CONSTRUCTIVE DEVIANCE – THE INFLUENCE OF ORGANIZATIONAL SUBCULTURES ON THE ADOPTION OF A NEW INFORMATION TECHNOLOGY SYSTEM

Raphaël LISSILLOUR
IPAG Business School
I3-CRG, École Polytechnique
(France)

Johnny WANG
IPAG Business School

(France)

ABSTRACT

Industrial companies can be characterized as culturally plural organizations, as different occupational groups within the organization are likely to follow specific cultural preferences. This cultural diversity challenges the enterprise information system (EIS) implementation since subcultures may be more or less consistent with the values embedded in the EIS. This paper relies on a longitudinal study of a German industrial company's subsidiary in China. Data has been gathered through participant observation, interviews and focus groups over a two-year period. We identified and detail the cultural divide between a reference group and three groups. In order to continue performing and fulfilling their professional obligations, the contending groups engage in constructive deviance behaviors, thus accommodating the prescriptions associated with both the dominant culture and their subculture. We identified three types of constructive deviance that result from the cultural contradictions: creative performance, issue selling, and taking charge. We discuss the effects of constructive deviance in the organization and conclude with theoretical and practical contributions.

Keywords:
Organizational culture, constructive deviance, occupational groups, interpretive case study, Enterprise Information System.

INTRODUCTION

The influence of culture on information technology adoption and diffusion has been studied at several levels: organizational level (Rai et al, 2009), subunit level (Huang et al, 2003) and individual level (Srite and Karahanna, 2006). At all three levels can resistance to a new information system take place (Joshi, 1991) Organizational culture generally refers to interrelated patterns of underlying assumptions, shared values, norms and beliefs within organizations (Schein, 2010). If the concept of organizational culture drew the attention of managers and consultants for its eventual contribution to performance (Lorsch and McTague, 2016), academics raise doubts on the appropriateness of organizational culture as a factor to understand corporate financial success (Schneider, Ehrhart and Macey, 2013) and organizational effectiveness (Hartnell, Ou and Kinicki, 2011). Even

though prior research partly addressed the impact of corporate culture on satisfaction, performance and motivation (Gregory, Harris, Armenakis and Shook, 2009), how culture influences organizational outcome remains an area for future research (Chatman, 2016).

The role of espoused national cultural values in IS has drawn the attention of scholars, notably in impact on technology acceptance (Srite and Karahanna 2006) and on ERP introduction (Avison and Malaurent, 2007). The role of social embeddedness in offshore IS projects (Maruping and Venkatesh, 2009) and that of cultural characteristics in offshore collaboration (Levina and Vaast, 2008) has drawn the attention of prior research.

EIS implementation is often challenged by resistance to change and requires firms to alter their existing organizational culture (Umble et al, 2003). Even though organizational culture is an important factor of success for ERP implementation (Ke and Wei, 2008), the role of organizational culture in the EIS post-implementation period has been less studied. Previous research stressed the need for future studies to look at organizational sub-culture to better understand the influence of culture on IS use (Leidner and Kayworth, 2006).

Instead of providing a categorization framework to understand user resistance (Lapointe and Rivard, 2005; Rosenthal, 2004; Ferneley and Sobreperez, 2006), this article looks at the way *organizational subcultures* influence the response of subjective meaning of the EIS in the organization and its consequences regarding adoption and use and how do organizational groups reconcile subcultural contradictions resulting from the EIS implementation. We argue that group members engage in constructive deviance behaviour to sustain their performance despite the constraints imposed by the EIS. This raises the following research issue: what type of constructive deviance behaviours can organizational actors seek to reconcile cultural contradictions after EIS implementation?

Previous research mainly focused on quantitative methodologies with an etic view of culture (Jung et al 2009; Boyce et al, 2015; Kotrba et al 2012), this paper argues for a qualitative methodology (Martin, 2002) and for the valuable insights that an emic perspective on organizational culture can bring in the understanding on how values and beliefs shape subjective meaning. Prior studies of constructive deviance in EIS implementation also used a quantitative analysis (Schaarschmidt and Bertram, 2019), this study will contribute by providing a qualitative emic account of organizational members' practices.

This paper is organized as follows. First, we introduce our theoretical perspective by tying the literature on organizational subculture with constructive deviance. Then, we present the case study method and the research context. Next, the findings with the case analysis in which we identify and describe the activities and groups under focus, the subculture of each group, and the constructive deviance deployed by each subgroup. The discussion section elaborates on our findings. We conclude with the methodological, theoretical and practical contribution of our study.

