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**Developing shared product platforms during a merger:  
the Fiat-Chrysler case**

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**Abstract.** This paper, building on R&D integration and improvisation literature, explores how firms organize to jointly develop common product platforms if their integration process is still in progress. In order to address our exploratory research question, we draw on a unique set of empirical data gathered during the Fiat-Chrysler R&D integration process and during the development of their first shared product platform. We show that, how due to fierce competition on time in the industry, the two companies did not have time to complete the planned R&D integration. As a consequence, the first shared platform development project represented the real locus of technological, knowledge, and organizational integration between the two firms. In line with the R&D integration literature, this paper identifies a set of planned integration mechanisms: a centralized R&D area, two teams that mirror each other, integrator roles and shared technical norms. This organization was designed to help Fiat and Chrysler exploiting their complementarities. Furthermore, building on the improvisational literature, we show that the planned organization did not suffice: interstices between the two firms exist and planning and improvisation are complementary. Improvisation should be built upon a minimum structure and firms willing to accelerate their integration process can rely upon NPD activities.

**Keywords:** R&D integration, improvisation, NPD organization, merger and acquisitions

**JEL classification:** O32

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## **Introduction**

Given the raise of mergers and acquisitions aimed at developing shared product lines and platforms, post merger integration processes concerning new product development activities are becoming particularly relevant (Muffatto, 1999). After a merger, firms that point at sharing product platforms may decide to integrate their organization and technical norms to benefit from their synergies and complementarities. In this case, speed in integration appears as being a critical factor and firms may be willing to co-develop new products before the completion of their organizational and knowledge integration (Angwin, 2004; Bauer and Matzler, 2013).

In this paper, building on post merger integration (Birkinshaw, Bresman, and Hakanson, 2000; Chakrabarti and Souder, 1987, Gerpott, 1995; Öberg and Tarba, 2013; Shirvastava, 1986) and improvisation literature (Akgüna et al., 2007; Kamoche and Pina e Cunha, 2001; Magni et al., 2009; Samra et al., 2008; Miner, Bassof and Moorman, 2001; Moorman and Miner, 1998; Vera and Crossan, 2004), we explore how firms organize to jointly develop common product platforms if their integration process is still in progress and if they cannot rely on ex-ante well-defined shared organization, culture, and standards.

In order to address our exploratory research question, we draw on a unique set of empirical data gathered during the Fiat-Chrysler R&D integration and during the development of their first shared product platform. We had the chance to study how Fiat and Chrysler planned their R&D integration process and how they organized their first joint product development process while it was happening. This project started long before the R&D organizational and knowledge integration was completed.

We observed the specific organizational and technological challenges the two firms faced in developing a common international platform and how they solved them. We show that, how due to fierce competition on time in the industry, the two companies did not have time to complete R&D planned integration process. In particular, the two companies did not have the time to fully re-write their NPD procedures and norms. As a consequence, this first shared platform development project

represented the real locus of technological, knowledge, and organizational integration among the two firms: several new technological and organizational solutions as well as new procedures aimed at managing shared product platforms took form within this first project. Data show that the integration process was far from a completely planned one, and that actors continually tackled general (concerning broader issues of the merger) and specific (project related) post merger integration problems while performing NPD activities. This raises many questions concerning post merger integration activities and how theory explains it.

In this paper we argue that firms need to balance pianification and improvisation in managing their R&D integration. When distant firms are urged to co-develop their first shared product platform on one side they will try to ex-ante define some organizational solutions and integration mechanisms but, on the other, they will face unexpected issues and threats. Under these circumstances firms improvise (Akgüna et al., 2007; Crossan et al. 2004; Vaara et al., 2012; Weick 1993, 1998b). Hatch (1998) observed that managers improvise recombining existing knowledge and routines (parts of memory) to create novel action, much as a musician reassembles previously performed bundles of notes into a novel melody. Vera and Croassan (2004) suggested that managers improvise when they do not have a full script but just a trace. This paper sheds light on the reassembly process as well as on the trace and submits a model that balances painification and improvisation as self-reinforcing mechanisms in post merger integration for product development activities on a global scale. In this model planning and improvisation are complementary. On one side planned integration allows ex-ante advancing firms integration and supporting, as well as shaping, the integration itself. On the other, improvisation fills the interstices of planned integration and fosters the development of real-time solutions for ineffective planning.

The paper is structured as follows. The theoretical section summarizes the main contributes of the R&D integration and improvisational literature. The data and method section presents the Fiat-Chrysler R&D planned integration and the development of their first shared product platform,

while the findings report our results. Finally the discussion and conclusions summarize our findings and identify new research avenues.

## THEORY

### **Planning and improvisation in R&D integration**

#### *Planning*

In this study, building on the R&D integration and improvisation literature, we analyze how Fiat and Chrysler planned their integration process and how they managed the development of their first shared product platform.

