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Organizational change as tension management: a grounded theory

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Abstract

Purpose – Implementing automatic sorting operations in the parcel delivery industry can dramatically improve both capacity and service quality but demands radical and complex organizational change. The present in-depth grounded theory study examined a change process of this kind within one of the few global companies in the parcel delivery sector, focusing on three European hubs where automatic sorting had recently been introduced.

Design/methodology/approach – Grounded theory methodology, which facilitates the gradual emergence and dialogical interpretation of empirically grounded theoretical concepts, was particularly suited to the current project's open-ended research design and the hybrid (prescriptive but also constructive) nature of the change process under study. The investigation comprised iterative cycles of data collection, open coding, selective coding and theoretical coding over a three-year period.

Findings – In keeping with the dual nature of the change underway, a set of tensions were identified between pairs of opposite poles: manual vs automated, planned vs emergent and corporate vs site. The management of these tensions, which leveraged both prescriptive and sensemaking approaches, was found to trigger knowledge production, facilitating a gradual transition from high to low uncertainty and, consequently, progressive movement along the continuum between each pair of competing poles. Within this process, the industrial engineering function acted as an agent of change with a key orchestrating role.

Originality/value – As one of the first in-depth grounded theory analyses of tension management, this study contributes to the relatively recent debate on the recognition, analysis and handling of tensions and paradoxes in organizational change, suggesting innovative criteria for successful change management and identifying promising new avenues for research. From a managerial perspective, the study outcomes suggest that explicit recognition of uncertainty and tensions in organizational change can pave the way for solutions based on agility and continuous organizational learning.

Keywords Organizational change, Tension, Paradox, Grounded theory, Industrial engineering, Automation, Parcel delivery industry

Paper type Research paper

1. Introduction

The organizational change setting analyzed in this study is the implementation of automatic parcel sorting systems in the parcel delivery sector, a leading segment of the continuously expanding logistics industry, with a current annual growth rate of around 10% and global shipping volumes approaching 100 bn parcels per year (Pitney Bowes Parcel Shipping Index, 2019). Within this tumultuous growth scenario, the few global players in the market are experiencing enormous opportunities for expansion but also intense competitive pressure to innovate, with a view to enhancing service quality and leveraging new business models as well as maximizing capacity and economies of scale.

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Parcel sorting is a complex operational process performed in a dedicated facility called a hub. The hub is a physical place that receives stacks of incoming parcels from multiple points of origin. Parcels are unpacked, regrouped and repacked by destination.

Among new operational models and systems in parcel delivery, automatic parcel sorting is one of the most strategically important, particularly for the small number of global players in the sector. Optimum implementation of automatic sorting operations in appropriate operational areas can dramatically enhance both capacity and service quality. However, it demands complex and radical organizational change.

The current paper presents an extensive examination of such a change process, across three European hubs of a global parcel delivery company where automatic sorting had recently been introduced. In the course of a three-year grounded theory (GT) study, which included three-site visits and 43 interviews with internal informants at different levels of the organization, the authors gradually developed an in-depth understanding of a complex corporate change program aimed at expanding capacity and radically transforming the parcel sorting process. The main outcome of this research trajectory is a substantive theory framing change management as tension management. The three cornerstones of this proposed theory are: (1) the hybrid nature of change, as both rational/planned and negotiated/emergent: for example, automatic sorting, as a complex dynamic blend of manual and automatic procedures, requires both rational planning *and* experimentation, negotiation and adaptation; (2) the change agent's (in this case, the industrial engineer's) evolution from a purely technical and prescriptive change leader to a social negotiator and tension manager; (3) the need for effective change management to address uncertainty and tensions (concerning the optimum balance between manual vs automated – and relatedly between planned vs emergent and corporate vs site solutions) by generating new corporate knowledge.

This study may be viewed as building on the current debate surrounding industrial automation processes using advanced manufacturing technologies (AMT). Early studies advocating the replacement of manual activities with automatic procedures often embraced an over-simplistic view of organizational change: typically the only human factors investigated were the impact of automation on work activities, methods of overcoming resistance to change and the structure of automation project teams (e.g. Majchrzak, 1988). Over time, cumulative advances in the field of organization studies have yielded a far wider range of approaches to change, at least in terms of theoretical perspectives (Van de Ven and Poole, 2005). Yet, organizations continue to overlook the non-instrumental aspects of change and many change programs still fall short of their target outcomes (Beer *et al.*, 1990; Busse *et al.*, 2019; Hughes, 2011; Kotter, 1995; Mosadeghrad and Ansarian, 2014). Organizational factors are crucial to explaining why some change programs fail while others are successful (Zammuto and O'Connor, 1992). However, such explanations demand a focus on the nature and dynamics of change itself and a shift from the earlier view of organizational change as prescribed, rational, technical and mechanistic to a more complex understanding of it as constructive, situated and socially negotiated among actors (Van de Ven and Poole, 1995; Brown and Humphreys, 2003; Durand and Calori, 2006; Clark *et al.*, 2010; Luscher and Lewis, 2008; Thomas *et al.*, 2011; Thomas and Hardy, 2011; Nigam *et al.*, 2016; Kraft *et al.*, 2018; Oreg *et al.*, 2018; Hambrick and Lovelace, 2018). Similarly, change should not be viewed solely as episodic but also as embedded in a continuous process (Weick and Quinn, 1999; Tsoukas and Chia, 2002; Tsoukas, 2009; Wiedner *et al.*, 2017) whereby strong assumptions of rationality are softened to incorporate situated learning via recursive negotiation cycles (Orlikowski, 1996; Armenakis and Bedeian, 1999; Rerup and Feldman, 2011; Thomas *et al.*, 2011; Bligh *et al.*, 2018).

