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Towards the Gigantic: Entification and Standardization as Technologies of Control

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Abstract

This paper is based on studies of how standardized entities work as elements in a regime to control risk and hazardous work. Drawing on empirical examples from the petroleum industry and infrastructure sectors, we illustrate not only the mechanisms by which particular modes of entification are involved in regimes of control but also their shortcomings and seductive powers as representations. We show how the world is semantically captured and organized to consist of controllable standardized entities by the organizational regimes in the industries we have studied. This mode of entification is particularly effective in providing transcontextual mobility, as the registered entities can enter the ever-expanding information infrastructures of modernity. Although information infrastructures comprise the standards regulating communication, they commonly materialize in information and communication technologies (ICT) that provide an increasing number of effective and ubiquitous pathways through which standardized semantic signs can move and have effects. This is a core concern in the increasing focus on management by detailed regimes of accountability, measurement and standardization seen in most modern organizations. These developments, combined with the representational shortcomings of the standardized entifications, lead to a movement *towards the gigantic*. An ever-increasing number of signs with increasingly higher granularity are produced in order to control an ever-elusive non-entified world.

Keywords: Entification, standardization, work, risk, the gigantic, information infrastructures

Introduction

This paper discusses how risk and work are represented as standardized classes of entities that can be manipulated and controlled. We draw on empirical examples from risk management in offshore shipping and in the control of work by procedures and governing documentations in the petroleum and infrastructure sectors. Based on these examples, we argue that the discourses or ideologies in which these representations operate move *towards the gigantic*; in Heidegger's sense of this term, an ever-increasing number of entities is produced to capture a world that remains ever elusive.

The gigantic is important in Heidegger's questioning of *technology*, which presents descriptions of modernity's metaphysics. In this article, we present descriptions of concrete manifestations of the metaphysics understood as *technological articulations.* Furthermore, we show that this empirical phenomenon dominates our work life and that the power held by *technology* can be understood by examining concrete standardized entifications and thus *technological* articulations.

The important topic of standardization and entification is recurrent in our research (Almklov 2008; Almklov & Antonsen 2010; Røyrvik 2012). Our theoretical approaches, the terminology we have used, and our fields of study have been somewhat different, however. [1] In this paper, we seek to combine our insights and share some joint reflections on how entification and standardization operate in organizational contexts. A motivation for combining our efforts is to highlight the ubiquity of the phenomena we study and distill general insights from our work. Rather than focusing on the details of our differences, our main objective here is to give an inclusive account of a phenomenon that has been approached from many different angles: standardization and entification as a characteristic of modernity. This account is grounded in an epistemological discussion of how entifications are made to represent the world and how they operate when constructed.

We start by providing a brief overview of our epistemological and ontological viewpoints before we introduce concepts and ideas that form the background for the subsequent discussion. The first section of the empirical presentation focusses on the entification of risk in anchor-handling operations offshore. Here we describe in some detail how the entification of risk is created based on standardized templates and how this is connected to a regime of control. This is followed by a section on procedures in onshore supply bases for oil platforms and in critical infrastructure sectors. Here we discuss the entification of work in procedures and in the discourse of work as commodified tasks, tracing some related developments. Finally, we discuss some combined insights from our observations. We argue that they all can be seen as instantiations of a modern ideology of *technology* (in the Heideggerian sense), and of control by entification, suggesting that information infrastructures (understood as standards providing transcontextual mobility to the entifications) are key enablers of this control. Finally, we conclude by suggesting that the ambition to gain control by means of ever-more detailed entifications, combined with the opportunities provided by new information technologies, leads to development towards the gigantic.

Epistemological and Theoretical Background

The argument of this paper is based on Bateson's theory of meaning (2000), Heidegger's questioning of technology (1977a) and Larsen's reflections on entification (2010). A common thread in all three perspectives is that understanding and questioning the ontological status of the object[2] is a way of understanding contemporary epistemology as representations that belong to modernity and science practices.

Bateson (1979, 2000) argues that reality becomes meaningful by the experience of differences. Reality is not in itself differentiated, but by recognizing something as different from something else, both "things." although different from each other, emerge as something. Thus, everything known to man appears and is experienced as a whole by differences projected on to that non-differentiated whole (Johansen 2008). The map (i.e., our representations) is not the territory; instead, it consists of differentiations based on selected aspects of reality (Almklov 2008). Our perception of reality, regardless of its ontological status, is a matter of differentiation and abstraction. Representations are of another logical type than the represented, and the reality beyond these is an endless reservoir of new (potential) abstractions. Things, objects, and entities are constructed gatherings of such aspects.

