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'I love you... Me neither!': From marginalization to the integration of the adult entertainment film industry in the Blu-Ray network

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Abstract

Based on Actor-Network Theory (ANT), this article explores the way that actors faced to the closure of a network supporting an innovation succeed to open up it. To do that, we study the case of the adult entertainment film industry that is initially excluded from the Blu-Ray network during the high-definition DVD standard war. Our findings lead us to introduce a new concept, the 'marginalized' actant that is defined as an actant rejected on the periphery of a network against its will. Our results also show that 'marginalized' actants adopt specific logic of resistance to open up the network, notably by changing their identity. Eventually, the analysis of the relations between the 'marginalized' actant and actants at the centre of the network leads to some insights into the way the power struggle between them is structured and evolves over time.

Key words: Innovation, Macro-actor, Actant, Network, actor-network theory

INTRODUCTION

1.Sociology of innovation or sociology of actor-network

According to Actor-Network Theory (ANT), an innovation develops within a social network (Akrich, Callon, & Latour, 1988; Callon 1986; Latour, 1989). In this context, the success of an innovation depends on the size and stability of the network that supports it. In fact, more heterogeneous actors support the network and the relationships between them are stable through a negotiated compromise, more an innovation is likely to succeed. The challenge for promoters of a new solution is twofold: to create the largest possible network of actants (concept used by ANT to define all actors, both human and non-human as organisations, technologies, objects or animals) while at the same time ensuring the stability of the network.

Following this challenge, promoters of a new solution develop a two-stage innovation management process. First they attempt to attract and enrol the largest number of actants interested in the innovation they propose. Then the actants at the center of the network need to stabilize it through a translation process. The aim of a translation process is to condense all the diverging interests of the heterogeneous actants involved into an integrated whole. This process leads to share a common language, goals and direction between them in order to support the innovation.

Yet, another strategy can be used to develop and stabilize a network supporting an innovation. This strategy consists of deliberately excluding specific actants from the network (Lee & Brown, 1994; Leigh-Star, 1991; Vickers & Fox, 2005). This choice can seem paradoxical as it limits the size of the network and excludes extra support. Yet, exclusion can be justified by the second objective pursued during the constitution of a network, its stability. Some actants can be considered as problematic and can challenge the enrolment of existing actants and thus compromising the success of the innovation or relational stability within the network.

Even if this issue seems important, it has rarely been explored in ANT research as Whittle and Spicer (2008) point out. Our paper attempts to fill this gap. More precisely the aim of this paper is twofold. First, we want to explore the way some actants are rejected on the periphery of the network by the actants in the center. Then, we want to detail how the former can react and eventually open up the network. Thus, our objective is to study "all the negotiations, intrigues, acts of persuasion and calculations" (Callon & Latour, 2006: 12-13) between such actants rejected on the periphery of the network and the macro-actors (Callon, 1991). Macro-actors are defined as the actors in the center of the network in charge of its development and stability, such as organisations, institutions, etc. To address this issue, we study the case of the closure of the Blu-Ray network to the adult entertainment film industry during the standard war for high-definition video. Following their marginalization and their rejection of the network supporting the Blu-Ray innovation, members of the adult film industry adopt specifically adapted behaviour to open up this network.

Exploring this issue within the theoretical framework of ANT leads to some interesting insights. First, our results allow us to introduce and define a new type of actant rejected on the periphery of a network, the 'marginalized' actant. Second, our results highlight a specific resistance logic adopted by the 'marginalized' actant. This resistance logic mainly involves the redefinition

of its identity. Finally, a re-examination of the power struggle between the 'marginalized' actant and the macro-actor in a network provides the third major contribution of our study.

The rest of the paper is structured as follow. In the first part, we present the Actor-Network Theory (ANT). This theoretical framework allows defining the potential relations between the actants at the center of the innovation network and those on the periphery. In the second part, we present the methodology used for our case study. Our results are detailed in a third section and are then analysed and discussed in the fourth and final part.

REVIEW OF LITERATURE

The theoretical ANT framework leads to examine how a network supporting an innovation develops (Steen, Coopmans, & Whyte, 2006). This theoretical framework focuses on movements and associations of elements within a network. More specifically, in this paper, we focus on the relations between the macro-actors at the center of the network and the actants on its periphery. These latter are less connected to the other actants in the network (Callon & Latour, 2006).

Logics of closure of the network of macro-actors

Adopting ANT perspective, the success of an innovation depends on the capacity of one or several macro-actor(s) to develop the largest support network for it and to align the divergent interests of all actants. Yet, divergences can appear between these two aims. Sometimes, it would be better to reject some actants in order to preserve the stability of the network and the enrolment of other actants. Thus the network can be closed to some potential actants (Callon, 1986a, b).

Even if the logics of closure are not directly been investigated by research on ANT, we identify several ways to close a network. In doing so, macro-actors selectively improve the position of certain actants in the network or reduce dissonant positions to silence (Helgesson & Kjellberg, 2005; Munro, 1999).

To illustrate the five different logics of closure identified in the literature, we refer to the example of a 'program' initially studied by Latour (1992). A 'program' defines a common goal that sustains for alignment between the different network actants (Aanestad, 2003; Akrich, 1992). The 'program' studied by Latour (1992) consists for client on handing in their room key at the reception desk when they leave the hotel. Thus, the actants are expected to respect the 'program' and to hand in their room key at the reception desk when they leave. To avoid a non-alignment in the behaviour of some actants, ie a non-respect of the 'program', a macro-actor can decide to close the network to them through several actions. These actions are called media of 'program'. In the present case, the macro-actor, represented by the hotel manager, can adopt different logics of closure to ensure that customers adhere to the 'program' and hand in their room key at the reception before leaving out.

A first logic of closure consists on counter-attacking by rendering the cost of alternatives too costly (Latour & Woolgar, 1988). Following the example of the hotel room key, this involves asking customers to pay a fee if they refuse to

respect the 'program' and to hand in their room key at the reception desk.

A second logic of closure consists on isolating what is problematic in the dissonant behaviour without necessarily changing the questionable behaviour (Helgesson & Kjellberg, 2005). This solution is illustrated by attaching a much heavier key-holder to the key. Due to the highest weight of the key, it will be more difficult to carry around or forget it. This extra-weight should incite the actants to follow the 'program' and not keep their room key with them when they leave the hotel.

A third solution is to offer a new alternative which counters the alternative developed by the peripheral actants (Latour, 1992). In our case, this means changing the room keys for magnetic cards. Thus the hotel manager can follow the customers' comings and goings more easily.

A fourth solution consists on ignoring the peripheral actants. This means not considering their behaviour as problematic or adopting more neutral behaviour while being informed of the situation. This solution allows maintaining the enrolment of actants already supporting the innovation (Marks, 2000). We can illustrate this by the alternative of allowing customers to leave the hotel with their room key. No prosecution or punishment is prescribed for a deviant behaviour of the 'program'.

