

Circuit-Bending and the DIY Culture

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Abstract

The present article intends to inscribe Circuit-Bending in the Do it Yourself (DIY) Culture and analyze the anti-consumerism, rebelliousness, and creativity aspects of this kind of culture. The main goal is to show the subversive status of the DIY culture, using the specific circuit-bending case, which, seen by this prism, can subvert the hegemonic “distribution of the sensible”, achieving what Jacques Attali, in the late 1970’s, called the “age of composition”, where creators are enticed to produce their own aesthetics.

Introduction

To circuit-bend is to open up low voltage (battery powered) electronic devices (musical toys, radio devices, electronic keyboards, synthesizers, cd and dvd players, etc), change (bend) the way electricity flows through its circuit until an interesting sound is achieved. Circuit-bending can be done by removing and/or adding electronic components, connecting different circuits or even by adding organic elements in the circuit (like the hand of the bender, or even fruits and vegetables). Once the result is obtained, usually the component is soldered into the circuit, or even a mark in the spot to touch is made. At the end of the process, a nice case can be made to accommodate this new instrument created - an infra-instrument, in the words of John Bowers and Phil Archer in the article *Not Hyper, Not Meta, Not Cyber but Infra-Instruments* (Bowers & Archer: 2005).

The technique was named by Qubais Reed Ghazala in 1992 for the *Experimental Music Instrument* magazine, in a series of articles written by him to show this way of creating instruments he discovered by accident in 1967, when, still a teenager, he let a screwdriver touch the circuitry of a battery powered amplifier, producing a short-circuit that sounded really interesting. As he puts it:

If this can happen to an amp, not supposed to make a sound on its own, what might happen if one were to short out circuits that already make a sound, such as keyboards and radios and toys? (Ghazala: 2004, 97)

As Ghazala affirms, circuit-bending is inscribed in the experimental music tradition, although some pop bands, like Radiohead, Flaming Lips, Mike Patton and Bjork, are using bent instruments in some of their setups (sometimes using instruments not bent by themselves).

Experimental electronic music has evolved way beyond the monumental oscillator sweeps of the 1950s, entering new spaces today at a startling pace. No longer confined to academia, experimentalism has taken flight and can be heard within many popular genres. Circuit-benders are at the very forefront of this experience of new experimentalism, constantly pushing music forward with original discoveries. (Ghazala: 2005, 23)

Through this experimental attitude, a rupture is established in the consumerist society, presenting a first rebelliousness aspect of this musical practice, as it is based on the necessity of free time, a

time to “loose” on the mistake (trial-and-error attitude), on the unexpected. Seeking the apprenticeship, the creation, in this unexpectedness. The main goal of circuit-bending is not to play the latest hi-tech tool, dealing only with inputs and outputs in a pragmatical way, but to create something unique. Following the path of creators such as John Cage, David Tudor, Alvin Lucier, Gordon Mumma among others, experimentalism seeks a discipline of the ego, for that the artist has to “accept the contribution from outside and even from things he dislikes, this way freed from his personal preferences, opened to new experiences”. (Campos: 1998, 135)

Another key aspect of this practice is its lo-fi aesthetics. Fernando Iazzetta says that, at the end of the 20th century, is the error, the flaw, the glitch that feeds music. “The musical sonic material are the noises generated by the electronic devices”. (Iazzetta: 2009, 189) Following this logic, circuit-bending proposes an art that does not claim for specialist players, approaching other artistic models. It is an interdisciplinary practice, between electric engineering and music, but also with a pinch of design, sound art and performance, that emphasizes its procedural character and its focus on the concept. As John Cage says: “the utility of the useless is a good news for the artists. For art does not have a material objective. Has to do with changing of minds and spirits.” (Cage apud Campos: 1998, 130) Transforming the useless and the expendable into raw material for creation and production is the tonic of circuit-bending.

From there emerge musics that appropriate from the precarious, the unusual, from improvisation. They became accessible insofar they connect those who create and those who listen, and allows the opening of niches where the ordinary fellow can (re)approach the musical creation. (Iazzetta: 2009, 211)

Two important aspects of circuit-bending are its immediacy and the singularity of the instruments created, two intentional aspects of this practice, as seen on Ghazala's book *Circuit-Bending: Build Your Own Alien Instruments*:

My aim, more than a decade ago when I began to write about the DIY of circuit-bending, was to launch new, unique instruments by means of explaining only the general discovery process of circuit-bending instead of using the more standard “this wire goes here” dialogue — a dialogue that usually results in exact duplications of a target instrument.