Recent contributes have addressed the growing importance of M&As in absorbing complementary external technological capabilities needed to compete successfully in radically changing and globalized economies (Chakrabarti, Hauschildt and Sueverkruep, 1994; Grandstrand, Bohlin, Oskarsson and Sjoberg, 1992, Hitt, Hoskisson, Ireland and Harrison, 1991; Gerpott, 1995; Hagedoorn and Duysters, 2002). Among these contributes, some studies specifically examine the question of how firms organize R&D activities for developing common artifacts after a merger and how resources should be shared and combined (Grimpe, 2007). These studies suggest that a higher level of integration increases the chances to exploit value growth potentials but also that conflicts may increase and that the integration tends to reduce the overall organization's creativity and innovative capabilities—at least initially (Birkinshaw, Bresman, and Hakanson, 2000; Chakrabarti, 1990; Chakrabarti, Hauschildt, and Suverkru, 1994; Chakrabarti and Souder, 1987; Gerpott, 1995; Puranam, Singh, and Zollo, 2003; Ranft and Lord, 2002; Weber and Tarba, 2011).

Scholars have investigated specific integration instruments, such as firms' culture, exchange of technological knowledge, job rotation, joint NPD project groups, the delegation of decision-making authority to the R&D unit, and the use of an integration team or integrator managers. Overall, all these instruments positively affect the M&A's performance as concern the R&D activities (Birkinshaw, Bresman, and Hakanson, 2000; Chakrabarti and Souder, 1987; Gerpott,

1995; Mairea and Collettere, 2011). “Common structural patterns and interlinked structures within the R&D units have a positive effect in that they facilitate better collaboration and research outcomes. A common organizational structure hence serves as a basis for realizing innovative resource combinations and streamlining the NPD process” (Grimpe, 2007, p. 626). Also, standardization of systems exhibits positive links with the R&D outcomes and innovative capabilities after a merger (Chakrabarti, Hauschildt, and Suverkru, 1994; Grimpe, 2007).

Bannert and Tschirky (2004) showed that the integration process in M&As positively affects M&As’ performance if characterized by a holistic change of the merging companies in all the following dimensions: functional and technological, organizational and structural, socio-cultural and legal, financial and IT. Such integration is more complex in cross-border acquisitions, when often firms have different bundles of resources, knowledge and organizational routines (Morosini et al, 1998). The distance in norms, routines, organization and culture between countries in across border M&As can increase the complexity and the risks of the integration process (Kogut and Singh, 1988; Morosini et al., 1998; Björkman, Stah and Vaara, 2007). As Quah and Young (2005) pointed out in international acquisitions the management of both cultural and organizational integration requires caution to avoid conflicts but caution is also suggested because of market factors, and particularly adverse customer responses may derive from the firms’ inability to account for differences in developing new products. Bannert and Tschirky (2004) suggested that the organization of the technological integration activities aimed at preserving the capabilities as embedded into the acquired firm’s specific context, should focus on the creation of specialized teams, to preserve each firm’s key knowledge and competences and, at the same time, on integration mechanisms that allow the cross-fertilization of each team’s areas of excellence. Bannert and Tschirky (2004) suggest that diverse areas of integration, from the technical to the cultural, show higher performance if dedicated teams manage them.

Overall, while the R&D integration literature has mainly focused on ex-ante planned integration efforts and on their impact on R&D or acquisitions’ performance, we still know little at

the micro level about how firms manage NPD activities when the integration of R&D activities is not yet completed: how do firms manage to organize and integrate NPD activities for the first time? How do they manage NPD activities if they do not completely share technical norms and standards? How do firms face unexpected issues during their first shared NPD project?

Given the raising number of M&As aimed at designing international shared platforms under circumstances of time pressure and uncertainty, the research questions of how firms face this challenge and balance between the benefits of a planned integration and the need to quickly cope with uncertainty become relevant. In such a context, organizations cannot just plan and act, they also need some improvisation (Minor, 2001).

### *Improvisation*

Improvisational actions occur when organizations face unanticipated situations, have no ex-ante defined plans or routines and work under conditions of time pressure, ambiguity, and uncertainty (Akguna et al., 2007; Crossan et al. 2004; Magni et al., 2013; Weick 1993, 1998b). Groups improvise when acting without the benefit of prior planning and when they have a limited structure. Moorman and Miner (1998b) define improvisation as “the degree to which the composition and execution of an action converge in time” (p. 698). Improvisation is the fusion of the design and execution of a novel production. It implies that an organization could, at any given moment, do nothing enact preexisting routines in their usual patterns, plan an activity, execute a prior plan, or improvise (Minor, 2001).

