Introducing a corporate concept into organisational practices: a case study of domestication and organisational choice[15]

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Abstract

This article discusses a case of introducing and launching a new corporate concept, a so-called company-specific production system (XPS), into an organisation. Such concepts are at present very commonly used, but what does it take to implement a new logic into an existing organisation? As a theoretical point of departure, the process was understood as a process of domestication, where the imported concept moves from being external, general and unfamiliar to becoming internal and known, owned by the organisational culture and embedded in its practices. Domestication is a process where the import has to be rescripted through how the organisation, as individual members and as various collectives, enacts it, makes sense of it and understands it. The organisation in this case study had a rich tradition of participation, and in the process under study, members from most levels and functions were involved in the attempts to transform the general concept into something workable and company-specific. This paper takes a socio-technical design approach, which argues that organisations importing new technology or new organisational concepts are faced with choices, not with something inevitable. The study reveals the challenges of the domestication process and how the organisation faces not one choice but a multiplicity of interdependent choices, and how handling the process calls for an untraditional, complex and participatory approach.

Keywords: socio-technical systems, domestication, choice, company-specific production systems, organisational learning, organisational routines, sensemaking, participation

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Introduction: importing production concepts into an organisation

The purpose of this article is to address what is taking place within an organisation when a *corporate concept* is imported. An import of a new overarching concept such as a production system will imply changes in the organisation, for better or worse, profoundly or superficially. A production system as an import does not lead to increased organisational performance unless it is well integrated. This requires planning, control and management systems, competence and expertise. It also requires the import to be well aligned with the organisation's way of operating and with its culture and cultural expressions. Through its organisational practices, the organisation's members perform actions and behaviours that put the theory of the organisation (its visions, goals, rules, procedures, values etc.) into practice. When an organisation seeks to implement a new production system, institutionalised organisational practices will be challenged.

In has become common to seek to implement a new "organisational concept" or "corporate concept". The launching of such has become a big industry (Micklethwait and Wooldridge 1996, Røvik 2011), and the menu is vast. Examples include Scientific Management, Management by Objectives, Total Quality Management, World Class Manufacturing, Business Process Re-engineering, Lean Production and Balanced Scorecard.[16] Within manufacturing industry, the term company-specific production system, or XPS for short, is in frequent use at the moment (Netland 2013). XPSs in general are built on a mix of principles from, for instance, Mass Production, Lean Production and TQM. The best-known example is the Toyota Production System, TPS, which has been a model for many other companies when forming their own production system.

"Corporate concepts", or recipes, are systems used to manage a corporation's operations at all sites, across cultures. Through such systems, companies attempt to standardise planning, control, monitoring of manufacturing and corporate culture. An XPS expresses the fundamentals about how a manufacturing system is/should be designed, organised and run. It lays out the organisation's ideas about how to focus, develop and run a production facility (Netland 2013).

In most cases, an XPS is somewhat fixed. A local production site cannot ignore or circumvent the XPS rooted in its corporate office. This means that the systems for and practices of managing operations at the local production site must be aligned to or yield to the XPS. It is important to note, however, that XPS is intended to be as much a mindset containing values and principles for leadership and ways of organising work as it is a toolbox for problem-solving or a recipe for redesign.

However, the performance potential of an XPS is linked to its ability to support and facilitate simplification and improvements in the work process and work organisation. These concepts are very general and do not take into account how working life is organised in a specific location (country, state or region). For instance, in Norway, labour unions generally have a significant influence on the governance of a company, and the rights of individual workers are also guaranteed by labour laws and collective bargaining agreements.[17] Any lack of consideration or deliberate alignment between an imported concept and key local organisational features means that the concept is poorly adapted and carries a risk of "involuntary non-use" by the organisation members (Andersen 2018). Thus, the challenges in implementing this type of concept are often insurmountable when the established practices of local working life collide with assumptions in the new concept, especially when such issues have not been given proper attention prior to implementation.

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[16] The concept industry has even developed differentiated concepts for the public sector, such as "New Public Management" (NPM), a term for a whole family of different rationalising changes and reforms within the thinking of public sector management, with a strong emphasis on effectiveness and efficiency (Hood 1995, Kickert 1997).

[17] Norwegian labour laws and collective agreements also specify obligations of employees, such as the obligation to engage and participate in enterprise development efforts or safety work.

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What, then, is at stake when introducing a corporate concept into an organisational practice? What are the pitfalls? How does such a process end up as the new organisational reality? These questions make up the problem statement of this research.

