CONTENT 2022

The Fourteenth International Conference on Creative Content Technologies

April 24 - 28, 2022

Barcelona, Spain

CONTENT 2022 Editors

Hans-Werner Sehring, Tallence AG, Hamburg, Germany

CONTENT 2022

Forward

The Fourteenth International Conference on Creative Content Technologies (CONTENT 2022), held on April 24 - 28, 2022, continued a series of events targeting advanced concepts, solutions and applications in producing, transmitting and managing various forms of content and their combination. Multi-cast and uni-cast content distribution, content localization, on-demand or following customer profiles are common challenges for content producers and distributors. Special processing challenges occur when dealing with social, graphic content, animation, speech, voice, image, audio, data, or image contents. Advanced producing and managing mechanisms and methodologies are now embedded in current and soon-to-be solutions.

Similar to the previous edition, this event attracted excellent contributions and active participation from all over the world. We were very pleased to receive top quality contributions.

We take here the opportunity to warmly thank all the members of the CONTENT 2022 technical program committee, as well as the numerous reviewers. The creation of a high quality conference program would not have been possible without their involvement. We also kindly thank all the authors that dedicated much of their time and effort to contribute to CONTENT 2022. We truly believe that, thanks to all these efforts, the final conference program consisted of top quality contributions.

Also, this event could not have been a reality without the support of many individuals, organizations and sponsors. We also gratefully thank the members of the CONTENT 2022 organizing committee for their help in handling the logistics and for their work that made this professional meeting a success.

We hope CONTENT 2022 was a successful international forum for the exchange of ideas and results between academia and industry and to promote further progress in the area of creative content technologies. We also hope that Barcelona provided a pleasant environment during the conference and everyone saved some time to enjoy the historic charm of the city

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At the Intersection between the Design Culture and Music: How to Co-Design Lyrical and Audio Contents

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Abstract— **Within the framework of knowledge correlation, disciplinary specificities come into play with diverse contributions at various scales and according to different thematic areas, although they persist and operate in a conscious manner. The research stems from the intention to creatively experiment, intersecting design and music, to develop a complex project. It is a cultural operation that enhances the communication between designers and artists, and that wants to combine the tradition of Italian Commedia dell'Arte with the changing contemporaneity of the peninsula; the methodological basis used belongs to co-design approach. Using design as a point of observation and a lens, the lyrics of the song narrate the local context of Milan to provide a complete snapshot of the city.**

Keywords— design practice; co-design; music; digital technologies; new cultures

I. Introduction

Within the framework of knowledge correlation, disciplinary specificities come into play with diverse contributions at various scales and according to different thematic areas, although they persist and operate in a conscious manner. This is achieved through an integration that is configured as an articulated condition of synergy and collaboration. Alongside, or going beyond the logic of knowledge transfer processes, cognitive and operational processes, which are based on transdisciplinary approaches to knowledge sharing and circulation, are now being consolidated. The project presented in this contribution results from the intention to creatively experiment, uniting and intersecting the disciplines of design and music, in order to realize and develop a complex project.

First of all, it is a cultural operation that enhances the communication between designers and artists as a fundamental aspect of a musical performance and that,

specifically, wants to combine the tradition of Italian Commedia dell'Arte with the changing contemporaneity that characterizes the main cities of the Italian peninsula; the methodological basis used is the co-design, which has involved various actors. Using design as a point of observation and a lens, the lyrics of the song narrate the context of Milan to provide a snapshot of the city, for example, in terms of its colors, materials, sounds, lifestyles and architectural styles.

The common thread, which sews together design, music, and urban landscape, has been identified in the Commedia dell'Arte: a colorful world of characteristic costumes, which mark the evolution of lifestyles and urban contexts. Another element that characterizes this collaboration can be found in the combination of the creative and technological spheres: it is possible to guide artistic creativity towards innovative forms of representation and use of content by processing the potential of digital technologies related to the area of Industry 4.0 through the application of a design perspective. Section 2 is dedicated to the background of the project, while the third one is used to analyze the process applied. Section 4 is instead focused on the development of a theoretical framework for further research and the last one addresses the conclusion.

