How to start a revolution: organizational changes and lean system at the FCA Pomigliano plant[1]

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Abstract

***Purpose of the paper**: The study has two goals: first, we highlight the inadequacy of mainstream change management models to fully explain complex change interventions; secondly, we juxtapose WCM (World Clan Manufacturing) and change management and propose a framework that integrates elements of emergent change models with the so-called planned change models, in the light of evidence collected from a WCM reorganization in the FCA Plant in Pomigliano.*

***Methodology**: We perform an inductive case study of how the Fiat-Chrysler Automotive (FCA) group managed change at its Pomigliano plant from three sources-archived data, direct interviews of FCA managers and employees, and field observations of the production plant*

***Results**: The study demonstrates a new model of organizational change characterized by diffuse processes, activated by the hybrid choices between organizational design and emergence.*

***Research Limitation**: The analysis is limited to the case in point, even though highly representative in terms of the themes addressed in the paper.*

***Managerial implications**: Two main normative implications emerge from this work: first, seeding methods centered on agents of change represent a viable alternative to traditional triggering methods; and second, the involvement of all personnel is very important in both the design and the implementation of change.*

***Originality of the paper**: Our proposed analytical framework allows for the identification of a hybrid model for conducting organizational change that integrates several of the existing prevailing models.*

Key words: organizational change; lean production; automotive; change management

1. Introduction and overview

Between 2008 and 2013 the FCA Pomigliano plant (Naples) was the focus of a broad debate in the press and among social groups; in the scientific field, the discussion focused on the industrial relations between the company and the surrounding area. However, the academic discussion has so far focused little on the important innovations of process and the managerial decisions that took place in this controversial production

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context. In fact, what happened at the plant is one of the most extraordinary examples of transformation and recovery of a production line seemingly destined to close. The case of Pomigliano, therefore, constitutes an exceptional opportunity to study the management of change in a complex situation.

The fundamental idea of *change management* is the management of a structural change consistent with a strategic business reorientation. It is often stressed in the literature (Burnes, 2004) that change, while being an inescapable characteristic of any company, its management should be one of the basic skills of managers (Senior, 2002). In particular, one would expect, both from the theoretical point of view and as regards the nature of regulatory approaches, the emergence of a solid and coherent corpus of guiding principles. However, this expectation does not coincide with reality (Todnem By, 2005): despite many attempts to interpret and systemize change management practices, the overall picture remains fragmented and, to some degree, contradictory. In addition, the idea of change management is often expressed quite generically with regard to the relationship between scale and pervasiveness of change. A further cause for dissatisfaction is related to change practices associated with the design implementation: by nature, planned projects are-or should be-instruments of change, and change management techniques should, therefore, relate to these transformations.

For these reasons, our study has two goals. The first is to account for the substantial inadequacy in change management literature to provide an appropriate framework for understanding the implementation of a complex exercise of change. The second is to contribute to an improvement of the existing interpretative schemes, by proposing a framework that incorporates certain elements of the notion of emergent change into the setting of so-called planned change. To achieve these goals, we inductively reconstruct the example of radical transformation provided by the FCA Pomigliano plant.

The remainder of this paper is structured as follows. In the next section, we summarize the characterizations offered by the literature of the principal change management frameworks. A section detailing the methodology used to reconstruct the present case follows this. Therein we offer a summary of the historical evolution of the plant to illuminate the particular difficulties inherent in the plant's transformation. Finally, we turn to the explanation of the case, give our analysis, and draw conclusions from its example.

2. Change management: a synthesis of the literature

Change management is defined as "the process of continually renewing an organization's direction, structure and capabilities to serve the ever-changing needs of external and internal customers" (Moran and Brightman, 2001, p. 111). Change management should, therefore, be an essential element among managerial practices and principles. However, some meta-analyses of cases of change (King and Peterson, 2007) agree that successful

completion of an organizational change initiative is not an event to be taken for granted, as confirmed by failure rates of 70-81%. One critical issue is the lack of common theoretical and normative frames of reference (Burnes, 2004). In fact, the literature on change management presents a fragmented framework (Todnem By, 2005). The keys of this fragmentation are two: first, projects of change are extremely heterogeneous amongst each other, a factor making a systematic approach difficult; moreover, the approaches and conceptualizations emerge from irreconcilable conceptions about the very idea of change.

An attempt to bring the numerous change management contributions into sharper focus was proposed by Senior (2002): every change phenomenon can be described in three dimensions - frequency, scale, and approach to management (cfr. (Tab. 1).

Tab. 1: A characterization of change management

Approach	*Frequency*	*Scale*
Planned	Discontinuous	Fine tuning
Emergent	Incremental	Incremental adjustments
	Incremental in leaps	Modular transformation
	Continuous	Corporate Transformation
	Continuous in leaps	

Source: Adapted from Senior, 2002

From the perspective of change pace, we can identify at least five methods. The first, 'discontinuous change', is characterized by rapid changes in strategy, structure, or culture - or in all three together (Grundy, 1993) - and it includes discrete readily identifiable events with a clear beginning and end. 'Incremental change', however, concerns discrete incidents related to particular organizational issues or aspects, which are addressed sequentially. When incremental change does not take place within a frame of periodic review or according to scheduled processes, we can talk about 'incremental change in leaps', characterized by periods of stagnation that are followed by periods of rapid change to reach a tipping point (Romanelli e Tushman, 1994). In contrast, change is 'continuous' when the organization as a whole adopts an approach of monitoring and constantly adapting to exogenous and endogenous changes (Luecke, 2003). When there are strong temporal discontinuities and the clustering of change episodes alternating with periods of relative stasis, we refer to change as being 'continuous in leaps'.