Consider the role of organisational choice when faced with a concept import. As a rule, the reason for introducing new organisational concepts is to improve company performance, through new and better routines, processes and practices. Nevertheless, for such improvements to take hold, the work organisation needs to be addressed appropriately. A vital principle underlying the socio-technical systems design approach (STSD) was that an organisation facing new technology is facing not inevitability but choice (Trist et al. 2013 [1963], Herbst 1976, Emery and Thorsrud 1976, Eijnatten 1993, Emery 1993, Klemsdal et al 2017). The people of the organisation and their skills, expertise and capacity will be the prerequisites for how an import is set up and used in the organisation, and it is the socio-technical system as a whole that must be addressed. Case studies utilising a socio-technical approach show how alternative modes of work organisation can be developed that exploit the same technology, giving the possibility of organisational choice. A production system does not assume its final shape before it is put into use. The socio-technical principle of choice is generic, but how choices are made, and what form they take, will vary depending on the situation (Clegg 2000).

In a case like this, aiming for an in-depth organisational appropriation of a new production concept, the likely assumption is that it is not a matter of *one* choice but of a whole series of choices, and it is also likely that there will be path dependencies between them. The socio-technical principle of organisational choice is thus correct but far too simplistic to serve our purpose. For that reason, we will pay particular attention to the idea of organisational choice. We will assume that organisational choice is a continuous component of the anchoring and implementation processes associated with the new production concept. We will also argue that the multiple-choice perspective requires customised approaches if the domestication process is to succeed.

Importing into an organisational practice: domestication by organisational routinisation, enactment and learning

An organisational practice may be defined as an organisation's particular ways of conducting organisational functions that have evolved over time and have become institutionalised (Kostova 1999), i.e., the organisation's routines as evolved over its lifespan. Such practices "reflect the shared knowledge and competence of the organisation" and tend to be accepted and approved by the organisation's members (Kostova 1999:309). Organisational practices may be partly outlined explicitly, but will also be partly tacit, embedded in the behaviours of the organisation's members, as individuals and as teams, and also woven into various organisational arrangements.

The introduction of an XPS is a disturbance of the prevailing organisational practices of the organisation. It will rarely make considerable organisational change in itself, unless the organisation adopts it and adapts accordingly. To be able to exploit the potential effects of an XPS, the company will have to focus on organisational matters and on the organisation's role in importing and implementing the new design. XPS does not provide a comprehensive recipe for this. To fully utilise such imports, companies will have to consider a number of issues, and this leaves them with a lot of choices and opportunities. In the following we will refer to this process of introducing and implementing new production systems and/or technologies as a *domestication* process.

The concept of domestication was developed by Silverstone and others as a tool for understanding the introduction of technology but will here be used for organisation concepts. Domestication in a figurative sense is making something taken from the external world applicable, meaningful and useful to the internal word. Originally a term in animal husbandry, domestication meant changing a wild animal species into one that lives in and is useful for a

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household. The concept was taken up by the field of science and technology studies to describe how innovations and new technologies are appropriated by users (Silverstone and Hirsch 1992). Domestication in our case is the process by which a new XPS is conceived, made meaningful and put to use in an organisation. Domestication of an import into a system is understood as an interactive process, not as a one-way process that forces cultures and practices to reshape. As Becker (2006) argues, domestication entails cognitive, practical, and cultural/symbolic aspects. The cognitive aspects concern how the organisation's members learn the new concept, individually and among themselves. The cultural aspects concern how they inscribe meaning to it and institutionalise it as part of the presumed reality of the organisation. Finally, the practical aspects concern how to make it operational practice in the concrete work processes.

As an overarching conceptualisation, domestication serves its purpose well, but in order to understand and analyse the case in detail, there was a need for a more fine-meshed conceptual apparatus. Therefore, the concept of domestication was supplemented with theories to develop further the three aspects mentioned above. The concept of organisational routines (Nelson and Winter 1982) was used to operationalise *practical* domestication. Levin's concept of technology transfer as an organisational learning process (1993) was used to address *cognitive* domestication. Finally, to operationalise the organisation's *symbolic/cultural* domestication, Feldman (2000) and Feldman and Pentland's (2003) dual concepts of organisation routines as rule-following and generative enactment practices were used. We take the domestication concept to cover the process that follows the decision to implement an XPS, and also the phase in which the organisation explores or tries to understand the concept and its potential.

Practical domestication: concept import as a change of organisational routines

Change at organisational level requires institutional change: change that affects the organisation's behavioural patterns. According to Nelson and Winter (1982), for an organisation to have changed, it must have changed some of its operational *routines* (scripts or programmes). Routines are the consequence of people working together and gradually aligning their "behavioural relationship" to each other, thereby institutionalising the organisational practices. These new routines/scripts/programmes are then inscribed in the organisation's assumptions about itself and its ways of operating. In the phrasing of Nelson and Winter: "the routinisation of activity in an organisation constitutes the most important form of storage of the organisation's specific operational knowledge" (1982:99). Nelson and Winter proposed routines as the core concept for understanding and explaining an organisation's actions and, correspondingly, *change of routines* as the vehicle for change. A routine is a "pattern of behavior that is followed repeatedly but is subject to change if conditions change" (1982:14).

