009

Hadrović, A.: Bioklimatska Arhitektura-Traženje puta za raj, Faculty of Architecture in Sarajevu, Sarajevo, 2008

Pucar M. is ostali: Bioklimatsko planiranje i projektovanje, Svet, Beograd, 1994

Riza E. I Haliti N.: Starogradska kuca 18.-19. Vijeka na Kosovu, Academy of Science and Art of Kosovo, Pristina, 2006

Bošnjačka riječ, Br.13-16, 2009

Ministry of Health, Sectoral Healthcare Strategy 2010-2014, Prishtina, 2009

Municipality of Prishtina: Municipal Development Plan 2012-2022, 2013

Support to the Promotion of Cultural Diversity (Council of Europe Project): Conservation Basics for the 'Historical Center', Prishtina, 2012

Municipality of Prishtina: General Urban Plan 2000, Priština, 1987

Institute for the Protection of Monuments of Kosovo: Survey on Demographic, Social and Reproductive Health in Kosovo -2009, Pristina, 2009

Ministry of Culture, Youth and Sports, Cultural Heritage Databases, http://dtk.rks-gov.net/tkk_objekti_sr.aspx?id=8943, Access April 2018

Ministry of Culture, Youth and Sports, "Cultural Heritage Databases", http://dtk.rks-gov.net/tkk_objekti_sr.aspx?id=8943, April April 2018

FUNCTIONAL TEXTILES FOR INTERIOR IN SUSTAINABLE CITIES

–

Assoc. Prof. CELCAR Damjana PhD

Faculty of Design,
Associated member of University of Primorska,
Trzin, Slovenia
damjana.celcar@fd.si

Lect. PILAR Tanja MSc

Maori d.o.o.,
Trzin, Slovenia

Abstract – Nowadays, next to the aesthetic and practical properties the textiles used for interior design and public institutions are expected to demonstrate special functional properties as well as environmental human-friendliness. The paper presents textiles for the interior furnishing with specific (particular) functions such as fire resistance (fireproof textiles) and antimicrobial properties (antibacterial textiles), with sound absorption function (acoustic textile), and with the ability of self-cleaning and air-purifying. Their specific functional characteristics, the advantages and standards that define functional characteristics are also presented. From the aesthetic point of view, some textile collections of the Drapilux brand are also presented, as well as the possibility of individual product requests and the development of interior textiles at customer's wishes.

Keywords: Interior / Textiles / Functional / Antimicrobial / Flame Retardant / Acoustic / Self-cleaning

1. INTRODUCTION

Interior textiles are intended for furnishing living spaces and public institutions (hotels, shopping centres, government buildings, hospitals, health centres, theatres, etc.) and are, in addition to textiles for clothing, the most widely represented on the market.

Some sources classified interior textiles into bedroom textiles, furniture upholstery fabrics and textiles for decoration. In practice, interior textiles are divided according to the function they have in a space: kitchen textiles, bathroom textiles, bedroom textiles, floor textiles, wall fabrics, upholstery fabrics and window textiles. Considering the function of the textiles in space for interior furnishing are used different raw materials and construction assemblies as well as design trends depending on final purpose. In the most cases their function in the living spaces is multifunctional; it is a mix of aesthetic and different useful properties. From a functional point of view, textiles for interior have to be simple to use and maintain, durable, pleasant to the touch, environmentally and health-friendly and have the desired service life. The interior textiles should also have appropriate mechanical properties (such as strength, elasticity, resistance to dry, wet rubbing and exfoliation), they have to be lightfast and anti-static. An extremely important feature that is required for all textiles used for furnishing in the public spaces is being fireproof (JEVŠNIK, 2013, NIELSON, 2007).

Nowadays, next to the aesthetic and practical properties the textiles used for interior design and public institutions are expected to demonstrate special functional properties as well as environmental human-friendliness. The paper presents textiles for the interior furnishing with specific (particular) functions such as fire resistance (fireproof textiles) and antimicrobial properties (antibacterial textiles), with sound absorption function (acoustic textile), and with the ability of self-cleaning and air-purifying. From the aesthetic point of view, the interior textiles should correspond to the style of the rest of the furnishing in order to achieve a good and pleasant state of health. In the last section, some textile collections of the Drapilux brand are also presented for this reason, as well as the possibility of individual product requests and development of interior textiles according to customer's wishes.

2. FUNCTIONAL TEXTILES FOR INTERIOR

2.1. FLAME RETARDANT TEXTILES

The tightening of fire safety regulations also exacerbates the requirements for reducing the flammability of combustible materials such as, for example, wood, plastics, textiles, etc. The appropriate treatment of these materials with flame-retardant substances (i.e., flame retardants) is capable of inhibiting the ignition of flammable materials and / or reducing the flame spread, thus removing the risk of fire and loss of life or destruction of property. Flame retardants belong to a group of chemicals aimed at slowing down the spread of fires, especially in fast-burning materials such as, for example, textiles (LAKIĆ et al., 2014).

In commercial property, safety plays a huge role in addition to aesthetics. When selecting textiles, therefore, customers should not make any compromises when it comes to protecting their staff, patients, visitors and guests (DRAPILUX, 2018).

Comfort and safety, the two most important requirements in home textiles were first successfully combined in 1980: with flame retardant Trevira fibres and yarns. Textiles made from these fibres and yarns bear the trademark Trevira CS and are permanently flame retardant. Unlike fabrics that receive a surface treatment at a later stage, Trevira CS textiles offer long-term security. This small but decisive difference results from the chemical structure of the polyester fibre. In the shape of a comonomer – a phosphor-organic compound, where the flame retardant properties are firmly anchored in the fibre. It is not possible for external influences to affect them. For this reason materials made from these fibres and filament yarns are likewise permanently flame retardant.

This is an important argument from the ecological aspect as well. Apart from their environmentally friendly manufacture materials in Trevira CS require no additional fire protection treatment, such as normally combustible materials need. Treatments of this kind are harmful to the environment. Flame retardant Trevira fibres and filaments are, furthermore, certified to Oekotex 100 Standard. In comparative terms only very slight amounts of toxic fumes develop in the event of a fire. This is particularly important, since in a fire the danger of suffocation from smoke fumes is greater than the risk of injury from flames. Textile materials must meet the worldwide set standards for slowing down the burning. Therefore, a number of companies that produce textiles for furnishing public spaces work with various laboratories to carry out fire tests and issue test reports and relevant certificates. Table 1 presents the selection of the most important and valid test standards that are applied in determining the burning behaviour of textiles, indicating also the flammability class achievable by Trevira CS materials (TREVIRA GmbH, 2018).

Test standard Drapes, curtains, decorative fabrics, wall coverings	Flammability class	Country
DIN 4102	B1 ("Brandschacht")	Germany
EN 13772 and EN 13773	Class 1	Europe
NF P 92-503 to 92-505, 92-507	M1	France
BS 5867, 5438	Part 2, Type C	Great Britain
Upholstery fabrics, seat covers		
EN 1021	No ignition	Europe
EN 13773	Class 1	Europe
NF P 92-503 to 92-505, 92-507	M1	France
BS 5852 (crib 5, 7)	Passed (with flame retardant foam or interlayer)	Great Britain

Table 1. The selection of the most important and valid test standards that are applied in determining the burn behaviour of textiles (TREVIRA GmbH, 2018).

2.2. ANTIBACTERIAL OR ANTIMICROBIAL TEXTILES

The finishing of textiles with antimicrobial agents plays an important role in protecting against the attack of microorganisms, such as bacteria, moulds, fungi, viruses, mites, etc. Antimicrobial finish is used for clothing, decorative, medical, technical and special textiles. Its role is to protect the user from bacteria, fungi, insects and mites from aesthetic, hygienic and medical reasons, as well as to protect textiles against biodegradation due to moulding or rotting. Antimicrobial protection can completely prevent the growth of microorganisms or simply reduce the rate of bacteria growth of textiles.

This is achieved by the application of a variety of classic or modern antimicrobial agents that differ from each other in terms of chemical structure, performance, effectiveness and durability, impact on humans and the environment. Various antimicrobial agents are known, e.g. elemental silver, zinc, active copper, cobalt, chitosan, etc., which relate to textiles differently. Antimicrobial textiles are known on the market under many commercial names. Common used and well known are Trevira Bioactive fibres with silver ions, Figure 1 (TREVIRA GmbH, 2018, SIMONČIČ-TOMŠIČ, 2007, LESKOVŠEK-STANKOVIČ ELESINI, 2005).
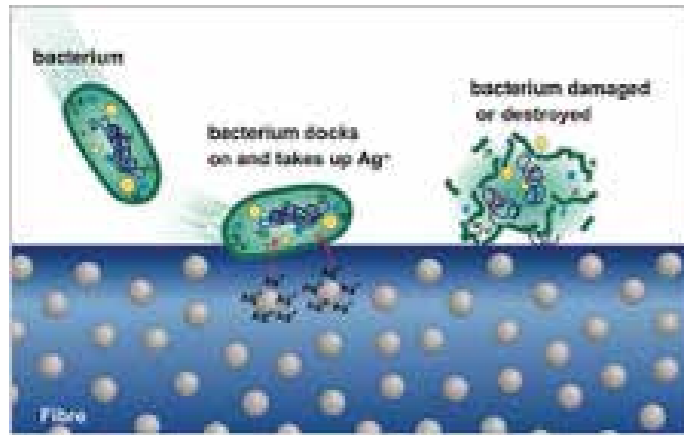
Figure 1: Trevira Bioactive fibre with silver additive in the fibre (TREVIRA GmbH, 2018)

Trevira Bioactive fibres protect textiles by inhibiting the growth of microbes in or on the fabric. The bacteria disappear and the sense of well-being remains. With Trevira Bioactive the antimicrobial agent is based on silver and is firmly anchored in the fibre polymer. This additive exercises a permanent antimicrobial effect that is neither affected by frequent washing nor wear. It functions on the surface of the fibre and does not migrate into the surrounding atmosphere. It has been shown that Trevira Bioactive causes no change to the skin flora and is therefore compatible with the skin. When bacteria come into direct contact with the textile, they are damaged by the silver ions, preventing them from multiplying (TREVIRA GmbH, 2018).

2.3. ACOUSTIC TEXTILES

In public places, there is often a high level of noise. Noise is a constant cause of stress and severely affects health and well-being. Good acoustics depends on a large number of factors, including the basic purpose of space. Room acoustics on the other hand is the science of sound and it is propagation inside closed spaces. It therefore investigates the optimal way to control this propagation. It is often achieved through absorption, selective reflection or diffusion.

The most important measure regarding the room acoustics is the reverberation time. The reverberation time depends mostly on the room volume, surface texture and items within the room, the following relationship applies: the larger the room volume, the longer the reverberation time and the more absorption there is (furniture, curtains, carpets etc.), the shorter the reverberation time.

To decrease the reverberation time in a room, absorptive materials like curtains or open-cell foam etc. should be considered. When air is flowing through these materials, the sound energy is transformed into thermal energy by the effects of friction and diffraction and as a result it absorbed. Materials which fulfil these characteristics fall into the category of porous absorbers. The no(n) dimensional value α (absorption coefficient) describes the ability of a material to absorb sound. The following applies:

α = 1: 100% absorption

α = 0: 100% reflection

In most cases, the ability to absorb sound varies greatly with frequency, α should actually be called αs (frequency-dependent absorption coefficient, developed by Wallace Clement Sabine: Alpha Sabine). This value is given for each third-octave band between 100 Hz and 5000 Hz and when measured in a reverberation chamber. In order to be able to quickly compare the absorptive capacity of different materials an average value has been established.

This is done by merging three third-octave bands to form an average octave value (αp). The six resulting octave values are then consolidated by matching these with the reference curve described in DIN EN 11654. This mathematical operation results in an average acoustical absorption value αw.

The absorptive capacity of a material can now be classified and described with one single value, as shown in Table 2. Although the average acoustical absorption coefficient αw is well known all over the world, it is still based on the European norm DIN EN ISO 11654. An additional coefficient called the NRC (noise reduction coefficient) also exists as well as the measure SAA (sound absorption average) in the US. Both of these are based on the αs values but are calculated in a slightly different way (GERRIETS, 2018, MAORI, 2015).

Class of acoustic absorption	a_w - range
A	0.90-1.00
B	0.80-0.85
C	0.60-0.75
D	0.30-0.55
E	0.15-0.25
Not classified	0.00-0.10

Table 2: Classes of acoustic absorption value aw

Notes: The absorption coefficient always depends on the measurement configuration. One material can have an absorption coefficient of w = 0.65 when hung in 100 mm distance to a wall, but the same material can have an absorption coefficient of w = 0.75 with a distance of 290 mm to the wall. When you compare two materials with one another, it is crucial to also compare the measurement setups.

2.4. SELF-CLEANING AND AIR-PURIFYING TEXTILES

Nature has already developed an elegant approach that combines chemistry and physics to create super repellent surfaces as well as self-cleaning surfaces. Lotus leaves is the best example of self-cleaning surfaces. The concept of self-cleaning textiles (Figure 2) is based on the lotus plant whose leaves are well-known for their ability to self-clean by repelling water and dirt. Basically, the lotus leaf has two levels of structure affecting this behaviour micro-scale bumps and nano-scale hair-like structures coupled with the leafs waxy chemical composition. On the basis of lotus leaf concept scientist developed a new concept self-cleaning textile the textile surface which can be cleaned itself without using any laundering action (TECHNICALTEXTILE, 2018).
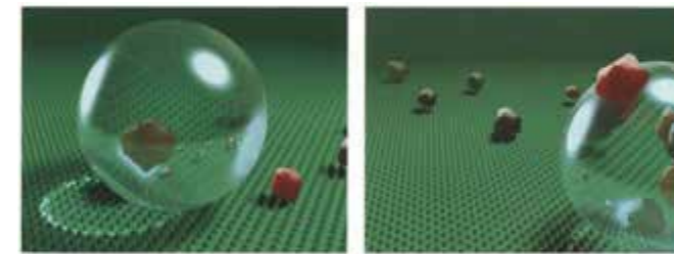

Figure 2: Self-cleaning textiles with lotus effect (SPRINGER)

Today, the textile industry has more than one technique of developing self-cleaning textiles, which can be manufactured by application of either fluorocarbons or by nanotechnology. There are basically two different types of self-cleaning coatings: Hydrophilic and Hydrophobic coats. The lotus effect is achieved with a hydrophobic coating, which have high water contact angles, above 90 degrees. The contact angle is determined by evaluating the chemical and topographical qualities of the surface. Super hydrophobic coating has a water contact angle of greater than 150 degree. The water droplets from such surfaces form a spherical shape and roll away from the surface carrying all the dirt away. Nano particles used in the coating have a large surface area to volume ratio and posses high surface energy. This makes particles have better affinity to fabrics, which ultimately makes the functional coating last longer. This has led to extensive research and growth in the use of nanotechnology. Today, there are textiles that repel not just water and dirt, but also can keep wine and coffee stains, bacteria, and odour away. One of the techniques while using nano particles for coating is by using photo catalysts, wherein a mixture of titanium dioxide and zinc oxide act as self-cleaning and anti-bacterial agents. A thin coating of titanium dioxide particles which measure just 20 nanometres in diameter is treated over the fabric. The surface of the textile material when exposed to light breaks down the impurities such as dirt, pollutants, and micro-organisms that come in contact with the fabric into carbon dioxide and oxygen. This leaves the surface free from all sorts of stains and impurities (TECHNICALTEXTILE, 2018; FIBER2FASHION, 2018).

In addition to the visual impression, the ambient air plays a major role in creating a pleasant atmosphere. The air-purifying function means that fresh ambient air is available at any time. The Drapilux air fabrics are well known air-purifying textiles. Metal salts are integrated into the textiles and they break up odour molecules; these are then converted into harmless elements of carbon dioxide and water. Unpleasant odours are permanently broken down. The function remains effective even after frequent washing. The textiles of the Drapilux Air brand are really working; this has been confirmed by the certificates that were awarded on the basis of tests in independent international laboratories. The results of the measurements on formaldehyde and ammonia are shown in Figure 3 (DRAPILUX, 2018).
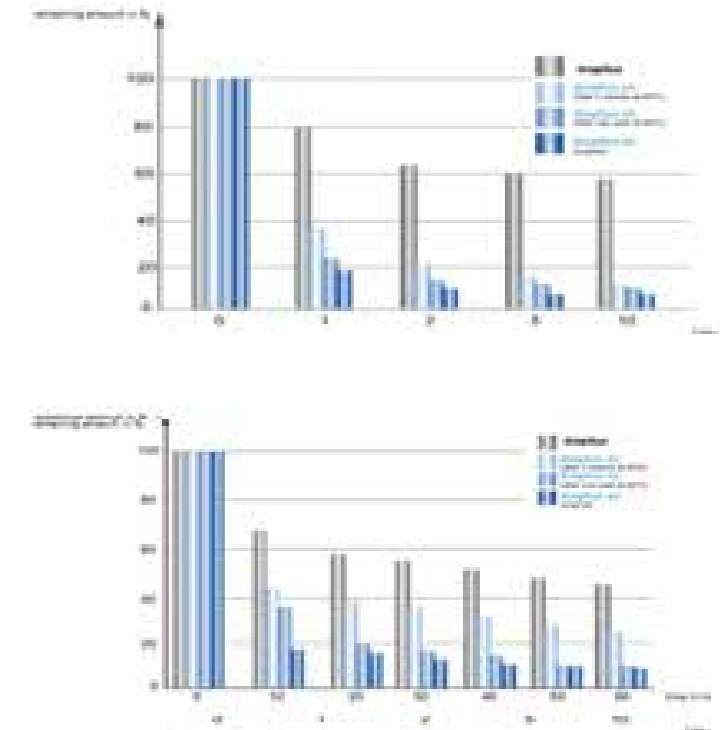

Figure 3: Breakdown of Formaldehyde and Ammonia (Test results from Institute for Environmental Protection and Agricultural Chemistry, Drapilux 2003)

3. DRAPILUX INTERIOR TEXTILE COLLECTIONS AND INDIVIDUALLY DESIGNED TEXTILE PATTERNS

The demand for individuality is higher than ever. Drapilux is a brand by the German company Schmitz-Werke GmbH and they do their very best to fulfil customers' requirements with the aid of printing expertise, flexibility and quality. They offer three exclusive options for the design and completion of individual product requests: Collection option, Module option and Creative option. Drapilux brand Design studio has developed many collections of original printed designs: Boutique, En Suite, Care Comfort, Coordn8 and many others, see Figures 4-6. Care Comfort collection (shown in Figure 4) presents a combination of sophisticated designs and selected shades by using psychological and scientific knowledge. All designs and colours are tailored to the needs of care facilities. Coordn8 collection (shown in Figure 5) was inspired by nature. The intention of this collection was to create recurring, organic shapes that are ideally suited to a print collection. The special thing about it is that the new designs harmonise with each other, not only within a single colour palette, but also in combination with other palettes (DRAPILUX, 2018).

