Dynamic capabilities for connection to a GPN: the Brazilian studios in the animation industry

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Abstract
Study on which dynamic capabilities Brazilian studios developed for successful connection to animation industry's GPN. Multicase research showed the most important capability was Harmonization, for coordination of companies and cartoon production. Future research includes cross-industry comparisons. Moreover, it seems necessary to extend theory with new frameworks, suited for virtual goods.

Keywords: Global Production Networks, Dynamic Capabilities, Animation Industry.

Introduction
For a successful connection to its Global Production Network (GPN), a firm has to develop appropriate dynamic capabilities, given that there is set of organizational resources and activities that is critical for cross-border operations. Therefore, the dynamic capabilities, defined as the organizational ability to continuously integrate, develop and reconfigure resources both internal and external to the firm, in environments with rapid technological change (Teece et al. 1997), have strategic importance.

Virtual goods and their production networks
The connection of a firm to networks is a broad topic, because it involves research areas as diverse as Business Administration, Operations Management, Economic Geography, as well as technical areas, according to the good or service being produced. Consequently, not all the theory is, so far, able to cope with the research opportunities.

That is particularly true when it comes to virtual goods, that is, those whose outputs – and, sometimes, the inputs too - are intangible and don't need physical means to be produced and distributed (Techcrunch 2007), especially due to Information and Communication Technologies (ICT). Depending on the product or service, there can be an entirely new business model, with the possibility of new network configurations for producers, distributors and clients (Gereffi 2001). Usually, the production of virtual goods for entertainment, like animations, videogames,

etc., occurs in global networks (Yoon and Malecki 2009). For this reason, it was chosen to conduct the field work in the animation industry, more precisely in the independent "toon studios" that produce animated films and series, located in Brazil.

Research problem

As previously stated, internationalization and its consequences for operations strategy is a broad subject. The research proposes to test the prevalent theory, and will focus on the relation between a company's acquisition of dynamic capabilities and its connection to the GPN of its industry.

In this sense, the research problem is to describe and explain which dynamic capabilities the independent animation studios located in Brazil have developed, in order to successfully get connected to the animation industry's GPN. The paper also builds on a previous, similar exploratory research by Laiho (2011), conducted in manufacturing companies of physical products. Some questions can then be raised:

- Which capability was the most important for the connection and operation in that GPN?
- Once connected to the GPN, did the studio's production process suffer alterations?
- How do the studios deal with the dependence on the GPN's leader?

Literature Review

The review's objective is to build the theoretical framework for the research, as well as establish its propositions (Booth et al. 2005).

Dynamic capabilities and Global Production Networks

The concept of capabilites is derived from the Resource-Based View (RBV) of the firm (Barney 1991). It can be defined in terms of resources, and are the outcome of complex interactions and coordination between these resources (Colotla et al. 2003). An important derivation of the concept is the "dynamic capabilities": it is an integrative approach that emphasizes the ability to continuously develop, integrate, and reconfigure internal and external resources to meet the demands of changing environment (Teece et al., 1997; Eisenhardt and Martin 2000).

Although the isolated topics of dynamic capabilities and GPN have had remarkable research, the integrative topic of dynamic capabilities *in* GPN has been little discussed. Examples with focus on operations have been mentioned already in the early research on dynamic capabilities: for example, Teece et al. (1997) noticed the importance of production. Similarly, global networks have been studied by Enst and Kim (2002) and Coe et al. (2008). But still, the capability perspective in the area of manufacturing, in a global context, remains scarce. One exception is Ferdows and Thurnheer (2011), who discuss factory fitness from the capability perspective. Ferdows (2008) also worked on a capability-based view of production networks in a context of globalizing operations. He proposes two types of strategies for production networks: a rooted network and a footloose network:

- A rooted network strategy means that a company's focus is on exploiting its own manufacturing capabilities and manufacturing is viewed as a major contributor to its competitiveness;
- A footloose network strategy, in opposition, is based on leveraging the capabilities of the other participants. The company gives up core knowledge about manufacturing and restricts its own resources to other activities, such as marketing or general management.

