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Paradigms of creation processes in digital media: a cartography

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Abstract

What are the foundational elements (theoretical principles and concepts) and characteristics of the inventive thinking realized in digital media? This article explores creation processes in networks. More specifically, it investigates how recent changes in digital media have influenced procedures and methods of creation and made possible the emergence of creative processes in networks and in a permanent state of fluctuation. The guiding objective of this article is to understand the characteristics of network creative processes as well as the movements of thought that compose the journey of production. The article is structured in three sections. First, we present the principles and fundamentals which ground the research. Then, we propose a reflection on the paradigmatic models which define the creative processes in terms of their objectives, as well as their nature and the perspective of their questionings. The third part is dedicated to explore the digitally-mediated creative processes.

Keywords: creation processes in digital media; criticism and theory of process; artistic poetics; design.

Initial considerations

This article proposes a possible cartography of the paradigms of processes of creation in digital media and dialogues with more extensive research we developed, as Professor of the Postgraduate Study in Semiotics and Communication Program at the *Pontífica Universidade Católica* of São Paulo, in the creative processes line of research. We worked in conjunction with Cecília Almeida Salles, and our scientific research activities propose investigations which

articulate knowledge originating from theories and practice. The research moves along three axes: critical creation processes in various media expressions; critical accompaniment of creative processes, and works of collective ownership based conceptual propositions involving the creative process (Leão and Salles, 2011). The investigation of the stages that comprise the construction of a media product emphasizes theoretical and conceptual choices. Among the line of research can be cited: creation processes in diverse media formats; knowledge production in communication; dialogues with the concept of aesthetic experience and reflections about the concept of authorship¹. Among our recent publications, we highlight "Archives of Creation: Art and Collective Ownership" (Salles, 2010) and "Digital Media Creation Processes: Passages of the Imaginary in Transcreation Aesthetics "(Leão, 2010a).

Laan Mendes de Barros, claims the possibility of a displacement of the antagonism between theory and practice towards a "communication praxis". In his argumentation, aiming to overcome this dichotomy, Barros reviews the meaning of praxis:

'When knowing and doing come together, when practice incorporates critical reflection of what is being done, what one has is the exercise of praxis. The term praxis, in Greek, does not merely indicate the pragmatic dimension of production, appropriate of the term poiesis, more linked to technical crafting; it extrapolates the notion of practice, present in the term praktiké. Praxis, a term also found in Latin, implicates a thinking-action process, of conscious action, which incorporates values and implies insertion in historical time and social space. To think of praxis involves, therefore, consequential action, with meaning, significance' (Barros, 2011, p.9).

As we shall see, the research on creative processes assumes a hybrid perspective, at the confluence of poetic experimentation and conceptual reflection. In other words, it is research towards praxis.

Principles of Research

We are going to present a brief summary of the conceptual guidelines which lay the foundation for our investigation, aiming to clarify the starting points in our research of the creation process. As we shall see, the explanations of the epistemological presuppositions are manifested not only in theories, but, mainly, in the practices which comprise the creation process. We have organized the three following logical propositions upon which our reasoning is based. These propositions have received the denomination of "principles" as they organize and systemize the ways in which our research is performed.

The first principle proposes the creative processes be considered open interactive communication systems which include elements of diverse natures. Sociocultural context,

¹ See, regarding these researches, Salles (2003, 2010) and Leão and Salles (2011).

media, values, individuals, groups, narratives, memories, dialogues, encounters, places and temporalities are some of the possible in these processes. It is appropriate to point out that these elements have dynamic characteristics and join relationships and forces. By adopting a systemic perspective, the study of creative processes assumes that the system is not simply the sum of its elements. This means the elemental characteristics considered individually appear to be different from the system when considered as a whole. Another consequence of this approach is that parts of the system establish a complex relationship of mutual implications, in which actions and reactions feed into each other. This property is referred to as "circular causality." Finally, the systemic perspective requires a regulation precept, as the elements must share a minimum number of rules or conventions.

