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DELIBERATIVE AND MATERIAL ORGANIZATIONAL BECOMING: SOCIOTECHNICAL LEADERSHIP OF DIGITAL TRANSFORMATION

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ABSTRACT

This chapter directs attention to dilemmas and paradoxes embedded in information and communication technology (ICT) changes and transformations. Through the case of a merger between industrial groups, we examine and compare two ICT solutions based on different ICTs and organizational participatory philosophies. Strategic management challenges comprise important features of our discussions. The solutions are one custom-made proposal box and one standard solution. We analyze the proposal box through the communicative perspectives of Jürgen Habermas. The chapter outlines broad participation and democratic work-life arrangements as means by which to handle and implement the proposals. A representative formal department council conducts preliminary strategic choices among proposals. This council also decides upon the further destiny of the proposals evaluated. Gradually, representative councils at different levels and areas of the organization become involved. These

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councils are affected by the outcomes of the decisions made in other different councils. Eventually, the whole organizational system—with its surrounding economic, political and industrial relation arrangements—comes into play. To conduct analytic examinations and critical reflections on these processes, we applied system theories, organizational becoming perspectives and emphasis on diverse team configurations from Niklas Luhmann and Calvin Pava. These approaches show how ambiguities and paradoxes between control, surveillance and participation create strategic choices to be made between the competing logics of management principles and ICT configurations. Our conclusion does not entail prescribing a preferred solution or organizational arrangement. Rather, we indicate the capability to cope with paradoxes and deal with the contradictions on an ongoing basis. In this respect, organizations that constantly face demands for change and transformation are better understood as organizational becomings.

KEYWORDS

Sociotechnical Systems Theory, Paradox, Participation, Digital Transformation, Organizational Deliberation.

1. Introduction

Ambiguities and paradoxes between control, surveillance and participation require strategic choices to be made between the competing logics of management principles. Such choices become crucial when the development and implementation of new information technology create a new interplay between technology and organization.

Traditional conceptualizations of strategic leadership tend to situate the organization in such a way that it is strategically led in a competitive market environment, while these conceptualizations are more ignorant of the deliberative/governing institutional set-up—both internally, in the organization itself, and within the organizational environment. Organizations not only decide, produce and compete; they also deliberate and negotiate, both internally and externally. This invites a reconceptualization of leadership. It concerns both the internal and the external deliberative/governing institutional set-up in deliberative arenas and in decision-making bodies.

A case in the context of Norwegian manufacturing provides an example of such a set-up in deliberative arenas and in decision-making bodies. Within companies in this sector, we typically find a department council (AU), an arena at department level in which management and labor deliberate and negotiate organizational policy and decisions.1 This set-up is linked to the external deliberative/governing institutional set-ups, corresponding to the way the

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[1] This is a body regulated and recommended by the Norwegian Basic Agreement (§13.1) in Companies with more than 200 employees. Each of the company's main departments are set up with a separate AU. Members of the AU are managers, shop stewards, safety representatives and other elected representatives from the department. The AU's scope of activity comprises health, safety and environment (HSE), working environment, productivity and enterprise development.

organization (managers, union representatives and others) and external institutional arrangements (laws, union–employer agreements, owners and national-level unions) interact. Through such interactions, the organization's space for maneuvering is both widened and restricted. The process of making restrictions through regulations could also, paradoxically, widen the scope of decision making and increase the degree of freedom. Standardization through regulatory practices can be one such example of a paradoxical outcome from increased surveillance and a simultaneous enhanced freedom and space for decision-making practices. This paradox between surveillance and freedom may change in character as the organization experiences digital transformations—but it does not go away. This is an important topic, which we discuss in the following sections.

Ongoing transformations occur largely as a result of external conditions. Often, transformations are caused by regulatory and standardization requirements. Additionally, they may concern the choice of technology intended to fulfill more specific purposes. Standardization and flexibility, as well as the ability to meet special-purpose requirements, are covered by the term flexible specialization (Piore & Sable, 1984). This built-in ambiguity has been a constant tension in the development of ICT. This chapter thematizes how today's industry transformations cope with this ambiguity encapsulated within the strategy of flexible specialization.

We will outline some aspects of collaborative work-life arrangements and participatory arenas within specific organizational systems. We will also present a case study to illustrate some of the challenges facing company-specific operations on a micro level when an organization is faced with macroeconomic transformations. We provide specific attention to ICT transformations framed within a company merger.

Financial, political, climatic, demographic and technological transformations constitute the environments in which enterprises operate. In recent years, the development and introduction of new ICT has also had a major impact. These macroeconomic transformations guide microlevel operations within specific companies and their organizational systems. Among the features of these organizational systems are their work-life regulation structures—structures that can entail varying levels of collaboration and participation. These bodies are structurally linked to regulative institutions beyond the singular enterprise (Hall & Soskice, 2001). In modern industrial nations these arrangements at different internal/external organizational levels impact macroeconomic strategic and political decision making. Through these work-life structures, changes and transformations in different strategic decision-making arenas come into play, and have a significant impact on microeconomic strategic decision-making operations.

Our case directs attention to management, leadership, collaboration and participation. ICT creates new opportunities, as well as challenges, for the existing participatory arrangements. These arrangements' structure decision making in which collaboration between management, unions and the shop floor plays a key role. Our reflections explore the following topics:

- Strategy, with emphasis on organizational environment.
- Management, with emphasis on depersonalizing of leadership.

- Digital transformation, with power, resistance and objectification on the one hand, and empowerment, skills formation, democratization of decision making and enhanced transparency on the other.

The main point of departure is the last point, with the other topics cultivating critical reflections when the digital transformations (Vial, 2019) are addressed. Critical reflections on discourse practice, system theory and sociotechnical strategies (STS) provide the key theoretical perspectives.

2. Transforming the Organizational Environment

Despite high labor costs in several highly industrialized countries, these regions' work-life and welfare state arrangements, efficacy, skilled workforce and advanced production processes arguably provide competitive advantages (Claussen, 2009). Notwithstanding higher wage costs and higher general costs versus most other countries, many manufacturing companies have managed to gain comparative advantages in such an environment.

