Learning Strategies in Coopetitive Environments

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Coopetitive environments (Brandenburger and Nalebuff, 1996) are characterized by situations where firms simultaneously compete and cooperate with competitors. Such situations impede the generation of proprietary and discretionary learning, by forcing competitors to selectively share critical knowledge about their assets (Baumard, 2008). Coopetition can arise from partial or incomplete interest into a rival's domain, yet not requiring a full entry or deployment in the latter. Dagnino and Padula (2009) hence note that coopetition is not restricted to situations of simultaneous cooperation and competition, but rather extends to every form of strategic interdependency, where partially congruent and divergent interests need to be managed simultaneously. How do they differ from more traditional "collective strategies" (Hawley, 1950; Astley and Fombrun, 1983)?

Whilst collective strategies are temporary arrangements that increase the chance of success of previously or geographically competitive firms, coopetition translates in more durable form of inescapable coexistence. In order to distinguish between the forms of dependency that links firms in such a fate, Astley and Fombrun (1983) have borrowed from Hawley (1950)'s work on the coexistence between species in a biotope to describe the forms of durable arrangements that maintain the flow of interactions between firms. They suggest that the dependence upon a shared resource (commensalism), the mutual and symmetric dependence on core assets (symbiotic relations), or the dependence of a smaller player upon an architecture generated by a large incumbent (parasitism) trigger different environmental configurations, such as federations or conglomerates.

While mixed motives (Axelrod, 1984; Schelling, 1986) and knowledge exchange within inter-firm networks (Grandori & Neri, 1999) have been studied extensively, little attention has been given to strategies of learning that firms must deploy in order to be successful in a setting where they have to learn from, or learn with, a competitor. While coopetitive arrangements are not conditionally antagonistic, the learning that occurs in the midst of an agreement where copyright laws, industrial secrecy and non-disclosure agreements are the sole barriers to protect the firm's discretion is often felt as an adverse experience (Baumard, 2008). "Adverse learning" is a term used in education sciences to describe learning that triggers anxiety, emotional blockage, phobias, and poor responses (Menec et alii, 1995). Studies focus on providing alternative learning strategies that would help students in adverse learning strategies to overcome such obstacles. Two streams of research, one coming from the works of Burrhus Frederic Skinner (1968) on associative learning, and one coming from the works of Piaget (1972) on participative learning have focused on human antagonistic learning. Skinner observed that further responses of a learner are much influenced by what follow them. In his experiments, Skinner also shows that rats resist complete conditioning, and invent a behavior that does not respond mechanically to the stimulus. They adapt adversity by creating a routine that bypass the trick that has been designed to create an aversion (usually an electric shock), and still allows for accessing their food. Whereas Skinner's theory of behavioral chain received harsh criticism, noticeably by Chomsky, Piaget's theory of reciprocity in learning brought an in-depth understanding of adverse learning in childhood. Piaget did not focus on a stimulus-response scheme, but rather in understanding the forms and logic the child uses when faced with a lack of response, trying to assimilate and accommodate with contradictory or adverse inputs. For Piaget, the journey into learning the mechanisms of learning, from birth to childhood, is one of slow and gradient *asymmetric* gains. The child learns simultaneously to define who he or she is, constructing an ontology of being, while inventing and discovering the epistemology of his or her interactions.

Economists and etiologists have also studied antagonistic learning. We will see in this chapter how unexpectedly parallel these studies were. Akerlof (1970), in *his market for lemons*, developed a *seminal* example of adverse learning in economic trade-off situation. He shows that buyers can engage in adverse selection, when facing antagonistic and uncertain learning settings (in his example, when buying an untrustworthy second-hand car). Lorenz (1966) in his study of animal and human aggression disclosed similar examples of reluctant and adverse learning, noticeably when animals must accommodate a non-cooperative partner in order to achieve a vital learning mechanism for food and reproduction. Hence, "unbalanced" or "adverse" learning is inherent to most human and animal activities, but did not receive adequate attention by management and strategy scholars.

Nevertheless, unbalanced learning in coopetitive dealing has gained a worldwide momentum with the rise of compensation mechanisms, involving for instance the retrocession of know-how or R&D capabilities to gain access to emerging markets. The objective of this chapter is to explore the learning strategies that can be deployed by firms in coopetitive configurations with no other choice than deploying an "adverse learning" mechanism to reach their customers through cooperation with their competitors. After exploring the mechanisms of asymmetric learning in a first section, the chapter adopts an ecological perspective (Hawley, 1950) in drawing parallels between animal organization and groups of firms in gaining a strategic advantage through asymmetric learning.

Asymmetric learning

Coopetitive situations are similar to settings described by Akerlof (1970) in his 'market for lemons': two parties are seeking to get the most of their interaction, seeking cooperation to reduce information asymmetries, while engaging in competition to get the most out of the deal. In Akerlof's seminal example, the market for used cars would diminish, even to the point of collapsing, because the fear created in the buyer by the information asymmetry reaches the point of preferring to pay more, for a new car and less uncertainty. In such a double bind context, the buyer of the 'lemon' will try everything he or she can to reduce the information asymmetry, by means of trust enabling, seduction, and eventual intelligence gathering from fellow buyers who visited the same shop. Unfortunately, as he or she soon discovers, buying a used car is a situation where the moral hazard is inescapable, for the asymmetry ultimately plays in favor of the seller.