1 - THEORETICAL FRAMEWORK

1.1. Organizational culture

Prior research reflects disagreements concerning the very definition of culture which is sometimes conceptualized as language (Srivastava, Goldberg, Manian and Potts, 2016), shared corporate practices (Christensen and Gordon, 1999), cognitive schema (Harris, 1994), and emotions (Barsade and O'Neil, 2014). In the frame of this study, we focus on three main aspects of corporate culture: value, beliefs and underlying assumption. The values constitute sets of social norms that "define appropriate attitudes and behaviors for organizational members (how to feel and behave)" (O'Reilly and Chatman,1996, p. 160). The beliefs are essentially attitudes toward ideas that unconsciously guide organizational members' thinking and actions. Beliefs are based on underlying assumptions, which are cognitive structures "that are held by members of an organization and which facilitate shared meaning and guide behavior at varying levels of awareness" (Denison et al, 2014, p. 4).

Organizational culture provides employees with shared meaning and is thus a foundation for collective identity and commitment (Harrison and Carroll, 2006). Since organizational culture exercises a strong influence on people's perception (Denison and Mishra, 1995) and behavior (Barney, 1986), a cultural fit between the organizational culture and the EIS is a key success factor for implementation (Canbrera et al, 2001). In other words: "even good technology can be sabotaged if it is perceived to interfere with the established social network" (Martinsons and Chong, 1999, p. 124). In case of a contradiction between organizational values and those inherent to the EIS, the implementation of the EIS is likely to be slowed down because of numerous adaptations to the new system to match people's values or be rejected altogether (Cooper, 1994).

1.2. Organizational subcultures and constructive deviance

Organizations may theoretically be characterized as a single overall culture, but organizations more often than not are organizationally heterogeneous (Martin, 1992). Culturally heterogeneous organizations are likely to be challenged during and after EIS implementation as diverse groups may respond differently to the new system. If organizational members are expected to share the norms of the dominant group which subculture influences most the overall culture of the organization, Robinson and Bennett (1997) urged future research to look at the interplay between the norms of the dominant group and that of a specific group or subculture. Few studies focused on the role of organizational subculture in IT adoption, with notable exceptions such as Huang and colleagues (2003) and Von Meier (1999). The first found out that conflict between organizational subcultures impacted negatively two key behaviors during EIS implementation, namely information sharing and collaboration (Huang et al, 2003).

Sagiv and Schwartz (2007) argued that the nature of organizational tasks indirectly influences organizational values. Employees who have the same occupation tend to have similar personal values (Knafo and Sagiv, 2004). Consequently, since organizational tasks are usually delegated to specific groups,

it seems legitimate to look at the extent of the consensus on corporate values among groups. Individual employees' reaction depends on attitudes and beliefs generated during their former experience of EIS implementation (Martinko et al, 1996) and it is likely to be shared with the other members of the occupational group. In Von Meier's (1999) study, resistance from occupational groups occurred because of different cultural interpretations of proposed technological innovations. Organizational tasks are undertaken by specific occupational groups, who may emphasize different values than other groups. This shift in value from one occupational group to another may predispose subgroups positively or negatively toward the EIS implementation. Some groups' cultural preferences are consistent with the values embedded in the EIS. Other groups have some kind of cultural fit and are more likely to be reconciled with the values of the reference group that is in charge of the EIS implementation. If this type of group can integrate smoothly the EIS into their work processes, many cannot.

Horwitz and Horwitz (2007) had shown the positive impact of occupation diversity on performance, but it is worth wondering how the other organizational groups can cope with these cultural inconsistencies and continue working productively. In order to function effectively and bring positive results despite cultural conflict, they have to deviate from the expected norm and adopt a constructive behavior. Opposed to destructive deviance, this phenomenon is called constructive deviance (Warren, 2003). A deviant subgroup disregards the behaviour imposed by a reference subgroup, namely the subgroup whose values become established normative standards for the organization. Constructive deviance is when this departure from norms leads to positive ends for the organization (Spreitzer and Sonenshein, 2004). The concept of constructive deviance became a focus for management researchers as innovation and creativity more often than not compel organizational members to think outside the box and depart from prevalent norms (Appelbaum, Iaconi, & Matousek, 2007). According to Warren (2003), constructive deviance is a concept that includes many different types of behaviours, such as principled organizational dissent (Graham, 1986), counter-role behaviour (Staw and Boettger, 1990), tempered radicalism (Meyerson & Scully, 1995), whistle-blowing (Near and Miceli, 1985), exercising voice (Van Dyne and LePine, 1998), some types of prosocial behaviors (O'Reilly and Chatman, 1986), and functional and creative disobedience (Brief, Buttram, and Dukerich, 2001). According to the review of literature produced by Vadera and colleagues, constructive deviance behaviours are triggered by three main mechanisms, namely intrinsic motivation, felt obligation, and psychological empowerment (Vadera et al, 2013).