Figure 4: Drapilux Care Comfort collection – some examples of textile patterns (DRAPILUX, 2018)

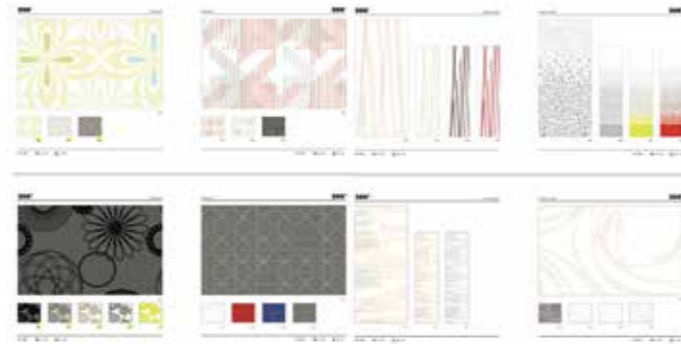Figure 5: Drapilux Coordn8 collection (DRAPILUX, 2018)

Figure 6: Textile patterns from Drapilux Collection 200°; more than

Drapilux place high importance on creating special designs that have been developed either in their design studio or with the assistance of external designers. The customer can discover the diverse range of printed designs from the 200° (shown in Figure 6) and CoordN8 collections and choose preferred decorative fabric in line with modular system: choose favourite design and base printing fabrics (DRAPILUX, 2018).

3.1. CREATIVE OPTION – CREATIVE INK FOR INDIVIDUAL CREATION OF INTERIOR TEXTILES

With Creative INK there are no restrictions on any customer's wishes – whether it is own logo, special colour requests or an individual design. The customer can choose the ideal basis for his or her own project from fifteen high-quality materials: from shining satin to transparent reversible voiles or to opaque dim-out curtains, see Figure 7 (DRAPILUX, 2018).

Figure 7: Drapilux interior textiles and patterns from collection Creative INK (DRAPILUX, 2018).

4. CONCLUSION

The design of interior space is multilayered. To serve the purpose of interiors, it requires both creative as well technical solutions. Such solutions certainly provide textiles with functional properties such as flame-retardancy, bioactivity, self-cleaning and air-purifying, improving acoustics and the quality of living. These textiles are friendly both to people and the environment. It is important that designers follow development trends also on the field of developing new techniques of manufacturing and finishing of textiles, as well as customers' requirements for individual design, so that the latter are sustainable and environmentally friendly.

REFERENCES:

DRAPILUX (2018): URL: https://en.drapilux.com/bereiche/druck

FIBER2FASHION (2018): Self-cleaning textiles URL: https://www.fibre-2fashion.com/industry-article/7172/self-cleaning-textiles

GERRIETS (2018): URL: https://www.gerriets.com/si/prenosi-download-nalozi-navodila

JEVŠNIK, S. (2013): Tekstilije za notranjo opremo. Tekstilec Vol. 56 (3): pp. 238-246.

LAKIĆ, M. et al (2014): Nanomateriali za uporabo v funkcionalnih tekstilijah. Tekstilec Vol. 57 (2): pp. 139-152.

LESKOVŠEK, M.; STANKOVIČ ELESINI, U. (2005): Mikrokapsule v medicinskih in higienskih pripomočkih. Tekstilec Vol. 48 (1-3): pp. 37-42.

MAORI (2015): Maori Gerriets Akustika

URL: http://maori.si/application/maori/upload/files/Maori_GerrietsAkustika_Katalog_2015_.pdf

NIELSON, K. J. (2007): Interior textiles: fabrics, application and historical styles. John Wiley&Sons inc., New Jersey.

SIMONČIČ, B.; TOMŠIČ, B. (2007): Določitev učinkovitosti protimikrobne apreture na tekstilijah v skladu s SIST-standardi. Tekstilec Vol. 50 (7-9): pp. 208-217.

SPRINGER: Self-cleaning: Lotus-Effect

https://link.springer.com/content/pdf/bfm%3A978-3-7643-8321-3%2F11%2F1.pdf

TECHNICALTEXTILE (2018): Self Cleaning Textile – an Overview by Tanveer Malik, Shriraj Nogja and Purva Goyal URL: https://www.technicaltextile.net/articles/self-cleaning-textile-an-overview-2646?no_redirect=true;

TREVIRA GmbH (2018): Flame Retardant Textiles – Trevira CS; How Trevira CS works; Fire safty; Antimrobial Textiles; How Trevira Bioactive works

URL:https://www.trevira.de/en/textiles-made-from-trevira/home-textiles/flame-retardant-textiles-trevira-cs.html

https://www.trevira.de/en/textiles-made-from-trevira/home-textiles/flame-retardant-textiles-trevira-cs/how-trevira-cs-works.html

https://www.trevira.de/en/textiles-made-from-trevira/home-textiles/flame-retardant-textiles-trevira-cs/fire-safety.html

https://www.trevira.de/en/textiles-made-from-trevira/antimicrobial-textiles.html

https://www.trevira.de/en/textiles-made-from-trevira/antimicrobial-textiles/how-trevira-bioactive-works.html

RESEARCH OF NEEDS AND EXPECTATIONS OF ELDERLY CITIZENS (WHO CURRENTLY RESIDE AT THEIR OWN HOME) REGARDING ELDERLY NURING HOMES

–

SAMSA Teja, Student
Faculty of Design,
Associated member of University of Primorska,
Trzin, Slovenia

HROVATIN Jasna Ph.D, Professor
Faculty of Design,
Associated member of University of Primorska,
Trzin, Slovenia

VAN GEETSOM Nansi,
Sr Lecturer and Researcher
Thomas More University of Applied Sciences,
Mechelen, Belgium

Abstract – Despite the aspirations to stay in their homes in a familiar environment, it is necessary for many of elderly to leave their homes and move to the health care institutions - nursing homes. This can present a stressful, unpleasant situation. Therefore it is important to understand the cause of potential discomfort and consider the opinions of the elderly still residing at home. One of the reasons behind elderly citizen's negative outlook on nursing homes is seeing them as institutions lacking homey ambience. The latter is often heavily dependent on interior design and activities provided within the service of nursing homes. This report aims to investigate the outlook of potential residents on nursing homes with a purpose to obtain information that would help improve elderly citizen's user experience in nursing homes.

Interior Design / Elderly / Nursing Home / User Experience / Service Design

1. LITERATURE REVIEW

Sense of home in nursing homes is effected by many factors:

- Sense of Acknowledgement (Cooney, 2012; De Veer – Kerkstra, 2001; Lewinson et al., 2012; Rijnaard et al., 2016; Molony et al., 2011),

- Preservation of One's Habits and Values (Van Hoof et al., 2016; Falk et al., 2013; Nakrem et al., 2013; Fleming et al., 2015; Rijnaard et al., 2016),

- Autonomy and Control (Molony et al., 2011; Van Hoof et al., 2016; Cooney, 2012; Klaassens – Meijering, 2015; Van Dijck-Heinen et al., 2014; Jonsson et al., 2014; Rijnaard et al., 2016),

- Coping (Rijnaard et al., 2016; Robinson et al. 2010; Nakrem et al. 2013; Falk et al. 2013),

- Interaction and Relationship with Staff (Rijnaard et al., 2016; Van Dijck-Heinen et al., 2014; Falk et al., 2013; Klaassens – Meijering, 2015; Fleming et al., 2015; Lewinson et al., 2012; Nakrem et al., 2013; Hauge – Heggen, 2008; Van Zadelhoff et al., 2011; Robinson et al., 2010),

- Interaction with Other Residents (Rijnaard et al., 2016; Van Dijck-Heinen et al. 2014; Van Hoof et al., 2015a; Van Zadelhoff et al., 2011; Klaassens – Meijering, 2015; De Veer – Kerkstra, 2001; Nakrem et al., 2013; Bland, 2005),

- Interaction with Family and Friends (Rijnaard et al., 2016; Molony et al., 2011; Van Hoof et al., 2015a; Bland, 2005; Lewinson, et al. 2012; Van Zadelhoff et al., 2011; Van Dijck-Heinen et al., 2014),

- Interaction with Pets (Rijnaard et al., 2016; Van Hoof et al., 2015a; Fleming et al., 2015; Van Dijck-Heinen et al., 2014),

- Activities (Rijnaard et al., 2016; Falk et al., 2013; Lewinson et al., 2012; Van Dijck-Heinen et al., 2014; Cooney, 2012; Fleming

et al., 2015; Robinson et al., 2010; Molony et al., 2011; Van Hoof et al., 2015a; Van Zadelhoff et al., 2011),

- The Private Space (Rijnaard et al., 2016; Nakrem et al., 2013; Cooney, 2012; De Veer – Kerkstra, 2001; Van Hoof et al., 2016; Klaassens – Meijering, 2015; Van Dijck-Heinen et al., 2014; Fleming et al., 2015),

- The (Quasi-)Public Space (Rijnaard et al., 2016; Hauge – Heggen, 2008; Molony et al., 2011; Van Hoof et al., 2015a; Van Zadelhoff et al., 2011; Robinson et al., 2010; Falk et al., 2013; Fleming et al., 2015)

- Personal Belongings (Rijnaard et al., 2016; Van Hoof et al., 2015a; Klaassens – Meijering, 2015; Lewinson et al., 2012; Jonsson et al., 2014; Hauge – Heggen, 2008; Fleming et al., 2015; Carboni, 1990; Van Hoof et al., 2016; Cooney, 2012; Van Dijck-Heinen et al., 2014),

- Technology (Rijnaard et al., 2016; Van Dijck-Heinen et al., 2014; Van Hoof et al., 2016; De Veer – Kerkstra, 2001; Fleming et al., 2015),

- Look and Feel (Rijnaard et al., 2016; Van Hoof et al., 2015a; Robinson et al., 2010; Lewinson et al., 2012; Jonsson et al., 2014; Fleming et al., 2015; Cooney, 2012; Van Dijck-Heinen et al., 2014),

- Outdoors and Location (Rijnaard et al., 2016; Van Dijck-Heinen et al., 2014; Van Hoof et al., 2016; De Veer – Kerkstra, 2001; Fleming et al., 2015; Klaassens – Meijering, 2015; Robinson et al., 2010; Van Hoof et al. 2015a).

2. METHODOLOGY

The research was conducted for and in Slovenian environment, primarily focusing on the Central Slovenia (Ljubljana) region. Therefore to understand the outcomes of this research it is important to understand the current context of the nursing home situation in the region as well as the factors influencing on the situation (figure 1, 2).

Figure 1. Percentage of the residents in the Ljubljana region above the age of 65 (KOPRIVŠEK, 2017)

The basis of this report is field research. The primary research data consists of interviews conducted with elderly citizens currently residing at their own homes. Additional data was collected using research toolkit »experience bullseye« (figure 3). Interviews with five elderly people aged between 67 and 87 years were conducted to gain first-hand knowledge on elderlies' outlook on the nursing home service, what influences their outlook, and what would in their opinion improve the service. Three participants were female, two male. The interviews were conducted at the elderlies' people residences. Interviews included open questions that sometimes resulted in storytelling by the elderly. After the interviews took place they were carefully analysed, using Transcribe – online transcription and dictation tool.

Experience Bullseye was part of each interview to get concrete information on what would matter the most to respondents within the nursing home service experience. Respondents were offered two visual toolkits, one to describe their preferences in their current physical condition and another to describe their preferences in case of severe physical disability. For better understanding participants rated the factors from 1 to 5, one being most important and five being the least important (figure 3).
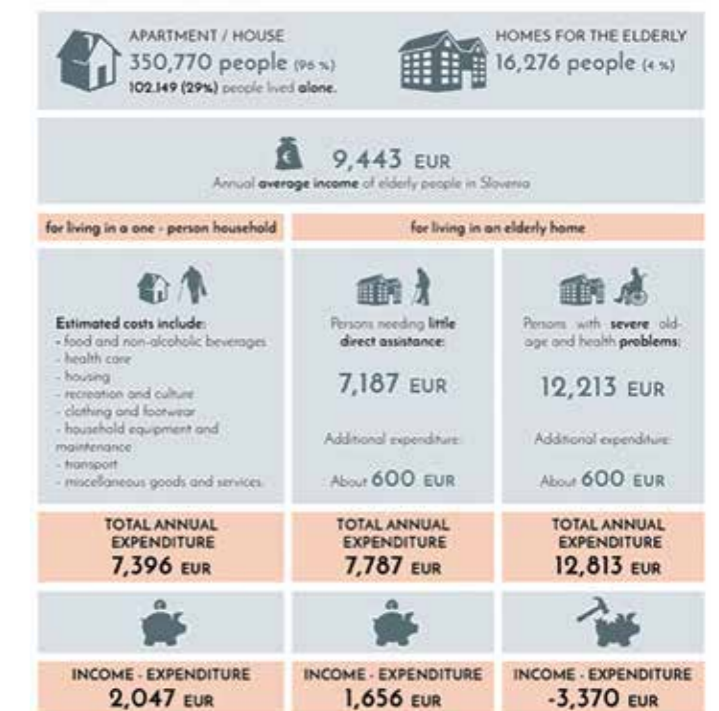
Figure 2. Housing situation of the elderly in Slovenia and annual costs of living of the elderly people in Slovenia in 2015 (LOZEJ,
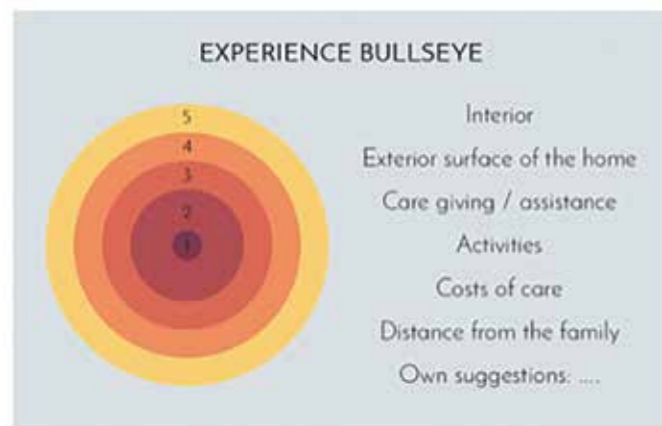
Figure 3. Experience Bullseye 2017)

3. OUTCOMES

The interviews began with a question about the general opinion of the participants on the nursing homes. Four out of five respondents claimed they do not have a good general opinion. They expressed their concern about the residents not receiving proper care, with the main reason being the lack of caregivers. All of the respondents said their opinions are based on information they got from acquaintances, friends or relatives. In addition, two of them expressed media coverage also influenced their opinion.

In further discussion respondents affirmed they would not move into elderly home unless they had severe age related health problems or injuries. All were certain they would be able to determine if and when the time for moving to a nursing home is right. The four respondents who still live with their partners stated they would move in a nursing home in case their partners had to, no matter their own physical state. One respondent added he would not go if his partner was suffering from dementia.

One respondent also added that one of the criteria for choosing a nursing home would be the interior, especially if she would be forced to spend most of the time in her room due to immobility. Two added that their condition will probably be so bad by then that they will not care where they will be going and the most important factor will probably be the price.

In all interviews the respondents denied being fearful of moving into a nursing home. Three of the respondents added they only fear that the care they will get might not be satisfactory. One of the three later stated that she has a slight fear of losing her freedom of movement and decision making. Four of the respondents affirmed they do not fear being put into an elderly home against their will, while one of the respondents stressed that she fears of having dementia as she knows she would not be able to make decisions for herself anymore.

Three respondents denied that moving into a nursing home would result in having less contact with their relatives, one respondent stated she would have less contact with her rela-

tives and one was undecided but expressed the fear of being forgotten.

When asked what they would miss the most when moving into a nursing home, only one respondent replied he would not miss anything, while the other four would miss their physical surroundings and being in contact with nature. Further on the respondents stated they would not miss their hobbies as they think they would be able to continue with most of them in a nursing home if they were capable to do so.

Discussing about the potential dislikes, three respondents said they would feel uncomfortable if they would have to share a room with somebody they would not get along with. One respondent mentioned he would be distressed if he would not be respected or taken good care of, while another pointed out not being able to decide for herself as much.

Interviews ended with ranking various factors that would influence the respondents' nursing home experience the most. They were ranked using the experience bullseye. All of the respondents were given two toolkits. The first was used to express their preferences in their current physical and mental state and the latter presuming they had severe old age and health problems. Below you can find a weighted aggregate of all collected responses (Figure 4).
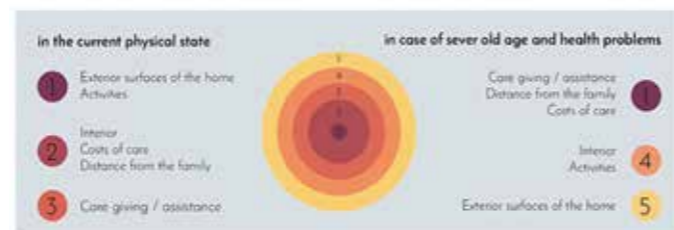

Figure 4. Importance of the factors influencing nursing home

4. DISCUSSION & CONCLUSIONS

Based on the interviews with the elderly citizens, it can be summarized that most elderly citizens have a negative general outlook on nursing homes. Reasons behind their outlook were different to what was hypothesized before the beginning of the research. Rather than the lack of ambiance or even the loss of independence the elderly worry more about the low quality of care provided in the nursing homes. Even though they indicated high importance to their independence they viewed aging as being a larger hindrance than the institution they might have to go into. Their main concern above all was getting good care and being able to afford the care itself. The core of the problem seems to be organization and/or management within the nursing homes and the lack of caregivers. As reassurance to the elderly (or in case of their disabilities to their relatives), a better monitoring system should be established.

