museums in NETWORKS of development

Entwine

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Preface

The warm color, the most intense of all, is identified not only by our vision but by our synapses. The trilogy Retell, Entwine, and Detangle, whose acronym refers to RED, is of similar intensity to the author who subscribes to them.

To scrutinize and cross the culture, Olira Rodrigues turns, stirs, and pokes, provokes twists and turns as she defends her readings about a time, the contemporary zeitgeist, linked to the museum, the object around which the three books orbit. **Museums in NETWORKS of development**, the trilogy, present themselves with the breath of an

epic, the epic of a thesis developed at the Post-Graduate Program in Art and Visual Culture of the Federal University of Goiás.

By inquiring, through her attentive gaze, about museums, their configurations, and reconfigurations, the author moves in time, in diachronic and synchronic observations, with particular attention to technology. In doing so, she distances herself from a mere relation of causality. She singularizes her discourse, instituting the polyphony of voices of time, spaces, and their objects, entangled in networks, implicated in moorings and liberties.

More than a reading about ways of retelling (Retell), interweaving (Entwine), and untangling (Detangle), the trilogy bends throughout the culture. It needs to be apparent motivations, densifications, and pulses.

The first volume, "**Retell: Museum in Evolution**" keeps an accurate seam about history, punctuating motivations, conceptualizations, and configurations of museums, from the Louvre and Smithsonian models to the most modern concepts of Atlas,

the one that bears the weight of the world. Before gaining time, the volume scrutinizes the space institution's formation and formal actions. This weaving results in a composition of diachrony that catapults the reader to the next book, "**Entwine: Networks**".

The second volume invites the reader into a weft, an amalgam of networks, systems, and rhizomes, whose flows, reflows, and reflexes suggest emergent technological links between humans and non-humans. The means have as a principle to reach the end. Although these wanders, intermingled with present and past, vectors that draw the imagined dazzle of the future crookedly.

And the end, at least of the trilogy, comes with the third volume, "**Detangle: Redesigning the Museum**". Here, the problematization is formed with a more excellent body, feeding on the previous volumes to analyze the anatomy of the present museum, its biometry, and its kinetic physiology. Spaces and times could summarize this foray, although one needs help to think of summaries of times and spaces. The volume provokes, like a storm that rages in the forest, new approaches

to museums, redesigning songs, chants, and past steps, traces of a future we stubbornly want to build, which we call Culture.

Cleomar Rocha

Presentation

Museums in NETWORKS of development

The relationship between the museum and the world has always affected human sensibility, and this affectation has intensified in contemporary times. While the future is imagination, the past glides in our memories, and we keep trying to fill our past narratives, making them unshakable over time. Museums contribute as guardians of the social past and go against the marks and consequences of the course of time. And, as subjects in this process, we are affected by this temporal storyline, appropriating a space in this world in the face of all temporal phases.

The trilogy **Museums in NETWORKS of development**, which arises from thesis research, leans on the potentialities of cultural environments, with the specificity in museums, after the establishment of modernity, a consequence of scientific-technological advances in the social context. As a fertile ground for studying social and cultural evolution, the museum slides in moving limits with the insertion of technology in an informational way, exposing poetics and aesthetics – sometimes materialized, sometimes projected in subjectivities – the discomforts and tastes of society.

It is worth clarifying that, in this trilogy, the museum is, in a broader sense, considered as a space for the socialization of knowledge, where one discovers, learns, expands knowledge, and deepens the consciousness of identity; and, in a more specific sense, a territory of interaction, facing sensations, ideas, and images irradiated by objects and referential.

Thus, the noun "museum" is identified as a space of interaction with the possibility of socializing knowledge and subjectivities. The characterization

of the study of museums, acquired in the expression "in contemporary contexts" – or it can be replaced by the temporal adverbial locutions "nowadays" or "in the twenty-first century" – indicates the material cut of the object of study, the period proposed for analysis, which qualifies a possibility of actions that go through formatting, connectivity, culture, and language studies, determined in a socio-communicational change of information flows and interaction.

The title of the trilogy, **Museums in NETWORKS of development**, enables a polysemic reading through various prisms: museums in networks, as well as the involvement of museums with network formatting, and even museums in reiterated development, following the changes arising from aspects of modernity. This writing indicates an expansion of museums in this sense in the face of numerous pointed indications. In a way, the research enables, in its evolution, the formation of a semantic context that leads to plural interpretative paths, such as the network conception itself.

The network formatting for museums formally indicates the contemporary context. The museological cultural institutions have reformulated their communication modes with new languages and forms of interaction – which sometimes incite strangeness – besides seeking to adapt to this cultural contemporaneity, updating their configurations with agglutinating ways. Thus, flows and relationships are fundamental to tracing museums in a network.

The trilogy is composed of the first volume, "**Retell: Museum in Evolution**", which describes the historical path of museological institutions. The second volume, "**Entwine: Networks**", proposes a study of network museological configurations. It describes the structuring of museums by nuclei – independent of the area category – from art museums to science museums, morphology, anthropology, natural history, and scientific museums, among many others. Although there is a space for discussion regarding evolution, in which art museums are highlighted, the trilogy in question is not restricted to studying the networking of art museums, thus covering all other species. Finally, the volume "**Detangle: Redesigning the Museum"**

concentrates on notes on the distance between theory and practice, verifying a gap between intention and action.

The three volumes – **R**etell, **E**ntwine, and **D**etangle – form the acrostic RED, like the color in English, in a sense of passion for the object of research, throughout its construction, symbolically with epistemic sacrifice (blood), for its exercise of hard work (fire) in analysis and reflection.

This exercise of interpretation of meanings made me feel like a researcher and an artist of this web that the work handcrafted entangled, given my background in Culture, Education, Language, and Technology.

Olira Saraiva Rodrigues

Presentation

Entwine

The volume "**Entwine: Networks**" begins with the concept of Rhizome by Deleuze and Guattari to enter the concept of network, using as a research base the work "*Tramas da Rede: novas dimensões filosóficas, estéticas e políticas da comunicação*" (2013), organized by André Parente and the work "General Systems Theory: fundamentals, development, and applications" (2013) by Ludwig von Bertalanffy.

Distinguishing networks and systems through definitions granted by the works that underlie the chapter is one of the goals. However, perceiving

clear distinctions is only sometimes possible because there is no faithfully pure separation. However, the study advances in discussions and conceptual parameters between both theories.

The centralized, decentralized, and distributed network types are described through their particularities, besides presenting the hierarchical network model derived from the centralized network, emphasizing the structures that provide these dynamics and the connection processes between the nodes.

The organismic analogy is proposed to contribute to understanding system theory, with processes subjugated to the concept of organization to its development and functioning. The volume also mentions the language system, initially as a closed system, detached from the history of culture and society, and later as an open system, facing the fruits of socio-historical-cultural contexts.

Finally, under the inherent properties of external and internal aspects, language is manifested as a complex system human beings develop. It does not present linearity and completeness in

systems theory but a hybridization when it merges with each new linguistic formation into semantic networks.

Considering some systems concepts in mathematical terms, the volume states that the mathematical system transcends time and space because the formulas are absolute truths and remain universally intact. Again, the characteristic of an organization, associated with that of control, is legitimized. The way to modify the relations of calculus with the displacement of reasoning is made explicit in the face of the diffusion of the creation of links between theories that engender the general idea of mathematical systems.

The Actor-Network Theory (ANT) is referred to through the correlation with the discussed focus of network and system, with the particularities of the network prevailing in theory over the properties of the system.

In an attempt to resume the concept of contemporary museums, the automaticity of technical images is analyzed as a current mark, based on Flusser (2002; 2008; 2010). Flusser brings

superficiality to the technical image as an always liquid and mutable presence, in the face of the possibilities of navigation in the networked system, in constant flux.