Heidegger (1977a) writes that difference and information can obtain a specific form in modernity, a form that in essence is instrumental. Modernity's "way of occasioning." which is causality, belongs to technology and the "the-bringing-forth" of the world as objects related and separated by relations of cause-effect. This, Heidegger contends, is the essence of *technology*. In the following discussion, we will italicize *technology* to refer to this understanding of technology (as modernity's entification and ascription of causes and effects), to separate it from everyday usages of the word.

Larsen uses the term *entification* to describe how aspects of reality are solidified and elevated into something more real and more important than the rest of reality. The concept of entification is employed to describe how "thinghood" to an increasing extent is ascribed to less concrete, relational phenomena. "[S]omething inchoate congeals into a thing (Latin: *ens*), a unit, a category with discernible boundaries" (Larsen 2010: 155 [emphasis in original]).

An important feature of modernity is that the objects brought forth by *technology* enter cause and effect relations beyond their immediate contexts. Things, objects or entities gain mobility when they conform to certain "rules of abstraction" (Almklov 2008: 881). Entification in modernity must be seen in parallel with standardization. In modern life, differentiation and entification more often than not are disciplined by the standards guarding the entrance of an information infrastructure. Information infrastructures are conventional and technical arrangements by which information adhering to these rules can travel across contexts. These arrangements are essential arrangements by which the *technological worldview* gains its power. Modern science and modern society is based on the transcontextual mobility[3] provided by disciplined standardizing entifications. Consider, for example, the difference in transcontextual mobility between the systematic, standardized taxonomies of biological species as pioneered by Carl von Linné and the typical folk taxonomies found across the world of the same animals. Bureaucracies and science alike gain power over remote areas and contexts by controlling standardized entities, maps, samples, records, measurements and so on. These "immutable mobiles" can be combined, counted and compared and are sources of the control and power gained in Latour's (1987) "centers of calculation."

Bowker and Star (1999) and several others have demonstrated that standards are fundamental elements of information infrastructures. The standards are in one sense the essence of the infrastructure as such. They regulate the kind of information that is allowed to be mobile (Hanseth & Monteiro 1997). This is what one can call a *formalistic*[4] understanding of information infrastructures. They are underlying rules of how information must be structured to gain mobility. These are usually manifested or materialized in some way or another. (A substantivist conception will typically focus on infrastructures as the material technologies through which information travels.) While they can be as simple as a list on a piece of paper or a filing cabinet, computer-based infrastructures are clearly the most relevant manifestations of information infrastructures today. These provide for an extreme spatial and contextual mobility for standardized data and are therefore illustrative examples of what infrastructures really *do*. The World Wide Web is indeed worldwide, and standardized data can move everywhere and be compared and combined almost indefinitely. For example, today it is in theory unproblematic to combine and compare scientific sample data from different parts of the world, provided that they are collected and recorded in adherence with the same standards.[5] Within science studies, the importance of decontextualization of standardized entities and their transcontextual mobility is recognized as essential elements of modern science. We also find similar phenomena in organizations, in trends and in increasingly fine-grained and invasive situated work contexts where entification and standardization are more important as control mechanisms.

Understanding infrastructure as both cognitive and institutional, Ciborra and Hanseth (1998: 321-322) point out that information infrastructures "as formative contexts, shape not only the work routines, but also the ways people look at practices, consider them ´natural´ and give them their overarching character of false necessity." As a formative context, infrastructure concretizes the mechanisms of technology because it is explicitly based on standards and institutionalized by reifying practices. As information infrastructures are primary means of communication and control, standardized entifications proliferate ceaselessly into new areas and arenas. Thus, a discourse based on standardized entities increasingly dominates modern contexts. Information infrastructures provide trans-contextual mobility for the standardized entifications of *technology*, provided that they adhere to standards.

The last decades have seen an "explosion" of accountability and transparency as governing principles in the public and private sectors (Power 1994). This has also affected the public and private industries we have studied in the form of an increased focus on measurement, reporting, key performance indicators (KPI), procedures and so on. Accountability and transparency are key elements of the organizational forms found not only in most of the public sector and new public management (NPM) today but also in most private companies (Hood 1991; Hood 2007). The dominating vehicles of transparency in both post-NPM public organizations and in many private sector organizations are standardized reporting systems, KPIs, checklists and so on. This trend is strengthened by the increasing reliance on information and communication technologies (ICT) in management and society, which makes it easier to make the systems of governance even more detailed. Means of control based on accountability have particularly been important in controlling safety in both private and public organizations (see e.g., Hohnen and Hasle 2011).

In sum, these perspectives provide the basis of our analysis. We understand entities as abstractions that arise out of the unrepresented world based on perceived differences. *Technology* is a specific way of revealing the world that dominates modernity and is characterized by the creation of specific kinds of entities. Infrastructures are important for this specific revelation to function because the trans-contextual aspect of entities is essential to technological articulations.