Adequate learning strategies can reduce the information asymmetries between the two parties. As Stigler suggested (1961:224), partners in such adverse selection scheme, often rely on the reputation of the other party, coping the fact that they cannot afford or access the search for complete information on the correct price. As Stigler puts it: "Ignorance is like subzero weather: by a sufficient expenditure its effects upon people can be kept within tolerable or even comfortable bounds, but it would be wholly uneconomic entirely to eliminate all its effects" (*op. cit.,* p. 224). The problem with coopetitive situations is that both parties mirror each other, being simultaneously reciprocal buyers and sellers. They need to unveil minimum level information to engage in cooperation, while keeping from sight a sufficient level of information to preserve their competitive stance. In other words, both parties need to "sell" part of their information to the other party, while at the same time "buy" themselves some discretionary and competitive knowledge on their partner in order to be able to eventually compete, later or sooner. They are symmetrically ignorant of the other's actual performance, not knowing if they are in a situation of "lemon for lemon" or "gold for gold". This situation is similar to an employer meeting a prospective employee: the applicant does not know if the firm is a lemon or a paradise; the employer does not know if the applicant is a lemon or a world-class. Spence (1973) proposed a specific learning strategy for such two partially ignorant parties cooperating in a competitive situation. He named it "signaling". Previous experience has taught employers that higher education in their employees return higher profits, while applicants know that firms that can afford better trained professionals usually pay them higher and provide better workplaces. Of course, the intrinsic value of the higher education, and likewise, the intrinsic value of the workplace, does not prevent the model to work. In other words, escaping information asymmetry can be achieved through games of convention (Lewis, 1969). The application's education does not possess a known price, even if it had a cost. Its appreciation is a social convention, and usually labeled as such, e.g. "Ivy League". The firm's reputation either does not come with a price, but much evidence can be found in "precedents", a term used by Lewis to denote the existence of common knowledge shared by the parties on the state of the social convention.

A convention is a highly ambiguous approximate of a price. In *the market for lemons*, Akerlof (1970) puts a buyer in the position of choosing between prices for a lemon, or walk away, and eventually buy a new car. In most coopetitive situations, the choice to stay or go does not come with a price. If there are prices, they are so disperse in the intertwined implications of their collateral effects on future cooperation and competition, that even Stigler's concept of "dispersion" would not capture the dilemma facing the coopetitive partners. As a consequence, partners in coopetition trade "conventions" that are crafted for the purpose of trying to stay in the game, while not chasing away the partner from its cooperative predisposition. An adequate etiological myth to illustrate such coopetitive strategies might be found in Hesiod's *Theogony.* Hesiod relates how Greeks tricked Zeus when faced between the choice of their self-starvation and satisfying the God's demand. Prometheus assembled a pack of bones and fat made of the sacrificial animal, keeping the meat aside, hence cooperating the Gods, while not totally betraying them.

An ecological perspective

What prevents Prometheus to inform Zeus that his people are lacking food is not malignity, but fear. As Mariani (2007) showed in his analysis of Italian opera houses consortium, coopetition is rarely a deliberate situation desired by partners. It is more likely to be emergent and somewhat undesired. When thrown into coopetition, firms face a change in their ecological arrangements with other firms that can be compared to a change of biological equilibrium in a living organism, or in nature. Several authors have borrowed from biology and ecology to describe organizational phenomenon. McKelvey (1982) in *Organizational Systematics* borrows the principles of natural selection to try to apply them to populations of organizations. Nelson and Winter (1982) draw an analogy between organizational routines and genetic characteristics. For the latter, routines that match environmental conditions allow firms to survive, while firms failing to adopt adequate routines disappear. In the same perspective, Astley and Fombrun (1983) borrowed Hawley (1950)'s characterization of living organisms' interactions within an ecosystem to describe interactions between firms, building extensively on concepts such as commensalism, antagonism, symbiosis, parasitism, etc. Hence, by seeking to explain how firms survive by drawing analogies with ecology, these authors have founded the primary stones of the study of strategic learning (Starbuck, Barnett and Baumard, 2008). However, loyal to a functionalist tradition, strategic management literature that has borrowed from ecology and biology has performed a discretionary selection, stopping the analogy at a mere description of interactions, and putting aside what in fact motivates the adoption of an antagonistic behavior rather than a cooperative one.

Studies of cooperation and competition, by large, have put too much emphasis on *intent* and the deliberate nature of competitive configurations. Even the work of Astley and Fombrun (1983) that intensively borrows from Amos Hawley (1950) study of biotic communities, fails to underline the instinctive and "natural" organization of those interactions. In fact, the authors state that their analysis "highlights the importance of collective, as opposed to individual, forms of organizational adaptation" (p. 578) as to suggest the importance of "collective strategy: the joint mobilization of resources and formulation of action within collectivities of organization" (*ibid.*). It is unfortunate that organizational theory only borrowed the surfacing and salient aspects of ethology and biology, for much of the most interesting part of this body of science lies at the very low level of animal behavior in face of uncertainty and ambiguity (Burkhardt, 2005).

In particular, Lorenz (1966) introduced four different dimensions in attempt of explaining animal behavior: the immediate response to a stimulus, which could be compared to a competitive reaction such as a retaliation; the inherent and programmed behavior (ontogenetic), which can be compared to the works of population ecology; the mimetic and homothetic behaviors, which are routed both in genetic inheritance and imitation, which can be compared to institutionalism; and finally, the functional adaptation, which is learned from experiencing with other species and the natural environment, and which seems to have attracted most of the attention from the management literature (Astley and Fombrun, 1983).

Lorenz defended the idea that these four dimensions of behavior continuously interact while an animal is experiencing a large variety of events and learning challenges. Although Lorenz's theory of instinctive behavior has been partially invalidated by early critics (Lehrman, 1953), he was the first to underline that the failure of human strategic learning does not lies in the lack of learning abilities, but on the contrary, and contrary to animals, in the excess of learning functions that humans are conducting. Finally, animals live in coopetitive settings. Cooperation, either symbiotic, parasitic or commensalist is a necessity, not a choice. Likewise, competition, that happens simultaneously, and eventually among the same species, is also a vital component for feeding and their social organization (Mesterton-Gibbons and Adams, 1998). Therefore, animals need to adapt, whether the context being one of cooperation or competition. Bence (1986) notes that some species have developed skills in "antagonistic learning", i.e. adopting a behavior that precludes feeding efficiently on more than one type of prey at a time. He observes that mosquito fishes decrease their feeding rate as they increase attack specialization on profitable prey. Krane and Wagner (1975), however, showed that a modification of such a behavior can be "imprinted", to use a Lorenz's term, on animals by associating an electric shock with a specialized food (in that case saccharin with rats). Yet, the Charles River's rats defy theorization by being able to cooperate with the experimenters, hence accessing their food, even with the burden of an adverse and antagonistic learning. Faced with contradictory choices, animals do engage in learning behaviors that are adverse to their objectives, and manage cooperation and competition simultaneously. The question rose by such an observation: why do theorizations of coopetition do not assume that human beings can do just the same?