The scale of change is the second relevant variable. In the classification proposed by Dunphy and Stace (1988), we move on to the concept of 'fine tuning', the adaption of personnel and procedures to a given strategy, 'incremental adjustment' referring to discrete changes in procedures or organizational structure, 'modular transformation' associated with the change of an entire sector of the enterprise, to the radical concept of 'corporate transformation' involving the entire corporate structure.

Two types of approaches emerge from the literature. The classical idea of 'planned change' (Elrod II and Tippett, 2002) provides that before

adopting a new behavior, it is necessary to identify the unacceptable elements of current behaviors and to define actions to bridge the gap. In such approaches, the clear priorities are the ability to define the areas of change, to design the path toward it, and to promote the participation of the relevant actors to bring about the change, starting from top management. In contrast, the approach of 'emergent change' proposes the necessity of governing change from the bottom of the transformation, given the distance between top management and the strategic sensors that signal the problems, and the relative conservatism of management. In this case, change is viewed as a continuous and open process, able to handle uncertainty and complexity.

This debate has recently been revived by the reflections on change wrought by scholars dealing with lean management practices.

TPS, lean manufacturing and WCM

The most important factory transformations developed in recent decades in the automotive industry are primarily *lean* production methods originating from Toyota (*Toyota Production System* or TPS), stylized by Shingo and Ohno (Ohno, 1988). The novelty introduced by the TPS can be summarized in two basic features: reduction of production costs resulting from attention to cutting time (*Just in Time*, JIT) and the centrality of the human factor, in particular operational staff (Sugimori *et al.,* 1977) who actively participate in setting up production processes, reducing waste, and establishing multifunctional teams. These elements are integrated with other tools such as statistical quality control and *zero inventory* methods (Monden, 1983).

An understanding of such practices can be traced to MIT's research program on the automotive industry (Womack *et al.,* 1990) that formalized and popularized the concepts of *lean management*. This is a systematic approach in which change is realized to adapt to an indirect stimulus (Spear e Bowen 1999), as opposed to normative approaches such as the TPS that is of a prescriptive nature (Shah and Ward, 2003).

The Western attempt to adopt Japanese methods is represented by WCM (*World Class Manufacturing*) (Hayes and Wheelwright, 1984) and stems from the awareness of productivity gaps in the U.S. manufacturing industries with respect to the Japanese one. WCM embodies a set of practices, implying that the use of best practices would lead to superior performance. Such practices are mainly rooted in the TPS experience and include, among others, workforce participation, workforce skills and capabilities, competition through quality, and incremental improvement approaches (Flynn *et al.*, 1999). The method is currently articulated around a set of technical and managerial pillars, whose number has grown over time as a result of inclusion of new strategic instances and application areas. Schonberger (1986) considered seven pillars, whilst the current mainstream implementation includes ten pillars (Yamashina, 2013). The WCM approach is fostered by the World Class Manufacturing Association, a not-for-profit organization of manufacturing companies founded in 2006; in 2013, it included 166 companies in 16 different countries. It supports

and audits the introduction of WCM practices worldwide and assigns "WCM Awards" to the leading plants (Chiarini and Vagnoni, 2015).

Alongside the efforts to standardize and codify Japanese tools and practices, there exists the opposite tendency to differentiate from the management approaches originating in Toyota, by introducing specific variations better suited to local contexts (Netland, 2013).

The Fiat-Chrysler Automobiles (FCA) group has centered the improvement of its production process on the logic of WCM that, based on ten technical pillars and ten managerial pillars, introduces and propagates the process over seven stages.

The process of introducing WCM in FCA represented a turning point for the entire group, from 2005 onward (Ketter, 2008). In the period 2006-2009, the spread and adaptation of the WCM system had already produced a number of results in terms of efficiency and the development of organizational practices (Ketter, 2010): by the end of 2012, WCM had already been introduced in 109 plants, representing coverage of 95% of the total operating costs of the group (FIAT, 2013).

Lean management approaches pursue a steady pace of introduction and change, mainly in order to secure integrity and stability (Bhasin, 2012). Likewise, WCM exhibits an incremental nature in its application, as it provides for the identification of a pilot (*Model Area*) that allows experimentation in the introduction of techniques and principles, to be extended subsequently to the entire structure only if proven helpful. It is common practice, particularly with respect to each facility, to designate a department or an implementation model for a project addressing a specific pillar of WCM.

The typical factor triggering improvement initiatives is that of *Cost Deployment*. This pillar allows the assignment of costs or losses to the conditions of inefficiency that occur in an operating environment (Yamashina, 2013). This method allows prioritizing, by efficiency levels, the areas and contexts in which to intervene, in addition to measuring the potential savings achieved by such intervention.

Combining the main findings of the literature on change management with the specific perspective contributed by scholars investigating lean management techniques, more in general and specifically WCM, allows us to indicate two research goals. The first, most obvious, goal becomes that of understanding WCM and similar techniques within the more general change management literature. The second is that of improving the understanding of the duality between the concepts of emergent and planned change. As we have seen, this dimension is considered as a dichotomous key and oppositional, from different interpretive currents, and yet it remains unclear how this opposition plays out during change implementation.

3. Method and field of research

In this section, we first illustrate the research strategy adopted to make sense of the change management process conducted by FCA at the

Pomigliano plant. Next, we summarize the plant's history and highlight the elements that characterized the factory's transformation.