Interweaving networks

Weft, web, connected nodes, mesh, intertwining, tangle, net, in short, countless terms are used to determine network conception in various contexts and areas of knowledge. In all these terminologies, the meaning overcomes linearity and tends toward complexity.

Using the concept of other sciences to better understand a term is common and enriching, although one can see that this use without due reflection becomes irrelevant. Pierre Musso, for example, in his text "The philosophy of the

network"[1], begins by pointing out the omnipresent characteristic of the term network in numerous disciplines, such as social sciences, physics, mathematics, computer science, technologies, economics, and biology (Musso, 2013, p. 17). However, as the author himself clarifies, great caution is needed in the symbolic use of the term so that it remains focused and becomes diluted. Even if there is no holistic view, there must be an analyzed semantic relationship of the terminology.

> The concept of a network created by Deleuze and Guattari is a fractal concept, which leads us to think of an intermediate dimension that helps us to overcome the dichotomies of the intelligible and the sensitive, the discursive and the extra discursive, the subject and the object (Parente, 2013, p. 106).

Through this study, one can note the phenomenon of Rhizome (Deleuze and Guattari), integrating the construction of network meaning. Always inserted in visual culture, the rhizome is a vital representation resource for the concept of a network, with the idea of a branched structure.

1 Originally published in "Tramas da rede" by André Parente (org.).

> What Guattari and I call rhizome is a case of an open system [...]. A method is available when concepts are related to circumstances and no longer to essences. But, on the other hand, ideas still need to be given ready-made. They pre-exist: one must invent, create the ideas, and in this, there is as much creation and invention as in art or science (Deleuze, 2004, p. 45).

Kastrup (2013) considers that "among the topological figures, the network stands out for being hollow, composed of lines and not of spatial forms" (p. 80). For her, "the primacy of line over form, as well as its definition by a logic of connections, evokes the concept of the rhizome, created by G. Deleuze and F. Guattari" (p. 80).

As an image, the rhizome reveals the notion of the network with the ability to branch. Generally, the rhizome can emit new branches in an underground stem structure, sometimes aerial. As examples, we can illustrate the banana tree, the ginger, and the potato, as figures of this rhizomatic structure.

Another example of a root with which the effectiveness of the network idea is identified is from the trees of the Trembling Poplar, found in the United States. There are thousands of trees

connected by a single root. In this case, a root system functions as a distribution center with a complex dynamic. With a lower level of complexity, trees, in their broadest sense, exemplify a distribution system. This includes all species, even if each tree species has a specific development architecture.

In the case of trees, except for the Trembling Poplar species, there is a distinction with the Rhizome concept: "As an accent system, rhizome makes connections without obeying a hierarchical order or affiliation" (KASTRUP, 2013, p. 81). In the trees, there is a center where all the branches communicate.

In the roots of trees, it is possible to verify the existence of a primary source, more significant than the others, from which arise the lateral roots. The root has the function of taking nutrients from the soil to be sent to the plant. With a branched model, the youngest roots carry out this absorption function. This is a process of distribution, communication, and mainly of organization of tasks so that the tree can carry out its primary objective in the ecosystem: oxygen production.

In the case of the examples cited above, the image representation enables the integration with the described concept of the Rhizome, not its substitution, even because the Rhizome takes on a much more philosophical character, starting from Deleuze and Guattari. And, as a philosophical theory adopted here, the Rhizome will be taken before one of its principles, which is the connection, which promotes the relationship between elements.

For Kastrup (2013), "working with the concept of the rhizome is to affirm that there is 'another domain,' which exceeds the domain of forms, where what was in appearance distinct is mixed, where what remained separate is connected" (p. 83, emphasis added).

> Rhizome is, from the point of view of forms, another domain. Still, it should be noted that this other domain is also the medium from which they emerge and which subsists in their surroundings, making that, among forms, relations are more than an obscure game of transports and influences (Kastrup, 2013, p. 83).

Rhizomes are representations constructed by visual culture, a metaphor of botanical explanation, in

which nature is an inspirational source for models of applicability to human purposes. The looks are crucial in interpreting the image, and, as the literary writer Veríssimo (2002) even states, everyone's behavior changes before the circumspect act of observation.

> Subatomic particles
> Behave in one way
> When they are observed
> And another way is when they are alone.
> As, in fact, do we all
> (Veríssimo, 2002).

The image uses vision to be perceived. The work, "*The primacy of perception*" by Merleau-Ponty (1990), establish perception as the possibility of making something present to oneself with the help of the body. Thus, perception brings sensoriality in a fruitful and elementary way.

> When we perceive a table or a lamp on this table, we have already primarily interpreted our visual sensations, for example, the bottom of the table, its solidity, or even the other side of the lamp. So we make a synthesis. We enunciate an invariable link between certain present sensations and other virtual sensations(Merleau-Ponty, 1990, p. 77).

Harmoniously, Didi-Huberman (1998), in "What we see looks back at us", supports the idea that recognizing the sensation is already a perception because sensibility is what one learns to perceive from the sensory organs. The author himself refers to an experience of vision with disquieting strangeness. For him, reading – imagery – is not converting to vocabulary but harvesting meaning.

> For this door remains before us so that we do not cross its threshold, or rather, so that we fear to cross it so that the decision to do so is always deferred. And in this difference, all our gaze remains - is suspended, between the desire to pass, to reach the target, and the endless, as if continually anticipated, grief of never reaching the target. We remain at the edge, as before those Egyptian tombs that appear only doors in every corner of their labyrinths, even though they only raise the concrete, limestone obstacle of their dreamed immortality before us. In this situation, we are simultaneously forced into a passage that the labyrinth has decided for us and disoriented before each door and sign of orientation. We are, in fact, between before one and within. And this uncomfortable posture defines our whole experience when it opens in us what looks at us in what we see (Didi-Huberman, 1998, pp. 232-4).

Recognizing, here, is nothing more than the triggering of meaning in a semantic shooting. From

a symbolic perspective, we have a polysemic gaze that flows and enjoys, making sense.

> The network metaphors seem inscribed/ situated halfway between the tree and chaos, between a hierarchical linear order and an absolute disorder. The network's image is that of an intermediate figure: a weft more open and more complex than the tree but too structured to account for randomness and disorder. Whereas at the beginning of the 19th century, the picture of the network as opposed to that of the tree, modernity places the network between the tree and the cloud. The network allows opposing a general form to the pyramid or the tree, linear and hierarchical but prevents it from falling into chaos and disorder (Musso, 2013, p. 34).

The tree or the root inspires a sad image of thought that keeps imitating the multiple from a superior unit, center, or segment.

> The rhizome has diverse forms, from its simple extension branching in all directions to its concretions into bulbs and tubers. There is a rhizome when mice slide over each other. *There is the best and worst in rhizome*; the potato, grass, and weed.
>
> Animal and plant, the grass is the weed. We will only convince people if we enumerate specific approximate characteristics of rhizome (Deleuze & Guattari, 1995, p. 4, emphasis added).

In its structural flow, the diversity of paths woven by rhizomatic formatting resembles both branching roots and, pejoratively, folds, cracks, wrinkles, and striations. "The network is an embodiment, an empirical and updated version of the rhizome. It is already a visible field of effectiveness, where concrete agency occurs between the elements that compose it" (Kastrup, 2013, p. 84). In this sense, its context will allow the analysis of the best and worst paths traced.

Aspects of the network structure

Networks, then, are produced from connections in all dimensions, whose multiplicity allows the movement of a vast and diverse range of insertions and contextual perspectives.