Cooperating and competing at the same time

Like Spence's (1973) applicants for a job, animals have an intensive use of "signaling" to reduce informational asymmetries, discourage aggression, or engage in courtship. This "signaling" activity is highly conventional, ceremonial and codified (Lorenz, 1966). In the event of courtship that Lorenz describes as a simultaneous activity of aggression animals also use what Stiglitz (1975) has labeled as "screening". Screening is a technique used by an economic agent, trying to reduce an informational asymmetry, to extract discretionary information from another. Within a group of similar job applicants, an employer has a keen interest of finding out who are the most qualified, without letting them know that he is after this information. In a situation of coopetition, a firm is in a similar situation. It has a strategic interest to "screen" partners, among which it competes and cooperates, without letting them now that such a screening is taking place. Animals have a very similar problem when they try to mate, and this is largely due to social conventions and perceptions of hierarchy (Lorenz, 1966). Lorenz observed that animals resort to "redirected activity" when provoked and in the incapacity of conducting a retaliation on the animal originating the aggression. Hence, they start a very aggressive move towards the provocateur, drop it at the last minute, and redirect their aggression on the closest neighbor. This redirection of aggression has two functions: first, it informs the provocateur that its offense has been acknowledged, and second, it provides a simultaneous "screening" by reasserting the hierarchy of the dominant male in the social structure. Similar behaviors have been observed in human competitive signaling among populations of salesmen (DePaulo, 1988) and in product announcements from firms trying to "bluff" the competition (Robertson et al, 1995). In both instances, the bluff signaling has two purposes: first, to deceit the receiver in believing in the sender's superiority (maintaining or enacting an information asymmetry), and simultaneously, to inform the receiver that the firm may engage in an irreversible move if the current equilibrium would come to be threatened (screening).

What the animal is also doing when redirecting its aggression to its closest neighbor is to take a "hint" at the status of both its cooperative and competitive perception within its social group (Lorenz, 1966). Doing so, a much larger risk is involved in trying to solve both problems at the same time. If the provocateur, most likely a female during mating season, stands in the way, this unwanted aggression, on both sides, even if initiated by one of the parties, will terminate any prospects of future relations. If the aggression is successfully redirected, but unsuccessful, the dominant male looses its status within the group, and consequently, both prospects of cooperation (in this case, mating) and competition (in this case group dominance) are lost. This is a high level of risk for just taking a "hint", and as Schilling noted: "*Taking a hint* is fundamentally different from deciphering a formal communication or solving a mathematical problem; it involves discovering a message that has been planted within a context by someone who thinks he shares with the recipient certain impressions or associations. One cannot, without empirical evidence, deduce what understandings can be perceived in a nonzero-sum game of maneuver any more than one can prove, by purely formal deduction, that a particular joke is bound to be funny" (Schelling, 1960: 163-164). Lorenz or Parker et al. (1999)'s gorillas are in a very similar situation: a provocation has been deliberately thrown to call for his *attention;* but the signal carries simultaneously several meaning, and several intents. It is directed as much as its attention, than at the attention of the social group. Taking a "hint" either cooperatively or competitively are not available options. The "hint" must be obtained while managing simultaneously a competitive (with the social group, and the provocateur to assert its legitimacy) and coopetitive relation (with the provocateur to maintain the bound, and the social group to assert belonging the pack).

Attention Sharing and the Dilemma of Coopetitive Stance

Managing simultaneously a cooperation and competition increases the problems of attention and sense making in managing competitive dynamics. Ocasio (1997) defended the idea that firm behavior is mostly the result of how firms channel and distribute their attention. Although Ocasio is more interested in revisiting Simon's behavioral theory of the firm by proposing another limitation to human bounded rationality, he justly points out that managerial attention is situated, structurally distributed between tasks and limited in span and depth (see model Figure 1).

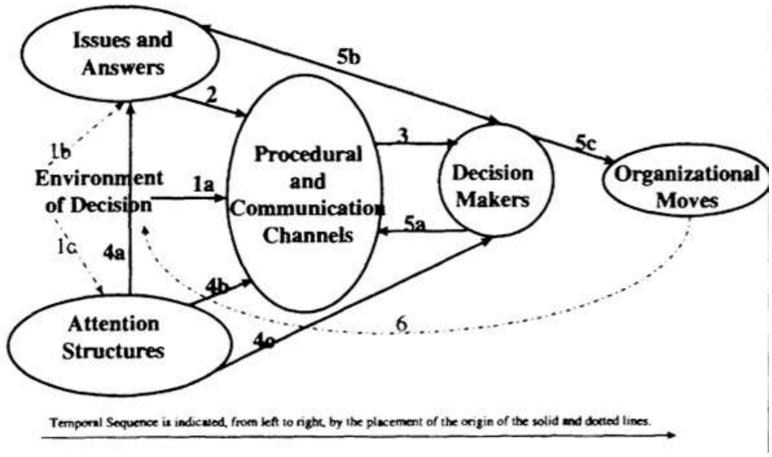

Figure 1: Ocasio (1997)'s model of situated attention and firm behavior (P. 192)

Ocasio (1997, 1995) opposes two perspectives on the effect of economic adversity. On one hand, he cites Kiesler and Sproull (1982) who advocated that failures of economic performance induces corrective actions, and on the other, the theory of threat-rigidity effects (Staw et al., 1981), which argues that adversity leads to more oil congealing, more control, and more ridigity. The author then suggests that both phenomena are simultaneous. Mimetic isomorphism brings repertories of responses that can rigidify the firm's response to environmental adversity; while the same adversity triggers at the same time a higher amount of "paralleled" problemistic search. In other words, there is a trade-off between the *attention* given to maintaining group acceptance and conformity (mimetic isomorphism) and trying to get an advantage (problemistic search). Indeed, Ocasio teaches that executives have problems which are in nature very similar of gorillas'. One interesting twist of Occasio's theory would be to analyze such double-bind effects by mirroring the situation of an organization A with an hypothetical organization B. The following diagram (Figure 2) has been drawn in this purpose, notwithstanding that its dyadic nature does not imply than more than two firms can be intertwined in the very same configurations. Both organizations are thus trying to maintain legitmacy to their respective strategic groups. Meanwhile, because of their coopetitive stance, they must reciprocally signal (Spence, 1973; Stiglitz, 1975) a fair behavior to their competitor-partner. A missing element in Occasio's model, however, is the role of the customer, who is likely to be ignorant of the coopetitive nature of the goods he or she consumes (see Figure 2).