All five respondents appreciate their connection with nature, so it is highly recommended for the elderly homes to include greenery in the interior and conduct gardening activities with their residents. Establishing a volunteering system could be a solution to offer assisted walks to the elderly. If possible, the exterior and landscape design of the elderly home should also be considered to provide the possibility of safe, easily monitored walking paths. The importance of exterior is emphasized in many research papers, in research by Van Hoof et al. (2015b) it is identified that even though some of the residents cannot access the exteriors (due to their immobility) they appreciate and enjoy to gaze upon it.

As the respondents stated they would enjoy socializing with other residents, the common spaces should be designed in a way that would promote social activities and be accessible for everyone. Interiors should allow to host different kind of activities to make the elderly feel involved in the community. As mentioned in the study by Van Hoof et al. (2015a) the sense of home is heavily influenced by participating in group activities, sharing hobbies or even just sharing common habits. The spaces might also include a kitchen, where the residents would be able to do cooking activities with their relatives or other residents. Lewinson et al. (2012) and Bland (2005) both discuss the importance of incorporating friends and family into planned activities.

Individual approach and identifying talents of residents also affect the sense of home which has been noted in papers by Robinson et al. (2010) and De Veer – Kerkstra (2001). An important factor for homey ambience is also the concept of dignity and respect, which was also stressed by respondents. Similarly Rijnaard et al. (2016) found that dignity and respect play crucial role in the context of nursing homes, as well as in a broader social context.

The elderlies' rooms are a crucial factor influencing the acceptance of the new living situation and are especially important to people who are immobile and spend most of their time in them. In addition a study by Falk et al. (2013) identified that the elderly who were allowed to personalize their rooms had less issues adapting to a new home, therefore to enhance the acceptance of new living situation the elderly should be allowed to personalize their rooms as much as possible.

5. REFERENCES

BLAND, M. (2005): The challenge of feeling 'at home' in residential aged care in New Zealand. Nursing praxis in New Zealand inc. 21 (3): pp. 4-12.

CARBONI, J. T. (1990): Homelessness among the institutionalized elderly. Journal of Gerontological Nursing 16 (7): pp. 32–37.

COONEY, A. (2012): 'Finding home': A grounded theory on how older people 'find home' in Long-term care settings. International Journal of Older People Nursing 7 (3): pp. 188-199.

DE VEER, A. J. E.; KERKSTRA, A. (2001): Feeling at home in nursing homes. Journal of Advanced Nursing 35 (3): pp. 427-434.

FALK, H.; FALK, K.; WIJK, H.; PERSSON, L. (2013): A sense of home in residential care. Scandinavian Journal of Caring Sciences 27 (4): pp. 999-1009.

FLEMING, R.; KELLY, F.; STILLFRIED, G. (2015): 'I want to feel at home': establishing what aspects of environmental design are important to people with dementia nearing the end of life Palliative care in other conditions. BMC Palliative Care 14 (1).

HAUGE, S.; HEGGEN, K. (2008): The nursing home as a home: a field study of residents' daily life in the common living rooms. Journal of Clinical Nursing 17 (4): pp. 460-467.

JONSSON, O.; ÖSTLUND, B.; WARELL, A.; DALHOLM HORNYÁNSZKY, E. (2014): Furniture in Swedish nursing homes: a design perspective on perceived meanings within the physical environment. Journal of Interior Design 39 (2): pp. 17–35.

KLAASSENS, M.; MEIJERING, L. (2015): Experiences of home and institution in a secured nursing home ward in the Netherlands: a participatory intervention study. Journal of Aging Studies 34 (3): pp. 92–102.

KOPRIVŠEK, L. (2017, June 26): Pokritost potreb domsko varstvo starejših.

URL: http://www.ssz-slo.si/wp-content/uploads/POKRI-TOST-RS-28.6.2017.pdf

LEWINSON, T.; ROBINSON-DOOLEY, V.; GRANT, K. W. (2012): Exploring 'home' through residents' lenses: assisted living facility residents identify homelike characteristics using photovoice. Journal of Gerontological Social Work 55 (8): pp. 745–756.

LOZEJ. M. (2017, September 26): Average older persons' income lower than the cost of living and most demanding care in a home for the elderly.

URL: http://www.stat.si/StatWeb/en/News/Index/6952

MOLONY, S.L. (2010): The meaning of home: a qualitative meta-synthesis. Research in gerontological nursing 3 (4): pp. 291-307.

NAKREM, S.; VINSNES, A. G.; HARKLESS, G. E.; PAULSEN, B.; SEIM, A. (2013): Ambiguities: Residents' experience of 'nursing home as my

home'. *International Journal of Older People Nursing 8 (3): pp. 216-225.*

ROBINSON, C. A.; REID R. C.; COOKE H. A. (2010): *A home away from home: the meaning of home according to families of residents with dementia. Dementia 9 (4): pp. 490–508.*

RIJNAARD, M. D.; VAN HOOF, J.; JANSSEN, B. M.; VERBEEK, H.; PO-CORNIE, W.; EIJKELENBOOM, A.; BEERENS, H. C.; MOLONY, S.L.; WOUTERS, E. J. M. (2016): *The Factors Influencing the Sense of Home in Nursing Homes: A Systematic Review from the Perspective of Residents. Journal of Aging Research 2016: pp. 1-16.*

VAN DIJCK-HEINEN, C.J.M.L.; WOUTERS, E.J.M.; JANSSEN, B.M.; VAN HOOF, J. (2014): *The environmental design of residential care facilities: A sense of home through the eyes of nursing home residents. International Journal for Innovative Research in Science & Technology 1 (4): pp. 57-69.*

VAN HOOF, J.; VERHAGEN, M. M.; WOUTERS, E. J. M.; MARSTON, H. R.; RIJNAARD M. D.; JANSSEN B. M. (2015a): *Picture your nursing home: exploring the sense of home of older residents through photography. Journal of Aging Research 2015.*

VAN HOOF, J.; RUTTEN, P.G.S.; STRUCK, C.; HUISMAN, E.R.C.M; KORT H.S.M. (2015b): *The integrated and evidence-based design of healthcare environments. Architectural Engineering and Design Management 11 (4): pp. 243-263.*

VAN HOOF, J.; JANSSEN, M. L.; HEESAKKERS, C. M. C.; VAN KERSBERGEN, W.; SEVERIJNS, L. E. J.; WILLEMS, L. A. G.; MARTSON, H. R.; JANSSEN, B. M.; NIEBOER, M. E. (2016): *The importance of personal possessions for the development of a sense of home of nursing home residents. Journal of Housing for the Elderly 30 (1): pp. 35-51.*

VAN ZADELHOFF, E.; VERBEEK, H.; WIDDERSHOVEN, G.; VAN ROSSUM, E.; ABMA, T. (2011): *Good care in group home living for people with dementia. Experiences of residents, family and nursing staff. Journal of Clinical Nursing 20 (17-18): pp. 2490–2500.*

RESEARCH OF NEEDS OF ELDERLY CITIZENS AND EMPLOYEES IN A NURSING HOME

–

SAMSA Teja, Student
Faculty of Design,
Associated member of University of Primorska,
Trzin, Slovenia

HROVATIN Jasna Ph.D, Professor
Faculty of Design,
Associated member of University of Primorska,
Trzin, Slovenia

Abstract – In the developed countries the percentage of elderly people is on a rise. Parallel to that the percentage of elderly in need of moving to nursing homes is on a rise as well. Often the elderly are afraid of moving from their living environment as they fear the new environment from the social aspect as well as from the aspect of adapting to new physical environment. As the interior design itself affects the acceptance of new living environment, we have decided to redesign the (semi) public spaces of nursing home "Dom starejših občanov Bežigrad". Understanding the needs of all the stakeholders is crucial to design more adequate tangible and intangible content of nursing homes, therefore we conducted a research within the residents and employees of the nursing home that would help us as a basis for redesigning the interior.

Interior Design / Elderly / Nursing Home / User Experience / Service Design

1. LITERATURE REVIEW

In the times of rapid technological development, progress in social welfare and health care, globally, there is also a rise in the aging population. »The share of the older persons in Slovenia is increasing. In 2010 it was 16.5%; in 2017 it was 19.1%« (Lozej, 2017). Due to the aging of the population our society is upon a challenge to adapt to the changing of the demographic structure. Many countries, including Slovenia are already responding by developing new strategies of healthy aging.

The current capacities in the nursing homes in Ljubljana region are not sufficient for the needs of the elderly population, consequently the topic related to institutional care is often debated on (figure 1).

Figure 1: Coverage of needs of nursing homes in Ljubljana region

»Various studies have shown that the architecture and design of a nursing home can have a profound impact on the sense of home of old people residing in the nursing home, next to psychological and social factors« (Eijkelenboom et al., 2017 pp. 111).

Nowadays nursing homes aspire to distance themselves from the "hospital look" and are abandoning features that resemble hospitals. Instead of multiple-bed rooms, shared

bathrooms, and mandatory uniform wearing for employees, they rather focus on providing high quality care, positioning an elderly in the center of attention, enhancing his or hers autonomy and general wellbeing (Eijkelenboom et al., 2017; Bland 2005; Kane et al., 1997; Cooney, 2012, Falk et al., 2013; Rijnaard et al., 2016; Van Steenwinkel et al., 2012; Van HooF et al. 2015b, 2016; Felix et al., 2015; Sixsmith, 1986).

Understanding the physical and psychological changes related to aging is crucial to understand the needs of the elderly residing in nursing homes. Physical factors noted by Institute of Gerontology are sensory loss (e.g. impaired vision, loses of hearing and sense of touch), decline of energy levels, decreased muscle strength and reflex time following to the decline in mobility. Wellbeing of the elderly is affected by the mentioned factors as they alter the perception of the environment. In addition the changes can become so significant that the ability to gather information and participate in normal social interactions is impaired (Wang – Kuo, 2006; Kalymun, 1989).

Elderly people have difficulties adapting to changes of light levels as their visual acuity and contrast sensitivity is reduced, as well as having a restricted field of vision and depth perception. As the pupil of the eye decreases in size subsequent to aging the elderly need three times as much light to see with the same clarity as people in their early twenties (Wang – Kuo, 2006; Hutton et al., 1982; Turano et al., 2004).

Difficulties distinguishing speech from background sounds and inability to hear high-frequency sounds are the most common hearing problems faced by the elderly. Hearing deficits present a frustration for the elderly creating stress and consequently leading to increased blood pressure, headaches, shortened attention span, and even memory loss (Wang – Kuo, 2006; Kalymun, 1989; Hietanen et al., 2004).

Due to the decline in motoric abilities and other physical impairments related to the aging process the elderly are prone to accidental falling. Considering the physical impairments while designing the interiors of the nursing homes can not only prevent falling or injuries but also reassure the elderly and comfort their fear of falling (Wang – Kuo, 2006).

For most of older persons moving to a nursing home presents a stressful or even a traumatic experience. Creating a home-like ambience can ease the sense of loss and fear of being abandoned. To prevent feelings of loneliness and isolation the semi-public spaces of nursing homes should be designed to encourage social activities and interpersonal interactions. (Cormack, 1990; Wang – Kuo, 2006).

2. METHOD AND MATERIALS

For the purpose of designing a new reception, lobby and cafe in nursing home »Dom starejših občanov Bežigrad« we conducted a user research with seven elderly citizens residing in

the nursing home and three employees employed at the reception and café.

The residents who participated in the research, four female and three male individuals, are aged from 65 to 97 years, with their average age being 82.4 years. Respondents have resided in the nursing home for the duration of 3 months to 6.5 years, the average being 3.5 years. All the respondents are mobile.

In the second target group three employees working in either reception or café participated. Two of the respondents were female, one was male. They have been employed in the nursing home for the duration of 7 months to 40 years, the average being 25.9 years. For the respondent who works in the nursing home for 37 years, working in the café has been her first and only employment, whereas the receptionist who has been working in the nursing home for 40 years has previously worked in nursing home's kitchen. The respondent who has been working in the home for the least time, has previously worked as a receptionist in other jobs.

Prior to the interviews an analysis of the spaces was conducted, which helped us identify the flaws of the spaces, which we later discussed with the respondents. Interviews were conducted at nursing home »Dom starejših občanov Bežigrad«. Interviews included open questions that often resulted in storytelling of the elderly and employees. To gather concrete information on what would matter the most to the elderly within the nursing home's service experience we used additional toolkit, the "experience bullseye". After the interviews took place they were carefully analysed, using Transcribe – online transcription and dictation tool.

3. OUTCOMES OF THE SURVEY OF THE ELDERLY RESIDING IN THE NURSING HOME

The interviews began with the questions regarding the reasons for their move to the nursing home and their general satisfaction with the service. Generally the residents are satisfied with the service, and have on average marked their overall satisfaction with a score 8.5 out of 10. When discussed about what they like the most in the nursing home, four stressed they enjoy the company of the fellow residents, being relieved of household chores and the general cleanliness of the nursing home. Two of the respondents expressed they appreciate the quietness and the opportunity of residing in a one-bed room. One of the respondents stressed the possibility of using the outdoor spaces of the nursing home as a significant benefit.

Sense of home is strongly connected with good relationships with fellow residents as well as employees based on the opinion of three respondents. Other answers also included having own space, being respected, feeling relaxed and having a nice view. One of the respondents added that the nursing home

has all the spaces his own home had, which can be used by all the residents (living room, library, kitchen, garden etc.).

Further on, the respondents valued the importance of the factors influencing their satisfaction with the life in a nursing home using the "experience bullseye" toolkit (1 being most important and 5 being least important). All respondents had difficulties valuing their preferences and determined most of the factors as very important. Even though they were encouraged to list their own suggestions, they had none. Below you can find a weighted aggregate of all collected responses (Figure 2).

Figure 2. Importance of the factors influencing nursing home

All the respondents stated that the reception is noticeable and well positioned within the space, expressing the proximity to the entrance. Five of the respondents stated that the information on the notice board can be easily read, while one added the letters could be larger. One person reads the notice board at her department only, while another person stressed she is often unable to read the content, emphasizing difficulties reading the menu as the letters are too small.

When asked about the problematics of the reception, only one person expressed the small size of reception desk and the cue that gathers around the reception due to it being positioned too close to the entrance. The reception is perceived as homey by six respondents, mostly because of the staff, whereas the seventh person emphasized that the reception itself doesn't give him a sense of home.

The respondents are satisfied with the lighting in the lobby, two of respondents stressed the acoustics of the lobby are insufficient, which is especially noticeable when occasional events are occurring in it. Six respondents stated that the seating in the lobby is comfortable, though sometimes dirty or too occupied, whereas one respondent does not perceive the seating as comfortable. One of the respondents also added she does not like to stay in the lobby much as she is bothered by the draught.

Four of the respondents visit the café on daily basis, occasionally even multiple times a day. One of the respondents visits the café few times a week, whereas two respondents rarely visit the café. Respondents often socialize with their family and friends at the café or on the terrace, some in the nursing home's park as well, or in their rooms, common spaces within their department or at the café in the neighbourhood.

All the respondents agree that the lighting in the café is sufficient. Five out of seven respondents stated the acoustics of the café are good, whereas two stressed that because of café's position within a transit area, there is too much noise in the café. Regarding the seating in the café, two respondents stressed the amount is sufficient in contrast to the five who stated that the amount is not sufficient especially in the visiting rush hours and in the case of bad weather. The seating is perceived as comfortable by six of the respondents, while one stressed the seating is stiff, but offers handles for support when standing up and is stable. Four respondents stated they would not want to change anything regarding the café, whereas other three perceive the design as outdated and would appreciate if it was modernized. They also mentioned they are bothered by the draught in the space. Even though the respondents already play cards and chess in the café, they wouldn't want to do any other additional activities there.

4. OUTCOMES OF THE SURVEY OF THE EMPLOYEES AT THE NURSING HOME

To understand the needs of the work space the employees were asked about the tasks of their job positions. When asked if the current work space enables carrying out all the stated tasks, the person employed at the café affirmed, but added she would appreciate if the café was more spacious and had more seats and tables as she has noticed there is often lack of space, especially when the terrace is closed. She added that she is satisfied with her current work space, but would prefer to have more counter space and a vitrine for glasses. She agreed that the current counter is not well designed in the manner of accessibility for the disabled people. When asked what she likes the most about her work space, she mentioned the position of the counter as she thinks it gives her a good overview of the café and lobby.

One person employed at the reception stressed she can carry out her job tasks, but added she is bothered by the lack of visibility of the surrounding space due to the design of the reception cubicle. The other person employed at the reception said he is unable to carry out his tasks due to the design of the work space. He stressed the lack of visibility and the fact that the area around the reception and entrance is often impassable due to the design and position of the reception. He added that due to the proximity to the entrance there is a problem with draught, especially during winter. Both employees noticed that visitors often overlook the reception due to its position. They also mentioned the insufficient acoustics of the space and the design of the reception desk which hinders the communication and direct help to the disabled and is generally not accessible for them. Employees at the reception also added they would benefit from having more storage space for documentation and appliances, as well as for their personal items. They also expressed they wish they had storage space for their lunch and that the reception was designed in a manner which would give them privacy during eating as they cannot leave their workspace for lunch.

5. DISCUSSION

Based on the interviews with the elderly residing at nursing home »Dom starejših občanov Bežigrad«, we can conclude that the elderly are satisfied with their life in the nursing home. Respondents who are all in a relatively good mental and physical state are still afforded a high level of independence and freedom of choice, most of them even stressing many positive effects of moving into a nursing home, such as being relieved from household chores. The importance of coping with a new living situation and accepting it in correlation with a sense of home has been indicated in a study by Nakrem et al. (2013) as well.