Scholars described NPD teams improvising a) processes, b) new technological solutions without prior design and c) new interpretations or frameworks (Dougherty, 1992; Hatch, 1998; Miner, 2001). Scholars have focused on the role of improvisation in NPD activities because it is a valuable source of flexibility and agility (Galbraith, 1990; Mintzberg, 1994) and helps innovation teams generating more NPD projects and increasing their speed in response to changes in the business environment (Eisenhardt and Tabrizi, 1995; Moorman and Miner, 1998a; Samra, Lynn, and Reilly, 2008; Song et al., 2001; Weick, 1996). A firm that emphasizes improvisation creates



more NPD projects to fit rapidly changing markets, customer preferences, and environments (Chelariu, Johnston, and Young, 2002; Miner et al., 2001). More NPD projects arise from improvisational processes when managers' creativity is triggered by situations in which they cannot rely on pre-existing norms and standards and need to generate new ideas. Indeed, improvisation generating new solutions is a source of organizational learning especially in new product development (Nonaka, 1990; Eisenhardt and Tabrizi, 1995; Miner, 2001; Moorman and Miner, 1998a; 1998b).

Team improvisation has a positive influence on project team performance by allowing team members to respond to unexpected challenges through creative and timely action. However, increasing degrees of teams' geographical dispersion attenuate this relationship by making it difficult to have timely access to other team members' knowledge and by limiting real-time interactions that may lead to the development of creative solutions (Magni et al., 2013).

Nevertheless, Brown and Eisenhardt (1997) pointed out that firms should balance planned integration and improvisation: mechanistic organizations rely on planned integration, clear and ex-ante defined structures, and schedules that can be exploited and replicated over time and in a number of NPD activities, while organic organizations foster improvisation, exploration, and creativity. Kamoche and Cunha (2001) express a similar view and highlight how the critical challenge firms face is to balance between improvisation/adaptability and pianification/control in new product development activities (Kamoche & Cunha 2001). These authors suggest that improvisation and planning are complementary because we cannot improvise on nothing and planning offers a minimum structure upon which to improvise. Furthermore, improvisation and planning need to be balanced because improvisation increases R&D productivity at a lower cost than direct investments but improvisation also increases firms' internal uncertainty and decreases control in the long run. Indeed, some levels of pianification are needed to balance improvisation.

Also, managerial literature addresses the problem of if and how firms' knowledge, structure, procedures and skills somehow shape improvisation. Brown and Eisenhardt (1995), Moorman and

Miner (1998a and 1998b) and Weick (1993a) found that organizational memory and routines shape improvisation in new product development in two ways. First, improvisation may generate new routines but also recombine existing routines in a new way. Hatch (1998) described this process using the musicians metaphor that write their melodies all relying on the same closed set of notes. Indeed, while improvisation occurs when no plans are in place, improvisation is affected by firms' organization, norms, culture and routines. Second, Eisenhardt and Tabrizi (1995) observed that firms, by establishing basic aspects of processes such as milestones and guidelines, could provide a sense of structure and routinization to improvisational activities. Moorman and Miner (1998b) contend that improvisation occurs within an upper-limit of spontaneous action and a lower-limit of totally planned action (1998b). Cunha, Cunha, and Kamoche also note that improvisation can happen in environments rich with direct supervision and standardization (1999). Magni et al. (2009) found that team behavioral integration and team cohesion positively affect individual improvisation and that cohesion positively moderates the influence of team behavioral integration on individual improvisation.

Indeed, scholars believe that improvisation within structured contexts fosters innovation processes and improve their performance. In this study, we analyze at the micro level how Fiat and Chrysler balanced pianification and improvisation before the completion of their integration process and we deliver a model of R&D integration viable for global firms.

## **DATA AND METHOD**

On April 30, 2009, Barack Obama announced that Chrysler would be shepherded by \$6.6 billion in American Treasury capital through the bankruptcy process and into the arms of Fiat Auto. The short-term goal was to save jobs in the midst of a cataclysmic financial crisis. Today, one of the main Fiat-Chrysler goal is to benefit from their integration developing shared product platforms.

Robertson and Ulrich (1998) define a platform as the collection of assets (i.e. components, processes, knowledge, people and relationships) that are shared by a set of products. Following

Robertson and Ulrich “by sharing components and production processes across a platform of products, companies can develop differentiated products efficiently, increase the flexibility and responsiveness of their manufacturing processes..... in the auto industry, firms taking a platform approach enjoyed marked share gains of 5.1 percent per year, while firms pursuing a single-model approach lost 2.2 percent market share per year” (page 20).

The wide diffusion of product platforms in the automotive industry dates back at the ‘80s when car makers experienced a drop in their sales and started developing inter-firms product platforms as a means to obtain the benefits of scale. By sharing components and production processes across product models, companies increased their economies of scale, while developing several different models at a lower cost. Furthermore, mergers and acquisitions with firms operating in foreign countries allowed domestic firms acquiring the knowledge needed to effectively adapt their offer to new and distant countries. Nevertheless, platforms shared across distant geographical areas are challenging because platforms components have to contemporarily accomplish the requirement of diverse clients and States (Muffatto, 1999).

