Digital Disruptive Innovation: Paradox or Conceptual Distortion?

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ABSTRACT

Cultures that incorporate new knowledge produced elsewhere in the industrial or academic environment need rethink the basic elements of knowledge they incorporate, or else they may incur huge conceptual distortions or even superficial absorption, without intrinsic value. This seems to be the case of concept on disruptive innovation. Its conceptual purposes seem to be distorted as disruptive innovation spreads through academia and industry. The main objective of this research is to identify the conceptual premises of disruptive innovation in selected cases of digital disruptive innovation, to characterize an epistemology meaning to it. The methodology is quantitative. We used the CAPES journal base and Publish or Perish, evaluating the articles and performing a textual scan with the Iramuteq software. The main results indicated that there are two clusters of concepts of disruptive innovation, one from the context of established companies and another from the context of new companies, originated as result of digital transformations. Conclusions lead to same conceptual logic in both concepts. However, conceptual logic based on events of established companies, is epistemologically more dogmatic than the one that considers disruptive innovation in the context of digital companies, which is a more typically perspectivist view.

PALAVRAS-CHAVE:

Inovação;
Conceito de inovação;
Inovação disruptiva;
Inovação disruptiva digital.

RESUMO

Culturas que incorporam novo conhecimento produzido em todo lugar no ambiente industrial ou acadêmico precisa repesar os elementos básicos do conhecimento que eles incorporam, ou então eles podem incorrer em enormes distorções conceituais ou mesmo em absorção superficial, sem valor intrínseco. Este parece ser o caso do conceito na inovação disruptiva. Este conceito proposto parece estar distorcido à medida que a inovação disruptiva se espalha pela academia e pela indústria. O principal objetivo desta pesquisa é identificar as premissas conceituais da inovação disruptiva em casos selecionados de inovação disruptiva digital, para caracterizar um significado de epistemologia para ela. A metodologia é quantitativa. Utilizamos a base de periódicos CAPES e "Publish" or "Perish", avaliando os artigos e realizando uma varredura textual com o software Iramuteq. Os principais resultados indicaram que existem dois clusters de conceitos de inovação disruptiva, um do contexto de empresas estabelecidas e outro do contexto de novas empresas, originado como resultado de transformações digitais. As conclusões levam à mesma lógica conceitual em ambos os conceitos. No entanto, a lógica conceitual baseada em eventos de empresas estabelecidas é epistemologicamente mais dogmática do que aquela que considera a inovação disruptiva no contexto das empresas digitais, o que é uma visão mais tipicamente perspectivista.

1 Introduction

“Storms of creative destruction”, as posed by Schumpeter (1942), from time to times ride on industries and sweep away the weak and outdated ones from business. Schumpeter, in his words, was offering the first insights to what would become, some fifty years later, the fundamentals for the disruptive innovation, figured out by Christensen (1997).

Disruptive innovation, by definition, “creates new market, when introducing new product or service, technologically rougher in the beginning, when judged on acceptance standards of consumers majority” Christensen & Overdorf, 2000, p.6). This definition encompasses the notion of a sustaining technology in the industry, a market launch of a product/service by means of a specific methodology, a product/service incorporating a less sophisticated technology breaking up the dominant technical business paradigm and thus, opening a new market for the second technology. This is, in fact, a technological discontinuity perception, totally switching the way Schumpeter (1942) and specialists on technological discontinuity, like Tushman and Anderson (1986), see the cycle of a technology, however, highly evident in the trajectory of substitutive technologies.

Disruptive innovation theory became very effective to explain, as pointed by Schumpeter (1942), the solution to regain economic growth: the creative destruction of technologies. Disruptive innovation, thus, explained most of shortcomings among industrial routines, with implications for economic development and directly for the society. Suddenly, disruptive innovation paved the way to solve poverty problems, unemployment problems, lack of access to health care programs, and problems of illiteracy, acquiring generalizing intuitive amplitude to all phenomena, related to the disruption of the technological *status quo* of an industry.