Contrary to our initial hypothesis, elderly residing at nursing home »Dom starejših občanov Bežigrad« do not perceive the nursing home as an institution lacking homey ambience. We can conclude that most of the respondents were fairly open to the new living situation and therefore accepted it as well as they did. The latter was also indicated by Molony (2010) who identified that individuals who aren't willing to accept the new living situation will most likely never have a sense of home in a nursing home. The outcomes of results partially differ from hypothesis that predicts that interior design has a crucial role in establishing a sense of home. It has been noted that the importance of having good relationships with fellow residents and employees is much greater. Similar outcomes have also been noted by Robinson et al. (2010), Cooney (2012), Hauge – Heggen (2008), Nakrem et al (2013), Falk et al. (2012), Van Hoof et al. (2015a), Van Dijck-Heinen et al. (2014), Fleming et al. (2015), Van Zadelhoff et al. (2011) who strongly value the relationships between employees and residents as well as the relationships among residents themselves. The respondents were mostly able to continue with their lifestyle after their move to the nursing home, emphasizing their sense of home. The connection between the continuation and the sense of home has also been confirmed in a study by Rijnaard et al. (2016).

Respondents have also expressed a fair amount of satisfaction regarding factors such as interior and exterior of the nursing home they reside in, as well as with the service provided by the nursing home. Despite that, it has been noticed that most of the respondents were uncritical towards functional flaws of the spaces. This can also be related to the fact that some spaces such as reception are not used often by the majority of the respondents. Therefore even though only one person stressed the problematics of the small size of the reception desk, the reception are in general, its over-crowdedness, poor visibility and lack of homey ambience, it is very important to consider this information.

Our second hypothesis, predicting that the current design of the spaces is not optimal, has been confirmed. In addition it is interesting that most of the residents do not recognize the flaws regarding the functionality of the spaces they use and that most of the problematics of the current design have been expressed by the employees.

Due to the limited amount of respondents and their mainly unified characteristics (psychophysical state, age, financial capabilities, character traits etc.), it is important to note that the outcomes of the research may not be as representative. Therefore in case of further research a larger and more diverse target group should be formed.

6. CONCLUSIONS

Based on research we were able to identify advantages and disadvantages of the current design of spaces in the nursing home "Dom starejših občanov Bežigrad". The findings of the research will help us to design a more suitable, user centered design for the reception, lobby and café.

Reception:
- is too small and inconveniently positioned, resulting in the over-crowdedness of the area
- it's design blocks the view towards adjacent spaces
- visitors often overlook the reception
- lacks homey ambience
- the design of reception desk is inconvenient (it is necessary to redesign the reception desk in two levels – for persons standing and for the disabled in wheelchairs)
- it lacks storage space (for documentation and personal belongings)
- the current design does not afford privacy for employees during meal time
- the acoustics are inadequate
- direct and indirect lighting is insufficient
- characters on the message board are undersized
- draught

Lobby:
- the acoustics are inadequate,
- the amount of seating is insufficient
- draught,
- there is a lack of hand rails that would help reassure the elderly and prevent injuries
- direct and indirect lighting is insufficient

Café:
- the acoustics are inadequate
- the amount of seating is insufficient (the café could possibly be expanded into the lobby area)
- when designing the new café, comfortable, easy to clean and safe seating should be considered
- draught
- the counter is not accessible for people in wheelchairs (should be designed in two levels)
- insufficient counter space and amount of vitrines
- current design offers good overview to the adjacent spaces which should be preserved in the new design
- current design allows access to unemployed people (should be prevented)
- characters on the menu are undersized

We can conclude that even though the current quality of the service provided by the nursing home is already at a high level, but would be additionally enhanced with the optimization and improvement of functionality of the interior.

7. REFERENCES

BLAND, M. (2005): The challenge of feeling 'at home' in residential aged care in New Zealand. Nursing praxis in New Zealand inc. 21 (3): pp. 4-12.

COONEY, A. (2012): 'Finding home': A grounded theory on how older people 'find home' in Long-term care settings. International Journal of Older People Nursing 7 (3): pp. 188-199.

CORMACK, D. (1990): The Therapeutic Influence of the Environment: A Nursing Home or a Nursing Home. Journal of Gerontological Nursing 16 (3): pp. 3-4.

EIJKELENBOOM, A.; VERBEEK, H.; FELIX, E.; VAN HOOF, J. (2017): Architectural Factors Influencing the Sense of Home in Nursing Homes: An Operationalization for Practice. Frontiers of Architectural Research 6, (2): pp. 111-22.

FALK, H.; FALK, K.; WIJK, H.; PERSSON, L. (2013): A sense of home in residential care. Scandinavian Journal of Caring Sciences 27 (4): pp. 999-1009.

FELIX, E.; DE HAAN, H.; VAANDRAGER L.; KOELEN, M. (2015): Beyond Thresholds: The Everyday Lived Experience of the House by Older People. Journal of Housing for the Elderly 29 (4): pp. 329-247.

FLEMING, R.; KELLY, F.; STILLFRIED, G. (2015): 'I want to feel at home': establishing what aspects of environmental design are important to people with dementia nearing the end of life Palliative care in other conditions. BMC Palliative Care 14 (1).

HAUGE, S.; HEGGEN, K. (2008): The nursing home as a home: a field study of residents' daily life in the common living rooms. Journal of Clinical Nursing 17 (4): pp. 460-467.

HIETANEN, A.; ERA, P.; SORRI, M.; HEIKKINEN, E. (2004): Changes in hearing in 80-year-old people: a 10-year follow-up study. International Journal of Audiology 43 (3): pp. 126-135.

HUTTON, J.; Shapiro, I.; Christians, B. (1982):. Functional significance of restricted upgaze. Architectural Physical Medical Rehabilitation 63: pp. 617-619.

KANE, R.A.; CAPLAN, A.L.; URV-WONG, E.K.; FREEMAN, I.C.; AROSKAR, M.A.; FINCH, M. (1997) : Everyday matters in the lives of nursing home residents: Wish for and perception of choice and control. Journal of the American Geriatrics Society 45 (9): pp. 1086-1093.

KALYMUN, M. (1989): Relationship between sensory decline among the elderly and the physical environment: Implication for health care. Rhode Island Medical Journal 72: pp. 162-167.

KOPRIVŠEK, L. (2017, June 26): Pokritost potreb domsko varstvo starejših.

URL: http://www.ssz-slo.si/wp-content/uploads/POKRI-TOST-RS-28.6.2017.pdf

LOZEJ. M. (2017, September 26): Average older persons' income lower than the cost of living and most demanding care in a home for the elderly.

URL: http://www.stat.si/StatWeb/en/News/Index/6952

MOLONY, S.L. (2010): The meaning of home: a qualitative meta-synthesis. Research in gerontological nursing 3 (4): pp. 291-307.

NAKREM, S.; VINSNES, A. G.; HARKLESS, G. E.; PAULSEN, B.; SEIM, A. (2013): Ambiguities: Residents' experience of 'nursing home as my home'. International Journal of Older People Nursing 8 (3): pp. 216-225.

RIJNAARD, M. D.; VAN HOOF, J.; JANSSEN, B. M.; VERBEEK, H.; POCORNIE, W.; EIJKELENBOOM, A.; BEERENS, H. C.; MOLONY, S.L.; WOUTERS, E. J. M. (2016): The Factors Influencing the Sense of Home in Nursing Homes: A Systematic Review from the Perspective of Residents. Journal of Aging Research 2016: pp. 1-16.

ROBINSON, C. A.; REID R. C.; COOKE H. A. (2010): A home away from home: the meaning of home according to families of residents with dementia. Dementia 9 (4): pp. 490–508.

SIXSMITH, J. (1986): The meaning of home: an exploratory study of environmental experience. Journal of Environmental Psychology 6 (4): pp. 281-298.

TURANO, K. A.; BROMAN, A. T.; BANDEEN-ROCHE, K.; MUNOZ, B.; RUBIN, G. S.; WEST, S. (2004): Association of visual field loss and mobility performance in older adults: Salisbury Eye Evaluation Study. Optometry and Vision Science 81 (5): pp. 298-307.

VAN DIJCK-HEINEN, C.J.M.L.; WOUTERS, E.J.M.; JANSSEN, B.M.; VAN HOOF, J. (2014): The environmental design of residential care facilities: A sense of home through the eyes of nursing home residents. International Journal for Innovative Research in Science & Technology 1 (4): pp. 57-69.

VAN HOOF, J.; VERHAGEN, M. M.; WOUTERS, E. J. M.; MARSTON, H. R.; RIJNAARD M. D.; JANSSEN B. M. (2015a): Picture your nursing home: exploring the sense of home of older residents through photography. Journal of Aging Research 2015.

VAN HOOF, J.; RUTTEN, P.G.S.; STRUCK, C.; HUISMAN, E.R.C.M; KORT H.S.M. (2015b): The integrated and evidence-based design of healthcare environments. Architectural Engineering and Design Management 11 (4): pp. 243-263.

VAN HOOF, J.; VERBEEK, H.; JANSSEN, B. M.; EIJKELENBOOM, A.; MOLONY, S.L.; FELIX, E.; NIEBOER, K. A.; ZWERTS-VERHELST, E. L. M.; SIJSTERMANS, J. J W. M.; WOUTERS, E. J. M. (2016): A three perspective study of the sense of home of nursing home residents: the views of residents, care professionals and relatives. BMC Geriatrics 16.

VAN STEENWINKEL, S.; BAUMERS, S.; HEYLIGHEN, A. (2012): Home in later life. A framework for the architecture of home environments. Home Cult 9: pp. 95-217.

VAN ZADELHOFF, E.; VERBEEK, H.; WIDDERSHOVEN, G.; VAN ROS-SUM, E.; ABMA, T. (2011): Good care in group home living for people with dementia. Experiences of residents, family and nursing staff. Journal of Clinical Nursing 20 (17-18): pp. 2490–2500.

Wang, C.-H.; Kuo, N.-W. (2006): Zeitgeists and development trends in long-term care facility design. Journal of Nursing Research 14 (2): pp. 123-32.

PRINCIPLES WHICH CONTRIBUTE THE CREATION OF SUSTAINABLE INNOVATIVE PRODUCTS IN DESIGN MANAGEMENT PROCESS

–

BERGINC Jordan, Assoc. Prof. Ph.D.
Studio of Entrepreneurship,
Faculty of design, Ljubljana-Slovenia
jordan.berginc@guest.arnes.si

ABSTRACT: This paper seeks to understand the value of most important principles which need to be followed in the process of creating sustainable innovative products in design management. This approach for development of sustainable innovative products is conceptualized as a tool for design management process in the company. Very often research, development and design teams use this approach which result a proper level of satisfaction and fulfill the needs of customers. It is known that sustainable design process is following the principles of creativity, economic, social and ecological aspect of product development. All these aspects are introduced by sensitive design process which is part of design management. Generally, sustainable design process appear to emphasize ethics over aesthetics in product development. Most important sustainability principles can help innovation developers teams to consider the full system as they design products. Considering the life-cycle system of a product can reveal design decisions that may lead toward unsustainability. For this reason the development team should seriously consider and learn which sustainability principles have to be the part of design management innovation process

KEY WORDS: Sustainability, Design management, Innovation and product development, Sustainable design principles, Sustainable development, Product life cycle.

1. SUSTAINABILITY AND DESIGN MANAGEMENT

Based on theory that design management can stimulate sustainability approach in innovative product development, we have focused primarely on defining conceptualization of the process.

The concept of design management relates to certain management activities, methods and skills that are required to optimize and manage design processes. This is directed by the highly complex nature of the design process. As a professional field, design management focuses on a complex of all visual manifestations of companies, brands and products. On the other hand, on non-visual aspects relating to the design process as such which concern processes for product development, supply, production, distribution, sales, delivery or service. Generally, the design is often defined as a process of active planning and decision making, resulting in a finished product.

A company which facilitate design management model has many benefits on the market. Such a company can improve innovation process in product development, customer experiences, makes more stronger brand name, achives higher visibility and can improve performance effeciency at all stages of the process. Finally, the company with design management strategy is able to make higher profit and reaches fast growth based on sustainability. Design oriented companies stimulate culture of design thinking system among employees. We define design thinking as a process for practical, cre-

ative resolution of problems or issues that looks for improved and innovative future results (Berginc, 2014).

1.1. SUSTAINABLE PRODUCT DEVELOPMENT WITH DESIGN

Although many manufacturers view sustainability favorably, some executives remain skeptical about the purported benefits of sustainable design. Similarly, sustainable design can reduce or control product development costs through improved material usage, alternative manufacturing processes, reduced energy consumption, optimized shipping scenarios, and decreased risk and liability concerns. Drive Growth and Innovation with sustainable design on the revenue side, sustainability can help you increase revenue by stimulating the development of innovative products, supporting the creation of new business initiatives, improving the quality of existing products, and differentiating your products in the marketplace.

Sustainable design also enables to enhance company's reputation, build brand equity with your customers, and achieve preferred supplier status with bigger customers. Moreover, adopting a sustainable design strategy will foster a culture of corporate responsibility within your organization. By nurturing an eco-friendly, challenging work environment, you can attract and retain design and engineering talent, and task them with creating the innovations that will move your business forward (Dassault, 2015).

Sustainable design is more than just the right thing to do to save the environment. It also makes good business sense and result in a range of benefits that can drive innovation throughout company.

Figure 1: Benefits of sustainable design for products2017)

2. SUSTAINABILITY AND PRODUCT DEVELOPMENT CHANGES

Many tools, methods and concepts are available to support sustainability oriented innovation. Manufacturers that effectively adopt sustainable design practices are positioned themselves to successfully respond to increasing consumer demand for ecological products. They also spark innovation in product development, control energy and material costs, and grow revenues. Sustainable design create products in a manner that minimizes their negative impact on the environment, making them more economically viable, socially acceptable, and ecologically sensible and is often misunderstood in practice.

Many breakthrough changes have been conidered in the last few decades, including the:

• Introduction of green products at all levels

• Rising costs of traditional energy sources

• Increasing reliance on renewable energy sources

• Continuing depletion of natural resources

• Substantial growth in municipal recycling programs

• Rise in consumer-driven "eco-labeling" programs

• Adoption of carbon legislation by governments worldwide

• Launching of major sustainability initiatives and awarding of best sustainable index companies worldwide (Broman, Holmberg, and Robert 2000).

Figure 2: Sustainability attributes for innovative products

Without including a long-term orientation view as part of the business strategy for sustainable products, the company may find organization unmotivated and unable to respond to competitive pressures, or incapable of capitalizing on new green markets and business expansion opportunities.

The only thing certain in life, and business, is change. The visionaries who perceive and anticipate management of change—and who can apply outside-the-box thinking to the businesses they run—will stay ahead of the curve and be prepared to identify and capitalize on rapid innovations in the global market.

2.1 SUSTAINABILITY AND ENVIROMENTAL POLICY

Sustainable design as an approach works towards achieving zero net environmental impact. This includes but is not limited to the following:

• Eliminating the use of non-renewable resources.

• Eliminating air, soil and water pollution.

• Creating healthy and accessible indoor and urban environments.

• Protecting and enhancing natural eco- systems and cycles.

• Supporting the conversion of 'waste' into useful resources.

• Creating a built environment that is resilient, flexible and adaptive to climate change.

• Supporting decentralised electricity and water systems.

• Supporting a move towards understanding and implementing 'positive development'

• Supporting sustainable modes of travel.

The vision is to create a more sustainable urban environment, comprised of architecture, landscapes, transport networks and infrastructure that are low carbon, water sensitive and resource efficient in both construction and operation.

2.2 SUSTAINABILITY AND SMES

In some countries the term sustainable design is known as ecodesign, green design or environmental design. There is a large need for integration of sustainability into the innovation processes in small and medium-sized enterprises (SME). Some key reasons for this are:

ï Innovation is expected to be one of the key factors for future success in global competition. In reflection of this, EU has announced the Innovation Union to boost innovations within the Union. SMEs are supposed to play an important role, as many innovations are generated in SMEs.

ï Sustainability has now been widely accepted as a necessity to ensure the well-being of future generations.

ï The current production and consumption pattern is not sustainable, there is a need for new and innovative solutions.

ï SME are an important economic factor in the EU. They are by far the majority of companies and they are responsible for a large part of the economic activities.

ï SME are also responsible for a relevant part of the environmental and social impact (Willard, 2005)

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Although sometimes defined differently, the common understanding is that sustainability is built on three pillars: economic, environmental, and social sustainability. As sustainability covers a broad area of different aspects, it is very difficult to make it measurable (Baumgartner, 2010).

3. SUSTAINABLE DEVELOPMENT PRINCIPLES

While the practical application varies among disciplines, some common principles of sustainable development are as follows:

- Energy efficiency: use manufacturing processes and produce products which require less energy

- Low-impact materials: choose non-toxic, sustainably produced or recycled materials which require little energy to process

- Design for reuse and recycling: "Products, processes, and systems should be designed for performance in a commercial sense

- Emotionally durable design: reducing consumption and waste of resources by increasing the durability of relationships between people and products, through design

- Design impact measures for total carbon footprint and life-cycle assessment for any resource used are increasingly required and available. Many are complex, but some give quick and accurate whole-earth estimates of impacts.

- Sustainable design standards and project design guides are also increasingly available and are vigorously being developed by a wide array of private organizations and individuals. There is also a large body of new methods emerging from the rapid development of what has become known as 'sustainability science' promoted by a wide variety of educational and governmental institutions.

- Biomimicry: "Redesigning industrial systems on biological lines which enabling the constant reuse of materials in continuous closed cycles

- Service substitution: shifting the mode of consumption from personal ownership of products to provision of services which provide similar functions, e.g., from a private automobile to a carsharing service. Such a system promotes minimal resource use per unit of consumption

- Renewable resource: materials should come from nearby (local or bioregional), sustainably managed renewable sources that can be composted when their usefulness has been exhausted

- Robust eco-design: robust design principles are applied to the design of a pollution sources (UPA, 2010).

4. WAYS FOR BETTER INTEGRATION OF SUSTAINABILITY ASPECTS IN INNOVATION PROCESS

Several factors are important to improve the integration of sustainability aspects in innovation processes. Some crucial points are the understanding, motivation, and commitment from management and engaged personnel. This can be achieved by better knowledge about the needs for sustainable innovation and the possible benefits. Such benefits are for example business cases leading to increased sales or improved efficiency leading to higher competitiveness.