The challenge of developing international platforms is twofold: on one side car makers need to know the foreign clients’ needs and how to translate them into product specifics, on the other they have to solve the trade-offs arising from the need of translating the domestic and foreign clients’ needs into a unique set of specifics. All these issues have specific time-constraints given by the intense competition (Midler et al., 2002).

In this paper, building on the R&D integration and improvisation literature, we explore how firms manage the co-development of shared platforms after M&As, when R&D integration is still in progress. We analyzed the B-SUV project, which is the first platform co-development project, carried on by Fiat and Chrysler. We relied on a holistic single-case study because it is appropriate when the case represents an extreme or unique case (Yin, 1994). Also, single, in-depth case studies are often used in longitudinal research (Voss et al., 2002).

The B-SUV platform is targeted to small SUVs for the US (Jeep brand) and Emea (Fiat brand) markets. The project started in 2011 and aimed at creating a platform that includes about the 65% of derivative cars' components. The project was expected to last three years. The responsibility of the platform design was assigned to a Fiat team of 300 members. The model team has 30-40 members.

We collected the data, from 2011 to 2012, via semi-structured interviews and by analyzing several company documents. We collected data on a) Fiat-Chrysler integration schedule, strategy and organization and on b) the development of their first shared product platform (i.e. on the B-SUV platform). This research is part of a broader project aimed at analyzing in depth the Fiat-Chrysler merger. To answer to the research question of this study we focused on seven interviews, for a total amount of 8 hours, out of ten interviews conducted till 2012. Table 1 reports the list of managers we interviewed, the data, place and length of the interview. Being our focus the Fiat-Chrysler R&D integration, we interviewed: the Fiat-Chrysler Research & Innovation Responsible & Fiat Research Centre S.c.p.A. General Manager, Chief Technology Officer (Fiat Group) and Head of Engineering (Chrysler), the Head of NPD W&E Europe, and the VLE - B-SUV segment.

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Insert Table 1 about here

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A team of four investigators conducted the interviews. As Eisenhardt maintained (1989), the presence of multiple investigators adds to the reliability of the results and increases the likelihood of surprising findings. Each interview was recorded and transcribed.

## **FINDINGS**

### **R&D integration in Fiat and Chrysler**

Fiat-Chrysler integration hinges on building one NPD organization to benefit from economies of scale, component standardization across models, technological complementarities, and savings on purchasing due to a combined purchasing power. To achieve this goal, Fiat and Chrysler underwent a planned integration process based on a) the redefining of Chrysler's organizational structure that was designed to mirror Fiat's one and on b) shared technical norms.

Fiat-Chrysler relies on a matrix organization which dimensions are geographical areas (NAFTA, Europe, Latin America, and Asia-Pacific) and functions. The only functions of the company that remained centralized are research and development, finance and human resources (West). While in Chrysler, platforms were almost independent as they were business units, Fiat, building on its own successful experience, decided centralizing the R&D area to increase coordination and centralization, to manage synergies across platforms, and to create central competences that can support all platforms (pierallini). This new organization and the corresponding roles and resources were well functioning after two months. As Kun explained, "one of the very first things done after the emergence from bankruptcy with Fiat as a partner is to take the Chrysler and Fiat engineering organizations and align them in terms of how we were structured. That was done immediately in the summer of 2009".

In the centralized R&D area there is a staff in charge of coordinating architectures standardization, i.e. those architectural solutions that have to be shared across platforms and geographical areas. This area defines standard components and norms. While this section is in charge of coordinating technical norms, the responsibilities -- so the operational part of the architectures-- is allocated relative to the center of gravity of application and competence, i.e. to platform development teams.

Fiat decided to assign the main responsibilities of each platform development either to Fiat or Chrysler. The small A platform, which includes models such as 500-mini, 500-pound Epsilon, and the B platform, which includes the B-SUV, are both designed by Fiat and produced in Europe. The compact platform (the C architecture) has been handed over to Chrysler and is produced in US.

Nevertheless, Fiat and Chrysler have to share each new platform. Indeed, even if there is one unique team responsible for the development of each platform, Fiat and Chrysler designed an organizational solution aimed at ensuring the cooperation between the two firms and that each platform developed is suitable to cover the EMEA and NAFTA areas.

Fiat and Chrysler have two teams working on the same platform, one in Chrysler and the other in Fiat. While these teams mirror each other and have the same structure, resources and organization, only one team has the formal responsibility of the project while the other, which is called shadow team, supports and validates the decisions of the team in charge of the project. The shadow team helps the counterpart understanding its clients (e.g. Chrysler shadow team will support Fiat in understanding US clients, and vice-versa), solving-trade offs, evaluating technical solutions, controlling that the platform is aligned with client's needs and with legal technical requirements of its own country. Each member of the team in charge of the project has to validate his decisions interacting with his specific counterpart in the shadow team.

In addition to a shared R&D, Fiat and Chrysler integration was achieved creating one unique set of technical norms. This convergence process is described in the following section.