Indeed, as noted by Rosenbaum *et al.* (2018), recent scholarship has thematized: the interrelatedness of situational content, organizational context and change process

(Armenakis and Bedeian, 1999; Pettigrew *et al.*, 2001); shifts in individual and collective perceptions alongside the need to appropriately modulate responses as an organization progresses through the various phases of a change program (Schneider and Sting, 2020); and critical questioning of the extent to which it is possible to effectively manage change (Balogun and Jenkins, 2003). Besides Rosenbaum and colleagues, these more recent perspectives on change have been examined by other scholars too. For example, the interrelationship between situational content, organizational setting and processes of change has also been discussed by Mohrman *et al.* (2003), Oreg *et al.* (2011), and Waeger and Weber (2019); while Choi (2011), Rafferty *et al.* (2013), Cullen *et al.* (2014), Vakola (2016), Helpap and Bekmeier-Feuerhahn (2016) and Rafferty and Minbashian (2019) have contributed to our understanding of evolving perceptions and responses throughout the change process; and finally, Wisse and Sleebos (2016), Oreg *et al.* (2018), Kraft *et al.* (2018) and Sparr (2018) have debated the ability of organizations to effectively manage change.

Against this backdrop, the open-ended perspective adopted in the present study – which allows for a blend of prescriptive and constructive approaches – paves the way for a GT of change management as tension management. From such a perspective, change management in the presence of uncertainty is an arena where tensions are generated and resolved thanks to the production of corporate knowledge via recursive cycles of experimentation and negotiation.

The next section outlines the rationale for adopting GT methodology in this study, describing the key research activities and outcomes, from initial setup through onsite visits, and how these formed iterative cycles of data collection, data analysis and theory development. The research outcomes are presented and discussed at two progressive levels. The first level is a thick analytical description of the selected organizational change process, directly grounded in the data via open and selective coding. It is briefly summarized in the section "Research outcomes: Level 1 – The change management process". The second level, scaled up from the first via theoretical coding, is discussed in section "Research outcomes: Level 2 – Tensions and tension management". It offers an account of the multiple tensions that emerge during the change process and are dynamically managed by the industrial engineer. The final sections of the paper explore how the proposed substantive theory of change management as tension management might fit into the current academic debate, describe avenues for future research and discuss the managerial implications of the current findings.

2. Research methodology

The present empirical investigation was conducted following GT methodology (Glaser and Strauss, 1967), and specifically the so-called Glaserian stream (Glaser, 1978, 1992; Locke, 2001; Goulding, 2002) as it has recently evolved (Urquhart, 2013; Charmaz, 2014; Holton and Walsh, 2016). In comparison with the more rigid "Straussian" version of GT (Strauss and Corbin, 1990, 1998; Corbin and Strauss, 2008), the Glaserian approach facilitates the free and gradual emergence of empirically grounded theoretical concepts, in keeping with the researchers' initial exploratory perspective and the nature of the change process itself, in which social interactions, perceptions, negotiations and interpretations can play a key role in the final outcome. Hence, the epistemological approach adopted in this study departed from the original neo-positivistic stance of the founding authors of GT, viewing the emerging conceptual framework as a disciplined act of social construction – involving researchers and informants – rather than as the discovery of objective reality, in keeping with Charmaz (2014).

With respect to GT-informed research in general, the GT methods in this study were not used as tools for cross-case analysis as for example in Badewi *et al.* (2018) or Maheshwari *et al.* (2010), nor to complement other methodologies as in Remus (2007), but rather as a complete methodology for conducting in-depth interpretive analysis involving different actors and perspectives within a complex organizational setting, as for example in Isabella (1990).

2.1 Sample selection and data sources

The selected company, at the time of initial investigation, had embarked on a global automation process in its main parcel sorting hubs, making it an ideal candidate for a multi-site, multinational exploration of organizational change dynamics. The three sites investigated in two European countries differed in size and capacity. Plant Alfa is a medium-sized international hub in Southern Germany, with a capacity of 30,000 parcels per hour and 750 employees. Plant Beta is a major international airport parcel sorting center in North-West Germany that handles all air shipments to and from Europe; it has a sorting capacity of 190,000 parcels per hour and 2,100 employees. Plant Gamma is a relatively small terrestrial hub in central France, with a capacity of 10,000 parcels per hour and about 160 employees. The three sites, while sharing a common corporate identity and culture, with a similar basic need for capacity expansion and service enhancement, experienced change at different scales of complexity and with different managerial issues, making them ideal contributors to an in-depth integrative analysis. The focus of investigation was the management of the change process. Therefore, the primary informants were the project managers, who corporately were drawn from the Industrial Engineering (IE) function. The PMs' perspectives were continuously compared and contrasted with those of other key figures with a role in orchestrating the change process: the hub directors and hub managers. During the onsite visits and interviews with key actors, attention was also paid to the voices of those in operational roles. In addition to guided visits of the three corporate plants, the researchers conducted 22 face-to-face interviews and 21 conference-call interviews, involving three IEs who were project managers, three plant directors, three hub managers and three supervisors, as well as having repeated informal contact and conversations with operational personnel during the site visits. Further data sources were internal corporate reports, presentations and emails as well as corporate website pages and documents, complemented by secondary sources including external reports on the company and press coverage.