Finally, referring debates on the notion of vivisection, Michael (1996) highlights a fifth logic of closure. This logic consists on changing the identity of promoters of alternatives in order to exclude them from the network (Vickers & Fox, 2005). Michael (1996) illustrates this logic through several practices. The simplest practice is 'demonizing' that involves rejecting an actant from the network by underlining its 'criminal' status, "persons who are outside of the common limits of civilized society"(Michael, 1996: 97). In doing so, other actants become more acceptable. Following our example of the room key, this practice involves attracting attention of customers when they arrive that not handing in their room key put the safety of other customers at risk. Such behaviour is therefore highly risky and criminal. Another practice refers to the 'delimitation of rationality'. This practice consists on showing the incapacity of rejected actant to distinguish between an important problem and a minor one. In the example studied, customers keeping their room key rather than handing it in can try to explain to the hotel manager that the problem is not whether the key is handed in at the reception or not, but how are controlled comings and goings in the hotel.

Table 1 summarises the different logics of closure identified in the literature and used by the macro-actors to close the network. All these logics of closure are illustrated, as above, by the 'program' of the room key by Latour (1992).

Table 1. Logics of closure of network of macro-actors

Logics of closure	Behaviour adopted	Case of leaving a hotel room key at the reception
Render the alternatives too costly	Persuade them to change their behaviour by acting directly on the behaviour in question	Fine customers who do not give their room key
Isolate the problematic behaviour	Persuade them to change their conduct without acting directly on the behaviour in question	Make the weight of the key holder attached to the room key much heavier
Develop a counter alternative	Propose an alternative which counters the unwanted alternative	Remove the room keys by magnetic cards
Ignore the alternatives	Do nothing that could lead to controversy, debate, or call into question the established 'program'	Let the customers leaving with their room key
Change the identity of promoters of alternatives	Provide arguments that justify the rejection of a behaviour and incite other actors to reject this behaviour	- Indicate that customers who do not let their room key put the safety of other customers in jeopardy - Explain that the main issue lies in controlling who enters and leaves the hotel

This table lists a range of possible behaviours for a macro-actor to close its network and reject on its periphery actants promoting an alternative strategy. This corresponds to a continuum ranging from direct confrontation to total silencing. These different behaviours underscore the more or less significant capacity for resilience of the macro-actors.

Logics of resistance of actants in the periphery of the network

By mainly focusing on how a network progressively stabilises and becomes irreversible, ANT fails to study the logics of resistance of actants (Whittle & Spicer, 2008). While the seminal works of Callon (1986a); Latour (1996) and Law (2000) focused on disruption to existing networks by showing how a network can be reinterpreted after its supposed stabilisation, the resistance of some actants failed to attract attention in the literature (Prasad & Prasad, 2000; Tryggestad, 2005).

Yet, we succeed to identify two principal logics of resistance of actants on the periphery of the network. As our presentation of logics of closure, the logics of resistance will be illustrated through the same 'program' defined by Latour (1992). However, as you focus our interest on the logics of resistance, we adopt the viewpoint of the actants on the periphery. So we take into account the viewpoint of customers rather than the hotel manager who represents, in our case, the macro-actor.

The first logic of resistance consists on rejecting the 'program' defined by the macro-actors and proposing different alternatives (Latour, 1989). This behaviour leads to the development of 'anti-program' (Akrich & Latour, 1992; Latour, 1992). An 'anti-program' is defined as an opposite alternative 'program' of macro-actors. The introduction of an 'anti-program' requires the development of an 'anti-plan' (Tryggestad, 2005). An 'anti-plan' goes further than a simple cognitive process or a single logical deviation from the original 'program'. It supposes the mobilisation of people, objects and diverse resources to introduce and implement the 'anti-program'. Following our example of the room

key, an 'anti-program' for customers consists on not handing in the room key at the hotel reception desk. Customers keep their key when they leave the hotel or remove the key-holder considered as too heavy ('anti-plan') before going out with their key.

A new alternative can also be developed through 'counter-enrolment' (Vickers & Fox, 2005). 'Counter-enrolment' involves the creation of new relationships and associations to offer another form of enrolment to the existing one. In our example, customers can prefer not to leave their key at the reception but instead give it to a new actant, the hotel porter. The latter then hands in it to the hotel desk reception.

The second logic of resistance is to remain silent (Callon, 1986b). In this case, either actants on the periphery will opt not to discuss the 'program', even if they disagree (Latour, 1989), or they put forward alternatives as 'anti-program'. Yet, these alternatives are not considered by the macro-actors, either because they are made in relative silent, or because they are silenced by the center. This second logic of resistance can be illustrated thus. Customers remain silent as they hand in their room key to the hotel desk reception, even if they disapprove the 'program', or complain to the receptionist without obtaining any response. Table 2 summarises the different logics of resistance that can adopt the actants facing the closure of the network orchestrated by the macro-actors. These different logics are illustrated by the 'program' defined by Latour (1992).

Table 2. Logics of resistance of actants on the periphery of the network

Logics of resistance	Behaviour adopted	Case of leaving a hotel room key at the reception
Develop an 'anti-program'	Develop a new opposite 'program' to the 'program' defined by the macro-actors	Customers decide not to hand in their room key. They keep their key in their pocket when they go out or remove the very heavy key-holder (anti-plan) before leaving with their key
	Create new associations to propose another enrolment	Customers decide to give the key to the hotel porter. The latter then hands in it back to the reception
Remain silent	Say nothing or not sufficiently express disagreement with the 'program'	Hand the key in to the hotel reception either saying nothing or complaining to the receptionist without getting a response

In conclusion, while few studies have explored the notions of resistance, asymmetry, associations, and relations between the center and the periphery, our literature review leads to several comments. First, these studies are rare compared to all researches using ANT to describe the progressive constitution and stabilisation of a network (Whittle & Spicer, 2008). Second, the few studies focused on resistance adopt the perspective of macro-actors. Their reactions are taken into consideration to shut down or to integrate the 'anti-programs'. Potential resistance behaviours by actants situated on the periphery of the network attracts less attention (Helgesson & Kjellberg, 2005; Leigh-Star, 1991). Finally, the starting point of this research is that the aim of actants that resist is not to be enrolled into the network (Harrison & Laberge, 2002; Tryggestad,

2005; Vickers & Fox, 2005). Thus, the literature fails to investigate how actants seek to integrate a network after their rejection. Our research question attempts to fill these gaps identified in the literature on ANT by analysing the way that actants on the periphery resist to the closure of a network orchestrated by the macro-actors and then succeed to integrate it.

METHODOLOGY

To answer our research question, we study the case of the adult entertainment film industry during the standard war between the Blu-Ray and HD-DVD formats. This case allows us to study in particular behaviours adopted by the actant initially rejected on the periphery of the Blu-Ray support network and its various attempts to be integrated as the relationships between these two actants in general.