The second principle states that creative processes are networks in a constant state of transformation. This involves renouncing concepts such as origins and/or conclusion of a work. The topologies of the networks require that concepts such as hierarchy and linear organizational methods be abandoned. Understood from this viewpoint, creative processes are constituted as sets of moments with generative potential, trajectories with various versions in the development of a creative thought.

The third principle sustains that creative processes, due to their former characteristics as (1) open communicational systems and (2) networks in constant states of transformation, require a kind of research which is also in network and has systemic characteristics. In other words, reflection on the creation processes must be of a polyphonic nature in which a set of theoretical instruments from diverse disciplines communicate in an orchestrated discourse. In this sense, the conceptual body of research necessarily has inter and/or transdisciplinary characteristics.

Considering these three principles, we propose here a reflection on possible production models. The proposal we present makes use of a cognitive modeling procedure and has three matrices of communication theory as a foundation.

Production Models

Considering the communicational nature and perspective of its questioning, which are the matrix models that organize creation processes? We propose that creation processes in the media be studied on the basis of three possible conceptual models that are connected and revisit some theories of communication. These are: the informational model, the media model and the post-media model. They will be presented in three layers: theoretical framework characteristics; characteristics of the model and its application in creative processes in general; and a reflection regarding the presence of these models in digital media creation processes.

Informational Model

The first model presented comes from the classical informational vision, based on the emitter-medium-receiver (E-M-R) triad. Its objective is the transmission of content in the most precise manner possible. The linear informational paradigm, as it is also known, is established with the studies of mass communication media and defines those media as neutral, that is, mere information transmission instruments². Thus, in this model, the medium should be transparent, in order to avoid interference in the communication process.

It is interesting to observe that this model is derived from the mathematical communication theory that, paradoxically, is not concerned with the semantic level of communication. Shannon and Weaver's model considers information in a totally different sense than communication sciences, as they use the information concept in a subjective way, capable of being encoded in signals (by the emitter) and decoded in signals (by the receptor). For this theory, information would be something concrete and exact. The mathematical communication theory was developed to be applied by engineers to the creation of telecommunication devices. While the aim was to design systems in which information could be transmitted efficiently, this theory was not concerned with the meaning of the information. Other points which set this theory apart from communicational studies include: the exclusion of contexts in communicational process analysis; the reduction the qualitative aspects of the process, such as noise and interpretative capacity; and the lack of interest in the characteristics of the medium, which are seen as neutral and given metaphors such as "canal". Regarding the complex implications of the "mathematical communication theory" in communicational studies, see Klaus Krippendorff's (2009) excellent text.

However, returning to the informational model, in the manner in which it is understood by the communication field, a hermeneutical tendency is observed, a centralization of studies in the scope of interpretations and search for meaning. In the words of Felinto (2011, pp.6-7):

'As a discipline fundamentally concerned with the investigation of processes of meaning between emitters and receptors, communication was characterized as an investigation of hermeneutical order...From content analysis to reception studies, it is essentially about sense interpretation... This way, it is not surprising that traditional models of communication theory have almost always considered noise as something negative to be eliminated from the communicative processes [...] The classical communicational conception engendered a kind of "communication metaphysics", which has made us, perhaps, too confident in its efficiency and transparency'.

² See, regarding this model, the Albuquerque article (2002) that discusses how the consolidation of the communication field occurred through the "challenge of investigating a very particular set of communication technologies – those of radio and broadcasting". In this sense, this implantation of this model, fundamental for the structuring of research, is bound to a specific moment as well as specific communication technologies. In this article, Albuquerque discusses how digital media destabilize the traditional model for research in communication.

Media processes creation ruled by this paradigm start from the assumption that the focus of creation should be the message. The author(s) should impose his (their) mark on the material support, impress their dominance. In this sense the creative agent(s) are endowed with technical skill and material mastery of the medium specificities. This paradigm contains every manner of operating mechanically on matter, for example, in the processes of sculpting, carving, modeling, painting, etc. (Laurentiz, 1991, p.103). We can also place here all critical investigation which organizes creative processes on the basis of ability and mastery processes of material supports.