> The network is a vehicle that transmutes us into "passers-by," always immersed in the flows (of information, images, sounds, data...). The movement is continuous: just as the Platonian Republic puts everyone in their place, reticular democracy puts everyone in a situation of passage, 'connecting' them to a network. The present is the passage, transition, and movement. There is no longer any need to operate social change. It is done permanently.

> Thus, the network has become the end and the means to think about and accomplish social transformation or even the revolutions of our time. The imagination of the web is simply an ideology, that is, a way of doing the economics of the utopias of social transformation. Paradox: while Saint-Simon forged this concept to think about social change, it has become a means of no longer thinking about it. That is proper fetishization. The network has gone from the concept stage to percept or even precept (Musso, 2013, p. 37).

The network model, although symbolic, appears in movements that suggest multiple paths, which do not always propagate from a core.

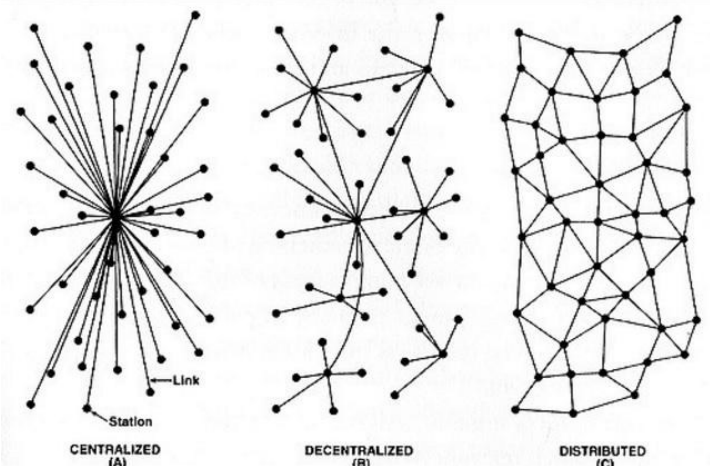
> The inventors of the internet – including Robert E. Kahn and Vint Cerf – envisioned a world where networks connected to other networks – thus creating and interconnected fabric of networked systems (Greengard, 2015, p. 08).

First, it is necessary to understand the types of networks illustrated by Paul Baran since the 1960s.

According to the diagrammatic figure above, centralized networks start from a central point, from a single source. Due to its star architecture, there is greater management control and less flow routing. In the centralized model, the network can

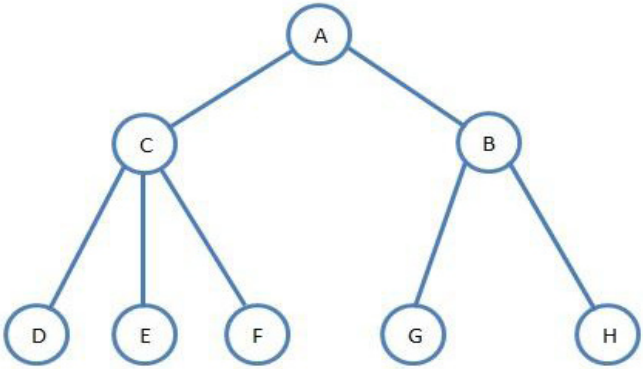
be hierarchical, with a central point forwarded to other secondary issues and then to the remaining points.

Figure 1 – Centralized, Decentralized, and Distributed Networks



Source: Baran (1964).

Figure 2 – Hierarchical networks



Source: Gama (2015).

Centralized networks can be formatted hierarchically when communication from the cores first passes through intermediate points until it reaches the central issue.

Decentralized networks reach a higher level of complexity and, therefore, less control over their flows. A multi-center format with several centralized networks interconnected. Multiple hubs deconcentrate the traffic of connections, decentralizing existing flows in a constellation architecture.

In distributed networks, each point connects to another interconnection point, maintaining contact with one or more other attributes. Its non-hierarchical format resembles a fabric, with each node being independent of another yet directly connected to the other. Fully democratic, the distributed network works through interconnections between different network members. Both decentralized and distributed networks are non-centralized and, according to Antoun (2013, *p. 224*):

> [...] are freely scalable power networks where growth plays a crucial role in shaping their topologies. They are not centralized like a star network. No central hub sits at the center of the spider web to control and monitor every link and node but are held together by a mobile hierarchy of tightly linked axis (hubs) that are connected (linked) to many smaller nodes so that there is no single node whose removal can break the web.

What determines whether a network is centralized, hierarchical, decentralized, or distributed are not the nodes and their positions but the structure that provides these dynamics and the connections process between nodes. Synthesizing, according to Musso (2013), is the network that "designates the space of territory over which devices of fortification or circulation are connected. To control

or to circulate, that is the original ambivalence of the network" (p. 23).

Similarly, Actor-Network Theory (ANT), the network is not delimited to infrastructure but to the result of production by connections (Demo, 2012). Therefore, it is not static, structural, or dynamic and builds itself from the movement of mediations. When describing the concept of the network from ANT, Demo reiterates that:

> The network is, on the one hand, an open dynamic, but, being a way in which entities associate, there is there, on the other hand, a "mode," that is, a type of structuring. ANT tries to escape this trap by always warning that it remains in an ongoing process of re-elaboration, but, as I have already alluded to, it is more charming than "exit." It can be alternative structuring, much more airy, sensitive, and agile, which seems to be the case (Demo, 2012, p. 80).

According to the author, open dynamics is described by network similarity. Thus, ANT lies in the less stoic structuration, the more open and dynamic structuration. "Like a rhizome, Latour's network is both a way of thinking about the emergence of hybrids and its own ontology. The elements the hybrid brings into connection are

heterogeneous - material, social, technological, linguistic, etc." (KASTRUP, 2013, p. 84). To this end, a conceptual hegemony of network aspects over system aspects is established.

Interestingly, the acronym ANT – like the insect – refers to a collective work well suited to a networked format. "Like a rhizome, the network articulates heterogeneous elements such as pieces of knowledge and things, bits of intelligence and interests, where matters work outside the control of methods" (Kastrup, 2013, p. 85). In this same direction, ANT considers that everyone is an actor in this process, both human and non-human.

> It is the most essential ontological principle because it is through it that Deleuze and Guattari can affirm that the field of actual existences – *subject, object, etc.* – remains immersed, since always, in a moving area of pre-individual singularities, which ensures its situation in becoming (Kastrup, 2013, p. 81, emphasis added).

The term 'actor' denotes something that acts or is the target of the action conceived by others, so, in this perspective, it can be both human and non-human. Latour considers, in ANT, agents every

entity by absolute equality insofar as they act on others. Even if the force is not equal, all are agents.

> For Latour, hybrids emerge from the network and the science that rejects it. Both are products of the network, composed of elements of nature and society, intellectual and political, material, and institutional [...]. Like a rhizome, *the network articulates heterogeneous elements* such as pieces of knowledge and things, bits of intelligence and interests, where matters work outside the control of methods (Kastrup, 2013, pp. 84-85, emphasis added).

Per the theory, no rigidity is instated in the elements that make up the network. "Interactive dynamics do not endorse definite identities; they mix them and from that emerge others, generally unpredictable" (Demo, 2012, p. 49). Since the basis of ANT is moving, validities are relative, able to "float on data, not drown in it." (Latour, 2005, p. 24 *apud* Demo, 2012, p. 55).

In this way, according to Demo (2012), ANT is known for the exercise of dissensus, where it does not hold a stabilization, but a de-structuring and "endless re-elaboration" (p. 50). The unpredictability of its movement is based on the dynamism and hybridization of its heterogeneous components,

thus the dynamics of movement, process, and fluidity. Therefore, its flow has no regularity and control, for it is not closed, concluded, or consummated.