The widely spread disruptive innovation theory, among academics and business world as well, inadvertently undergoes a conceptual distortion on the original meaning of disruption. Because it has been used indiscriminately as the means of explanation, or as an alternative for solution economic and social needs such as, disruptive innovation could be used to uplift declining industrial sector..., disruption

phenomena, has been pushed to explain any sort of events. This kind of digressions deprived the original intents of the theory, to such level that creates intellectual discomfort in Christensen, the creator of the theory, whom refers to the distorted uses of his theory, expressed it this way, to the Harvard Business Review (2016) editor “...I never thought...that disruption would have so many connotations...to the point that people would get an idea, wrest it and use it to justify anything crossing their minds...” A hard cry of the author himself, pointing at the trivialization of the real concept of disruptive innovation.

The fact is that, as the time passed and because people from many distinct fields with distinct epistemologies, used the terms to explain correlate phenomena, the concept of disruptive innovation undergone a substantial detour from its origins. Anytime someone uses this theory to bolster an argument to clarify rationale or explicate event that could be explained through the elements of this theory, it seems again a clear opportunity to bend the original concept to specific interests. Paradoxically, this trend confers to the disruptive innovation a bigger capacity to explain phenomena, by means of increasing conceptual commonalty of the terms, however, each time it happens, it pushes the concept far away from its real meaning.

The main reason of the detour from the original meaning of disruptive innovation seems to be a gradual oversimplification of the theory, among non-specialists, around the term disruption (King & Baatartogtokh, 2015). It seems that any event or phenomenon interrupting or significantly altering the technological route of an industry, could deserve the classification of disruptive innovation. There is no evaluation or attempting to abide the distinctive grounds of the original concept, setting the basement for an event to be disruptive. For example, the amount, sometimes in excess, of incremental innovation, intended to be “disruptive”, ends up having no impact on consumers’ behavior because it is blind in value. Such kind of innovation platform could be wrongly interpreted as disruptive. Also, assuming “true” disruptive innovation involves only modifications on technological paradigms of a sector. Since phenomenon of that sort, are not selective, i.e., could be in any company or industry, tend to pervert the meaning of disruptive (innovation), flushing under the same flag, phenomena of

distinct nature.

Conceptual oversimplification of the theory seems to lead managers of technology to degenerate the meaning of other classical types of innovation, such as radical innovation, for the benefit of disruptive innovation. For this specific issue, there is always a big deal of confusion. Since disruptive innovation implies an abrupt interruption of a flow of processes trajectory, associated to the use of less sophisticated stages of the technology, less attentive eyes would assume similarity in both events. The change of technological contents, that is, radical innovation, may blur the real nature of the phenomena, leading people to read it as a disruptive one. Therefore, due to the novelty of disruptive innovation terms, the radical innovation became totally incorporated by the former and gradually, unnecessary, since radical phenomena would now be explained as a “disruptive” one.

This phenomenon of conceptual alterations seems to have reached the frontiers of innovation, meaning, innovation in the digital era. Advancements in the frontiers of innovation now became all disruptive as it provides for new paradigmatic trends, that is, the possibilities of the digital era offer alternative challenges to the traditional evolutionary trajectory of technology in an industry. In its original concept, however, disruption does not relate to root changes in the incumbent technology, but it comes from a simplification of current contents of a technology in a specific market segment. It does not refer to a new or renewal of technical paradigm in the frontiers of innovation. In the innovation roofed by digital era, technical paradigms simply lift the existing standards of technical sophistication to a higher degree (King & Baatartogtokh, 2015). New opportunities become immediately opened as new trends point to cost reduction, to new applications and to new solutions to issues still not resolved through current technologies.

The development of recent set of technologies connected to the Internet and Information and Communication Technologies (ITC) pushed contemporaneous society into the digital era. Becoming digital in any sense was one of the promises of IT in the last two decades. The digitalization of not digital information and the digital information in nature allow for a profound modification on transactional formats between enterprises and between enterprises and consumers.

This becomes the scenario of the digital economy (Dawson et al., 2016). It is the newly born field of disruptive innovations, intended to members of existing industrial sectors as well as to the new enterprises established through leveraging on digital opportunities.

When the concept of the disruptive innovation is used in the context of the frontier of innovation, the so called “digital disruptive innovation”, illuminated by digital business examples, such as Netflix, Uber, Airbnb, Biive (Caylar et al., 2016) and similar, collapse the basic premises of disruptive innovation, because a new technical paradigm imposes. The issue here is not a simplification in technology implying business rearrangements, like in Christensen (1997) definition. In the digital context, the disruption is on a new route for existing technologies (Manyika & McAfee, 2014), meaning new formats of application for the same technology, given birth to new business, not just to new format of same business. This event requires a parallel reflection and question. If technical changes (in digital era) are so dramatic that allow for radical changes in the direction of the technological context, can it be called disruptive innovation? Wouldn't it be a case of typical radical innovation? What's the disruption process behind this phenomenon of disruptive innovation generalization?