Method and Case

The examples we will discuss here are cases employed to illustrate the theoretical basis of the paper. The empirical data are therefore not an outcome of a deliberate design, but examples from a diverse research portfolio. Although not all of it is presented here, much of our previous research has been concerned with entification and standardization. Participant observation is a method that is very well suited to investigate the relationship between standardizing discourses and the local and particular, and forms the basis for our insights and understanding. However, we have also conducted interviews and document studies. The empirical discussion of the anchor-handling case is the most exhaustive as it goes into some detail on the entification processes and the standardizing infrastructures involved. This case is primarily based on ethnographic fieldwork, whereas the discussions of procedures are drawn from projects that are primarily based on semi-structured interviews. Studying representations of practice, such as documents, procedures, forms, checklists and computer visualizations, combined with participant studies of the practices they are entangled with has been particularly relevant and fruitful for the present argument.

Conquering the Sea Piece by Piece: Risk Governance in Anchor Handling

Entification of the work conducted by anchor handlers is an important part of Røyrvik's (2012) PhD thesis, "The Weather window, a technological articulation in the oil industry's conquest of nature." Sailors conduct complex work by engaging in the world as tool users, and the thesis focuses on how their work and nature are transformed into entities by scientific procedures, such as the one presented in the forthcoming example of risk governance.

The focus on *risk and safety* is intense in the North Sea, and therefore provides a scientific regime that decides how operations can be conducted, when or if they can be started, who can participate, and how many resources are needed in order to do it. This is very much the case for operations conducted by *Anchor Handling Vessels* (AHV). AHVs are constructed to release and anchor oilrigs to the seabed and to tow them from one location to another. In contrast to oil platforms, which are mounted on the seabed and *produce* oil, rigs are floating installations used more commonly to *search* and drill for oil. When they are used for exploratory drilling, the rigs are frequently moved to new locations where the rig legs are partially submerged (10-30 meters down, depending on the size and type of rig) and anchored to the seabed by two anchors and an anchor system for each leg.

The length of an anchor system is seldom less than a kilometer, stretching from the rig in one end to the anchor embedded in the seabed in the other, and depending on the depth, they can be considerably longer. In addition, the anchor itself is made up of chains, wires, fiber lines, and joints that connect the other components of the system. All components are massive and their dimensions are great; thus, the weight and forces of all anchor systems are considerable and increase with length. As the operations are conducted in the North Sea, 24 hours a day, 365 days a year, the great forces of the systems must be handled during periods of darkness, cold, and not the least, in difficult weather conditions.

In 2007, the Norwegian AHV *Bourbon Dolphin* capsized off the coast of Scotland. In brief, the weight of the anchor system combined with the current dragged the vessel down, causing the death of half the crew, eight people. This accident led to an increased focus on anchor operations by the safety regime. These operations are sometimes referred to as *advanced operations* because their complexity, and sometimes *extreme operations* because of the weather conditions in the North Sea and the accidents they cause.

It is widely predicted within the oil industry that future operations will be even more challenging, in terms of both weather conditions and economic viability, specifically with regard to the process of searching for oil. The areas in which the industry is established on Norwegian territory are known as both “mature” and “easily accessed.” This implies both that the industry is heading away from the mature areas in the hope of finding new unexploited reservoirs of oil, and that these areas are harder to access and more costly to search. The northern regions are examples of areas of interest to the oil industry, and especially during the winter, the AHVs need to operate in harsh environments, in the dark, in subzero temperatures, in harsh winds, and far off the coast. If these operations are to be initiated, they have to be defined as safe. Hence, this section presents the process that produces *technologically* articulated safety, which in turn formally and scientifically allows an operation to begin.

Risk Objects

The responsible oil company has to approve every operation before it can be initiated. An operation can be approved and initiated as long as the risk involved is considered under *technological* control (i.e., it is entified according to specific procedures). The operational risk is analysed and controlled by *risk assessment*, a scientific procedure that more than anything is based on a *risk matrix*. The risk matrix is a tool designed to measure risk and thereby quantify the risk of differentiated time pieces of the operation.

This procedure is taught to the R&D departments of oil companies by the *Norwegian Veritas* (DNV). The course focuses on how to divide the operation into units that are quantifiable and thereby subject to technological manipulation and control. The explicit goal is to gain control of reality by using this analytical procedure and the tools for measuring risk, and through control, create a safe situation where safe is defined as “disappearance of risk” (DNV 2003: k 2).

Risk is defined as “the product of frequency and consequence” (ibid.), and can be expressed by the formula of (Risk = probability X consequence[6]). The risk matrix is the standard that the operation is measured by, and in a way the operation is transformed into different risk objects by this measuring procedure. The premise of the procedure is that any part of the operation in principle can be articulated by a risk object, and the challenge is to find which risk object is the correct one for that specific part of the operation.