II. The Background of the Project

The culture of design germinates and finds its origins in the relationship between art and technology. What becomes fundamental is to understand whether, even today, design can play an artistic role, as it certainly happens with music. If we look at design as an institution, there is no doubt that this is not the case: it is a profession, a professional activity just like lawyers, engineers and doctors. From this point of view, it appears to be a profession that is more difficult and less comprehended than others that are considered more

structured, more coherent and more easily framed in today's panorama.

In order to understand if design can be considered a form of art, on a par with music and painting, it is necessary to observe whether design activities present, within their own professionalism, the requisites that all human activities that take on the name of art do have. It is also necessary to comprehend whether design also may allow the expression of human feelings to take shape (rather than purely technical specifications or those aimed at selling a particular product). Furthermore, it must be understood if it is capable of producing symbolic forms, namely, an image of what is felt and perceived: Design, therefore, becomes a partner with and integral part of music, blending with it, taking on the role of a means to create and make tangible the symbolic form of the artistic act.

In order to achieve a coherent and defined result, the design process has been contaminated by the technology of design and, therefore, can be portrayed as a technological process (in the Greek sense of the term: 'a systematic process and treatise on an art'). Furthermore, the project aims to define the relationship between design culture and music, through a transdisciplinary approach supported by partners, who are able to contribute with a wide range of complementary technical and scientific expertise: research facilities and infrastructure, market knowledge, music knowledge, design knowledge and approach to design thinking, and finally, communication for public engagement: it is a complex process which has been based on what can be outlined as the language of design.

It should be considered that the process that one follows to give form to any kind of artefact occurs in the same way that language originates. Of course, language is made up of words, whereas the creation of a mask, of a musical composition consists of other elements (matter, notes, etc.) which, like words, are only tools, means of communication of thoughts. Like every word, each constructive element of a form has its own meaning, and, at the same time, it goes to make up the overall meaning of the discourse. Thus, language, whether verbal or visual, can be considered a system of symbols that, by using the meanings of the individual component parts and by following grammatical rules, is articulated into sentences, periods, discourses, by means of materials, notes, structures. Like spoken language, it is an articulated form of expression: while maintaining their own autonomous existence (a shoe is always a shoe, a G note is always a G note), its parts blend together to form a larger entity, which is not a mixture or sum of parts, but an articulated integration that we comprehensively and aesthetically perceive. Therefore, the artifact is a language: it aims at the integration of words (the construction elements) whose purpose, as with any language, lies in the discourse, which never exists, because it is shaped as communication of thought and feelings; it is what validates and makes tangible the symbolic form [1]. Similarly, the

technique of design does not exist in itself: it is the means of realising and making tangible the symbolic form of design.

Technique is a discursive form, and, like language, it is capable of realizing a significant and expressive form and verifying it in order to give it a concrete body. As much as we can study the technique of design, we can study grammar and syntax, but, in practice, the technique of design is always heteronomous in relation to the ability of design to verify, modify, invent, and give it life, just as speech invents and makes thoughts communicable. In any case, there is always an intimate and reciprocal relationship (or interaction) between the idea of design as art, its thought or spatial conception, and the means and language that are adopted to realize the idea. It can be stated, therefore, that from a cultural and philosophical point of view, design and music meet and mix themselves in a discourse that is articulated on the theme of semiotics: in the semiotics of design, as in that of music, interpretation, according to Plato's texts, is the process that leads to understand what is presented to the mind as obscure and capable of generating surprise [1]. As Peirce stated [2], the meaning of a sign must be sought in the effects and consequences to which the production of that sign may lead: from this perspective, the meaning of any designed artifact (by design or music, or by the joint action of the two disciplines) resides in the way in which the consequences of that act are considered, which, in turn, arises from a process of observation and navigation in reality [3]. Interpretation, as a founding action of a design process, can therefore be considered the very activity that aims at the creation of an artifact, which, in turn, generates an interpretative process, that becomes the stimulus for the next semiosis.