A routine is a pattern of behaviour at the organisation level much in the same way a habit is a pattern of behaviour at the individual level. Organisational routines, like habits, are often carried out without conscious deliberation. Organisations live by them and carry them out, often without noticing them. Routines are carried out "automatically": people follow them without much conscious deliberation. Therefore, they may slip into the unobserved, tacit realm. On the positive side, routines save or economise on the mental resources of the organisation members who follow them. Thus, they economise on cognitive resources; as they become more automatic, mental resources are freed up. Routines also focus the attention, guiding thinking and reducing the volume of matters that need to be taken into consideration. Routines economise on scarce capacity for information processing and decision-making. In this way, they enable an organisation to cope with uncertainty.

For organisational learning to occur, an organisation must change its routines. Nelson and Winter hold that their model best fits organisations that have some stability in their offerings:

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"since 'routine' is a key concept in our theoretical framework, the framework applies most naturally to organisations that are engaged in the provision of goods and services that are visibly 'the same' over extended periods: manufacturing hand tools, teaching second graders, and so forth, and for which well-defined routines structure a large part of organisational functioning at any particular time" (1982:97).

Thus, routines/changing routines may need some complementary concepts in order to account for an engineering-to-order organisation (ETO; for details, see the case description later in this paper) at aggregated levels, although most operations at the level of the individual worker are routinised.

Cultural/symbolic domestication: concept import as an enactment/institutionalisation duality

The concept of organisational routines has had great importance and has developed into a research field in itself (Becker 2004), and the concept of organisational routine has been developed beyond the idea of repetitive behaviour. One interesting contribution is the work of Feldman and colleagues (Feldman 2000, Feldman and Pentland 2003, Feldman and Rafaeli 2003). In these analyses, organisational routines are made in a mutual interplay between actions and patterns of actions. Routines are considered not just as regulating structures but as generative systems consisting of interacting parts. Routines contain both performative aspects (the actions that reconstitute them) and scripts/patterns of action (the ostensive aspects that embody the abstract idea of the routine), and these are seen as mutually constitutive elements. These systems of interacting parts produce stability and repetition when people (or machines) that enact routines respond to naturally occurring disruptions by making efforts to replicate previous action patterns, but they are also capable of producing change when organisation members within the routine retain emergent variations. The work of Feldman et al. is informed by Weick's concept of sensemaking and organisation as enactment (Weick 1995). Also, in play is Giddens' idea of the "duality of structure", where structures are both the medium and the outcome of human agency (1979),[18] and routines are *ongoing accomplishments*:

"As we move toward a notion of organisation (or organising) as an ongoing accomplishment we need a notion of routine to match. The performative model of routines that I propose in this paper provides an image of routine as an ongoing accomplishment" (Feldman 2000:613).

Seen in this light, the process of importing a XPS into an organisation may be understood as partly a script, partly an invitation to the organisation to enact it. An organisation (its management) is capable (probably) of introducing and installing new routines, in the form of the scripts around new technologies or new corporate concepts, but this is only one element of the routines. They will also have to be enacted by the organisation if they are to become organisational practice.

Cognitive domestication: concept import as a socio-technical learning and development process

One key characteristic of routines is that they are repetitive; without repetition there is no routine. Nevertheless, it may be argued that repetition, or behaviour in accordance with routines, does not account for ETO practices in their entirety, since these also involve a lot of non-routine activity. Nelson and Winter's model offers an important concretisation of how something new, once installed, comes about in an organisational practice. However, the

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[18] "By the duality of structure, I mean that the structural properties of social systems are both the medium and the outcome of the practices that constitute those systems" (Giddens 1979:69).

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concept of the repetitive routine does not fully capture the installation, or first phase, of an import as it comes into organisational being. Levin (1993) has argued that the introduction of a new artefact/technology into an organisation should be conceived as an organisational learning process. Levin identifies technology transfer as a socio-technical learning and developmental process. Any imported artefact is also a social construction in which human choices and values determine the outcome, through a socio-technical change process, eventually succeeding when the artefact/technology is introduced practically into the organisation's day-to-day operations. As Levin notes, this argument is not trivial, since technology is usually "considered as a material artefact and not as a carrier of knowledge and cultural values" (1993:498). An equally common mistake is to design a bureaucratic and top-down introduction process instead of inviting the organisation into the process on a broad and participatory base. According to the latter perspective, there is a process of learning among the organisation members, individually and jointly, that enables an organisation to domesticate an import.

Any real change in an organisation, such as a concept import, requires organisational participation: (some of) the organisation's members must be substantially involved. From the discussion above, we are now able to present a theoretical understanding of what is involved when an import such as an XPS or a new technology is to be introduced into an organisation. We started out by noting that such an import, if it is a matter of importance to the organisation, is about successfully developing a new organisational practice or practices. Then we envisioned theoretically what is involved in such processes. For a new organisational practice to come about, the organisation must domesticate the import, making it their own, and this process includes several aspects, practical, cultural/symbolic and cognitive. These different aspects of domestication have been further conceptualised by the use of core contributions from the theory of organisations, technology transfer as a learning process, the concept of repetitive organisational behaviour as organisational routines, and the newer concept of organisational routines as part script and part agency.