To study these phenomena of conceptual expansion of disruptive innovation, the study targets at identifying the conceptual premises of disruptive innovation among selected cases of digital disruptive innovation, aiming at the characterization of its epistemological sense. Among the three main approaches to explain knowledge building, empiricism, rationalism, constructivism – dogmatic, skeptic, relativist or perspectivist – sense, as thinking currents of the rationalism.

The academy builds science and its internal principles (epistemology) by adding, in each field of knowledge, cumulatively tested universally accepted truth, which become scientific truth. The understanding of a science, therefore, runs through the analysis of the constituents themselves, to assess basic elements and their function. In this sense, advancements in science, also, must consider first those constituents and their mutual relation, abiding by the methodology used to pool constituents in the field of knowledge. These two conditions are needed to understand and explain

the digital innovation phenomenon in its own context, allowing, therefore, for less uncertain ways of classifying whether a phenomenon is disruptive or not. This also is a part of the process of building knowledge, one important pillar of the research in the academic environment.

2 Theoretical Precedents - Disruptive and Sustaining innovation

Generically speaking, all kind of innovation present two types of modifications. One refers to the modification in the object (products or service) and their respective process of production and commercialization. The other refers to the degree of novelty of the modification made in current products or services, or in the degree of novelty of the new products and services.

Christensen and Bower (1996) see disruptive innovation as a phenomenon frequently observed in small low profit firms, with no attention to assure a well-established organizational structure. Besanko et al. (2010) approach Christensen and Bower's (1996) thoughts in a distinctive way, arguing that small firms stand up higher and quickly against the established ones and are readier to innovate because they are highly determined to search for new approaches, are quicker in response and less bureaucratized than their bigger size peers. Incumbent bigger companies have against themselves, issues hard to solve, such as sunk costs, which are investments made on specific technologies, resources and organizational capabilities. Sunk costs reduce the interest in innovation (Besanko et al., 2010).

Rodrigues et al. (2010) discuss Christensen (1997) concept of disruptive innovation and its nature on technological contents of companies targeting at breaking down the dominance of incumbents. Christensen and Raynor (2003) a bit later come back again with a deeper view to disruptive innovation as a phenomenon that changes the business model, that is, the transaction processes of product and services of an enterprise. These are changes that may cause the disruption in the traditional processes of the incumbent companies, allowing rivals a quick market growth and soon sharing the leadership with incumbents. Discussion on Disruptive Innovation concepts cross pass some other concepts that become important to bring up front. Any company does hold or run on a sustaining technology (Christensen

& Bower, 1996). First, in the context of disruptive innovation, sustaining technology upholds the incumbent and other businesses, based on defensive or imitative strategies. Sustaining technologies used by incumbent, fundament their business, to keep competitive advantage strong.

Second, an enterprise when going disruptive, may offer innovations in key dimensions to a new market, normally to a low acquisition power market still not consuming the products because has no access to it, as well as may offer to a low market. Disruptive Technologies would not reach the upper market, with higher acquisition power (Rodrigues et al., 2010). Because disruptive technologies are cheaper they meet better the need of the low-end market and thus go initially to non-consumers.

However, the rationale of incumbent does not help them deal well with innovation that brings sustaining technologies back to their rough nature and requires adjustments or restructuring business model, like disruptive innovation. Even despite experience show that disruptive innovation opens opportunities for growth and success ten times bigger than just investments in innovation on the sustaining technologies (Christensen & Bower, 1996).

A good reason for executives be hard on adopting disruptive innovation is because sustaining innovation meet top clients needs, holds focus on business process improvements and thus, does not alter models and current process standards. Executive opposition, therefore, to disruptive innovation falls on the perception they would be offering less when adopting disruptive technologies, even if the late bring potentially more promising new businesses (Zucatto & Pinheiro, 2008). Distinct specialists share this same vision when argue evidences of companies reaching success by adopting sustaining technology innovation, in any field of enterprising, tend not to alter their status quo (Demo, 2010). This condition obliterates the unstoppable consolidation of wining challenging technological paradigms in the technological discontinuity cycle (Tushman & Anderson, 1986).