2.2 Research process: overview

Figure 1 offers a schematic overview of the multi-year and multi-site research process. Preliminary interviews were conducted in early 2016, followed by three major site visits and numerous cycles of data collection, data analysis and theoretical framing over a three-year

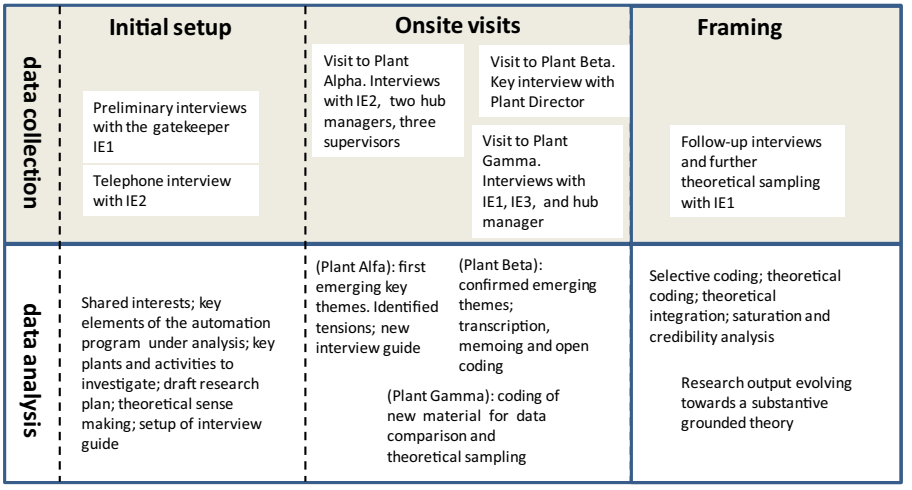

Figure 1.
An overview of the research process

period. The last on-site interview was conducted in late 2017, while the following iterations of open coding, selective coding, theoretical coding and theoretical sampling (including further data collection) required another year.

A major feature of GT research is "constant comparison" between collected data and emerging concepts (Glaser and Strauss, 1967; Suddaby, 2006; Urquhart, 2013). Data collection and conceptual analysis are not sequential and separate, but cyclical and connected. Hence, each of the three main research phases represented in Figure 1 (initial setup, onsite visits and theoretical framing) involved numerous iterations of data collection (upper boxes in the figure) and data analysis (lower boxes).

2.3 Initial setup

The researchers first developed a relationship with a key Industrial Engineer (IE1: Industrial Engineer 1) at the company, via a small number of informal meetings. Three preliminary interviews were later arranged: two face-to-face interviews with IE1 and a telephone call with IE2 (Chief Regional Industrial Engineer) with the participation of IE1. A face-to-face follow-up meeting with IE1 helped the researchers to clarify and confirm their notes. Throughout the interviews, discussions and telephone calls, both researchers took separate notes in parallel. Immediately after data collection, they revised, discussed and merged their notes with a view to identifying the main research themes grounded in the observed data. Thus, "thematic coding" was carried out, as recommended and discussed in Urquhart (2013, p. 40), to make initial sense of the data and formulate overarching research themes. The emergent research themes were written down and then coded and linked (using the software application Atlas TI version 8) with a view to constructing initial thematic concept networks, omitted here due to space constraints (see Virili and Ghiringhelli, 2019, for a detailed account). The bottom left box in Figure 1 summarizes the main outcomes of the setup phase: establishment of a set of shared interests with the key informants, acquisition of information about the key features of the automation program under investigation, identification of the key sites and activities to be investigated, gathering of first impressions for theory building and devising of an interview protocol and scheduling of the first visit.

2.4 Onsite visits: plants alpha and beta

At Plant Alfa, two main interviews were conducted: a two-hour interview with Industrial Engineer 2, followed by a one-hour interview with the hub director and a hub manager. The researchers also availed of the opportunity to arrange two unplanned, informal interviews with three supervisors. The next day, a follow-up interview with Industrial Engineer 1 was conducted to check the data gathered during the visit and collect additional information and documents.

During the subsequent analytical phase, a preliminary thematic coding map was produced to orient the next research steps. Specifically, a further interview was held with Industrial Engineer 1 to share the preliminary outcomes and discuss visiting a second facility.

As a further step in the data collection process, the researchers visited Plant Beta, conducting a two-hour interview with the Plant Director (PD1) and a follow-up interview with Industrial Engineer 1. Analysis of the new data collected enabled the researchers to identify a more detailed set of research themes.

2.5 Framing and visit to plant gamma

Later, the audio-recorded key interview conducted at Plant Beta was fully transcribed, and Atlas.ti was used to attach descriptive labels to individual textual units (the initial categories formed by grouping conceptual incidents, as described in Glaser and Strauss, 1967, Ch. V).