In conclusion, "actors in networks do not establish determined, definitive, finished relationships, but intertwining incomplete, renewable, innovative reciprocal dynamics" (Demo, 2012, p. 54) in an update built at each resumption.

The semantic proximity of the IoT with ANT makes it possible to perceive an intersection in both theories. For ANT, the network is not limited to infrastructure but to the result of production through connections (DEMO, 2012). Therefore, it is not static, structural, or dynamic and builds itself from the movement of mediations.

> The various mediations between humans and non-humans (the IoT in school, in the city, in cars, in commerce), the morality instituted (or not) in algorithms, and the delegation of actions to non-humans (objects, software, data centers....) appear all the time, even if these terms are not present in texts about IoT. There needs to be a philosophical reflection on objects and IoT. The ignorance of ANT as an essential theoretical perspective for viewing the controversies and

> networks being constituted is worrying. This poses an academic challenge in a terrain that still needs to be explored, which is stimulating (Lemos, 2013).

ANT, like IoT, considers that everyone is an actor in this process, both human and non-human. Both theories adhere to this communicative format. In ANT, technology is currently among the most active objects. In IoT, technology is foundational. Again, proximity reveals itself.

> The history of technology is filled with optimistic, if not utopian, views of a happier, and more leisure – oriented future. However, as every new wave of technology arrives, numerous chances occur – some positive, some negative, and many entirely unintended. It's virtually impossible to anticipate where any particular technology will take society and how it will interact with a vast array of other technologies, social systems and factors (Greengard, 2015, p. 135).

There is also a convergence of concepts regarding the connection between humans and non-humans. In ANT, Latour considers agents every entity by absolute equality, to the extent that they act on others, and even if the force is not equal, all are agents.

> Connected devices translate into connected people – along with entirely different relationships among groups of people. Yet these human connections, however important and profound, are only a piece

> of the overall IoT puzzle. And individual device or thing connected to the Internet increases the power of that particular device – and often adds substantial value for the person using it. However, the ability to connect devices into a vast network – essentially the Internet of Things – increases the possibilities and capabilities exponentially (Greengard, 2015, p. 83).

In this case, the IoT establishes a relationship with technological devices connected to the Internet and people by a similar approach, whose connection of such devices expressively enhances human abilities and capabilities.

There is, in this process, a decentralization of the human being so evidenced by ANT, for even recognizing the extraordinary achievement of the human being concerning scientific knowledge, it is essential to consider its fragility concerning the "Unwanted of the people"[1] in which all the technological advances focused on medicine are not enough to make man perpetual.

IoT is an embryonic and emerging scenario that dialogs with several concepts. Some analyzed in this study, such as ANT, verify how the integration

1 Expression given to death by Manuel Bandeira in "Consoada".

process via technology is consolidated in a connected perspective. It explores the relationship between systems and humans, pointing to a future already indicated in the deflagration of vectors verified by technology, focusing on connectivity as a practice and aesthetics.

Networks, in this investigation of the work, do not appropriate the concept of network mentioned in IoT. However, the idea of IoT is advocated in the work because it is one of the vectors of development and social evolution and, consequently, related to the museum. In fact, the first volume analyzes this evolution and refers to the presence of IoT as one of the indicators of scientific-technological advances in these institutions. Thus, museums on the network necessarily surround the research for being in conformity with the transformations arising from aspects of modernity, but they are not the target in question.

System

Like the web, in recent times, the concept of a system has gone viral. And, as Ackoff (1959 *apud* Bertalanffy, 2013, p. 28-9) clarifies:

> In the last two decades, we have seen the emergence of 'system' as a critical concept in scientific research. Of course, systems had already been studied for centuries, but something new has now been added... The tendency to look at systems as an entity rather than a cluster of parts is in line with the trend in contemporary science that no longer isolates phenomena in narrowly confined contexts but opens itself to examining interactions and investigating ever larger sections of nature. Under the aegis of systems research (and its numerous synonyms),

> we have also seen the convergence of many more specialized creations of contemporary science... This research continues, and many others are interwoven into a joint research effort involving an ever-wider spectrum of scientific and technological disciplines. We are participating in what is the broadest effort to arrive at a synthesis of scientific knowledge such as has ever been made.

The expansion of disciplines that have adopted systems as their theoretical support has strengthened and legitimized systems research, intertwining concepts and characteristics of the disciplines concerning theory. When analyzing the peculiarities of systems theory, the isolated characteristics and behaviors of the elements are not necessary, but the constitutive ones depend on the specific relations within the complex.

> If, however, we know the total of the parts contained in a system and the relations between them, the system's behavior can be derived from the behavior of the elements. We can also say: while we can conceive of a sum as being composed gradually, a system, as the total of parts with their interrelations, must be developed as constituted instantaneously (Bertalanffy, 2013, p. 83).

In this way, a system can be conceptualized from a complex of related and integrated elements, even because behavioral differences exist between segments analyzed in isolation and details in interaction with the system. The text will start with examples of systems entangled in various fields of knowledge to lead to the development of systems with the versatility of conjunctions.

The organismic analogy assists in the understanding of system theory. The biological organism, for example, is governed by a neural system in the face of an incredible multicellular organism architecture:

> The biological model for organizations [...] means to take *the living organism and those processes and principles that regulate its growth and development as a model*. It means looking for operations subject to laws in the evolution of organizations (Haire, 1959, p. 272 *apud* Bertalanffy, 2013, p. 159, emphasis added).

The brain, in this representation, would be the communication center, with the whole remaining organism, as a vertical centralizing and controlling system. The organism is full of autonomous processes managed by the brain, such as:

> Automatic movements of the organs of respiration, circulation, and digestion; electrical, automatic-rhythmic activities of the nerve centers and the brain, supposedly resulting from rhythmic chemical discharges; automatic movements of the organism in totality (Bertalanffy, 2013, p. 163).

Also in Bertalanffy (2013, p. 162, emphasis added), "The organism is not a closed system, but an open one. We say that a system is 'closed' if no material enters it or leaves it. It is called 'open' if there is import and export of matter." The dynamic organization of processes in the biological domain is characterized precisely by the input and output of matter, attributing vital phenomena to the organism, such as growth.

"The basic characteristic of the organism, the fact that it represents an open system, constitutes the principle of organismic growth" (Bertalanffy, 2013, p. 181). In addition to growth, to attest it as an open system, other characteristics such as metabolism, development, reproduction, autonomous activity, stimulus-response, and self-regulation are present in the organismic system.

Control systems

As living organisms, humans are not control machines. Even though they may become so to a certain extent, they will never be wholly mechanized and manipulated, as the movie "Modern Times" (1936) by Charles Chaplin, mirrored in the Industrial Revolution, ironically says. In any case, the control systems present an inevitable dominance in social behavior, observed in the conduct of each individual that makes up society.

Control, as one of the characteristics of systems theory, opens a range of discussions in modern society, as a reflective theme, even in countless classics of literature and cinema. The novel "Brave New World", by Aldous Huxley (2007 [1932; 1941]), discusses social control, conditioning, and standardization in the name of technical modernity and criticizes the fact that, in the future, we will be manipulated without even realizing it and that there is only predictability, never change. The book presents an acid analysis of an end with a controlled society, with people who are automated and lack critical thinking. In this way, Huxley denounces human alienation and mediocrity.

The work is a futuristic exercise about state authoritarianism that is not futuristic but is current, with authoritarian states prioritizing universality over singularity and, therefore, over unique experiences. Similarly, George Orwell's "1984" (2005) eagerly criticizes totalitarian governments. The book is a work of fiction where the state vehemently controls the lives of citizens, starting with language.

> Actually, few people ever wrote letters. For the messages that it was occasionally necessary to send, there were printed postcards with long lists of phrases, and you struck out the ones that were inapplicable (Orwell, [1949], p. 63).