Although Christensen's concept of disruptive innovation became well discussed and target for innumerable research, the generability and validity of the theory have been rarely tested in academia (King & Baatartogtokh, 2015). Thus, the epistemological contribution of the disruptive

innovation theory is still an issue to be consolidated, in despite of its wide use and innovation explaining appeal. The authors emphasize also, that from 77 cases studied by Christensen and Raynor (2003), that lay grounds to the conceptual principles of the disruptive innovation theory, only about half a dozen, in fact, have reached all the conceptual premises of disruptive innovation, as originally proposed.

A different approach to define disruptive innovation comes from Charitou and Markides (2003), who consider “disruptive” a new way of prospecting value attributes, still not explored, of products and services. Following the authors’ vision, one can consider traditional brokers versus on-line brokers. The formers base their sales effort on personal research when counseling their clients. The later, in opposition, communicate their services (and products in hands to sell), in direct way, despite of not being much interactive, to their clients. These brokers use to close the deal more efficiently, with better prices, higher level of comfort and speedily than the traditional ones. As a result, on-line brokers have become more attractive to a segment of clients, growingly knowledgeable of buying via Internet. Figure 1 shows some examples of disruptive innovation, listed by Charitou and Markides (2003).

Figure 1. Examples of disruptive Innovation

Industry	Strategic Innovation	Innovator(s) and Date of Introduction
General retailing (United States)	Online distribution	Amazon.com: July 1995 (books), June 1998 (music)
Car-rental industry (United States)	Focusing on a different type of customer and operating an extensive network of car-rental offices located in cities, rather than in major airports	Enterprise Rent-A-Car (The company was founded in 1957.)
Computer industry (United States)	Selling computers directly to customers	Dell Computer: 1983
Retail-brokerage industry (United States)	Online trading	Aufhauser & Co.: 1994 E*Trade, Charles Schwab: 1996
Banking industry (United Kingdom)	Direct banking ■ Telephone banking ■ PC banking ■ Online banking	First Direct: ■ October 1989 ■ May 1996 ■ Summer 1997
General-insurance industry (United Kingdom)	Direct insurance ■ Direct motor insurance ■ Direct home insurance	Direct Line Insurance: ■ April 1985 ■ Fall 1993
Life insurance and pensions industry (United Kingdom)	Direct life insurance and personal pensions	Virgin Direct: June 1996
Airline industry (Europe)	Low-cost, no-frills, point-to-point airline service	Ryanair: 1991 (routes between United Kingdom and Ireland only) easyJet: November 1995

Source: Charitou & Markides (2003).

In general, a disruptive innovation, because holding less technological contents in nature and because of lower cost, penetrates market in an, apparently, inoffensive way, since it reaches a distinct market share. In the beginning disruptive innovation remains “invisible” to incumbents (Christensen & Bower, 1996, Charitou & Markides, 2003). Since disruptive innovation evolves incrementally, it only attracts incumbents’ attention when it frontally reaches their market. At

his point, normally, it comes to be too late for incumbents to stand up with a counter-strategy to repel the challenging technology. Incumbents, then, end up, undesirably, having a new incumbent to deal with in their sector.

For a better understanding of nature and function of disruptive innovation, the studies by Yu and Hang (2010) come handy. They point chronological events with meaning to the profile of the disruptive innovation phenomenon, in the view of many authors. Figure 2 shows this chronology of events, as they like to call it, of the theory of disruptive innovation, since Schumpeter (1942) up to Christensen (2003).

Figure 2. Chronology of Disruptive Innovation

Source: Yu e Hang (2010).

Yu and Hang (2010) discuss the interpretation of Christensen’s (1997) disruptive innovation concept, shown in Figure 3, however, they do considering the model from Christensen and Overdorf (2000). Incumbents, using sustaining technologies are represented, in Figure 3, through dotted line. Around this line, that is, above and underneath considering the *Product Performance in Key Dimensions* is the market main segment of incumbent users. Market segment above this line holds a more demanding profile. It shows higher acquisition power, requires growing sophistication (in general, incremental in nature) of that technology, pushing upward that line. Immediately under this line, but within the limits of performance and price of the sustaining technology are two distinct market subsegments. One subsegment is satisfied with performance of the sustaining technology. Customers in this subsegment only