RISK MATRIX WITH RISK FACTORS

	Consequence					Increasing probability →				
						5 > 5 years	4 > 1 year	3 > 6 months	2 > 14 days	1 < 14 days
	Personal injury **P**	Oil spill to sea **O**	Chemical Group 1 **C**	Economical: Lost rigtime/ equipment **E**	Reputation **R**	Never heard of in the industry	Has occured in Statoil	Occurs several times a year	Occurs several times a month	Occurs once a week
						Highly unlikely	unlikely	Low likelihood	Possible	Probably
1	Fatality	>1000 m3	> 1000 m3	> 50 mill. NOK	National impact. National media coverage.	75	150	225	300	375
2	Serious pers. injury w/possible permanent injury	> 100 m3	> 100 m3	> 25 mill. NOK	Considerable impact. Regional media coverage.	25	50	75	100	125
3	Serious pers. injury	> 1 m3	> 10 m3	> 10 mill. NOK	Limited impact. Local media coverage.	10	20	30	40	50
4	Medical treatment	>0.1 m3	> 1 m3	> 500.000 NOK	Slight impact. Local public awareness.	5	10	15	20	25
5	First aid	< 0.1 m3	< 1 m3	< 500.000 NOK	No impact	1	2	3	4	5

		Frequency				
		1	2	3	4	5
Consequence	1	375	300	225	150	75
	2	125	100	75	50	25
	3	50	40	30	20	10
	4	25	20	15	10	5
	5	5	4	3	2	1

Table 1. Risk matrix

The objects are two-dimensional and defined by two scales named *consequence* and *frequency*. The scaling of consequence allows for the measurement of five different qualities: 1) personal injury, 2) oil spill, 3) chemical spill, 4) economic loss, and 5) reputation. Additionally, all these potential consequences are ranged in five different degrees of seriousness or steps on the same scale of consequence. Thus, these consequences are standardized by the same scale, defining death as the same as a hundred cubic meters of oil spill, a hundred cubic meters of chemical spill, the losses of more than 35 mill NOK, and bad reputation. All these consequences are represented by a factor of 75 on the scale of consequence.

The scale of frequency also has five steps or categories. To find the correct grading or numbering, each step is described in three ways; therefore, if something can be expected to happen *less than every six months*, *several times a year*, or has a *low likelihood* of occurring, the risk objects are graded by a factor of 3.

SCALE STEPS	1	2	3	4	5
VALUE	1	5	10	25	75
LEVEL	5	4	3	2	1

Table 2. The scaling of consequence

The five categories are: (1) >5 years, (2) >1 year, (3) >6 months, (4) >14 days and (5) < 14 days. Every step on the scale is given values; on the scale of frequency, level one is given the value of 1, 2 has the value of two and so on. On the other hand, on the scale of frequency step one is given the value of one and step two the value of 5; 3 has been valued as 10, 4 = 25, and 5 = 75. Finally, each step is labeled according to level: the most serious level is 1, and the least serious is level 5.

		Frequency				
		1	2	3	4	5
Consequence	1	##	##	##	##	75
	2	##	##	75	50	25
	3	50	40	30	20	10
	4	25	20	15	10	5
	5	5	4	3	2	1

Table 3. The standard matrix consequence

According to this procedure, an object that is considered level three on the frequency scale and level two on the scale of consequence is identified by a risk degree of 75 (3 x 25). As the objects are defined by two scales, two different risk objects can be represented by the same degree of risk, which is the case for the values of 5, 10, 25, 50 and 75. These values exist in two places in the matrix; thus, two risk objects can be identical by their inherent degree of risk, but different in how that degree is defined. The two risk objects that hold the risk degree of 5 are defined either by frequency 5 and consequence 4, or by frequency 1 and consequence 5. As we will show below, the difference is important because the objects are subject to manipulation, but in order to define an operation as safe enough, the degree of each risk object important.

1– 2– 3– 4– 5– 10– 15– 20– 25– 30– 40– 50– 75– 100– 125– 150– 225– 300– 375

Before the operation can be measured and then transformed into risk objects, the operation is divided and separated into timepieces. The timepieces differ in length and can be more or less detailed. In this case, the operation as a whole is first separated into three operational categories, and then these three timepieces are separated into smaller pieces that are separated into even smaller ones. Finally, the operation is divided in 28 sequences: the first one is the briefing of the crew, and the last one is the setting of the anchor.