(Ghazala: 2005, XIII)

Circuit-Bending and DIY culture

Ghazala, as clearly exposed in his quotation above, inscribes circuit-bending as part of the DIY culture. It is interesting, then, to explore the DIY and its relations to circuit-bending. Eric Paulos and Stacey Kuznetsov in *Rise of the Expert Amateur: DIY Projects, Communities, and Cultures* pose a really short and good definition of DIY in the following terms:

any creation, modification or repair of objects without the aid of paid professionals. We use the term “amateur” not as a reflection on a hobbyists’ skills, which are often quite advanced, but rather, to emphasize that most of DIY culture is not motivated by commercial purposes. (Kuznetsov & Paulos: 2010, 01)

The phenomenon of DIY is obviously not new. It dates back to the practices in which a craft and unskilled amateur stage was opposed to the professional practice and industrial mass production. Historically speaking, DIY was the way of production used to develop through most of our

history. However, modern societies changed this "principle of self-reliance with mass-production and consumer economy. Tangible things can be bought. Professionals can be hired to build and repair. Artists can be employed to decorate or customize." (Kuznetsov & Paulos: 2010, 01) This modern logic prevailed in western societies in the 20th century, getting hegemonic after World War II.

During the 20th century the appeal of science and technology issues led to a boom of hobbyist activities. Model building, photography, high-fidelity audio created a vast host of technical hobbyists who gathered around specific communities. The fragmentation of the production chain and the alienation of the individual brought about by mass production awoke a new interest in manual and craft activities. The activity of hobbyists had an important social role because they allowed the layman to approach complex issues of science and technology that shaped the idea of modernity. These practices were organized around magazines, books, clubs and suppliers. They also implied the connection of the hobbyist with a specific social network that helped define some kind of identity to an increasingly homogenized massified social condition. A remarkable case of audio technologies that attracted the attention of hobbyists was the radio that in the decades of 1920 and 1930 was sold in kits to be assembled.

The Second World War and the globalization of the consumerist model, however, softened this movement for a period of time, until the punk movement of the 1970's came as a rebellion against this hegemonic order, bringing the DIY back to the scene. In the 1980's it got stronger with low-cost electronic equipments, in the 1990's with the rave culture and the beginning of the netlabel movement, and in the 21st century with the Internet becoming a vast net of interchange

of information, amplifying the amount of adepts in a variety of fields: from the indoor cultivation of herbs, to textile products, craft such as knitting and crocheting, to electronic projects of many kinds

In the above mentioned article, Kuznetsov and Paulos present some really interesting data collected in polls taken in DIY websites (such as Instructables, Dorkbot, Craftster, Ravelry, Etsy, and Adafruit). In one of the most clarifying charts presented, it is possible to see how the commercial aspect is one of the less important for the DIY community, being the most important ones the Expressive, the Creative and the Learning of new skills.