However, solutions that facilitate the integration of a sustainable innovation process in the current organisation are helpful. Successful companies need to keep and develop their competences in innovative way. All different actors in the innovation process have to have knowledge and awareness about sustainability as a need and possibility to create more sustainable innovative solutions: the visionary, the entrepreneur, financing actors and sales persons.

Networking is important for most companies, and can also be a support for integration of sustainability in innovation processes. Inspiration and support can be gained both from dialogue with customers or with suppliers, but also within network meetings e.g. in branch organisations. As support for companies, a large number of tools have been developed that cover different aspects of business processes and innovation. Not all of these tools are applicable to small companies and many of them are also more generic for the innovation process, not addressing sustainability. On the other hand, many tools do not address all different aspects of sustainability, but usually are focussing on the economic or environmental dimension (Robin, 2000).

4.1 TOOL EXAMPLES FOR SUSTAINABILITY WORK

There are a number of tools available to help companies in their planning and execution of sustainability work, carbon footprint calculations, environmental management etc. Some sites and/or tools are intended specifically for SMEs whereas others are more general but still useful for them.

The following tools are examples of such tools and programs. They are chosen to illustrate types of available sites, tools and programs and not because they by any means are con non-exhaustive list of tools that have been collected and assessed with regards to their suitability to help SME in their innovation process. More information is available on homepage (www.spin-project.eu). The tools take up different main aspects that are needed to support SME in their sustainable innovation process:

ï Financing tools that provide financial support to sustainable innovations,

ï Competence tools that increase the competence in the company, for example a number of life-cycle tools to assess the impact of new products

ï Business and market tools that support e.g. business analysis allow designing more competitive solutions.

ï Other tools that are not covered by these categories.

There are different ways for integration of sustainability in innovations processes as described above. The following activities address the needs of SMEs in order to facilitate such integration in the future:

ï SMEs need better help to reduce their lack of time, e.g. by new tools or time saving regulation, i.e. less administration

ï There are a number of supporting tools available today for financing as well as competence. Many of these tools can be adapted better to SME needs and there is a need to provide guidance on how to choose tools and increase the accessibility.

ï Improve access to internal and external financial support / capital for SMEs, and include sustainability aspects in financing.

ï Competence is a key factor, meaning that different competences and "roles" are needed for successful innovations. Possible measures are to o improve internal competence o increase competence to increase willingness to introduce innovations o Increase competence in networking and in utilizing research results including better connection to academic research, o Provide support for external competence in specific questions, e.g. a system where small questions can be answered by experts free of charge o Provide better access to competence in intellectual property – IP.

ï Support for demonstration of innovative solutions including verification and export, which is only partly available

ï Public procurement should support sustainable innovations.

ï Easier access to, and a clearer picture of, governmental programs for SMEs. The governmental programs should better than today promote sustainable innovations (Zott, 2008).

CONCLUSION

Each top management of the company has a responsibility and duty to implement the strategies that will enable company to grow and prosper. The critical role that sustainability will play in establishing strategic advantage has already begun. In this sense, most business experts anticipate that sustainability will force companies to rethink their business models to make their products, technologies, and processes more sustainable—not just to achieve regulatory compliance or engender goodwill, but to remain viable and successful.

The challenge for each company is now to face how to go about translating your company's strategic sustainability goals into effective action throughout design management tools. Secondly, how can the management promote a sustainability strategy internally? Thirdly, how can the management demonstrate that implementing sustainable design makes sense from a business standpoint? Finally, how can management inculcate sustainability into corporate culture without handicapping existing business model?

To answer these questions, they need more than just assumptions regarding environmental impacts. The management need to be able to compare the consequences of staying it's current situation with the advantages of doing things differently – in sustainable design way.

REFERENCES:

Baumgartner, R.J., Korhonen, J. (2010). Strategic thinking for sustainable development. Sustainable Development, 18, p.71-75.

Berginc Jordan (2014) A comparison of design management approaches as a part of companies business models: A contemporary theoretical approach. ALICE 3rd conference proceedings, Faculty of design, Ljubljana p.2

Broman, G., J. Holmberg, and K.-H. Robert. (2000). Simplicity Without Reduction - Thinking Upstream Towards the Sustainable Society. Interfaces: International Journal of the Institute for Operations Research and the Management Sciences. P.30.

Charker Martin, Tom Clark (2007). Sustainable Innovation, Key Conclusions from Sustainable Innovation Conferences 2003-2006 organised by the Centre for Sustainable Design. The Centre for Sustainable Design, University College for the Creative Arts.

Dassault Systems., (2015) Drive growth and innovation through sustainable design. Solid works brochure

Hilke Bos-Brouwers (2010), Sustainable innovation processes within small and medium-sized enterprises, Vrije Universiteit, ISBN: 9789086594733

Kungl (2010). Ingenjörsvetenskapsakademien (IVA), Innovations, Entrepreneurship and growth, ISBN: 978-91-7082-817-1

Omer Rana (2011), Tools for implementing sustainability in the innovation process at small and medium-sized enterprises (SME), Master Thesis at Linköping University

Robin, Roy. (2000). Sustainable product-service systems. Futures 32. p. 289-299.

UPA. 2010. What is User-Centered Design and Sustainability principles. Available from https://en.wikipedia.org/wiki/Sustainability (accessed 10 September 2018).

Willard, Bob. (2005). The Next Sustainability Wave. Canada, New Society Publishers, Chapter 4: p.129-161.

Zott, C. and Amit, R., (2008). The fit between product market strategy and business model: implications for firm performance. Strategic Management Journal, 29, p.1-26.

RESEARCH OF SOCIAL RESPONSIBILITY IN DESIGN MANAGEMENT PROCESSES

–

Gruden Veronika, Msc.,
Head of Department for
Design management,
Faculty of Design,
Associated member of University of Primorska,
Trzin, Slovenia

Abstract: The paper examines the aspect of social responsibility (SR) and its importance in the management of design processes. Nowadays, SR is one of the most significant concepts for a company´s success, as companies subdue their strategies to the expectations of a wider society, thus fulfilling an important condition for acceptance and coexistence with local communities, increasing their own competitive advantage and ensuring transparent and sustainable operation. The latter is especially important for organizations that are aware of the added value of design and implement design in their management, thereby increasing their competitiveness and strategic position on the market. Just as the level of awareness among the end users of products and / or services is increasing, so is the level of difficulty in managing design (i.e. design management, hereinafter DM), which requires taking into account not only the economic, but also social, environmental and cultural aspects of this process. In doing so, new competences, skills and methods of operation and thinking are being developed, which must all be mastered by design managers. The purpose of the paper is to identify the significance and characteristics of the DM approaches for promoting socially responsible design solutions. The objective of the paper is to study the DM in the context of social responsibility and explore the possibilities for the creation of a new DM model that takes into account socially responsible aspects. We conducted a qualitative survey, namely a study of foreign professional literature, with an emphasis on the analysis of research by foreign authors. Based on a study of literature and research from the subject area, we summarized the key findings and answered the raised research question "How do the factors of social responsibility influence the implementation of DM processes?" The research is useful for all organizations that strategically plan their DM, as it provides a deeper understanding of the DM, determines its significance, characteristics, and identifies the gaps between the various DM approaches in the context of social responsibility.

Keywords: Design / Design Management / Social Responsibility / Companies

1. INTRODUCTION

Nowadays, design has become the central means of identifying an individual, since everyone in the society is under the constant influence of design achievements. The aesthetics of design personalizes and increases the usability of objects and shows their importance (De Mozota, 2016 in Gruden, 2016, p. 30). More and more companies therefore recognize design as a valuable tool for achieving strategic goals and competitive advantages. The latter has already been identified by Philip Kotler (Kotler & Rath, 1984 in Bruce & Cooper, 1997, pp. 204–206), and studies carried out (especially in the United Kingdom, Scandinavia and the USA) have shown that design actually has a positive impact on business performance in terms of higher returns, quoted value, and exports. In addition, at the macroeconomic level, there is a strong positive link between the use of design and the competitiveness of the domestic market. At the same time, with the increasing importance of design, the need for understanding the tools for planning and implementing the processes of DM appeared in companies, as they have become increasingly complex and increasingly demanding. Best (2010, p. 9) argues that bringing any product, service or experience to market requires extensive input and support from a wide range of different people, with different areas of expertise, capabilities and skills, among which an important place is the competence of literacy in the area of corporate social responsibility (CSR), since society increasingly recognizes the need for sustainable products and socially responsible services.

The idea of socially responsible design solutions has developed side by side with the concept of CSR to encompass social, economic and environmental issues (Cooper, 2005). Consumers, producers and, ultimately, designers are becoming more and more aware that each of their products or services affects the global environment. Current DM approaches do not necessarily include socially responsible aspects in theory and practice, therefore, there is a need for more socially responsible business models that will help designers, design managers and their teams understand these aspects in order to develop more socially responsible and sustainable solutions (Koklacova & Volkova, 2017, p. 101). The purpose of the paper is to identify the significance and characteristics of the DM approaches for promoting socially responsible design solutions. The objective of the paper is, upon the research in foreign professional literature, and with an emphasis on the analysis of research by foreign authors, to study the DM in the context of social responsibility and explore the possibilities for the creation of a new DM model that takes socially responsible aspects into account.

2. THEORETICAL FRAMEWORK

The concept of "design management" first appeared in 1965 in England, at the Royal Academy of Arts, when design was already recognized as a strategic asset of the company. In 1966, the first book related to the field of DM by Michel Farr, was published. It was only in 2011 that the first academic conference Cambridge Design Management was organized, which indicates that the academic sphere has also recognized this research area. There are numerous definitions of DM in the literature, which illustrate the synergy between the creative and the business field. Kootstra (2009, p. 9) defines the concept of DM which relates to certain management activities, methods and skills that are required to optimize and manage design process. Kootstra also claims that DM, as a professional field, focuses both on visual and non-visual aspects, where visual aspects stand for the manifestation of the brand, product, and non-visual aspects cover the development, production, distribution, sale, supply or service of products.

Design Management Institute (DMI) states that DM involves the implementation of processes, business decisions and strategies that enable innovation and create efficiently designed products, services, communications and brands that improve quality of life and ensure the success of the company (Best, 2015 in Koklacova & Volkova, 2017, p. 104). Wolff and Amaral (2016, p. 145) understand DM as "the deliberate use of design as a tool for the design, production and sale of goods in order to implement the company's strategic goals in products and services, which differentiates the company from its competitors, thereby improving organizational efficiency. Similarly, DM is defined by Borja de Mozota as "the implementation of design as a formal program of activity within a corporation by communicating the relevance of design to long-term corporate goals and coordinating design resources at all levels of corporate activity to achieve the objectives of the corporation" (Borja de Mozota, 2003, p. 71). There is a range of DM aspects that can influence the way in which design is integrated and managed by a company. Borja de Mozota (2003) defines these as operational, functional and strategic levels. At an operational level, the main activity is administering individual design projects. At functional level, design is structured and integrated into all business functions and at the strategic level the design thinking is used as a means to achieve innovation and a longer-term design vision is incorporated into corporate activity. In this regard, Topalian notes that the organization needs to manage design at the same level at the same time, both at the corporate level, as well as at the project level (Topalian, 1994 in Koklacova & Volkova, 2017, p. 104). In the research and implementation of DM in companies, two models have been established, i.e. model "design ladder," developed by the Danish Design Center. The model envisages four stages of design inclusion in the company's operation (no use of design, design as a project, design as a process and design as a strategy). Another model that was developed as part of the research of Design Management Europe is the "staircase model," which is also a four-level model (no DM, DM as a project, DM as a function, DM as a culture), but the key difference is that the four stages in the DM staircase are defined on the basis of five factors, which makes the design of the DM staircase in the company more explicit. The second difference is that in the staircase model, the focus is more on DM, rather than just on the use of the design. In both models, it is clear that the company at the highest level emphasizes the strategic importance of design (Kootstra, 2009, p. 12).

In addition to the above mentioned models, Westcott et al. also mentioned the DM at three levels: the strategic level (corporate level or enterprise-wide), the tactical level (business level or individual business units), or the operational level (individual project level). According to Junginger, design might be a driver, depending on the purpose of design: as a tactical driver (Aesthetics / Function), as an organizational driver (Connector/ Integrator), as a strategic driver (Business Models / Markets) (Westcott et al., 2013). Designence Model, developed by Borja de Mozota (2003, p. 75), suggests that conceptual schemes and management paradigms can serve as a starting point for convergent design development model which is based on two aspects: reactive (managerial) and proactive (strategic) (Borja de Mozota, 1992). The managerial

approach includes a design principle, accompanied by economic concepts. The basis of this approach relates to a thorough review of all management paradigms in order to select those ideas that will most fully address the corporate image of the company. This can be achieved by linking design with key product concepts, branding, identity and managing innovation. This aspect takes into account different theories in the study of management-scientific, behavioural, situational, etc., which help us to enrich the practical relevance of DM. The strategic approach involves an overview of the design as a new paradigm in order to come up with an idea and method that can be used to improve the effectiveness of management in general and in this context to the effectiveness of DM. This requires the understanding of design elements such as shape, colour, aesthetics, sociology of objects, etc. Such a vision of organizational reality stems from the "science of design" as a system of governance based on form which is above all very interpretative and, as such, can significantly contribute to improving the company's business strategy and vision (Borja de Mozota, 1992, pp. 19-25).

2.1. LITERATURE REVIEW

In order to better understand the connection of DM processes with social responsibility, it is necessary to emphasize the importance of socially responsible activities for the company. Social responsibility consists of ethical, legal, economic and philanthropic expectations that the participants in the company, at some time interval, expect from the organization (Caroll & Schwartz, 2003). Potočan and Mulej (2007, p. 130) define social responsibility as the responsibility of all business entities (especially owners, managers and experts) for the planning and implementation of actions aimed at realizing needs and interests of external environment of an organization (natural, business and social) and its internal processes. According to a survey by Bain & Company (2013), awareness-raising organizations understand the quest for social responsibility as a situation that brings a universal benefit, while not reducing their profitability. In organizations, through socially responsible behaviour, they express their character, as it serves as an innovative means of improving relationships with users. From this point of view, we can understand the concept of co-design, where designers have engaged effectively with communities and then co-designed and co-manufactured a solution that utilises local or regional materials, craftsmanship and expertise, facilitates new skills and knowledge acquisition, empowers the community and allows the user to »own« the solution (Melles, De Vere & Mišič, 2011, pp. 143-158). Melles, De Vere & Mišič also argue that in socially responsible projects, design is seen as the means to empower the users' and designers' attempt to develop products (and/or systems and services) that address the holistic needs of the society. Morelli (2007, pp. 3-21) argues that co-design and participation of civil society are required for sustainable product innovation. Creating synergies can bring greater benefits to organizations, especially in terms of a positive public image, innovative products and services, highly skilled and mo-

tivated employees, and the prospect of penetrating on new markets. Corporate responsibility can be used by organizations to upgrade the brand, thus gaining a competitive edge over other organizations (Doebele, 2005). In order to increase their competitiveness through the implementation of socially responsible principles, companies can connect with different anti-globalization, consumer, environmental and similar non-profit associations and include social and environmental programs and ethical standards into their operations (Ahmad, 2012. p. 1). Such activities also strengthen the social capital of the organization, since they can be fully integrated into the local or wider community. The latter is particularly important in the development of social and environmental projects in the organization (Jančič, 2002, pp. 4–7). Kathryn Best (2010, p. 16) argues that organisations that take CSR to heart within their management structures and product and service offers are able to offer costumers clear evidence of how business can benefit the society and the environment and influence local and global political agendas. But this can happen only if the DM process is well-managed, enabling businesses to take advantage of the design for innovation (Knoskova, 2011 in Koklacova & Volkova, 2017, p. 105). The European Commission also classifies DM in the field of innovation management, and companies need innovation capability to respond to new market opportunities or threats (Kootstra, 2009, p. 9). Borja de Mozota (2003, p. 115) argues that "successful innovation requires the improvement of products and organizational processes. Design is value-created in both areas for its superior product quality and its superior NPD (new product development) process." This process is already used in companies through implementation of design thinking methods. Through design thinking process, experts develop design competences that lead them to evaluate both old and new ideas, methods and products. Properly applied, these competences can teach them also how to promote the use of design to care for and sustain our environment, improve social conditions, and respect diversity. Kotler and Rath (in Bruce & Cooper, 1997, pp. 204–206) argue that well-managed, high quality design offers the company several benefits such as corporate distinctiveness, personality for a newly launched product, reinvigorating the product interest, communicating value to the consumer, making selection easier, informing and entertaining. With the right DM strategies, visual impact of the product can be heightened, information efficiency is greater and consumer satisfaction is considerable. These areas often work with their own culture, their own values and opinions, and their own dynamics, so Libânio, Amaral & Migowski (2017, p. 195) defined several features for the design manager, such as leadership, entrepreneurship, vast technical knowledge, specific competencies, managerial abilities, proactive profile, capacity to coordinate, in addition to being motivating and capacity to influence the team. Boland and Collopy (in Libânio, Amaral & Migowski, 2017, p. 196) emphasize that design experts have the opportunity to formulate possible solutions to emerging problems arising from a natural, social or business environment. According to Kusz (2005, pp. 29-26) designers daily make decisions about the use of re-

sources and life cycles of products and services, and the way businesses or brands are perceived. In his opinion, designers are essential to the promotion of CSR. Social responsibility stems from the values and standards of designers and ethical standards of the company, but it also responds to the needs of end users who expect products that are more functional, more reliable, safer for the user, more environmentally friendly and still attractive.

3. METHODOLOGY

The article can be defined as a scientific article, where we used the qualitative method of research, in particular, the analysis and interpretation of secondary sources, as described by Zelenika (2000, p. 338). We used the description method (we set definitions, described facts and the theory), the method of summation (we summarized the facts of other authors and their research, which will be the starting point for our research), the method of comparison (we compared different methods, approaches and research by other authors in the field of social responsibility, organization management, design and DM, etc.) and the method of compilation (we formed a synthesis of findings based on the views of other authors). The selection of appropriate literature was carried out by including the main academic bibliographic databases, for example, Elsevier, Emerald, Ebsco, Springer and DOAJ, and Cobiss and DIKUL. We wanted to get as many quality professional articles as possible. To help identify the appropriate articles, we created the following questions:

1. How is the concept of DM understood?

2. What is the correlation between DM and the concept of social responsibility?

3. How do the factors of social responsibility influence the implementation of DM processes?

4.) What are the design manager's competences relevant to the implementation of socially responsible projects?