2 - RESEARCH METHODS

2.1. Research context and case selection

This two-year in-depth field study is based on the interpretative case study of SpareCorp[1], a European manufacturing firm specialized in the fields of compression technology and hydraulic systems in the car industry. Because of a lack of process management, accounting and controlling reports were not standardized throughout the company. The top management decided to implement an EIS to optimize data collection, synthetic reporting and keep control despite unprecedented growth:

> *We are in a fast-growing period. The businesses doubled and even tripled within one year and we even integrated new businesses. This is a huge cash and material flow with suppliers and customers. Without SAP, it is impossible to drive this business in a clean way. (General Manager, transcript page 16).*

This study has been realized at HDC, the Chinese subsidiary of SpareCorp. Local employees at HDC recognized the restrictions of the previous EIS and welcomed the new system. Nonetheless, the Chinese IT team had conflicting relations with the headquarters' IT team that managed the implementation:

> *[The headquarters] of SpareCorp want all plants to have the same process of system customization, so before this project started in HDC, all the templates were already available. [The headquarters' IT team] just wanted to implement everything as they defined it. They didn't care about [local] requirements and expectations. They just told us to follow the deadlines and the templates. This is the expectation of the central team, but not of local users (IT manager, transcript page 3).*

The case was selected to study the role of organizational culture in EIS adoption and use because the time the new EIS went live at this plant coincided with the beginning of this research. Moreover, the case included quite a number of internal conflicts during the implementation which were connected to clearly identifiable groups of people who may qualify as sub-cultural groups. Finally, thanks to the second author, we could establish contact easily with these groups. This enabled us to collect longitudinal data during three main phases.

2.2. Research method

During the first phase, the second author has been dedicated to direct observation on site and informal interviews in order to understand the context and the conflicts during the implementation process of EIS at SpareCorp. During this phase, time had to be invested to identify the main groups involved, establish contact and build trust. As organizational culture is intrinsically subjective, and in

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[1] The name of the organization has been disguised. This case is not related to any real-world company with a similar name.

line with Geertz, we argue that the ambition of researchers should be to develop an "extraordinary sensitivity, an almost preternatural capacity to think, feel, and perceive like a native" (Geertz, 1983, p. 86). Consequently, the second author has been deeply immersed in the organization for three years while playing a managerial role. This immersion allowed us to understand the implicit and unconscious beliefs shared within the organization. Thus, we argue that such a qualitative methodology is more appropriate than quantitative approach (Alvesson and Berg, 2011) that assume that organizational informants are able to describe and express with accuracy these intersubjective values and shared assumptions that are unconsciously shared within the organization.

In the second phase, a questionnaire has been designed to help respondents reveal the perceptions and the practices of ERP-users. The questionnaire has been designed according to the main dimensions of corporate culture identified in the literature, namely values, beliefs and underlying assumptions. We selected informants from targeted departments and from diverse hierarchical level in order to gather as many "voices" as possible (Myers and Newman, 2007). A total of 12 open-ended interviews has been realized.

In the third phase, we conducted 3 focus groups and a few additional interviews from which data could be triangulated (Yin, 2003) with that of the direct on-site observations and the interviews, thus allowing us to enhance our social understanding of EIS users' practices. Our study integrated archival data, including yearbook and the company's magazine which illustrate the corporate culture at SpareCorp. A significant document was the presentation materials that SpareCorp CIO and CPO produced for the Fujitsu Forum in which they detailed the company's management processes and EIS implementation phases. We created a case study database (Yin 2003) to organize all data collected during the three phases. The analysis of data has been inspired by grounded theory (Strauss and Corbin, 1998), we did thus not refer *a priori* to popular sets of values from Hostede (Cyr, 2008), Globe (Fang et al, 2011), Trompenaars and Hampden - Turner (Dibbern et al, 2012) and Chinese Guanxi (Davison et al, 2009). Our interpretation of data was focused on identifying the values, beliefs and underlying assumptions that were most able to help us understand the behaviors.

3 - FINDINGS

3.1. Four activities

SpareCorp anticipated that the EIS would contribute to standardize processes. While some improvements were apparent after the implementation, discrepancies between the expectations of several groups and the actual consequences of the EIS implantation occurred. We focused our investigation on four activities which were facing challenges related to the EIS: procurement, quality management, inventory deviation, and machine renewal.