One case from a main industrial environment in Norway—the oil and gas industries—serves as an example. Technological advantages and self-governing workforces can explain the industry's competitiveness. An autonomous and skilled workforce has contributed to companies' capacity to reduce the indirect costs associated with detailed planning, management, coordination, and control. Companies have thus managed to keep their total costs at a competitive level (Levin et al., 2012; Ravn & Øyum, 2020).

The efficient work processes enabled through empowered employees have led to competitive advantages. On a macroeconomic level, the legitimacy of such statements is partly reflected in the flow patterns of foreign direct investments that mirror the attractiveness of investment opportunities in advanced countries characterized by these work-life arrangements and participatory strategies (Busch, 1992; Claussen, 2009).

Recent developments in the manufacturing industry have reinforced the need to assess and develop the interaction between organizations and technology. In recent years, technology-driven high-tech industries have invested significantly in advanced production equipment to ensure their competitiveness. A new potential for productivity development and competitiveness is present in radical changes in the interactions between technology and personnel—that is, by enabling blue-collar workers and teams to utilize new opportunities that are emerging through the introduction of ICT solutions. However, increasing the pace and complexity of production implies that production managers, for example, face new challenges regarding the coordination of people and activities. When management is restricted to focusing on unforeseen events in the present, focus is sidetracked from long-term strategic improvements.

Digitally empowering shop-floor workers implies an increased opportunity for them to take responsibility for the production system and labor processes. Increased confidence in making decisions for efficient production, coordination and work safety, and continuously developing

skills, become essential. This provides new opportunities. Simultaneously, the empowerment entails challenging organizational arrangements that require carefully considered strategic action. On the one hand, these arrangements may foster enhanced skills, innovative capacities and high-quality work. On the other, they may foster indifference and even resistance, as well as challenges for management capabilities.

An approach presented by Piore and Sabel (1984) emphasizes flexible, scalable and renewable organizational arrangements based on a balance between internal self-regulation and strategic choices. This approach accentuates the combination and integration of different organizational designs, such as self-governing work teams in production lines, matrix-organized project teams and ad-hoc coalitions (Pava, 1983). These designs are a form of dynamic network organization. Increasingly turbulent environments and technological development require that organizational design be perceived as a continuous dynamic process rather than as a one-time event (Tsoukas & Chia, 2002). However, this approach has not itself presented as an undisputable advantage. Instead, few organizational architecture and dynamic networks have managed to find a sustainable solution to how to be a flexible, and yet effective, organization. To support continuity and stability, organizations require, on the one hand, reproduction and consistency in their structures. On the other hand, dynamics for change and the transformations required to adjust, stay competitive and gain advantages present themselves as ever-demanding external conditions in the organizational system's environment. Organizational systems constantly face environments and surroundings with macroeconomic and political challenges.

2.1. Logics of Digitalization and Governance: A Case Study

Standardization of operative levels offers equal ways of approaching matters, eases overview/transparency and increases the ability to plan and control. Standardization also enforces a "one-size-fits-all" template across an organization, thus risking removal of the space for adaptability, improvisation and creativity. In a merger of a large system of 15,000 employees and a smaller one of less than 3,000 employees, the standards are likely to be rooted in the larger system and to be found "unfit" by teams within the smaller system.

2.2. ICT, digitalization and organizational transformation

Increased information availability can make possible flexibility at an operative level. New operational digital tools can support the decentralization of service and material handling that has previously been performed by managers/facilitators. This enables work organization redesign. Digitalization potentially offers increased individual autonomy, distribution of decision-making authority and problem-solving capability. Customization of the work process includes possibilities to adjust, adopt, experiment and enhance ownership/commitment and empowerment. On the other hand, several digital solutions (such as enterprise resource planning systems) have traditionally forced bureaucratization and standardization upon organizations. Increased complexity risks lowering the efficiency of systems such as quality systems.

Specialization produces specialists and experts. Through such processes, specialist and experts gain monopoly and power (Crozier, 1964). Flexibility and standardization could be ways to increase capacity and make navigable space for substitutes for and replacement of skills, technology and people in organizations. This could count as a measure to counter the monopolies and power positions seized by specialists and experts. Flexible specialization directs attention to the measures that strategic management faces. Participatory and collaborative arenas supported by targeted ICT solutions could be STS to cope with such organizational challenges.

New technologies are increasing the pace, dynamics and complexity of production. Technology and automation make up simplifications and generalize the pace and dynamics of production.

Self-governing workforces that are interconnected, attentive and possess new levels of skill and competence underpin the deliberative capabilities of organizations (Weick & Roberts, 1993). In the case study, we elaborate on and analyze how such features operate. First, we use different perspectives to analyze, discuss and reflect upon our case, in which ICT-induced change is our main focus. We make some notes on Habermas and his concepts of deliberative performance and arenas for dialog. The subsequent contributions elaborate on these topics, before we advance to a closer examination of the multipurpose and proposal box ICT-based solutions.

2.3. Perspectives on (ICT) Changes

The proposal box/AU arrangement is compared with an ICT solution based on the centralized information processing of multipurpose database arrangements. In our case, a multipurpose solution is supported as a strategic choice linked to a merger within a new unified corporative structure. In the multipurpose solution, the shop-floor workers provide input while management/leadership and supportive expert units enact strategic analysis and decisions based on this input. Essentially, the proposal box solution supports collaborative, decentralized and distributive information-gathering and decision-making processes. Multi-purpose arrangements, on the other hand, supports more centralized information gathering and decision making: where in these cases, strategic processes and change projects are governed by managers/leaders and experts.

The internal change processes take place within an organization that is facing external challenges from its environment. Surrounding the organizational system are changes that greatly influence and condition the internal dynamic working and processing.

Habermas's deliberative approach may address participatory collaborative processes in work life Habermas, 1981). He touches upon features that can be linked to essential aspects of negotiation practices, agreements and labor law arrangements. We briefly present and comment on these areas. In both agreements and laws concerning work-life parties and their interactions, we can differentiate three aspects of information-distribution and decision-making processes:

- *Informing*: Information is presented to employees.

Traditionally, this occurs where managers/leaders update the workforce and union representatives on specific matters. There is an expectation and obligation that managers/leaders inform affected employees and/or union representatives in due course of changes such as the introduction of new technology, new strategies, major changes in work conditions and work processes/organizational changes. Important in this respect is the presentation and distribution of information to those concerned.