In the novel, Big Brother leads and controls citizens through screens as tools of control.

> In his novel 1984 (first published in June 1949), George Orwell used Big Brother to define the control exercised by monitoring cameras. He certainly did not prophesize the complex web currently built on such systems. In the novel, the 'big brother' was a tool of control, a panopticon of the totalitarian regime to scrutinize deviations, including thoughts, of workers, aiming for the entire exercise and maintenance of control (ROCHA, 2017b, emphasis added).

The book is prophetic because today, we are experiencing a breach of privacy through technological advances, such as monitoring systems, either via satellite or micro cameras.

In the movie Truman's Show (1998)[1], the protagonist discovers that cameras and broadcasts have monitored his whole life on a national network. The film discusses the imprisonment of people unconsciously immersed in totalitarian societies using a reality show's resources. The film is a critique of the monitored reality of society. It generates a question of whether we are free or spend our whole lives being manipulated by social dictates and imprisoned by the artificiality of the system. In short, the film triggers a reflection on a social reality built from the symbolic values imposed by the hegemonic system.

Countless examples of literary and cinematographic works have explored the control system under some sociocultural aspects. Although fiction, these plots converge to configurations that appear, to a lesser extent, the reality. In the name of security, society has sought control by monitoring systems.

1 Directed by Peter Weir and written by Andrew Niccol.

Therefore, we are heading toward a scientifically controlled world whose technological advances have made modern totalitarianism reach its highest effectiveness.

Language system

Considering that everything happens in language through language and with language, since we are subjects of language, therefore dialogic, and producers of ideological texts, we must anchor ourselves in the linguistic system to understand the system's possibilities.

Returning to the discussion of control, the Newspeak, a linguistic system quoted in the Orwellian novel, had the objective of considerably reducing the length of thought by reducing the number of words to the minimum possible. The purpose of Newspeak's "Vocabulary A" was "only to express simple, purposive thoughts, usually involving concrete objects or physical actions" (Orwell, [1949], p. 175).

Removing the extremism of the system adopted in the Newspeak, the linguistic system was

initially characterized as a conventional system acquired by individuals in social interaction. Saussure, considered the father of Linguistics, emphasized the structural character of the linguistic phenomenon. He stated the language was structured in rules that organized speech logically, abstractly, and systemically. Therefore, a closed system is detachable from the history of culture and society.

A later conception, coming from several linguists of the 20th century[2], emphasizes the discursive character of the language. Sociolinguistics emerged, establishing a relationship between language, culture, and society. Thus language is configured as an open system, bearing the fruits of social-historical-cultural contexts, commonly referred to as extralinguistic aspects.

One of the central concepts in contemporary language systems studies is that of context. Because it is involved in such contexts, linguistics interacts with several other sciences, such as biology, psychology, sociology, neurophysiology, and many others.

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2 Mikhail Bakhtin, Émile Benveniste, Roman Jakobson.

There are, therefore, two linguistic systems: a closed and an open one. The rules of the language: Phonetics, Morphology, Syntax, and Semantics, including even Pragmatics, constitute an internal system composed of rules for the formation of the utterances of that language. In contrast, the other system values linguistic and sociocultural diversity in identifying the factors to which this diversity relates.

The language system is a metaphorically living example of systems and their functionality. Languages influence each other, and "it would be difficult to cite an example of a language or dialect living completely in isolation, especially in the case of primitive peoples" (SAPIR, 1980, p. 153).

> We begin this section by accepting the Chomskian definition of lang/language (i.e., of a linguistic system) as a set of sentences. However, it is preferable to conceive of a linguistic system composed of an inventory of elements, a vocabulary of units, and rules determining the proper formation of sentences at both levels. (Lyons, 1987, p. 68).

Thus, language is governed by a structural system:

> Because these patterns vary widely, the ways of thinking and perceiving in groups using different

> language systems will result in fundamentally different conceptions of the world (Fearing, 1954 *apud* Bertalanffy, 2013, p. 281).

The linguistic system is hierarchical and based on cultural aspects, even because language does not exist in isolation from culture.

> There are precisely five languages that have had a dominant action as vehicles of culture. They are classical Chinese, Sanskrit, Arabic, Greek, and Latin. Compared to them, even culturally essential languages such as Hebrew and French fall in a secondary position. It is disappointing that the English cultural influence has been practically negligible. Our language has expanded because the English have colonized immense territories. Still, there is nothing to indicate that it is creeping into the core of any other language in the way that French has tinged the complexion of the English language or Arabic has dragged into Persian and Turkish (Sapir, 1980, p. 154).

According to anthropology, humans are classified according to a triple helix: race, language, and culture. So geographical, historical, political, and economic aspects segregate linguistic groups.

> Aesthetic and cultural practices are particularly susceptible to the changing experience of space and time precisely because they involve the construction of representations and spatial artifacts from the flow of human experience. They

> always serve as an intermediary between Being and Becoming (Harvey, 2013, p. 293).

Harvey (2013), when mentioning time and space, refers to historical and geographical aspects in social life and the insertion of a politics of flow and connection. Also, according to Sapir (1980), language "is about the most remarkable and colossal work the human spirit has ever developed: nothing less than a complete form of expression for all communicable experience" (p. 172). For him, "language is the broadest and most massive art that comes across, the anonymous culmination of the unconscious work of generations" (p. 172).

It is, therefore, a highly complex system developed by humanity. However, a language system is abstract and has no physical existence. It is a social phenomenon observed in language behavior[3] through the speaker's knowledge of the structure of the language system, translated as language competence.

> Language systems are two-level structures: they have the property of duality. Spoken sentences are not mere combinations of phonological

3 Factors such as age, sex, occupation, ethnic background, and attitude influence linguistic behavior (Labov, 1963).

> elements but also combinations of syntactic units. Chomsky's partial definition of a language system as a set of sentences, each finite in length and constructed from a limited set of elements, must be extended to account for this essential property of natural languages (Lyons, 1987, p. 65).

According to Harvey (2013, p. 53), "cultural life is thus seen as a series of texts intersecting with other texts, producing more texts." To this end, there is a free intertextual interweaving, as the author himself confirms:

> It is vain to master a text because the *perpetual interweaving of texts* and meanings is beyond our control; language operates through us. The deconstructionist impulse is to seek within one text for another, to *dissolve one reader into another, or to embed one text into another* (Harvey, 2013, p. 54, emphasis added).

In short, language is a hybrid whose tensioned meanings in multi-stratified and fragmented relations represent the connections for linguistic formations, a meaningful chain of meaning that creates a simple sentence.

The emphasis is on the non-existence of a linear and pure linguistic system. The linguistic system with the characterization of hybridity dissolves

and regenerates itself with each new creation in semantic networks. The linguistic system elucidates relevant characteristics by interweaving and juxtaposing textual and semantic units. And as an example, mathematics is also enveloped by systemic features.

The mathematics of systems

For Bertalanffy (2013), organization is one of the key concepts for the definition of Systems because of a mathematical model.

> Notions such as those of growth, differentiation, hierarchical order, dominance, control, competition, etc., are characteristic of the organization of a living organism and a society. These notions do not appear in conventional physics. Systems theory can deal with these matters. It is possible to define these notions within the mathematical model of a system (Bertalanffy, 2013, p. 74, emphasis added).

And according to Pimentel and Fuks (2011), the organization is "the activity in which the group establishes the relationships between information. The group may classify the information, or structure

the information in some way (for example, in a hierarchical structure)" (p. 28).

Bertalanffy (2013), in his book "General Systems Theory", includes a chapter considering some systems concepts in elementary mathematical terms. In the article "The philosophy of the network" (2013), Pierre Musso apprehends the network conception as a model of rationality supported by a geometric view.