5.) What obstacles will we encounter in exploring the concept?

6.) Are there opportunities for further research?

In searching and identifying possible literature we used key words, such as social responsibility, sustainable development, design, DM, organizational management concepts, quality standards, design thinking, etc. We found that there are many publications on the topic of our research field, and we mainly used the presentations abstracts which were sorted according to key words. Classifying the articles, we took into account the year of publication and the impact factor of the publication, where possible.

4. RESULTS

The findings of the research related to the review of CSR literature in the processes of DM were based on a wide range of definitions of the terms "design management" and "social responsibility." The thread of both concepts is based on the success of companies in recognizing the concept of social responsibility in terms of managing relationships with stakeholders and the environment, in recognizing the importance of design, in terms of managing the design process, which is related to internal and external stakeholders. Socially responsible (SR) design has developed side by side with CSR as a strategy to improve products, profits and brand equity. On the other hand, through dialog with the civil society, the purpose of design has expanded to meet new challenges, to develop strategies that lead to sustainable business and product models. This is the key point of connecting SR with design, defined by designer Richard Seymour during the Design Council's Design in Business Week 2002, titled "Making things better for people." It emphasizes that design activity is focused first and foremost on human behaviour and quality of life. According to Cooper (2005, p. 10), socially responsible design has developed side by side with CSR and widening of the definition of sustainability to encompass social, economic and environmental issues. Papanek (1991) argues that sustainable designers have to deal with environmental issues (the output of greenhouse gases, acid rain, pollution of soil, habitat and species decimation, etc.), so they are able to realize that every product and service they bring to the market has some impact on global environment and resources. Common to all definitions that have been reviewed is the fact that the concept is focused primarily on achieving goals and objectives of the organization, which should have beneficial effects on the society as a whole. The central themes of the reviewed literature touched on the research of various meanings of DM in the organization, which also envisages cooperation with the environment in which they operate. The reviewed literature focused on studying relationships with stakeholders. As an element of social responsibility, the vast majority refers to the organizations ethics and project management. These factors encourage designers, and in particular design managers to define their own responsibilities and competencies that are necessary and important for the company's socially responsible operation. The study also examined several different models for the implementation of DM in companies, and it was found that most models recognize at least three common processes, namely, DM at the level of individual projects, which could be an operational level in terms of aesthetic function, secondly, the DM at the level of processes in individual departments (development, marketing etc.) and thirdly, at the strategic level of management, where the design is already included in company strategic documents and is aiming to become a culture of organization.

5. CONCLUSIONS

DM can be considered as the implementation of design in the application of activities within the corporation, with the aim of designing and achieving long-term goals and company strategies. According to the results of the research, companies are more successful if they succeed in successfully exploiting the design potential and linking the business and creative field. The goal of DM is to develop and maintain a business environment in which companies are able to implement their mission – through design. Recently the mission of companies has been closely linked to social responsibility, which implies the organization's responsibility for the impacts of its decisions and activities on the social and natural environment. Social responsibility of the company can be communicated through its products, services, therefore, it is important that design creations at all levels of the company are properly guided. The latter means the coordination of resources for the implementation of design projects at all levels. Much of the design process takes place in cooperation with experts from other areas, so that the direct impact of design on the final result is difficult to completely separate from other functions. Some of these impacts, such as the ease of use and the attractiveness of products, are clearly related to design, while others, such as improving innovation processes and working conditions, product safety and so on, are connected with other stakeholders in the company. The business strategy is thus dependent on common synergies of different functions (R&D, marketing, human resource management, design ...). In the foreground, design managers also need to be competent in the field of social responsibility. The research is useful for all organizations that strategically plan their DM, as it provides a deeper understanding of the DM, determines its significance, characteristics, and identifies the gaps between the various DM approaches in the context of social responsibility. Our research only covered a part of the field as it is a very broad and multidisciplinary concept, with emphasis on cooperation between designers, design managers and companies and a wider environment, which can make a key contribution to sustainable development. Further research will be possible in the direction of the environmental and economic aspect of this broad paradigm, more specifically, focusing on managing individual processes within the company, on the competences of design managers and innovation processes.

REFERENCES:

Ahmad, J. (2012). Can a university act like as a corporate social responsibility driver? An analysis.. Social Responsibility Journal, 8 (1), 77-86.

Best, K. (2010). The Fundamentals of Design Management. Lausanne: AVA Publishing SA

Borja de Mozota, B. (1992). Design Education and Research: A Theoretical Model for the Future. DMI Review 3 (4), pp. 19-25.

Borja de Mozota, B. (2003). Design management. New York: Allworth Press

Bruce, M. & Cooper, R. (1997). Marketing and Design Management. London: Thompson Business Press.

Cooper, R. (2005): Ethics and Altruism: What Constitutes Socially Responsible Design? Design management Review 16 (3): pp. 10-18

Doebele , J. (2005). The importance of corporate responsibility. The Economist . Najdeno na: http//:www.graphics.eiu.com/files/ad_pdfs/eiuOracle_CorporateResponsibility_WP.pdf.

Gruden, V. (2016). Dizajnerji danes oblikujejo prihodnost podjetij. Lesarski utrip 22 (159), pp. 30-31

Jančič, Z. (2002). Nova družbena odgovornost podjetij. Industrijska demokracija, 12 (4).

Kootstra, G.L. (2009). The Incorporation of Design Management in today´s business practices, An analysis of design management practices in Europe. Rotterdam: Centre of brand , reputation and design management, Innholland, University of Applied Sciences.

Koklacova, S., Volkova, T. (2017). Design management in the context of social responsibility. Journal of Business Management 12, pp. 101-112.

Kusz, J. (2005). When "Good" Design Means Responsible Design. Design Management Review 16 (3), pp. 29-36.

ibanio, C., Amaral, F. G. & Migowski, S.A. (2017). Classification of competencies in design management: Individual, collective and organizational levels. Strategic Design Research Journal, 10 (3), pp. 195-203.

Melles, G., De Vere, I., Mišič, V. (2011). Socially responsible design: Thinking beyond the triple bottom line to socially responsive and sustainable product design. CoDesign 7 (3-4): pp. 143 – 158.

Morelli, N. (2007). Social innovation and new industrial contexts: Can designers "industrialize" socially responsible solutions? Design Issues 23 (4),pp. 3-21.

Papanek, V. (1991). Design for the real world: human ecology and social change. Revised 2nd ed. London: Thames & Hudson.

otočan, V.& Mulej, M. (2007). Družbena odgovornost trajnostnega podjetja. Organizacija, 40(5).

Westcott, M., Sato, S.,Mrazek, D.,Wallace, R.,Vanka, S.,Bilson, C. & Hardin, D. (2013). The DMI Design Value Scorecard: A new design measurment and management model. Des. Manag. Review 24, pp. 10-16.Wolf, F., Amaral, F.G. (2016). Design management competencies, process and strategy: A multidimensional approach to a Conceptual Model. Strategic Design Research Journal 9 (3), pp. 145-154.

Zelenika, R. (2000). Metodologija i tehnologija izrade znanstvenog i stručnog djela. Rijeka: Ekonomski fakultet.

SUSTAINABLE CONCEPTS AND FENG SHUI

–

Assist.Prof. KRYŽANOWSKI Špela, Ms.C., Arch.
Arhitelje nova d.o.o.
Faculty of Design,
Associated member of University of Primorska,
Trzin, Slovenia
spela.kry@gmail.com

Abstract – In addition to anthropological research, the field of feng shui research in conjunction with modern sustainable concepts is certainly one of the most current ones. Among the principles of feng shui and sustainable concepts we can find many common points. Feng Shui has contributed significantly to the stable and sustainable development of Chinese farming society, but Yoon first began to connect sustainable concepts with feng shui in the 1990s, which coincides with the growing awareness of environmental problems. This Chinese traditional worldview contains concepts of ecological thinking that place the economy in a wider social ecological context. In the articles dealing with concrete objects and arrangements in terms of sustainability and feng shui, we find two approaches. In the first authors study traditional objects and arrangements in line with the recommendations of feng shui and try to upgrade and / or build on the basis of the obtained data, to improve the existing sustainable design practice. In the second case, modern objects or arrangements are presented, which are built according to modern sustainable principles (without the explicit use of feng shui) and are subsequently analyzed from the perspective of feng shui. The purpose of these analyzes is to show that the selected recommendations of feng shui (especially in relation to school of form) and modern sustainable concepts are largely overlapping.

Key words: Sustainability / Feng Shui / Scientific Research

1. SUSTAINABLE CONCEPTS AND FENG SHUI

In addition to anthropological research, the field of feng shui research in conjunction with modern sustainable concepts is certainly one of the most current ones. This is understandable because there are many common points between the principles of feng shui and sustainable concepts. Thus, some of the anthropological researchers of feng shui are also concerned with sustainability and ecology. For Eitel, the foundation of feng shui represents the understanding of the structure of nature (Eitel, 1993: 2-4, in Wang, 2012: 24). For Anderson (Anderson in Anderson, 1973: 127), feng shui is one of the aspects of Chinese cultural ecology, which in a pragmatic and modern ecology similarly directs the use of space and resources. For Freedman (Freedman, 1979), feng shui is a mystical ecology, in which the universe is permeated with living forces, and where each construction constitutes a disruption in the existing balance of nature and society. For Han (Han, 2001), feng shui is a holistic way of choosing a location. It includes ecological and evolutionary values, that are important for choosing an optimal human habitat. Han lists 22 criteria which, from the point of view of feng shui, are crucial for choosing the ideal location. He also agrees with Yum that feng shui has made a significant contribution to the stable and sustainable development of the Chinese agricultural society with a quality choice of accommodation. Chen and Nakama, in the paper A Summary of Research History on Chinese Feng Shui and Application of Feng Shui Principles to Environmental Issues (Chen and Nakama, 2004), state that

feng shui has had a positive impact on the sustainable development of China, but it was Yoon (1980) that formally began to connect sustainable concepts with feng shui in the 1990s. This coincides with the growing awareness of environmental problems. Jenkins (Jenkins, 2002) highlights the moral dimension that is lacking in the modern neoclassical economy. He points out that the Chinese traditional worldview contains concepts of ecological thinking that place the economy in a wider social ecological context. Dan (Dan, 1994) explores the environmental impacts of feng shui on the built environment. Through the analysis and integration of ecology and feng shui he develops a tool for integrating human and ecological design. Chen (Chen, 2013) derives from modern ecological theory and uses it to scientifically analyze feng shui and highlight elements of rationality in it. In this way, he tries to create a new, modern ecological paradigm with Chinese characteristics. Huang and Fang (2013) in their work Developing concentric logical concepts of Environmental Impact Assesment Systems: Feng Shui Concerns and Beyond use feng shui techniques (eg five elementary levels and 8 hexagrams) in order to improve the practical application of impact assessment systems in environment (EIA - Environmental Impact Assignment). Xue's model, developed under the doctoral dissertation (Xu, 2003), connects feng shui and sustainability. Using the model, it analyzes the location from the perspective of various modules, among which the environmental module is the most important (it includes climate, geology, hydrology, topography and vegetation). In the analytical part of the doctoral dissertation, Xu also makes a comparison between the recommendations of feng shui and contemporary environmental design concepts. In the end, the acquired data corpus is entered into the SiteOne program, which enables architects to provide qualitative analysis of several different design solutions in the early stages of design.

As we shall see later, some pioneers of a sustainable way of thinking have also been inspired by holistic Eastern philosophies. The fact is that, at the time when the traditional feng shui was created and developed, environmental problems, as we know them today, were not present. Sometimes people were at risk from nature and wildlife, but today it is the opposite. Through its entire history, China has been facing the problem of the rapidly growing population and the related problems of resources, settlement and consequently (especially in recent decades) also pollution. Some researchers therefore argue that in feng shui the tool was primarily focused on the quality survival of the individual and society, and not in the protection of the environment. Thus, when dealing with feng shui from the perspective of modern concepts, we meet with an interesting paradox. On the one hand, traditional Chinese philosophy is often cited as the starting point for the development of modern sustainable concepts, and on the other hand, it is evident that this holistic view of the world failed to prevent the severe degradation of the environment facing modern China.

In the articles dealing with objects and arrangements in terms of sustainability and feng shui, we find two approaches. In

the first authors study traditional objects and arrangements in line with the recommendations of feng shui and try to upgrade and / or build on the basis of the obtained data. to improve the existing sustainable design practice. In the second case, modern objects or arrangements are presented, built according to modern sustainable principles (without the explicit use of feng shui) and are subsequently analyzed from the perspective of the feng shui. The purpose of these analyzes is to show that the selected recommendations of feng shui (especially in relation to school of form) and modern sustainable concepts are largely overlapping. There is no clear dividing line between feng shui and architecture and feng shui and sustainable concepts. The scale on which authors are studying is very large and ranges from the level of the landscape, through the city level, villages to analyzing an individual object. Therefore, the concepts of Daoism and Confucianism, which are most often quoted as the inspiration for sustainability, are presented first, followed by an analysis of contributions that deal with feng shui and sustainability at the level of the building, and ultimately the analysis of contributions dealing with feng shui and sustainability at the level of the landscape.

1.1. CONCEPTS OF TRADITIONAL CHINESE PHILOSOPHY IN CONNECTION WITH NATURE, ECOLOGY AND SUSTAINABILITY

Mary Evelyn Tucker (Snyder, 2006), one of the most prominent authors in the field of exploring the world's religions and ecology, who together with her husband founded the Forum for Religion and Ecology, has among others contributed Daoism and Ecology: Ways Within A Cosmic Landscape and Confucianism and Ecology: The Interrelation of Heaven, Earth and Humans. Tucker perceives Daoism and Confucianism as organic, vitalistic and holistic, and the universe is viewed as a dynamic, continuous process of eternal change (Tucker, 1994 in Snyder, 2006: 104). Usually, most researchers of sustainable concepts and traditional Chinese philosophies relate to Daoism and not to Confucianism. The latter is usually understood as a humanistic (anthropocentric) tradition, with the main emphasis on the relationship between the individual and the family, the society and the ruler. Nevertheless, Confucianism perceives man as part of a universe, which works together with heaven and earth in a harmonious relationship, in the desire to create a harmonious society. In this sense, Confucianism is still completely opposed to the western Cartesian dualistic separation of spirit and matter.

But researchers of sustainability turn more to Daoism. Daoist philosophy is itself inherent in nature and inspired by it. Daoism is not a uniform philosophy, but it is just like feng shui a collection of beliefs, whose central point is Dao. Dao (the term literally means the way) is supposed to represent the origin, pattern and substance of everything that exists. Dao emphasizes wu wei (or inaction) and spontaneity. In Jiying it is described as the flourishing of nature itself. Nature is the central theme of Daoism and is understood slightly different-

ly than in the west, where the notion of nature is mostly a wilderness, with spatial and material aspects. Nature in Daoism often means that which is beyond the material. In the article, Taoism: The Way of Nature (Marshall, 1992 in Snyder, 2009: 114) Marshall points out, that nature represents the whole universe, from which also man and a daoistic society arises. Ames in article Taoism and the Nature of Nature (Ames, 1986 in Snyder, 2009: 114) presents wu wei as a model of creative cooperation, that is in harmony with the surroundings. According to Laei wu wei stands for responsible action. The fundamental objective of ecological sustainability can only be achieved through altruistic action in favor of the universe, not merely for the benefit of the individual (Lai, 2001 in Snyder, 2009: 115).

Some researchers, for their inspiration for sustainable behavior, turn directly to Chinese popular religions and practices. Meyer argues (Meyer, 2001 in Snyder, 2009: 122) that, for the implementation of a sustainable ethos, Daoism is inadequate because it is elitist and direct knowledge of the nature of nature is attainable only to the chosen ones through the mystical experience. He finds better the practice of Chinese traditional gardening, which is an example of cooperation between man and nature. When arranging gardens it is not just about controlling nature, but nature is perceived as an active partner. For Fields (Field, 2001 in Snyder, 2009: 122) feng shui is the best basis for the development of ecological ethics, and at the same time this practice is more widespread than, for example, Daoism or Confucianism. Bruun shares similar opinion in Fengshui and the Chinese Perception of Nature (Bruun, 1995: 173 in Snyder: 123). Yoon in The Image of Nature and Geomancy (Yoon, 1980) says that nature in feng shui appears in three images: magical, personalized and vulnerable. The magical image of nature is one that creates magical powers with which it affects human beings. The personalized nature is perceived as a functioning system consisting of living organisms and non-living matter. Vulnerable image of nature shows, that it can be destroyed or revived through human activity. It is this concept of nature, the totality of the universe as a living entity, each part of which is alive, permeated with the life force qi and interconnected, that distinguishes traditional Eastern philosophy from the western materialistic dualistic perception of nature and the world.

1.2. SUSTAINABLE CONCEPTS AND FENG SHUI ON THE BUILDING LEVEL

One way in which feng shui can contribute to the development of sustainable concepts is also the study of traditional buildings and arrangements. Lau and colleagues in the Sustainable Design and Its Simplest Form study (Lau et al., 2005) presents the findings of a field analysis of traditional houses from Hakka village in Fujian Province, China. The specialty of these houses is that they are gathered from the earth and have round or rectangular layouts. Researchers also use feng shui to help understand and link the results of the study with modern sustainable concepts. The most important sus-

tainability message of the study is simplicity and respect for nature. Another similar study focuses on traditional Korean houses, which take into account local feng shui (Shin and Lim, 2013). The researcher focuses on the elements of passivity in traditional houses, which could be used in the design of modern passive houses. An example of the project, which should link the traditional feng shui part of the village with the modern extension, is an article of Xia Futou's Public Bathhouse - A Sustainable Urbanization Experiment in a Chinese Village (Lu, Li and Zhang, 2008). The new public bathing ground should take into account the sustainable principles of construction and, together with the old part of the village, preserve the image of the traditional cultural landscape. It is an example of how traditional villages can turn into more sustainable urban structures.