3.1.1.   Procurement

Procurement implies the planning and consolidation of the needs in materials of the production departments and of the other departments. The EIS

covers the purchasing process, consequently the IT teams request the procurement operations to be executed in the system. Procurement professionals stress the fact that optimal procurement is key for the production to work without interruption and to avoid warehouse overload. Even though the procurement professionals were at first supporters of the EIS implementation, the increased amount of data input that the new system required raised issues since data input implies the coordination of several departments, including a few which did not prioritize timely input of quality data:

> they create the purchase requisition in the system, then they create the purchase order manually, but not with the help of automatic system, because they have different concerns. The system can help you, but they think that to avoid risks is the most important thing (IT manager, transcript page 11).

Because of the lack of cooperation from the other departments, the data stored in the EIS is not accurate and generates reports with wrong information. In order to function effectively, procurement professionals spend more time doing manual simulations with trustable data outside of the EIS than they did prior to the SAP implementation.

3.1.2.   - Quality management

Quality is a key issue at the SpareCorp, as it has direct implications for customer satisfaction and plant optimization. The company is constrained to implement a demanding process quality control and define quality control standards to be respected by the production department. SAP was meant to contribute to process quality control and plant optimization as it allows the registration and tracking of all the process quality issues. For example, if a quality issue occurs on the customer side, the quality department is able to know where, when, and what problems happened for this given batch of product.

The process quality operators and process quality engineers are now to solve production quality problems by following the standard process set in SAP. This process requires the manual, real time input of a lot of information; namely the time, product number, problem description, actions to be undertaken, etc. Even though they have attended a specific SAP training, during the post-implementation phase, they were not satisfied because the operations required by the SAP standard process are too complex and time-consuming:

> When I used SAP at SpareCorp for the first time, it felt very complex. From my personal point of view, it neither reduces my workload nor increases my efficiency. For example, when I created the rework order for non-conformity request, it was really very complicated. Even if we spend a lot of time on it, we still cannot follow all the processes in the SAP (Quality engineer, interview transcript page 21).

In addition, little information about the actual quality problems can be registered in the EIS, so process quality operators manage them outside the EIS, especially during the middle and night shifts because they have not been trained and due to a lack of time. Consequently, they write by hand on pieces of paper the information necessary for their colleagues on the day shift to handle the issue. The

piece of paper is stuck onto defective products, and they post the details of the issue together with photographs in a WeChat group for other process quality engineers to formally register the data in the EIS the following day. This workaround allows them to feel more efficient while a periodical data input is realized to reconcile with the constraints imposed by the EIS.

3.1.3. - Inventory deviation

The EIS was to allow SpareCorp to benefit from reliable financial reports generated with more transparency than with the previous EIS. The finance manager and the project manager detected inventory deviations on a regular basis between the data of the EIS and the reality. These deviations occurred between the warehouse and the production site and led to inaccuracy in the financial reports. The project manager investigated the reason for inventory deviation and found out that the warehouse and the production site used to manage material consumption in a way that involved the signature of a receipt note. But after the implementation, both departments had to follow a paperless process:

> *According to the formal process, all SAP data has to be correctly registered before releasing production orders, which are then released automatically. However, sometimes when we have urgent orders, there is no time for maintaining the SAP data which takes a long time. In this case, the production needs to be started before SAP data has been set (production planning planner, interview transcript page 20).*

Subsequently, a recurrent deviation occurred for which neither the warehouse nor the production department wanted to carry the responsibility. Indeed, warehouse managers stressed the fact that their responsibility is limited to goods located in the warehouse and production managers insisted that they are primarily dedicated to production and quality, rather than inventory issues. The EIS project manager suggested a solution, namely that the production planning department would carry the responsibility to coordinate the inventory for the goods located in the production lines. But production planners did not receive additional resources and authority to cope with the additional workload nor could they address the roots of the problem.

3.1.4. - Machine renewal

In order to maintain or increase output capacity, the production department orders and installs new machines on a regular basis. Upon delivery of a new machine, mechanical engineers first test the machine's functionality and stability to ensure that the parameters match the technical requirements for a specific production line. These tests, which continue until final validation, will have produced a significant quantity of scrap. In order not to overload the workshop and to avoid the scrap being mixed with qualified products, the scrap has to be dealt with quickly, both physically and virtually in the EIS.

A low scrap rate is one of the key performance index (KPI) for the production line. Consequently, it is crucial for production managers to allocate the

scrap parts generated during the machine renewal process to the industrial engineering department or else it will impact negatively the performance of the production department. Nonetheless, SAP does not make it possible to allocate scrap to a department which is not part of the working process. The industrial engineering department is not part of the working process because it plays a consulting role that provides support to the departments involved in the production. As a result, production managers had to develop a way to handle special cases such as new machine acceptance, in order to be able to maintain high performance. They requested production planners to design an invented process card in SAP that simulates that the products to be scrapped are finished goods (as only finished goods can be allocated to a department which is not in the working process):

> *Although the scrap is simulated up to the final step, it doesn't mean the products have been finished in reality. At the end of the SAP process, we can book out this scrap from the finished product stock. Then, we can book in the scrap rate to the Industrial engineering (IE) department, which is our technical support department, because they generate scrap during the machine acceptance process (production manager, transcript page 23).*

Production managers are aware that this solution does not conform with the standard processes foreseen in SAP, but they insist on doing this operation to keep their KPI high.