### **Technical norms integration**

Car makers codify their knowledge into thousands of technical norms. While Fiat and Chrysler decided to harmonize their technical norms to exploit their complementarities, often car makers, as also happened in the Daimler-Chrysler case, prefer adopting one set of norms, as for example Daimler's norms, instead of facing a complex harmonization processes. Integration may leverage complementarities but it is complex, expensive and demanding task.

Overall, Fiat and Chrysler norms to harmonize were about 20.000 (10.000 for each firm) but they decided to focus on 2.000 key norms. The norms that did undergo the harmonization process regard the project development and components design while norms about industrialization, such as plants' layout, were not included in the 2000 norms to harmonize. The harmonization process was

expected to take 215 thousands hours of work and about three years (Di Muro). Kuns explained that “the system and component teams meet regularly with this specific task: to harmonize specifications for various systems and components”.

Fiat and Chrysler started comparing norms one by one but soon acknowledged that this was taking too long<sup>1</sup>. Indeed, Fiat and Chrysler tried to speed the process by reviewing clusters of norms. For example, Fiat and Chrysler had different norms about materials. One option was to compare these norms one by one, but it would have taken 8 months (Di Muro), another option was to organize the norms into clusters or families, e.g. all norms about materials, and decide if to select the cluster of Fiat or that of Chrysler. In the latter case, the challenge was to define the selection criteria.

Fiat and Chrysler managers stressed the criteria followed in selecting clusters. First, clusters that accomplish both EMEA and NAFTA legal requirements should be preferred. Second, if Fiat or Chrysler has higher competences as regard the analyzed clusters, these have to be acknowledged and exploited in the new set of norms. As regard materials, Chrysler Material Standards were selected because these can be applied to both NAFTA and EMEA markets, while Fiat norms do not respect all US requirements about materials because this is a more demanding legislation. Fiat-Chrysler harmonization of technical norms also aims at emphasizing complementary competences. For example, Fiat has special competences in the sport segment, which includes Italian brands such as Maserati and Alfa Romeo, and thus defines the suspensions, handling, and comfort of the sport segment. Chrysler, which is years that produces the Jeep, manages the handling comfort of the off road and tracks (Pierallini). When both firms are highly competent as regard the same set of norms, one leader is selected and the counterpart signs the application: there is a high level of cooperation and both firms have to agree on the norms selected.

When we asked Pierallini if this approaches worked, he answered that “I do not know yet, we have already started”. Pierallini noticed that despite the guidelines about how to select clusters

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<sup>1</sup> At the end of 2012 the harmonization was still a work in progress.

of norms, managers faced unexpected and complex issues during the integration process. First, over design is a central issue. If technical norms have to contemporarily accomplish the needs of diverse clients and legal requirements of the diverse states, firms may be willing to set norms that contemporarily accomplish all needs and that are complex and translated into expensive product specifications and tests. This was the case of norms about suspensions durability, “They had to be defined having in mind differences in states’ roads and had to contemporarily pass a number of stress tests”. Second, even if selected clusters can be applied to both geographical areas and complementary competences were exploited, technical norms may depend on some specific and unique firms’ features and these norms should not be come standard. “For example one firm may have quality issues that can be solved with a sensor that has a cost. The other firm, which has never experienced such problems, may say no. A compromise is needed” (Pierallini). Third, Fiat is traditionally more focused on the manufacturing area then Chrysler. Fiat plants have more sophisticated tools developed to specifically measure and control components and aimed at helping the R&D area in solving technical issues in components design. The lack of such tools in Chrysler reduces its ability to ex-ante define technical norms that are clear enough for the manufacturing area and that will avoid assembly issues (Pierallini). Indeed, Chrysler technical norms are less reliable then Fiat norms as regard manufacturing issues. Finally, as we will see in the B\_SUV case, identifying complementary competences when firms have distant clients may be meaningless: each firm is more competent in understanding its clients needs and in translating them into product specifications.

Interestingly enough, technical norms harmonization was central in Fiat-Chrysler integration but also complex and long. This is why Fiat and Chrysler decided to start the development of their first shared product platform before the completion of technical norms integration.

### **The first shared product platform: the B-SUV**



As above explained, platforms shared across countries have one team that is overall responsible for the development but its design decisions have to be shared and validated by a shadow team. In the B-SUV case the team responsible for the overall development is a Fiat team while the shadow team is a Chrysler team. Two Chrysler expertise were expected to join the responsible team to ease and ensure coordination between the responsible team and the shadow team two and the harmonization of technical norms should have eased the development of this first shared product platform.

Indeed, when the B-SUV project started the integration process was supported by the organizational structure and shared norms. Interestingly enough, the following sections will highlight that a) the planned organizational structure failed and that b) technical norms integration was far from being completed when the project started and the guidelines offered to complete their integration were too vague. Indeed, the project itself became the locus of harmonization of such norms. Overall, despite the efforts of ex-ante planning the integration process, the teams involved in the B-SUV project had also to rely on improvisation to complete the project and the integration process itself.