3.1 The strategy of research

Method and data collection strategy

The aim of this study is that of improving our understanding of the process of change management, specifically enhancing our comprehension of its critical success factors, as this has been clearly identified as one of the most glaring gaps in the existing literature on change management (Todnem By, 2005). For this reason, we decided to adopt the empirical analysis of a single, exemplary, case (Yin, 1994) that can represent an ideal laboratory for such an endeavor. This choice is justified essentially by our need for a case that could be objectively considered a success according to standard organizational measures of performance, and yet, that allowed a level of access compatible with the need to understand the process of managing change in its details.

Our analysis of the case required a recursive interaction between data collection and coding and theorization (Yin, 1994; Denzin and Lincoln, 1994). During a preliminary phase, we relied mainly on open-format interviews with three key informants to roughly reconstruct the change management process. At this stage, we integrated the narrative with internal corporate documents and press releases and other publicly available written materials (e.g. communications to investors). The authors independently open-coded the materials. This stage was combined with a second phase in which open codes were matched against the theory-driven concepts derived from our starting analytical framework illustrated in section 2. The concepts and the narratives thus constructed were used to inform the semi-structured interviews of the following phase that largely confirmed the robustness of the constructs. One might argue that the relatively small number of interviews of insiders of the plant - at all levels - conducted in this stage does not offer a comprehensive picture of the process. However, we found that that theoretical saturation (i.e. the convergence of data around common themes) occurred after just 6-7 interviews (Duncan *et al.*, 2001). The third phase, where we refined the starting theoretical framework enriching it with the constructs emerging from the coding, followed. This method allows a reconstruction of the causal relationships between the constructs under examination and at the same time permits an appreciation of its complexity, including a view toward deriving regulatory constructs (Eisenhardt, 1989; Eisenhardt e Graebner, 2007). The triangulation of different data sources (documents, interviews, presentations and direct observations) allows cross-validation and verification of the reliability of sources in terms of accuracy of the data and the subsequent results (Yin, 1994).

Below we present the results of our analysis in narrative form using excerpts of select interviews, to draw a more accurate and vivid picture of the setting.

Data

We can distinguish three main sources in our process of data collection. The first was based on the collection of documents, internal to the FCA group or from other sources, which reconstruct, albeit in a simplified way, the type of organizational intervention used in restructuring the Pomigliano plant. The field work in support of the documents took place at various times: the tours of the plant allowed direct observation of factory work and interaction with members of the press department, the assembly department, and the metrological center, in addition to participation in the DIM (Daily Improvement Meeting). Finally, a third source is represented by interviews with several informants in order to precisely reconstruct the process of change management as it occurred at Pomigliano (Tab. 2.)

Tab. 2: Sources of data to support research

Interviews	Subject of interview	Interviewees	Date	Location
	Pomigliano plant manager	2	18/07/2014 13/02/2015	Pomigliano
	Former Pomigliano plant manager	1	21/11/2014	Torino
	Pomigliano HR director	1	13/02/2015	Pomigliano
	Former Pomigliano director of personnel	4	14/05/2014 18/07/2014 21/11/2014 13/02/2015	Trento, Pomigliano (2), Torino
	HR Director of FCA Manufacturing	1	21/11/2014	Torino
	Director of Manufacturing of FCA EMEA	1	21/11/2014	Torino
	Team Leaders	3	13/02/2015	Pomigliano
	Supervisors	2	13/02/2015	Pomigliano
Documents		Origin	Title	
		FCA	Presentation: The organizational revolution of Pomigliano	
		FIAT	Sustainability Reports - 2011-2015	
Field observations	Date		18/07/2014 13/02/2015	

Source: Our elaboration

3.2 Our research setting: the Pomigliano plant

The FCA plant in Pomigliano has a lengthy history. In 1938, the IRI (Istituto per la Ricostruzione Industriale, a State-owned Holding) decided to create an Alfa Romeo production center for military aircraft engines.

In the mid-1960s, a mass-market production project was launched to manufacture a four-door car intended for middle class buyers, known as 'Alfa-Sud' (Pesce, 2013). Pomigliano was a typical Taylor-style plant, with an assembly line, reliance on division of labor, and a very hierarchical organization.

In 1986, the IRI decided to sell Alfa Romeo to FIAT. The production of various models of the new FIAT-Lancia-Alfa Romeo Group was assigned. FIAT put in place a strategy dedicated to trimming down the Pomigliano plant. From 12,800 employees in 1987, they downsized to just 5,000 in 2002. The plant output rose to around 200,000 cars per year in the period 1989-90 and peaked in 2001. In the following years, there was a steady decline in production. In 2005, the production was in fact equal to roughly half of that in 2001 (Simone, 2006).

In 2007, the Pomigliano plant produced the Alfa Romeo models 159, 147, and the GT, by then advanced models. The plant was deemed problematic, to say the least. The absenteeism rate was quite high. A sizable number of employees happened to be absent for any plausible reason, like soccer matches or elections: in 2008 alone, there was a 30% absentee rate for electoral permits. (Mania, 2007). Moreover, very few employees wore work uniforms, and precautionary safety gear was not used.

The product defect rate was high, at roughly ninety percent (Mania, 2007). The prevailing logic was quantitative: it consisted in producing a certain number of cars per day, without regard to quality, but required the reworking of numerous pieces prior to salability. Between January and November of 2007, there were 150 micro-strikes that halted production without prior warning.

In early December 2007, FIAT announced a plant revitalization plan that would drastically change the workflow. With an investment of 110 million Euros - 70 designated for the redesign of the equipment layout and 40 for retraining employees and paying them two months' salary during the training phase (Volpato, 2011).

