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MACRO-ACTOR: OR HOW MATERIALS
PRODUCE DEGREES OF HUMANITY IN
STRATEGIC RESEARCH AND
PRACTICE**

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TECHNOLOGICAL STRATEGY AS MACRO-ACTOR: OR HOW MATERIALS PRODUCE DEGREES OF HUMANITY IN STRATEGIC RESEARCH AND PRACTICE

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Abstract

The aim of this article is to inquire into the possible significance of materials in the production of emerging strategic outcomes. The article first sets out to discuss the different ways contemporary strategy research define the identity of strategic actors. It is argued that the various schools of strategy research, although different in important respects, operate with a common human centered assumption: Humanity is treated as given – the strategic actor or subject is assumed to be an individual human or a collective of humans.

By adding the possible significance of materials and other non-human entities to the explanatory repertoire of strategy research, another line of inquiry is pursued. The performative perspective thus proposed, is inspired by the classical work of Von Clausewitz and the recent anthropology of science, technology and organizational identities. In the proposed perspective, the human centered assumption is no longer just a premise for doing strategy research, but instead considered an interesting emerging outcome to be explained. Further more, the performative perspective allows strategy research *to extend the notion of emergent strategies* so as to include the possible significance of materials and other non-human entities in the explanation of

emerging strategic identities and outcomes. Hence, also a new task has been added to strategy research: To explain how emerging strategic identities – consisting of both humans and non-humans, are produced as part of strategic outcomes.

Three cases are presented, each of them with a particular bearing on how materials participate in the making of emerging strategic identities and outcomes:

The first case account for strategies transforming plans into anti-plans. This is a case of how a strategic plan is betrayed (or rejected) by an emerging collective consisting of both humans and diverse materials like a paper *inscription* and heavy machinery.

The second case account for how the emerging twin identities of the strategic management subject and the human object are co-produced in interaction with a *machine delegate*.

Finally, the third case account for how the strategic technology and the strategic collective emerge and co-produce each other as a *macro-actor*, only to become transformed in unexpected ways - as common technology and reflective human subjects.

In the concluding section, it is argued that the humanity of the reflective human subject should be regarded as an emerging identity, co-produced in interaction with diverse materials like machinery. It is further argued that strategy research has slowly written out Von Clausewitz original insight in this respect. The complexity Von Clausewitz introduced with the notion of ‘degrees of humanity’ has been replaced with a given humanity, yet the costs of doing so remain outside the frames of contemporary strategy research. Failing to attend to the possible significance of materials in producing degrees of humanity has made strategy research as much producers of strategic outcomes, as providers of explanations and observations. The expression ‘technological strategy as macro-actor’ summarizes these findings and the associated implications for research and practice.

1. RE-SEARCHING AN ANTHROPOLOGY OF STRATEGY

The origins of strategy seem multiple and intertwined. Tracing its history will lead us to organizational entities and events such as the modern corporation, the social scientists writing about strategy, as well as to the conduct of war. As described by Evered (1980) and recalled by Quinn et al (1988), this intertwined history of strategy can at least be traced back to Alexander's time. Every contemporary strategy researcher is familiar with that history, yet – or so it will be argued – one of its most important lessons seems largely forgotten. Somehow strategy research made a radical break from its own history, by directing its attention away from the possible significance of materials in the production of strategy. This radical break seems to coincide with strategy research becoming a modern institutionalized domain of the social sciences. However, at the moment of becoming modern, it carried other names and titles, such as '*On War*' (Von Clausewitz, 1832/1988).

The author and General from the battlefields in Europe paid close attention to the possible significance of materials:

“ If a bloody slaughter is a horrible sight, then that is a ground for paying more respect to war, but not for making the sword we wear blunter and blunter by degrees of feelings of humanity, until some one steps in with one that is sharp and lops off the arm from our body”.
(Von Clausewitz, 1832/1988, p.345).