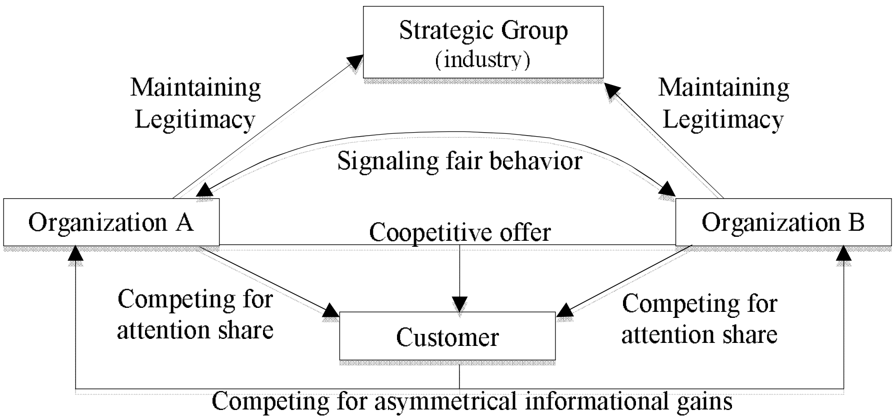

Figure 2: Signaling and Learning Behavior in Coopetition

Although the customer is buying a "bundled" or "integrated" offer", there is still an intensive rivalry between the involved organizations for grabbing their share of attention. Hence, both organizations are likely to compete for asymmetrical informational gains gathered in the privileged space they maintained with the customer, despite of the running coopetition. Customers found themselves in a situation quite similar of a buyer of a "lemon" (Akerlof, 1970): while they purchase the overall offer on the basis of the aggregator's reputation, their selection of the respective components is an adverse selection, as they purchase the coopetitive offer not knowing the intrinsic performance of its various components.

In Akerlof's seminal example, both buyer and seller can eventually rely on their own examination of the car. Although engine performance greatly varies from make and year, even with the same brand of car, general state of the car, and general aspect of pipes, carburetors, etc, can be thoroughly inspected. General knowledge is also available from word-of-mouth and specialist registries. Knowing that buyers could access external knowledge, classic car sellers may try to "obfuscate" evident liabilities in their cars. A well-known practice is to wax, blacken and shine engine components as to conceal the wariness of the mechanical pieces. The rise of electronic and software components, however, has render obfuscation more permissive, less detectable, to a point that can both challenge Akerlof's theory and explain the sustainability of paradoxical configurations such as coopetitive agreements.

Obfuscation is the concealment of meaning in communication by the use of placebic and neutrally functional capabilities to a technological set or chunk of knowledge. Obfuscation is not necessary driven by malevolent intents. Faced with incompleteness, indeterminacy, irrelevance and incommensurability, managers often rely to industry recipes that temporarily "obfuscate" their lack of responses (Spender, 1989). For instance, a doctor can use such obfuscation in order to conceal the meaning of a difficult operation to an overly worrying patient. Linsley and Lawrence (2007) found large firms' annual reports to display a very low readability level when it comes to communicating risks to the public opinion. Similarly, Bournois and Point (2006) found that commentary letters from CEOs in annual reports contain themselves a high level of obfuscation regarding imminent losses, future profits and confidence. Rutherford (2003) produces similar findings when he extensively studied the textual complexity of Operating and Financial Reviews (OFR). Kono (2006) sees in obfuscation a core mechanism of modern democracies. In his study of trade policies of 75 countries, Kono finds that democracy promotes "optimal obfuscation" by forcing policy makers to a more acute management of transparency, which mostly relies on sophisticated obfuscation of communications to trade partners.

The use of obfuscation in strategic alliances rose steadily with the generalization of "obfuscated codes" in software development. Coping with a weak legal intellectual protection for software, many large software firms started to obfuscate their source codes before integrating them in commercial products, or when leading co-developments with partners that could be, or become, competitors. Obfuscation allows maintaining a paradoxical alliance by preventing opportunistic behavior in shared learning (Larsson et alii, 1998). Obfuscated codes allow software to run with the exact same performance than its non-obfuscated version. "Optimal obfuscation" using in international trade negotiations do not prevent commerce relations to grow in volume and profitability. They allow, however, sharing a critical know-how, such as an algorithm to fly a plane at a very low altitude, with a competitor; allowing this competitor to gain learning on low-altitude flights for improvement in other domains, such as aerodynamics, and without compromising the balance between cooperation and competition.

Advances in learning require the concentration of knowledge on specific assets, as to develop rents or cumulate enough experience to take a market lead. Such learning curves consume large shares of companies' R&D investments. Obfuscated sharing allows continuing to develop and gain knowledge rents. Advantageously, the use of obfuscating strategies does not imply that the sharing firm needs to impose causal ambiguity on itself. Causal ambiguity has been defined by Lippman and Rumelt

(1982) as a coincidental or deliberate retention of knowledge "concerning the nature of the causal connections between actions and results" which can include uncertainty "as to what factors are responsible for superior (or inferior) performance" (Lippman & Rumelt, 1982: 420). While causality cannot be established in an obfuscated code, its transformation is simply based on the addition of artificial and placebo complexity, that does not prevent the buyer to use the code, performs its application at the same level of performance, and eventually to inspect the obfuscated code. The following figure (3) shows two versions of the same code, obfuscated on the right, and non-obfuscated on the left:

