The 16th International Conference on Virtual Learning
VIRTUAL LEARNING – VIRTUAL REALITY

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Notice!

All papers were presented during conference according to the schedule.
All papers were checked for plagiarism.
However, there is no perfect software to certify "free of plagiarism".
All papers were reviewed for scientific value and relevance.
The responsibility for the results presented in this book is assumed by authors.

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About ICVL 2021

ICVL Project intends to explore and propose innovations in education in the perspective of the Knowledge Society. The International Conference on Virtual Learning contributes to the development of both theory and practice in the field of Virtual Learning having the following objectives: creating a framework for a large scale introduction of the eLearning approaches in teaching and training activities; assisting the teachers, professors and trainers in the use of innovative teaching technologies both in formal education and life-long learning; stimulating the development of eLearning projects and software for education process and systems; promoting and developing scientific research for eLearning, educational software and virtual reality.

Participation is invited from researchers, teachers, trainers, educational authorities, learners, practitioners, employers, trade unions, and private sector actors and IT industry.

The ICVL committee accepts academically robust papers, topical articles and case studies that contribute to Virtual Environments for Education and Training (VEE&T), Virtual Reality (VR), Computer Vision (CV), Information and Knowledge Processing (I&KP), and presenting, as well, practical results and original applications. The education category includes:

- The use of Web Technologies, Computer Graphics and Virtual Reality / Augmented Reality Applications;
- New tools, methods, pedagogy and psychology;
- Case studies of Web Technologies and Streaming Multimedia Applications in Education;
- Experience in preparation of courseware;
- Design and Development of Massive Open Online Courses (MOOCs).

The main sections and related topics are (http://c3.icvl.eu/):

- **Models & Methodologies (M&M):** Innovative Teaching and Learning Technologies; Web-based Methods and Tools in Traditional, Online Education and Training; Collaborative Virtual Learning, E-Pedagogy; Design and Development of Online Courseware; Information and Knowledge Processing; Knowledge Representation and Ontologism; Cognitive Modelling and Intelligent systems; Algorithms and Programming for Modelling.

- **Technologies & Virtual Laboratory (TECH):** Innovative VR and Web-based Teaching and Learning Technologies; Advanced Distributed Learning (ADL) technologies; Web, Virtual Reality/AR and mixed technologies; Web-based Education (WBE), Web-based Training (WBT); New technologies for e-Learning, e-Training and e-Skills / e-Competences; Educational Technology, Web-Lecturing Technology; Mobile E-Learning, Communication Technology Applications; Computer Graphics and Computational Geometry. Intelligent Virtual Environments.

- **Software Solutions (SOFT):** New software environments for education & training; Software and management for education; Virtual Reality Applications in Web-based Education; Computer Graphics, Web, VR/AR and mixed-based applications for education & training, business, medicine, industry and other sciences; Multi-agent Technology Applications in WBE and WBT; Streaming Multimedia Applications in Learning; Scientific Web-based Laboratories and Virtual Labs; Software Computing in Virtual Reality and Artificial Intelligence; Avatars and Intelligent Agents.

- **Intel® Education - Innovation in education and research (IntelEdu):** Digital Curriculum, collaborative rich-media applications, student software, teacher software; Improved Learning Methods, interactive and collaborative methods to help teachers incorporate technology into their lesson plans and enable students to learn anytime, anywhere; Professional Development, readily available training to help teachers acquire the necessary ICT skills; Connectivity and Technology, group projects and improve communication among teachers, students, parents and administrators.

From the first edition in 2006, ICVL has published 15 volumes (one volume per year), and awarded 13 papers, as shown in the following table (http://c3.icvl.eu/).

Order Number	ICVL edition	ICVL Location	Received papers	Published papers	Awarded papers
1	2006	Bucharest	55	34	--
2	2007	Constantza	45	35	2
3	2008	Constantza	64	44	2
4	2009	Iassy	103	52	2
5	2010	Targu-Mures	134	78	2
6	2011	Cluj-Napoca	145	85	--
7	2012	Brasov	146	67	3
8	2013	Bucharest	104	55	2
9	2014	Bucharest	155	70	--
10	2015	Timisoara	121	69	--
11	2016	Craiova	101	55	--
12	2017	Sibiu	116	74	--
13	2018	Alba iulia	124	82	--
14	2019	Bucharest	144	87	--
15	2020	Bucharest-ONLINE	123	77	--

The 2021 edition of ICVL was planned for October 30, 2021. However, the death of the leader of the ICVL Project, associate professor **Dr. Marin Vlada**, in the last decade of September 2021, led to the postponement of the event for November 20, 2021.

Organized on this day, in two parallel sections, all 28 articles accepted by the program committee have been presented online using the ZOOM platform. This volume contains all these works in the final version for publication after their improvement by the authors following the recommendations submitted by scientific reviewers. Some articles were directly rejected either because of plagiarism, or because of poor contributions to one of the conference's topics, or because of the inappropriate subject for the ICVL.