Von Clausewitz seems to argue that war is not made from humans alone. The body politic of war is produced and reproduced in the interaction among humans *and* artifacts such as more or less sharp swords. The author also seems to pragmatically question those that make a distinction between humanity and the technologies of war while feeling that the former becomes more

human as the latter becomes blunter. Such a distinction between humanity and technology can be associated with costs and complexifications: When humanity transform in the course of events – when the arm is looped ‘from our body’ - bloody mess and dirty hands became part of it. To Von Clausewitz, humanity can be produced in degrees – and there seems to be a significant difference between a humanity that includes and one that excludes the significance of technology into its definition. In my reading, Von Clausewitz has articulated an interesting and original definition of humanity that includes the significance of technology – while paying some more attention to the costs and complexifications arising from a failure to do so. Pure humanity – an entity separated and protected from technology, contains its own ironic paradox. *Through practice*, it seems to transform into a bloody mess. Indeed, the work of Von Clausewitz can be read as an argument against such purifications, be it in relation to ‘humanity’ or ‘strategy’ – the twin main topics of this article.

1.1 Humanity as given– in contemporary strategy research

Contemporary strategy research pays tribute to Von Clausewitz (e.g. Quinn et al. 1988, Mintzberg et al. 1998). But is the possible significance of various materials of technology included in the way strategy research is addressing its central topic? To begin with, it is one of the early merits of modern strategy research to put technology on the research agenda. Ansoff & Stewart (1967), were among the first:

Technology is here to stay. Managing it well takes no more effort than managing it poorly, and the results are a great deal more profitable. The best way to be sure of achieving such results, we suggest, is to formulate a technological strategy that is based on a systematic analysis...(p. 83).

Technology is seen by them as something to be planned and managed with the help of rational cognitive schemes, that is, the ‘technological strategy’. This concern with an abstract and dematerialized cognition, i.e. planning, analysis and the development of procedural rationality, has turned out to be one of the more persistent themes in strategy research. In the words of Pappas (1984/1988, p. 235): “...technology can be planned and managed using formal techniques... “. To take another example, Rieck & Dickson (1993, p.398), seek to develop a “...utilitarian model of the process of technology strategy...using a problem-solving technique more generally associated with engineering design, which provides a convergent and coherent pathway to possible solutions”. More recently, Chiesa & Mazini (1998) try to reformulate what they appropriately label the ‘traditional approach’ to technology strategy but the only change is an attempt to integrate the dynamics of technology in a general framework for corporate technology planning.

The reader does not see so much of the materials of ‘technology strategy’ in these accounts. There is little interaction between humans and the various materials of ‘technology strategy’. There is little left of the emphasis Von Clausewitz puts on the messy business of producing strategy and more emphasis on analytic frameworks for strategic planning. It should perhaps be noted that Von Clausewitz too recognized planning as part of strategy. But as the writings unfold, *On War* seems to *reverse* the simplifying approach in which strategy is either defined as a plan or defined as something that follows a plan conceived of elsewhere. A more complex *anthropological* approach to strategy emerge – strategy should travel with the field – not be kept pure and protected from it:

“Strategy must go with the army to the field in order to arrange particulars on the spot, and to make the modifications in the general plan which incessantly become necessary in War.

Strategy can therefore never take its hand from the work for a moment. That this, however, has not always been the view taken is evident from the former custom of keeping Strategy in the cabinet and not with the Army...”(Ibid.p.241).

When strategy is separated from the field and kept safely in the cabinet, there is little left of the messy work of strategy emphasized by Von Clausewitz. In its place, the author seems to argue, a new purified entity emerge - strategy as a plan separated from politics. Von Clausewitz questioned such purifications, notably for their less recognized political implications. Less than four years prior to his death, the General is asked to comment upon a strategic plan made by the Prussian General Staff:

“War is not an independent phenomenon, but the continuation of politics by different means. Consequently, the main lines of every major strategic plan are largely political in nature, and their political character increases the more the plan applies to the entire campaign and to the whole state...According to this point of view, there can be *no question of a purely military evaluation of a great strategic issue, nor of a purely military scheme to solve it.*” [My emphasis]¹.