The use of the ANT framework involves some methodological principles. The starting point is to follow the different actants and to observe their behaviours. Researchers have to take care of not attributing an external definition of them and their work. Instead, researchers have to just observe what they “take to build the world in which they live and what they challenge with regard to the world in which they would like to live” (Brechet & Desremaux, 2008: 5). Data collection and analysis were conducted according to these principles.

Data collection

We collected data from diverse sources. First, secondary data were collected from the Internet. The aim was to gather as much information as possible about the different actants in the network and their relationships.

More specifically, we saw two types of website to collect as much information as possible. The first type of websites were the institutional websites of firms developing the new technology and their partners (like Sony, Toshiba, Disney or Microsoft), associations created to support the different solutions (Blu-Ray Disc Association or HD-DVD Group) and specialised film industry websites (such as Variety, Hollywood Reporter and Ecran Large). These websites contain a great deal of information through press releases, discourses of directors and business reports. The second type of websites consulted were news sites like Computer World, MacWorld, PC World, PC Mag, Présence PC and HD Numérique. These sites give a lot of information about the actants mentioned above and enable us to crosscheck and add information. They also provide information on other, smaller and less directly involved actants.

Finally, the last source of data collected is based on interviews with industry professionals. We conducted eleven interviews (4 with professionals from the traditional film industry, 3 from the adult film industry, 1 from the manufacturing and production of the optical disc, and 3 with manufacturers of electronic equipment). Each interview lasted between 40 minutes and one hour. The interviewees have either worked in firms directly involved in the HD-DVD and Blu-Ray standard war at the time it occurred, or were direct observers of this standard war even if they were not directly concerned. The interviews were non-directive to not incite the interviewees to answer if they had no recollection of the events (Miller, Cardinal, & Glick, 1997). The purpose of the interviews

was twofold. First, we wanted to ensure that our network representation was as accurate as possible. Then, we wanted to check or compare some facts or information collected on the Internet to ensure its reliability.

Contrary to many studies using ANT (see for example Harrison & Laberge, 2002; Vickers & Fox, 2005), we could not adopt an anthropological approach. While we were able to access to the discourse relayed by the media and the official websites and we did all the possible to remain neutral, we were not able to follow the process directly. Yet, the exploitation of primary and secondary data a posteriori does not represent in itself a problem. These collected data constitute 'traces' of the actants' actions (Bergström & Diedrich, 2011; Latour, 2006). If the actants do not act, there is no trace, so no available information and consequently, no analysis. However a limit remains as secondary data can induce analysis, conceptualisation and distortion by the people who have been in contact with the primary data. To reduce this risk and to prevent behaviour explained by a social context, we excluded any presupposed social explanation, theoretical explanation or 'pseudo-explanation' (Dumez, 2011: 36) from our analysis of the empirical material collected. We focus our study on the network through an exhaustive analysis of actants and relations between them. Thus, our study framework can be considered as decontextualized.

Data analysis

To analyse our data, we followed the methodological principles recommended by Callon (1986a). The first principle extends the agnosticism of the observer to include also the social sciences, and avoids any a posteriori rationalization. We took great care in describing the way in which opinions were formed, and we dealt with the ideas put forward in the same way, whether or not these were provided by specialists.

The second principle is symmetry. We also tried to deal symmetrically with the opponents' contradictory demands. This means that we had to try to explain their adherence to all their beliefs about the world, whether these were perceived as true or false, rational or irrational, successful or failed – and all this in a symmetrical manner (Bloor 1991). More specifically, we tried to remain impartial to the arguments developed by the actants. We avoided any form of judgement when actants spoke about themselves or about different analyses. We respected all points of view and did not favour one of them (Callon, 1986a). The third principle concerns free association. This implies not separating the events of Nature from those of Society. Indeed, Gherardi and Nicolini (2000: 334) recommend making "no a priori distinction between the social and the technical". Following this principle, we did not judge their importance or their certain or uncertain character on the basis of an external point of view. Thus, Callon's method (1986) makes it necessary to follow all the actants involved according to their appearance in the process, without overstepping the limits defined by those actants, in order to explain how it unfolds.

According to these three principles, we conducted data analysis in three stages. First, we organized the data collected into a database. More specifically, a chronological database of events was constructed (Van de Ven & Poole, 1990). This database permits to develop a full description of all enrolled actants and a detailed chronology of their behaviours. Thanks to all empirical material collected, we were able to follow the different actants over time, even if it was

in a retroactive manner. This means 'following the actions, without making any assumptions – or the minimum – about a context' (Dumez, 2011: 30), making it possible to determine who adopts which behaviour and at which moment.

We then developed a narrative (Latour, 2006) to analyze the relationship dynamics between the macro-actor represented by the Blu-Ray consortium and the actant initially rejected on the periphery, the adult entertainment film industry. This narrative enabled us to describe the associations between these actants as well as their evolution.

Finally, to analyze the process, we decomposed it in different periods. To proceed to temporal bracketing and cut the process in successive periods separated by discontinuities (Langley, 1999), we considered both our primary and secondary data as our narrative. Based on those data, we distinguished three periods.

- *Logics of closure of the network of the consortium Blu-Ray (April 2006-December 2006)*. Following the choice on 24 April 2006 of the adult entertainment film industry's to opt for the Blu-Ray format, the consortium supporting this technology publicly declared it did not want to open its network to this actant.
- *Logics of resistance of the adult entertainment film industry (January 2007-July 2007)*. While Sony stated that it did not close its network to the adult entertainment film industry, the reality was quite different as the network remained closed to the latter. This rejected actant thus began to resist.
- *Progressive opening up of the network by the Blu-Ray consortium (August 2007-January 2008)*. This third and final period began with the sale of an actant (a disc-pressing machine) to a Taiwanese supplier. This sale allowed producing and then commercializing high-definition DVDs with pornographic content to the Japanese market.

This methodology allowed us identifying and following all actants for each period. This helped us to understand how the actions realized in one period can lead to changes during the same period, as well as the following ones.

FINDINGS

The first part of our findings presents the initial composition of the two networks in competition during this standard war as the two actants in opposition, the macro-actor, the Blu-Ray consortium and the initially rejected actant, the adult entertainment film industry. It is important to note that the term used, the adult entertainment film industry, involves several actants. First, the industry operates through its trade union, the Free Speech Coalition. This coalition includes all the producers of pornographic films, suppliers of content on the Internet, distributors, manufacturers, journalists and all the actors involved in defending the interests of the adult entertainment industry. In addition to the Free Speech Coalition, the central organism of this industry, the leaders of the major studios (Hustler, Vivid, Wicked, etc.) and the most influential people in the industry (Hugh Hefner, Larry Flint, etc.) are also viewed as central spokespersons for this industry.