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First, our thoughts go to **Marin Vlada**, the initiator of the ICVL project, who, year after year, managed not only the electronic platform of the project, but also the coordination of all tasks necessary for the conference, almost every time, in another city in Romania. In parallel with the ICVL, the National Conference on Virtual Education (CNIV) was held with the large participation of teachers and students from the pre-university environment in Romania. Marin Vlada thought of the ICVL and CNIV projects as high-profile events that would bring added value in the field of learning with the help of modern technologies.

The success of a rigorously conference asks for strong efforts of many parties like chairs, reviewers, and contributors. Fair and detailed feedback was sent to authors by the Technical Program Committee based on reviewers' recommendations. Despite the time pressure imposed by the new conference deadlines, authors did their best to supply camera ready version in time before the conference. Finally, the volume has been processed according to the ICVL standards.

We are extremely grateful for efforts of all mentioned parties. Below, the lists of Chairs, Scientific committee/Technical Program Committee/Reviewers and Contributors are given.

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Section M&M
Models and Methodologies

Design Strategy – Art, Education and Functions

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Abstract

Design covers many different disciplines and each of them has its own specialized need, preparation and practice. By design we mean the integration of art and technology to create products, communication and the environment to meet human needs. We also think of design conveying the spiritual values of national art and culture in innovative artifacts. Great designers have a responsibility to subtly educate the company about values to create a striking and intuitive work, it is very important that the designer has something to say. Developing a design concept that strives to become innovative is of great importance, the more innovative the concept is and the more likely the visual interpretation is to be innovative. New ideas arise in the minds of creative individuals in their hard-to-reach lonely side of consciousness that the average person cannot comprehend. The discussed tools can be applied to improve the methods and methodologies in training future specialists in the subject area.

Keywords: Style, Design, Process, Space

1 Introduction

First design thought – The design? – From the line, we create forms and the forms we create reality. The emergence of design in the process of its creation, there are two basic underpinnings – creative and intellectual. In creative design it observes, form and under the influence of a certain emotion, it unconsciously creates a function, while the intellectual suppresses one and strengthens the other components, so that it gets an image appropriate to the creativity of the reality of the function (Baudrillard, 1996).

The final conclusion is the result of a spontaneous choice of the way the shapes and colors are organized, whose special character is determined by their place and function as a whole. The design process can take many forms depending on subject or individuals involved.

The definition of design as an activity is: furniture design is a creative activity, the purpose of which is to determine the formal properties of the product (Jan, 2002). These qualities include the external characteristics of the form, but mainly those structural and functional interdependencies make the furniture a unique whole, both from the point of view of the user and from the point of view of the interior manufacturer.

The goal of the design activity can be both the formation of a separate product, as well as the creation of a whole family of homogeneous products.

Designing the environment is another, more ambitious task that brings the profession of the designer closer to that of the architect. Regarding the above definition it is important to give an explanation of the shape of the furniture. It is the material structure of industrial products determined by the materials, construction and processing technology of these materials. Therefore, in order to solve the set task after determining the shape of a given product, the designer should give an answer to the question of what material, with what construction and what technology a shape will be created.

2 Design without strategy is called art, Design with a strategy is called marketing

Emphasize shapes and sizes to move space. And we aim to wake up the furniture so that warm winds can start blowing.

The combinatorics of strong color is our inner urge for emotions. The main inspiration is usually the circle as the main source of energy.

A new project, a step towards overcoming what has already been created. If we are what we create, every new design is a transcendence of ourselves. Free spirit, the only way to create a design without prejudice. To succeed we need to model the spirit (Lefteri, 2006; Ilieva et al., 2019).

The world around him sees it as a great exhibition of design artificial environments that are out of control day by day. In fact, everyone around us, every material object that we can see, feel, use, is designed is given a look, form, function, purpose and life.

Although designers, as creators of the world, play an important role and have a great responsibility to the consumers and the environment in which they place their creations, it all starts with nature.

Man is primarily a natural being and is destined to live and act in accordance with nature, to meet its needs, with minimal changes and damage to the flora and fauna around us, because he was created for the needs of man as a natural being.

The problem arises when the connection between man and nature ends. Unlike animals, our creativity leads to ego and emotions, which is sometimes not good for the world around us. Although all the materials that surround us come from nature, by that I mean they are not brought from another universe, or even plastic that comes from nature or from the oil that we, selfish creatively turned into plastic for the sake of obvious functionality, without thinking about its environmental damage (Serbedzija, 2007). It was that we destroyed our world around us with our needs and soon emotions and self-destruction will happen if we do nothing. The problem is not in the individual, the problem is in the mass.