During the traditional pre-Christmas "family day" celebrated with employees and their families, Sebastiano Garofalo, plant manager, explained that the risk of plant closure was high and what lay ahead was a last chance: if the new investment and training failed, there would be no further opportunity.

A single event symbolized the turning point: with systems down, the plant began layout improvements and intensive training programs that would last until March 2, 2008. From the second quarter of 2008, the European car market was hit by an unprecedented crisis and the plant was forced to drastically reduce production levels.

The survival of Pomigliano was linked to the launch of a new car model with positive sales prospects. Marchionne, CEO of the group, evaluated the possibility of bringing production of the model *Nuova Panda* to the plant.

The strategic action involved complete reorganization of the production process according to the principles of World Class Manufacturing (WCM) in order to make the Pomigliano plant a laboratory example for eventual application of the new system to the rest of the Italian FIAT-Chrysler plants (Campagna *et al.*, 2015).

3.3 The WCM at Pomigliano: operational profiles

The path to redesigning productivity at the Pomigliano plant reflects the FCA orientation toward the WCM, starting with daily operations. At

first glance, the WCM can be traced back to traditional *lean* methods, only with customization. For example, the Poka-yoke design is evident in simple and effective technological solutions such as the requisite routing of departments along the line, visual and audible assembly signals, and calibrated instrumentation.

Lean management tools are used systematically: statistical quality control, *Kanban*, and Andon signals, just to mention a few. Another obvious tool is holding a regular meeting at the start of each shift to discuss, consolidate, and continuously improve work process and best practices; the *Daily Improvement Meeting* (DIM) is an instrument used pervasively for internal processes but scarcely applied to supply relationships. However, it is important to identify the peculiarities of the selection process that have led to the use of these instruments in the factory setting.

The timing of the interventions

Pomigliano had been undergoing upgrades since 2008. The operation of the plant was interrupted for about two months for the introduction of a series of changes aimed at reorganizing production lines, improving the layout of certain departments, and redefining certain assembly processes for the Alfa Romeo models. On this occasion, certain continuous improvement (*kaizen*) initiatives were developed through the involvement of workers, as well as some sessions of intensive training aimed at learning the WCM principles and instruments. The latter was achieved by training 266 employees who in turn developed tutorship initiatives for the remaining (approximately 7,000) plant workers (Ketter, 2008). These activities were instrumental in improving internal performance indicators (such as absenteeism and injury rate) as well as external ones (product warranty work), but were not yet connected to a full implementation of WCM ideas (Ketter, 2008).

In the introduction of the WCM, there was no identification made of a specific Model Area in which to focus the improvement process, nor was a specific aspect of the production process addressed. Rather the process involved the abandonment of almost all of the pre-existing production practices in favor of operational solutions far removed from the *status quo*.

Another interesting element of the WCM implementation is Cost Deployment: the systematic introduction at the Pomigliano plant consisted of developing a completely new product, namely the *Nuova Panda* model, previously made in Thychy (Poland) where the production took place in terms of efficiency. La *Nuova Panda* is a model with very low margins, and requires significant production volumes and minimal time intervals between the production launch and the first sales (time to market). In 2010, the production was moved to Pomigliano, while the production of the Lancia Ypsilon was transferred to Poland (Ketter, 2010).

The choice of the *Nuova Panda* represented a challenge implemented in relatively controlled conditions: the aim of Cost Deployment was to improve an already known and relatively efficient process.

WCM Pillars and other planned choices

The WCM can be introduced through ten technical and ten managerial

pillars. The fundamental method for the introduction of the WCM and the distinctive aspect of this model is the human factor. Each pillar of the WCM emphasizes the involvement, empowerment, and operational autonomy of workers, in particular through education and training.

Many of the technical and organizational choices that characterized the introduction of the WCM in Pomigliano and led to its diffusion are fairly common and can be found in many *lean* experiences (Netland, 2013). First, the overall restructuring of the production layout consisted in defining functional departments for certain stages that could not be engineered ergonomically within the line (upstroke and downstroke auto body paint coating), and including only the intermediate production stages on the line.

Still today, the standardization of the division of labor is oriented toward the multi-specialization of skills, and such standardization is specifically required to receive WCM certification. This arrangement is accompanied by job rotation at the workstations, managed by the teams themselves in order to facilitate the acquisition of comprehensive and widespread knowledge on the part of employees.

A small division between technical and managerial roles was also designed, through the presence of technologist staff figures in the departments and supply table instrumentation that had been previously operated by specialized staff units. This element too demonstrates the broad delegation of decision-making and accountability extended within the team.

3.4 The elements of transformation at Pomigliano

Discontinuity (I): Work Place Integration and study of the Virtual Line

The first novelty in change management for the Pomigliano plant took place with the implementation of the so-called Work Place Integration (WPI). The WPI is an exercise in micro planning of tasks involving characteristics that are new with respect to the traditional approaches; the goal is to achieve a production line that allows employees to work at their best, with some measure of discretion. This macro-objective results in the definition of sub goals in ergonomics, safety, internal material handling, and respect for the work environment, autonomy and quality. The first step saw the virtual reconstruction of the assembly line on paper, representing the proposed modification of the exact sequence of the workstations and the flow of materials and labor. The WPI saw the involvement of 182 employees, including 69 workers from the Pomigliano plant and 50 experts in WCM techniques from other plants in the group. Thus the tasks of individual workstations were performed by mixed groups of expert ergonomists, task specialists (workers), and technologists from all the plant departments in order to ensure continuity and consistency of the workflow. The result of this work was the total redesign of transformation process. Notably, however, some cardinal principles of the organization of work at the plant were established: (1) the work team (*il dominio*) and team leader (*il capo-dominio*) and (2) the rethinking of the Elementary Technological Units (UTE).