Mak analysis selected traditional buildings, but also deals profoundly with the analysis of modern sustainable buildings and their compatibility with the recommendations of feng shui. A study summarizing the analysis of 31 business buildings in Sydney (Mak, 2017) and other sustainably-designed office buildings are presented in Sustainable Design and Feng Shui: A Case Study on Fan Office Building and Sydney (Mak and Ge, 2010) and Feng Shui: A Chinese Perspective of Sustainability (Mak in Ge, 2012). Mak is looking for points of connection between feng shui and modern sustainable concepts. Therefore, it defines five concepts of feng shui related to sustainability and examines how they appear in modern Sydney business houses. The five concepts are: the connection of the sky and man, the five elementary phases, the harmony of the yin and the yang, the school of form model and the balance between the interior and the exterior. The connection between heaven and earth deals with the harmony of the universe, earth, and man. All that exists is supposed to belong to one of the five elemental phases or their combination. The phases can be in a harmonic or disruptive relationships. With the harmony of yin and yang in space, we are supposed to support harmony in the user's life. With the so-called model of the school of form, Mak describes the combined concept of five geographical secrets and four emblems (five animals). With the concept of interior and exterior spaces, Mak describes four design modules: the wider surroundings, the immediate surroundings, the design of the building and the interior. He applies these five concepts to CBA business buildings, Workspace 6 and No. 1 Bligh Street. The eight-storey CBD building is located in the Sydney port of Darling and is an example of state-of-the-art sustainable approaches in the field of environmental protection as well as in the field of economy and social relations. It is certified according to Green Star (National Environmental Evaluation System) and NABERS (National Environmental Performance System), uses advanced cooling and heating systems, rainwater harvesting and recycling of used water, recycled materials, followed by the concept of mobile workplace and has a community roof garden. According to Mak, from the point of view of feng shui, the innermost atrium, which sums up the inner courtyard of the traditional house, is the most important in design, and in the modern business build-

ing it enables the natural illumination and the playfulness of the building. The central atrium also represents the connection between the sky and the earth, connecting the exterior with the interior and the roof green garden. At the same time, the central atrium should also create a balance between the built (yang) and the natural environment (yin). The central atrium is also feng the most important feng shui element in the analysis of the other forementioned business buildings. The six storey building Workplace 6 is in Darling Quarter and is built to the highest sustainable standards. Equally ecologically effective is N.1 Blight Street, which is a tower with an automated double glazing facade, a local water treatment plant and a central atrium for the entire height of the building. The Malian architect and feng shui practitioner Loo (Loo in Mak & So, 2009: 232) designs his own sustainable and ecological feng shui house model. The feng shui is implemented from the compass school and therefore designs the house on the orthogonal feng shui bagua, the module of 9 equal squares. Each module has a 2.8 m side and can serve as a stand-alone unit or connected together into a bigger unit. The design is modular and flexible. The concept of modules allows for the selection of modules for each family member that are supportive from the point of view of the compass school (taking into account the eastern western system and flying stars). The final design also takes into account the school of form and ecological principles (eg collection rainwater, photovoltaic, green roof, use of ecological and recycled materials).

1.3. SUSTAINABLE CONCEPTS AND FENG SHUI ON THE LANDSCAPE LEVEL

Sustainable development of the landscape is one of the main challenges for Chen, for whom landscape architecture and landscape ecology play a major role. In the contribution titled Sustainable Landscape Architecture: Implication of the Chinese Philosophy of Unity of Man with Nature and beyond (Chen in Wu, 2009) he explores how feng shui can influence the development of sustainable principles in the landscape. He notes that the traditional design principles of the East and West are different, but they are extremely close in terms of sustainability. Erdogan (Erdogan and Erdinc, 2009) and Wang (Wang, 2012) also study the usefulness of feng shui in landscape architecture. Wang notes that feng shui knowledge can contribute to the theory of landscape architecture, especially in terms of sustainability and ecology. Through the evolutionary perspective, the archaeological remains show that the hominids in China were primarily settled in the basins, which in terms of topography corresponds to the feng shui model of five animals. Wang argues that feng shui positively influences the sustainable development of the environment because it incorporates the ideal of harmonious coexistence of man and nature. An example of the analysis of a concrete landscape from the perspective of feng shui is found in the contribution of Wang and Du (Wang and Du, 2012), which analyze the involvement of the historical sites of Changan (today Xian, China) and Heijo-kyo (today Nara, Japan) to the model of

Changan. They find that the landscape around Changan does not correspond to the ideal feng shui model because it is too open. In addition, higher elevations are in the south, as in the hinterland of the city (in the north). The Heijo-kye district of the city corresponds to the ideal Fengshui model, with higher elevations in the north and lower in the south. In none of the cases, there is no structure that could symbolize the dragon. Similarly, the provincial analysis of Seoul and Kaesong in the Korean Peninsula is also carried out by Tembata (Tembata and Okazaki, 2011). Both places are placed on a visually protected terrain that takes into account the ideal model of five animals, opens to the south, has protected hinterland and hips, and the view open up to the distant peaks. From Korea, however, there is an analysis of the transformation of the landscape as a consequence of the recommendations of feng shui (Yoon, 2011). In order to approach the ideal feng shui model, in accordance with local geomantic practice, artificial hills were created (the practice of placing ground or stone mottles was called chosan pibo), planting trees or changing the waterways. The evaluation of the landscape using feng shui is not limited to the Asian cultural circle where feng shui is a part of the tradition. In Iran, the authors (Mansouri Daneshvar, Khosravi in Rezayi, 2013) used the recommendations of the school of form (five geographical secrets and the model of five animals) and the compass school (orthogonal bagua with 8 trigrams) to evaluate the landscape around the city of Shandisi. Based on the results of the analysis, they determine the point of power in the space (cave) and give recommendations on how the existing situation could be further improved. In Colorado, the researcher Xu (Xu, 2016) uses the recommendations of the feng shui school of form to develop four landscape models that can help assess the risk of exposure to floods in the Canyon River canyons. Its model is called the ancient geodesy, inspired by the study of the devastating floods in the area in 2013, which highlight the problem of safe location selection for settlement.

2. FENG SHUI CRITICISM, AS NOT BEING AN EFFECTIVE SUSTAINABLE DEVELOPMENT TOOL

However, not all authors see feng shui as one of the drivers of sustainable development. Bruun (Bruun, 2008: 174) thus falls among those authors who claim that there is no objective evidence that feng shui would help protect the environment in China. As one of the first, Tuan wrote in the essay Dispersions of Environmental Attitude and Bahavour: Examples from Europe and China (Tuan, 1967 in Snyder, 2006: 104). Elvin also notes (Elvin, 1998: 41 in Snyder, 2006: 128) that China has been working on sustainably unsustainable patterns for the last 3,000 years and avoids collapse by mere technological adaptations and spatial expansion. In any case, it is true that the fengshui thinking is holistic (the connection between heaven, man, and earth), and it is also true that Confucianism shares a worldview in which the whole universe is one connected entity. However, Bruun points out that the naturalistic philosophy of feng shui should not be confused with environmental prac-

tices, and that for China, throughout history, there is a huge gap between the theoretical philosophy of the elite on one hand and the practical action of the simple man on the other. At least from the 7th century. Onward, the population growth in China was heavily burdened by the environment (Economy, 2004 in Bruun, 2008). The destruction of the environment has been going on for centuries, but it has become the most dramatic in the last 70 years. Dramatic changes in the landscape that promise wealth and better survival have never been perceived as incompatible with feng shui. Bruno's field experience also confirms (Bruun, 2008: 178) that contemporary understanding of feng shui focuses explicitly on the well-being of people and their domestic animals. There is no room for the well-being of other living beings in this understanding. It is therefore not surprising that, in some areas of China, wildlife virtually no longer exists. Throughout the entire period of communism to date, economic growth and development are on the list of China's highest political priorities.

Regardless of the reasons for and against feng shui, as an inspiration for sustainable action, it is always necessary to take into account the fact that no religion or culture develops in a vacuum but is always a response to concrete historical and spatial circumstances. This must always be taken into account when transferring concepts from other traditions.

3. REFERENCES

Anderson, E., Anderson, M. (1973): Mountains and Water: Essays on the Cultural Ecology of South Coastal China. Taipei, Orient Cultural Service.

Bruun, O. (2008): An Introduction to Feng Shui, Cambridge, Cambridge University Press.

Dan, H. (1994): A Human – Ecology Approach to Environmental Design – An Integrative Human Ecology Design Derived from Chinese Agricultural Cultural Experiences, Journal of Environmental Sciences, 6, 478 – 486.

Chen, B. X., Nakama, Y. (2004): A Summary of Research History on Chinese Feng – shui and Application of Feng – shui Principles to Environmental Issues. Kyushu J. For. Res., 57, 297 – 301. Dostopno prek: https://s3.amazonaws.com/academia.edu.documents/34739834/57po013.PDF?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1544194264&Signature=ZT9nJj8cWdBtqDQ7LFrZnSInWSo%3D&response-content-disposition=inline%3B%20filename%3DFeng-Shui.pdf (25.11.2017)

Chen, X., J. (2013): Modern Environmental Design of Feng Shui Culture Ecological Analysis, Applied Mechanics and Materials, Vols. 361-363, 519-524.

Chen, X. in Wu, J. (2009): Sustainable Landscape Architecture: Implication of the Chinese Philosophy of Unity of Man with Nature and beyond, landscape Ecology, 24, 1015 – 1026.

Economy, E. (2004): The River Runs Black: Environmental Challenges to China's Future, Ithaca, Cornell University Press.

Mansouri Daneshvar, M. R., Khosravi, S. in Rezayi, S. (2013): Ecological Evaluation of landscape Using Feng Shui Theory at Shandiz Urban Region NE Iran. International Journal of Environment Protection and Policy, 1, 32 – 37.

Erdogan, E. in Erdinc, L. (2009): Landscape Design and Feng Shui, Journal of Tekirdag Agricultural Faculty, 6, 291 – 301.

Freedman, M. (1979): Chinese Geomancy in the Study of Chinese Society: Essays by MauriceFreedman. Standford, Standford University Press.

Eitel, E. J. (1993): Feng-shui: The science of sacred landscape in old China.

Synergetic Press.

Eitel, E. (2015): Feng shui, die Urspruenge der Naturwisenscaften in China, Froehling & Froehling.

Han, K. T. (2001): Traditional Chinese Site Selection – Feng Shui: An Evolutionary / Ecological Perspective. Journal of Cultural Geography, 19, 1, 75 – 96.

Huang, K. H., Fang, W. T. (2013): Developing Concentric LOgical Concepts of Environmental Impact Assessment Systems; Feng Shui Concerns and Beyond, Journal of Architectural and Planning Research, 30, 39 – 55.

Jenkins, T. N. (2002): Chinese Traditional Thought and Practice: Lessons for an Ecological Economics Worldview. Ecological Economics, 40, 1, 39 – 52.

Lau, S. S. Y., Garcia, R., Ou, Y., Kwok, M. M., Zhang, Y., Shen, S. J. in Namba, H. (2005): Sustainable Design and Its Simplest Form: Lessons from the Living Villages of Fujian Rammed Earth Houses, Structural Survey, 2005, 23, 371-385. Dostopno prek: https://hub.hku.hk/handle/10722/149372 (28.2.2019)

Loo, K. H. (2009): Sustainable Feng Shui Eco House, prispevek v Mak, M. Y. in So, A. T. (urednika) (2009): Research in Scientific Feng Shui and the Built Environment, City University of Hong Kong Press, 231 – 247.

Lu, H., Li., L. in Zhang, H. (2008): Xia Futou's Public Bathhouse—A Sustainable Urbanization Experiment in a Chinese Village, Journal of Environmental Management, 87, 300-304.

Mak, M. Y. (2017): An Empirical Study of Modern Sustainable Office Buildings in Sydney from the Feng Shui Perspective, Academic Journal of Feng Shui, 1st Symposium Oceania, University of Technology Sydney. Dostopno prek: http://ajofengshui.co.nf/wp-content/uploads/2017/06/Mak_Michael_2017_Empirical_Modern_Sustainable_L_PA.pdf (28. 2. 2019)

Mak, M. Y. in Ge, J. X. (2010): Sustainable Design and Feng Shui: A Case Study of an Office Building in Sydney. Dostopno prek: https://www.irbnet.de/daten/iconda/CIB_DC24655.pdf (28. 2. 2019)

Mak, M. Y. in Ge, J. X. (2012): Feng Shui: A Chinese Perspective of Sustainability, Global Chinese real Estate Congress Annual Conference, Macau. Dostopno prek: https://www.um.edu.mo/fba/gcrec2012/83974183/12203-Mak.pdf (28. 2. 2019)

Mak, M. Y. in So, A. T. (urednika) (2009): Research in Scientific Feng Shui and the Built Environment, City University of Hong Kong Press.

Shin, K. S. in Lim, Y. H. (2013): A Study on Passive Elements of Han – Ok on a Standpoint of Feng Shui Focused on the Old House of Yang Dong Twon, Journal of the Architectural Institute of Korean Planning & Design, 29, 12 – 20.

Snyder, S. (2006): Chinese Traditions and Ecology: Survey Article, Worldviews: Global Religions, Culture and Ecology, 10, 100 – 129. Dostopno prek: https://brill.com/view/journals/wo/10/1/article-p100_5.xml (28.2.2019)

Tembata, H. in Okazaki, S. (2011): Enclosed Spaces for Seoul and Kaesong based on Feng-Shui, Intercultural Understanding, 1, 89 – 97.

Xu, J. (2003): A Framework for Site Analysis with Emphasis on Feng Shui Contemporary Environemntal Design Principles, Virginia Polytechnic Institute and State University, Environmental Design and Planning, Doctoral Dissertation. Dostopno prek: https://vtechworks.lib.vt.edu/handle/10919/29291?show=full (28.2.2019)

Xu, P. (2016): Feng Shui – Ancient Geodesign as a Clue – Identifying Predictive Landform Models of Mountain Flood Impact Zones, Journal Of Digital Landscape Architecture, 1, 141 – 148.

Wang, Y. (2012): A Comprehension of Feng-Shui and Its relevance to Landscape Architecture, Deegree Project in Landscape Planning. Alnarp, Swedish University of Agricultural Sciences

Faculty of Landscape Planning, Horticulture and Agricultural Sciences.

Wang, J. T. in Du, A. L. (2011). The Modern Landscape Architecture Education Using Traditional Feng Shui Theory in China, Third Pacific Asia Conference on Circuits, Communications and Systems (PACCS). Dostopno prek: https://www.infona.pl/resource/bwmeta1.element.ieee-art-000005990330 (28.2.2019)

Yoon, H. K. (1980): The Image of Nature in Geomancy. Geo Journal, 4, 4, 341 – 348.

Yoon, H. K. (2011): Human Modification of Korean Landforms for Geomantic Purposes, Geographical review, 101, 243 – 260.

DESIGN MANAGEMENT AND ITS ROLE IN THE ENVIRONMENT OF SOCIAL RESPONSIBILITY

–

MATIČIČ ZVER Manca
Faculty of Design,
Associated member of University of Primorska,
Trzin, Slovenia
manca.maticiczver@fd.si

Abstract – Design management is a relatively well researched and popular way of managing organizations abroad. Approaches offered by design management are holistic and tend to apply modern methods. The article deals with the analysis of key concepts, the importance and role that the participants in the study attribute to design management in modern, sustainable development, with a special emphasis on social responsibility. The purpose is to identify ways of design management functioning, which promote development and innovation and to research the understanding and importance of sustainable design for society and environment. The results show that in Slovene companies with long tradition an important role is attributed to design management. The presence of its principles can be felt predominantly in the top management, whereas the intensity of modern ways of functioning in production sections is still at its early stage. Nonetheless, design, as an aesthetic element, conveys a strong strategic role in participating companies. Designers are an indispensable integral part of company's development and functioning. The research could not identify Design Management Departments in participating companies nor was there present a post including a Design Management definition. There is a high sensitivity to socially responsible attitudes both inside, and outside of the companies in the region of Slovenia. The research results are of importance in order to further promote DM implementation and sustainable attitude in companies.

Key words: design management/design/social responsibility/strategy

1. INTRODUCTION

Design Management (DM) is a modern principle of managing organizations. It comprises the managerial – economic area, the area of social aspect and environmental area.

For better understanding of the term DM it is necessary to determine concepts such as design and management. Design is determined in SSKJ (Slovene Literary Language Dictionary) as "architectural presenting of a form to an object, with respect to compliance of functionality, aesthetics, and technological process" (SSKJ 2019). Today's concept of DM is much broader now, encompassing not only the architectural area, but all areas of production and service design as well, including marketing sector. European Union Intellectual Property Office (EUIPO) defines design as omni – present and intertwined with art culture and science (EUIPO 2017).

The idea of inter connectivity between science and art within design is also supported by Nigel Cross, who adds that design is a fruit of intuition and creativity (Cross 1989). In view of that Rachel Cooper and Mike Press attributed multidisciplinary value to design. From the scientific point of view, another research can be mentioned – it was presented by Margaret Bruce and Rachel Cooper and was based on market knowledge, along with profit power. They included a sample of 200

small and middle enterprises (SME) that made capital investments in design. The research showed that by re-designing or implementing design in organizations the enterprises were able to cut production costs, increase the stock, the exports increased by 13%, new product sale rose by 40%, the projects were generally more profitable by 90%. According to these figures it can be deduced that design is connected to and an integral part of performance strategy of the company (Bruce and Cooper 1997).

The theory is affirmed by Katheryn Best, who claims that design represents a strategic tool for marketing moves. Further on she interprets beneficial and encouraging results in enterprises that have invested in design. She considers the strategic angle, whereby a good design should be end user and solving problems oriented. From the organizational point of view design encourages multi-level communication (Figure 1), inwardly and outwardly of the company (Best 2011).