have lower acquisition power as compared to the top segment. The other, down below, in the skirts technology because there is no less sophisticated and less expensive technology available. At the graphic base, to the level of very low performance of product in key dimensions comes the big market of nonusers, not met by sustaining technology and, therefore, uninteresting market to incumbents. Disruptive technologies, being inferior in content to the sustaining technology, at least at the beginning, reach exactly this unmet market, however, being bigger than the market segment of sustaining technology. The oblique arrow, at right, in the graphic, represents disruptive innovation. At time elapses, this type of innovation increases functions and applications of key dimensions in products. Nevertheless, because of its inferior performance, they sell at a lower price and thus, meet the unmet market needs. Through successive incremental modifications, disruptive innovation gets perfect and better its performance, rivalling sustaining technologies, shown with the red star at the crossing point on dotted line.

When reached the minimal performance, accepted by unsatisfied audience, disruptive innovation receives adhesion of this audience propelling its performance and expanding market share, competing with sustaining technology. Incremental modifications perfect disruptive innovation and allow it to reach the next, satisfied market subsegment, which is below the dotted red line in the Figure 3. This move adds up the lower market subsegment of incumbents and quickly thicken disruptive innovation market shares. Also, by adhering to disruptive innovation, the satisfied market subsegment signalizes that the direction of the incremental modifications in the disruptive innovation is correct, bolstering the possibility to compete straight against incumbents' sustaining technology. At this point, incumbents perceive the dangerous of an imminent loss of market share and leadership in their economic sector, but probably, it's going to be too late, to properly react in time. Without options, incumbents must surrender leadership to the move from challenging innovation which quickly wins over the sustaining incumbent technology.

Figure 3. The phenomenon of Disruptive Innovation

Source: Yu e Hang (2010).

Up to this point, disruptive innovation is considered as an identified opportunity to market with interest in the key dimensions of products. So if any one or more key dimensions are modified, combined with price strategies, could generate market opportunities, reshaping business. Another way to provide for disruptive innovation, however, is to rethink the key dimensions set of products and so, arousing the attention of idle costumers (Lindsay and Hopkins, 2010). When modifications in the combination of the key dimensions or on their nature could provide distinct or extra benefits to non-users, then disruptive innovation could find new market segments. Critical factors to be disruptive, however, becomes the identification of a new combination of key dimensions (Zucatto and Pinheiro, 2008). In current days, disruptive combination of key dimensions relates to the company's analytics capability (Kane et al., 2018).

2.1 Building Knowledge

Scientific knowledge comes associated with epistemological validation. In other words, knowledge, systematically accumulated and socialized as truth in world, must have been submitted to the sieve of academia and scientific rationality. The epistemology involves essentially the relationship of reality consciousness, or of an object, by an individual, that is, a person who thinks, generates and incorporates knowledge, in a scientific format. Epistemology involves the what (object), the how (relationship between object and subject), and the ontology, the thinking being, who discovers/recognizes the reality, or the object (Santos, 2015). Therefore, epistemology becomes the science of knowledge validation.

Formally, epistemology is a science, because it focuses on the logical explanation of reality, that explains human knowledge. According to the Dictionary online, epistemology is "theory of science; analysis of theoretical premises and related practices with the scientific knowledge,

after its historical evolution in a society.” (DICIO, 2017). Accordingly, it is the branch of philosophy that, in rational terms targets at validation, structuring and sustaining of scientific knowledge. Its scientific validation power comes from its nature, concerned with explanation of real objects in its own reality, under universally accepted scientific methods (Vasconcelos, 2010).

The study of epistemology encompasses a variety of approaches to explain knowledge, involving three platforms or streams, as way to explain the construction of knowledge: empiricism, rationalism and constructivism (Jensen, 2013). The first category, empiricism, explains knowledge construction through human experience. Put in a simple way, individuals rationalize, the way they perceive, sensations, the world and the surrounding reality, projecting assertions intended to explain those experiences and thus, producing knowledge.

The rationalism, however, explains the approach to knowledge construction, using natural abilities and rationality, not experience. Rationalism asserts that each experience and human knowledge comes from cognitive mechanisms, that is, combination or integration by logical connections. Finally, in the last category, constructivism, specialists argument that knowledge is gradually constructed by the accumulation of fundamental blocks of knowledge, influenced by socio-environmental conditions. Constructivism focuses on knowledge building based on intersubjectivity and pragmatic viability of how knowledge is being elaborated (Jensen, 2013), to be incorporated by humans. In the present essay, we adopt the episteme of rationalism to analyze and interpret the phenomenon under discussion.