The categories were generated and constantly compared with the data, following a procedure that is conventionally termed "open coding" in GT (Glaser, 1978, 1992; Urquhart, 2013). During this open-coding process, extensive comments, issues and alternative interpretations were noted in documents called "memos" (Glaser and Strauss, 1967, p. 108), which were later used to generate new questions and explanations. To facilitate the identification of categorical groups and associations, the researchers copied the coding labels onto "post-its" of different colors and sizes and grouped them together as a function of their meaning, gradually building up a three-level conceptual hierarchy (selective coding: Glaser, 1978, 1992; Urquhart, 2013). They next set out to identify meaningful relationships among the categories (theoretical coding: (Glaser, 1978, 1992; Urquhart, 2013).

This evolving system of concepts, categories and relationships – represented via a series of posters filled with different arrangements of color-coded post-its and concept notes – formed the basis for ongoing theoretical discussion, further data collection and theoretical sampling. These paper-based representations of grouped and linked concepts were later transferred back into digital format in Atlas.ti.

The site visit at Plant Gamma included a two-hour live discussion with Industrial Engineer 1, followed by two separate one-hour interviews with the hub director and the project manager (Industrial Engineer 3). This additional data collection and comparison process represented a significant step forward in the theoretical sampling process.

After several iterations, the collection and analysis of data on the three major industrial automation projects underway in Plants Alfa, Beta and Gamma converged toward theoretical saturation (Glaser and Strauss, 1967, p. 61), producing a substantive theory of organizational change as tension management (see Figure 5) based on the change process depicted in Figure 2.

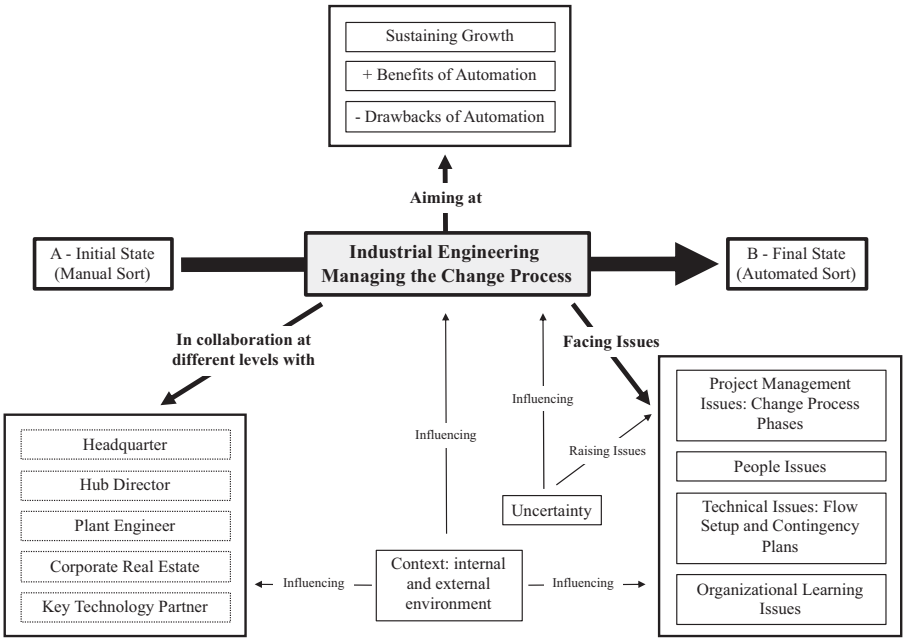

Figure 2.
A conceptual map representing the change process associated with implementing the automated parcel sorting. This process (Level 1 research outcomes) underpins the proposed substantive theory of change management as tension management (see Figure 5: Level 2 research outcomes)

3. Research outcomes: level 1 – the change management process

The change process initiated by the parcel delivery company with a view to implementing automated parcel sorting is represented in Figure 2. This first level of theoretical development is only reported here in synthesis given that it is the object of in-depth analysis elsewhere (citation removed for anonymity).

There is a direct connection between each of the categories depicted on the map as labeled boxes (for example, to the bottom right of Figure 2, the four categories of issues faced by the Industrial Engineering function: Project Management, People, Technical and Organizational Learning issues) and the empirical data collected. As briefly outlined in Section 2.5, each category was formed by grouping several concepts. In turn, each concept was linked to one or more "conceptual incidents", that is to say textual units, such as sentences, that had been recorded during the interviews. As stated above, the Level 1 categories and concepts are not described at length here due to space constraints, but are presented in detail in (citation removed for anonymity), along with samples of the underlying empirical evidence. In relation to the Level 2 outcomes on the other hand, a more detailed analysis of the underlying concepts and their empirical bases is provided in Section 4 (see discussion of Figure 4). Overall, the GT qualitative data analysis implemented via ATLAS.ti (Friese, 2019) produced hundreds of codes from the empirical data sources, which were grouped into 25 different categorical maps. For the purposes of the present study, the categorical maps most salient to the theme of tension management were selected.

In a typical parcel sorting process, the most important activities are: identifying incoming parcels by origin and destination, creating new parcel groups for each destination and assigning and moving parcels to their destination groups. Prior to automation (Initial State A to the upper left of Figure 2), parcel handling and sorting are fully manual procedures: parcels are moved around the hub on conveyor belts (the only mechanized step in the process), but parcel loading, sorting and unloading are performed manually by human operators. Once automation is introduced (Final State B), the entire operation is performed with minimal human intervention. A complex system of scanners, photo-eyes and cameras identify parcels and read their destination data, enabling them to be automatically transferred to the appropriate group.