#### *The B-SUV planned integration*

The VLE of the B-SUV project explained that Chrysler-Fiat integration was key to support the development of a platform shared between culturally and administratively distant countries. Working in the US, he acknowledged that only US citizens could understand to the fullest US clients: this is a tacit knowledge that cannot be taught and easily transferred. There are performances that have to be deeply understood. This is why B-SUV project needed to integrate human resources from Chrysler and Fiat.

First of all, Fiat-Chrysler integration in the B-SUV development was enabled by the interaction between the Fiat development team, in charge of the project, and the Chrysler shadow team, which main components are a Chrysler chief engineer, product manager and a quality

responsible. The shadow team is the interface of the Italian team developing the B-SUV that helps the Italian team solving trade-offs and harmonizing technical norms. Each member of the B-SUV Italian team has a counterpart in the shadow team with whom it interacts daily. Fiat and Chrysler shadow team exchange every day a high amount of data, share and evaluate performances, select alternatives and solve trade-offs.

Second, Fiat decided to manage the integration of the responsible and shadow team relying on two expatriates. Immediately after the merger, Fiat supported Chrysler adaptation of Italian platforms to the US market. For example, this happened for the Fiat 500 platform. During these projects, Chrysler team was responsible for the development and Fiat shadow team supported Chrysler. Furthermore, two Fiat expatriates joined the Chrysler team. These managers were the Vehicle Integration Responsible (VIR) and the Program Manager (PM). The VIR is in charge of vehicle performance particularly as regard the performance specifically related to the brand. Moreover, the VIR ensures that the car has performances in line with clients' expectations. The PM has the task to ease, coordinate, integrate, and monitor new product development activities. In the B-SUV case the VIR had to manage trade-offs, monitor the product adherence to the Jeepness feeling while the PM had to improve the B-SUV new product development organization by transferring some key Chrysler excellences, i.e. "Chrysler's modus operandi", to Fiat.

Responsible and shadow teams, the VIR, the PM, and shared norms were planned and structured integration mechanisms between the responsible and shadow teams. This article shows that despite this intense integration effort, improvisation played a central role and enabled coordination.

#### *The B\_SUV improvisation*

Fiat and Chrysler were not able to find the VIR and PM for the B-SUV project. As Kuns explained "especially the younger population in Fiat speaks relatively good English but virtually no-one speaks Italian in Chrysler". DiMuro highlighted that expatriates from US to Italy face objective difficulties and the first is the language and the second is the integration in a complex

organizational structure such that of Fiat. Initially, a Chrysler PM was identified but he subsequently renounced. The same issues explain why Fiat was still searching a VIR and renounced to the expatriate solution. The B-SUV platform responsible said that they were trying to find a “Chrysler performance engineer responsible for the jeepness. This engineer would not be required to live in Italy, but just to participate to some meetings in Fiat especially during most crucial development phases”. The B-SUV model responsible still believes that it is key to integrate Fiat and Chrysler human resources but he has renounced at relying on VIR and PM expatriates. Moreover, the shadow team has a VIR and a PM that still lack a counterpart in Fiat, contradicting the principle of “mirroring” in Fiat and Chrysler organizational structures. This is an additional issue in that DiMuro explained that engineers and managers of the responsible team and shadow team directly interface with each other to solve issues, and extensively share knowledge and data. Although a hierarchy exists within each team, the level of delegation is high and the team leader is rarely involved to take decisions instead of team members. This happens only when members are not able to find an agreement among them.

Also the harmonization of technical norms had to ensure a guidance to coordinate Fiat and Chrysler new product development activities. Despite the harmonization process focalization on a restricted set of technical norms and their management into clusters, when the B-SUV project started the harmonization was far from being completed. DiMuro explained, “The integration process is long and expensive and requires a huge amount of hours. This process is not yet completed. For example there are areas, such as the ergonomics, for which no shared technical norms exist”.

Therefore responsible and shadow teams had to define how to design components for which technical norms did not exist. In so doing they faced multiple challenges. First, they had to understand clients’ needs and how they could be translated into technical specifications. What is the meaning of “good habitability” for US clients? Second, not only Italian clients and US have different needs but also how they are technically measured and translated into product attributes differs in

Fiat and Chrysler. DiMuro said, “we have engaged in a complex comparison. Particularly on those product attributes more directly related to clients use of cars: what does it mean comfort for a US client as compared to a European client? Which is the most appropriate measure of comfort? How should we translate this concept into technical attributes? In Fiat and Chrysler there are still different answers to such questions and we need to find a shared solution because we are developing a shared product platform”.