Epistemic rationalism covers a spectrum of reality and phenomena/events interpretation going from dogmatism (realism), passing by perspectivism, then relativism and ending up at next furthest point, with skepticism. Epistemic dogmatism postulates the existence of an absolute truth, that can and should be acquainted by human intellect.” (Vasconcelos, 2010, p.25). As dogmatic as is this view, the reality and phenomena interpretation is ruled, and depends, of a set of discipline validation rules. These rules juxtaposed and combined all together explain the object or the reality, in a rational way.

On the other side of the spectrum, epistemic skepticism defends the premise that human

intellect is incapable of learning or incapable to reach the totality of knowledge of the absolute truth. Skepticism rejects the capacity of the mankind to objectively acknowledge the whole content of reality. Humans, preach skeptics, are able only to visualize the form, or appearance, remaining the inner contents of reality, inaccessible to human comprehension.

At middle way in the spectrum, stand epistemic perspectivism and relativism. The later comes to be, in essence, a moderate skepticism. Relativism premises deny the inexistence or inaccessibility of reality for humans in its completeness, as asserted by skepticism. Relativism denies only part of reality. Thus, it considers human intellect perfectly capable of learning part of reality, that is, capable to acknowledge part of the absolute truth, in such way that the incomprehensible part of reality remaining inaccessible, pertains in the realm of mystery or myth (Jensen, 2013).

As per epistemic perspectivism, it comes to be a more flexible dogmatism (rationalism). In fact, perspectivism uses to be understood as a subjective rationalism, that is, an individual rationalism. Perspectivism stands closer to dogmatism and admits human capacity to acknowledge the absolute truth. However, the acknowledge of the absolute truth stands within the limits of individual perception. Perspectivism does not considers the complete or partial human inaccessibility to the contents of reality, as in the two precedent cases, based on the argument of incomprehensibility of reality contents per se, but based on limitations of human perspective. Reality and its forms are seen and acknowledged by human intellect, however, within the limits of self-cognitive and experiential perceptions of each human individual (Jensen, 2013).

3 Research Methods and Technics

In this research, qualitative in character, we used selected cases to evaluate the digital nature of innovation considered disruptive. This methodological option bets on the potential of deepening and of contextualization understanding of phenomena studied this kind of method can bring to a research (Pettigrew, 1992).

To evaluate concepts and its differentiation, in a tentative to identify eventual paradoxes in disruptive and radical innovations’ the definition, a

bibliometric study was carried out to feed a content analysis. The objective is to study the distinct conceptual approaches adopted by the many scholars on the phenomenon of disruptive innovation. Essentially, the target involves the comparison of different streams of understandings of the disruptive innovation phenomenon in the literature, or significant part of the literature, living in present-day in the most important data bases of human knowledge.

3.1 Data Collection

Data were collected by means of syntactic analysis of disruptive innovation publications, living in Publish or Perish data bases and CAPES data bases of scientific articles in social applied sciences, abiding a proportion of about 30% and 70%, respectively. Publish or Perish is an intermediate data base in size, containing a significant number of periodicals, however, all of them with a higher Impact Factor. CAPES data base is a bigger data base than the Publish or Perish, but it is not selective in terms of the Impact Factors of the periodicals. To the purpose of this work analysis all articles not yet evaluated through blind/peer review, even if accessible in the data bases, were excluded and picked only the articles evaluated and published in periodicals of these bases.

The sweeping search of specialized literature, after disruptive innovation concepts, was made using Iramuteq, a software available for free, developed to process statistical analysis in texts and other not numerical formats of data presentation. Iramuteq became recently one of the most used tool for textual analysis in academia (Camargo & Justo, 2103). This software main application involves applied social sciences. It allows for counting analysis and other statistical connections, to classify words and terms hierarchically. It also supports processing for dispersion identification, based on similarity comparisons. Because of its statistical fundamentals and comprehensiveness of interfaces, this analytical tool holds special application in research focused on contents of texts as platforms for phenomena understanding.