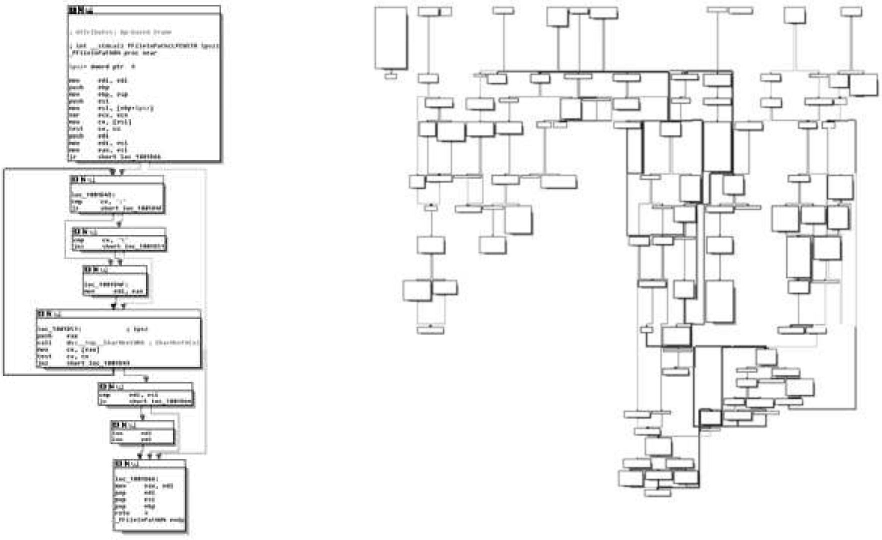

Figure 3: A clean "non-obfuscated" code (left) and its obfuscated version (right)

Obfuscation techniques were not developed collaboration in mind. The technique has a long history that began with the birth of Ancient societies. Detienne and Vernant (1991) have described how duplicity of meaning and deed constitutes the architecture of *mêtis*, know-how of cunning that allows Greek heroes to defeat their enemies by design, not brute force. More recently, Lin Foxhall (2007: 107) describes how olive tree growers in Ancient Greece, as to deter imitation, or conceal the real usage of their land to the jurors of their jurisdiction when in dispute with their neighbors, used obfuscation. Hence, narrative obfuscation was a frequent usage in Ancient Greece, playing with a language that authorizes puns, word play and versatility of sense making. While obfuscation has a long history, it never achieved the perfection that software technologies had brought to this technique; that is to say to achieve a perfect duality, a perfect dissociation between *intelligibility* and functional *authenticity*.

Examples from the telecommunication and media industry

In the previous paragraphs, we saw that signaling is essential to coopetitive collaboration as it reduces the mutual temptation for opportunistic behavior between the involved partners. Borrowing from ecology and ethology, we induced that excessive learning impedes the performance of coopetitive arrangements, because it increases tensions and antagonistic learning. Observing ape behavior, we inclined towards a proposition that "redirected activity" may play a central mechanism in avoiding direct confrontation between two firms in coopetitive dyad. Following Schelling (1960), we inferred that weathering out a problematic relation in a coopetitive dyad involves “taking hints” on the competition; a deed impractical and hardly realizable with discretion. Investigating the need for discretion and distracting attention further, we learned from Ocasio (1997) that firms constantly arbitrate in a trade-off between conformity with the dyadic partner (mimetic isomorphism) and individualistic search. The question was then to find a solution to “share without sharing”, “cooperate without cooperating”, and “competing without competing”. We finally discovered that modern obfuscation techniques were used in Ancient Greece for this exact purpose between olive tree growers, forced to cooperate with other farmers, but protecting their farming techniques by obfuscating their disclosure using the versatility of the Greek language (Foxhall, 2007). In other words, obfuscation allows mediating destructive signaling by drowning antagonistic learning within a placebic set of sharable of information.

Telecommunication is a coopetitive industry. The rise of digital technologies in its infrastructures and services production led the industry towards complex arrangements, with multi-level competition and cooperation at different layers of the service delivery. For example, Apple Inc is delivering digital musical pieces through its on-line digital stores ITunes. The revenue model of the on-line store is mimetic and symbiotic with the historical economic model of the music publishing industry. Apple Inc insured a proper signaling policy towards the Recording Industry Association (RIAA) by adopting a pricing structure that respects the Digital Rights Management, and the historical economic model of this industry. Although this precaution sent the right signal to the recording industry, Apple Inc rapidly collected “asymmetrical informational gains” (see figure 2) by captivating most of the attention share of the customer, and developing an in-depth understanding of consumer behavior that the Cupertino firm did not share with its “coopetitors” in the recording industry. Although the delivery system used by Apple seems transparent for its coopetitors, it is highly obfuscated. Algorithms used for the display of customer preferences and recommendation engines are proprietary to Apple Inc, and not shared with the recording industry. Even if the whole economic model is readable and understandable by the recording industry, the meaning of the change introduced by the system was inherently concealed to the recording industry, which in good faith pursued this deadly cooperation with the Cupertino firm. While the recording industry is steadily losing market shares in the 2003-2008 period, Apple Inc is gaining exceptional growth. Obfuscation created a long-term strategic advantage for the firm that grasped most of the attention share with the customers.

Not all winning strategies imply the establishment of a symbiotic agreement with the “coopetitors”. New entrants can also adopt *parasitism* by stealing the attention share from the main incumbent, and developing the same strategy that we described about Apple Inc. The “LastFM” venture is an exemplar of such a strategy. LastFM is an Internet radio. Because it uses the right to emit without recording digital music, the firm has obfuscated one major legal backdrop in order to enter this coopetitive market. Pursuing a parasitic strategy, LastFM is both a website platform and a software component that self-installs within the ITunes platform. When installed, the software “listens” to music played by the user, and records its consumption of digital music on any support: on the computer itself, on the digital music player IPod, and on multiple supports. This practice has already been nicknamed by users as “scrobbling”. Scrobbling is the act of recording constantly one’s preferences as to re-use the accumulated learning in another functional environment. For instance, a user can go hiking for many hours, listening to its portable music, and when returning home, connect its portable music player, such as an IPod, and upload the chronology of its listening, both to the ITunes software, and directly to the LastFM database. The LastFM software will then upload the entire library, and its evolution to its own central databases. Of course, once this library is present on LastFM server, the company can provide a “radio” that plays authors and composers present in the ITunes platform. But it can also do more. Because many customers are “scrobbling” and sending their accumulated learning to the LastFM platform, the firm accumulates their learning and can use sophisticated collaborative technologies to create a *new learning* available for each customer: A powerful recommendation engine that can help the customer extend its primary musical tastes to new authors and composers. LastFM strategy is an exemplar of the use of obfuscation to gain an asymmetric advantage in a coopetitive arrangement. Similarly to the trick played by Apple Inc on the recording industry, LastFM is implementing an obfuscated routine *within* the platform of its “coopetitor”: it delivers transparently a legal function (listing in a database what the customer listens), but beyond this placebo “façade”, pursues the creation of a valuable meaning, which at turn becomes the core of its economic model. After its significant success in grabbing attention share, LastFM was acquired by the CBS Corporation. Hence, it has become a core instrument of coopetition between the CBS group, owning and publishing contents, and the Apple platform, distributing those contents.