The National Week of Science, Technology, and Innovation (SNCT), held in October 2017, with the theme "Math is in everything!", proposed discussions about the omnipresence of mathematics, almost in its entirety, in social, knowledge, and productive areas.

The text "The Mathematics that inhabits the objects around you", from the Institute of Mathematical and Computer Sciences (*ICMC* in the original acronym) at USP in São Carlos, published on the website of the Ministry of Science, Technology, Innovations, and Communications (MCTIC) in SNCT/2017, the ICMC mathematician and professor Ton Marar explains the spatial dimensions, with disturbing

and surprising examples of Mathematics being present in everything. He arouses the interest of the audience with a mathematical exhibition.

Edward Frenkel, professor at the University of California at Berkeley and considered one of the greatest thinkers in modern mathematics, in an interview for "Veja" magazine in January 2015, entitled "Under the command of algorithms", states that algorithms are at the basis of some of the greatest human innovations.

Frenkel mentions that "companies like Amazon and Google monitor the web and recommend products. Buyers think they decide for themselves, but they are influenced by programs that analyze their behavior" (2015, p. 16). For him, the analysis of history, culminating in the cross-referencing of data, makes most people not even imagine that they are being influenced by machine programming and, consequently, do not reflect critically before decision-making.

In analyzing Frenkel's conclusion regarding the criticality of Internet users, it is necessary to verify that data analysis and even data crossing will

not eliminate the user's/customer's decision to buy. The user/customer may even be influenced, but not definitely. And the fact itself does not eliminate the possibility of critical life. Otherwise, we would all be at the mercy of technology uncritically. Another vital factor to be mentioned is that such influence does not occur only in digital environments; the malls themselves, for example, are stimulating and instigating places, not to say areas that are persuasive to the act of buying. However, it is necessary to consider, through a not naive view, that the subject is always coated with autonomy.

The apex of his interview is the assertion that mathematics transcends time and space, both because it is a universal language and because the formulas are universal truths and remain the same, without updating, anywhere in the universe. Among the examples cited by Professor Frenkel, one can find mathematics even in the musical note system and the plastic arts, such as Escher's[4] paintings with symmetrical figures.

4 Dutch graphic artist (1898 - 1972).

In the introduction of the book by Ludwig Von Bertalanffy (2013), the author measures the scope of the term system, indicating that they are everywhere, corroborating the thoughts of Frenkel and Marar regarding the insertion of mathematics in the world.

> Systems thinking plays a dominant role in various fields, from industrial enterprises and armaments to esoteric topics of pure science, and countless publications, conferences, symposia, and courses are devoted to them (Bertalanffy, 2013, p. 21).

This consideration implies, according to him, a fundamental reorientation of scientific thinking in the face of a critical concept in contemporary scientific research. Similar to people influenced by programmed machines, whose mathematics is behind them, cited by Professor Frenkel (2015),

Bertalanffy (2013) describes man as a replaceable, mechanized, conformist, controlled, and standardized being in this new cybernetic world. He even gauges him as "a mental weakling, a trained or button-driven idiot, that is, highly trained in some narrow specialization or else he has to be simply part of the machine" (p. 29).

Progressive mechanization is a system characterized by organization and control. Therefore, its viewpoint is related to wholeness. Thus, it is holistic and comprehensive.

Several theories engender the General Systems Theory, such as compartment theory, set theory, graph theory, network theory, control theory (cybernetics), information theory, game theory, decision theory, and queue theory. For Bertalanffy (2013), "this enumeration is sufficient to show that there is a range of approaches to systems research, including powerful mathematical methods" (p. 44).

> Numerous works of anthropology of the sciences show, for example, that the most fundamentalist mathematicians are bricoleurs. Bricoleurs of a particular kind, since they bricolage with equations, formulas, and curves that they strive to make compatible, to accommodate each other by experimenting with their resistances, taking up my colleague's recipe (Callon, 2013, pp. 67,68, emphasis added).

Callon (2013) indicates bricolage as intermingling mathematical resources to arrive at the same result. These are strategies that make use of numerous paths through networks of combinatorial arrangements. Modifying calculus relations with

the displacement of reasoning spread the creation of links between theories.

As presented, different fields and sciences derive their foundations from network and systems laws. The principles that govern these various phenomena show remarkable similarities in sciences, whether human, exact, or biological.

Bertalanffy (2013) states that general conceptions or even theories in different fields are "a consequence of the fact that they refer to 'systems' and that certain general principles apply to systems whatever their nature" (pp. 118-9, emphasis added).

> We understand, however, that all scientific laws merely represent abstractions and idealizations that express certain aspects of reality. All science means a schematized picture of fact, in that a specific conceptual construction unambiguously relates to certain parts of order in the reality (Bertalanffy, 2013, p. 117).

However, in the face of the definition of a system, we observe numerous properties expressed in well-known laws in various scientific fields because much of the dynamics of the functionality of these fields, an important aspect to consider, is part of the general laws of systems.

Several other fields could be mentioned in this study, configured from the Systems Theory. However, only a few were exemplified and unveiled in different areas of knowledge so that it was possible to measure the dimension of their application.

Museological networks

According to the study above, discussed by several authors, the systems law excels in an organization, hierarchical structure, verticality, rigidity, definition, and predictability. At the same time, the network is more flexible, dynamic, horizontal, unstable, transient, and mobilizable.

From this point of view, the system is more commonly represented in a single institution or peer institution; the network, in turn, is more comprehensive and can be used in different institutions. Also, by comparison, the system is concrete compared to the network, which is

abstract. The system's functioning is visible, which is not the case with the network dynamics.

The network structures itself with mechanisms different from the system because it can exercise a punctual protagonist role. In the clock system, for example, when a part moves, it moves the whole gear, and it is impossible to operate an element in isolation. While the neural network, in continuity to the examples, presents aspects with a specific, solo protagonist role, which does not occur in the system.

These distinctions indicate that both concepts are linked and that although they present apparent differences at times, there is not a pure separation but a blending. Dependence, however tenuous, occurs between the two. Nonetheless, there is dominance between one or the other due to specific characteristics.

For what is envisioned here, museums composed of cores, some theories surround with some proximity. The idea of compartments is an example since the system belonging to this theory consists of subunits with transit processes. The

network theory is broader since it encompasses other approaches, such as sets, graphs, and compartments, and is equated to nerve networks because of its ramification.

This research starts from the theory of networks aggregated to the general systems theory to study the sense of network with a completely autonomous denotation belonging to the order of living things. In this sense, the network is a phenomenon, in proportion, as it makes sense as a whole combination process. It assumes various forms between solid, liquid, and intermediate states in this combination process.

> The network can thus assume various forms: at the same time, solid-crystal, fluid circulation system, and intermediate state between solids and fluids. The network can alternatively be a crystal, organism, and hybrid being. The surprising plasticity of this figure of the web can coat various forms: a state, its inverse, and the passage from one to the other (Musso, 2013, p. 25).

The network as an intermediary being is more flexible than systems. It lies on the threshold between extremes. "The network is more than the machine but less than the living; more than the linear, but less than the hyper-complex; more than

the tree, but less than the smoke" (Musso, 2013, p. 30). For the author, it is a borderline between the mineral's rigidity and the smoke's decomposition. However, between these two distinctions, there is an immense flow environment, acting as a tool to produce the passage.

> The network is a vehicle that transmutes us into 'passersby,' always immersed in the flows (of information, images, sounds, data [...]). The movement is continuous: just like the Platonian Republic puts everyone in their place, the reticular democracy puts everyone in a situation of passage, 'connecting' them to a network. The present is the passage, transition, and movement. There is no longer a need to operate social change. It is done permanently (Musso, 2013, p. 37, emphasis added).