There are several different occasions on which such informing takes place. When work-life parties face each other in regular negotiations, such as wage negotiations, they usually present their claims. On other occasions, management must inform employees/representatives of important matters affecting employees. Specifically, this concerns changes impacting workplace arrangements, logistics, work processes, etc. According to Habermas (Habermas, 1981), we could phrase this presentation of information as a process in which the objective is to provide the receiver with rudimentary knowledge of what is at stake. This informative speech act can be followed by a communicative act, where the main objective is to reach a mutual understanding of the information presented.

- *Understanding*: Interpretation and understanding may be extended to cover the intended outcomes and familiarization with the positions involved.

An exchange of arguments, viewpoints and perspectives involved entails elaborating on topics to enhance parties' knowledge and understanding of each other's points of view, as well as the differences and conflicts of interests involved.

- *Mutual understanding and consensus making*: This stage involves incorporating the others' points of view.

Coordination and mutual understanding, as well as incorporating each other's different points of view, is a major aim in the communicative performance that Habermas addresses.

A possible consensus could be one outcome. Such a consensus could still involve major disagreements. Prevailing disagreements may be maintained simultaneously as an overlapping consensus is an ambition. An overlapping consensus implies reaching agreement on some elements, but disagreement on others—and even an agreement on what one disagrees about. John Rawls is famous for introducing the term overlapping consensus to reflect these processes of mutual understanding (Rawls, 1996). Habermas uses the term mutual understanding to mean both incorporating each other's different points of view and to cover similar consensus-making efforts when parties coordinate their opinions and ambitions. He often refers to Mead (1934) when he presents this way of adopting others' point of view (Habermas, 2004)

In negotiation processes between work-life parties, we can view mutual understanding and overlapping consensus as stages that have several outcomes. Parties could reach an agreement that is acceptable and brings consensus. Another possible outcome could be conflict and strike. It may be necessary to forward negotiation to a new arena, for instance, an arena involving the state and public authorities as a third party.

Incorporating others' points of view as an aspect of mutual understanding is a special advancement in communicative performances. At this level, each participant familiarizes themselves with the others' positions. Their aim is to explicitly rehearse each other's positions until all involved agree that every participant is able to present every position involved in a way that is acknowledged by all involved. Disagreements and conflicts of interest are here mutually accepted and understood by all. This is a baseline for later conscious consensus building. This mutual understanding does not necessarily involve agreement or consensus. Nonetheless, it can provide a greater awareness among the participants of what is involved and the different positions that are argued.

The above illustrates stages in communication processes, where different positions, views and interests interplay in discourses and speech acts. We have directed attention to the possibility that these stages can be at play in negotiations between major work-life parties. In our analysis, we will present how to apply these concepts and perspectives to analyze and discuss the proposal box case. Emphasis in subsequent sections will focus on strategic choices for change facilitated by the ICT app, as well as on the decision-making arenas involved. In the next section, we will target a way to interlink external conditions that affect the internal communicative processes.

2.4. The Organizational System and External Relations

The proposal box/AU and multipurpose solutions are embedded in broader work-life and extended arrangements that go beyond the organizational system as such. An organizational system has its internal meaning production, memory, units ("cliques") and cultures. It creates its specific ways of coding and identifying a "we" and "external others." Niklas Luhmann tries to describe some of these features through the outline of his system theory (Luhmann, 1997, 2000).

For Habermas, communicative actions in different arenas constitute the production of meaning and understanding. Actors address a matter that is a target for common understanding. The way we address others is one aspect of a communicative action. Actors additionally have their own interests and motives behind their utterances and statements, which are hidden from the participants to different extents. Habermas suggests that a communicative action presupposes that we are acknowledged participants in our communicative performances. This implies that we downplay the presence and influence of interests and motives that could disturb the validity of the claim and efforts to reach mutual understanding and consensus. For Habermas, self-interest, ambitions and motives are to be avoided and eliminated. This is necessary in order to produce an idealized speech situation.

For an extended case view, we could imagine that our motives and self-interest are linked to wider external relations. Such wider external relation could be supportive structures and linkages to rely on and refer to. Our internal organizational context, such as the proposal box/AU, is linked to more or less explicit system externals such as markets, macroeconomic conditions, environment, local/national/global surroundings and negotiated agreements. Work-

life arrangements on national and international levels are examples of such external linkages. Disciplines and educational linkages are other examples. They can operate as common trades and make up the background for references to specific interests and motives. Communities, cultures and national identities can stage similar functions. These arrangements can cover some of what could count as functional system references in the phrasing of Luhmann (Luhmann 1997, 2000).

Luhmann refers to functional systems as processes that crosscut organizational, specific meaning production and coding. They interfere and interact with the internal meaning production and identity forming in organizational systems. External functional systems, however, have their own meaning production and coding.

Internal work-life practices and structures are linked to a company's external arrangements of work life, such as national and international work-life parties. Educational, scientific, economic and political systems are other examples of such functional systems, with their specific meaning productions and coding processes. They interfere with communicative performance on internal arenas and their corresponding decision making and strategic choices. For Luhmann, it is essential to demonstrate these external and internal linkages between internal organizational systems and external functional systems. These linkages are instituted within the surrounding environment.

An obvious example of such linkages is the negotiation taking place on company and local level between union and management. These negotiations take place according to a general agreement and national law directed towards work life and the work environment, as well as more specific negotiations forming agreements concerning, for instance, wage settlement. Such negotiations structure and code the processes taking part at different levels of the participatory and collaborative structures being practiced.

By utilizing Luhmann's system approach, our objective is to link internal organizational change processes to external system change conditions and performances relating to our case. The working of the proposal box/AU and multipurpose solutions are extensively framed by, for instance, the current merge process. This merge process takes place within a more wide-ranging external environment with its own macroeconomic and political conditions. Contrary to Habermas, Luhmann does not focus primarily on actors interacting, but rather on internal information and decision-making processing, and on the external interactions with the environment where other systems operate.