Obfuscation is also a core mechanism in another firm at the center of a coopetitive ecosystem: Google from Mountain View, CA. By multiplying its listening to customer behavior at multiple points (search engine, electronic mail, electronic geographic software), the firm developed a convergent and obfuscated learning infrastructure, which allows to operate an antagonistic learning, usually not tolerated by users when transparent, and bring back the fruit of this learning directly in its economic model. When the customer has means to identify the obfuscation, the technology is indeed rejected. Although it has a superior performance to most built-in search engines, the Google Desktop solution never gain an according market share. The problem is that this application “calls home” frequently, i.e. repatriates its obfuscated learning for further exploitation to the main servers of the firm. Although customers do not see and do not understand what learning is taking place, they can still detect that an unauthorized outgoing communication is taking, usually blocked by specialized software such as a firewall.

“Obfuscated learning” and “obfuscated components” are not provided in disguise. They do not constitute a violation of the law. However, the sophistication of modern obfuscation techniques make it very improbable for a partner in a coopetitive arrangement to be certain that the announced and visible functionalities are truly the ones performed. Hence, like the gorilla who cannot decided if the invite is an aggression or a collaboration, firms are forced to “take a hint”, either by redirecting aggression as a means of signaling, or by blurring, or bluffing, the obfuscated learning that accompanies the collaboration. Such a case occurred when the “inhabitants” of Second Life, a large persistent virtual world where users develop replicas or phantasmagoric versions of reality, discovered that the owner of the company, Philip Rosedale, known as Philip Linden in the virtual world, was also a main component in the virtual world’s regulation. Second Life is a coopetitive environment, which organization and development is shared between its inhabitants (and customers of

Linden Labs) and Linden Labs themselves, who owns the architecture and provide the services. Originally, the virtual world started as an experiment, and little thought has been put in its democratic processes, for Second Life was nothing else than an entertaining platform. As the world grew, it absorbed most of the deviant behaviors of the real world, so that the owner of the platform, which is legally liable in the real world, started to impose regulation on behaviors. However, inhabitants compete as much as they cooperate in such a world. They compete for attractive parts of the land, such as isolated islands, like in the real world. They cooperate as the "life" of the virtual world depends on a minimal cooperation and game play. Linden Labs, with no doubt with the intent of "doing good" started to apply discretionary and obfuscated sanctions to deviant inhabitants who might have decided that laws "from the outside" could not be applied in a virtual and phantasmagoric world. As long as the various interventions were obfuscated, the virtual world continued to grow, with little disturbance of its precarious coopetitive equilibrium. But mistakes were made. And harmony was gone: "redirected aggression" took place in many forms: inhabitants started to own and run "independent press", both in the virtual world and in the real world. Democratic rules were asked. A supplier of electronic voting systems from the real world was suggested in good faith by the Labs, but the inhabitants redirected most of their aggression on the supplier, and then, on the founder of the virtual world. Excessive discretion and lack of discretion both contributed to an unbalanced ecosystem, riddled with conflicts.

In the three above examples, obfuscated learning serves the purpose of mitigating coopetition. In LastFM case study, the obfuscated learning allows the firm to benefit from the ITunes platform without infringing copyright laws, yet yielding its own learning grounded in another learning ecosystem. Interestingly, on LastFM own platform, the songs of the "discovered" new music artists can be purchased through other vendors, in direct competition with ITunes, but cannot be purchased back on the ITunes platform. Apple Inc introduced in September 2008 its own recommendation engine, but the latter has intrinsically a poorer performance as it sources its learning in its own closed ecosystem. The Second Life case study is different. Obfuscated learning was made explicit as the Linden Labs were struggling with a rapid growth a petty criminality in their virtual environment. Explicit and direct discretion was exerted, not without humor by for instance building a virtual jail inspired by the final chapter of Philip K. Dick's *Substance Death,* i.e. a never-ending field where inhabitants are forced to run a virtual tractor until completion of their sanction. Here we discover that tolerance to obfuscated learning strategies by customers play a central role in maintaining a coopetitive environment perceived as well balanced and fair by users. Google Inc has known similar difficulties when customers groups claimed than a ten years archive of their learning was an exaggerated measure, and was not justified by the delivery of services. The firm from Mountain View accepted to revise its recording process, and subsequently moved its obfuscated learning strategies in other domains such as geo-location, the creation of its own Web browser where it can operates freely a various range of obfuscated learning devices.

Towards a theory of obfuscated cooperation

Coopetition is an emerging paradigm. The combination of globalization and commoditization forces firms to integrate more and more generic components from competitors in the assembly of their offers to customers. The quest for larger market coverage also induces firms in sharing a coopetitive space facing a single customer, such as the ITunes platform. In our investigation, we compared coopetitive dyadic situations, such as a reciprocal adverse selection inspired by the works of Akerlof (1970), Spence (1973) and Stiglitz (1975). We first concluded that such a configuration would lead the coopetitive dyadic partners to deploy parallel learning mechanisms in order to obtain asymmetric learning gains "bypassing" their fair collaboration agreement with their coopetitors (Figure 2). Inspired by the practices of Ancient Greece olive tree growers (Foxhall, 2007), we then suggested that competing ad cooperating within the same learning system was possible if both learning devices were mutually obfuscated. Doing so, the coopetitive firm is still signaling a "fair behavior", or at least a legal behavior, to other members of the coopetitive platform, but can at the same time build its own discretionary learning (see Figure 4)