Migration from State A to State B is underpinned by an organizational change program aimed at fostering growth by exploiting the multiple benefits of automation while minimizing its drawbacks (see top of Figure 2). This program is led by the industrial engineer, in collaboration with other key actors at multiple levels within the organization (see Figure 2, bottom left). The conceptual map shows that change is characterized by uncertainty, raising issues that are managed by the IE who must also take into account the influence of contextual factors (see Figure 2, bottom right).

4. Research outcomes: level 2 – tensions and tension management

The complex change management process depicted in Figure 2 is marked by uncertainty: the IE is challenged by the need to make choices and identify an appropriate balance with respect to a set of key polarities, namely manual-automated, planned-emergent, corporate-site. These polarities correspond to specific tensions, which will now be examined in turn. For each tension, the researchers drew a dedicated graphic map, grounded in the three-level hierarchy of codes that emerged during the open and selective coding of the source texts and documents. The contents of all three maps are discussed in the following paragraphs.

4.1 Manual-automated tension

The manual-automated tension is due to the fact that full automation is not currently possible to achieve, and therefore manual and automated solutions must necessarily coexist (see Figure 3).

The main categories identified suggest that this tension concerns two interrelated factors: (1) the overall degree of automation (automation extent); (2) the degree of automation present locally across the different functional areas (automation distribution).

Automation distribution: for each functional area, it is necessary to identify which processes and activities to automate, and which it is mandatory and/or advantageous to continue to conduct manually. Hence, automation is not applied uniformly across the company.

Automation extent indicates the overall level of automation currently pursued by the organization. While the hub director aims to lead the organization toward full automation, he is nonetheless aware that telemetric technology has still not attained its full potential. If volumes and flows remain low and stable, manual solutions may remain advantageous.

4.2 Planned-emergent tension

To address the manual-automated tension, the organization needs time and experience to fully define the optimal extent and distribution of automation across its operations. Consequently, it is not possible to devise a "perfect" plan: some decisions must be deliberately left on hold until the learning process has produced the required knowledge.

While a "total planning" approach is not feasible, neither can the plan be undefined in every particular: the need to establish the optimum position between these two extremes generates tension between scheduled and emergent approaches. As mentioned in relation to the IE's social role, this tension concerns the contrasting expectations of two key players: the hub director and the IE. The former expects to implement a "perfect" plan, though recognizing that the early stages of the change process will be marked by some uncertainty (Figure 4, codes: Perfect plan possible despite uncertainty; hub director expects a perfect