When reading *On War*, contemporary representatives of strategy research have opted for the purifying approach. The custom of keeping strategy in the cabinet continues, albeit from a desk in the library. One genre of strategy research - commonly known as the ‘planning school’, is perhaps

¹ Von Clausewitz in written letter to C.v. Roeder, 22 December 1827, in *Zwei Briefe des Generales Von Clausewitz*, special issue of the *Militärwissenschaftliche Rundschau*, 2 (March 1937), p. 6. Quoted from *On War*, First Princeton paperback printing, 1989, Introductory essay by Peter Paret ‘The Genesis of War’, p.7. Princeton: Princeton University (1976/1989).

most closely associated with that custom. The following standard assumptions seems to be reproduced in this research:

- The *dematerialized cognitive* assumption that strategy is primarily a domain restricted to rule based cognition, such as formal planning and reason.
- The *managerial* assumption that strategy is primarily a domain restricted to formal higher-level positions.
- The *human-centered* assumption that strategy is primarily a domain restricted to humans - their cognitions, plans, intentions, rules, actions etc.

As suggested above, there are other ways of reading Von Clausewitz than the one favored by the 'planning school'. There are also other perspectives on strategy that claim to have made the study of strategy in practice their central concern. Pavitt (1990), a keen observer in the field for several decades, summarize the status in an article with the suggestive title "*What we know about the strategic management of technology*". He says: "... some of the conventional wisdom from business schools and management consultants about technology strategy is irrelevant and even misleading. (p. 24). The author finds the planning school to be of little interest (which is no regret), and gives due credits to the 'process school'² (p.21) for emphasizing the politics of strategy formation. In one of the more influential textbooks on the subject, titled "*The Strategy Process*" (Quinn et al, 1988) the fairly central notion of '*emergent strategies*' (Mintzberg, p.15, in Quinn et al 1988) is contrasted to the standard assumption that strategy is just a plan, expressing human intention. Instead, the notion of emergent strategy emphasizes the significance

² Pavitt is referring to Pettigrew's (1987) interesting discussion of strategy research. The field of strategy research is no different from other fields in that there are several ways of describing it, all of which are emphasizing some distinctions and differences while downplaying others. The present discussion is no exception – hopefully one or two fresh distinctions will emerge. For some other interesting discussions and overviews, see Melin 1987, Quinn, Mintzberg & James 1988, Zan 1990, Knights and Morgan 1991, Pettigrew 1992, Bengtsson 1993, Whittington 1993, Mintzberg, Ahlstrand & Lampel 1998, Sveningsson 1999, Nygaard *et al.* 2000, Pettigrew et al. (2002).

of human action. Strategies are as much produced outcomes in the absence of intentions or despite them: "...strategies may result from human actions, but not human designs...[that is] *emergent* strategies, where patterns develop in the absence of intentions, or despite them, which went *unrealized*." (Ibid., p.15, Mintzberg's own emphasis³). Pettigrew (1992) puts a similar emphasis on humans and their actions in the production of emergent strategies. "The most important ['ontological assumptions'] for scholars of strategy process are that...The social process is constructed, created by human agents – individual or collective-through their actions...a process of structural emergence via action" (Ibid., p.8).

In the remaining part of this paper, I will argue for an *extended notion of emergent strategies* that includes humans *and* the possible significance of materials of technology in the explanation of emerging strategic identities and outcomes. However, in order to qualify this line of argumentation, it necessary to first take this detour into contemporary strategy research to a provisionally conclusion by considering some recent contributions:

Not unlike Pettigrew (1992) above, Clarke (1992) proposes a social constructivist perspective and then extends it to the world of technology. This allows the author to address the question of stability and change in a new refreshing way. The notion of maturity or equilibrium associated with industrial economics, and present in Porter's (1985) writings on strategic positions, can now be questioned "Maturity is a condition of the mind, not of the technological design configuration of the firm" (p.40), the author argues. In line with social constructivism, Clarke puts an emphasis on human agency by shifting the focus away from the possible significance of the artifacts of technology: "The design configuration concept shifts the focus away from technology as artifacts