The applications of the informational model in the digital media creation processes are ample and cover projects which demand controlled operation of the system. When an e-commerce interface is developed, for instance, it is expected that the informational system work exactly as desired, avoiding any possibility of interference or virus. The same goes for internet banking and service projects. We can also observe the predominance of this model in the majority of videogame design projects. That is, in the creation process, the designer plans that determined actions by the user correspond to the specific reactions by the system. Such expectations should have maximized probabilities of occurrence and, therefore, in that sense, the prevailing logic in this kind of project is the same linear logic of the informational model.

Media Model

The second model inverts the focus of attention and is less interested in the meaning of communication (semantic level) and than in the characteristics of the medium. In this line of research, Kittler (1999) proposes the media to be considered from a "materialistic", systemic and historical perspective. According to Wellbery, in his preface, Kittler establishes a possible research program for a post-hermeneutical critique. In this program, media is an inscription device, notation system and discourse network (Wellbery, 1999, pp.xii-xiii).

The media model affirms and emphasizes the materiality of the media. Here, the medium is not transparent. On the contrary, it is seen as an entity actively inscribed in the communicational system, and due to its qualities, impresses meanings to the work and to the creative process. In Laurentiz's reading (1991, p.102):

'The concept of materiality does not oppose that of matter; it goes beyond it. Matter is the mechanical preoccupation with material support, whereas materiality covers the expressive potential and the informational charge of these supports, also encompassing the extramateriality of the information medium'.

Also according to Laurentiz, the operative acts of materiality are acts which occur in a cooperative context, in which the expressive qualities of the medium couple with the expressive force of the author(s).

The applications of the media model in the digital media creation process can be observed in several projects. Formally, all works which explore the potential of the media are included into this categorization. Here, it is important to consider digital media in terms of their specific material characteristics. In a non-exhaustive list of examples, we would have: a) works which operate with programming, so to say and software, scanning languages and codes and revealing generative potentials of the numeric-software art; b) works that articulate geographical localization information with network data systems – locative media art; c) works that speculate with information from the biology field and use digital media in life simulation processes – bioart; d) works which utilize the digital media's numerical potential with the objective of generating dynamic data visualizations – infodesign; e) works that unveil automation systems and intelligent systems, producing objects from the physical world endowed with digital processing systems, hybrids – robotics, interactive objects, sentient objects; f) works that create immersive recreational environments and propitiate interaction in the media-based universe of games; g) works which make use of the communicative potential of digital networks in search of telematic processes and/or telepresence and create dialogical and/or collaborative environments. In short, our list could go on and include various subitems from poetic experimentations. But, for the purposes of this article, this summary systemization is a sufficient illustration of the multiple universes which permeate the field. The focus of this article is on the final category listed.

Post-media Model

We now turn to the description of a third possible model that engenders creative processes. In this model, which we call post-media, the projects exceed the characteristics of a determined medium and advance through territories of a plural nature. The post-media model is founded on the observation of works which do not rest neatly within the confines of any particular medium, but operate in hybridization processes.

The post-media term reintroduces a very rich discussion raised by Krauss in her book *A voyage on the North Sea* (1999). For Krauss, in contemporary art, artists pass through different tools and processes and seek to include expressive media heterogeneity. Thus, differently from other art periods, in which the artists centralized their production in a specific media and were known for this specialization, the post-media artists are not so limited. Krauss' study caused a series of inquiries in several fields. One of the questions her proposition raises regards Krauss's own media definition. *De rigueur*, works by artists such as Marcel Broodthaers (whom Krauss presents as an example of an artist in a post-media condition) are representative of media heterogeneity. However, Krauss's proposition was quite successful in eliciting discussions and debates on medium specificities. With television, film and their expanded formats, videos and digital media, considering language purity is, to say the least, complicated.