Timeline

From the progressive development of networks to the victory of the Blu-Ray format

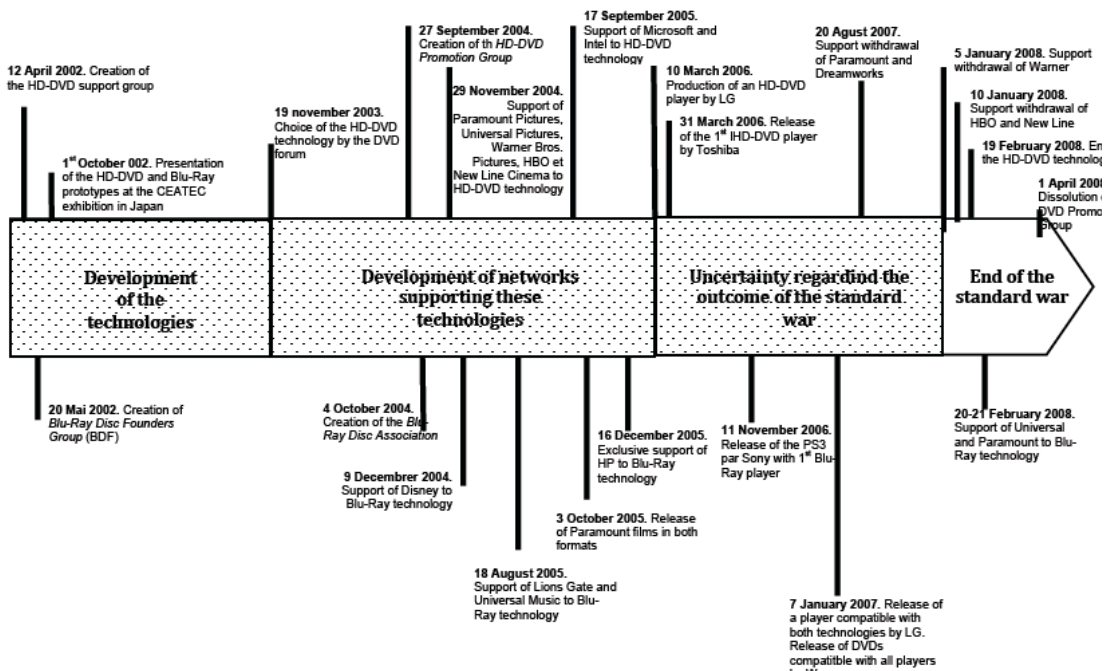
The end of the 1980s is marked by the emergence of new technologies to succeed the DVD format. The most advanced projects are those of Toshiba, the Advanced Optical Disc (AOD), and of Sony, the Ultra Density Optical Disc. The prototypes of these two technologies are exhibited for the first time at the CEATEC exhibition in Japan on 1st October 2002. It is also in 2002 that the Blu-Ray Disc Founders (BDF) is created. This association is composed of the founders of the Blu-Ray technology (Sony, 20th Century Fox, Dell, Hewlett Packard, Hitachi, LG Electronics, Panasonic, Mitsubishi, Philips, Samsung, Sharp, TDK and Thomson). To avoid a costly standard war, on 19 November 2003, the DVD Forum votes (eight votes to six) for Toshiba and NEC's AOD technology to replace the traditional DVD. This technology will be later renamed the 'HD-DVD' (High Definition Digital Video Disc). Despite this decision, Sony decided to pursue the development of its own format.

Consequently, the promoters of each technology compete to ensure the success of their own format. The Blu-Ray Disc Founders consortium, created by the founding members, changes its name in 2004 and becomes the Blu-Ray Disc Association. The aim of this consortium is to enrol as many actants from different horizons as possible. By the end of 2004, the Blu-Ray Disc Association includes over 70 firms. In parallel, Toshiba and Nec create a support group for the HD-DVD technology: the HD-DVD Promotion Group. This group rapidly increases to around thirty members in the first year. Aware of dangers and costs of standard war, the DVD Forum and the promoters of the Blu-Ray project attempt to negotiate a compromise to develop compatible products until the beginning of 2005. Yet, on August 22, 2005, these negotiations fail.

During the next three years, we observe a succession of alliances and defections from film studios and specialised electronics and IT firms as regards the two rival technologies. Yet, following the withdrawal of Warner studios from the HD-DVD technology on January 5, 2008, and then the withdrawals of HBO and Newline on 10 January 2008, Toshiba officially ends this standard war. On 19 February 2008, Toshiba publishes a press release announcing the end of the HD-DVD format. This press release acknowledges the victory for the Blu-Ray format. Following this statement, Universal and Paramount studios respectively announce their switch to the Blu-Ray format on 20 and 21 February. On 1st April 2008, the HD-DVD Promotion Group is officially dissolved.

Figure 1 shows the key events in this standard war.

Figure 1. Key events in the HD-DVD vs. Blu-Ray standard war



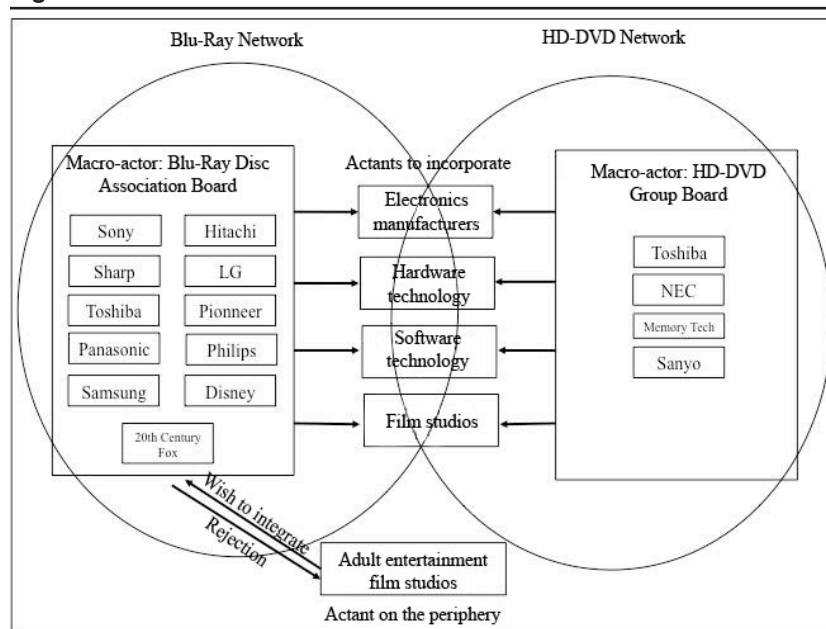
The position of the adult entertainment film industry faced to the Blu-Ray technology

Based on this standard war, we focus our analysis on the third period, called 'uncertainty of the outcome of the standard war' (April 2006 - January 2008) to study the relationship between the adult entertainment film industry and the Blu-Ray consortium. This period begins on 24 April 2006 with the official announcement of the choice of Blu-Ray technology by the major adult entertainment film studio² during the annual conference of the National Association of American Broadcasters (NAB) held in Las Vegas. As Ron Wagner, director of IT operations of E! Entertainment Television, notes it, there were "several major players in the porn industry going the Blu-Ray route". Three main reasons explain this choice. First, the Blu-Ray technology offers better guarantees against hacking. This guarantee is important as hacking is considered as a main risk that leads to loss of revenues in the adult entertainment industry. Then, the Blu-Ray technology has a significant installed base of consumers as the Sony's PlayStation 3 integrates a Blu-Ray disc. Finally, the greatest storage capacity of the Blu-Ray disc enables to include more bonus options with the film. These bonuses allow the largest pornographic studios to differentiate their offer from free and amateur films that you can upload on the Internet.