	RISK ID	Phase	Operation	Hazard description	Consequence description	Risk Cat.
1	Anchor operation	Mobilization of AHV	Briefing in port	Briefing not performed	Misunderstanding, unclear routines, Delays in operation	E, R
2	Anchor operation	Mobilization of equipment	loading	Uncertified and wrong equipment mobilized. Not correct equipment loaded on correct boat.	Delay in operation	E
3	Anchor operation	Mobilization onTO Arctic	Briefing onboard TO Arctic	Involved personnel not present during briefing prejob meeting on the rig	Misunderstanding, unclear routines	E, P
4	Anchor operation	Mobilization	Communication check	Bad communication	Misunderstanding of information, wrongly performed operations	E,P

Table 4. The operation divided in time-pieces

By definition, every timepiece has some inherent degree of risk, and the next step of the procedure is to define that degree of risk by the means of measurement. All 28 pieces are assessed according their degree of probability and degree of consequence. For example, timepiece nr. 3 is described as "briefing onboard TO Arctic." and the hazard involved in this sequence is considered "involved personnel not present during briefing pre-job meeting on the rig." and the consequence is "misunderstanding, unclear routines." These consequences are considered possibly leading to accidents in the risk categories of personal injury (P) and economic loss (E).

As timepieces are measured by the risk matrix, consequence is considered within the categories of P an E; the timepiece is defined as belonging to level 3. Risk Category P is considered "Serious personal injury." and measured by "E." the potential consequence is ">10 mill NOK." The probability is considered level 3 as well, which means it is considered a "low likelihood." which is the same as "Occurs several times a year" and ">6 months." As the timepiece is measured as level 3 on both the consequence and probability scales, it is graded by 30.

RISK MATRIX WITH RISK FACTORS

	Consequence					Increasing probability →				
						5 > 5 years	4 > 1 year	3 > 6 months	2 > 14 days	1 < 14 days
	Personal injury	Oil spill to sea	Chemical Group 1	Economical: Lost rigtime/ equipment	Reputation	Never heard of in the industry	Has occured in Statoil	Occurs several times a year	Occurs several times a month	Occurs once a week
	P	O	C	E	R	Highly unlikely	Unlikely	Low likelihood	Possible	Probably
1	Fatality	>1000 m3	> 1000 m3	> 50 mill. NOK	National impact. National media coverage.	75	150	225	300	375
2	Serious pers. injury w/possible permanent injury	> 100 m3	> 100 m3	> 25 mill. NOK	Considerable impact. Regional media coverage.	25	50	75	100	125
3	[illegible] pers. injury	[illegible]	[illegible]	[illegible] NOK	[illegible] Local media coverage.	10	20	30	40	50
4	Medical treatment	>0.1 m3	> 1 m3	> 500.000 NOK	Slight impact. Local public awareness.	5	10	15	20	25
5	First aid	<0.1 m3	< 1 m3	< 500.000 NOK	No impact	1	2	3	4	5

Table 5. The creation of risk objects

According to the measuring procedure, timepiece nr 3 is defined as a problematic object, which is symbolized by the color yellow; thus, the operation should not include this kind of risk object. Therefore, in order to initiate (safely) the operation, the object needs to be manipulated into a less risky object. This step is named "risk reducing measure", as shown in Figure 6. As the hazard description was "Involved personnel not present during briefing pre-job meeting on the rig." the risk reducing measure is "all personnel involved in the operation is present and informed on SOW (i.e., Statement of Work)."

Freq	Cons	RF	Risk reducing measures	Freq	Cons	RF	Actions / comments.
4	4	10	Perform a well planned briefing of all vessels at port. OIM/stabsjef to be present at briefing.	4	5	2	If this is not possible, a marine rep representing Transocean should be present. Procedures to be submitted to AHV as soon as possible after nomination of vessels
4	4	10	Transocean/Viking Mooring to check equipment according to load list. AHV captains to confirm equipment manifest.	4	5	2	Sign "utsjekkliste"
3	3	30	All personnel involved in the operation is present and informed on SOW.	4	4	10	Call for meeting prior to start of operation. If crew change, have new meeting with all personnel. Relevant personnel to be presented at meeting.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 6. Green and yellow risk objects

After including "Risk reducing measures." both the frequency and consequence are measured as one step below on their respective scales. This transforms the timepiece into a green object with the degree of risk of 10, so the object is no longer problematic. As Table (6) shows, even green objects are subject to risk-reducing measures, making them even safer than they would have to be in order for the operation to be initiated. This shows that just as all timepieces by definition have some inherent degree of risk, all risk objects are controllable because their attributes are subject to manipulation.

The legitimation for performing this procedure is to ensure safety and reduce risk. We do not discuss here whether this is an actual effect of the procedure, but instead we point out that there are at least two other important consequences:

First, the procedure produces many new risk objects: nature is conquered and transformed into objects that can be controlled and manipulated. Second, the procedure ensures formal safety in a way that allows the anchor operation to be initiated. When all objects are green and the operation is under technological control, it is by definition safe and the seafarers are allowed to start their work.