Luhmann's concept of organization emphasizes not only communication and decisions, but also decision premises, heuristics and procedures. Through these, the organization is able to recreate itself, evolve and grow, as well as perish. For Habermas, communication is understood as interaction between speech actors. Communication is also fundamental in Luhmann's

position. For Luhmann, communication implies utterances that are made in response to previous utterances, and which in turn generate new utterances.2

Both Habermas and Luhmann have had a major influence on the elaboration of STS approaches (Claussen et al., 2019). Their contributions—and any shortcomings these might have—operate as the background for the following closer presentation of STS, specifically related to Calvin Pava. Additionally, beyond critical reflections on STS, we will extract some possibilities and limitations to any claimed final solution to the paradoxes, dilemmas and inevitable ambiguities that face our effort to picture future ideal type models beyond the current state of affairs.

2.5. Pava's Conceptual Tools as Sensemaking of Discourse Theory and Systems Thinking

One of the hidden treasures within sociotechnical theory is the work of Calvin Pava (1983, 1986a, 1986b). In the 1980s, Pava made a break with previous STS. In this break, he made STS relevant to the new digital reality— and also to today. We have earlier envisioned a paradox approach to allow organizations to steadily face and handle conflicting demands simultaneously. Pava's concepts of deliberations, discretionary coalitions and reticular organizations serve as a point of departure in this.

Unlike Habermas and Luhmann, who also developed theories to address society as a whole, Pava's work is limited to the operations of organizations. However, in this setting, his concepts may even function as a possible conceptual merger of the Habermas-discursive and the Luhmann-systemic communicative perspectives. We will attempt to apply our examinations of Pava's work in order to have a closer view of the digital proposal box as a means of organizational becoming:

- procedurally, as a series of discourses (as arena and processes) making particular use of Pava's concepts of deliberations and temporary, discretionary coalitions, and
- systems-theoretically, as communication within communication systems and perturbations across systems that are somewhat incommensurable with one another, illustrated by the merge process. Here, Pava's concepts of vocational separatism and individualistic professionalism will be applied.

STS sees organizations as systems that convert environmental inputs to outputs fed back into the organization's environment. Pava kept this focus, but redirected it towards non-routine, multidirectional and ambiguous information work processes. Non-routine work and dynamic systems also have their conversion processes, but they involve complexity and uncertainty, and therefore also nonlinearity, ambiguity and paradox. Unlike for more routine STS processes, such conversion processes must emphasize temporary coalition formations and reciprocal mutual understandings rather than shared goals and lasting teams. Furthermore, in digitalized

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2 "Organizations arise and reproduce themselves when decisions are communicated, and the system becomes operationally closed on the basis of this operation. Everything else – goals, hierarchies, opportunities for rationality, members bound by instructions, or whatever else is regarded as a criterion of organization – is secondary in comparison and can be seen as the result of the system's decision-making operations" (Luhmann, 2018:41).

non-routine conversion processes, demarcations between technology and people become blurred, since they are interlinked and interact in several ways (Claussen et al., 2019).

Pava identified deliberations as the basic analysis unit of non-routine, knowledge-based work, and he defined deliberations as "sequences of reflective and communicative acts employed to resolve problematic issues" (1983: 177). Deliberations, following Pava, are patterns of exchange and communication in which people engage with themselves or others to reduce the equivocality of a problematic issue; the input, conversion and output of such processes move the non-routine work forward. In the view of Eric Trist, the deliberation is a dimension of the professional and managerial that previously went unrecognized, because focus had been on decision making (1983, Trist). Organization—or organizational becoming—is enacted by deliberation more so than by decision. In our reading, the concept of deliberation developed here parallels Habermas's concepts of communicative interaction that presuppose actors observing validity claims and making efforts to reach mutual understanding and consensus.

Pava made another interesting observation: he saw that the modern and digitalized knowledge organization was characterized by what he called "individualistic professionalism (made up by extensively trained specialists)" (1986b:204), and this led him to develop a concept of *vocational separatism*: an orientation that "stresses the individuals and their occupational identity more than a specific collective enterprise" (1983:180).

As we read it, this *occupational identity* can be understood as aligned with Luhmann's concept of functional differentiation. Vocational separatism is an organizational condition produced when meaning production and coding is functionally differentiated into separate subsystems. On the one hand, vocational separatism will interfere with communicative performance on internal arenas and their corresponding decision making and strategic choices, thus disturbing communicative reason and mutual understanding. On the other hand, vocational separatism produces linkages between internal organizational systems and external functional systems. When organizational communication and decision processes occur at the local company level, then an organization may be hampered in its own development of mutual understanding, but the very same factor that is hampering it—vocational separatism—is also enabling it to utilize communication and connection with the external.

Our case study demonstrates the case of a merger between two different units, with emphasis on two different strategies applied when choosing a future ICT solution for the merged entity. The final outcome, specifically regarding the ICT solutions compared in our illustration, indicates a dynamic organizational change process. The paradoxes and dilemmas involved illustrate that there are no ideal type solutions that can bring the change process to its final stage. Rather, the case illustrates an organizational becoming (Tsoukas & Chia, 2002), which moves from two existing units to a single major company. A single major company, however, carries a series of diverse interests, strategic options and decision-making processes. Finalizing the change and transformation process implies solving the paradoxes and dilemmas we address through our case presentation and illustrations. We try to demonstrate that a final ideal type organizational stage is not an option. Moving beyond STS and Pava's theories could reveal

new options, though this is not in the scope of this chapter. As we move on, we will uphold more modest ambitions. At most, we will indicate possible paths beyond Pava's work and STS, though this will not resolve the paradoxes and ambiguities addressed in this chapter.

3. Case Study: Leadership Challenges in a Transition

Currently, the offshore sector is facing expectations concerning more sustainable production and products. There are no obvious options to replace the offshore market for these companies, and uncertainty is high. This coincides with expectations about a digitalization makeover. Extensive digitalization is now taking place globally as well as nationally. Software development has traditionally been aimed at specialists and experts, and ICT solutions for wider distribution were more limited. Generally, an ambiguity has occurred between special-purpose solutions to serve specialists and more general and standardized solutions that satisfy the demand for wider application.

At the same time, company boundaries have become more fluid. Capacity and competence are sought both within and outside of individual companies. Owners' overall strategic considerations determine mergers and demergers. The scope and speed of such processes has increased. All this puts pressure on companies' ability to manage change without disruption to production.