Figure 3.
Manual-automated tension

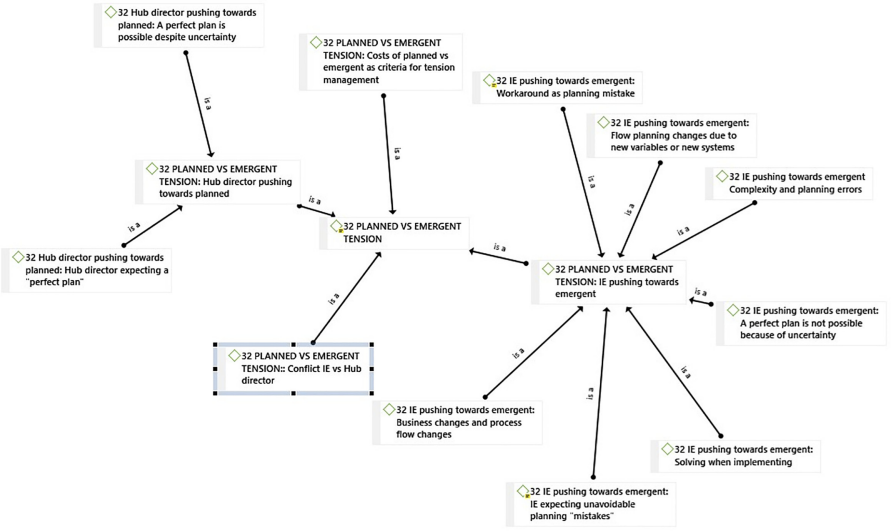

Figure 4.
Planned-emergent tension

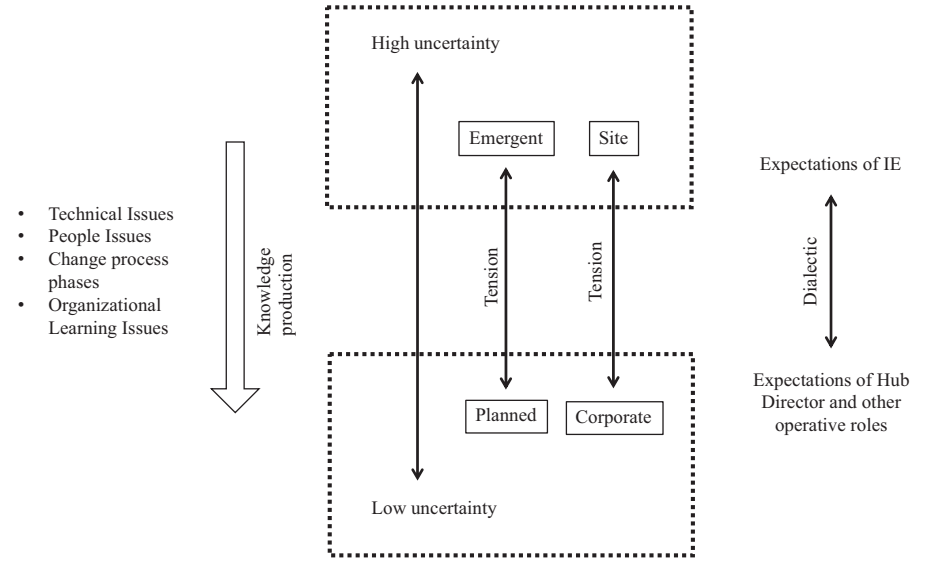

Figure 5.
Tension management in organizational change programs: a dynamic model

plan). The IE takes a different view (code: Perfect plan not possible because of uncertainty). In negotiating with the hub director, the IE advances multiple arguments in support of his/her position: the need to allow for unforeseen changes in operating conditions with respect to those known at the time of planning (codes: Business changes and process flow changes; Flow plan changes due to new variables or new systems). Changes arising in highly complex systems should not be viewed as planning errors but as inevitable (code: Complexity and planning errors) and indeed to be expected (code: IE expecting unavoidable planning mistakes) and must be managed by providing a range of alternatives (code: Workarounds seen as planning mistakes) that allow solutions to be identified during implementation (code: Solving while implementing). Thus, a potential conflict arises between the hub director and the IE (code: IE vs hub director conflict), which must be resolved by negotiating a point of convergence between their different views. Identifying this balance is mainly the responsibility of the IE and involves complex power dynamics and economic considerations.

Here, the dynamics of organizational relations depend not only on the IE's formal authority (now increased in line with his/her expanded role in the organization) but also on the hub director's *de facto* influence as the person overseeing operations. The IE must deploy persuasion and influence to bring the hub director to consider the multiple dimensions to be taken into account in implementing the plan.

The economic basis for choosing the balance point is a comparison of the costs that would be incurred to collect the information necessary to define a closer to "perfect" plan and the costs associated with suspending given decisions (code: costs of planned and emergent as criteria for tension management decisions).

4.3 Corporate-site tension

Each site experiments with its own customized solutions in the course of the automation project with a view to identifying its optimum positioning along the manual-automated axis. The experience gained at different sites generates solutions and organizational knowledge at the corporate level, most of which may be disseminated among other sites. The resulting corporate-site tension concerns finding the appropriate positioning between two theoretical

extremes: adopting a "copy-and-paste" solution that conforms 100% with corporate directives vs a solution developed solely based on the specific characteristics of the local site. The outcomes of site-level experimentation generate new local knowledge, which needs to be well-organized and integrated at the corporate level; they also initiate a process of organizational learning. However, in global organizations, this is not always entirely feasible, because local experience can be radically diverse and even unique, being influenced by non-replicable factors such as culture, language and local practices.

4.4 Tension management dynamics during organizational change

This study pointed up the dynamic nature of tension management during an organizational change program, as illustrated in Figure 5.

The investigation focused on organizational change at the implementation level only, without taking into account the decision-making dynamics that come into play at the various managerial levels of a global corporation when a complex change project is assessed for feasibility, approved and launched.

At the outset of the change process (here termed the planning stage), full information concerning the technical and social aspects of automation was not available to the actors involved in implementing the organizational change. Specifically, neither the distribution nor the overall extent of automation to be effectively adopted was clearly known at this stage. Furthermore, the different sorting facilities' positions between the two opposite poles, fully manual (A) vs fully automated (B), could only be provisionally defined in terms of planned site-specific testing and controlled experimentation. This partial lack of key information about both the technical and the social implications of the change process gave rise to high levels of uncertainty (see upper box in Figure 5), which in turn dynamically shaped the ongoing management of both the planned-emergent and corporate-site tensions. Site-specific experimentation is crucial to gradually reducing such strong initial uncertainty: it is by trial and error that missing information may be collected, and the required knowledge created and transferred (Lombardi, 2019; Milagres and Burcharth, 2019). In addition to acquiring in-depth knowledge about the implications of adopting automation, the actors involved in the experimentation negotiate meanings surrounding the change (Thomas *et al.*, 2011) and gradually develop a consensual perspective via social construction dynamics (Weick and Quinn, 1999). Reducing uncertainty and building knowledge and consensus require a constructive approach to organizational change (Van de Ven and Poole, 1995). The study proposed here shows how these processes played out in relation to the specific tensions identified. With regard to the planned-emergent tension, the conditions at the outset of the change program were generally situated closer to the emergent pole. Although all experimentation was conducted following explicit guidelines, the final outcomes could not be predetermined, but rather necessarily emerged from practices, social negotiation and exchanges among actors (emergent perspective). At the same time, with regard to the corporate-site tension, initial conditions were closer to the *site* pole, because the experimentation was conducted at specific sites whose peculiar characteristics and existing path dependencies were necessarily taken into account.