³ On 'emergent strategies', see also Mintzberg 1974 and Mintzberg, Ahlstrand & Lampel 1998.

to encompass the skill context which supports the technology.” (p.38). The ‘skill context’ is another word for the world of humans, including their beliefs, interests, decision-making, and skills. The ‘skill context’ is now allowed to influence the content of the technology. The notion of skill context no doubt adds important nuances to the black-box conception of the firm associated with (industrial) economics and the strategy as plan perspective. Yet there may also be costs associated with such an exclusive focus on humans and their skill context. Most importantly, it must become increasingly difficult to pay attention to the possibility that skills or the ‘skill context’ it self can be re-contextualized and co-produced in interaction with the materials of technology. I will return to this point in the concluding section of the paper.

With Clarke *et al* (1995), the social constructivist approach proposed a few years earlier is replaced with another, far more familiar approach: “ While the ‘strategy as plan’ may be a simplistic approach to technology, it at least has the merit of ensuring that many of the issues discussed here are placed on the managerial agenda.” (p.188). The authors do not explain why they conclude that simplicity is the way to ensure managerial attention and relevance. At least the empirical work reported by the authors suggests otherwise: “Several managers argued that explicitness in planning in this way was not possible or desirable.” (p.176). The managers interviewed seem to be closer to Von Clausewitz than the authors in recognizing the possible complexifications involved in simplifications.

Other researchers have articulated what they label ‘critical perspectives on technology management’ (Green, Jones and Coombs, 1996). Not unlike Pavitt (1990) above, a criticism is directed towards a neglect of the politics of strategy. In their own words “Much of the literature on strategic technology management ignores the voluminous evidence that strategy formulation inside firms is a political process...” (Ibid., p.4). The authors are referring approvingly to

Mintzberg's work on emergent strategies as well as Knights and Morgans' (1991) critical discourse analysis. There is very little attention to the materials of technology in this work though. Knights and Morgan (1991) have entirely other aims, notably to provide a critique of what they identify as the rationalist- and the process view of strategy. But more importantly to the present discussion, they also share concerns with the present author regarding humanity, notably the human condition for more or less free speech. This concern is also what makes their work both interesting and original, albeit with its own unresolved tension regarding the constitution of the free speaking critical discourse they seek to establish: The authors view strategy as discursive practices "which transform managers and employees alike into subjects who secure their sense of purpose and rationality by formulating, evaluating and conducting strategy" (Knights and Morgan 1991, p.252). The authors secure for them selves most of the roles and responsibilities for defining strategy:

To begin with, there are the authors them selves, defining strategy as discursive practices. Then the authors set the discursive plot in motion by an act of delegation to other humans such as managers and employees. These other humans are so reasonable as to agree to carry out the plot by acting in a responsible way according to the rules of delegation handed to them. They produce and reproduce the strategic discourse – so as to become the subjects, as defined by the authors. Knights and Morgan believe that their discourse analysis effects a more '*radical break*' with the rationalist view of strategy than 'processual theorists' like Mintzberg and Pettigrew can provide (Ibid. pp.266-7. My emphasis). There are different traces of this 'radical break'. One of the more explicit ones are "...where we differ [from the 'processual perspective'] is in holding distinct epistemological perspectives...the full logic of an hermeneutic epistemology...Our view acknowledges that managerial action is influenced by the structure of extrinsic rewards and sanctions, but that individual's preoccupation with identity frequently generates a subjectivity of

internal self-discipline” (Ibid. p.267). Less explicit traces of the ‘radical break’ are conveyed to the reader in the form of a ‘colonizing’ (Ibid. p.258) strategic discourse. The authors do not provide any case studies to substantiate these claims regarding discursive strategy’s capacity to ‘colonize’, to produce and reproduce internalized forms of individual control and self-discipline among the other humans.