All paper selected in both digital bases were published in the last five years. Searching words in titles and abstracts were: disruptive, innovation, concept. The words were used in the searches

altogether and separately. The identification of the articles was made based on the presence of at least one concept of disruptive innovation adopted. Iramuteq analysis abide by sweeping titles and abstracts of all papers in both bases. The search through Iramuteq evaluated 305 articles, however only 51 fulfilled the requisites.

4 Research Results and Interpretation

Data resulting from statistical syntactic analysis through Iramuteq are here interpreted on the basis of three sets of evidences. First set refers to disruptive innovation concepts adopted in the literature considering the analyzed phenomena in the articles. Second, the analysis covers clusters of conceptual similar incidences, evidenced in the Iramuteq syntactic analysis, leading to a categorization of concepts. And third, the interpretation of the research results always considers the four distinct streams (categories) to understand epistemology of science as possible elements of the concepts construction. The four categories used here refers to the most common epistemological basis: Realism or dogmatism; perspectivism; relativism and skepticism (Vasconcelos, 2010).

These four streams of knowledge construction or theories validation were chosen because of the rationalism underneath the process of knowledge construction seem in all the streams, that gives a certain self-evidence and objectiveness when used as arguments to explain the approach of authors when presenting or discussing “disruptive” phenomena. In the end it becomes a way of building theory, by concept consolidation and/or by combination of observation, analysis and rationalization learned from literature.

4.1 Results discussion

The articles analyzed via Iramuteq showed two sets of distinct origins or context where disruptive innovation was discussed by authors. One set of articles consider traditional organizations, long time, or recently established, however, organizations structured according to the traditional business model. This is a small, yet significant, percent of the sample, around 15%, of authors who concentrate analysis on organization suffering strategic movements or disruptive attacks in their business by direct rivals or new comers. A

second set of articles concentrate on new organizations, established by jumping on opportunities identified in the digital era or on the digital transformations contexts. These types of articles focus on modifications undertaken either in the structural arrangements of new business, as well as on modifications caused by those rearrangements.

What was found in the cases of disruptive innovations in established organizations, the concept did not change from the original proposal by Christensen (1997). Disruptive innovation, in this case means an attack to an industrial sector by simplification, in format, of sustaining technologies, with direct implications on the business model. In other words, always that a sustaining technology, or a technological paradigm, are not broken, but made simpler and at the same time allowing to deliver product or service costly, because it needs less process sophistication, then this is a disruptive innovation. Of course, in this case, implications from disruption applies to the business model. The modification is not technological in character, but structural in nature and happens on the format of how elements, processes and resources of an organization become rearranged to accomplish, in a predetermined or planed way, the transactional processes of the business. Lastly, disruptive innovation target, at least in the beginning, at dammed demands or market demands not answered and at unsatisfied market segments.

In the second case, where authors look over new business, created in the digital era, are established in very distinctive ways as compared to the traditional ones. Here, entrepreneurs design business looking at technical paradigms and at the same time, to new ways of serving market. Implications and structural changes among all involved elements – organizations, business and market – become very compromising to each other. Some main reasons involve a clear modification of the technology. In opposition to the first case, here in the digital context, technologies at stake are more sophisticated. They are more sophisticated, however, in nature, not in the way they are applied/used. At the user end, these technologies are simpler and evident, for they tend to be more user-friendly. One can imagine, therefore, that being more user friendly, these technologies are much complex internally, for they need greater flexibility to solve problems inherently more

complexes. The rationale for this disruptive innovation concept remains not in the technology itself, not even on any unattended or unsatisfied market standard behavior (there is no search for unattended markets, as in the first case, but a direct attack to existing market). The rationale remains in the modification/alteration of the business model, despite of the technological sophistication and on the bet of new market values, to break down the buying and selling intuitive hegemony, perceived among traditional markets.

Considering the epistemological principles, there are no way to identify objective evidences in the work that could assure the construction of knowledge straight under one of the episteme categories appointed before. Iramuteq only sweeps the texts searching for specific key-words. The validation of disruptive innovation concept construction, therefore, must be made in a subjective way. Thus, what was evaluated, after the key-words search was the format of knowledge building by analyzing the concepts themselves.

The stream of authors who take cases of disruptive innovation in the traditional companies block, considered the disruptive phenomena in objective means, based on characteristics of disruptive innovation according to the definition of Christensen (1997). As mentioned above, these authors abide by Christensen view of what would be a disruptive innovation. If the elements of the disruptive phenomena were not found in the case, then simply that case wouldn't be a disruptive innovation.