What we are calling “post-media creation process” also evokes the remediation concept proposed by Bolter and Grusin (2000). In the book ‘Remediation: Understanding New Media’ they postulate that digital media recontextualize and approximate old media, like photography, music, television, text, etc. However, for Bolter and Grusin, this process has a double logic – while it is an act of media multiplication, remediation is also a media-deleting movement. This deletion can be observed in the dissolution of the awareness of the very role of media as founding elements of world visions. In this sense, Bolter and Grusin, when questioning the digital immersion experience, adopt McLuhan’s narcotics concept.

Our proposal for a process model for post-media creation is founded on persistent practices in digital media, but can also be applied projects operating in the passages between the media (Bellour, 1993, 1997). What is to emphasize in this model is that the processes which emerge from this perspective operate at the intersection of the informational and media visions. In this approach, the processes hinge as much upon media-specific characteristics (this is reflected in the conceptually based choices of media to be used) as on the contents of the messages to be discussed. In general, the contents and discourses (semantic level) organize the proposals in multiple media. In short, they are processes which operate with two intertwined goals. We can observe this kind of procedure in several projects. They are particularly present when they are subscribed in diverse circuits and assume a character of flux. As an example we can cite the Guaraná Power project from the Superflex collective. The project, which had political objectives and inserted “chips in the monolithic situation” of the drink distribution oligopoly, joined forces directly with an Amazon community of agriculturists and with those enlisted through various media campaigns (social networks, video, internet, t-shirts, etc). We are not going to deepen our analysis of this interesting project, as we previously discussed it more detail (Leão, 2010b).

To discuss the presence of the post-media model in relation to digital media practices, it is necessary to first consider the dynamic nature of this model. Thus, projects that, despite making use of digital media, are not restricted to any specific media are examples of post-media processes. These are projects that are articulated in the media traffic, running through several mediatization processes. Let’s take a look at some examples.

“Vista On Vista Off # 2”, the artist Denise Agassi’s network installation invites us to an exercise of expanded observation through communications networks and online databases. Composed of a central device which provides the main idea, the project offers us a point of view that travels along a planispheric view of the Earth and, thus, through a representation of entire terrestrial surface as a rectangular plane, the system leads us to geographical points. In the creation process, the artist opted for a system in which the points correspond to “links” that point to YouTube videos. In this sense, the project consists of accessing online databases. Interacting with the system leads us to choose geographical locations. Similar to a compass, the act of turning the device corresponds to the act of pointing to a determined coordinate.

Thus, the cardinal directions, north, south, east and west reappear as “codes” which activate process of displaying videos.

“*Catavento*”, a project by Gilberto Prado, Silvia Laurentiz and *Grupo Poéticas Digitais*³ from the School of Arts and Communication at the University of São Paulo, is an interactive installation that switches between several media and projects generative digital images in public spaces. The project works with a weather station that captures atmospheric information related to humidity, temperature, wind direction and speed. This digital data feeds into an analytical system that produces images of clouds, which are then projected into the public space. The wind data directly affects the visual composition of the project. The cloud images are generated by a particle system normally used for simulating natural phenomena, such as fire, water, clouds, etc. An algorithm was developed to visually represent “snowflakes” inside the word “sky”. According to the wind variance (more or less wind) the word “sky” fades to a greater or lesser extent, until it completely vanishes and reappears moments later. The wind direction is also translated into visual stimulus, causing the word “sky” to move in various directions.

Collective Creation Processes in Digital Media

We shall now take a look at a possible matrix organization in an effort to understand the logic that operates in digital creation processes. Specific attention will be paid to creation processes that are carried out in digital networks. In accordance with the cartography of creation processes we present in the current article, these projects are placed in the media model (that is, they explore the materiality of the media) and are categorized as type “h” experiments, as they use the communicative potential of digital networks, aiming to create dialogical and/or collaborative environments.