There are many ways in which both strategies can be geographically spread. A network can be primarily local, as affirmed by Shi and Gregory (1998). Or it can be a global dispersion of manufacturing (Shi and Gregory 1998). Arlbjörn et al. (2011) then linked the two topics and

developed them, by identifying capability requirements related to the four configurations of global networks; rooted-local, rooted-global, footloose-local and footloose-global.

Framework for the analysis of dynamic capabilities of companies connected to a GPN
Such requirements can be seen in the list below. They will be used in support for the field work of the present research (Tab. 1).

Tab. 1 – Dynamic capabilities applied to GPN. Source: adapted from Arlbjorn et al. (2011).

Dynamic capability	Description
Supply Chain management	- Supply Chain design and continuous development, ensuring competitiveness of the integrated Supply Chain; - Ability to build a competitive supply network, sourcing and selection of suppliers, by the company sourcing personnel.
Supply chain integration	- Acquisition and integration process, conducted by company management plus Supply Chain development resources.
Harmonization	- Coordination and organizational integration capability primarily based on informal relationships and same frame of reference; - Standardization of processes, IT and master data by ICT and SC development resources; - Process and IT infrastructure architecture for the whole network, by the by ICT and SC development resources.
Supply Chain design / operations development	- Outsourcing of non-core competences, conducted by Supply Chain development resources; - Manufacturing footprint design and end-to-end optimization, done by SC development resources; - Sourcing and selection of the contract manufacturers, by the company business development personnel; - Understanding the capabilities of the own global network, done by SC development resources.
Product and process development	- Continuous development of product and manufacturing technology by R&D and Technology development.
Knowledge transfer	- Documentation and transfer of knowledge to contract manufacturers, by the engineers.
Network leadership	- Ability to build relationships, lead and facilitate a network of suppliers and contract manufacturers.
Strategic leadership	- Strategy creation for the overall network, by the company management.
Culture alignment	- Development of a consistent company culture, driven by human resources development.

It is necessary to say that, in the list above, the dynamic capabilities make sense only in a context of connection and operation in a network, that is, in a company's relationship with the other companies that contribute to the production and distribution of a good or service. For the analysis of an individual, isolated company, it is still valid the set of capabilities in manufacturing: cost, quality, dependability, flexibility and time (Skinner 1969; Wheelwright and Hayes 1985).

The global animation industry
For Tschang and Goldstein (2004), the animation industry can receive different classifications. The first refers to the number of on-screen dimensions. The most traditional is the animation in two dimensions (2D), and its production can be hand drawn (like the Disney animations) or with

a computer-aided process. More recently there is the 3D animation, totally dependent on computers. It is noteworthy that the 3D sensation in animations is different from the one present in films. The animations studied in this article, and hits like Disney's "The beauty and the beast" and "King Lion" are examples of 2D animations. Animated series for TV follow pretty much the same steps the movie industry has, but some business models are quite distinctive:

- Services provision – TV channels hire studios to produce animations; a kind of outsourcing.
- Co-production - TV channel makes an agreement with a studio and partially funds the animation project, with consequent division of property rights. Another type of co-production is between international studios, aiming to raise funds and "globalize" the animation.
- Pre-purchase - TV channel buys in advance from a studio an animation and its first broadcast right only.
- Licensing – The TV channel purchases the property rights of a cartoon, including a predetermined quantity of broadcastings for a predetermined period of time.

TV animations have differentiated characteristics and its production is closer to an assembly line than craftsmanship. Besides, in the last few years the major change in production was from paper-based process to paperless (computerized). For Winder and Dowlatabadi (2001) and Tschang and Goldstein (2004), the production comprises four phases:
(1) Creation or Development; (2) Pre-production; (3) Production; and (4) Post-production.
With the split of the production phases among the co-production partners in the network, often geographically dispersed, the research has its first proposition:
P1 – The production process *per se* does not change, but the connection to the GPN requires higher levels of coordination.