3.2. - Cultural consensus and heterogeneity

Social groups do share common concerns throughout the organization. Indeed, like most automobile factories, HDC is under increased pressure for better quality control, lean production and inventory transparency:

> *Being successful in tomorrow's digital economy requires globally functioning processes and new business models. We use the STREAM program to promote group-wide standardization. […] Automated monitoring, reporting and billing have now led to much more transparency. Sources of error were eliminated, and, despite the complex billing model, invoices are issued without delay, paid more rapidly and our liquidity is thus improved (Consultant, transcript page 27).*

These sectorial specificities were enhanced by the political context at HDC. Indeed, HDC is the first plant to implement SAP HANA system at SpareCorp, so there was added political pressure for a successful and timely SAP go-live.

HDC can be described as an organizational culture that encompasses different groups with specific values and beliefs (see Table 1). Although we identified more beliefs and values than those presented here, these were selected because they were significantly related to practical issues that were encountered during the implementation of SAP.

Table 1 - HDC corporate culture

	Belief	Value
1	SAP can help the company handle strong growth in business and assist leaders in guiding the development of the organization.	Transparency, control and standardized process management
2	Systematic and prompt solving of quality problems	Customer satisfaction
3	Production quantity and quality is key for organizational profitability	Maintain optimal workshop operations without fluctuation
4	Low scrap rate equates to performance	Optimal use of material leads to better profitability

If there is a consensus to a certain extent around these sets of beliefs and values across the organization, our field study shows that different social groups prioritize more one set over the other.

3.3. - Social groups and subcultures

3.3.1.   - Procurement planning and the culture of managerial rationalism

The social group in charge of procurement planning has been identified as the reference group. The group members believe in "managerial rationalism" (Danziger et al, 1982; Townley, 2002) which stresses standardization, accountability and control (Berente and Yoo, 2012). Consistent with this culture (see Table 2), procurement planners value timely delivery of raw material. This social group's mission is to ensure that the production lines are not negatively impacted by the delivery of raw material so that production deadlines are respected. This group value high quality data to generate precise and accurate planning. In the context of the SAP implementation, this requirement takes the form of a higher dependency with the input of data from other departments, which eventually puts the performance of the planning department at risk:

> *The most difficult thing, I think, does not come from the system itself but from the people who are responsible to keep it running smoothly, normally the key users. If we have a new part, the key users need to maintain a lot of data in the SAP system, and then we can start material procurement, release production orders and material account movements. If the data cannot be registered on time, all the production related activities will be postponed (production planner, interview transcript page 19).*

The planning profession identifies with the responsibility for just-in-time delivery which engenders acute pressure from various departments such as production, sales and top management. Informants consistently indicate that production and procurement planners prefer to use manual simulations to double-check, even if this implies a higher workload than before the SAP implementation:

Currently, the global site found out that our users didn't use the material resource planning as well as they had wished. Users make a lot of planning outside the SAP system. We use the excel file and make a lot of manual work for planning. Then, we place purchase orders, production orders in the system (IT manager, interview transcript page 9)

Indeed, planners firmly consider that their mission is to ensure that the availability of raw materials to keep production running smoothly and to maintain high customer satisfaction. Planning professionals prioritize results over the means used to reach it: "The planner needs to release production orders manually or adjust the production order in the SAP system" (production planner, interview transcript page 19). Even if its reliability ultimately depends on the accuracy of the data inputted by the other departments, they generally associate SAP with the backbone that should unite and guide the company.