The network structure is complex. Just understand that it leads to the direction of depths and stratifications. It is necessary to unfold it, to extend the whole tangle until it breaks all the layers of its thickness. In this thought, the networks are the fabrics whose intertwined threads form a hybrid context in continuous flow and reflow. As institutions integrate social material, museums try to work in networks. The museum institution is a reflection of society. In this reasoning, with the

constant social changes, museums have sought to adapt to new challenges that govern social patterns.

> ANT invites us to reconstruct the social sciences, no longer as 'sociology of the social' but as 'sociology of associations' (LATOUR, 2005), applying the term 'association' to all entities that can interact with others, human and non-human (Demo, 2012, p. 116, emphasis added).

Interaction by entities, according to ANT, is the role performance most emphasized in theory. Commodities, in this study, can be led to understanding museum institutions. As the author rightly said, they are associations and complementing, complex, non-linear associations.

The restructuring of museums into networks is a strategy of updating, acting towards development, and facing the challenges of new organizational models. According to Mestre and Molina, "to survive, local museums need to be interconnected in networks [because] building networks is the only way the local museum has to face isolation successfully" (Mestre; Molina 2008, p. 41 *apud* Café, 2012, p. 160).

Contrasting Mestre and Molina (2008 *apud* Café, 2012), in this aspect, Callon (2013) ponders that the world of science, market, and innovation does not impose modernization as the only possible choice, culminating in adaptation or disappearance. For the author, "they are collectively constructed through discussion, negotiation, agreement, and this construction process leaves many unpredictable avenues open" (Callon, 2013, p. 77). In pursuit, he maintains that "no one is doomed beforehand since what counts is the ability to connect, to cooperate, to enter into negotiations and compromises" (Callon, 2013, p. 77). The network concept is well suited for this analysis as a place of choice.

Following Callon's (2013) thought, Kastrup (2013) states that "the new is, in this sense, defined by the connection, by the coexistence of several layers of time, never lost, never definitively surpassed, but conserved since always and gathered in the cognitive forms of actuality" (Kastrup, 2013, p. 90).

There is, in this way, a recognition of the past, which is not merely replaced by the present with an eye on the future. Updating, in this view, is a

process developed by mediation practices where times and thoughts are merged.

> What makes the network strong is that each point in the network relies on the other issues on the web, and it is because each local network adds and joins these weaknesses with each other that it engenders strength. Weakness – no more than strength – is not a fatality, an essence, or a fate. It is about making alliances, about creating relationships. Politics is nothing more than that: the art of composing networks, of connecting points with each other, in such a way that the collection draws its greatness from the addition of singular weaknesses (Callon, 2013, p. 78).

The social, political, cultural, and economic context has dramatically influenced the insertion of museums in networks as a propulsive tool, allowing the institution to move towards new perspectives of cultural management. These contexts will enable us to infer the complexity of the sociocultural context of the space-time relationship that makes up the social plot. New forms of organization reveal new interactive and integrated structures.

> If the network produces so many representations and myths, it is a significant technique for organizing space-time. It is a space-time matrix: on the one hand, the technical network opens

> the spatial constraint without suppressing it and superimposes a space over territory – it de-territorializes and reterritorializes – and, on the other hand, it creates a short time by the fast transport or exchange of information. The communication network adds to physical space-time an expanded space and a reduced time. (Musso, 2013, p. 33, our emphasis)

Thus, the network must be understood as the axis in the logic of connections and not the reason for extremes. Museums have been following this organizational model because it is also a logic of innovation. Ending this writing with the notion of the network, coined by Callon (2013), provides a critical reflection on the possibilities of benefits in this scenario.

> The notion of the network allows, at first, to escape the opposition, itself paralyzing, between the local and the micro, on the one hand, and the global and the macro, on the other. This tension, present everywhere, is constitutive of the modern world. It sees the clinging to tradition and valuing heritage against globalization and standardization. The region against the world, particularisms against universalism. The contemporary world is the one that creates a common, homogeneous space and that can only achieve this by annulling differences (Callon, 2013, p. 77).

According to him, the network allows reconciling movements with local initiatives. It is about making links, alliances, and creating relationships. What makes the network work is that each point (element) is supported by other issues in the network.

A new configuration[1], embedded in concepts, is being created that reflects on contemporaneity given the epistemological changes underway. And every network configuration belongs to the excellent characterization of phenomena. In that case, the network is more than an object or an abstraction because it is a place of a dynamic process.

Museums scream and call for the dynamics of movement, the flow of stories, memories, remembrances, and forgetfulness, germinating a whirlpool of sensory, cognitive, and affective interventions, which would serve to express the museum in its configuration. From the concepts of Networks and Systems, the unfolded outcomes in the new constitutions of cultural management in museums will be approached, which enables us to think about the pressing need to reorganize these

1 Networks and Systems.

institutions. This book invites us to reflect on the act of looking, in different observation positions, with phenomenological postures. We must question and investigate our looks in unfolding, unraveling, penetrating, and going through the established networks, becoming phenomenologists.

Moreover, according to Rocha (2017a, p. 66):

> The nourishing base of culture is connectivity, responsible for ballasting and sharing the founding energy of thought, marking a continuous space-time. Therefore, mutable, and dynamic culture does not let itself be imprisoned but gains wings through connectivity, forming an idea of the future and launching our intelligence in the form of action to build together what we imagine.

The idea of flow, manifested in the ideals of polynuclear museums that work in networks, proposes mechanisms of interactive and transdisciplinary movement, which makes it possible to interact with its structure in nuclei and, simultaneously, outside its system.

Museums in flow

The museum in flow proposes to present the museum with its characteristics absorbed by contemporaneity, dialoguing with the thoughts of Flusser, whose name curiously means in flux, in transit, in process. To this end, a correlation with the word's etymology is well suited for this study because it mainly indicates the movement and displacement of the museum space in this context.

The choice of the author as a basis for the approach of museums in flux is established because he is notoriously considered a critical Czech thinker who deals with studies of images and their relations

with society, besides also being pointed, by the critics, as the primary intellectual mentor of several Brazilian artists who faced the challenge of technology.

At this point, we will borrow the provocative tone of Flusser's reflections, using a play on words to analyze contemporary museums. His famous work "*Filosofia da caixa preta*" (2002 — "Towards a Philosophy of Photography") reflects on the possibilities of freedom and creation in a primarily technological society. Although in this work, the author emphasizes the camera and, consequently, photography, his approach applies to any kind of technical image, including digital ones.

Similarly, Malraux's (2013) imaginary museum treated photography, in the mid-twentieth century, as modernity to the access to artistic works. However, in the context of the 21st century, numerous other technological devices can be analyzed in light of this prism.

After the appearance of the computer, scholars have resumed the concepts based on Flusserian reflections, such as that of the employee, for

example. Flusser (2008) calls the employee who deals with machines (technological apparatuses) and extracts technical images. The author's fundamental criticism is the substitution of learning by programming, that is, automaticity.

For Flusser (2008), there is no absolute freedom and a free choice expressed in technical images. Everything is previously determined and established. The author warns about the emergence of automatic situations produced by technical photos, in this case, by these digital museum environments. For him, attention is needed because instead of the knowledge space, the learning space, there will only be the programming space. Therefore, instead of learners, scholars, critics, and researchers, only "employees" will move through the area.

Although critics consider him the philosopher of the media, Flusser presents writing that produces scientific knowledge by philosophizing, calculating, criticizing, and, more than this, by allowing the dynamics of historical consciousness to advance. The essayistic tone of his texts is relevant since it already evidences the provocative manner of

his reflections, reinforced by the metaphors and word games he uses, always observing the proper language resources.