This contribution adopts the method of complexity management, focusing on an approach which is based on the pillars of design culture and its values: anthropological value [4], value of the semiotic component and its semantics [5], psychological and cognitive value [6], functional value [7], technological value [8] and perceptive value [9]. The aim of the activities is to design, build, test and distribute a musical product grounded on research and identification, of the profile of the "typical citizen" we can find in the Milanese city, which hosts a large community of young designers, through the analysis of their characterizing traits. By means of an acquired sensitivity towards the human beings, their ways of living and being part of a community [10], they have the ability and the tools to define the profiles (social and cultural) to be then translated into an iconic synthesis, which can outline the contemporary mask, recovering the historical references of the Commedia dell'Arte and actualizing a new model of the citizen of the 21st century.

The mask is nothing more than a Pirandellian mystification, an alienating symbol, an index of the depersonalization and shattering of the ego into multiple identities, and a form of adaptation in relation to the context and social situation in which the person lives [11]. The

anthropological value of this experimentation is to capture and synthesize the differences that can be configured in restricted societies, such as, paradoxically, cities: the work-image relationship, the man-social group relationship, language and expression become binomials that need a figurative and perceptible representation [12]. Design (form, colors, content) and music (interpretation, perception, emotional sensations) become the tools for transmitting and narrating these images, and thus for representing an era with its diversity, the values and non-values of a society in continual change, that acts as a synaesthetic photograph of the moment in which we live.

The initial core of the project was the desire to conceive a musical performance in collaboration with a physical environment: the idea was to design a concert where the B2 building of the Durando campus of Politecnico di Milano would be made to perform, through the recording of the typical sounds of the structure, and the insertion of vibrational sensors on the different floors, to allow listeners to interact with the songs played. This aim falls within the domain of the Internet of Musical Thing (IoMusT), a research field that is positioned at the intersection of Internet of Things (IoT), new interfaces for musical expression, computer-human interactions, artificial intelligence and participatory art [13]. The term has recently been used to indicate different views on the possible declination of applications in this field: musical instruments to which a QR code is applied in order to provide additional information; ubiquitous music; shared music production. Other interesting waves of innovation in this transdisciplinary field are represented by AI and robot-based music creation and digital art [14]. From this incipit, as it usually happens during collaborations with different actors, the project has been expanded, involving the University not only at an environmental and functional level, but also as a research hub, extending the collaboration to a group of young people from the School of Design. This is a co-design initiative involving young designers, with the aim of devising and applying a shared process of highly innovative musical composition; it is also a sociological operation aimed at painting Milan through the eyes of the new generations who live there.

III. THE PROCESS

This section describes the process used to reach the desired output, which can be divided into four phases, namely Meta-design, Co-design, Workshops, and, finally, Song creation.

A. Meta-design

For several decades, the Commedia dell'arte was the form of artistic expression closest to the Italian people and their traditions. It is a cultural heritage that survives to this day in a locally rooted way, making a comeback in the celebrations of the most popular and traditional festival of all: Carnival. If the Neapolitan mask of 'Pulcinella' has succeeded in

transcending its theatrical role to become an icon of histrionic Neapolitan culture, the Nordic 'Harlequin', with his rainbow costume, is still, in the years of Industry 4.0, the first thought associated to Carnival. Like them, Palermo's Peppe Nappa, Turin's Gianduia, Rome's Rugantino or Milan's Meneghino are still alive today, and the fact that they have not managed to emancipate themselves from their medieval genesis, maintaining the same prerogatives and social roles associated with their birth, is a true testament to the customs and sense of irony and satire of our ancestors.

In the centuries in which the Commedia dell'Arte has been developed, the masks have widely worn the clothes of cunning servants, swindlers or gullible people, peasants and masters rich in money, but easily coerced. It is precisely the staging of these stereotypes and the mask-city association that have inspired this cultural operation, born from a question: what would Italian city masks look like in the new millennium? This first phase is generally defined as a Meta-design [15] and can be divided into two sub-phases: analytical, which concerns the temporal, spatial, social and character research regarding the project; conceptual, which aims at elaborating the basic concepts of the project and its formal identity, taking advantage of the research carried out [16].