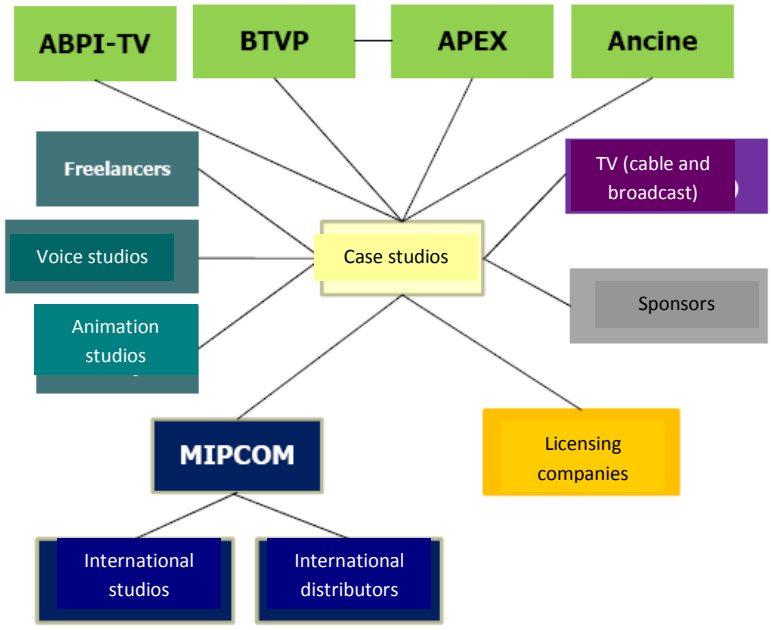

Fig. 1 – The animation industry's global network and its Brazilian branch. The authors.

Fig. 1 shows the network of the animantion industry. The largest markets for animations are the US, Japan, Canada, France, UK and Germany (Tschang; Goldstein 2004; Raugust 2004),

and the production is concentrated in the US (cinema and TV) and Canada (TV). Moreover, three large American TV channels (Disney, Time Warner's Cartoon Network, and Viacom's Nickelodeon) have their own structure for production (studio), distribution and licensing (Raugust 2004; Yoon and Malecki 2009). The major challenge for the industry is to finance the productions, with two models: the US and Japan rely on private funds, while Canada and Europe depend on public funds.

In Brazil the gathering of the companies in the industry began in 1999, with the foundation of the Brazilian Association of TV Independent Producers (ABPI-TV). In 2004, the Association created the Brazilian TV Producers (BTVP), with the aid of the federal governmental, in order to provide the Brazilian studios with skills and funds for competing abroad. This includes the support to the participation in professional exhibitions, like MIPTVP, MIPCOM, Realscreen, Kidscreeen, and BANFF, in order to develop relationships with international producers and distributors (Fig. 1). Therefore, the global scope of the production and consumption of animations indicates the second proposition of the research:

P2 – The most important capability is "harmonization", that is, it is necessary to share a common "world view", as well as processes with the other companies in the GPN: studios, distributors, TV channels, etc.

Currently, the softwares used as tools for the production of an animation are no longer a barrier: ICT has provided timely access to them at affordable prices, which shifted the attention to the animator, who became more important than the tools he uses. In this sense, qualification and educational background become more important and the skilled worker becomes scarce. Given this environment, influenced by governments, technological changes, skilled labor shortage, search for financing, outsourcing and subcontracting, among other factors, there is the third and last propostion of this research:

P3 – The studios' capabilities are really dynamic, that is, they are constantly challenged to change and reconfigure, acquiring thus a strategic sense.

Research Methodology

Research methods and techniques adopted

For Eisenhardt (1989), building and testing theory with case studies is more appropriate either in the early stages of the research about a given subject, or to provide a fresh perspective for a subject already studied. In that sense, Dynamic Capabilities and GPN can be seen as appropriate. Research data were collected during interviews with owners and other executives in four independent studios that make TV cartoons, as well as documental survey and direct observation.