The work team is a group of six workers led by a skilled worker, the team leader. Each team is in charge of a portion of the production process and operates a contained, although variable, number of elementary operations, such as the assembly. A team is characterized by a division of labor into individual stations accompanied by a consistent job rotation, entrusted at the time of its execution to local employee choice. The operative rule for promoting job rotation is the so-called 3x3x3 rule: three people must know all of the stations of the work team, at least one person must know at least three stations, and for three critical positions, several workers must be interchangeable. The rotation allows a better understanding of the overall team task and a lower level of stress attributable to repetition of tasks. The team is the basic organizational unit of the plant, but also the unit around which the other organizational structures have been designed. In particular, specialists (engineers) and management are thought to provide support for the work of the teams and to allow them to fully develop their potential. There is a genuine redefinition of these roles from essentially managerial tasks and control to team support and problem solving. This is described perfectly by one of our interviewees:

> Team Leader 2: [Team Leaders already existed] but they used to report everything, everything had to go through the supervisor. Then the supervisor, in turn, went up to his boss… there was a long process to follow […] [if I have a problem] now, by contrast, I go straight to my peer.

Even the layout provides a clear indication of change: offices are located at the center of the plant in a transparent glass enclosure that facilitates the exchange of visual cues and direct access to the area of specialized knowledge from the line.

The team leader is central to the reorganization of FCA. In the initial setup phase, the team leader selects, in part, the individual members of his/her team. At this time, the team leader also oversees their training on the 'micro plants' (see later sections) and gradually places them in the line. From an operational standpoint, the team leader has two essential tasks: the basic task of replacing any missing elements of his/her team, and supporting team members in solving problems on the line. This also means that the team leader has the responsibility for any line shutdowns owing to problems in assembly associated with the team's workstation. It is the responsibility of the team leader to signal the team's operational failure or problems in lead-time consistency that become global and shut down the line. Line shutdown is required if the problem is not resolved within 100 seconds.

The team leaders were identified in the first phase of the organizational change management through a selection aimed at identifying individuals with sound technical training (possessing secondary school training consistent with the job tasks), experience, relatively young age and high motivation level. The selection was then continued in the specific micro plant training, in which phase the search concretely focused on strongly process- and result-oriented individuals. This stage focused not on the hire of new workers, but rather on the selection and training of experienced

personnel. In the previous organization of the plant, teams had been formed of ten people, but often expanded to twelve or thirteen. Therefore, the ability of the team leader to closely supervise the line was in fact very weak, a fact making its position stressful. In addition, the team leader had a nearly exclusive supervisory role without having responsibility for the team's precise results.

The UTE had been a cornerstone of the organization of the Pomigliano plant even in the pre-FCA era. The UTE had been conceived as a 'small factory' and identified by a production goal. Within the UTEs were present all the professionals necessary for the transformations and their support (technological experts, material logistics managers, supervisors) with a series of quantitative and qualitative targets relative to a result. The new UTEs were different: they did not map the product in an isomorphic way, but could rather be seen as a collection of teams prepared sequentially without assigned objectives. In addition, the activity of supporting the main line was no longer assigned to the UTEs, but rather arranged and assigned according to a logical process as a whole throughout the UTEs.

Discontinuity (II): the Workshop

In April 2011, the plant held a training workshop that involved 150 workers from all organizational levels. The Workshop had multiple goals, each instrumental to the implementation of the production line in its Virtual Line design, and characterized by the use of heterogeneous work groups for training, formal roles, and professional history.

The individuals involved were divided into small groups of four to five units, each of which had the task of dealing with a specific topic related to the plant and its ongoing change. The Workshop was clearly a turning point in the life of the plant:

> Team Leader 2: The workshop has represented a very important element of change. The workshop has been an experience during which… we all got together, people from different levels, from the director to us, the team leaders… we formed groups of mixed people.

In total twenty-five different mini-projects were developed in this way to cope with several critical points proposed by the reorganization. The most relevant result, however, was the precise definition of new key roles: the team leader, the supervisor as a sort of second-level team leader who coordinates a comprehensive set of teams, specialists, and technicians, with the task of continuously supporting the line both from an operational point of view and the point of view of incorporating ideas of continuous improvement. From the training perspective, consistent with the objectives, concepts related to the new way of doing things were emphasized. In particular, other than redefining roles, emphasis was made of the concept that each operator would bear personal responsibility with regard to results, particularly in terms of product quality, reaction time in response to problems, and proposal of innovative solutions for improvement.

The FCA management was convinced of the need for full staff involvement to succeed in transforming the Pomigliano plant. A

distinguishing feature of the previous factory organization was the perception of a notable gap between management and workers. The division of labor, of the Taylors style, between those responsible for designing the work system (managers) and those performing the work (workers) meant for the latter a strong demotivation accompanied by an equally strong lack of responsibility, with reverberations on the results and on the degree of responsibility claimed for such results. The new manufacturing approach was characterized by the move toward a widespread use of discretion even among the workers, and required that all workers take responsibility, resulting in a decentralization of decision-making. The first passage to the new system consisted in the Workshop: the working groups were formed to enable direct communication between managers, employees, and line workers.

> Team Leader 1: […] because they [blue collars] found a completely different plant, we all started from the same level, this is why there was no past. We all started from the same experience, as if we had entered the factory for the first time.