The plot could have ended here - after having defined the other humans as caught up in the reproduction of ‘colonizing’ and ‘self-disciplining’ discourse of strategy. The plot would then leave these other humans to their own identity making – denying them any access to the resources, which allows critical strategy researchers to talk about a ‘radical break’. How then, can these other humans transform their identities to become the self-conscious critical free speaking subjects that will allow them to make the ‘radical break’? “In conclusion, we believe that our approach departs from this prevailing literature and offers the possibility for it to move in a more self-consciously critical direction.” (Ibid. p.271). This, then, is the ‘radical break’ and the promise the authors offers – the drawing of new boundaries and limitations for the expansion of the strategic discourse by adding critical humans equipped with discourse analysis.

Although it remains uncertain whether there are any boundaries and limits to the strategic discourse, Von Clausewitz’ suggestion to stay close to the field and the materials of strategy seems not to be part of it. Here, there is something that amounts to a radical break. Perhaps Knights and Morgan have viewed Von Clausewitz as part of the commonsense discourse they seek to break away from. Neglecting the materials - by only equipping the humans with a critical discourse, strategy research may participate in producing the kinds of complexifications first suggested by Von Clausewitz. This possible ‘critical paradox’ deserves further examination.

Pavitt (1990) argued quite forcefully that something was lacking in strategy and management research when the topic of technology was on the agenda. A decade later, in a co-edited and quite impressive book titled '*Handbook of strategy and management*' (Pettigrew et al. 2002), Pavitt and Steinmueller (2002) have little to add when once again summarizing strategy and management research on the topic. However, in this same volume that Pavitt published some of his last keen observations, there are interesting suggestions pointing towards an enriched notion of strategy. Beginning with Pavitt and Steinmueller (2002) in their opening paragraph, they remind strategy research of an important observation, that science and technology seems to be an integral part of 'all recorded civilizations' (p.344). The authors thus seem to argue that such collective achievements like civilization would be difficult to comprehend and explain, without paying some more attention to science and technology. The authors also refer approvingly to the work done by sociologists of science (Callon 1993) for stressing these issues, notably the relational and networked character of such collective entities like firms and their scientific and technological capabilities. From the title "Technology in corporate strategy", the reader can also easily infer that the authors see technology as an integral part of strategy, not as an entity or a thing to be separated from it. This is an important suggestion in so far as strategy research until a quite recent past seems to have become trapped by its own disciplinary distinction between 'technology strategy' and 'strategy'. At least since the work of Ansoff and Stewart (1967), this distinction has served to separate technology from 'strategy' in any serious discussion of what defines the latter. Instead, technology has been relegated into some sub-discipline within strategy research. Here, my aim to a large extent coincides with Pavitt and Steinmuellers' (2002) concerns above - to argue for a notion of 'strategy' that includes technology and associated materials into its definition.

There are also several other contributions in the Handbook pointing towards the redefinition of disciplinary boundaries. For example, Garud and Van de Ven (2002), and Grant (2002) seem to hold the view that the distinction between ‘strategic change’ and ‘organizational change’ should not be taken too seriously⁴. Grant (2002) finds that the resource-based theory of the firm, as well as strategic research in general, still operates in a ‘terra incognita’ (p.92) when it comes to grasp the organizational dimensions of how firms’ competencies and capabilities change and develop – “we need to know what firms are” (Ibid.) Grant argues. Such trespassing of disciplinary boundaries and distinctions sounds promising. For one thing, it should become easier to argue for the present line of inquiry in which technology and associated materials are allowed to make a difference in defining strategy. Adding to that a relaxed distinction between ‘strategy’ and ‘organization’, should also make it easier to explore in richer detail the issues and concerns raised by several of the authors and contributions in the Handbook referred to above, e.g., the organizational dimensions of strategy, including also the changing competencies and capabilities of firms. More specifically, Tsoukas and Knudsen (2002) ask this interesting question “who sets strategy?” and argue for a process-oriented view of strategy, emphasizing *how* the process produces outcomes. “...strategy research will become more relevant, encompassing, and subtle if it moves towards a process-oriented view of the firm and lets itself open to a constructivist view of strategy making” (p. 413) they further argue. Taking up their challenge some years ago (Tryggestad 1995), the present work will continue to pursue a constructivist perspective, yet one that may allow for slightly different answers to what is basically an important question of identity and agency in strategy research, i.e. *who or what makes strategy and strategic change?* The ‘who’ and ‘how’ of strategy making seems also closely associated with the recent ‘practice’ turn in strategy research. Still, according to Whittington (2002) in a practice perspective, there