This set of authors consolidate the theory as conceptual dogma, considering determinative of disruptive innovation, the presence of specific elements imperative to the phenomenon and grouped in a certain way. The elements that should be present embrace the following. A sustaining technology that was not replaced by another or by a better one but retaken in its original simpler format. A modified business model adapted to the new transactional object. And lastly, a redirection of the target market. In this case, a Market still not covered by incumbents.

With respect the stream of authors who consider disruptive innovation as changes in the business itself, based on digital technologies, disruptive innovation changes to the application, changing also the perspective of the concept. The authors suppose that innovation holds its pivotal point on the application, not on the technological

elements. It doesn't matter at all, the technological elements. It doesn't matter also if the instruments used to innovate are more sophisticated (digital technology), once its application modifies the behavioral trajectory of the business in an industry, be it in relation to the market, or in relation to the business components.

It seems evident that the concept of disruptive innovation, for these authors focus mainly the principles that break down barriers to new comers in a given industrial sector. In this case, the pivotal question does not refer to the simplification of a ruling sustaining technology, but, it refers to a greater technological sophistication, to the extend to get the same results, however, being a highly friendly and comprehensible technology to users. This approach thus, seems not to embrace a prevailing dogmatism in the process of building the concept, but to present a clear dependence of the perception that an idea, bolstered by a new technology, could function in a specific market, given an identified opportunity.

5 Conclusion

The tentative analysis of the seeming conceptual paradox present in the motto of disruptive innovation, according to the distinct understandings of the many authors revisited, can be explained through the same fundamentals. There are small nuances, distinctive among some of the constitutive elements of the disruptive innovation, but generically one can say that disruptive innovation concepts are in both contexts here evaluated similar in rationality (structural modification generating internal competitive capabilities, compatible with values of traditional business) and in effects (they approach market of the organization). These reflections lead to some important conclusions:

First, there is an original concept that involves a set of elements characterizing the phenomenon of disruptive innovation. This concept fits well the requisites in the analysis of business and traditional organizations. Disruptive innovation refers to modifications in business model of traditional organizations, embracing sustaining technology simplification and drives the resulting modifications to a new market (still unattended) or to an existing market, but involving a mass of unsatisfied costumers with the offerings

of the incumbents.

Under the point of view of the epistemological construction of the concept of disruptive innovation, one can infer that this way of building knowledge follows the dogmaticist episteme. In other words, it is perfectly comprehensible that the phenomenon can be accessed by human mind and understood in its fullness, once the elements of the original concept of the phenomenon are present and identified.

Second, there is an apparent contextual evolution in the structuring of the industrial sectors. Fragmented industries, yet operating in the same sector, begin to evolve a new format of product offering. These are enterprises based on the new digital technologies. These new industrial fragments formation do not characterize radical innovation, since technological paradigms of new comers were not embrace or accepted by incumbents, as a replacement to the current technological paradigms of the sector. These are not radical innovation because standard of acceptance by markets also are not consolidated. Therefore, these modifications could be considered disruptive innovations, but their premises distinguished from the premises of the preceding group. Here is the combinatory idea of elements, processes and offerings, that prevails. It seems that a there is a preferable combination of new instruments for products/services generation turning in to preferable forms of acceptance by market, that makes the modification to work.

Considering the epistemological construction of the concept (of disruptive innovation), one can infer this is a case of epistemic perspectivism. The main reason evidences that the author's perception and his/her interpretation on the degree of value that a suggested innovation (within the idea of combination of elements, processes and offerings) causes on incumbents and on market, determines the nature of the phenomenon as being a disruptive innovation. The classification of this phenomena as a perspectivist format of knowledge building fits in the definition of perspectivist episteme, where knowledge building comes from the assessment of people of reality (phenomenon) but limited to their own perception within the limits of self-cognitive and experiential perceptions of each one.

6 Implications and Further Research

This is a first study targeting at characterization of the concept of disruptive innovation phenomenon. Because of its novelty, this is a profitable area of future research aiming at deepening as well as enlarging human understanding of this phenomenon. As per deepening the research one might consider a complete study, involving a sweep by Iramuteq on the conclusions of the articles, not only on title and abstracts. As per expansion studies, one suggests replicating this research using periodical other bases, with a range of periodicals distributed among traditional and well known data bases, such as Scopus, Emerald, Web of Science etc.

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