It is clear, from the design intent already explained in the section on Work Place Integration, that the team leader was the central element in the new production method put into place in the FCA plants. Given the projected transformation, the selection of the team leaders became central to the successful implementation of the new factory system. Beyond defining certain critical demographic and attitudinal characteristics requisite to the role, the workshop represented the ideal setting to seek out individuals with proactive problem-solving approaches and offered an opportunity to identify those who would become the first team leaders.

From the perspective of training, the Workshop was crucial. Teamwork in the new factory organization directly corresponded to the way different groups approached plant problems during operations. In the team, being the primary work unit in the new factory, the responsibility was widespread and shared by all. The role of the new team leader was not to "supervise" the work of the others for monitoring and evaluation purposes, but rather to support and assist other team members, correct any problems that arose, and establish procedures for carrying out job rotation and on-the-line training. The philosophy behind the Workshop was, therefore, that of transforming individual attitudes in the direction of taking on greater responsibility and involvement. This was true for those selected as team leaders, but also line workers and managers, and technical staff and directors, who saw the corresponding transformation of their *modus operandi*. In fact, the management in the new configuration mainly assumed the task of supporting the line.

The discontinuity (III): the micro plant

One key element in structuring the organizational transformation of the Pomigliano plant was that so-called *micro plant* ("*pilotino*"), a simplified representation of the assembly line for the primary purpose of training staff in the operations associated with each stage of the assembly line. The

particularity of the micro plant with respect to the line stations was the ability to regulate the assembly timing and methods, thus facilitating the ability to learn the tasks and understand the relationship between actions performed and results obtained.

The micro plant already existed.

> Supervisor 1: … but it was far away from us. It was located in Turin, not all of us knew of its existence. As a supervisor, I knew it after 4 years. On the contrary, now it is something fully integrated in our plant.

In order to understand the profound change introduced at Pomigliano in the use of the micro plant, it is essential to describe how the plant management chose to use this tool.

> Supervisor 1: In the past, the training sessions were carried directly on the assembly line, on the car, and that created many problems. Today, we don't do that, we use the micro plant. The worker and his/her team leader move to the micro-plant to train. Only after receiving the certification […] they are allowed back to the actual assembly line.

The micro-plant is, in essence, a real assembly line, located in an area of the plant dedicated to training, and in which it is possible to instruct workers in the various assembly actions required at each workstation. In the micro plant, instructors are able to observe individuals in training in order to comment on their performance.

Currently, the micro plant is utilized in two ways to reach an even more valuable set of learning objectives. The methods employed were those traditionally used as described above, and new virtual reality methods. In the latter, workers could be trained to carry out operations using Virtual Reality tools, particularly viewers and haptic interfaces (specifically gloves), to enhance perceptual feedback corresponding to actions taken on a virtual line, where machinery and objects simply appear before the operator. This method presents some definite advantages: it is extremely safe as it avoids potentially dangerous physical contact with machinery and moving parts; it allows assessment of work in progress in order to manage and improve aspects of the job critical to productivity or ergonomics prior to progressing to the line itself; and finally, it allows the employee to contribute actively to the job design by proposing measures to improve standard procedures prior to inserting them on the line, in full coherence with the WCM's strategy of continuous improvement.

4. Toward a new change management model?

The change management model adopted by FCA is not easily classified in the traditional categories found in the literature: on the one hand, it presents elements attributable to more analytical schemes; while on the other hand, the process of change presents certain unique traits that suggest the presence of a highly innovative practice. Three dimensions characterize the adopted model of change:

a) the presence of discontinuous elements that allow signaling of the need for profound changes in the factory system;
b) the use of change management ideas based on *seeding* employees on the line and on the subsequent propagation of the practice;
c) the targeted selection of certain WCM pillars related to human resource development as a means of transforming production processes.

The first dimension prompts the notion of radical change (Lewin 1947), characterized by the application of the classic unfreezing-change-refreezing technique. The obvious approaches is the proposal to discontinue certain elements from the past to serve the dual purpose of providing a moment for organizational redesign and signal the passage from one state of transformation to the next.

The most important element in this regard was clearly the Workshop, from which arose the decision to close the plant and radically redesign its organization: in fact, all interviewees agreed that, on both substantive and symbolic levels, it was a pivotal moment in the beginning of the revolution in Pomigliano. The Workshop represented the moment of the conceptual *freeze* of the choices taken. The elements of radical transformation were to reverberate even on related decisions such as the redefinition of hierarchical levels (from seven to five) and job descriptions, in the team leader selection process with its questioning of pre-existing roles, and in the introduction of mixed teams of techno structural experts and operators.

The literature also emphasizes the importance of signaling the discontinuity through appropriate communication interventions that highlight the moment the change begins and crystallize its characteristics for all to see. In the case of Pomigliano, the Workshop sought to achieve four converging goals: a) to communicate the scope and the significance of the change in order to overcome the conservatism present in complex organizations, particularly in situations where the risk perceived by the individual is very high (job security); b) to identify a leadership adequate to meet the new challenges associated with reorganization; c) to train people for the reality of the new factory; d) to emphasize, even if only symbolically, the break with the previous work climate. According to its participants, the Workshop achieved these goals. Even the manner of development of the UTE represented a further example of breaking with the old: the intervention was decidedly different from the Fordism style, which saw a clear separation between techno-structural specialists, delegated to task design, and line operators. In particular, there was less role separation even physically: the planning responsibility was shared, to enhance divergent views that allow a better understanding of the phenomenon that typically need to be managed in a *lean* perspective.

At Pomigliano it was decided that production would recommence with a model never before produced in that plant and that the entire process would be revolutionized; however, the technical, economic, and operative features that characterized the production of the Panda were known *a priori* and imposing them at Pomigliano meant relying on a context of reference that was at least partially known and controlled.