The collective creation processes in digital network is organized in three categories which are defined according to the procedural logic that validates it. As they refer to creation processes, they cannot be regarded as “finished work”. On the contrary, the projects we chose to analyze here are characterized exactly for their opening nature and being though constant transformation.

Associative Processes

In this category are projects which allow and stimulate free movement of thought. Inheritors of common practices in processes of collective creation, such as “brainstorming”, the projects

³ [Digital Poetics Group] Andrei Thomaz, Claudio Bueno, Daniel Ferreira, José Dario.

in this category aim to create spaces that receive the flow of contributions and collect varied input. The emphases of these projects, or better said, their primordial interests, are the connections, the establishment of networks and the creation of space for dialog. In this sense, they propitiate approximations between people from different fields. In summary, they are data sharing processes mediated by rules and systemizations established by the community. In this category we find platforms like Delicious, Twitter, Flickr and YouTube, which permit the sharing of the addresses of favorite sites, messages, photos, and video, respectively.

Although these systems are founded on free data sharing, it is worth mentioning that they possess a minimum level of regulation that organizes their practices. In the case of YouTube, for instance, there are norms concerning the sort of content that can be published in the terms of service documentation (community directives). This normalization cautions the owner that his account is responsible for the contents which are published in his name and he is obligated not to display copyrighted material. YouTube assumes that all published material is of the account owner's authorship and that said author concedes all rights to the platform. Beyond this, a series of instructions establishes limits in prohibiting media products of prejudicial mature, i.e. sex and nudity, defense of hatred, illegal acts, etc⁴.

Project Processes

We denominate as "project processes" platforms present in the World Wide Web which, besides the characteristics indicated in the previous category (that is, data sharing), establish collective actions goals. Furthermore, in these cases, the structuring of phases and stages, as well as the determination of materials, media and methods is also observed. Wikipedia and *Overmundo* are some examples of processes which operate on this nature of logic. Whether the goal is the organization of information in a free-access encyclopedia or a collaborative site focused on Brazilian culture and the culture produced by Brazilians all over the world, this kind of project is characterized by always being in discussion among the members of the community. In the same way, its norms and procedures are constantly being revised.

The "open source" movement is also part of this category, as is utilizes the communication networks in its processes of creative development. The specific case of the "open source" movement involves a wide range of projects (including, but not limited to, software) and includes a systematization of collective creation procedures and methods of sharing (Delanda, 2011).

⁴ See details of the terms at: http://www.youtube.com/t/community_guidelines?gl=BR&hl=pt.

Translation Processes

Frequent in digital networks are projects which aim to aggregate procedures and content from different platforms. In this sense, they operate as mediators between different nodes of the network. Some of them, in the same way as language interpreters, propitiate conversational and multiple contribution spaces. Founded on what Manovich (2001) called "databank aesthetics", the translation processes appropriate and reconfigure applications, output and files from the networks to compose their proposals. The examples from this category work with recoding, appropriations, remix and reinterpretation. Mash-ups are also inserted in this typology, projects comprised of an agglutination of elements with content from different sources with the aim of creating a diverse application. At first, mash-ups are websites which use data obtained from content providers (or APIs). It is possible to find mash-ups with APIs from different applications: Google Maps, Flickr, YouTube, Twitter, etc. A research study on projects of this nature reveals an enormous quantity of applications (see for example, "ProgrammableWeb.com"). Let's see some examples:

TagGalaxy is a mash-up which operates with data originating from Flickr. It is possible to access images through the choice of a tag. As is known, tags are indexing data systems which can be customized by the user. Present in the Web 2.0 universe, the tags revolutionized the way of organizing and accessing digital information, as they do not utilize a fixed hierarchical structure. In the TagGalaxy case, the process of interacting with the system offers us an opportunity to articulate data in dynamic three-dimensional, circular visualization generation reminiscent of images of planetary systems and constellations. The size of the sphere corresponds to the quantity of the images located in the Flickr databases. With each tag searched, a galaxy of related tags unveils the associative networks among the images. Clicking on the searched-for sphere, an animation presents the database images. This project indicates characteristics which we judge to define a collective network creation process. The first one relates to the fact that TagGalaxy does not exist as finished work, but as a dynamic data visualization process. In this sense, it operates with combinatory logics and their potentialities, updates itself at each choice made. The interaction of the user can occur in a deeper level as it is possible to feed the Flickr databank.