A model of an organisation's domestication of an XPS

Table 1 summarises the theoretical discussions of domestication and thus provides an apparatus for seeing and understanding the processes and complexities involved when an organisation is to implement an XPS within itself.

Table 1. Aspects of an organisation's domestication of an XPS.

Aspect of domestication	Theoretical support	Examples	Challenges and dilemmas = choices (examples)
Practical: constructing practices related to XPS	XPS becomes part of the pattern through being repeatedly enacted Routinisation of activity brings it into the organisation's script	• Establish project schedule for XPS implementation with steps and decision gates • Set up implementation groups • Include subcontractors in organisation's own production apparatus	• Conflicts with prevailing practices • Concept does not work in practice • Variance, changes and instabilities
Cultural: ascribing meaning to and institutionalising XPS (values, norms, images)	Sensemaking, organisation as enactment; routinisation as script/agency duality	• Involve IR system (unions) in the translation and sale of XPS • Use familiar terms to give XPS local meaning • Develop XPS local content through group discourses facilitated by IR system	• "Not invented here" • XPS rests on "wrong underlying assumptions" • XPS challenges prevailing power structures
Cognitive: members learn practices and meanings of XPS, individually and together	Introducing XPS may be regarded an organisational learning process and a social construction, and thus requires the organisation's participation	• Training/courses to ensure understanding and commitment • Participation-based realisation in design to ease implementation	• Competence diversity • Misunderstandings • Language • ICT literacy

The table shows that domestication of an XPS, or another concept or technology, is a highly complex process that presents numerous challenges and dilemmas. Domestication is a process where a programme (imported) has to be rescripted through how the organisation, as individual members and as various collectives, enacts it, makes sense of it and understands it. Through this rescripting process, the XPS may become associated with and integrated into the organisation, but it is evident from Table 1 that as part of the domestication process the organisation faces a number of challenges, and therefore choices. The choices made along the way may not be accidental, because one chosen solution can completely or partially take away the effect of previous choices. The selected solution has to be interconnected with previous and later choices in order for the entire domestication process to be successful. There are countless examples, in terms of implementing both organisational and technological solutions, where the process has covered only parts of what should have been included and has thus failed.

The classic literature on STSD (Trist et al. 2013 [1963], Herbst 1976, Emery and Thorsrud 1976, Eijnatten 1993, Emery 1993) emphasised that organisations facing new technology were facing not inevitability but choice. On our reading of this, choice is first and foremost the opportunity to build an alternative to the Taylorist organisation, one based on more holistic jobs and where the individual worker and the (autonomous) team are responsible for a set of

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tasks including job planning, job execution, quality control and final reporting. In this literature, choice is more about the guiding principles of organisational design and less about the structural and processual choices to be made in implementing a new organisational concept or technology. The latter are the focus here.

Methods: an interactive approach

The empirical basis for this article is a case study (Yin 2017) over a time span of two years. It is based on action research and interactive research design, in which researchers and groups of partners have worked together to develop new knowledge. Two traditions of research close to the organisation were combined: action research-oriented organisation research and design/development-oriented operations management research (Coughlan and Coghlan 2002). The research team also drew on close cooperation between the researchers and members of the enterprise organisation: insiders played a full part in the whole research process (Coghlan 2003). The concept of interactive research emphasises a shared process between field and research in most or all phases of the research (Holtgrewe et al. 2015).

Among the number of organisation members engaged in different arenas during the initial stages of the project, more than fifty people had a direct voice. There were interviews, encounters, meetings, presentations and discussions, at various workstations and in offices, seminar rooms, canteens and boardrooms. Data types include analysis of secondary data (meeting minutes, reports, presentations, company figures and statistics, and industry statistics), observations, interviews and attendance at meetings.

Organisation members and researchers collaborated in most phases of the research: studies, fact findings, reflections and conceptualisations, and in the case itself. The case study report is based on a thorough and comprehensive organisation process. The number of arenas in which the understandings were put to the test by various groups of organisation members serves as a series of member checks. Member checking, or participant validation, is an established technique for validating the trustworthiness of results (Lincoln and Guba 1985), and it is reasonable to claim that this case study is a credible report of the process taking place. There is no claim of generalisability for the findings, but they shed light on many challenges, opportunities and options that are likely to find parallels in similar projects undertaken by others.

Case study: the yard

Offshore topsides and onshore processing facilities are unique complex products created in similarly complicated processes. The completion time of the projects is compressed through parallel implementation of engineering and construction, and processes are characterised by the involvement of many subcontractors and suppliers who deliver modules (e.g., steel structures and pipes) and other equipment that will be installed at the yard. This way of implementing projects causes uncertainty and leads to many changes, as the design of the complex products has not yet completed when fabrication starts. Galbraith's proposition describes the challenge well: "The greater the task uncertainty, the greater the amount of information that must be processed among decision makers during task execution in order to achieve a given level of performance" (1974:28).