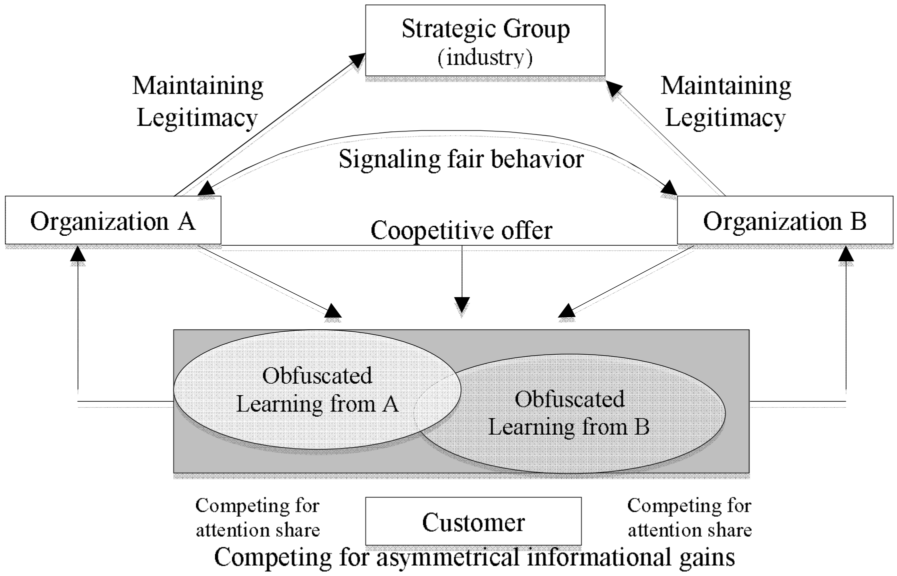

Figure 4: Obfuscated learning in coopetitive spaces

Several authors are proposed typologies of coopetitive strategies; noticeably Dagnino and Batista (2009) suggested to distinguish simple dyadic coopetition from complex network coopetition by differentiating the level of interfirm relation (macro, meso, micro) and respective gains in terms of knowledge and economic value. Likewise, we would like to propose several categories of learning strategies within a coopetitive framework. These categories do not represent a finding, but rather probable alleys of empirical research that may contribute to a more structured study of coopetitive management of growth and innovation.

Mixed motive cooperation, benevolence and contrition (RSTL)

The first generic learning strategy we propose is situated within the classic context of perfect competition, perfect information and mutual transparency behavior. Such contexts are traditional to laboratory experiments of game theorists. We call this strategy the "reciprocal symmetric transparent learning" (RSTL, see table 1 below). In such a context, market regulates competition (Clifton, 1977), and "players" accommodate their behavior in order to win over the cooperative dynamics. The *learning strategy* is hence transparent, and it aims at obtaining from the partner, by the symmetric games of dissuasion, persuasion, and conviction, an expected behavior.

When information circulates freely amongst partners, corrective actions are taken on the *behavioral determinants* of the interaction. Partners use signaling intensively (Spence, 1973; Robertson at al., 1995), but signals get easily jammed and misunderstood. Co-opetition hence heavily depends upon complex “tit for tat” strategies (Axelrod, 1984). When messages are misunderstood, partners correct them by adding generosity, for example by compensating a losing party once the deal has been won. Vice versa, a partner that has betrayed the fragile gentleman’s agreement of co-opetition can still engage in cooperation after being punished for his selfish behavior (Wu and Axelrod, 1995). Natural biotopes (Hawley, 1950) and animal packs (Lorenz, 1966) display similar learning strategies. They are, -- as Axelrod and Dion (1988) noted --, similarly used by nations, bats, birds and monkeys.

Asymmetric Open Adverse Learning (AOAL) strategies

In a context of a free information and perfect market, one can always walk away from an adverse situation. The expectation, or the inescapable constraint, of an on-going relationship can dramatically change the perspective. In the various examples we found in the literature, Charles’ River rats bend their aversion to shocks in order to continue feeding, Mosquito Fishes over-specializes their hunting strategy, despite individual risks, to protect their feeding regime. Organizations engage in similar antagonistic learning when they face an abrupt change in environmental trends, and decide to develop an adverse learning strategy within their core to accommodate the change. Intel pursued RISC architectures, despite its path dependency on previous architectures. Microsoft developed an Internet browser, despite its path dependency on static operating systems. Apple engaged in DRM-free distribution of digital music, despite its symbiotic economic model based on the defense of digital rights with the RIAA. These learning strategies are developed openly. Signaling is here used to reduce uncertainty in an adverse selection scheme (Stigler, 1961; Akerlof, 1970). When direct cooperation becomes too expensive, traditional “tit for tat” strategies become inefficient. Hence, firms engage in “contingent altruism”, i.e. trying to “discover ever more minimal conditions for the evolution of altruism” by selecting with parsimony the recipients of temporary favoritism (Hammond and Axelrod, 2006: 333). In reviewing literature, we found similar behaviors within gorilla packs, when dominant males need to protect their competitive status in the pack, while simultaneously displaying a cooperative stance for mating purposes (Parker and al., 1999). Firms like gorillas, “take a hint” (Schelling, 1960), and eventually use redirected aggression as both a signaling and intelligence gathering tactic. We named such strategies: “asymmetric open adverse learning” (AOAL). There is no concealment. Gorillas are rather explicit about their intents. They are conducted openly. As a matter of fact, visibility is key, for all players must clearly see their meaning in terms of direct and indirect reciprocity. They are swift and dynamic. Timing is key, for the gain in asymmetry will only be temporary, as the overall strategy is still pursuing the goal of maintaining the on-going and future relationships. The successful development of the ITunes platform and business model could well be the archetype of such a strategy.

Obfuscated learning strategies: Adverse and Non-Adverse

Our observation of the co-existence of partially cooperative, and partially antagonistic partners around the ITunes platform suggests that obfuscation may actually play a major role in handling causal ambiguity and friction in a long-lasting co-opetition. Non-Adverse Obfuscated Learning (NAOL) has a long history in co-coopetitive settings. We found examples of obfuscated technical secrets of production in Ancient Greece (Foxhall, 2007), when olive tree growers needed to partially share access to their domains without sharing the specific asset of their regional trade. Spender (1989) gave similar examples of the use of industry-jargon, which allows industry peers to cooperate, even when working for competitors. More recently, several works have studied the role of obfuscation in creating "selective perceptual filtering" in company documents or official communications (Linsley et al, 2007).