2. While the small independent studios tended to back the HD-DVD technology for its cheaper cost, it was difficult for them to get their voice heard. Given their lack of political weight on the market and their lack of cohesion, it was the major studios that had the final say.

Yet, the adult entertainment industry faces a problem as the Blu-Ray Disc Association denies access to its technology to this industry. Sony clearly expresses its position in a press release dated 15 December 2006: “Sony DADC is open to other contracts but would not take part in any adult titles or content” (L. Gephardt, spokesman for Sony). Consequently, on 20 December 2006, Joone, the founder of the adult entertainment studio, Digital Playground, says: “Sony wants me to publish my films in HD-DVD”. In December 2006, the rival network can be represented as follows (Figure 2).

Figure 2. The network structure in 2006



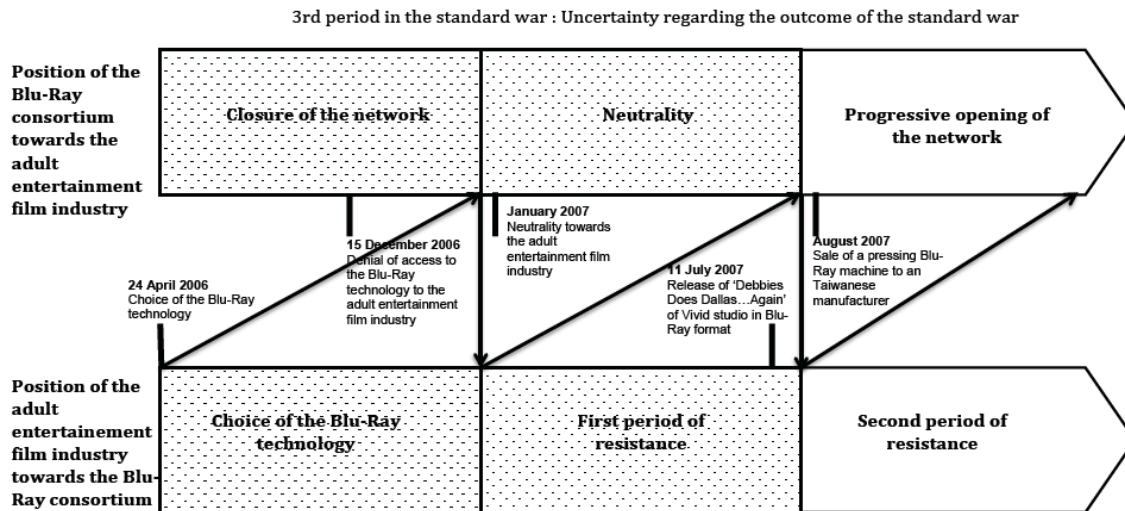
Faced with this initial rejection, the adult entertainment film industry will react and resist. One of attempts concerns the launch on 11 July 2007 of the first adult content film in Blu-Ray format, ‘Debbie Does Dallas... Again’. Despite the lot of technical difficulties encountered³, Vivid studio succeed to produce this film.

3.The film was also released in HD-DVD format.

Progressively, the Blu-Ray Disc Association’s position evolves and becomes more and more open. Without totally supporting the adult entertainment film industry, the consortium’s official position towards this industry first becomes neutral. Due to the uncertainty about the issue of this standard war, the Blu-Ray Disc Association’s position evolves once again. In August 2007, Sony sold a Blu-Ray disc-pressing machine to a Taiwanese firm in order to supply Blu-Ray DVDs for the Japanese adult entertainment film market. The Japanese market is historically dominated by HD-DVD. Its entrance on the Asian market shows the tacit acceptance of the adult entertainment film industry by the Blu-Ray Disc Association.

Figure 3 represents the three periods of the relationship dynamics between the Blu-Ray consortium macro-actor and the initially rejected adult entertainment film industry. These three sub-periods are part of the ‘uncertainty of the outcome of the standard war’ period in Figure 1 (about the key events in the standard war).

Figure 3. Relationship dynamics between the Blu-Ray consortium and the adult entertainment film industry



Behaviours adopted by the different actants

In the second part of our findings, we examine the relationship dynamics between the Blu-Ray consortium and the adult entertainment film industry in more detail. The first step consists on the closure of the network orchestrated by the Blu-Ray consortium to the adult entertainment film industry. Then the marginalized actant organizes its resistance. This leads to a positive outcome as in a third time the network is gradually opened to this actant.

Closure of the network by the Blu-Ray consortium (April-December 2006)

Even if each consortium seeks to enrol as many actants as possible in order to develop its own network, the Blu-Ray consortium initially decides to close its doors to the adult entertainment film industry. The necessity to keep enrol existing actants, such as the Disney Company, justifies this behaviour. Disney is a prominent member of the consortium's executive committee and plays an active role in the technical and social distribution of this new technology.

The Blu-Ray consortium justifies its rejection of the adult entertainment industry by 'demonizing' its identity (Michael, 1996). To begin with, it raises moral arguments. For instance, the incompatibility between Disney's target audience (families and children) and values, and those of the adult entertainment film industry is highlighted. Attention is drawn to the probability of an error in burning a high-definition DVD. This could result the presence of adult content on a film initially intended for a family audience. This type of incident has already occurred in the past and dealt with controversy at the time⁴. To prevent this risk that tarnishes Disney's reputation, the Blu-Ray Disc Association requests firms that manufacture Blu-Ray films to assign different machines and different staff to the production of conventional films and adult-content ones. As consequence, seven of the eight manufacturers authorised to produce Blu-Ray films are unable to press adult-content films. According to their corporate policies or specific agreements with Disney, these manufacturers do not have the right to establish links with the adult entertainment film industry.

4. In 1999, when the new home video technology (with VCR recorders and video cassettes) was making its debut, copies of the film 'The Rescuers' were found to contain two stills from a pornographic movie showing a topless woman in the background. This blunder led to a recall of all copies of the video.