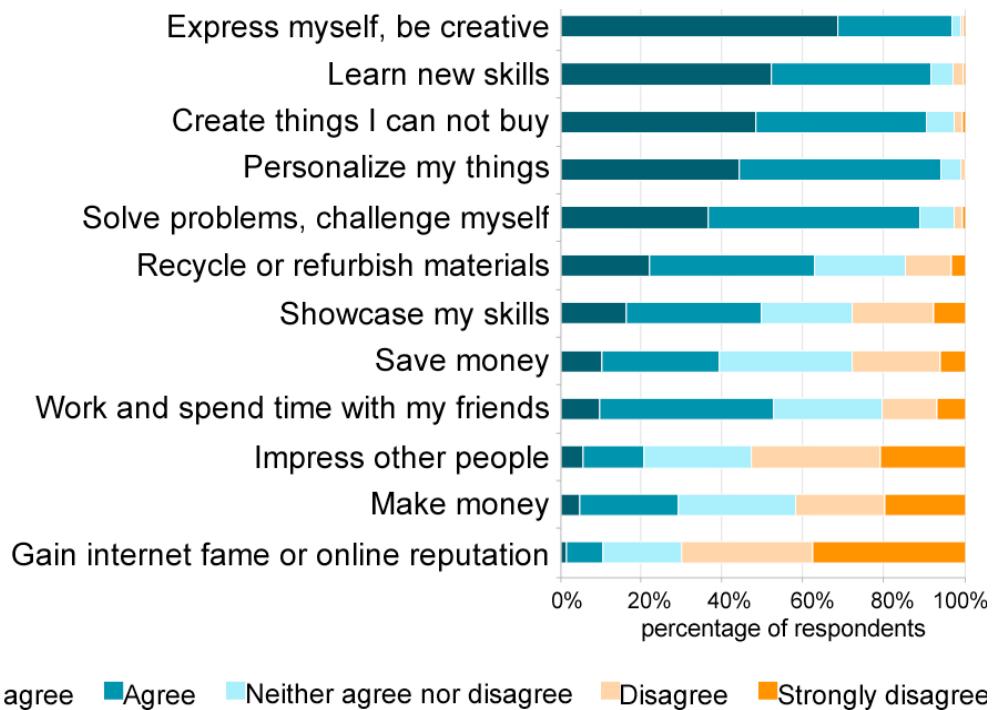


Figure 1: Motivations for contributing to DIY projects (Kuznetsov & Paulos: 2010, 6)

Juan Ignacio Gallego Perez in the article *DO IT YOURSELF: Cultura y Tecnologia* for the Spanish magazine *Icono*, analyzes the DIY culture in similar terms. He argues that this form of production allows “any person to create, distribute and promote the product, overlapping the

basic rules of capitalist society.” (Perez: 2009, 279) Seen by this prism, he shows that DIY culture implies three states: an ideological/political one, being a rebellion against the hegemonic marketing order; a industrial one, searching for new ways of production, outside mass culture; and an aesthetical one, which is related to the search for singular forms of expression.

There was a search for abolishing specialization and breaking the lines between worker and creator, together with the possibility that anyone could be a creator, regardless their origins and background. The DIY is based on the “action”: first to act, then to think. It took shape in the early 1970’s, and must be regarded as related to movements like Situationism, among others, which stimulated intellectuals like Guy Debord or Vaneigem, and which were based in the attitude of acting and creating situations out of the control of the dominant cultures. (Perez: 2009, 280)

He follows showing that this movement “changes the social relations, creating a community feeling, independent from industry, which seeks to change the ordinary mercantile relations”. (Perez: 2009, 280) It is interesting, then, to discuss this social order we are talking about.

Social Context

French economist Jacques Attali has a really interesting view on the subject. In his book *Noise: The political Economy of Music*, he analyzes our society through the musical forms of different ages.

The cardinal importance of music in announcing a vision of the world is nothing new. For Marx, music is the mirror of reality; for Nietzsche, the expression of truth; for

Freud, a text to decipher. It is all of that, for it is one of the sites where mutations first arise and where science is secreted. (...) More than colors and forms, it is sounds and their arrangements that fashion societies. With noise is born disorder and its opposite: the world. With music is born power and its opposite: subversion. In noise can be read the codes of life, the relations among men. Clamor, Melody, Dissonance, Harmony; when it is fashioned by man with specific tools, when it invades man's time, when it becomes sound, noise is the source of purpose and power, of the dream – Music. It is at the heart of the progressive rationalization of aesthetics, and it is a refuge for residual irrationality; it is a means of power and a form of entertainment. (Attali: 1999, 6)

In this line of thought he divides history into four different ages: Sacrifice, Representation, Repetition and Composition. Sacrifice represents societies focused on religion, where the mythological ways prevail. Representation relates to the rational view of the world - the enlightenment era. Repetition, is the era we live in, beginning with the advent of recording devices. And finally Composition is the embryonic form of subversion of the Repetition era.