3.1. The Case Study Yard

The yard that serves as a case for this chapter delivers topsides and large modules to the oil and gas industry offshore and onshore. Their main market is deliveries to clients operating at the Norwegian continental shelf. The yard has about 1,600 employees. In addition, it usually has a significant contingent of temporarily hired labor, mainly from Poland.

The yard is part of an industrial unit that specializes in the realization of engineering, procurement and construction (EPC) contracts. EPC contracts cover an all-inclusive solution for a production unit. The larger industrial unit is a typical engineering-to-order supplier that fulfills the obligations covered by the EPC contract. In our case, the industrial unit does not hold an engineering capacity. Such capacity is purchased in order to supply resources according to the needs of the specific EPC contract. Consequently, the engineering supplier varies from project to project. This creates challenges for project implementation.

In large offshore/onshore projects, the yard does not have enough manufacturing capacity to take on all the fabrication itself. A large manufacturing volume will be outsourced to subcontractors.

The yard is currently in the process of a merger between two units. The yard was part of the smaller partner, which had a total of under 3,000 employees. The other unit had about 15,000 employees. However, the units were familiar with each other, having previously been part of the same larger unit. Through the last decade, the units have had the same main owner, but they

still have developed in different directions. This applies not least to the digital developments that have taken different directions, obviously producing challenges: for example, should different parts of the company be allowed to use different applications for the same business area, or should the digital solutions be standardized and used throughout all parts of the larger unit? If one part of the company chooses standardization, which solution should be chosen and why? How might flexible specialization bring insight into these complex processes (and prescribe new ways of coping)? The yard is heading towards alternative markets, since their main products will be in decline. An optional strategy could be diversification. How, though, can units maintain a key strategic core within an existing market while simultaneously diversifying and adjusting to new market possibilities? The oil and gas market will not disappear overnight. Thus, the yard seeks to maintain an offshore market share, while also seeking shares in alternative, more environmentally friendly markets.

This diversification will require changes in the existing work organization. Different markets have different requirements for quality, documentation, expertise etc. The yard has so far operated in the offshore market, which has strict regulations and conditions, and demands very thorough documentation. Moving to other markets implies that information and documentation regimes will have to be adjusted to new levels and conditions. Strategically, the yard seeks to maintain and gain a position in both new and existing markets. Simultaneously and actively, the yard must comply with different requirements. This is an organizational issue and will create new challenges for the personnel allocated to the specific project. These challenges will include large variations in the scope of work, organizational design, logistics and setup of construction management, alongside alternations between roles and responsibilities.

Addressing the above will require an organization dedicated to facing challenges in different settings based on more flexible and specialized experiences, knowledge and skills. Overcoming these obstacles requires both flexibility and specialization. This ambiguity is covered by the term flexible specialization (Piore & Sabel, 1984).

3.2. The Merge Process and Digitalization

In the merge processes, two software systems monitored, supported and provided decision-making capacity regarding participatory improvement. The proposal box solution is closely linked with existing collaborative work-life traditions, but the multipurpose general system is a more centralized database system with fewer options for participation and collaboration according to the work-life philosophical tradition outlined above.

For the new merged unit, having the right software is important. This can be achieved by retaining all the systems from the two previously separated units. This implies that the company will keep and operate different systems within the same field or area, and creates a significant software portfolio to fund and maintain. If the company chooses to reduce the number of software systems, some systems must be phased out. As a result, companies should urgently assess which factors are most important in this choice. Table 1 outlines the components from

the assessments of the two competing improvement systems: this systematization is a starting point for such a decision.

Table 1.
Assessment of two competing designs for the improvement system

Element	Multipurpose general system	Customized proposal box
Software solidity	Proven system from known software supplier, used by many companies operating in the market segment of the yard. Adaptations of the total system are difficult: changes become special adaptations from the system supplier.	Newly developed software developed by a start-up company, customized to the yard. Tested, but not yet implemented in full. Customization is easy: the yard is the sole customer for this supplier.
Anchoring	Managed by project organizations and hooked up to the Quality Assurance (QA) organization. Software (SW) is developed externally, and only partly adapted to own organization.	Managed by base organizations, and hooked up to the departments (dept.). SW is developed internally with wide participation. The blue-collar unions and workers have participated in the development, improving the product and gaining ownership. They are willing to facilitate implementation.
Learning	Achieving learning across projects is demanding: each project has separate management.	Linked to dept. that owns people and the process: eases transfer of learning across projects.
User interface	Deficient: an old system that has been polished.	Functionality close to the user interfaces of social media platforms.
Communication interface	Static: you must search for information.	Continuous updates through feeds/alerts. Competitive aspects in the system—individual and dept.—create engagement.
Nearness to decisions	The projects are temporary organizations that the employees move in and out of. The SW is designed so that QA/performance in the project will handle the improvement proposals.	The departments are static: the employees all belong to a basic dept. The software is designed so that the dept. committee will handle improvement proposals. The dept. committees are occupied by elected representatives: this brings legitimacy.
Handling options	Can categorize cases into different subject areas and different processes.	All cases that the personnel in a dept. deliver will go through the dept. head. Three possible routes are designed: (1) the dept. head decides, (2) cases can be lifted into the dept. committee. This committee again has two choices: handle the case based on existing data or (3) establish a development project.
Multipurpose vs single purpose	Covers several areas, such as health, safety, security and environment (HSSE), improvement, audits and inspections. It is possible to link the disciplines together: for example, if an audit suggests improvement proposals. Users have only one system to deal with: can simplify use.	Covers only one area. Entails that system users must deal with several systems.
Cost	Can reduce the cost since the software system covers several areas.	May increase cost since the software only covers one area.
Software portfolio	Reduces the number of software systems, since several areas are covered.	Increases the number of software systems, since it only covers one area.

3.3. Digitalization of the Yard

In 2017, the company launched a comprehensive digitalization program. This program focused on issues such as cloud computing, the internet of things, big data, artificial intelligence, robotics and mobile devices. Based on these general issues, specific projects were launched to target the development of specialized software.

During the three years that have passed since the program was launched, it has undergone significant changes. Initially, no less than 40 smaller projects were identified. Due to capacity constraints, not all of these could be implemented at once. Therefore, the company established a list of priority projects.