The use of an interactive map with points related to the geographical location data (latitude and longitude) and an image databank originated from a historical patrimony are the starting points of an "Old S.F." Mashup project that operates with the Geocoding Google API, the "Old S.F." is a website which offers an interactive map of San Francisco, California, that can be accessed in different historical moments. Navigation occurs through a timeline that comprises the 1850-2000 period. In each date of this period, there are points on the map indicating the number of photos available. The project comprehends the visualization of 16.000 photos, originated from the San Francisco Public Library Historical Photography Collection. Interestingly, this project makes possible the travel though the city's past, at different times,

as we were unveiling palimpsest layers. The project invites collaboration and allocates the archives with the images' description and the geocode points of the maps.

The poetics which work with the databanks explore the creative potential that dwells the digital languages core. The processes, when dealing with complex, nonlinear systems, operate crucial issues of the combinatory analysis. What are the process control limits? How does the system programming interfere in the data update? How does the "tags" system filter and choose the images that are going to be veiled and unveiled? These, among other questions emerge in processes of this nature. Even more, makes us reflect upon the aspects of the contemporary culture and the data endless organization and reprogramming. As clearly put by Manuel Delanda:

'Our world is not only governed by the nonlinear dynamics, which makes predictable execution and control impossible, but also the nonlinear combinatory analysis, which implies in possible mixing numbers of networks and hierarchies, of command and market, of centralization and decentralization, the ones we simply cannot predict are huge and the emerging properties from these combination, endless' (Delanda, 2000, p.273).

"Your life, our movie" project by Fernando Velázquez, Bruno Favaretto and Francisco Lapetina is a piece that travels along the databanks aesthetics and operates translations and remixing with files and digital images. Proposed in different platforms, a site and a multimedia interactive exhibit, the project was thought as a generative process that uses the Flickr databank. In this process, a real time visual narrative with images from the internet is generated. Visitors of the expositive space participate by typing words in the system. As interaction happens through the internet, the process is the same and consists of the choice of the word. A programming searches Flickr files that receive this tagging. Three selected images are remixed with audio files. The typed words are also the elements which compose the generated video, establishing unexpected relations. After some time without interaction, the system starts to work automatically, bringing other words and corresponding files. In this dynamic, the apparent associative "random", generated by the algorithmic logic, aspects of the surrealist poetics of the automate writing and the potential poetry are revisited.

Final Considerations

In this article, we tried to draw a possible cartography of the collective creation processes which happen in digital networks. In order to do so, we set off from the research guidelines we made in creation processes. Inserted in an academic environment which traditionally is interested in the analyses of the finished product, or epistemologically - based approaches, it is essential that we point out the principles of the research of theoretical-practical nature. As we could observe, research on creation processes is directed towards praxis, that is, the practice moved by a conscious thought of its models and choices. In this sense, aiming to contribute

with this praxis construction, we set ourselves to the task of reflecting on the conceptual models that corroborates the creation processes in media. In our analysis, we could evidence the presence of models originated from the communication theories. These models work as meaningful lenses which structure visions of the world and activate creation processes. We defined three models (informational, media and post-media), pointed out their characteristics, applications on the creation processes in several media and specifically in processes performed in digital media. From this model definition, we situated the collective creation processes in digital media and proposed a discussion about their characteristics. Conceived as systems, open networks in constant transformation, these processes reveal their specificities. We expect the typology of processes we proposed in this article can contribute to the reflection about the methods and procedures which runs through the digital media experimentations.

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