For now what interests us about Attali is the way he describes Repetition era. An era of a new kind of society, that of mass production, where “usage was no longer the enjoyment of present labors, but the consumption of replications”. (Attali: 1999, 88) It is the time where industry is born and also the period when the logic of show business and star system invades our daily lives. In this era, our relation to power is also revolved:

In this type of organization of the production of society, power can no longer be located simply in the control of capital or force. It is no longer an enactment through

representation. And if there are no longer any localizable power holders, neither are there counterpowers that can be institutionalized in response. Power is incorporated into the very process of the selection of repeatable molds. It is spread among the different elements of the system. Impossible either to locate or seize, having become the genetic code of society, power must be changed or destroyed. (Attali: 1999, 90)

An important contradiction, then, emerges: as people no longer are creators, but only consumers: they must “devote their time to producing the means to buy recordings of other peoples time.” (Attali: 1999, 101) In this process, they end up losing the time required to enjoy what is consumed - or almost anything else. The stockpiling of goods becomes, then, the major goal in our society. The use-time is, then, obliterated by the exchange-time.

This way of considering our social context is complementary to that of french philosopher Bernard Stiegler, for whom we live in an era of general proletarianisation.

With general proletarianisation, human knowledge is short-circuited as a result of its technological reproduction and implementation, leading, after the Second World War (which is the time of Duchamp strictly speaking), to the globalisation of the consumerist model. In the consumerist model it is not only the know-how (savoir-faire) of workers that becomes obsolete, but also the knowledge of how to live (savoir-vivre) of citizens, who thus become as such mere consumers: a good consumer is both utterly passive and irresponsible. (Stiegler: 2010, 11)

Stiegler argues that the consumerist model came up, in the beginning of the 20th century, as a way of solving an efficiency crisis the capitalist order was suffering at that moment (First World

War and Wall Street Crash of 1929 are two simptons of that). The problem is that this consumerist model leads to another crisis, since it is dependant on libidinal energy¹ (what Jean-François Lyotard called libidinal economy). To captivate libidinal energy, people are enticed, by marketing strategies, to consume - in order to create a chain of production and consumption. The side effect, however, is that this marketing strategies end up prevailing, destroying singularity. As Stiegler puts it, in the opposition between diachronicity and synchronicity, in this era, the diachronic (singular) is no longer achieved, there remains only the “subcategory of the synchronic: that which marketing calls *segment*, to eliminate diachronicity and the possibility of the assertion of a singularity.” (Stiegler: 2007, 40) This context obstructs the process of individuation², ending up in a process he calls *disindividuation*:

a process that destroys the collective and destroys culture. And this disindividuation is also a kind of proletarianisation, given that the proletariat in fact refers to those who have lost their knowledge – their savoir-faire, their savoir-vivre, and their theoretical knowledge. (Stiegler: 2010, 17)

French curator Nicolas Bourriaud in his book *Relational Aesthetics*, commenting the work of Félix Guattari, also talks about the importance of the process of individuation through the way the French psychotherapist, philosopher, and semiotician sees the question of subjectivity:

in the Guattari order of things, subjectivity as production plays the role of a fulcrum around which forms of knowledge and action can freely pitch in, and soar off in pursuit of the laws of the socius. (...) The end purpose of subjectivity is nothing other than an individuation still to be won. Artistic practice forms a special terrain for this

individuation, providing potential models for human existence in general. (Bourriaud: 2009, 123)

Bernard Stiegler sees the de-professionalization of the contemporary era as a way out of this situation. For him the revalorization of the amateur made possible by the digital technology, strengthened by the internet, can create a new *avant-garde* and form new publics. Nevertheless, as he puts it: “the functioning of the global network depends on the capacity of users to become practitioners, that is, capable themselves of producing accessible information and knowledge.” (Stiegler: 2010, 18) He compares the new digital technology to the invention of writing in Plato's era. Like the ancient greek philosopher, he sees the new technologies as *pharmakon*:

at once a poison, a remedy and a scapegoat. Only the digital itself, insofar as it can be a remedy, enables an effective struggle against the poison which it also is, and this is without doubt a key to the 21st century. (Stiegler: 2010, 19)

For Stiegler this *pharmakon* raises the question of the proletarianisation, calling for a “far-reaching process of de-proletarianisation, that is, the recovery of knowledge of all kinds.” (Stiegler: 2010, 11) In this sense, DIY culture and circuit-bending can be understood as a consequence of this technological context to which Stiegler refers to as *pharmakon*, this way carrying the same potential contradictions: in one side, both can be a path to this process of de-proletarianisation, a way of changing the hegemonic “distribution of the sensible”, but, of course, on the other side, they can also be another way of creating commodities (the infra-instruments created by the benders, as the products crafted by people in DIY culture, can be sold by a lot of

money, as they are unique - another way of fetishism), and also can be a way of achieving fame and recognition.