Table 2 - Cultural preferences in production and procurement planning

Dimension	Characterization	Representative quotation
Belief	Enhanced accountability and visibility allow for high quality data in SAP which lead to accurate reports and forecasting. Only SAP can help the company handle strong growth in business and help leaders guide future development.	*We are in a fast-growing period. The businesses doubled and even tripled within one year and we even integrated new businesses. This represents a huge cash and material flow with suppliers and customers. Without SAP, it is impossible to drive this business in a clean way. 2017 was the exact time when the business needed SAP. Neither of our previous information systems could do that before (general manager, interview transcript, page 15).*
Value	Transparency, control and standardized process management	*SAP systems (is) to keep information transparent. For me, it doesn't matter who wants it. So far, they have authority assigned, and then the data should be transparent for them. [...] SAP, for me, is more for business flow control. I need clean data for effective invoice processing with suppliers and customers. The cash flow volume ensures that the internal process runs well. (general manager, interview transcript, page 16).*
Assumption	Planning is ultimately essential to ensure customer satisfaction	*Planners are important "because we need to satisfy the customer's demand" (production planner, interview transcript page 19).*

3.3.2. - Non-conformity request and the culture of quality consistency

Process quality engineers identify with the primary goal of controlling processes in a quick and efficient way: "*The most important value is to reduce waste, reduce scrap parts and optimize process quality problems" (quality engineer, interview transcript P21)*. In order to achieve this goal, they prioritize process quality issues over the respect of the SAP procedure to ensure uninterrupted production, which leads to timely delivery and customer satisfaction. They may stress the importance of quality standards as a first priority, but they believe that they can reach it without SAP, despite pressures from the top management. If process quality engineers would follow the SAP procedure, they would not have enough capacity to reach their quantitative target. For them, booking non-conformity requests in SAP is not as important as quickly solving quality problems. In their mind, SAP belongs to the category of "mere management requirements" because it is not linked with better and faster quality problem solving, but rather with internal corporate politics.

Table 3 - Cultural preferences in quality control

Dimension	Characterization	Representative quotation
Belief	Quality problem solving in an efficient and quick way	*You know, in the workshop, we have to solve the quality issues in a quick and efficient way. We cannot delay handling [quality issues] in SAP. (quality engineer, interview transcript P21)*
Value	Customer satisfaction is more important than conformity with SAP standard processes	*The real target is to satisfy our customers. But we if we want to improve our customer satisfaction, we need to use tools. I think [SAP] is the best tool (focus group transcript, page 25).*
Assumption	Booking in SAP is used to satisfy the top management	*We have to use the SAP system, but we still use paper records as well. We will only follow the standard SAP process for major problems or difficult issues. For other issues, we will do it outside of the system by using paper records. (quality engineer, interview transcript P21)*

3.3.3. - Inventory reporting and the culture of productivity

The third sub-culture relevant to SAP implementation was that of "productivity" (see Table 4). The process of handling raw material between the production department and the warehouse is new because it did not exist before the SAP implementation. The production managers mainly concentrate on enhancing productivity, delivery performance and product quality. They believe that they should not be in charge of the operation of this new task and regularly

feign lack of knowledge to justify their position. They assume that optimal workshop operation does not require SAP and that regular stock deviation errors can be dealt with manually. They believe that the quantity and quality of the production is key for organizational profitability and customer satisfaction. As production managers escalated to the SAP project manager to solve this conflict, the SAP project manager emphasized that deviations impact reporting could disturb the production order in the SAP process. Production managers associate SAP with another "additional workload" that does not provide real benefits to their work:

> *According to the standard process of SAP, all the purchase orders need to be generated automatically in the system. It requires a lot of data to generate the orders, and the data must be accurate. To check the accuracy of the purchase order in SAP, I will simulate the stock in Excel (production planner A, 20).*

As they still refused this additional task, they convinced the SAP project manager to allocate this task to production planners, who only temporarily accepted this task.

Table 4 Culture of productivity

Dimension	Characterization	Representative quotation
Belief	The quantity and quality of production is key for organizational profitability and customer satisfaction.	*Keep the promised delivery date [...] because we need to satisfy the customer's demand. (interview transcript P20)*
Value	Maintain optimal workshop operations without fluctuation	*The production manager's most important task is "to survey relevant people to identify the root causes and find the solutions and I need to track whether the solutions are really implemented or not" (Production manager A, 22)*
Assumption	Optimal operations do not require SAP. Regular stock deviation error can be dealt with manually.	*But sometimes when we have urgent orders, there is no time for maintaining the SAP data which takes a long time. In this case, production needs to be started before SAP data has been set. The planner needs to release production orders manually or adjust the production orders in the SAP system (production planner A, 20).*

3.3.4.   - Productivity culture: Lean Professionalism

The fourth relevant subculture is Lean Professionalism (see Table 5). Scrap rate calculation belongs to the standard process in SAP. However, the standard process does not distinguish between the scrap produced by the production line or

by the mechanical engineers. Production managers mentioned many times that the scrap rate has to be allocated to the right department because a higher scrap rate would have a negative impact on the operators bonus. Indeed, the scrap rate is one of the key performance indicators for production teams and new machine acceptance has a serious impact on this indicator. During the interview, a production manager mentioned that, before the SAP implementation, this KPI was calculated manually to consider all exceptions. As the production manager cannot do the same in SAP, he requested that the SAP project manager change the calculation logic in SAP. This request was clearly rejected because the calculation is a global standard process. In order to reach their own performance target, the production managers developed a shadow system under SAP which is time-consuming.