When we asked how they solved these issues DiMuro explained that “this is a natural process, it happens only working on it, only living the integration you can succeed”. This was the first common platform and was natural to have areas not covered by shared norms and conflicts may exist. The most critical areas were the ergonomics and the fuel economy. For example US clients prefer bigger handles that can be opened with snow gloves during winter while big handles are non-esthetic for Italian clients, or US clients prefer straight seats while Italians prefer more enveloping seats. Differences in fuel economy are driven by different norms in US and Europe and by different approaches used in measuring it. Also, US clients prefer medium petrol motors while in EU clients’ first choice are small petrol, diesel and ecological motorizations. Finally, SUVs in the EU are positioned in higher segments than in the Nafta area. DiMuro claimed that these issues can be overcome only during new product development activities when managers have a more in-depth understanding of each-other clients ‘needs, trade-offs and measurement approaches. “Everything is new, experimental, I expect to face further challenges at each step of the project, especially when we will develop the first prototypes”.

Indeed, Fiat and Chrysler teams had to develop a shared product platform without many shared technical norms: the two teams, relying on daily interactions managed to agree upon the technical solutions to adopt. For example, the “jeepness” had to be transferred to the B-SUV. The two teams integration was high to ensure such a transfer of explicit and tacit knowledge. They organized a meeting in Detroit to perform off road tests with the Jeep and its competitors. This way

it was easier for the Fiat team to understand the jeepness concept and to translate it into a set of product specifics with the help of Chrysler.

Additionally, DiMuro, in line with Pierallini, warned that the criteria set centrally to decide which cluster of norms to apply is useful but it does not suffice in guiding development teams decisions. Particularly, the choice of clusters of norms on the basis of Fiat and Chrysler competences is risky because often they do not have different levels of competences but a better knowledge of their own country and clients. This knowledge has to be shared if a common platform has to be developed. “Technicians have to work side-by-side to find a specific that works for both geographical areas. In some cases Fiat specifics will be modified, in other we will have an over-design. If norms were already been shared we would ex-ante known how to accomplish our clients; but this process is not completed and during the project we discovered that we needed to learn how to converge. We contemporarily did two things: we converged and developed a shared platform”.

## **DISCUSSION**

This paper analyzes how Fiat and Chrysler managed the development of their first shared product platform before the completion of their integration process. In order to address this research question we first analyzed R&D integration process in Fiat-Chrysler and then we focused on the organization and development of the B-SUV, the first project aimed at developing a shared product platform.

Our findings identify a set of organizational solutions that Fiat and Chrysler adopted to foster the integration of their R&D areas. First, they centralized the R&D area in order to benefit from synergies and complementarities. The organization of this area resembled Fiat’s R&D organization. Second, the R&D area was also in charge of harmonizing Fiat and Chrysler technical norms with the aim of creating a unique shared database of standard architectural solutions. Third, Fiat and Chrysler organized shared platforms development activities by: a) creating two teams, one in Fiat and the other in Chrysler, with the same organizational structure (i.e. they mirror each other).

Only one of these two teams is in charge of the project, i.e. the responsible team, while the counterpart, i.e. the shadow team, supports the former in understanding clients' needs and in defining technical solutions; b) the responsible and shadow team integration is ensured by interactions between team members and by two managers that act as integrators (the VIR and PM). If, as in the B-SUV case, Fiat is in charge of platform development, then the VIR and PM are two Chrysler managers that expatriate in Fiat.

Despite this planning effort, Fiat and Chrysler soon recognized that technical norms, which embody car makers' knowledge, are complex to integrate and this process takes years. Therefore, while technical norms integration was still in progress, Fiat and Chrysler decided to start the co-development of their first shared product platform. Indeed, teams working on this project had a twofold task: on one side they had to develop a new platform and on the other the project itself became the locus of technical norms integration.

Our findings highlight that Fiat and Chrysler defined guidelines to complete technical norms integration. Norms should be defined starting from the comparison of Fiat and Chrysler clusters of norms and should be applicable in multiple geographical areas and reflect firms' core competences. Nevertheless, our evidence shows that these principles were not easy to apply. Especially managers involved in NPD activities claimed that in few areas Fiat and Chrysler have distinctive technical competences and often the knowledge of clients, of their needs and of how translating them into product specifications are their core-competences. Before integrating technical norms, teams need to share clients' knowledge via frequent interactions and often this process leads to over-design of platform components. Indeed, during the B-SUV development, teams had only a trace as a guideline to decide how to harmonize their technical norms and they had to act without a clear prior planning (Vera and Croassan, 2004). Also, pre-existing technical norms represent building-blocks of knowledge that can be recombined, as musicians recombine notes, and eventually reshaped on the basis of project's needs (Hatch, 1998).

Furthermore, the planned B-SUV organization had to be modified during NPD activities. Particularly, the VIR and the PM, in charge of easing the responsible and shadow teams integration, were not identified. This organizational solution was performing when Fiat had to support Chrysler teams, but cultural distance between Fiat and Chrysler did not permit to rely on the same organization when Fiat was in charge of the project: almost no Chrysler manager speaks fluently Italian and Fiat organization is quite complex. Overall, the B-SUV project leader had to improvise and try to identify alternative organizational solutions. Indeed, the B-SUV experience helped testing pre-existing planned integration mechanisms and improving them: when mergers are cross-boarders not all distances between firms can be theoretically taken into account when planning integration mechanisms and improvisation helps overcoming poor or incomplete planning. For example, the responsible and shadow teams help leveraging and preserving firms' complementarities but being differences preserved these may also cause problems during NPD activities.