Universe and scope of the research

In Brazil, the animation industry is relatively recent. There are no official statistics about the animation studios located in Brazil. Yoon and Malecki (2009) identified 38 independent producers, without further details. The current and potential suppliers are restricted to other smaller studios, via outsourcing of specific production tasks (drawing, sound mixing, dubbing, etc.), and the customers are the cable and the traditional broadcast TVs, in terms of content production. The scope is limited to those studios located in Brazil.

Selection of the cases and unit of analysis

Four independent animation studios located in Brazil were chosen. It is public and notorious that they conducted successful co-production agreements with foreign companies (TV channels and other studios), and had their animations broadcast in Brazil and abroad. All four will be briefly

described in section 4. Finally, the unit of analysis is the studio in its entirety, for the capabilities necessary for getting connected to the GPN require investigations all over the company.

Field work: presentation of the cases, discussion and results

Production and broadcasting of TV animations in Brazil

The traditional broadcast TV in Brazil reproduces a paradigm established by large international groups: the companies are verticalized, as they take part in content production, scheduling and delivery (ANCINE 2010b). Verticalization also occurs to cable TV companies, where the content producers and schedulers usually belong to large international groups, which maintain themselves competitive due to low costs in production and broadcasting, thanks to the scale obtained by its global presence (ANCINE 2010c).

The cases – animation studios located in Brazil

Next, a brief description of the companies included in the empirical work.

Flamma – Founded in 2004; that same year, established a co-production agreement with Southern Star, Australia's biggest independent studio. The next year, Spanish studio Neptuno Films joined to produce the animated series "Sea Princesses"; it was sold to over 100 countries.

TV Pinguim – Founded in 1989; in spite of attempts to engage in international co-productions with other studios, in 2006 TV Pinguim ended up co-producing with the Discovery Kids channel the animated series "Fishtronaut". The cartoon is now broadcast to more than 60 countries.

2DLab – Founded in 1998, in 2008 a co-production was set with Canada's Breakthrough studio, resulting in the animated series "Mig Big Big Friend", now sold to more than 100 countries.

Mixer – Founded in 2003, it is a diversified studio, producing movies, documentaries, TV shows and commercials, and animations. In 2006 it set an agreement with Canada's Cité Amerique studio, for the animated series "Doggy Day School", now sold to more than 100 countries.

Discussion and results

The animation industry's GPN is of footloose-global type, where companies are increasingly specialized: large media groups, usually in the US and Europe, lead the network; they focus on marketing and content management, and outsource the production to smaller studios that may be located in other countries, as is the case of the four studios of the research. In order to get connected to the GPN, all studios had to overcome entry barriers, by showing that the production of animations in Brazil was technically consistent, transmitted values and knew how to tell good stories. Additionally, the vertizalization of the broadcast TV in Brazil made difficult the broadcast of animations produced domestically, and the co-productions, meaning the connection to the industry's GPN, was the solution for the Brazilian studios. Therefore, the difficulties faced and overcome by the the studios indicate that the third proposition of this research can be confirmed: those companies' capabilities are really dynamic, that is, they are constantly challenged to change and reconfigure, due to a business environment in constant change.

Four environmental facts, however, contributed to reduce this liability. First, the creation of ABPI-TV association, in 1999, and BTVP, in 2004, which shows that for small and medium companies the "networked" initiatives are more effective than isolated ones; second, the exhibition of the Brazilian studios in the major global events of the industry, like the MIPCOM annual exhibitions; third, the positive moment of the Brazilian economy grabbed attention for Brazil as a potential market and partner for animations; and fourth, the growth and sophistication of the cable TV in Brazil, leading to creation of exclusive cartoon channels.