The projects that were implemented have had somewhat different outcomes. Although considerable work was done to identify potential development projects, additional projects also emerged. The program steering committee had to continuously make strategic assessments of which initiatives to prioritize and which to put on hold. In Figure 1, we have chosen to study in detail one outcome of the strategic assessments made: the digital proposal box.

3.4. The Case of the Digital Proposal Box

The merge process led to digitalization and management challenges. Most companies have some sort of system or procedure for inviting staff to make improvement proposals. Both merging units had acquired a digitalized system for registering and handling such improvement proposals, but not the same system. The larger unit used general multipurpose software. In addition to improvements, it covered HSSE, audits and inspections. This is an off-the-shelf tool that is used by many companies in Norway.

We analyzed the proposal box solution in Figure 1 since it represents an alternative approach to proposal processing compared to standard ICT solutions. The latter contributes to a centralization of proposal processing, lacks some basic opportunities for participation from employees and observes limited collaboration with possible shop-floor proposers.

Over the past two years, a new digital improvement system has been developed. This participation-based process involved selected employees and union representatives in its development.

Its core is an app installed in the cell phones of all employees (the yard has equipped all employees with smartphones). Besides this app, the proposal box system also consists of a carefully developed organizational procedure that handles improvement proposals. The procedural flow is shown in the system map in Figure 1:
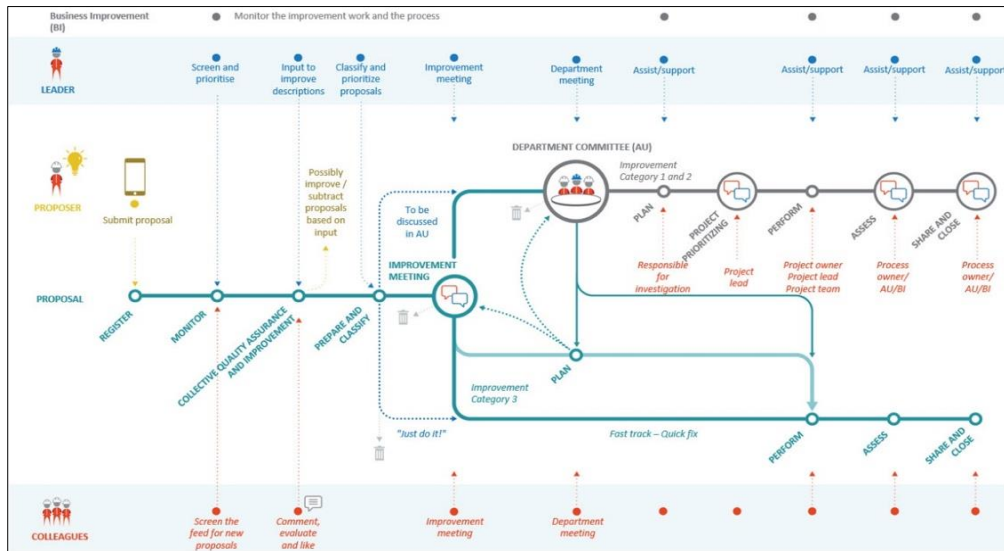
Figure 1. System map of the proposal box

Figure 1 illustrates the effort to facilitate an interaction between the initiators of proposals, the department head (leader of the AU) and the other employees (colleagues) in the department.

The chart starts with the proposer, who submits their proposal. The proposal will appear in colleagues' mobile app feed. The yard has equipped all employees with their own mobile phones, enabling them to access digital communication.

When a new proposal is submitted, the employees will be notified through the proposal box app. By entering the app, they can open the proposal, read it and access attached documentation. The next step will be to evaluate the proposal. This can be done through simple "likes," as well as through assessment of the associated effects and efforts involved. There are ample opportunities to add suggestions and improvements to the proposal, with the aim of making it ever more complete. All aspects of the process and communication involved will be visible to all departmental employees on the feed in the proposal box app. In this way, all employees have active involvement in the improvement work: a kind of direct democratic participation.

This initial stage of the proposal is noteworthy. The intention is that it should appear as a creative and playful phase where ideas "bubble up" in the organization, with lots of input, comments and additional suggestions.

When the next stage in the proposal processing begins, the head of department owns the proposals that have been handed over by the department's employees. Generally, the department head has three options for further processing:

- *Fast track/quick fix*: If there are minor improvements, the department head can make an immediate decision.
- *Promoted to the department committee*: If the proposal is somewhat more complex, the department committee will view the proposal. This committee consists of elected

representatives from the department: union representatives, the safety delegate, other elected representatives and the department head. Here the proposal will be considered, and a decision made on its potential implementation.

- *Improvement project*: The department head or the department committee may choose to generate an improvement project. This applies in particular to large and complex proposals that include details of financial means for its realization.

The proposal box system allows users to monitor the progress of proposals that have been received at various stages and arenas, such as departments, business areas and units. The proposal box system supports a collaborative tradition that is nationally associated with a Norwegian model, where an important feature is the interplay between direct participation at the shop-floor level and representative participation at different levels of the organizational structures. Additionally, in the proposal box system, participation is fundamental. Basic features of participation are essential regarding both the initial proposal process—which is based on direct participation and collaboration—as well as the representative participatory responsibility for the handling of proposals as they proceed through the decision-making processes at different levels of the organization.

The proposal box system is a single-purpose system, designed to cover only improvement work: the initiation, handling, completion and implementation of improvements. The system has been developed in alignment with the *Norwegian collaborative model*.[3] In the workplace, we find several interaction arenas where a main objective is to stimulate and support improvement initiatives. The AU is probably the most important arena in this model. Generally, the AU is the foundation for the renewal and improvement of Norwegian companies and working life. These committees include representatives of the department's employees, union representatives, safety delegates and the head of department. The employees' representatives are elected—that is, they represent the employees in the department. The intention is to ensure close linkage of the improvement work with the shop floor and to encourage active participation on the part of the employees.

In accordance with this participatory philosophy, the company tested and developed new software that represents the digitalized solution of the proposal box system. The roll-out of this software had only just begun when the merger of the two units was finalized.