B. Co-design

The research attempts to answer the above question through the interpretation of young Italian designers, residing, from time to time, in the cities under study, to validate design as a subject strongly linked to art in its greatest multidisciplinary sense. By accentuating the binomial "personal stereotype-Italian city" with respect to the traditional Commedia dell'Arte, the aim is to capture a socio-cultural snapshot of our new traditions. The involvement of the young designers in the activities helps to redefine the project goals, by deciding that they would produce the suggestions necessary for the writing of the piece, through the construction of the cultural and Meta-design scenario of reference. In this sense, it can be said that the project methodology followed has been co-design, which allows the co-participation of different groups of actors in the genesis and development of the creative process.

Co-design refers to the application of collective creativity in all phases of the design process; it is, therefore, a specific instance of co-creation, which refers to the collaboration between a structured form of creativity, typical of the designer, and its less designed form, which is instead possessed by people untrained in the design process [17]. Kleinsmann and Valkenburg [18] define it as a process in which different actors, from different disciplines, share their knowledge about the design process and content creation, to form a shared understanding and development of a new product. There are several benefits of following such an approach, such as the improvement of the idea generation

process and the development of products or services, the promotion of creativity and cooperation, and user's satisfaction over a long period of time [19]. Thus, in co-design the roles are mixed: the users become experts in their own experience [20] and plays a central role in knowledge development, ideas and concept generation. The role of designers becomes providing the tools to accompany users in the creation of content, although they maintain a critical function in translating ideas into formal concepts [21]. In the case of the research presented, the three macro-groups of actors involved played multiple functions: from a design point of view, the team composed of researchers and senior designers acted as facilitators [22] of the whole process, trying to contribute with targeted interventions to support the different activities; the group of young designers played the role of director of the operations [23], using and sharing tools from different areas of design. These operations were useful in order to involve the team of artists in the meta-design moments with the aim of generating ideas and concepts useful for the creation of the musical piece. When entering the creative-musical phase, the roles were reversed: the team made up of the songwriter, the musicians and the technicians engaged the design team in the creation of a part of the musical product, providing, albeit in a more naïve way, the tools and knowledge to achieve their objectives.

C. Workshops

In line with the theme chosen for the album, after several reflections, the designers were asked to think of a new Milanese mask, which, starting from a cultural analysis of the historical meanings of the traditional one, would reflect the attitudes, behaviours, habits and traits of the contemporary Milanese citizen. The launch of the brief was followed by three workshops involving around 20 people, including young designers, professors and researchers from the School of Design, creative people and music technicians. The conference calls and meetings with the artistic staff helped the designers in the creation of a graphic work widely used in the design process (mood board), represented by means of a video and a document accompanied by textual parts, keywords and images, resulting from an in-depth analysis and reinterpretation of the various researched, analyzed and connected contents.

From the mood board, a dynamic and multi-faceted Milan emerged; a metropolis enveloped by a fluid with an intense centripetal force and thrust, which acts on the city and its inhabitants, subdivided into nine different archetypes, described on the basis of character, clothing and manners, each associated with emblematic locations in the city and a symbolic object/material: the "Old Lady" with her perfume bottle; the "Cool People", who wears fashionable glasses; "Pride People", wrapped in glittering sequins; the "Influencers", constantly absorbed by their smartphone; the "Suburbs People" and their cubic zirconia earring; the "South People" who inhabits the Navigli and Darsena areas;

the "Hedonist People", who captures the soul of the city with their camera; "Fast People", who are always snappy and completely devoted to their profession; and finally, the "Artistoid" who has been depicted using the "ultra-fragola" filter (from Ultra-fragola mirror by Ettore Sottsass).