Throughout these activities, the IE was required to manage the various issues outlined earlier in the analysis (technical issues, people issues and change project phases, as shown in Figures 2 and 5), while also overseeing the ongoing experimentation and processes of negotiation among different perceptions and expectations concerning roles. As shown in Figure 5 (right), at the outset, the IE typically perceived a higher level of uncertainty than the hub director who, as observed earlier, tended to expect a more "perfect plan". Therefore, the IE tended to raise the hub director's level of perceived uncertainty, while negotiating scope for experimentation and justifying the associated costs.

The increasing importance of negotiation, social construction and people management in this type of complex changes program also pushed the IE to redefine his classical role, becoming a manager of change with a broader strategic focus, encompassing technical, social and business perspectives (Bligh *et al.*, 2018; Oreg *et al.*, 2018; Javidroozi *et al.*, 2020; Henk and Fallmyr, 2020).

As already stated, the negotiation process led to gradual convergence of the two perspectives and a shared basis for engaging in experimentation going forward. All this fed a cyclical process in which knowledge was progressively coded and institutionalized among individuals, groups and the entire organization, in keeping with the dynamic organizational learning framework proposed by Crossan *et al.*, 1999. As the corporate knowledge base increased, actual and perceived uncertainty and differences in perceptions were gradually attenuated, enabling gradual movement toward the low uncertainty poles of the planned-emergent and corporate-site tensions.

Specifically, the tension between planned-emergent approaches attained a balance that was closer to the planned pole. Clearer and shared information, knowledge, meanings, perspectives and tasks provided a stronger basis for a more detailed and "complete" plan. Expectations concerning key roles gradually became more convergent, fully supporting execution of a more exhaustive operational plan.

In parallel, the corporate-site tension saw a gradual shift from the site pole toward the corporate pole. As the rationale for change and its technical implications became better understood and were more widely shared among individuals and groups, the scope for focusing on and pursuing technical compliance with corporate guidelines and interorganizational operating processes increased. From a social point of view, the greater acceptance of change built up during the earlier phases of the program facilitated the elimination or modification of site-specific characteristics or path-dependencies where appropriate.

The overall change process yielded both technical and social outcomes. From the technical viewpoint, a clearer definition of the optimum distribution and extent of automation was achieved (although further experimentation and fine-tuning of solutions is still possible). From the social viewpoint, the final model of automation implemented took into account all the social issues that had not been fully identified or provided for in the original plan, including the motivation, commitment and job and psychological readiness of the employees involved in the change program.

5. Discussion

Taken as a whole, the study outcomes suggest that managing tensions and reducing uncertainty are at the core of successful organizational change. Tension management is a dynamic process involving multiple actors at different levels within an organization, often with divergent expectations, objectives and power profiles. Tension management entails addressing both social and technical issues and negotiating power relations, meanings and expectations. This process, based on experimentation and trial and error, triggers knowledge production that determines a shift from high to low uncertainty areas of the continuum between competing approaches and solutions. Industrial engineers play a key orchestrating role throughout the entire process, evolving from their traditional role as purely technical and prescriptive change leaders to become social negotiators and tension managers.

To explore the scope for generalizing the proposed substantive theory, in addition to conducting theoretical sampling and seeking theoretical saturation, the researchers also engaged in theoretical integration with a view to explicitly positioning the research conclusions within the current debate. The perspective adopted in this paper radically challenges the traditional view of organizational change as planned and prescribed

(Majchrzak, 1988), rather proposing that organizational change should be conceptualized and investigated as a complex, multidimensional and constructive process. Initially, this led the researchers to consider affinities with the literature on ambidexterity, which emphasizes tensions among the multiple dimensions involved in addressing the exploration–exploitation dilemma (O'Reilly and Tushman, 2008; Simsek *et al.*, 2009; Jansen *et al.*, 2009; Binci *et al.*, 2020).

However, pointing up and interpreting these emerging tensions in light of the broader theory of paradox appeared to offer a more promising pathway of inquiry. According to Smith and Lewis (2011), "today, as globalization, innovation, hypercompetition, and social demands create more dynamic and intricate environments, paradox becomes a critical theoretical lens to understand and to lead contemporary organizations". The empirical outcomes presented here were found to be consistent with Smith and Lewis's concept of dynamic equilibrium, whereby competing demands exist in ongoing interactions that morph over time (Smith and Lewis, 2011). Gradually, throughout the research process, this led to a proposed interpretation of *organizational change as the holistic management of multidimensional paradoxical tensions*. Later, further insights were discovered – again potentially in keeping with this conceptual framework – in a special issue on paradox, tensions and dualities of innovation and change (Smith *et al.*, 2017).

The integrated model proposed by Hargrave and Van de Ven (2017) appeared to be particularly relevant, given that it sets out to combine – the originally distinct – dialectical and paradox perspectives on managing contradictions in organizations. These authors' theoretical focus is descriptive and multilevel. It centers on how organizations manage socially embedded contradictions, and how these contradictions change over time. Furthermore, it is socially constructed, embedded and complex. Conceptual opposites are viewed as embedded in material artifacts, practices and arrangements, as well as in society's institutional orders and "social totality" (Hargrave and Van de Ven, 2017). Concerning the outcome of change processes, Hargrave and Van de Ven posit that "dynamic tension between contradictory elements can be reproduced, revised, or transformed. Outcomes are difficult to predict because management approaches have unintended consequences" (Hargrave and Van de Ven, 2017, p. 323). This theoretical position appears to fit well with the main results discussed here.