The author above presents an excellent linguistic mastery, which involves conceptual, cognitive, and pragmatic dimensions and coherence of argumentation, configured in different ways in his texts. Such knowledge would not be simply by the ability to write in four languages: German, Portuguese, English, and French, but above all, by stylish writing, remarkable writing, the solid and dense writing. After all, the way Flusser writes, without answers but with many questions, suggests a co-responsibility in the unfolding of the reflections presented to the reader, the interlocutor.

In the chapter "Abstracting", from the book "*O universo das imagens técnicas: elogio da superficialidade*" (2008 — "The Universe of Technical Images"), in an ingenious way, the author plays with the word calculus, the result of the fourth gesture of abstraction that, in the middle of his explanation, attributes the meaning of the stone and mathematical operation. Calculus is an instigating analogy in which he codifies and

decodes the language, dressing and stripping the code, reaching abstraction. With all agility, he appropriates the word calculus to indicate the stones that come loose from the necklace and roll around, forming piles.

Going back to work, for Flusser (2008), the four gestures of abstraction are described as manipulation, sight, conceptualization, and calculation and computation, representing, respectively, three-dimensionality, two-dimensionality, one-dimensionality, and zero-dimensionality.

With the incorporation of time, the gesture of manipulation has a four- dimensionality, which is already three dimensional. Through this gesture, Flusser reveals that humans can abstract time from the concrete world, transforming oneself into the human, properly. An analysis utilizing a thick symmetrical work in which first there is three-dimensionality through the hands in manipulating volumes; after that, two-dimensionality comes through vision, although the hands are guided by the eyes; following this reasoning, sight should go first, then. Man begins to act (manipulate)

according to a project – visual projection. One works on concepts in the third abstracting gesture, recognized as conceptualization. Therefore it could be called a definition, description, or explanation. Finally, in this gesture, there is an effort to explain the image, resulting in the writing of texts. Here is the one-dimensionality with the finger of the hand in the writing exercise. The author indicates, in this act, the formation of concepts and, by approximation of ideas, the abacuses and collars. Remember that necklaces are formed from stones. This association is fundamental to paying attention to the fourth abstracting gesture. In this gesture, there is the rupture of the threads that sustain the concepts described in the third gesture, as beads, stones, and abacuses that make up the necklaces, the textual structure.

The calculation, one of the words belonging to the designation of the fourth gesture, with the word count coming from the stones that build the necklace mentioned above in the third abstracting gesture, is structured in the ideological relation of stone and count, a perfect associative junction.

The pebbles, when loose, are not accessible to the hands, eyes, or fingers, but they are calculable, counted, and therefore touchable by the fingertips equipped with keys. The human becomes a player that calculates the conceived, and the universe becomes made of pixels and points, grouped in a network, no longer in a linear way. There is, in this case, zero dimensionality or nullity.

To understand what the technical image through pixels represents to society is the author's purpose in writing this work, as much as how the individual can receive this image.

In the attempt to resume the concept of contemporary museums, one has the presence of the post-historical world, in which the omnipresence of technical images is observed. The idea binds itself to the image and is submitted to it, and writing no longer presents fundamental importance, as in the historical universe.

Manipulation and vision, corresponding to three-dimensionality and two-dimensionality, respectively, are part of the physical spaces. Direct contact with museums in physical areas

enables the formation of the concept, in this case, the conceptualization, which belongs to the third abstracting gesture, the one-dimensionality, that is, writing. For Flusser, in his work "*A escrita: há futuro para a escrita?*" (2010 — "Does writing have a future?"), the role of writing is crucial for the formation of our historical consciousness.

> Texts need to be in tune. There are two kinds of tuning of rhythm. In the first, a wave of speech follows one after the other. In the second, it breaks up and foams. This second kind of rhythm can be called syncopated. A text is syncopated when it constantly contradicts itself and yet flows without gaps (Flusser, 2010, p. 58).

According to him, the gesture of writing is an expression of existence, paraphrasing the philosopher René Descartes "I think, therefore I exist." However, in an apocalyptic way, he reflects on the improbable permanence of writing in the face of technology with new codes since he registers that only historians and specialists would master such art.

In "*O universo das imagens técnicas: elogio da superficialidade*" (2008 — "The Universe of Technical Images"), in another way, he reveals

the substitution of surfaces for planes after the emergence of technical images. Returning to work "*A escrita: há futuro para a escrita?*" (2010 — "Does writing have a future?"), the surface would be paper, hence the cuneiform writing, with style, that marks; counterpoint the plane, constituted in a network, no longer linearly like writing, but constituted by points, pixels.

> The fourth abstracting gesture is present in museum interfaces, and although the interfaces are also composed of written texts and not only images, they are now considered all images. There is no surface, but plans, granulated points with dots and gaps. The computation and calculation will determine their constitution in these digital environments through zero dimensionality.
>
> The telematic network allows a rich layer of meanings, images, and hypotheses. There are multiple access points to the network, guiding to an eternal flow of transformations in which everything is unstable, uncertain, open, and incomplete, where the emphasis is less on input/output with fitting consequences but more significant on an almost total immersion in the media flow (Ascott, 2013, p. 244).

Connectivity and telepresence have practical implications for human behavior, cognition, perception, and communication. The distributed

extension of space and the discontinuity of time intertwine human nature with technology. Suppose these considerations are analyzed in the light of this study. In that case, it can be seen that this society, also considered post-historical, is now formed by zero-dimensionalities, not as replacements for three-dimensionalities, two-dimensionalities, and one-dimensionalities, but as articulations of all dimensionalities.

The technical reproducibility via image, made possible by the new technologies, has propelled the museum that continues, through networks and photographs, to contribute to the enrichment of our visual memory. Following this technological development, the museological institution continues in its mission: to aggregate the conception of our imaginary museums.

In a technological world represented by today's way of life, technology has entangled society daily through cybernetics, electronic computing, genetic engineering, molecular engineering, nanotechnology, biotechnology, information technology, industrial automation, medical technology, assistive technology, production

engineering, and a myriad of other advanced technologies, which call for reflection about the nature of this technology, its necessity and social function and the impacts that cause the generation of new forms of personal relationships and new institutional formats, whose network presences translate, what for Flusser was superficiality in the technical image, into an always liquid and changeable existence, in the face of the possibilities of navigation in the network system, in constant flux.

Weavings in mo(ve)ment

In transformation processes beyond its history-keeping character, the museum points out a cultural function, as exhibitions, entertainment, rescue, communication, and contemplation, through images, in convergence with resources, including media, revising the role of vision and visuality in the exhibition of contemporary visual culture.

Although Flusser (2008) presents the concept of connectivity and flow, amid technology, in the face of the contemporary context – museums in the network, the idea of museums here is in the sense of networked museums. They are not

concepts that cancel each other out and can even be complementary. Museums are treated here as subversion through a new model that instigates new experiences, proposing countless challenges via articulation and the visibility and formatting of appropriate actions to enhance dialogue, knowledge, flow, and interaction.

To this end, Networks and Systems in this study are independent of technology. In this case, the connectivity is interactive by linking modes in nuclei. In the case of museums, they are structured in the network (articulated in cores) and in the network (via technology - IoT) simultaneously, or in only one of the two molds regarding networks. For this, it is not exclusive and inclusive, enabling all conceivable formats.

Museums, thus, walk through time, which is now made, undone, and remade, with a reconstructed past, an interpreted present, and an invented future. The interpretation in the present is constituted precisely by not seeing the world as it is but as we are. In this attempt, the gift is only our reality, with all its physical, psychic, and social subjectivity. Meanwhile, the real goes on enigmatic, unreachable in its essential comprehension.

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