Elaborated by young researchers, this embryo of a local ethnographic study reflects a city heterogeneously inhabited and colored by different social groups, characterized by different lifestyles, behaviors, values and aspirations, which meet, mix and clash in those border territories between the typical spaces of belonging and recognition, constantly transforming the skin and fabric of the city. In order to investigate this chameleon-like and cosmopolitan aspect of the Lombard metropolis in greater depth, and to succeed in their aim of depicting these complex social and cultural aspects, the young designers involved created a mask, made up of the main attributes of the archetypes, with the name Camillevolt, derived from the dialect expression "Ca' mille volt", which means "which has a thousand faces", but also "which is there a thousand times", that acts as a forge for opportunities. Another image that has been associated with Milan, following the research carried out, is the one of a large circle and a set of other rotating and intersecting circles, as a kaleidoscope, representing the crossroads of people and events; but also, it represents the urban conformation of a metropolis characterized by two concentric ring roads. It is precisely this sense of circularity that gave the musicians the inspiration for the first chord sequence of the piece and for some of the guitar parts. The dynamism associated with Milan, on the other hand, determined the fast pace of the piece, with a modern style and sound, in tune with a city that is in step with the times. The strong association of Milan with the world of fashion and production was then rendered through the sampling of the recorded sounds, in stereo and binaural mode, of some machinery of the tailoring, photography and carpentry laboratories of the Politecnico di Milano.

D. Song Creation

The song "Camillevolt and Milan" was composed on a twofold interaction with Politecnico. The song -in terms of lyrics, melody, harmony, structure and speed- was developed, as stated above, from the creative input of the designers from the School of Design, while the soundtrack was enriched with environmental recordings of some of the laboratories in the B2 building at the Durando Campus. The song's lyrics and melodies were composed by the songwriter, the music by two professional performers, benefiting from the collaboration of a former artistic director of Italian EMI, now an independent producer. One of the performers also recorded the electric guitars, while the other artistically produced and arranged the song, also recording transverse flute parts. The entire artistic staff took care of the sound recordings of the machinery in the tailoring, photography and carpentry laboratories in B2

building; among the sounds recorded, there were the danger signal for the activation of the overhead crane, the circular saw, the vacuum cleaner, the sander, the knitting looms, the multiple clicks of the cameras and the loading of the flashes. The creative contribution of the designers was even more decisive in the writing of the song's lyrics, for which the author tried to stick as closely as possible to the images and terminology proposed through the mood board and the other representation tools used. In fact, the verse of the song mentions some of the traits traceable to the identified archetypes and the city places associated with them, in a play of mirrors in which the city of Milan is reflected in Camillevolt mask, and vice versa. The refrains, on the other hand, are dedicated to the image of the dynamic and circular city that "like a kaleidoscope turns, turns, turns" (citation from a song verse). Some young designers were also involved in the production of the song, through the recording of choral parts.

IV. THE PROJECT AS A CASE STUDY AND A FRAMEWORK FOR FURTHER RESEARCH AND POSSIBLE FUTURE DEVELOPMENTS

The expected impact of the proposal is to verify the relationship between design and music both from an anthropological and a social point of view. It is necessary to understand its scope and, therefore, its method of dissemination, which has to take place both on an initial push through innovative communication/marketing systems, and through the widening of consensus on its own, the so-called 'word of mouth'. It must also be understood whether this proposal could become a tool for disseminating a culture of coexistence at national and international level. Beyond the possible traditional exploitation of the results, the proposal can become a powerful promotional tool for the cities who want to be involved and for the country. The presence of scientific communities in the working group brings content to various disciplines including communication design, product design, ethnography, anthropology, music and many others directly or indirectly related to the content developed.

Knowledge is no longer involved according to a linear sequence, but as a large horizontal network, which operates on several dimensions, even with different approaches. In fact, the network makes it possible to bring together humanistic and technical heterogeneity, synergic and complementary souls of the new culture of knowledge, with the sole aim of exploring the future and hypothesizing solutions to improve collective well-being, which enhance and give meaning to mankind, his history, and his context. Also, this guarantees the possibility of disseminating the results through workshops and meetings in schools, at various levels, from primary schools to universities, as well as participation in national and international conferences. Through the whole process, it was possible to elaborate an operational framework and a series of design guidelines applicable to the development of the songs by the other

design universities. At the time of writing this contribution, the song dedicated to the mask of Milan has been completed and we have entered a phase of communication design of the product, using different techniques of representation.