Table 5 - culture of Lean Professionalism

Dimension	Characterization	Representative quotation
Goal	Lean production with the lowest generation of scrap	*The main KPI is "lower scrap rate" (production manager A, 22)*
Belief	Low scrap rate equates to performance	*Our KPI is very obvious. Everyone knows in the morning meeting that in this time period we have a good or bad scrap rate. We should fight to reach our target. If we get the target, then everybody should be happy about the result (production manager A, 22)*
Value	Optimal production leads to better customer satisfaction	*Our activity brings more customers and more orders to the company, then I can get a salary increase. (production manager A, 22)*
Assumption	Scrap generated by new machine testing has a strong impact on the production department's performance.	*But how to use SAP to book scrap into the right department, so that this scrap rate is not booked in the cost centre of the production department? (production manager A, 22)*

3.4. - Cultural contradiction and constructive deviance

During our study at SpareCorp, we found that the reference group is the promoter of EIS implementation, namely the planers with the culture of managerial rationalism. This reference group is in contradiction with the three other groups who have a different cultural preference with regard to the SAP implementation. These cultural contradictions gave rise to three different forms of constructive deviance (Table 7). The data we collected may not reveal all types of constructive deviance, but we identified three different forms of constructive

deviance that actors used to reconcile their practice with SAP, namely creative performance, issue selling and taking charge.

Table 7 Forms of constructive deviance in SAP implementation

Forms of constructive deviance	Definition	Examples	Practices
Creative Performance	"the generation of new ideas, products or procedures useful to organizations" (Alge et al, 2006, p. 10).	Solve data input constraints by periodically handling data input activities in SAP.	Process quality control: paper stick and record, book later in SAP.
Issue selling	"voluntary behaviors which organizational members use to influence the organizational agenda by getting those above them to pay attention to an issue" (Dutton and Ashford, 1993, p. 398).	Assign SAP operation to people from other departments: Workload transfer.	PM allocated Inventory deviation error solved by production planner.
Taking Charge	"voluntary and constructive efforts, by individual employees, to effect organizationally functional change with respect to how work is executed within the context of their jobs, work units, or organizations" (Morrison and Phelps, 1999, p. 403).	Develop a non-standard process in SAP: Solve problems in a non-standard. customized way within SAP.	Production manager reconciling non-standard process in SAP.

3.4.1.   - Creative Performance

We identified the creative performance as a form of constructive deviance, which can be defined as "the generation of new ideas, products or procedures

useful to organizations" (Alge et al, 2006, p. 10). Local practices arose to cope with the contradictions between the culture of managerial rationalism and the culture of quality persistence. While the culture of managerial rationalism emphasizes that the process quality control has to strictly follow the standard SAP procedure just-in-time, the culture of quality persistence emphasizes the efficiency and velocity of problem solving over timely attendance to SAP processes. In practice, process quality engineers reconcile this cultural conflict by adding a time buffer between these two activities. They use creative performance in the form of paper stickers and WeChat for information sharing, thus overstepping SAP's requirements for real-time data input, while periodically reconciling data in SAP.

3.4.2.   - Issue selling

We identified issue selling as a second form of constructive deviance. Issue selling can be defined as "voluntary behaviors which organizational members use to influence the organizational agenda by getting those above them to pay attention to an issue" (Dutton and Ashford, 1993, p. 398). The project manager's work practices indicate contradictions between the culture of productivity and that of management rationalism. They are committed to maintain optimal workshop operation without fluctuation, but they tend not to consider inventory deviation, while the project manager requires high quality of control reports. As a result, project managers tend to solve this cultural contradiction by delegating the tasks to a third party, namely the production planners.

3.4.3.   - Taking charge

We defined the third form of constructive deviance, taking charge, as "voluntary and constructive efforts by individual employees to effect organizationally functional change with respect to how work is executed within the context of their jobs, work units, or organizations" (Morrison and Phelps, 1999, p. 403). Our analysis shows a typical contradiction between the culture of lean professionalism and the culture of managerial rationalism. While production managers understood the importance of SAP standard operation, they are convinced that the non-standard process they developed can lead them to higher performance. The culture of management rationalism implies the strict application of standard processes which are associated with scrap rate calculation and booking sequences. Production managers reconcile this cultural contradiction by taking charge thus designing a new process on their own.