Images as well as human awareness of natural development day by day, open many opportunities for quality design and redesign of the world, as well as hope for a better and better tomorrow. Many individuals and businesses today shape and consume this consciousness, transforming it into qualitative and naturally acceptable forms, but created for the good of man. There is a growing need for new and renewable forms and sources of energy (Intelligent Energy).

3 The shape of the creation of objects by man

Following Sandeva & Despot (2017), it is important to mention that "design activity is one of the characteristic and at the same time the most widespread studies of plastic creativity" in the material production of the 20th century. Its specificity is to build the image of industrial production, including aesthetic expression and informative readability of the subject environment. It places the design creativity in the dialectical depend on the basic way of production of material goods in the epoch of the scientific-technical revolution.

The modern society of design as a plastic creation to a lesser extent dominates human activity with thousands of thoughts of man to design and turn the world in which he lives into a "better designed place of understanding and beauty" (Ermolaev, 1998).

That duality, or rather the dialectical contradictory nature of the design, reflects on top of all its manifestations.

The internally contradictory nature of design creativity imposes an imprint on the final design, product, turning it into a sensitive indicator of the technological development of material production, a criterion of the degree of cultural society of technique by man. In this way, design is accepted by millions of people as a formal symbol of the culture of human societies in the modern world (Taneva et al., 2016; Despot et al., 2019).

Modern design in its deep interior is a typical human way of adopting the technosphere, of adapting it to the possibilities and demands of human relationships and individuals. In that sense, the design is a kind of continuation of that feature of the folk crafts, through which the light of the design is revealed to us.

Not only do we want to discover the design activity in us, but also to get acquainted with the laws that the design activity works according to. Indeed, "we are still in a time that provides an opportunity for an objective assessment of science and practice". This fact in itself enters the field of furniture design and formation as its core. At the time, it was increasingly cluttered with factual material in the field of design and revealed not only the need for historical study, but also marked by increased criticism of the campaign. We have the opportunity to study a rich and timely uninterrupted design body, we also have the opportunity to follow the formation and development of a necessary creative activity. The fact that we are modern and participate in some of the various phenomena of the design activity is a new feature of the study of work. There is a quality difference between the traditional scientific activity and the emerging design activity (Efimov, 2004). In fact, this is not what will be engaged in practice, but the sense of subjective assessment of the activity, whether we will succeed in maintaining professional and civic awareness in certain criticisms.

The same problem can be expressed in another way. The design activity, both as a multifaceted statement and as an appearance for its development, is a complex reality, characterized by the dialectical union between objectivity and subjectivity between the results of the activity and the representations given to it.

That reality or more precisely its properties enter the minds of the generations which also mean a reversal in history. To turn it requires social, artistic creation and organizational management experience in the historical consciousness of the activity (Dimitrov et al., 2016; Dimitrova, 2020).

Another issue is the numerous facts that have been accumulated up to that point, and not only likely but also necessarily to be the object of not one but several dependencies that will illuminate the path of design.

Each generation gives its own changes to the previous knowledge of design and so the design itself changes. We owe it to ourselves in due course to submit fairly easy principles to a better path and to overestimate. The history of design is before all the processes in which it is possible to get involved only if we are masters of the necessary degree of design modification. Based on Sandeva & Despot (2017), "breaking stereotypes and in that sense enriching the tradition and its development are necessary and that is the main condition for the emergence and establishment of an artistic fact". The question is from the positions of modern scientific significance and from the conditions set by the aesthetic creation.

The research is built through the principles of sequence in the development of the form-construction of the lower to the higher appearances, from more elementary to more complex forms of organization (Čikič, 2006).

Regardless of the more prolonged in time are the periods of quantitative accumulation and we stop mainly at those moments, which mark transitions. The main argument for this is that the previous periods are most strongly stated in the meaning and depth of the previous studies. On the other hand, the research is based on the specifics of human knowledge of the following techniques used in modern design processes.

Human society in every day of its development, stimulates activities that are necessary for its development - regularity, in full force, having it as the basis for utility. The effect of that lawful design conditionality is even more pronounced. The design activity, even if it is possible only when achieving a certain technical and production development of the material production, strengthens the stimuli of its appearance and development, primarily from the social and political spheres.

Design and division of design - There are many definitions of design, as you would expect from a creative endeavor. Some tend to categorize design to explain how different or related it is to other activities, while others try to inspire through good design. Design as a process can take many forms depending on the subject being designed and the individual or individuals involved, as shown on Fig. 1. We would say that design is creativity mixed with innovation. Every designer has a slightly different approach, different design skills and their own way of doing things, but there are some general activities that are common to all designers.

Discovery - Designers try to look at the world in a fresh way, noticing new things and looking for inspiration from everything around them. They gather knowledge, develop an opinion about what they see, and then decide what is new and interesting, and at the same time practical and functional. Whether they do it consciously or unconsciously.