The change assumed a global dynamic that, after starting with a relatively reduced fraction of the line workers, gradually extended the

knowledge of the new practices and value systems to the entire plant system. The crucial moment consisted in the seeding choices, namely the identification, selection, and training of the staff members who in turn would become the principal agents of organizational change.

The selection process began even prior to the workshop, during which it increased in importance, and culminated in the identification of the team leaders. At this stage, the positions and roles reached previously were called into question and selection of the new figures was carried out primarily based on the attitudes that facilitate the sharing of knowledge. The team leaders constituted the first group of line staff exposed to the innovative problem-solving practices, as well as the operative tools and methods of WCM. This first group was systematically exposed and trained in practices emphasizing the elements of accountability, empowerment, and work engagement. Only in a later phase were the work groups formed, granting ample freedom to the team leaders in the selection of their staff.

Finally, the WCM pillars were the tools that guided change, in an incremental nature, through seven phases toward the subsequent Model Area: as one might have guessed, this structure was not precisely the case.

The technical and managerial pillars of the WCM are by their nature strongly interconnected and characterized by the development of complementarity and positive cross-effects. This aspect suggests the possibility of identifying certain pillars as primary factors of change and utilizing them indirectly to govern the development and coordination of subordinate pillars. For example, the pillar of Cost Deployment addresses cost and waste reduction; as a result, the levels of safety and quality (directed by other pillars) are improved in direct measure to the reduction of waste and inefficiency (Chiarini e Vagnoni, 2015). This flexibility appears to be an original feature of the WCM and demonstrates significant potential for adaptation to different production environments (Yamashina, 2013; Netland, 2013).

Tab. 3: Comparison of Change Models

	Clean slate / Big bang	Model Area	Pomigliano/Seeding
Pros	- Allows optimization of entire process - Top-down standardization of internal process - Allow change of internal culture - Fast	- Allows controlled testing of new solutions - Allows workers to significantly contribute to change - Low cost - Facilitates learning by doing	- Relatively fast - Allows workers to strongly contribute to change - Allows learning by doing. - Bottom-up standardization of entire process - Conserves part of past (that which is compatible with the new culture)
Cons	- Very costly in terms of financial/ human resources - Any pre-existing skills and knowledge are discarded - Generates problems related to internal communication and acceptance ("not invented here", poor motivation among those accustomed to working in a different way)	- Slow implementation process - Difficulty with portability of solutions from one problem area to another - Requires good starting point in terms of the efficiency of the entire plant (few bottlenecks)	- Possible conflicts between those who agree and those who reject change (creation of factions) - Requires great care in choosing the change agents (team leaders)

Source: Our elaboration

In Table 3, we compare the "Pomigliano seeding" model described herein to the prevailing models found in the literature. The design of a change model with such characteristics allows a balance of the benefits and the disadvantages from the different change models detailed in the literature (Clean Slate, Model Area), particularly in regards to the speed of implementation and achievement of results, the flexibility of application, and the possibility of maximizing organizational dynamics and coordination.

5. Conclusions

The restructuring project at the Pomigliano plant presents several interesting aspects, on the one hand relevant for similar cases in the Italian industrial landscape, but on the other hand for the peculiarity of the approach followed by the FCA management and staff in implementing a remarkable upheaval in what appeared to be a plant condemned by deeply unsatisfactory work culture and management. Among the many possible themes, we chose to focus on the analysis of the organizational transformation process.

The main contributions of this work to the debate on change management are two. The first, of a substantive nature, concerns the particular method of triggering the change process adopted by FCA at the Pomigliano plant. To implement change, the FCA management chose the path, seemingly hybrid in nature, of progressive contamination. It was neither a 'revolution in a vacuum' nor an incremental approach, but rather the identification of change agents (team leaders) that were then disseminated in the new departments with the dual role of selecting their fellow workers and mentoring them in learning new tasks. At the same time, a few 'pillars' or dimensions of change were chosen that then helped to activate the other dimensions that make up the WCM philosophy chosen by FCA.

Our second contribution is conceptual in nature and goes toward a different understanding of the relationship between the emergent and the planned aspects in the implementation of change. Traditionally these two methods are viewed as conflicting and incompatible. It is clear, however, from close observation of the FCA events that we are facing a different model: change is planned, in the sense that the methods of change are identified in an essentially bottom-up design, in such a way that the agents of change themselves produce the greatest and most important part of the change. The management plays an important role in supporting and sustaining the improvement initiatives arising from their own work team.

Of course, these results should be viewed in a precise framework. Specifically, the special, even unique, traits related to the context of the FCA plant make it a complex task to apply and extend the results verified herein. In particular, it is useful to note that specific conditions of their industrial relations heavily influenced the path FCA followed in implementing change.

For this reason, a first obvious direction for future research is the extension and application of WCM to other projects in plants of the FCA group located elsewhere. From this comparison of the process, it would be possible to determine more easily the manner in which the Pomigliano plant's peculiarities fostered a particular and favorable outcome. A second extension, of a more general nature, would include a comparison of the practices of adoption of WCM in other firm contexts, in particular in companies with a longer history of "lean" work practices.

Bibliography

BHASIN S. (2012), "An appropriate change strategy for lean success", *Management Decision*, vol. 50, n. 3, pp. 439-458.

BURNES B. (2004), "Kurt Lewin and the planned approach to change: A re-appraisal", *Journal of Management Studies*, vol. 41, n. 6, pp. 977-1002.