In addition to attribute a negative identity to the adult entertainment film industry, the macro-actor uses other logics to close its network. To ensure that all enrolled actants follow its 'program' that consists on excluding the adult entertainment film industry from its network, the Blu-Ray Disc Association renders the alternatives to the 'program' too costly. To this end, Sony refuses to give technical support to studios making adult content films in the Blu-Ray format. Without this assistance, manufacturers take the risk to incorrectly burn discs that can lead to considerably increases the production costs, or even make distribution impossible. Moreover, Sony DADC, Sony's subsidiary specialized in Blu-Ray production, is prohibited to work with the adult entertainment film industry. Thus, it becomes extremely expensive for adult content film studios to adopt a different behaviour than that advocated by the macro-actor.

Eventually, in order to prevent any 'counter-enrolment', the Blu-Ray Disc Association isolates the 'anti-program' content in behaviour. Each supplier is threatened withdrawal of its licence and the use the Blu-Ray logo on their products in case of relation with the adult entertainment film industry.

The different logics of closure adopted by the Blu-Ray consortium towards the adult entertainment film industry are summarised and illustrated in Table 4.

Table 4. Logics of closure of the Blu-Ray consortium network

Logics of closure	Behaviour adopted	Examples
Change the identity of promoters of alternatives	Demonizing the adult entertainment film industry	"The few outfits able to replicate Blu-ray discs Stateside are tied to either Sony or Disney, and both studios have long-standing policies against manufacturing adult product - rooted, on Disney's part in at least one embarrassing gaffe in the VHS era" Garrett, D., <i>Variety</i> (January 2007) "As late as 2006, both Sony and Disney were still releasing joint statements to remind everyone that the two companies wanted nothing to do with the porn industry. They relished in putting on airs as puritans who wanted to save morality." Interview with a film buyer from CanalSat "To Disney, we (adult entertainment film industry) have always been evil incarnate" Interview with the head of Dorcel prod.
Render alternatives too costly	Refusal of technical support Sony subsidiary forbidden from working with the adult entertainment film industry	"Sony is really protective of proprietary information and proprietary products, especially when it comes to the adult market. Sony is always a little more stand-offish and hands-away from it" Jay Grdina, head of ClubJenna Inc, <i>PCWorld</i> (January 2007) "Our stance at Sony is that Sony DADC does not replicate adult titles in Blu-Ray" G. Boyd, Sony executive, Tokyo, <i>Business Week</i> (December 2006).
Isolate the problematic behaviour	Threat to withdraw the licence in case of links with to adult entertainment film industry	"As far as I understand, Sony has said to the replicators that if you replicate adult, you'll lose your license" Robby D, a director at Digital Playground Inc. film studios, <i>Computerworld</i> (January 2007)

Table 4 illustrates the variety of behaviours adopted by the macro-actor against the adult entertainment film industry. The literature on ANT highlight different logics of closure but separately (Latour & Wolgar, 1988; Latour, 1992; Michael, 1996; Marks, 2000; Helgesson & Kjellberg, 2005). Yet, our results show that the macro-actor does not just used one single closure logic but, on the contrary, combines different logics to justify the rejection of the adult entertainment film industry. In doing so, it improves the enrolment of existing actants and the stability of relationships within its network.

Logics of resistance of the adult entertainment film industry (January 2007–July 2007)

Faced with this situation, the adult entertainment film industry reacts and develops two different logics of resistance. First, it develops an 'anti-program' and then, changes its identity defined by the macro-actor.

Develop an 'anti-program'

Despite the precautions taken by the Blu-Ray consortium, one adult content film studio, Vivid, succeeds to develop an 'anti-program' and launches a DVD in Blu-Ray format on 11 July 2007. This film, 'Debbie Does Dallas... Again', is the sequel to a successful film released on DVD. While Lisa Gephardt, a spokeswoman for Sony Corp. of America, says on 22 January 2007 that "there's no prohibition against adult content (...) we don't tell people how they can use the licences they get from the Blu-Ray Disc Association", the reality is worsening. It took several months to manufacture this DVD in Blu-Ray format. Steven Hirsch, head of Vivid, complains about the numerous obstacles he has had to overcome, but never confess how he manages to do it. He is suspected by competitors of pressing his discs in Europe to escape the pressure exerted by Sony and Disney in the United States.

In order to maintain the enrolment of other actants in the network, the Blu-Ray Disc consortium adopts a neutral position toward the adult entertainment film industry and still keeps a close eye on the situation. Yet with no additional assistance, the challenges to produce adult content films in Blu-Ray format remain the same. In spite of this, the adult entertainment film industry does not give up or do not adopt the rival HD-DVD format. On the contrary, this industry continues its struggle to open up the Blu-Ray network as it corresponds to its chosen technology.

Change its identity

Rather than develop other 'anti-programs' to entry to this network, the adult entertainment film industry instead chooses to change the identity it had been assigned by the macro-actor. In fact, the macro-actor defined this industry as a demon that makes it difficult to establish relationships with other actants.

Instead of challenging its 'demonised' identity, the industry decides to redefine it in highlighting economic arguments rather than moral ones. Thus, the industry puts forward its turnover about 20% of total DVD sales. Pornography puts forward a worldwide turnover for pornography of over 70 billion dollars in 2006 (Ropelato, 2007) and over 10 billion dollars in the United States alone (Lane, 2001). An annual turnover of 3.6 billion to 4.5 billion dollars for the rent and sale of pornographic DVDs in the United States is reproduced in the economic world as a whole (Cameron 2005; Braiker 2007; Garrahan 2008). If satellite and cable TV, Internet, magazines and strip clubs are included, a turnover of up to 13 billion dollars is sometimes given for the United States (Garrahan 2008). In comparison, the sales⁵ of traditional DVDs in the United States had a turnover of 14.5 billion dollars, and the rental market alone had a turnover of 76.5 billion dollars in 2008. By highlighting its huge economic power through these different figures, the adult content film industry indicates to the other actants, and in particular to the macro-actor, that closing its network means taking the risk of excluding a major economic actor. Its exclusion would therefore result de facto in substantial economic loss.

5. Source: Digital Entertainment Group, 2009.

The use of figures as tangible facts is considered as an usual way of stirring controversy (Mennicken, 2008; Arnaboldi & Spiller, 2010). Yet, in the present case, all the figures come from the same source. These figures are diffused through the professional magazine *Adult Video News* (AVN), which is the only source in the adult entertainment industry to publish regular figures on the results of specialized films and studios (Cameron 2005). AVN is specialized is also supported by the Free Speech Coalition. These figures are then picked up by the mass media. To express its disagreement, this actant has to use officious forum (Collins & Pinch, 1979) as this actant is not welcomed to official forum controlled by the Blu-Ray network macro-actor (conventions, official press releases, consortium meetings). To not remain silent, this actant uses the officious forum such as specialised website discussion forums or even the professional magazine *Adult Video News* (AVN) (Cameron, 2005). This change in forum allows it to express freely and control its arguments. To diffuse its arguments as convincingly as possible, the adult entertainment film industry does not hesitate, for example, to exhibit selected figures in a striking and playful manner.