The case project aimed to develop a XPS: a system to cover and integrate the entire ETO value chain. The need for smooth processes including a high number of subcontractors was paramount, not least if the yard was to enter new markets. The overall aim was to establish strong (healthy) linkages between generic concepts for technology and production systems and the distinctive contextual manufacturing characteristics of the case, thereby developing a methodology for better adaptation/mutual adjustment between corporate concepts (recipes) and typical local

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manufacturing traits. In the preparation phase of the XPS project and up to the final go/no go decision, considerations around different choices had to be carried out. Questions about all forms of domestication were involved: practical, cognitive and cultural. During the initial period of the R&D project the steering of the corporation that the yard was part of was centralised. Various former independent companies were merged into one joint company. Again, this was a situation that led to a number of choices being made; in particular, cultural and cognitive domestication challenges had to be addressed.

Additionally, after initiating the XPS project, the yard decided to initiate in parallel a large digitalisation project. A pilot study involving a core group of employees and a large number of interested parties working in the affected areas was conducted, and a recommended roadmap was prepared. The pilot study identified a number of areas to be addressed, and a number of development projects within each of these areas. The two initiatives, the XPS and the digitalisation project, were thus set up with separate project management teams, even though there were some interfaces, thereby creating a tension that may have prevented the organisation from fully examining the possibilities for optimising the socio-technical system. Assigning a relative weight to the development of the XPS and of the new technology was another cognitive choice that had to be made during this initial phase. Dealing with such uncertainty required deliberate choices to be made. For example, what assumptions should be made about the implementation of the XPS? What would be the technological point of departure when the XPS was fully developed?

The company's existing project execution model (PEM) covers the entire ETO value chain. The main process in the PEM is divided into five major phases: feasibility and concept, system definition, detailing and fabrication, assembly, and completion. The main phases contain a number of major dated milestones. For example, the system definition phase contains three milestones: (2A) critical purchase orders awarded, (2B) main layout/structure frozen and (2C) global design complete. Each of these milestones calls for detailed information to be transferred to meet the milestone requirements. The PEM thus contains comprehensive and detailed descriptions of the tasks in the value chain.

The main challenge is that the PEM is extensive, communicates poorly and is perceived as inaccessible. Furthermore, the degree to which the PEM is used varies according to the phase in the project; for example, it is used more in engineering than in assembly. However, the PEM provides a necessary, step-by-step description of the various steps in the completion process. As a consequence, clarifying the relationship between PEM and XPS was crucial and called for a whole set of cognitive domestication choices to be made.

Participatory arrangements

The yard has a tradition of participatory operation and takes pride in this. Unions and employees are involved in many ways and play important roles, including in making choices. To comprehend the relationship between management, unions and the employees, it helps to understand how the cooperation structures are set up to ensure dialogue and participation. Table 2 shows how the unions and the employees have a number of arenas where they may influence strategic choices and promote proposals for improvement/change. Combined with a focus on dialogue, this enables them to play an active part in the development of their own workplace.

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Table 2. Democratic bodies in the yard's IR system.

Body	Members
Board	The owners and union representatives are members of the board.
Company committee (BU)	The management and the unions are members of the committee. The chairmanship alternates between management and union representatives.
Department committee	The department manager and employees from the department are members.
Yearly cooperation conference	Each year a conference is arranged that focuses on cooperative business development.
Work environment committee	Management and elected safety delegates are members. The chairmanship alternates between management and union representatives.

The production system

XPS was not a familiar concept for the yard. The concept was presented to personnel from the company development department by their research partner. The development department were superficially familiar with the most famous production systems (such as Toyota's) without, however, having any knowledge of the details of such a system.

The R&D project

After the introduction of the XPS concept, a dialogue was initiated between the company-internal development department and the researchers around the concept and company's possible use of it. After an incubation period during which the idea of running an R&D project matured with both parties, it was decided to develop an R&D proposal and to apply for financial support from the Norwegian Research Council (NRC) for a four-year programme to develop and implement a production system. An application was developed by a joint team from the company and the research partner, and the application was accepted by the steering committee. The application was approved by the NRC, and the project was launched shortly thereafter. The company appointed a project manager and an internal project team consisting of personnel from different departments as well as union representatives.

The process

The case company's production system (KPS) was developed over a period of approximately a year and in two steps. To develop and document KPS, a core team of participants from the company and the research partner was formed. Fundamental input was obtained through a series of team workshops. The team was put together to cover the different parts of the organisation and the production process, and union representatives also took part in the workshops. A number of issues were on the agenda.