CAMPAGNA L., CIPRIANI A., ERLICHER L., NEIROTTI P., PERO L. (2015), *Le persone e la fabbrica. Una ricerca sugli operai Fiat Chrysler in Italia*, Guerini Next, Milano.

CHIARINI A., VAGNONI E. (2015), "World-class manufacturing by Fiat. Comparison with Toyota Production System from a Strategic Management, Management Accounting, Operations Management and Performance Measurement dimension", *International Journal of Production Research,* vol. 53, n. 2, pp. 590-606.

DENZIN N.K., LINCOLN Y.S. (1994), *Handbook of qualitative research,* Sage, Thousand Oaks.

DUNCAN M., MOULY S., NILAKANT V. (2001), "Discontinuous change in the New Zealand police service-A case study", *Journal of Managerial Psychology,* vol. 16, n. 1, pp. 6-19.

DUNPHY D., STACE D. (1988), "Transformational and coercive strategies for planned organizational change: Beyond the OD model", *Organization Studies*, vol. 19, n. 3, pp. 317-334.

EISENHARDT K.M. (1989), "Building theories from case study research", *The Academy of Management Review*, vol. 14, n. 4, pp. 532-550.

EISENHARDT K.M., GRAEBNER M.E. (2007), "Theory building from cases: opportunities and challenges", *Academy of Management Journal,* vol. 50, n. 1, pp. 25-32.

ELROD P.D. II, TIPPETT D.D. (2002), "The 'death valley' of change", *Journal of Organizational Change Management*, vol. 15, n. 3, pp. 273-291

FIAT (2013), *2012 Sustainability Report - Economic, Environmental and Social Responsibility*, Torino.

FLYNN B.B, SCHROEDER R.G., FLYNN J. (1999), "World class manufacturing: an investigation of Hayes and Wheelwright's foundation", *Journal of Operations Management* vol. 17, pp. 249-269.

GRUNDY, T (1993), *Managing Strategic Change,* Kogan Page, London.

HAYES R.H., WHEELWRIGHT S.C. (1984), *Restoring our competitive edge: Competing Through Manufacturing,* John Wiley, New York, NY.

KETTER S. (2008), *World Class Manufacturing, International Investor Day,* Torino, http://www.fcagroup.com.

KETTER S. (2010), "World Class Manufacturing: Towards excellence at Fiat Group", *International Investor Conference, Paris,* http://www.fcagroup.com

KING S., PETERSON L. (2007), "How effective leaders achieve success in critical change initiatives, part 2: why change leadership must transcend project management for complex initiatives to be successful", *Healthcare Quarterly,* vol. 10, n. 2, pp. 72-75.

LEWIN K. (1947), "Frontiers in Group Dynamics: Concept, Method and Reality in Social Science; Social Equilibria and Social Change", *Human Relations,* vol. 1 (June), pp. 5-41.

LUECKE R. (2003), *Managing change and transition,* Harvard Business School, Boston, Mass.

MANIA R. (2007), "Pomigliano la fabbrica difettosa da rieducare", in *La Repubblica* 27 dicembre.

MONDEN Y. (1983), *Toyota Production System, GE,* Institute of Industrial Engineers, Atlanta.

MORAN J.W., BRIGHTMAN B.K. (2001), "Leading organizational change", *Career Development International,* vol. 6, n. 2, pp. 111-118.

OHNO T. (1988), *Toyota Production System: Beyond Large-scale Production*, Productivity Press, New York.

NETLAND T. (2013), "Exploring the phenomenon of company-specific production systems: one-best-way or own-best- way?", *International Journal of Production Research,* vol. 51, n. 4, pp. 1084-1097.

PESCE G. (2013), *Alfasud, una storia italiana. La fabbrica di Pomigliano d'Arco dal fascismo alla globalizzazione,* Ediesse, Roma.

ROMANELLI E., TUSHMAN M.L. (1994), "Organizational Transformation as Punctuated Equilibrium: An Empirical Test", A*cademy of Management Journal,* vol. 37, n. 5, pp. 1141-66.

SCHONBERGER, R.T. (1986), *World class manufacturing: the lessons of simplicity applied*, ASQC Quality Press.

SENIOR B. (2002), *Organisational Change, 2nd Edn.*, Prentice Hall, London.

SHAH R., WARD P.T. (2003), "Lean manufacturing: context, practice bundles, and performance", *Journal of Operations Management,* vol. 21, n. 2, pp. 129-149.

SIMONE C. (2006), "Crisi Fiat Auto: la natura, le cause, gli effetti", *Sinergie*, n. 69, pp. 213-235

SPEAR S., BOWEN H.K. (1999), "Decoding the DNA of the Toyota production system", *Harvard Business Review*, vol. 77, n. 5, pp. 96-106.

SUGIMORI Y., KUSUNOKI K., OHO F., UOHIKAWA S. (1977), "Toyota production system and Kanban system Materialization of just-in-time and respect-for-human system", *International Journal of Production Research,* vol. 15, n. 6, pp. 553-564.

TODNEM BY R. (2005), "Organisational change management: A critical review", *Journal of Change Management,* vol. 5, n. 4, pp. 369-380.

VOLPATO G. (2011), *Fiat group automobiles. Le nuove sfide*, Il Mulino, Bologna.

WOMACK J.P., JONES T.D., ROOS D. (1990), *The Machine That Changed the World*, Rawson Associates, New York.

YAMASHINA H. (2013), "World Class Manufacturing Introduction"; http://wenku.baidu.com/view/07c001d2240c844769eaeea2.html, visitato in data 29 Gennaio 2016.

YIN R.K. (1994), *Case study research. Design and methods,* Sage, Thousand Oaks.

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