⁴ A similar example would be the newly established journal with the suggestive title ‘*Strategic Organization*’, including Whittington’s (2003) editorial essay.

are at least two distinctive differences compared to a process perspective; a respect for the *modest* (or simple) accomplishments of continuity as opposed to an emphasis on radical change, and an emphasis on the *micro-level of human practitioners* as opposed to an organizational level of analysis: “Processes tend to be properties of organizations; practice connects more directly to the practitioners...The focus of practice is typically micro-level, interested in the skills and performance of people before those of the organization. It is first of all their [peoples’] practices that make up processes” (Ibid. pp.128-129).

Strategy making, on this central topic, the Handbook offers few new suggestions. It is still individual humans or collectives of humans that make strategy, the important questions being who the humans are, and how they are doing it. The materials of technology are still not allowed to make a difference. Here, Von Clausewitz’ original suggestions regarding the role of materials seems to have been slowly written out of strategy research⁵. Unfortunately, this seems also to include the important connection he made to degrees of humanity. Instead of continuing the discussion of humanity opened up by Von Clausewitz, the *Handbook of strategy and management* seems to have reached the conclusion. Humanity is brought safely back into strategy research, the reader is ensured. It is certainly true that the process view of strategy, so closely associated with Mintzberg’s early work, added an enriched notion of human agency in strategy research – the point of reference being procedural rationality, economics, and associated notions such as homo economicus. But are there no longer any unresolved questions regarding human agency and humanity in strategy research?

The human centered assumption remains basically unquestioned in strategy research. This given humanity, in which the identity of the strategic actor or subject is assumed to be an individual

⁵Although acknowledging its many merits, the *Handbook of strategy and management* seems to have missed out Von Clausewitz all together.

human or a collective of humans – is what the present work will attend to. By so doing, it should be possible to make a constructive contribution to strategy research, perhaps also in approaching the more modest and promising place envisaged by Whittington, Pettigrew and Thomas (2002). The authors speak of such a modest place as ‘after modernism’. They also emphasize that such a modest place is different from ‘post modernism’, which is no regret at all. Of equal importance though, is that agreement can be reached regarding this implicit modern distinction between humanity and the materials and artifacts of technology, or what I have referred to as the human centered assumption. This modern distinction, it will be argued further on, does not resonates so well with such modest aspirations for strategy research.

1.2 Humanity produced – suggesting a performative perspective on strategy

Can a present day research agenda inspired by Von Clausewitz in any way add something to contemporary strategy research? A research agenda inspired by Von Clausewitz would reconnect to past concerns. The suggested complexification of the relation between materials and variable degrees of humanity should be investigated further. Following Von Clausewitz’ suggestions to do anthropology of strategy would also produce a set of concerns shared by contemporary strategy research, such as plans, processes, practices and discourses – including their possible transformative character. Yet, such a research agenda would focus the investigation on the possible significance of the materials - *all along*. Last but not least, doing anthropology of strategy will allow strategy research to connect the concerns with the materials to contemporary research on the anthropology of science, technology and organizational identities. This last connection, facilitated by the return to Von Clausewitz, will be elaborated below.

The notion of *performative* definitions (Latour 1986, Czarniawska-Joerges 1991) has been introduced in order to point out that - *through practice*, the actors in the field are constantly defining and re-defining the world for themselves and for each other. When conducting research in a performative perspective, the task is no longer to explain strategy with reference to some preconceived context such as ‘turbulent environment’, ‘external forces’, ‘the market structure’, ‘the firm structure’, or ‘the technology trajectory’. Such procedures are characteristic of an attempt to arrive at an ostensive (or essentialist) definition, that is, a definition that could be demonstrated once and for all⁶. Instead of doing more ostensive research, the researcher is encouraged to keep the question of strategy open for inclusion of actors’ changing definitions as the events emerges and unfolds.