The procedure described above articulates the process as a risk object. As it is a technological articulation, the objects are related by causa efficiens, a specific form of causality. Heidegger writes, "(f)or centuries philosophy has taught that there are four causes" (1977a: 290). In what would be the Heidegger-Aristotle typology, the four causes for anything to come into existence are as follows: 1) causa materialis, the material something is produced from; 2) causa formalis, the shape that something is shaped into; 3) causa finalis, the function that the thing will have in a concrete context; and 4) causa efficiens, that which produces the effect. According to Heidegger,

> ....every bringing-forth is grounded in revealing (entbergen). Bringing-forth, indeed, gathers within itself the four modes of occasioning – causality – and rules them throughout. Within its domain belong end and means, belongs instrumentality. (1977a: 12)

As the risk objects are *technologically articulated,* they exist as either a cause or an effect, or as both cause and effect. The kind of cause or effect they are related by is also decided by the process that articulates the objects; in this case, the degree of risk is either a cause or an effect.

We have described how diverse and heterogeneous risks were created as entities based on standardizing templates. These templates let the inchoate phenomena congeal (to paraphrase Larsen, 2010) into standardized risk objects with discernible boundaries and specific properties. As such they are transcontextually mobile through the information infrastructure of risk management and can be controlled within this regime.

To ensure safety for every operation that is to be initiated, greater numbers of risk objects are produced in increasingly finer detail and in increasingly complicated models. All follow technological procedures; thus, the operation exists by objects distinguished by a metaphysical distance that separates and relates them.

Entification of Work: Procedures and Standardization

In the previous section, we discussed how risk, mainly from external forces, is sought controlled by technological articulation. In this section we describe a similar and related phenomenon: How the activities of people in organizations are controlled by procedures and governing documentation. This section thus describes entifications of work, and how it, according to Larsen (2010: 155), "congeals into a thing, a unit with discernible boundaries." Less descriptive and more theoretical than the previous section, this section also seeks to outline the processes by which entifications head towards the gigantic. We will illustrate how work is described and prescribed in a discourse based on entification of work according to the rules of accountability-based infrastructures. Developments in both public and private sectors move towards and strengthen this discourse, which is related to a general "audit explosion" (Power, 1994) in modern society. In addition to discussing this way of controlling work, by way of a couple of examples, we outline some developments within this discourse: a) an increase in detailed control facilitated by new ICTs, b) market imitating or market based control of work, which implies that procedures in essence become definitive characteristics of the "work as entity" ordered.

What the Procedure Cannot Capture: Situated Work and Standardized Procedures

One of the authors of this article participated in a project aimed at improving the quality of procedures on the oil industry's supply bases and evaluating changes that had already been implemented (Antonsen et al. 2008). These supply bases store and handle all goods, parts and technical supplies that offshore petroleum platforms require. The goods are usually sent by supply boats that call regularly at the bases. Because of the constrained storage space offshore, the bases are crucial points in the supply chain, so errors and mistakes leading to delays may have serious consequences for operations on the platforms. The base personnel pack and send a wide variety of goods and handle return cargo, which often contains dangerous materials. The desire for control over work performance on the supply bases is understandable, both to ensure the smooth coordination of the supply chain and to avoid accidents and environmental damage. The main problem addressed by our applied research project was that the procedures had grown too complex and comprehensive while, paradoxically, they lacked sufficient detail in some areas. They were also frequently contradictory and difficult to understand. Deviations and incidents were typically followed up by new additions, to "close" cases (similar to the risk reducing measures described above). Generally, it seemed, the desire to control the work in detail made the procedures increasingly irrelevant as resources for the situated execution of work.

Our study detailed how the base personnel employed procedures as resources for situated actions instead of mere prescriptions (Suchman 1987). In order to obtain a realistic view of operational realities, we included operational personnel in the reflection (not only as interviewees) throughout the course of the project. This led to a very interesting clash of perspectives in a discussion during one of the first meetings of the project. Among those present were the internal project manager, a high-level manager for governing systems (including procedures), the research team, and a representative of the operational workers. When discussing the level of detail of in procedures for the governance of the work, the operational representative, with some support from the research team, argued that the procedures could not cover everything. Because it was impossible to describe every eventuality that might appear during operations on a base, they had to leave some room for situational discretion and adjustments. The response from the managers was to ask him for *examples*. For every example he came up with, they responded that it was covered (either directly or by loose generic phrases) or that it could easily be included in the procedures. The representative became increasingly frustrated. He tried to argue, we later realized, that *everything* could not be included in the procedures, but his point got lost since *anything* indeed could be included. Every example he gave for situational adjustments was already, or could be, described and prescribed; hence, his main argument that a class of situational work existed to which no prescription could or should apply was obscured. This observation served to illustrate the *technological* articulation of work and gave us interesting clues for understanding the growth of procedures that had occurred in the company. We will now move on to consider how procedures are turned into specifications of work as entified products in new modes of governance in the public sector.