4. Analysis and Reflections on the Case Concerning Information and Decision-Making Dynamics in Organizations

4.1. The Electronic Proposal Box: Analysis and Reflections

Our current case offers a way to mobilize shop-floor workers in the process of changes, improvements and innovations both technologically and in the work organization and overall operation of the whole organizational system. The most detailed knowledge and information

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[3] It would go too far to discuss the details of this model here, but it is important to point out that laws and agreements lay down premises for a certain degree of democracy and participation, both as a right and an obligation, for all employees.

about some of the core operations of the company are embedded in the daily work conducted at the level where actual production, supportive services and logistics take place.

The suggestions employees make are evaluated and elaborated on for further decision making through continuous refinements, selections, prioritization and reconsiderations. This is a dynamic stage of the creative evolvement of initial project ideas. Its distributive features are supported by the digitalization of the current proposal box application. Everyone within a specific organizational location, such as a department, has the opportunity to be involved. Next, the process of shaping the project is taken to a participatory body, the AU, who decides which projects to structure and calculate for advancement to the final decision making further up the hierarchy. Participatory aspects are addressed by the representative structure in the work-life democratic arrangements stated in agreements and laws, as well as in historically segmented practices.

The digital proposal box mirrors an ideal communicative practice outlined by Habermas (1981).4 The current proposal box practice supports information distribution among participants. Use of the proposal box makes information on all forwarded ideas available for everyone with legitimate access—that is, everyone located in the same work organization department as the proposer. So does the further destiny of these proposals since they are available to the same. For Habermas, this counts as an initial stage of communicative information sharing (Habermas, 2004).

A diversity of ideas undergoes elaborations, selections and prioritization that continuously develop into collaborative initiations of early project proposals. In this process, everyone has the opportunity to acquire an understanding and develop a notion of ownership of the different proposals and their evolvement. For Habermas, this counts as a stage of communication where common understanding of what is at stake gains major importance. It is not just a matter of informing participants. The key concern at this stage is mutual understanding and acknowledgement of what the case in question is all about.

Simply claiming that a message is understood is often not sufficient to achieve mutual understanding. A claim could involve a misunderstanding. Something agreed upon could rest on false premises. Later disagreements usually rest on insufficient mutual understanding and misunderstanding at a previous stage. Lack of sufficient checks on what is agreed upon can be as important as a statement made concerning mutual agreement on false premises. This can lead to a lack of ownership and support for specific proposals. The process whereby proposals in the digital proposal box are handled becomes as important as the technological solution itself. Organizing and processing the distributed proposals in order to gain a mutual understanding and promoting ownership are essential aspects of the application of the electronic proposal box.

For Habermas, a check on mutual understanding, agreement and ownership could mean that we are able to take on the other's point of view (Habermas, 1981; Mead, 1934). If those

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4 Otherwise described as a *democratic dialogue* in the work organization: see Gustavsen (1992).

involved can present the perspectives of the others involved in the communicative process in a way that is agreed upon by those holding them, then the perspectives involved can be mutually understood. People can rephrase each other's positions in a way that is recognized and accepted by others. Participants involved can agree on their own—as well as others'—opinions, without necessarily having reached a consensus. In Habermas's terms, we could phrase this as an agreement by all parties involved on what the agreement or disagreement includes.

A question here still remains: how can participants resolve a matter that have been agreed upon as a disagreement, but is no longer? For Habermas, a process of the exchange of arguments governed by ethically arranged discourse discourse ethical arrangement in an ideal speech situation, his formal pragmatics, is argued as a solution. Is this a workable arrangement in real life, where diverse ownership interests are displayed? Will controversies where actors possess diverse discipline backgrounds or power structures, for example, restrict the possibilities to reach a joint decision by those involved? Is a process aiming to reach consensus based on Habermas's perspective simply producing everlasting communicative efforts to reach an unreachable consensus? Could the proposal box and AU form a structure whereby it could be possible to reach a decision, forward consensus and common ownership to proposals, project and strategic choices?

The critical remarks regarding the digital proposal box and Habermas's approach produced this far could be summarized in the following points:

- Information distribution of the case in question: The proposal box as a distributive ICT solution/application.

- Reaching mutual understanding: Processing and organizing the usage of the digital proposal box.

- Reaching a mutual agreement regarding what is agreed upon and not agreed upon: The organizational process leading up to formal decision-making bodies, such as the AU.

4.2. The Multipurpose General Suggestion Processing Favored by the Major Unit in the Merger

An ongoing merge process could change the proposal box practice. A more multipurpose-like centralized arena for more individualized subjective idea and information processing could replace the current proposal box solution. Each suggestion will then be forwarded individually without emphasis on collaborative processes and participative arrangement that create, modify and adjust the final result into an agreed upon communal output. Additionally, a centralized multipurpose arrangement could restrict more dynamic creative processes that create both flexible and special-purpose outcomes. This is an important feature of the perspective covered by flexible specialization presented above. Flexible specialization can be viewed as the outcome of dynamic local participatory arenas and their involvement at the shop-floor organizational level (Piore & Sabel, 1984).

Suggestions forwarded through multipurpose solutions operate as individual views of the "reality" on the shop floor. This reality has not been formed as something evolving as different perspectives are tested and contested against other colleagues. Decisions take place through a hierarchical structure with less emphasis on broad participation from those affected by changes and transformations. One outcome would be that multipurpose solutions reflect and communicate a less representative overview of the reality in production, services and logistics to decision makers located higher up in the organizational hierarchy.

In the multipurpose solutions, ownership of changes, projects, suggestions and proposals are located higher up in the organization. A sense of alienation and a lack of ownership could face change processes that involve the development, introduction and implementation of change projects and ICT solutions. Increased resistance in organizations (Nord & Jermier, 1994) is one possible outcome. Resistance in the organization could weaken governing and management capacities, as well as legitimacy of leadership.

One aspect of multipurpose solutions could be encouragement of attitudes countering the development and implementation of new ICT solutions. Organizations may utilize collaborative and participatory structures in order to prevent such counter-implementation movements when digital solutions were initially introduced (such as regulation of ICT introduction in the main agreements).

On the other hand, management could choose strategically among ICT solutions in an effort to gain and regain control over information, decision making and project changes in the organization. Greater information gathering to acquire an increased overview and trustworthy image of what really goes on in the organization could be an important aspect of ICT strategies. Gaining control of information production and flow could be a strategy to strengthen management control and power positions. These are aspects reflected in the assessment of the competing design for the improvement system presented in Table 1.