In a cooperative agreement, "non-adverse" obfuscation is used to prevent opportunistic behavior (Larsson and al., 1998). As the cooperation has no direct or readable reciprocity, for example in a fast evolving population of temporary partners, such as open source communities, partners may try to trigger "indirect reciprocity, (…) when benevolence to one agent increases the chance of receiving help from others" (Riolo and al., 2001: 441). NAOL strategies are indeed quite frequent. Algorithms for low altitude flying, which are essential to the growth of the airline construction industry, are shared between constructors under obfuscated algorithms. Obfuscation is not used with an aggressive purpose, but solely to allow the growth of new applications and exploration of new domains, while maintaining causal ambiguity (Lippman and Rupert, 1982). Technology allows for a co-opetition where "no memory of past encounters is required" (Riolo et al., 2001: 441). Hence, instead of adopting a "sociological" perspective on co-opetition, here the technology makes simultaneous cooperation and competition possible between partners who do not need to physically meet, who do not need to question their respective strategic intent, and finally, which defies the resource-based view of coopetitive agreements (see table 1, below).

The fourth proposed generic learning strategy in a coopetitive environment is "competitive obfuscated adverse learning" (COAL). The purpose of obfuscation is here still to allow cooperating with a competitor without disclosing discretionary information and trade secret. But concealment also plays here a more competitive deed. We observed such a strategy when we analyze the growth of LastFM within the ITunes platform ecosystem. LastFM performs a better learning, and better recommendations according to users, than the embedded learning engine within its host's platform. Contrary to other Internet radios based on collaborative filtering, such as Pandora, LastFM directly installs an obfuscated routine within the user's ITunes platform, and hence, learns directly from his or her listening habits. This kind of articulation is not *per say* a parasitic behavior, as LastFM ends up extending the primary demand for digital music, by performing improved discovery, and returning demands to the ITunes commercial platform. On the contrary, LastFM performs an "optimal obfuscation" (Kono, 2006) allowing cooperation without compromising strategic independence (of both partners). The learning strategy that LastFM has to deploy is nevertheless *adverse*, as it is legally allowed to "borrow" consumer's preferences with their agreement, but not allowed any recording or storage on its own platform. As in both Ancient Greece olive tree growing, and examples from Detienne and Vernant (1991), the limit of deployment of such learning strategy lies in the social tolerance in obfuscation (see table 1, below).

Generic Strategies	Competition	Cooperation	Co-opetition
RSTL **Reciprocal Symmetric Transparent Learning** (Both parties learn shared outputs)	Perfect competition and perfect information market competition (Clifton, 1977)	Mutual benevolence and early signaling create cooperative learning gains (Axelrod, 1984)	Tit-for-tat strategies (Axelrod, 1984) and commensalism (Astley & Fombrun, 1983)
AOAL **Asymmetric Open Adverse Learning** (Both parties need to openly learn in a mutually adverse situation)	Individual adaptation to maintain learning despite adversity (Skinner, 1968; Bence, 1986; Menec et al. 1995). Burden of antagonistic learning is beard by subject.	Use of signaling to reduce uncertainty in adverse selection (Stigler, 1961; Akerlof, 1970; Spence, 1973) while balancing discretionary attention and conformity (Ocasio, 1997)	Contingent altruism when cooperation is expensive (Hammond & Axelrod, 2006) and Lorenz (1966)'s redirected activity, e.g. "taking a hint" (Schelling, 1960).
NAOL **Non-Adverse Obfuscated Learning** (One party is learning without disclosure with a non aggressive purpose)	Use of industry jargon to preserve discretion (Spender, 1989) and obfuscation for selective filtering of audiences (Linsley and al., 2007)	Cooperation without direct or readable reciprocity (Riolo et al. 2001). Obfuscation is used to prevent opportunistic behavior (Larsson et al., 1998)	Obfuscation is used to maintain causal ambiguity (Lippman and Rumelt, 1982) in sharing sensitive components of a cooperative system (e.g. olive tree growing; Foxhall, 2007).
COAL **Competitive Obfuscated Adverse Learning** (One party engages in parasitic adverse non-disclosed learning)	Obfuscated learning has a purpose of cunning (Detienne and Vernant, 1991) or "parasitism" (Astley & Fombrun, 1983).	Search for an "optimal obfuscation" (Kono, 2006) allowing cooperation without compromising strategic independence.	Obfuscation is used to disguise and antagonistic behavior within a cooperative ecosystem. Limit is tolerance to obfuscation.

Table 1: A proposed typology of learning strategies

Conclusion

The objective of this chapter was to explore different "learning strategies" that can make coopetition possible and profitable for partners. Our inquiry started examining the corrective behaviors (generosity, contrition, signaling of good faith, signaling of conventions, etc) that are deployed by coopetitive partners to weather the ambiguities and tensions of paradoxical simultaneous cooperation and competition. We learned from game theory (Axelrod, 1984) that appropriate signaling can induce partners in maintaining a paradoxical agreement, and eventually for one of those partners to win it over. In a second step, we examined the role of knowledge *within* the coopetitive interaction. Looking at classic works of biology (Hawley, 1950), etiology (Lorenz, 1966), and economics (Akerlof, 1970), we hypothesized that discretion and transparency could be achieved simultaneously, thus diminishing the need for corrective signaling. We found in the telecommunication and media industry various examples of "obfuscated processes", i.e. cooperative processes where meaning is concealed but authenticity and functionality preserved. We then synthesized these discoveries in four propositions of "generic" learning strategies that may be used to sustain, or win over, a coopetition.

These propositions trigger many questions. First, the apparent paradox of competing and collaborating at the same time can be waived, as obfuscated learning does not threaten the balance of coopetitive agreements. Second, the use obfuscated learning strategies can displace and distort situations that can be read, at first glance, as pure coopetitive archetypes. The case study of LastFM is exemplar: the firm is sourcing its customer base *within* the platform of its competitor, but then creates a totally different ecosystem based on discovery of “unknowns unknowns” (artists that were not knowledgeable from the user), yielding its profits from the discovery function. While the presence of LastFM within the ITunes platform seems symbiotic in its façade, it is indeed a rather antagonistic learning and strategy. Third, studies of coopetition generally assume that knowledge and learning possess the same ontology for both partners in a coopetitive agreement. This assumption over-emphasizes the paradox of the arrangement, overlooking the fact that coopetitive ecosystems can indeed develop a harmonious growth without hurting partners. Fourth, most studies of coopetition focus on the managerial skills that allow for a better management of the tension between competition and cooperation, while obfuscated learning strategies underline the role of economic and technological design in the sustainability of coopetitive economics.

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