Contributions from other areas present further affinities with the current research. For example, a recent study indicated that agility is becoming an increasingly crucial goal within business process management as a means of dealing with uncertainty while enhancing flexibility and achieving organizational learning (Badakhshan *et al.*, 2019). Agile approaches might be seen as a way of addressing uncertainty and tensions, given their emphasis on iteration, experimentation and negotiation.

Another interesting area of affinity is at the intersection of organizational change and organizational learning research. The evidence adduced here suggests that learning and knowledge creation are a continuous, progressive outcome of the tension management process. This is not in contradiction with the findings of Watad (2019), who suggested that IT-enabled change programs are often more focused on short-term outcomes such as productivity gains than on long-term corporate knowledge creation. The tension management perspective focuses on the continuous cycles of negotiation and experimentation involved in organizational learning, suggesting that the trade-off between short-term and long-term approaches may be dealt with by identifying and actively managing the associated management tensions.

6. Conclusions

6.1 Contribution

The research trajectory presented here investigated a complex change program in a major global parcel delivery company, across three European hubs where automatic sorting had

recently been introduced. The change program was aimed at expanding capacity and radically transforming the parcel sorting process. In the course of a three-year GT study, which included site visits and 43 interviews with internal informants at different levels of the organization, the researchers gradually came to develop an in-depth understanding of the underlying organizational change processes, producing a substantive theory of change management as tension management. The dynamic model depicted in Figure 5 shows that the key issues surrounding the change process (as represented in Figure 2) are addressed and progressively resolved by means of tension management. More specifically, with respect to each tension, a gradual shift takes place from high to low uncertainty, corresponding to the generation of new corporate knowledge.

The three cornerstones of the resulting theory are: (1) the hybrid nature of change, as both rational-planned and negotiated-emergent: indeed, automatic sorting, as a dynamic and complex blend of manual and automatic procedures requires both rational planning *and* experimentation, negotiation and adaptation; (2) the change agent's (in the present study, the industrial engineer's) evolution from a purely technical and prescriptive change leader to a social negotiator and tension manager; (3) the need for effective change management to address uncertainty and tensions (concerning the optimum balance between manual vs automated – and relatedly between planned vs emergent and corporate vs site solutions) by generating new corporate knowledge.

The proposed substantive theory of organizational change as tension management conceptualizes tensions as stemming from uncertainty during the implementation of organizational change. From this perspective, change management in the presence of uncertainty is an arena where tensions are generated and resolved, and ultimately where corporate knowledge is produced via recursive cycles of experimentation and negotiation.

6.2 Suggestions for new research

Uncertainty and tensions cannot be eliminated and should not be overlooked.

This key fact raises the following question: Are traditional prescriptive approaches to change – which have mainly been based on the notion of removing or isolating uncertainty from core organizational activities – still appropriate in a contemporary context marked by continuous dynamic transformation? The suggestion here, in keeping with some of the latest lines of inquiry into organizational change, is to embrace a new perspective with an explicit emphasis on uncertainty and tension management: by framing the change process as a blend of prescriptive and constructive change, tensions arising from undefined – and undefinable – prescriptions may be actively detected, managed and leveraged as an opportunity for organizational learning.

Promising new avenues of research are opened up by the questions that inevitably flow from this study. For example, is it possible to devise specific formal models for the successful detection and management of multiple tensions? What are the salient factors to be taken into account?

The formal specification of actual decisions and actions implemented in the field may be usefully informed by ambidexterity approaches that have focused on the costs and benefits of shifts along the continuum between competing opposite approaches: a key study by Gulati and Puranam (2009) may offer a particularly valuable point of reference for further research in this direction.

More generally, further research extending to different areas and drawing on different methods will offer a deeper understanding of the nature and workings of uncertainty, tensions and their management in contexts of organizational change. Another promising area of inquiry is the exploration of organizational learning processes stemming from effective tension management.

6.3 Limitations

Some of the limitations of the present study, which was based on the in-depth analysis of one global organization, may be addressed by similar studies aimed at extending and generalizing the current findings from a specific, substantive organizational setting.

6.4 Managerial implications and suggestions for practice

While follow-up research is required to formally specify quantitative factors to be taken into account in detecting and managing tensions, the outcomes reported here already carry significant direct implications for managerial processes.

First: The need to be aware that uncertainty and tensions cannot be avoided. Instead of attempting to apply managerial models based on outdated assumptions of stability and isolation from uncertainty, it is advisable to embrace a managerial perspective that explicitly and mindfully takes account of uncertain, undefined or instable areas of decision-making within organizational change processes. A useful first step is to identify critical polarities with a bearing on managerial decisions and the related tensions to be handled.

Second: The need to manage tensions by leveraging agility. Agile managerial approaches, with an emphasis on experimentation, negotiation and iterative progress may offer an effective way forward for tension management.

Third: The need to exploit tension management as an opportunity for organizational learning. The GT proposed here suggests that progressive tension management during organizational change tends to gradually resolve tensions by reducing uncertainty and generating corporate knowledge. Hence, effective tension management may yield rewarding outcomes in terms of novel organizational learning.

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