When the Description Becomes a Product: The Conception of Work in New Public Management

Illustrative cases of the entification of work can be found in the restructuring of public sectors under the banner of New Public Management (NPM). NPM refers to a broad trend of institutional changes in which the hierarchies in the public sectors are restructured according to ideas inspired by the private sector. We argue that the resulting organizational models are based on a discursive logic of standardization and entification. The NPM concept is largely defined by its critics and hence is a bit "mystical in essence" (Hood & Peters 2004: 268). Thus, no definitive list of ingredients of this broad trend of developments exists.[7] The most relevant developments for our discussion are disaggregation of public bureaucracies into more functionally focused organizations and the market imitating coordination between these organizations. Two main variants of this are a) outsourcing of public services to private contractors, and b) internal markets within the public sector where public bodies "trade" services through the market. An overarching idea within NPM is accountability. In contrast to responsibility, which we understand as a more holistic phenomenon, accountability can be seen as responsibility held according to certain measurable specifications or deliverables. Thus, when public sector hierarchies are fragmented, control is sought by giving standardized specifications and targets and following up on these, as in contract-regulated business transactions, for example.

In a project on NPM, one of the present authors studied deregulated infrastructure sectors (power networks, water supply and ICT at a hospital) and sought to understand how these institutional changes affected operational work and therefore safety (Almklov & Antonsen 2010; Almklov et al. 2011). Not only is intra-organizational coordination based on transactions of standardized entities, but also this discourse is also found in the conception of work down to the task level within post-NPM organizations. Operations of the infrastructures, a type of work that consists of a continuous flow of tasks and interventions to keep a system up and running and in many ways could be compared to caretaking, is now conceived as sets of standardized delimited tasks with an associated price and specifications. The power network fitters we studied had previously been responsible for a local section of the grid; each group was led by a foreperson and supported by the engineers at the main office. These groups had (and assumed) quite holistic responsibilities regarding the integrity of their grid; they monitored its condition and made small interventions and repairs more or less as they saw fit. Now they belong to internal or external subcontractors and are held accountable for producing a certain set of inspections and interventions according to specifications as ordered by the network companies' specialists. Work was "commoditized": To the extent possible, it was divided into entified, atomistic, standardized tasks according to what gives transparency in the market (Almklov & Antonsen 2010).[8] With regard to the fitters, NPM has implied a shift into more detailed control of their work, reducing their autonomy and connecting them to an infrastructure of control by standardization. Work is more systematic and standardized, but also more controlled down to the task level. Just as risk was dissected into a set of discrete, comparable sub-elements as described in the section above, so was the work of the fitters. It was carved into discrete tasks that can be quite cumbersome, they complained, to integrate into a smooth workday. This required situational adaptive work that was not specified in their orders. This development was described by the fitters as alienating, and they lamented their loss of autonomy. No longer able to make interventions and repairs as they saw fit, they also felt less responsible for the well-being of their grid (which was no longer theirs).[9]

Summary

The observation that work is governed by procedures is scarcely new. It is a classic control-mechanism from the era of Taylorism, at least. We have suggested here that these systems tend to grow as they are confronted by and try to capture and control peculiarities of work as performed in real life contexts. We have also noted some interesting developments in the way descriptions and prescriptions relate to work:

First, although standardized procedures and situated actions could coexist earlier unproblematically, the tendency to treat prescriptions of work as specifications of the "product" in a transaction on a market means that the aspects of work *not* specified will be actively suppressed. When work is a product that is traded and controlled by means of accountability, it has to be delimited and entified; hence, the entification becomes the reified object to be traded.

Secondly, the proliferation of digital technologies into continuously new domains and every work place makes the transaction costs of controlling work in detail—once forbiddingly high—possible to overcome. With handheld devices and PCs everywhere, there are no *material* constraints to the reach of the information infrastructures. However, there are, as we will discuss further, some limitations to the *technological* discourse by which these infrastructures operate.

While information infrastructures provide almost infinite mobility to certain kinds of information, structured data, numbers, and standardized codes in general, more complex contextual information is harder to convey and aggregate, and it must travel in more cumbersome ways to have organizational impact beyond immediate contexts. Hence, development strengthens the "contrast" between what is easily objectified, measured and quantified and the more diffuse, contextual and relational organizational qualities of work.