In addition to economic arguments developed in the officious forum, this industry regularly points its role to impose past standards. As Disney that reminds the controversy generated by the adult content found in a family-friendly film, the adult entertainment film industry refers to the past events to justify the opening up of the network. Studies (Johnson 1996: 1) point out that “throughout the history of new media, from vernacular speech to movable type to photography, to paperback books, to videotape, to cable and pay-TV, to ‘900’ phone lines, to the French minitel, to the Internet, to the CR-ROMs and laser discs, pornography has shown technology the way.” Thus pornography apparently encouraged the development of super-8 projectors and Polaroid cameras, right up to IP voice transmission. But it is during the VCR standard war, between JVC’s VHS and Sony’s Betamax, that the industry’s role has most often been mentioned. In addition to the traditional arguments mentioned in the literature on standard war, such as recording capacity, picture quality, price and copyright strategies (see Cusumano, Mylonadi, & Rosenbloom, 1992), the adult entertainment film industry claims that its support for the VHS format was decisive in the latter’s victory and enabled the technically inferior format to become the norm. Its role is often cited by various participants in forum discussion on the Internet and even in the general press. Lane (2001) emphasizes that a film like *Deep Throat*, released on videocassette in 1975, generated over 100 billion dollars in turnover. This film produced with a budget of 22,000 dollars is often presented as the most profitable film in the history of cinema.

These arguments aim to change the identity attributed to the adult entertainment film industry. Thus, this industry succeeds to demonstrate to the macro-actor that its arguments are justified, and its reflexion well-founded. Table 5 summarises the various logics of resistance adopted by the adult entertainment film industry to get the network to open up.

Table 5. Logics of resistance adopted by the adult entertainment film industry

Logics of resistance	Behaviour adopted	Examples
Develop an 'anti-program'	Launch a film with adult content in a Blu-Ray format	"We have been able to find a replication facility to do our title but it wasn't easy and it has deterred us for the most part from releasing titles on Blu-ray. That can be potentially problematic for Blu-ray" S. Hirsch, head of Vivid Entertainment, Reuters (April, 2007)
Change its identity	Emphasize its considerable economic power	"It's big business. The pornography industry has larger revenues than Microsoft, Google, Amazon, eBay, Yahoo, Apple and Netflix combined" Ropelato, 2007 "Pay-per-view sex from television hotel rooms may generate about \$190 million a year in sales" Egan, 2000 "Right now there are a lot of people making a lot of money. Somebody's got to take control of it, and we figure it might as well be us. We see ourselves as the designated driver of this business" Bill Asher, president of Vivid Entertainment "There's no business like porn business. Pornography is big business-with \$10 billion to \$14 billion in annual sales. Pornography is bigger than any of the major league sports, perhaps bigger than Hollywood. Porn is no longer a sideshow to the mainstream... it is the mainstream" Rich, 2001
	Emphasize its decisive role in past standard wars	"If you look at the VHS vs. Beta standards, you see the much higher quality standard dying because of [the porn industry's support of VHS]. The mass volume of tapes in the porn market at the time went out on VHS" R. Wagner, Director of IT operations at E! Entertainment Television Inc., MacWorld (May 2006) "When I worked at LZ Premiums in the 1980s, the Beta vs. VHS video tape formats were in full swing. Our store rented video tapes, including a fairly large selection of adult videos. Many many VHS sales were decided on because of the much greater availability of adult entertainment in the VHS format" Excerpt from a specialised discussion forum Is Sony's Blu-ray porn stance repeating Betamax blunder? InformationWeek (February 2007) "Throughout the history of new media, from vernacular speech to movable type to photography, to paperback books, to videotape, to cable and pay-TV, to '900' phone lines, to the French minitel, to the Internet, to the CR-ROMs and laser discs, pornography has shown technology the way" Johnson, 1996

Progressive opening up of the network by the Blu-Ray consortium (August 2007- January 2008)

Confronted with the different logics of resistance adopted by the adult entertainment film industry, the Blu-Ray Disc Association's position continues to evolve until it gradually accepts the previously rejected actant. After adopting a neutral position in early 2007, the relationship moves towards a discreet and progressive association. In 2007, Sony begins to support firms that produce adult-oriented DVDs in a Blu-Ray format. Yet its subsidiary Sony BADC is still not allowed to produce this type of film. In August 2007, Sony sells a machine to a Taiwanese manufacturer to supply Blu-Ray DVDs for the Japanese pornographic market. This market is considered as strategic as it has been dominated by the HD-DVD format. At the Adult Treasure Expo 2007 in Chiba, Japan, Sony announces also that it will offer more technical support to this industry. Kiyotaka Konno, director of administration at Assist Corp., a Japanese company specialized in pressing DVDs, declares: "So we asked some makers in Taiwan to do the work, and then we import the discs back to Japan. The Taiwanese company was able to obtain a pressing machine from Sony and will start mass production in August" (quoted by Nystedt &

Williams, 2007). The consequences are almost immediate. Ten pornographic titles in Blu-Ray format against one title in HD-DVD format are launched on the Japanese market. "The shift in positioning took place in Japan. It is a significant market for the pornographic industry, but it is far and less surveyed by Disney" (Interview with the head of communications at Private). The adult entertainment film industry thus succeeds in gradually opening up the Blu-Ray network, without destabilising other network actants who might initially disagree with this openness.

DISCUSSION

This paper examines the relationship between the actants in a network, especially between the macro-actors and the actants on the periphery. The aim is to gain insights into how the latter can resist against the closure of a network orchestrated by the macro-actors. Taking advantage of our case study of the relationships between the adult entertainment film industry and the Blu-Ray consortium, our analysis provides significant insights to the ANT literature.

A specific actant on the periphery of the network: the 'marginalized' actant

Our results contribute to improve knowledge on ANT as we focus on the actants on the periphery of the network that are less studied in ANT research (Czarniawska & Hernes, 2005). More precisely, our analysis show that these actants cannot be considered as a unified whole. The differences we identified between them lead us to introduce a new concept, the 'marginalized' actant. 'Marginalized' actants differ from other actants on the periphery. Although they are all on the periphery of the network, 'marginalized' actants occupy this position, not because they want to be here but because of the translation process operated by the macro-actors at the center of the network, which consists of relegating them to the periphery, or even excluding them entirely. Indeed, the macro-actors do not seek to integrate them but instead attempt to silence them. The aim of macro-actors is to prevent them from disturbing the stability of relations and the enrolment of actants within the network. Contrary to the other actants on the periphery, 'marginalized' actants would like to join the existing network but have to deal with logics of closure by the macro-actors who reject them, as in the case of the adult film industry in our study.