Information is essential to gain an overview of an organization and its relations to the external environment. Market challenges, critical external organizational movers, public policy and unpredictable external challenges could greatly affect core operations. An internal change process that affects the internal core and its relations to the surrounding environment requires adjustments to and reconsiderations of decisions made (Thompson, 1967). For management located higher up in the organizational hierarchy, these are features of utmost importance in the considerations and decisions they make on a daily basis. From the perspective of many employees, external macroeconomic and other environmental conditions are further away from the realities of daily shop-floor operations. A controversy over a multipurpose solution versus the proposal box could reflect such differences and preferences for different ICT strategies and corresponding solutions.

4.3. Multipurpose Arrangements and the Electronic Proposal Box: Some Reflections

The different strategic ICT solutions have become an issue in the merge process between two organizations that have different practices regarding strategic decision making, and

collaborative participatory arrangements and traditions. This reflects basic organizational dilemmas and paradoxes.

The strengthening and weakening of overall information ownership in the organization is one dilemma discussed above. The multipurpose system seems, according to our case, to weaken the generalized ownership of the strategic ICT choices and their outcomes. Shop-floor involvement is restricted. On the contrary, the electronic proposal box seems to strengthen shop-floor involvement, participation and collaboration.

A weakened shop-floor involvement and participatory collaboration could restrict options for dynamic and creative processes in decision making, strategic choices and change projects. This was an important advantage offered by the electronic proposal box solution.

On the other hand, central management control and power is increased through multipurpose systems. This could better link to the external conditions that the organization has to observe. The electronic proposal box does not seem to have the same focus on and linkage to these overall external macroeconomic and political conditions surrounding the functioning of the organizational systems. The centralized control and decision making identified with multipurpose solutions could provide increased support for the merger. It could support in overcoming contradictions between conflicting interests that prevent agreement to implement common objectives and solutions. The electronic proposal box seems less geared towards unification of differences in support of the merger.

On the other hand, unifying structures are present in local arenas, such as the AU. Though there are unifying structures on different levels of decision making, these do not necessarily support unification and consensus-making ambitions. The proposal box, however, seems geared to support unifying processes that create ownership, participation and collaboration among employees on different organizational levels and arenas.

With the digital proposal box, proposal processing takes place through three tracks:

- "Just do it" (minor issues that the department head decides),

- cases passed to the AU and decided there (small and medium-sized cases), and

- cases that are passed to the AU, described in more detail and passed further up for eventual deciding to run the project (larger project).

For the last track, which often involve resources outside a specific department, managers must establish a mandate and financial estimates, and the area manager then approves the project. This is to ensure that strategic choices and proposals/projects that do not fit into the organization's overall strategy will be rejected.

Conflicts of interests and the honoring of ownership seems always to be present, both explicitly and implicitly, in all human conduct. How to cope with these conflicts seems less obvious. Habermas tries to downplay this aspect of human conduct by purifying interest-free communicative arenas. Does he succeed in showing how respectable and knowledgeable speech performers can gain the capacity and capability to act accordingly? Do we support

democratic participation and collaboration when we ask for our leadership authorities to gain control and power to unify our differences of interests and ownership ambitions? How can we encourage creative participation and involvement to stimulate dynamic changes, transformations and innovations?

5. Summary: System Approaches and Third-Position Overview

The paradoxes and dilemmas explored through analysis and reflections on our case indicate that there is no straightforward strategy to suggest. The conclusion we arrive at is not to draw attention towards one preferred solution or organizational arrangement. It is rather the opposite: to identify the ability to live with the paradoxes and deal with the contradictions on an ongoing basis.

It is hard, often out of reach, to arrive at a mutual understanding (Habermas, 1981) and overlapping consensus (Rawls, 1996), however lengthy the organizational deliberations may be. This is certainly a strategic leadership challenge: balancing challenging and insolvable diverse opinions and conflicts of interest. Yet the organization must make final decisions. Leadership must produce legitimate outcomes.

If we return to system approaches (Luhmann, 1997, 2000; Pava, 1983, 1986a, 1986b), they provide us with alternative options. We are not enforced to search for one final solution to complex dilemmas and paradoxes.

An alternative way to cope could be to take a bird's-eye view or third-person perspective. This is what we have presented as the revised STS approach (Claussen et al., 2019). Such a system approach takes account of many features in and around organizations, as well as diverse and fluctuating positions and interests. The advantage could be that this approach enables both top-down and bottom-up views as parts of a common organization systems performance. Both the shop-floor participatory solutions and the hierarchical power/centralized solutions are different aspects of the same organizational systems performance. Solutions might fluctuate across these differences. The outcome can, at different stages of change, emphasize one or the other of the diverse possibilities reflected in the paradoxes and ambiguities addressed.

Since several system logics or occupational identities penetrate the organization in its operational deliberations as well as at its hierarchical summits, fluctuations between differences might take place within the same organizational system. The way the organization copes with these fluctuations relates to its unifying self-preserving dynamic stabilization and change processes. A template for how to conceive a model for this is found in Pava's concept of the *reticular* organization: "a network configuration for predominantly non-routine office work, involving multiple linkages among professionals and executives that complement the line organization" (1983:179). The organization, beyond its formal or stated structure, is also something that takes place: it undergoes shifting deliberations across temporary discretionary coalitions, while permeated by perturbations from beyond its (shifting) boundaries. Using this STS approach alone could possibly signify that any system with the best performative solution to cope with internal and external paradoxes and dilemmas will prove the best strategy to

survive in a present and future competitive environment. Nonetheless, the best solution is not absolute and may not point to any final state of affairs, according to Pava.[5] Constantly faced with demands for change and transformation, organizations are rather understood as organizational becomings.

In the case that has been introduced in this chapter, the chosen solution seems to include both ICT solutions—that is, the proposal box and the standard solution. This creates, indeed, interface challenges to be resolved, but at the same time, such a flexible solution allows the new group to benefit from the systems' respective and potentially complementary strengths. It will lead to an "and", not an "or, on the Yard's journey of its organizational becomings.

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[5] With this in mind, we intend to return to a critical examination of a concept of participatory innovation in a future publication.

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