First, it was necessary to achieve alignment over the XPS concept. In short, an XPS expresses the fundamentals about how a manufacturing system is/should be designed, organised and operated: what the idea is, why it is needed, whether all of it is useful, what should be understood in terms of fundamentals etc. The concept had to make good sense for the personnel involved. Second, it was necessary to figure out what the fundamentals or the main elements in the company's operation were and how these elements could be visualised. Third, it was necessary to detail the different elements to make them understandable for employees who were not part of the core team or the team workshops.

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Between workshops, the participants discussed what had been on the agenda of the latest workshop with their co-workers in their departments. In this way a number of questions and suggestions were raised and brought back into the workshops. This included judgements about the different types of domestication, for example, in the third step mentioned above, where familiarity of concepts and their cultural understanding is crucial.

The preliminary proposal

Throughout the process we hoped to collect the information base needed to design a first version of KPS. Based on the information made available from the workshops, the core team created a model and an accompanying description of the system (Figure 1). These main elements were identified: identity carriers, collaborative IR model, knowledge seekers, industrial mindset, synchronised parallel activities, integrator/scope control, information model and future skills.
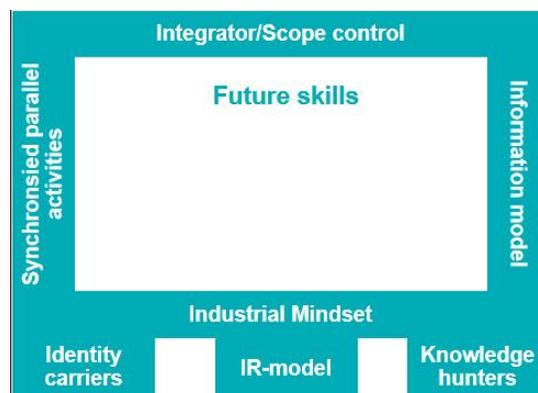

Figure 1. First draft of KPS.

This first version was presented at a number of workshops. On the basis of the feedback received, the first version was rejected, and it was concluded that a second version was needed. In essence, the feedback indicated that there were inconsistencies in the first version's elements, the main parts explaining the company's operation. These elements were somewhat overarching and needed to be grounded in a set of principles that would explain the content of the element. For instance, the "IR model" was identified as an element. To give this element a content, the following principles were identified: equality and team spirit, trust, down-to-earth management, conflict resolution proficiency, focus on training, and distributed involvement, responsibility and judgement. However, the distinction between element and principle was blurred, while some of the elements made it difficult to establish supporting principles. Thus, selecting a set of superior elements understood to be at the same level of abstraction turned out to be dependent on a number of trade-offs and choices. Furthermore, the core team learned that there were conflicts of interest, internally and otherwise, in the organisation, creating dilemmas about which elements to choose.

The company committee (see Table 2) was kept up to date during the KPS development period and had the opportunity to discuss its progress and to make suggestions during the process of developing the first draft.

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The revised proposal

The core team, equipped with written feedback on the first version of KPS and detailed feedback from a number of gatherings and from reflection within the project team, revised the model and came up with an advanced proposal. This new model was presented to local management and received their endorsement. The production system presented here is the final version prepared by the project team and contains six elements: credible contactor, partnership, technology, people, industrialisation and company culture (Figure 2). Each of these elements in turn consists of a set of principles, the numbers varying from element to element (Bakås et al. 2019).
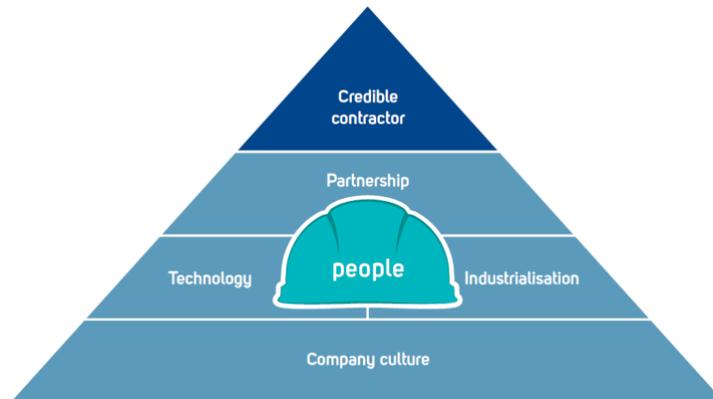

Figure 2. Final version of KPS.

Implementation process and choices

When a new concept is introduced, most likely it will be the specialists in the company who are the recipients. To clarify the content, the specialist will research the new concept. This includes retrieving information about who has already taken the concept into use and what experiences they have had. If these investigations indicate that the company should consider using the concept, an assessment will be made to establish its relevance. This process is about understanding and reflecting upon relevance and ways in which the concept may enhance efficiency and/or develop the organisation. Does the new concept make sense? Will the investment yield the return required to cover the investment cost and to increase earnings?