Definition - The aim here is to develop a clear, concise and creative answer to what has been previously explored in the "discovery" phase.

Development - The development period refers to where solutions are created, tested and validated. This trial and error process helps designers improve and streamline their ideas.

a) b)

Fig.1. Overview of strategy from art to design

4 New design – functions

Many design productions are still subject to aesthetics, and rightly so. However, we call today's design a NEW DESIGN, it is completely finished and opposite to the old model. Today, the focus is on human-centered innovation, which re-examines human needs, functionality, market opportunities, usability and sustainability.

Appearance is just one dimension, among the many dimensions in complex interactions that help people discover, understand, learn and accept created artifacts and their meaning and begin to use and transform them.

This approach in professional practice - from the design of artifacts to the design of a socio-technological system, the options and experiences reached their peak about 25 years ago. Since then the traditional disciplines have been divided into industrial and graphic design, interior design and architecture have been replaced by new interdisciplinary practices in strategic design. New design methods are applied in order to solve complex problems of corporate strategies.

In the last 50 years of practice we have witnessed three waves in design:

- Individual design;
- Design policy;
- Process design.

The new design is too significant to be left to the designers. When we say this we mean two things, first the designers should work with non-designers, ie professionals from all other disciplines, secondly I think that the design methodology is as strong as a driver of innovation in all areas from technological artifacts to social systems for everyone to knows how to use them and not just designers. Design methods and tools should be available to everyone. Design as a discipline should be accepted as a subject in general education in addition to mathematics or physics in all schools.

We believe that the process that designers use in creating new ideas and turning them into innovations, anyone can learn and use:

- Innovation protocol – Old Design;
- Innovation protocol – New design.

In the last few decades, the term design has entered widely into both the specialized scientific literature and into bits. The etymological interpretation of the term design covers the theory and practice of art-design activities for the formation of the object-spatial and environmental, the middle of industrial production, as well as the results of this activity (products that are defined as a synthesis of different structures). In English guides the term design has the following meanings: concept, meaning, purpose, intention, idea; it is a pattern, drawing, sketch, picture; in a word pure composition. In the German art and technical literature, the term form education has been established, as a reflection of the entire artistic process of building and implementing the form. In Russian guides, industrial design is incorporated into industrial aesthetics, which in turn is a major part of technical aesthetics. The terms industrial aesthetics and artistic design of industrial forms have been imposed on us.

The design has a huge division, we can find it in the following type: *Some designed pieces of furniture are considered both classic works of art and engineering works.*

The interpretation of design is seen in the creation of conditions for the aestheticization of everyday life as a consequence of the postmodern consumer culture. With the overall development of society, which implies sociological, cultural and technological development, the opinion is imposed that consumers increasingly seek goods and services to symbolize the meaning relevant to their lifestyle. Although design has some common methods and cultural roles with art, it still differs in its approach to problem solving and meeting the needs of users.

Design as a problem-solving activity involves balancing a number of factors:

- technology,
- production and
- use.

Furniture as part of the design is the subject of creative human activities that reflect the living conditions, customs, tastes, people who created it, the level of development of art and techniques, materials and method of production of a nation or region. In terms of art it has a lot in common with architecture, an integral part of the interior and provides comfort and convenience. Features of modern furniture are: unity of use, functionality, technical-economic and aesthetic properties, durability, and more recently safety when using the furniture.

5 Conclusion

Good and successful design start with a big concept. So what happens if you have a visionary spirit is crucial for the designer. The designer must know the process of creating the concept.

The creation can be perfectly shaped but if there is no message, ie if it does not communicate with the customers in the right way, the creation will not be successful and will meet the needs of the target group. One of the most accurate and well-established definitions of design is that design is the shaping of objects and environments that meet human needs. The keyword of the definition is need.

Only the design that analyzes in itself the way of life of the modern man and the need of the users that arises from him and tries to satisfy those needs, leads to a happy and better society. At the beginning of the 20th century, people are very eager for information, new thinking and the growing need to answer the questions: who are we, what are our events, where do we strive?

Existing opinions are questioned, the value of everything that exists and the moral norms and aesthetic values of societies change. New information is sent through design messages. A design that does not have a precise concept and message that it wants to convey is a design without identity and that design has no future.

All in all, for design as a mixture of art (meaning emotion) of comprehensive essential and natural knowledge of this and aliens, depends our future. Although being a designer means being in that aspect primarily an educated person, every person is a designer of himself and his environment. As long as humanity exists there will be designs. Therefore, it is necessary to create, art is not the result of pleasure, if we were satisfied with everything around us, there would be no need for new creations.

Despite our individual needs, all living things on this planet merge into one thing, the need for naturalness. It connects me and you. That is the secret of design. In this way, the principles of design will be effectively used. Also, the discussed tools can be applied to improve the methods and methodologies in training future specialists in the subject area.

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