Change identity as a new logic of resistance by 'marginalized' actants

Our analysis also contributes to the study of behaviour adopted by 'marginalized' actants. Contrary to previous research, the development of an 'anti-program' (Latour, 1992) appears as insufficient to open up the network. To successfully resist and open up the network, the 'marginalized' actant has to develop logics of resistance that allow it to counter-attack and totally answer to arguments justifying its exclusion. To invalidate interest and motivations used by the macro-actor to justify its marginalization, this resistance logic leads to a redefinition of its identity. This necessary change highlights the central role of identity to enrol actants during the translation process. Based on this new resistance logic, our

analysis leads to two findings.

First, this new resistance logic refers to the logic of closure identified by Michael (1996) that consists of "changing the identities of promoters of alternatives." In adopting a logic usually employed by macro-actors to close a network, the 'marginalized' actant's intention is to shift the debate from relations between the center and the periphery to the relations between the actants as a whole. The 'marginalized' actant adopts the macro-actors' own arguments such as "your interests are our interests" (Callon & Latour, 2006: 13). A 'marginalized' actant cannot just adopt the conventional logics mentioned in the literature to resist. Due to its specific characteristics, it has to elaborate a new resistance logic that involves using a variety of arguments to redefine its identity. The adult entertainment film industry, for instance, refers to economic arguments (expected turnover and profit for HD- DVD manufacturers) instead of moral ones (incompatibility between family-oriented and adult-oriented target audiences). This change in register can be explained by the 'marginalized' actant's activity. In our case, its activity can be considered as morally unethical and does not respect the intimacy of the other actants.

The aim of the 'marginalized' actant is then to coexist and link the two 'separated spheres' belonging to 'hostile worlds' that are in principle disconnected (Zelizer, 2005). Indeed, the economic arguments developed serve to further strengthen the close links between intimacy and economic interests. For economic reasons, opening the network to this actant and bringing these seemingly 'hostile worlds' together appears both rational and advantageous for all the actants. To bring these two spheres together, the boundaries of the network are finally represented by economic arguments, even if these arguments are indirectly related to intimate activities. Thus, the shift in the register used reflects the importance of changing its identity.

From power rules to redefining relations between the 'marginalized' actant and the macro-actor in the network

The last contribution is part of a broader context and refers to the notion of power and its dynamics within the network. First, marginalizing actants involves a political dimension. The macro-actors develop weak links with them, if they make the effort. Such 'marginalized' actants highlight the oppressive dimension often neglected in ANT literature (Whittle & Spicer, 2008). Although the aim of early ANT research concerned the exploration of explicit or implicit dynamics of power (Callon & Law, 1982; Czarniawska & Hernes, 2005; Latour, 1989), this approach has frequently been accused of legitimizing hegemonic power relations and ignoring oppressive ones. Indeed, research tend to focus more on the way the hegemonic macro-actor attempts to enrol actants on the periphery who do not want to join the network (Harrison & Laberge, 2002).

Second, the study of actions and reactions of actants leads to some insights concerning the way power relations are structured within a network. Our analysis identifies the interests and motivations behind such relationships, or in contrary, behind the absence of relationships. In addition to the actions, the description of tangible information (information from officious forum, published statistical data, the release of a high-definition DVD, etc.) shows how the logics used and their artefacts contribute to reshape the power struggle between the actants (Bergström & Diedrich, 2011; Parker & Wragg, 1999). By changing its

identity, the 'marginalized' actant's aim is not to enter into negotiation with the macro-actor, but rather to lead this macro-actor to adapt its behaviour in line with what Law (1994) called 'centered subjectivities'.

Contrary to previous results in ANT literature, our findings posit that the interests of macro-actors are not pre-determined by nature but are constantly redefined (Alcadipani & Hassard, 2010). Similarly, their motivations gradually evolve over time (Scott & Lyman, 1968). If the 'marginalized' actant's position in our study remains constant as it always seek to open up the network of its choice, the position of the macro-actor evolves over time as it attempts to establish its technology as the only standard. The power of each actant is thus relative, cumulative, and dependent on how each actant perceives one another. The reactions of actants are more appropriate according to their interests than the best solution (Parker & Wragg, 1999). As Munro (1999) argued, the actors still evaluate the pros and cons of their actions. The perception of their future outcomes prompts them towards action or inaction. Thus, power can be considered as a positive process that remains open to resistance, transformation and renegotiation (Foucault, 2001; Munro, 1999; Peltonen & Tikkanen, 2005).

CONCLUSION, LIMITATIONS AND FURTHER RESEARCH

While this study makes significant contributions and goes beyond one of the limitations of ANT identified by Walsham (1997) that consisted on neglecting political and moral issues, we can underline two limitations.

First, this case study represents a part of a broader context of the standard war between two rival technologies. Due to the uncertainty inherent in any standard war, economic arguments are the most likely to be listened to, and thus to succeed in opening up the network, against the rival technology. It will be interesting to study a 'marginalized' actant's possible behaviours when there is no alternative solution. In this case, quite different behaviours could be adopted to resist to the closure of the network. Second, in our case, the adult entertainment film industry represents the only 'marginalized' actant. It could also be interesting to study behaviours and relationships when several actants are considered as 'marginalized'. An association of 'marginalized' actants could lead to the emergence of a new macro-actor that creates a solution to exclusion. Further research might provide insights into how actants with diverging identities could eventually join forces.

While these two limitations reduce the external validity of this research to some extent, the potential for analytical generalisation and future research remains considerable. Indeed, this study provides an analytical framework that goes well beyond the case study.

While 'marginalized' actants can be relatively uncommon in conventional innovation networks as the actors are likely to share similar horizons and a large number of technical elements, values, etc., the situation is quite different in "business ecosystems" (Moore, 1993). As it involves diverse firms from different sectors, a business ecosystem increases the likelihood of diverging and conflicting interests and a struggle to occupy the central position. Such a situation therefore increases the role of macro-actors in charge of the management and the stability of the ecosystem (Moore, 1993). In parallel, new

possibilities for coalition and reorganisation emerge for 'marginalized' actants. All our contributions can thus be used to study this new type of environment. Finally, the new logic of resistance adopted by the 'marginalized' actant can help to analyse many situations with stakeholders with diverging interests. Indeed, it could be more interesting for a 'marginalized' actant to develop new ties once it has redefined its own identity, rather than to directly negotiate a more or less advantageous position in case of irreconcilable divergences between stakeholders. Instead of attempting to co-exist two separated spheres from 'hostile worlds' (Zelizer, 2005), an organisation that wants to be accepted can reshape its identity in order to be considered as more compatible with other organisations. Even if a McDonald's restaurant under construction in Millau (South of France) was destroyed by anti-globalisation activists in 1999, today McDonald's holds a central position in France's Agricultural Show. This is now considered as a major actor in the field both for its economic power and for the regulatory role it plays in many sectors. From being the symbol of industrial food, the American brand was able to redefine its identity as a responsible brand in the agricultural sector and as such, to be welcomed into the French food network.

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