All in all, this study suggests that when firms develop shared platforms and their integration process is still in place, improvisation completes planning activities and allows managing complex NPD activities. Also, improvisation allows modifying planned organizational solutions during the process itself, testing and improving them. Thus, planning and improvisation are highly complementary, in the sense that the more of one makes the other more relevant. Whereas planning is aimed at solving problems in an optimal manner, improvisation endeavors to adequately manage and improve them leaving space to learning and improvement that are crucial during mergers and that planning would not guarantee (Sharkansky and Zalmanovitch, 2000).

Our study contributes to both the R&D integration and improvisational literature suggesting how much is crucial their interaction when R&D integration processes are still in place. In line with improvisational literature, we acknowledge that improvisation and planning are complementary because we cannot improvise on nothing and planning offers a minimum structure upon which to improvise (Kamoche and Cunha, 2001) and we also add that firms willing to accelerate their integration can use NPD activities to test planned organizational solutions and to complete their

integration. Under these circumstances managers may be required to improvise in solving problems and define new organizational solutions. When managers can improvise upon a canvas of planned organization, or they can recombine building blocks of knowledge, this process nurtures learning and can ease firms' integration process. This was the case of technical norms integration that were selected and redefined during the project relying on an improvisational approach. Improvisation helps generating new ideas and balancing mechanistic and organic sides of an organization (Brown and Eisenhardt, 1997). Also, improvisation may alternative lead to change or stability (Chuna and Chuna, 2010).

Managerial literature has also addressed the problem of if and how firms' knowledge, structure, procedures and skills somehow shape improvisation (Brown and Eisenhardt, 1995; Moorman and Miner, 1998a and 1998b; Weick 1993a). We found that Fiat and Chrysler aimed at harmonizing technical norms mixing and matching their existing norms, as musicians write their melodies relying on the same closed set of notes, and at shaping this process with guidelines or a trace about norms selection (Hatch 1998; Moorman and Miner, 1998b; Cunha, Cunha, and Kamoche, 1999). Interestingly enough, the B-SUV case emphasizes how the complexity of NPD activities during an integration process is so high that improvisation may generate new notes and reshape traces. Improvisation is a source of learning because it generates new technological and organizational solutions (Minor, 2001).

## **CONCLUSIONS**

This paper contributes to the R&D integration literature by identifying a set of planned integration mechanisms in use by distant firms that want to integrate their R&D areas and build a unique set of shared technical norms.

We find that Fiat and Chrysler created a centralized R&D area, in charge of selecting and codifying technical norms, and also relied on NPD projects to complete their integration. Two teams, a responsible and shadow team, manage NPD activities by exploiting their complementary



competences and market knowledge. Also, we contribute to the R&D integration and improvisation literature emphasizing how planned integration may not suffice: planned integration cannot ex-ante predict and fill all interstices between distant firms and some integration mechanisms may not be effective. Indeed, planning needs some improvisation but also improvisation is effective if built upon a minimum structure (Miner, 2001). Overall, firms willing to accelerate their integration can use NPD activities to test planned organizational solutions, fill in interstices and complete their integration.

The interplay between improvisation and planning during NPD activities enact a learning process. Besides, the knowledge generated by this process may be project specific and risky to be applied to other settings. Indeed, future studies may focus on how firms select and retain the knowledge created mixing improvisation and planning during NPD activities.

Also, future study may analyze a) the performance of firms that decide to balance improvisation and planned integration during their integration process; b) the relative weight of improvisation up to planning in most performing R&D integration processes and; c) which is the minimum level of structure upon which firms may improvise.

Finally, future researches may study the impact that firms' distance has over planned integration mechanisms, improvisation effectiveness and their balance, with a particular focus on human resources features that enable improvisation between distant teams during NPD activities.

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**Table 1****Interviews list**

<b>Place of interview</b>	<b>Date</b>	<b>Interview length in hours</b>	<b>Role of person interviewed</b>
Auburn Hills (USA)	15/11/11	1	Chief Technology Officer (Fiat Group) and Head of Engineering (Chrysler)
Torino (ITA)	21/12/11	1	VLE - B-Suv segment
Torino (ITA)	21/12/11	1	Head of NPD W&E Europe
Torino (ITA)	29/05/12	1	Fiat-Chrysler Research & Innovation Responsible & Fiat Research Centre S.c.p.A. General Manager, Vice President International Corporate Communications
Torino (ITA)	29/05/12	1	VLE - B-Suv segment
Torino (ITA)	25/07/12	2	VLE - B-Suv segment
Torino (ITA)	23/10/12	1	VLE - B-Suv segment