New distribution of the sensible

To talk about the distribution of the sensible, we have to invoke the french philosopher Jacques Rancière, for whom politics, in the arts, dwells more in the distribution of the sensible than in the contents of the works themselves:

The distribution of the sensible reveals who can have a share in what is common to the community based on what they do and on the time and space in which this activity is performed. (Rancière: 2009, 12)

As seen before, in the modern capitalist societies, people became mere consumers, thus, our share of the sensible lies on what marketing analysts decide is good for us to consume, or what we have enough money (or credit) to pay for. Rancière argues that to change this hegemonic order, it is mandatory to short-circuit this distribution of the sensible, as seen in the words of Slavoj Žižek in the afteword of Rancière's book *The politics of aesthetics*:

Politics proper thus always involves a kind of short-circuit between the universal and the particular: the paradox of a singular which appears as a stand-in for the universal, destabilizing the “natural” functional order of relations in the social body. (Rancière: 2009, 70)

In this line of thought, artistic practices are ways to intervene in the general ways of doing things and in the relationships with form and visibility. Rancière points out that arts “never lend to

domination or emancipation maneuvers more than what they are able to: positions and movements of bodies, functions of words, slices of the visible and the invisible.” (Rancière: 2005, 26) Production, then, affirms itself as a principle of a new distribution of the sensible, as it unites the formerly opposite concepts of the maker activity and visibility. To produce is to create and to make it visible (to distribute), it is a new relationship between the making and the seeing. It can already be seen in the *avant-garde* movements of the 1920’s, as they sought to suppress art as a specialized activity, “giving it back to work, that is, to life, which elaborates its own meaning.” (Rancière: 2005, 68)

It is easy to see how the DIY culture, and particularly circuit-bending, can fit this way of thinking. The “products” created by the benders are less interesting than the process of their creation. The learning involved in this musical practice is always mentioned by benders as one of its key factors. Emphasis is placed in the creation of a particular aesthetic, of a singular instrument and in the way one experiments on it. Since its functioning can be odd or even random it may not lead to any kind of virtuoso's practice. As Qubais Reed Ghazala says:

That's the beauty of circuit-bending; anyone can do it. You don't need to be an electronics guru or a shop genius. All you need is the ability to solder and to think outside the box. (...) That's pretty immediate! (Ghazala: 2005, 3-4)

And also:

Just as bending led me into “real” electronics, many benders report to me the same. As mentioned, bending stirs great interest in electronics, and new designers often follow their curiosity into schooling not otherwise planned. Viva el electron! (Ghazala: 2005, XIV)

This amateurism, as we have already discussed, is a pivotal key for Bernard Stiegler, and is also fundamental for Rancière, for this is the key to the *aesthetic regime of the arts*, where art and life are no longer separate, specialized subjects, where

the ordinary becomes beautiful as a trace of the true if it is torn from its obviousness in order to become a hieroglyph, a mythological or phantasmagoric figure. (...) The Marxist theory of fetishism is the most striking testimony to this fact: commodities must be torn out of their trivial appearances, made into phantasmagoric objects in order to be interpreted as the expression of society's contradictions. Scholarly history tried to separate out various features within the aesthetic-political configuration that gave it its object. It flattened this phantasmagoria of the true into the positivist sociological concept of mentality/expression and belief/ignorance. (Rancière: 2009, 34)

Interestingly, that is what circuit-benders do: transforming an ordinary electronic device into an interesting musical instrument, “a truly alien instrument. (...) After all, now in hand is an instrument that exists nowhere else in the universe and that presents sounds no one else has yet heard.” (Ghazala: 2004, 99)

Two things are to be noted in this last quotation: first the usage of the word *Alien* - a word benders use a lot to talk about their instruments -, which reinforces the mythological, phantasmagoric figure of the transformation; second, the fact that the instrument created by the bender is unique, that it exists nowhere else. This second aspect leads us to our conclusion, calling again the french economist Jacques Attali.

Composition and Craftivism

As already mentioned Attali divides history into four different periods based on the way music is thought, produced, and played/distributed: Sacrifice, Representation, Repetition, and Composition. We've discussed how we still live in the age of Repetition and its implications. The interesting, however, is how DIY and circuit-bending fits this forth period.