Figure 1: Best, Multi-level communication

Design is beyond any doubt inherent to industry, with its cultural touch of passion. They also state that understanding of the concept of design is largely influenced by development and culture (Cooper and Press 1995). It can easily be concluded that Cooper and Press attributed leading properties to design. Nowadays a sensual story with aesthetically sophisticated product or service lures a consumer and convinces them into purchase. Delicately written story that anybody can relate to, triggers the emotions that are skillfully turned into profit by advertising agencies. Design adopts life as soon as it is clad into sensual garments.

Design goes hand in hand with numerous professional and scientific sectors. It acts as a connecting element among different industries and offers space to creative activities. Design Management dates back into the 18th century, when a pottery manufacturer produced stylish tableware. The enterprise was run by Josiah Wedgewood, who, according to K. Best, had a surprising ability of thinking creatively (Best 2015).

Combining technologies, production and design thinking have their roots in the 20th century. The development of the concept of design management has been going on for about a hundred years. In the period of industrialization design acquired a new image, a blend of craft and art, which is now known as an industrial design and was greatly influenced by Bauhaus. The vision of the school was to enable aesthetically and functionally sophisticated products to be available to a broader scope of consumers and not to be limited to high classes only.

Boston Institute introduces design as a strategy, a means of innovation development, communication with the outer world, creation of brands and as a tool of problem solving (DMI 2019).

Design Management Institute (DMI) defines the concept of design management as a path to new innovations and novelties. It advocates a modern concept that is based on communication promotion, team work and positions design as a file rouge of the organization's orientation towards end user. The company's tendency to multidisciplinary cooperation and sustainable development provides competitiveness and encourages economic growth. (DMI 2010)

1.1 SOCIAL RESPONSIBILITY OF DESIGN

Ecologically and socially responsible design is a key to preserving healthy society and nature. Designers are among the most important actors and are responsible for changes, since they are the ones who design products and services (Wahl 2017). Jones defines a paradigmatic shift from irresponsible environment treatment to a responsible one and identifies the principles of responsible design according to McLennan. A sustainable design should respect nature's wisdom. The nature should be a co-designer. A socially responsible design should build on development of healthy habitats for all living beings.

The respect of space should include macro and micro levels, understanding of global changes and biodiversity. The aim is a safe environment for all generations, therefore a thorough knowledge of life cycle plays an important role. Naturally renewable resources and their preservation are of great importance for natural harmony. Through sustainable design and well thought through plans we can pay a tribute to natural sources. Process modernization, holistic approaches and co-operation are key factors to influence our future (Jones 2008, by McLennan, 4-5). By adopting a responsible approach, design can offer solutions to sustainable development, from the social, environmental and economic (Figure 2) point of view of the future.
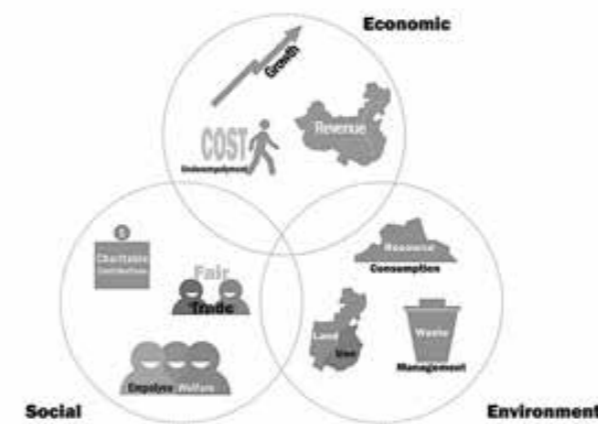

Figure 2: Sustainable Development 3P (tripple bottom line)

The design that is respectable of ecologically responsible actions influences the socially responsible environment. Sustainable design is zero waste oriented, supports recycling and envisages secondary purpose (reuse). Cradle to cradle design requires utilization of materials that, at any stage, whether it be processing or treatment, do not have adverse effect on the environment. On the other hand the specification of sustainable design still follows the direction of reduction and addresses consumers/users to reduce waste (Jones, 2008). The reduction of waste, greenhouse gasses, reuse of products, natural sources, recycling of materials and products are to be the guidelines for all of us.

Desur defines social responsibility in the sense of implementation of responsible strategy (environmental and social) into the company. Its actions should be oriented inwardly and outwardly. The internal features of a socially well organized environment are good communication, motivation, pleasant working environment, and financial goals realization. The outward social organization is presented by good relationships with clients and business partners, voluntary activities (Desur 2019). Carroll's pyramid (Figure 3) of corporate social responsibility determines economic responsibility as a foundation that enables a continuous company's operation. The next level is legislative responsibility, which is followed by ethical responsibility and is topped by philanthropic responsibility. Enterprise's cooperation with the environment and offering support to athletes, artists and scientists is not only a deed of nobility, but also provides competitive advantage (Bertoncelj et al. 2011).

Figure 3 Carroll's Pyramid Source: http://www.academia.edu/419278/The_Pyramid_of_Corporate_Social_Responsibility_Toward_the_Moral_Management_of_Organizational_Stakeholders.: Sustainable Development 3P (tripple bottom line)

K. Best emphasizes the idea that doing the right thing for all of us is becoming a responsibility and a competitive advantage at the same time. Design has a low environment footprint, offers solutions and promotes sustainable responsibility in society (Best 2011).

In order to achieve the environmental approach that supports the capital as well, a cooperation and integration of all interests are needed – the interest of capital, economy, and ecology (Jones 2008).

Further on the analysis of key concepts is conducted, together with the importance and the role that participants of the research attribute to design management in the modern sustainable development, with the stress on sociable responsibility.

The aim of this article is to present ways of DM activities that encourage development and innovation, to explore the understanding and importance of sustainable design for the society and environment. We wish to incite further research in the field of sustainable design and DM to achieve economic stability of enterprises. In this way we hope to explain to Slovene enterprises the importance of design implementation as a strategy for socially sustainable impact.

2. MATERIALS AND METHODS

2.1 METHODOLOGY AND SAMPLE

Qualitative method of collecting data involves a semi-structured interview, in the time frame of 45 to 90 minutes. The participants were invited to take part in research in writing. Interviews were carried out in domestic environment of the interviewees, so as to feel as comfortable as possible and provide most sincere responses (personal approach). The advantage of the interview is that the additional questions encourage the interlocutor to submit specific and detailed data, required for the purpose of research (Toš and Hafner-Fink 1998). During the preparation, execution and storage of the interviews all professional requirements were considered. Interviews were transcribed, adequately marked and archived regarding the groups of interviewees.

Further on the method of content analysis was utilized to perform data analysis (Esterby-Smith et al. 2005). The comparison method (Dimovski et al. 2008) was used to carry out analysis and interpretation of obtained data and is presented in the conclusion.

The sample of enterprises was purposeful. The selected companies are renown for high quality design and are aware of the importance and position of design management for a socially responsible business. Fourteen companies were invited to participate, five of which consented to cooperation: Gorenje, Steklarna Hrastnik, Alples, Terra Urbana and Plastika Skaza. These are enterprises with long tradition, with the exception of Atelier Terra Urbana, which has just entered the international market. The research was being conducted for five months, from February to June 2017.

2.2 RESEARCH QUESTIONS

Three research questions were studied in the article, and were later tested in the empirical part:

Research Question 1: How do respondents perceive design management?

Research Question 2: What importance do respondents attribute to corporate social responsibility?

Research Question 3: What are the interpretations of the existing business practices and policies stated by the respondents?

3. RESULTS AND DISCUSSION

14 questions were formed and divided into three groups: (1) how respondents perceive design management, (2) what importance respondents attribute to corporate social responsibility and (3) what the interpretations of the existing business practices and policies stated by the respondents are. The participating enterprises were, to facilitate interpretation, renamed as A1, A2, A3, A4, A5 for future reference.

3.1 RESPONDENTS' OPINION ON DESIGN MANAGEMENT

In the first set of the survey, the respondents' understanding of the design management was analyzed. The concept represent a holistic management of a project or organization. A1 believes that this type of management encourages communication and co-creates strategy. A2's response was that modern approach to managing a company creates an added value for all shareholders in the company. A4 describes design management as a strategic development of a product and cooperation among designers from the analysis stage to communication with the buyer. A5 added that design management presents a circular way of creating, taking into consideration all information available on the market. The holistic approach present at design management is of great importance for all the respondents. A1 explains that more and more activities are oriented toward this goal. A2 points out that design is part of their vision, as well. A4 considers design crucial for development of finer products, A5 emphasizes the fact that design enables a more realistic judgment and a clearer vision. Design strategy has a great meaning for all the interviewees and design itself is a constituent part of the company's strategy. A2 comments that they have adopted an adjustable strategy that offers an enhanced platform for innovation development. A3 also believes in organization ready to adapt to different projects and is user oriented. With the question in what way design is used as a tool of sustainable development, the respondents were unanimous and stressed the need to be user oriented. A1, A2, A4 and A5 specified three aspects of sustainability: economic, ecologic and social one. A1 claims that behind each successful sale there is a good story, meanwhile A2 mentioned the importance of targeting the best solution. A4 exposed the tendency to sustainability, which has been identified as a competitive advantage of design.

3.2 RESPONDENTS' OPINION ON CORPORATE SOCIAL RESPONSIBILITY

The second set of questions aimed at finding out what kind of meaning the respondents assign to corporate social responsibility. A1 and A2 agree that humanitarianism and supporting culture, sport and science form an important part of their strategy/ business vision. They also agree on the environment protection. A1 stressed the fact they are a family friendly company that takes care of employees' constant growth and pleasantness of working environment. A2 underlines the care for all shareholders, employees, owners, while A3 specified customer's satisfaction. A4 and A5 added environmentally responsible ethic action. All the companies consider social responsibility of utmost importance. When asked, whether their products are (designed, made and marketed) in compliance with social responsibility, all the respondents gave a positive reply. A1 clarifies their company adopted environmental policy for environment preservation and that regular technical monitoring is carried out. Apart from that, they also invest in innovative technological machines and water and gas treatment plants, which contributes to emission reduction. A5 adds that awareness among consumers should

be raised as well.

In what ways corporate social responsibility is used/implemented as a means of sustainable development? A1 ans A2 are of opinion that this is social friendliness. A1 lists the elements social responsibility consists of: motivation for employees, additional training, opportunity of promotion, good communication, offering support to local community and youth, encouraging mentoring, and intergenerational cooperation. A2 estimates that social responsibility is a part of competitive advantage. She also underlines that social and environmental friendliness requires a balanced development of economic indexes. A3 mentioned considering buyers' needs. A4 and A5 point out that each step, from the initial contact to manufacturing, is in accordance with principles of social responsibility and presents a case of circular economy.

3.3 RESPONDENTS' OPINION OF THE EXISTING BUSINESS PRACTICES AND COMPANY'S POLICY

In the third set different policies of the existing design management practices were examined. All interviewees support design management on a large scale. A1 adds that mutual cooperation is very important. A4 states their foundations are built on the principles of design management. When asked whether they employ designers or outsource them, A1 and A2 explain they have internal designers, as well as external design advisers. A3, A4 and A5employ designers in the companies.

What kind of status holds a Design Manager and what is their contribution in the companies? A1 explained the designers are expected to comprehensively manage projects and processes. A2 stressed that a Design Manager forms a part of corporate marketing and is engaged in all processes, from the idea conception to marketing communications. A3 defines a Marketing Manager as a highest ranking position in Development Department, with the highest salary. A4 admitted they do not employ a Design Manager at the moment, but are planning to. A5 mentioned that position of Design Manager coincides with Product Manager, who is an evaluator and project organizer for their brands. A1 responded that Marketing with Design represents the most important department of the company. In A2's opinion all departments are of equally evaluated, since design management is based on holistic approach. A3 favours Development Department and accounts for it with an explanation that well designed products with adequate price and quality sell best. A4 argues that all processes – from designing an idea to customer relationship and manufacturing – are of equal importance. A5 named all departments, with the exception of Finance and Production. On the importance of design in the future, all the respondents agree that design itself will have a great impact on raising competitiveness and that it should remain user oriented/targeted. A1 also added the importance of innovation.

4. CONCLUSION

In the first set of questions it was find out that understanding and evaluation of the concept of design management in the studied successful Slovene enterprises is very positive. The companies included in the research have developed a holistic approach to solving problems throughout all processes, from designing an idea to the market. They all attribute a great strategic importance to design management, since they view it as a step to enhancing competitiveness.

A flexible company is of key importance in today's rapidly changing environment, stated all the respondents. They all respect and follow the tradition and, at the same time, combine it with modern principles of management and business reasoning. By using these modern methods positive effects of design strategies could be observed. Our findings further supported the belief that smart design strategy with sustainable principles can result in enhanced competitiveness. The research shows that designers form an indispensable part in each of the respondent companies. Therefore, a conclusion can be drawn that all companies are acting in the desired direction, constantly improving products, developing novelties and supporting innovation.

The implementation of design management leads to making socially responsible decisions. Modern holistic attitude in a company stimulates integrity and communication between the employees and the outer world beyond company. Finding solutions and satisfying users' needs is their key target. It is widely known the consumers are becoming more and more demanding and only successful companies follow these guidelines by bringing innovation onto market. Integration of the inner and outer world of the company should aim at taking care of fellow human beings and be based on sustainable responsible approach that includes ecological and social dimension.

The respondent companies attribute great importance to corporate social responsibility and consider it a competitive advantage. All the participating companies underlined the support of cultural, sporting and scientific achievements. Such a manner of communication with the outer world inspires confidence in consumers. Being open for a broader social environment can also be advantageous in the sense of competitiveness.

As mentioned before, design management presents a comprehensive approach from the conception of the idea to its realization on the market. The participants in the process, covering the area of design management integrate all company departments and connect them. Design Management Department is not a dislocated unit, but forms part of/is included in Development or Marketing Department. The method utilized by all the respondents is a holistic one, where communication and organization play an important part in achieving synchronized and effective work process.

The research article will help assess the maturity level of a relatively fresh design management industry in Slovene enterprises. It will shed light on the importance and demand of design and design management in companies. It will show the implementation of social responsibility in organizational systems in Slovene companies.

It has been concluded that acting on the principles of design management brings about consistency and compliance among employees, which results in a high quality end product. Well organized management is carried out via all company's processes and creates an enhanced platform for acquiring better ideas and solutions. Multidisciplinary stands for advantage in every company, since the workers remain equally involved in product development. The company does not only obtain quantity value of ideas and solutions, but also enhances employees' satisfaction. Modern principles of company managing eliminates the sense of inferiority among the workers. Implementing design management principles results in socially responsible behaviour towards the employees and the society in general. Taking into consideration the lack of research in the field of design management and design strategies there is still an enormous gap to be filled in terms of further studies. For quality research foreign companies may be included in order to make comparison with domestic ones, and furthermore, for comparative analysis the principles of design strategy implementation should be introduced, in order to conduct comparison between younger companies and enterprises with long standing tradition. From socially responsible aspect the research should include lower jobs as well, in order to obtain a general picture of company's performance.

REFERENCES:

Bertoncelj, Andrej, Maja Meško, Andrej Naraločnik in drugi. 2011: Trajnostni razvoj organizacije, ekonomski, družbenopolitični in ekološki vidiki, prva izdaja. Ljubljana, GV založba.

Best, Kathryn. 2015: Design management, Managing Design Strategy, Process and Implementation, Second Edition, London, New York, Bloomsbury.

Best, Kathryn. 2011: What can Design Brings to Strategy, Design Thinking as a Tool for Innovation and Change, Inholland University of Applied Research in Rotterdam. Pridobljeno 4. februarja 2107. http://cdn2.hubspot.net/hubfs/1701231/ Documents/KBest_ Design_Strategy_Book.pdf.

Bruce, Margaret in Rachel Cooper. 1997: Marketing and Design Managemnet, Advanced Marketig Series, prva izdaja. London, Boston, Inthernational Thomas Business Press.

Carroll's Pyramid. Caroll, B. Archie. 2001:The Pyramid of Corporate Social responsibility: Toward the moral management of Organizational Stakeholders. Pridobljeno 17. aprila 2017. http://www.academia.edu/419278/The_Pyramid_of_Corporate_Social_Respon-

sibility_Toward_the_Moral_Management_of_Organizational_Stakeholders.

Cooper, Rachel in Mike Press. 1995: Design Agenda, A guide to Successful Design Management. Chichester, Wiley.

Cross, Nigel. 1989: Enineering Design Methods. Velika Britanija, John Wiley & Sons.

DESUR. Družbena odgovornost podjetij: dobre prakse in priporočila. Pridobljeno 16. januarja 2019. file:///Users/manca/Downloads/Guia-DESUR-V4-SLO.pdf.

Dimovski, Vlado, Škerlavaj, M., Penger, S., Ghauri, P. N. in Grønhaug, K. 2008: Poslovne raziskave/Business research. Harlow, Pearson.

DMI: What is design management? Pridobljeno 4. aprila 2017. http://dmi.site-ym.com/?What_is_Design_Manag.

Easterby-Smith, Mark, Thorpe, Richard in Lowe, Andy. 2005: Raziskovanje v managementu. Koper, Univerza na Primorskem, Fakulteta za management Koper.

EUIPO. Design definition. 2017: Pridobljeno 17. januarja 2019. https://euipo.europa.eu/ohimportal/en/design-definition.

Jones, Luise. LEED AP. IDEC. ASID in IIDA. 2008: Environmentally Responsible Design: Green and Sustaiable Designing for Interior Designers. John Wiley & Sons. Hoboken. New Jersey.

SSKJ. Dizajn. Pridobljeno 13. januarja 2019. http://sskj.si/?s=dizajn.

Sustainable Development 3P (tripple bottom line), Nat West. Pridobljeno 17. julija 2017. http://natwest.contentlive.co.uk/content/70529299-d6dd-8cb4-8288-bd59e8705a23.

Toš, Niko in Mitja Hafner-Fink. 1998: Metode družboslovnega raziskovanja. Ljubljana, Fakulteta za družbene vede.

Wahl, Daniel C. 2017: Visioners of Regenerative Design V: Victor Papanek (1927–1998). https://medium.com/@designforsustainability/visionaries-of-regenerative-design-v-victor-papanek-1927-1998-57019605997.