Now, with good ideas for cartoons and good marketing, the studios were then able to establish co-production agreements. Those negotiations were time-consuming (over a year), and in some cases just didn't succeed, in the initial attempts. Although internationalization (via co-production) was the solution to make the productions viable, the lack of experience of the studios' founders and executives became an organizational obstacle to overcome, especially in terms of communication with foreign partners. This confirms the second proposition of the research: Harmonization between co-production partners is the most important capability, in other words, it is necessary to share the same set of values the other companies in the GPN: co-producers, broadcasters, etc. The lack of this capability would make difficult to set the agreements, finance the projects and execute the production, still dependent on rigid processes and ICT tools.

In all four cases there was intense interaction between the partners in the Development phase, because it's in it the animation concept emerges. The very idea of animated series was not intentional; nonetheless it quickly received global proportions, that is, it was clear that it might be sold worldwide. The next production phases saw different arrangements as for the division of tasks: according to the technical skills and the co-production agreements, each studio was in charge of different responsibilities. Tab. 2 presents a summary of such division.

Tab. 2 – Division of responsibilities between the co-production partners. The authors.

Production phases	Responsible	Responsible	Responsible	Responsible
1. Development	Flamma and foreign partner	TV Pinguim	2D Lab and foreign partner	Mixer and foreign partner
2. Pre-production	Foreign partner	TV Pinguim	2D Lab	Mixer
3. Production	Foreign partner	TV Pinguim	2D Lab	Mixer
4. Post-production	Foreign partner	TV Pinguim	Foreign partner	Foreign partner

The studios then had to cope with the coordination of the production and its schedule, because an animation project used to last from 18 to 22 months. On the other hand, such projects were intense in learning and knowledge transfer, especially for the Mixer and 2DLab studios, which worked with more experienced Canadian studios. Therefore, the first proposition can be confirmed, because the production process remains the same, but getting connected to the GPN (via co-production partners) requires more coordination. These managerial and technical capabilities, acquired either through the company's own trajectory or learning with the co-production partners, resulted in: (1) co-production agreements, in other words the connection to the industry's GPN; and (2) the ability to make world-class cartoons. All in all, co-productions also led to the development of more capabilities.

Based on the framework by Arlbjorn et al. (2011), the four studios' dynamic capabilities that enabled them to get connected to the animation industry's GPN were assessed (Tab. 3). This first research was not meant to assess the degree, but solely evidence of such capabilities.

In all four cases the ability to create a network of production partners was vital (capabilities: Supply Chain Mgmt. and Supply Chain Design/Operations development). Once the studios become contractors to a TV channel for the production of an animated series, they increasingly focus on core activities, such as the development of the cartoon idea/concept, and outsource the production *per se* to third-party studios, domestically or abroad, forming thus a complex network (see Fig. 1). This is usual in licensing contracts, especially for the Mixer studio.

Therefore, the sourcing and selection of partners and the timing for the execution of tasks must be well coordinated for the project's success (network leadership capability).

Tab. 3 – Dynamic capabilities of the Brazilian studios connected to the animation GPN. The authors.

Dynamic capability	Flamma	TV Pinguim	2DLab	Mixer
Supply Chain management	X	X	X	X
Supply Chain integration	-	-	-	X
Harmonization	X	X	X	X
Supply Chain design / operations development	X	X	X	X
Product and process development	X	X	X	X
Knowledge transfer	X	X	X	X
Network leadership	-	X	-	X
Strategic leadership	-	X	-	-
Culture alignment	-	-	-	-

The knowledge transfer capability identified occurred between the co-production partners in both directions: during the production process, Brazilian studios technical knowledge from the Canadian studios. On the other hand, institutional knowledge was handed to Canadians, especially in regards to the relationship with the Brazilian government and TV channels. It also includes the improvement in the scripts and storyboards, the standardization in ICT (softwares, databases, etc.), and the recognition of the director's primary role, a central element for the team coordination and overall project management (Product and Process Development capability).

Tab. 4 – Propositions, analyses and results. The authors.