4.   - DISCUSSION

The results of this study indicate that the organizational culture is a bundle of values of beliefs that are unequally shared among groups. These values and beliefs are interdependent and interact in complex ways. Indeed, there are trade-offs between the various organizational goals and the values that are instrumental to reach these goals. As such, these findings are in line with a "configurational approach" of organizational culture (Meyer et al, 1993) and the complex interdependencies and interactions between cultural dimensions are underlined (Ostroff and Schulte 2014). One aspect that reflects the

interdependency between subcultures is the rising influences of the values and beliefs of the EIS promoters throughout the organization as the three other groups adhere to some extent to managerial rationalism. The cultural integration of the EIS can be understood as the interactions with existing subcultures within the organization and the increasing adherence of subgroups to the culture of managerial rationalism.

Industrial companies can be characterized as culturally plural organizations, as different occupational groups within the organization are likely to follow specific cultural preferences. This cultural diversity challenges the implementation of standardized systems since subcultures may be more or less consistent with the values embedded in the EIS. But despite this challenge, the literature also refers to successful implementation and adoption of EIS (Moon and Phatak, 2005). We reconcile this paradox by identifying constructive deviance as the way organizational groups reconcile the cultural contradiction between their mindset and the beliefs and values associated with the EIS.

We identified a reference group that promotes the new enterprise system and in which cultural preferences are in line with the mindset implied by the EIS: managerial rationalism (Townley, 2002). However, some groups draw upon other subcultural preferences that contradict managerial rationalism in given instances. We focused the study on three groups with specific subcultures, namely quality consistency, productivity, lean professionalism. In order to continue performing and fulfilling their professional obligations in these instances, the contending groups engage in constructive deviance behaviors, thus accommodating the prescriptions associated with both the dominant culture and their subculture. We identified three types of constructive deviance that result from these cultural contradictions: creative performance (Alge et al, 2006), issue selling (Dutton and Ashford, 1993), and taking charge (Morrison and Phelps, 1999).

CONCLUSION

Unlike prior research on constructive deviance in IS which deployed a quantitative method (Schaarschmidt and Bertram, 2019), this paper contributes by providing a qualitative account of organizational members' practices. Still on a methodological basis, rather than focusing on quantitative analysis culture (Jung et al 2009; Boyce et al, 2015; Kotrba et al 2012), this study provides an emic description of an organization that cultivates subcultures and allow groups to strive for different but complementary goals. Despite limitations due to the narrow number of semi-structured interviews, this qualitative study contributes to the literature on organizational culture by illustrating in detail the cultural difference of groups within the organization and the constructive deviance behaviors subsequent to EIS implementation.

By conceptually integrating constructive deviance and organizational culture, this study aims at contributing to this understudied field. The findings draw the attention on conflicts between organizational subcultures as the loci for new innovative behavior able to bring positive change and solve problems (Pascale, Sternin and Sternin, 2010) after the EIS implementation.

A practical contribution is to suggest that top managers' cultural awareness, both of their own cultural bias and of the cultural diversity of their organization, is instrumental in the establishment of constructive dialogue

concerning the current cultural variety and the degree of variation within the organization that is adequate. Such a dialogue may prevent subgroups to be unintentionally prejudiced by an EIS that is designed globally for the whole organization, but that may not respond to their subcultural needs. Occupational diversity within groups has a positive impact on performance (Horwitz and Horwitz, 2007). This study suggests that organizations should promote diversity within groups to reduce the level of cultural contradiction between subgroups and the reference group. Future studies regarding the role of constructive deviance on the adoption of a new information technology system may look at the mediating role of cross-cultural competence in reducing the level of cultural contradiction between subgroups and the reference group. The theoretical lens of constructive deviance leads to new questions: how long should these behaviours stay deviant rather than become integrated into the ERP? The reactivity from the ERP project team is also instrumental to sustains motivation when technical problems occur and to recognize eventual new best practices. Managers should accept constructive deviance within the organization to encourage employees to design solutions to practical problems related to the ERP. Future research may look at how to instill intrinsic motivation, felt obligation, and psychological empowerment (Vadera et al, 2013) for teams to engage in constructive deviant behavior when necessary in the frame of ERP implementation and post-implementation.

The continuous confrontation between dominant organizational culture and subcultures plays a significant role in EIS implementation (Kawalek and Wood-Harper, 2002), future research may look at new types of constructive deviance performed by subgroups which enhances EIS success in the post-implantation period. If organizational culture is a key element to sustain innovation within a corporation (Claver et al, 1998), future research may look at how organization can promote diverse subcultures and handle constructive deviance to foster innovation (O'Reilly and Tuschman 2016). Future research may look at the link between cultural diversity, constructive deviance and knowledge creation and management (Chaabouni and Yahia, 2013a and b).

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