If the concept appears interesting, the next phase is likely to involve setting up a task force with a mandate to examine advantages and disadvantages, costs and possible efficiency gains. In addition, the mandate will probably set out an expectation of how development, testing, training and implementation may be accomplished. The decision on go/no go for such a task force will, in most cases, be made by the head of the development department. This phase involves transferring the concept and/or technology from something external to something internal; i.e., it takes on the flavour of a company-internal concept. If, on the basis of the task force evaluation, the company decides to realise a project and implement the concept, this will be left to a task force with a broader composition. The composition is absolutely crucial if it is to be possible to develop solutions that suit the organisational culture and competency. The same goes for the way the implementation is intended, how it is presented, the training etc.

The last phase in such a process is operationalising the new solution in the organisation. This crucial phase tends to receive relatively little attention. However, routinising the new technology, solution or organisation entails turning the new way of working/the new organisation into *our* way of operating.

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Table 3 summarises the process leading to the establishment of innovative projects, and the phases that projects go through before a new solution, organisational and/or technological, is implemented.

Table 3. Phases and associated actors.

No.	Phase	Participants
1	Pick up and understand new concepts or technologies	Specialist environment in the company
2	Assess possible use in the company/corporation	Specialist environment in the company
3	Translate concept/technology into the company/corporation (language: problem to be addressed, approach etc.); start giving the concept a local content	Specialist environment in the company
4	Establish a participative organisation that continues the process of making this an internal project; make the concept a company-specific one with company-specific content	Work group (union, management)
5	Run a development project to realise the initiative	Work group (union, management)
6	Establish a project schedule that takes the project through several steps and decision gates	Work group (union, management)
7	Perform the development steps and develop the final solutions	Work group (union, management)
8	Implement the final solution	Work group (union, management) and implementation group

At such a general level, it is possible to establish a common step-by-step process for an improvement project regardless of whether it is organisational or technological. Nevertheless, we see that there are differences, including in the anchoring in the collaborative system that has been established between unions and management.

Discussion

As van Amelsvoort and Hootegem noted, "ICT systems profoundly determine organisational design choices, as they create the technical context within which many organisations are operating and, hence, they also affect the social work system" (2017:295). This is an apt way to describe the role of a corporate concept finding its way into an organisation. The discussion here focuses on how better to draw the consequences from this. How can we better conceive of the processes by which a new XPS becomes workable in an organisation? How does an organisation act in order to integrate its import into itself?

In the theoretical discussion of the process of importing a corporate concept into an organisation, it was argued that such a process must materialise in the form of new organisational practices. In order to reach this point, the organisation must go through a process of domestication to make the import its own, and this process consists of many elements. It is routinisation of new scripts, it is an organisational learning process, and it is sensemaking. It is an enactment of the new organisational practices that takes place both through (repeated) practising of the new recipes and through their reinvention. Most noticeably, the process is composed of a number of choices.

Table 3 indicates how such import processes may be organised in a set of phases or steps that will be part of most projects. Each aspect of domestication will have varying importance in the different phases. In the initial phases, the import is still somewhat loosely defined and open to interpretation, and it tends to involve relatively few

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organisational actors. This phase will involve sensemaking and learning, in particular. As the domestication unfolds, the import gains weight: more detail is added, and it becomes more concrete, to the extent that it is possible to simulate its unfolding within the organisational processes. In these phases where the concept is understood, interpreted and translated, many choices are made. One chooses to interpret the concept in one direction or another, and these choices give clear guidance on how the concept will be understood in the subsequent phases. Nevertheless, this part of the implementation process is controlled, owing to the limited number of people involved and their common competency and experience. As the process continues, more people, and more diverse perspectives, are brought into the process, including opposition voices. Since this process gradually involves more people, and since the import equally gradually grows in detail and concreteness, the various aspects of domestication will have to overlap. Even if a number of issues have been resolved during previous steps in the process, subsequent steps are also filled with decisions. However, with the increasing number of people, backgrounds and interests involved, reaching consistent decisions becomes more demanding.

Table 4 shows the process of domestication that the yard went through. The different stages involved a varying and increasing number of organisational actors, and a varying set of organisational dynamics: learning, sensemaking, routinisation and enactment.

Table 4. Phases, actors and aspects of domestication.

No.	Phase (step)	Participants	Domestication aspect
1	Pick up and understand new concepts or technology	Specialist environment in the company	Learning process Sensemaking
2	Assess possible use in the company/corporation	Specialist environment in the company	Learning process Sensemaking Enactment
3	Translate concept/technology into the company/corporation (language: problem to be addressed, approach etc.); give the concept a local content	Specialist environment in the company	Sensemaking Enactment Routine drafting
4	Establish a participative organisation to oversee the internalisation process (to make the concept/technology company-specific in its content)	Work group (union, management)	Learning Sensemaking Enactment
5	Run a development project to realise the initiative	Work group (union, management)	Sensemaking Enactment Routine drafting
6	Establish a project schedule that takes the project through several steps and decision gates	Work group (union, management)	Sensemaking Enactment Routinisation
7	Perform the development steps and develop the final solutions	Work group (union, management)	Routinisation Re-routinisation
8	Implement the concept or the technology as organisational practice	Work group (union, management), implementation group	Routinisation Re-routinisation