The next steps concern the realisation of the cover and the videoclip of the song, once again co-designed by the designers and the musicians, and the presentation of the song through different media (digital and non-digital), including a live performance at the B2 building of the Durando campus of Politecnico di Milano, which will become the co-protagonist of the performance in the interactive mode outlined in the introduction of the contribution. The project, once completely framed and disseminated, can become a replicable model for other Italian cities which, as Milan, host a design scientific community, to map the new local traditions which oppose the global context. Following the framework designed during the Milan experience, the suggestions regarding lyrics and sounds must be born from brainstorming sessions, in which the singer, his artistic staff, the staff of the design schools involved, and, above all, the young designers have to participate. Also, in these cases, starting from the brainstorming, a visual elaboration must be realized, that places the revisited mask in an articulated city stage, which must provide guidelines for the song development. Finally, the song must be produced through the recording and the rendering of the sounds produced by the design school building and typical of the host city.

The character traits typical of the masks must be again the basis for modelling new modern characters placed or acting in a current city context, described using terms related to design and its culture and images depicting what emerged from the brainstorming sessions. The works developed by the young designers should become, as in the case of Milan, the covers and booklets of the album and of the different tracks, as well as constitute further dissemination and communication material about the project. The results of the project must be made accessible to potential users through a wide range of dissemination activities. As a general guideline, the results must be made open and available to reach as many people as possible. This will concern technical results, which have to be published on relevant digital platforms, as well as scientific publications.

V. CONCLUSION

The project aims to demonstrate how a transdisciplinary attitude [24], between apparently different knowledge and skills, can become an added value in processes characterised by complexity, evolving the multidisciplinary and interdisciplinary approach that has been applied to date to projects requiring such contamination. The transdisciplinary approach aims at overcoming and blurring the boundaries between different disciplines: in this sense, it differs from multidisciplinarity, which is defined as the integration of different knowledge, and from interdisciplinarity, which refers to programmes, models, projects and analyses that

involve more than one knowledge in order to carry out the activated processes. The goals of the project and research presented are manifold and consciously directed towards answering different questions and needs. From a socio-cultural point of view, it is essential to map the characteristic lifestyles the city examined, in order to define the features of the reference mask.

Ethnographic studies have to be conducted, using different techniques and methods such as observation or interviews, in order to better understand the rites, rituals, norms, values, behaviours and artifacts of the subcultures examined. Music and musical experiences play a fundamental role in defining these specific community traits, their formation and their affirmation at a social and cultural level. It is therefore essential to highlight the necessity and importance of the establishment of a relationship between design and music, which favours the management of the growing complexity of the music sector, due to the impact of new technologies, new ways of communicating, disseminating and enjoying such a product: processes and tools of the design disciplines can give a substantial contribution to the field of action. The application of innovative technologies, for example the ones ascribable to the area of IoMusT, allows to conceive, hypothesis, and design innovative experiences of fruition of musical contents and, by implementing the potentialities of the framework, to build new experiences. Therefore, a dialectical reasoning is necessary to define the purposes of a phenomenon that embraces, at the same time, the individual and the collective spheres and that implies an activity, at the same time, natural and artificial, instinctive and disciplined, physical and intellectual.

This is a phenomenon that certainly has the function of organising and supporting social activities, of inducing and coordinating sensory-motor reactions, of facilitating expression [23]. Therefore, the role of young designers is vital and represents an interesting innovative approach to social lifestyles analysis and research: although they could be naïve researchers who are not experienced with the use of techniques, methods, and tools, they can provide actual points of view due to their active sociality and immersion in social life. Different questions remain open and could become source for further research: how can design and music cross fertilize each other resulting in new approaches to music production and in transdisciplinary areas of research for design studies and practices? In which way a naïve, but fresh point view can be integrated and mediated in ethnographic discourses, as a source for radical analysis?

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