Attali foresaw, in the 1970's (in embryonic form, as he puts it), that a new way of thinking music would appear to replace Repetition, he called it Composition:

There is no communication possible between men any longer, now that the codes have been destroyed, including even the code of exchange in repetition. We are all condemned to silence – unless we create our own relation with the world we try to tie other people into the meaning we thus create. That is what composing is. Doing solely for the sake of doing, without trying artificially to recreate the old codes in order to reinsert communication into them. Inventing new codes, inventing the message at the same time as the language. Playing for one's own pleasure, which alone can create the conditions for new communication. A concept such as this seems natural in the context of music. But it reaches far beyond that; it relates to the emergence of the free act, self-transcendence, pleasure in being instead of having. (Attali: 1999, 134)

Resonating this way of thinking is the conception of *Craftivism*. As Kevin Henry puts it in the article *Craftivism: Reconnecting art and design education through the social act of making*:

Capitalist production has been hyper-accelerated by the exploitation of cheap foreign labor; containerization made economically feasible by cheap foreign oil; and global capital that moves at the speed of fiber optics. The result is a world challenged by climate change, overpopulation, global terrorism, diminishing energy and material resources, etc. – issues for the most part that won't go away but instead comprise the world our students will manage. The question of whether we are adequately preparing them for that challenge can be partially addressed with a new definition of craft. (Henry: 2010, 94-95)

This new definition of craft Henry talks about is given by Richard Sennet in *The Craftsmen*: “the desire to do a job well for its own sake”. (apud Henry: 2010, 95) This definition - which is quite close to Attali’s definition of the era of Composition - leads, according to Henry, to a *craftivistic* approach - that of the open source software, the peer-to-peer production. This changes the educational emphasis from the one-size-fits-all strategies “to focus on knowledge communities united by the goals of ‘problem-finding’ and problem solving.” (Henry: 2010, 95)

Henry argues that this new approach is really dependant on trial-and-error dynamics, and self-sustainability. It is interesting to notice that this new craftsman is no longer craftsman by necessity (as for every product needed there is a mass-produced solution), but by lifestyle choice, as Eudorah Moore puts it: “fashioning his lifestyle to realize the creative impulse so vital to the whole person, providing those objects of the hand and the mind so necessary to us all.” (apud Adamson: 2010, 217-218)

As we have seen before, DIY culture, and circuit-bending in particular, can fit really well this logic of “doing for the sake of doing”, not seeking commercial profit or stardom. Composition and Craftivism, then, can act as de-proletarianisation tactics, a way to short-circuit the hegemonic consumerist distribution of the sensible, subverting the consumption chain, by reusing what is meant to be thrown away, by creating one’s own instruments instead of buying some new hi-tech tool, and, this way, creating something interesting and new, “outside the box”, by choosing a new lifestyle that has the potential to change the way we live.

Notes

1. Bernard Stiegler talks about an important paradox of the hiperindustrial capitalist society: “industrial life tends to canalize the libidinal potential of individuals, that is, their desires, because it is mandatory, for people to consume objects, that they wish them first. But this captivation is *destructive*, its a destructive control, as it is also said in the mechanical geniality, meaning that what is submitted to control ends up being destructed by what it controls. And if we believe, like i do, that we live in the epoch of the capitalist order that explores libidinal energy (as it before explored fossil energies, natural resources, etc.) than, hiperindustrial capitalism is on the verge of a serious crisis.” (Stiegler: 2007, 26) And also: “What I describe here is a tendency: we are heading a scatter of the consumption, heading to the consumer who does not want to consume anymore. Marketing people are very aware of those socioprofessionals of high profits who do not want more cars, organized trips, etc., people who begin dreaming about a world without consumption, that is, whitout *consuming oneself*, without *suffering of consumption*. That’s the tonic of movements called anti-publicity, or ‘ad-busters’. This, however, is absolutely not a good sign, meaning that the society we live in has gotten into a dilemma, from which will be mandatory to get away, and that won’t happen in a painless way.” (Stiegler: 2007, 35)

2. “To individuate oneself is to learn, to experiment, to become what one is by making the passage to the act of a potential that lies within every noetic soul.” (Stiegler: 2010, 16)

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