Within the socio-technical school, perhaps especially within the Scandinavian school of Democratic Dialogue, it has always been argued that any real change in an organisation requires deep organisational participation. Members from all levels and functions concerned must be substantially involved and engaged. Developing and implementing an XPS is as much a matter of developing a mindset and a set of practices of the organisation members as of setting up a set of disciplinary structures. The development of an understanding shared by all requires a persistent and

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supportive leadership who understand how to invite the organisation to participate. This requires high-level interplay between skills (individual as well as collective), technology (parts as well as the overall system) and participatory management (hands-on management as well as leadership).

The case studied here is typically Norwegian in terms of industrial relations and participation: most employees are unionised, there are high levels of direct participation (and expectations about participation), and several governing bodies are in place, including union representatives. Cooperative and constructive industrial relations are seen as a resource for dealing effectively with disagreements and for developing high levels of trust and communicative skills all across the subgroups of the organisation. The *collaborability* of an organisation is its proficiency in communication and cooperation across levels, departments, professions, functions, positions and interests (Ravn and Øyum 2009). High-performance collaborability gives companies a competitive edge within both operations and innovation work, because the organisation gets faster and smarter and improves its learning proficiency. All this is perceived to reduce the costs of co-ordination and control and to ease the implementation of decisions.

However, the complexity of the choices inherent in the implementation of the new organisational concepts, combined with a culture of wide and fundamental participation, presents a dilemma. When inviting an organisation to participate widely in implementation processes, conflicts of interest make it inevitable that optimal solutions will not be identified. In this way, participation may prevent the organisation from finding optimal solutions (to prevent open conflict). The way interaction and collaboration take place within companies may be a driver that makes it impossible to identify and agree upon the best solutions. Is it possible to cut this Gordian knot?

Calvin Pava's alternative STSD approach for the non-routine office work is helpful here (Pava 1983). In his work, Pava developed an alternative to traditional STSD. While studying specialist teams in office environments characterised by non-routine tasks, he observed situations that could not be handled with traditional participatory STSD, because they were "too non-routine": too complex, too diverse and too dynamic. Pava coined the phrase "virtually saturated interdependence" to describe an organisational situation marked by "complete interrelation of all variances in a work system" (1983:180). Under such circumstances it is hard to develop designs for work processes. Instead, Pava focused on the organisation's discursive capacities, using concepts such as "deliberation", "discretionary coalitions" and "dilemmas" to describe ways of working and of solving problems in non-routine settings. Pava's work is a promising point of departure for how to proceed and deal with a dilemma like the one presented in this case. His perspective involves a change in approach, away from work process design and toward a focus on the deliberations needed to take place, and the discretionary coalitions and personnel needed in these deliberations. Transferred to an implementation setting in an organisation, Pava's approach may allow for a more varied and selective use of people in the different stages of the process. His approach calls for involvement of personnel who may contribute to finding the best solutions, not a specialist regime in the strict sense; this will have to be tested and elaborated further.

In a case like the one discussed here, the organisation is staffed with competent people from many levels and functions. Furthermore, because of the participatory traditions, many of the employees, and not only the manager, are "competent at discourse". They have experience of being involved and are able to take responsibility. This opens up the organisational ability to handle Pava's recipe for non-routine office work, not just in managerial offices but also on a wider scale. As has been shown, cooperative industrial relations, the ability to deal constructively with disagreements, and high levels of trust and good communicative skills may all contribute to reducing the costs of co-ordination and control and to easing the implementation of decisions (Ravn 2017).

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Conclusion: choice as a trigger for domestication of new organisational concepts

This case study has shown the complexity and difficulty of developing and implementing a new logic in the lived world of an existing organisation, and how broad participation from the organisation may not always ease the process. Implementation of new technology and new organisational concepts require a number of decision (choices) to be made, and these choices have to be handled in relation to one another, otherwise one decision might conflict with another and the process will fail. Organisational ownership of the import requires involvement and participation, but it is a significant challenge to achieve a coherent set of choices and decisions in a participatory process involving a high number of participants where levels of complexity are similar to those in the case under study here.

The STSD literature has always argued that participation adds quality and offers solutions that are in no way inferior to pure expert designs. This case does not seek to contradict this position but argues that organisational challenges in situations marked by high dynamics and complexity pose a challenge to the idea of broad participation. A participatory process with a high number of diverse participants and high stakes that requires a large number of interrelated choices to be made, and made well, poses a dilemma that few traditional STSD approaches have addressed. Pava's approach, developed for the non-routine office work of professionals, may allow for more coherent deliberations and decisions, even in a complex manufacturing setting such as the one studied here.

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