Proposition	Analysis	Result
P1 - The production process per se does not change, but the connection to the GPN requires higher levels of coordination.	The dissemination of ICT enables the productive agents to work geographically dispersed. This in turn creates greater need for coordination, in a production process that still has relatively strict, serial phases.	CONFIRMED
P2 - The most important capability is "harmonization", that is, it is necessary to share a "world view", as well as processes with the other companies in the GPN: studios, distributors, TV channels, etc.	The negotiations for co-production agreements were time-consuming, due to the need of previous creation of a common worldview and the sharing of the project's idea; after the agreement, there was necessity for standardization of processes and other ICT elements.	CONFIRMED
P3 - The studios' capabilities are really dynamic, that is, they are constantly challenged to change and reconfigure, acquiring thus a strategic sense.	The studios' resources are challenged to change and se reconfigure almost at each new animation project, in relation to various aspects of the company.	CONFIRMED

Likewise, the co-production agreements indeed reflected the search for aligment between the local and international partners. Since the beginning, the studios already knew what might be of interest to new markets and thus attract co-production partners, except for the Mixer who

received the animation idea from the Canadian partner studio. This is a good example of Harmonization capability. On the other hand, despite the success in managing co-productions, there was little development in organizational culture, in the sense of understanding and stimulating the network-based labor (between the companies), which is a remarkable feature of the industry. At last, analyses were carried out in order to answer to the three propositions previously formulated. Tab. 4 has the summary of the propositions.

Concluding remarks

This research aimed at studying the dynamic capabilities developed by the Brazilian independent studios, for them to get connected to and be able to operate in the animation industry's GPN, which is dominated by large international studios and media groups, including the Brazilian market. The research indicates the existence of network-related capabilities, such as the studio's capability of establishing agreements in every project, that is, the production of a new animation. Although each of the studios produced its animation in different time and condition, the international co-production was in fact adopted by all four. This may suggest that the connection to the industry's GPN is the best strategy for their organizational development, in years to come. Given that the referred GPN is "footloose-global", where companies tend to specialization – and the consequent fragmentation of production -, the connection to it has two important consequences: it is a means of learning with the large international studios and media groups, as well as helps enabling the international financing of the animations.

The research identified a set of organizational activities and characteristics considered important for a successful reconfiguration in order to get connected, and stay so, to the GPN. Are those capabilities really dynamic? Indeed, it can be recognized as a set of resources and routines, and the findings fit into the definition of dynamic capabilities (Teece et al. 1997; Winter 2003). The studios told they systematically conducted changes and development, following good practices and processes learned from the larger companies in the network. The current research did not go deep enough into the case companies to verify whether that is really the case, for example to assure it there is some kind of project management methodologies, change management skills, training policies for human resources, etc. However, when compared to the discussion by Ferdows and DeMeyer (1990), the list of dynamic capabilities proposed by Arlbjorn et al. (2011) are in fact closer to what was found empirically, including aspects like improvement, integration, and learning. In this sense, it is possible to conclude that while the referred list is not exhaustive, it does contribute to the understanding of what the dynamic capabilities in a GPN may be.

This paper also opens a number of possibilities for future research: the list proposed by Arlbjorn et al. (2011) does not help explain in detail cases involving virtual goods, like the animations; after all, it was devised for physical goods. We believe that an extension of the theory is convenient, with further development of another list. A crucial point that makes harder its adherence to virtual goods is that the physical flow of materials, components, and finished products is near to inexistent. Therefore, the theoretical background of Supply Chain Management seems inadequate. And for that same reason, the flow of production inputs and outputs is fast, through the ICT infrastructure, and it is necessary a framework that captures such dynamic interactions within the GPN. It was observed, too, that it is possible to deepen the understanding of the animation industry and its "virtual" GPN, and Bendassolli et al. (2009) propose further research that focuses on the role of the government in the local development of toon studios. Additionally, there could be cross-sector studies, with the comparison of dynamic capabilities for the GPN among several virtual goods: animations, videogames, softwares, etc. ◙

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