Towards the Gigantic

In this paper, we discussed and illustrated entification processes in organizational practice. We went into some detail to elaborate how entification according to regulating standards is a part of the regime of control. In the first case, we demonstrated how entification is a means of domesticating and controlling risk, and in the other cases we showed how it controls work. Although we provided most details in rather limited empirical contexts, we find it reasonable to suggest that the types of entification we describe are manifestations of broader trends of *technology* throughout modernity.[10]

In the anchor-handling case, risk entities emerged from diverse and heterogeneous origins into a standardized class of controllable entities. To understand the concrete way these entification processes permeate modern work and are a power in modernity, we suggested that it is important to see the standardized entities in relation with information infrastructures. Simply put, it is only because entities adhere to certain standards that they are mobile and able to gain effects across contexts by means of information infrastructures. The entifications created in anchor-handling risk analysis may seem arbitrary and weak, but their power lies in their transcontextual nature, which allows for comparison and control by means of accounting or audit-based methods. Such methods seemingly exclude personal judgment and risk thus can be seen as “objective” (see Porter 1995). Risk analyses may approach absurdity when they transform death, environmental pollution and reputational problems into the same entity. Nonetheless, they are components of a mechanism that in most cases is able to proceed with operations without damage. A perceived hazard on an anchor-handling vessel must be simplified to absurdity for risk analysis, but when it does, it might trigger remedial actions and resources.

As actions and resources are triggered, the risk analysis is done and the operation is completed, the objects are no longer of immediate interest. New risk objects will be produced for the next operation to be initiated; meanwhile these are stored as a gigantic standing reserve of already objectified nature. Heidegger’s idea of the gigantic refers to this ever-growing pile of entities with causes and effects, which casts a shadow that “extends itself out into a space withdrawn from representation” (Heidegger 1977b: 136). Less poetically, we believe that the dominating ideologies with new ICTs as enablers lead us to search for ever more detailed entifications. In the same way as the managers chased examples of the situational in our story about a meeting at a procedure project, ever-seeking entifications of all that remained undescribed, all articulations in the gigantic´s shadow will contribute to casting the shadow. This is partly illustrated by our case of NPM but is probably generalizable far beyond any specific case.

In *technology*, all that exists is either a cause or an effect. Thus, to create an intended effect, there is a need to create the cause that will produce that effect. To have control, one needs to produce controllable objects, and to control risk—or to produce safety—one needs to produce controllable risk objects. Similarly, to control work in increasing detail, one needs to produce increasingly detailed work entities represented by more and more detailed checklists or operations separated in shorter and shorter timepieces.

Because the procedure that leads towards the gigantic is always rational, *technology* is the rationality by which rational goals can be achieved. However, the gigantic is not the rational goal of the procedure even though this is the ultimate shadow-consequence. Instrumentality and *causa efficiens* are the underlying reasons for the process that leads towards the gigantic, and because it is not the intended effect of the procedure, the gigantic is not subject to the *technological* causality.

The gigantic is the shadow of modernity, an elusive intangible *something* that is not in itself a thing and thus cannot be observed. However, in this article we have presented glimpses of it in procedures and entities that contribute to the casting of an even greater shadow of the gigantic. It is rational to include one more entified detail in the risk analysis, one more eventuality in the procedure on the supply base. Out of this rationality a gigantic system is born.

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Notes

1. Røyrvik (2012) bases his discussion on a Heideggerian understanding of technology, while Almklov (2008; Almklov & Hepsø 2011) employs insights from ANT and other relational perspectives within STS and anthropology. See also the recent debate on Latour and Heidegger in Social Studies of Science, e.g. Riis (2008), Kochan (2010) and Schøilin (2012).
2. This line of argument is inspired by Håkon Fyhn's PhD thesis (2010) in which he discusses and challenges science as object-based ontology.
3. This refers not only to geographical distance and time but also more generally to mobility between contexts.
4. We borrow some inspiration from the distinction between formalism and substantivism in economic anthropology here. We believe that Larsen's (1977) argument that these perspectives depend on each other is also true for different conceptions of information infrastructure. We highlight infrastructures as rules, but do it on a background of their typical material manifestations.
5. This is not always simple, however. See Bowker (2000), Ribes & Jackson (in press), Almklov (2008).
6. Implicitly, this means negative consequence or harm.
7. However, see Hood (1991), Hood & Peters (2004), Dunleavy et al. (2006), and Christensen and Lægreid (2001) for some discussion of its contents.
8. Although here we highlight how entification of work is an element of making it fit a market, Bowker and Star (2000) describe how the discipline of nursing is entified in a similar manner

to gain organizational visibility of their work. When “comforting” is a countable nursing intervention and not something a nurse just naturally does, it becomes visible within an accountability based system.

9 Though they had their grievances one should not be too nostalgic either: Many fitters and other workers also described advantages of the changes. Among these were the opportunity to specialize in specific tasks and the increased homogeneity of the grid.

10 Our discussions of accountability regimes and the audit explosion (Power 1994) in modern society point in this direction. Our suggestion is also at least indirectly supported by Larsen’s (2010) observations, our reading of Heidegger, and by several other theories of modernity.

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