So far, the performative perspective, and the process- and practice perspectives seem to speak with rather similar voices. But there are important differences, notably when the question of the identity of the actor is considered in some more detail. Callon and Latour (1981) came up with this intriguing suggestion to *consider actors as networks* made up of diverse materials, i.e., associations consisting of both human and non-human entities. “Although in order to stabilize society everyone – monkey as well as men – need to bring into play associations *that last longer than the interactions that formed them*, the strategies and resources may vary between societies of baboons or of men (p.283. Authors’ own emphasis). The emerging difference then – producing a performative distinction between baboon society, and that of human society, is that

⁶ Just to take a few relevant examples from ostensive research: As Grant (2002) has already pointed out, several decades of strategic research in more than hundred studies into diversification along such lines have failed to establish these kinds of enduring links, e.g. between diversification and profitability, nor been able to come up with any conclusive results regarding the question of whether related diversification outperforms unrelated diversification. Whittington (2002) makes a similar case regarding corporate-, or more generally, organizational structure. Perrow(1986), one of the most prominent researchers associated with contingency theory or the 'technological school' concluded after a few decades of research: "There are many problems...The foremost has been the measurement (and thus the definition) of technology it self" (p.143).

the latter seems to associate more of these long lasting entities, in effect creating a more extended network of associations.

In strategy research, the corporation, the firm and associated collective bodies of coordinated action, has for long been a topic of central importance⁷. This makes strategy research to share with Von Clausewitz a mutual topic, i.e., the body politic of the collective. With Callon and Latours' (1981) notion of a '*macro-actor*', the very *making* of the body politic of coordinated, or stabilized action has come to the fore. In their own words: "...*how* does a micro-actor become a macro-actor. How can men act 'like one man'?" (Ibid. p.279. My emphasis). Hence, in order to explain such an outcome, in which the identity of the corporate body made to exist, it is first necessary to ask this important question of *how* these kinds of extended and highly aligned networks are constructed and brought into existence. This is a question that is too often missed out in strategy research, although it is recognized here – indeed even emphasized, that Porter and many other eminent strategy researchers has described and defined the *outcome*, i.e., the macro-actor it self, in quite precise terms.

Callon and Latour (1981) urges us to pay some more attention to the possible significance of durable materials and technologies like machines, written documents and the like in constructing the tightly aligned corporate body of the macro-actor. Their work also offers to strategy research an entirely different way of describing and explaining the emergence of a *strategic actor*. For example, it becomes possible to make a fairly precise and empirically informed description of the difference between a strategic actor (or macro-actor) and the more mundane micro-actor. The difference between the two becomes one of *degrees* – the difference being not an essential (or

⁷ For example, Porter (1996/2002) rightly points out that strategy research since long has emphasized that strategy is about creating fit. In Porter's own vivid renderings "Fit locks out imitators by creating a chain that is as strong as its *strongest* link" (p.21, author's own emphasis). Strategy is about the creation of "tightly linked activities" (p.24) and further on that "Strategy is creating fit among a company's activities ...integrating among them." (p.25).

ontological) one, but one of relative size of the networks making up the two actors and their identities. Once again, there are no fundamental ontological difference between the two, only the “*variations in relative solidity and durability of different sorts of materials.*” (p. 284, authors’ own emphasis). Such are the heterogeneous materials and associations making up the social, the organization, and indeed strategy, the authors argue. An actor then, is made from the same substance as the network (or association) that defines it – the identity of the actor being defined at any given time through the associations making up of the network. Their work makes visible the process of constructing differences in relative size between the associations, and also explains why Callon and Latour(1981) ends up questioning ontological distinctions between micro- and macro in social theory. ‘Micro’ and ‘macro’ are made of the same substances, the author argues. Instead of maintaining such distinctions a priori, the authors argues that the distinction between micro and macro can be both (re)produced as well as undermined *through practice*, that is, the performative definitions. In their work, Callon and Latour investigate both the construction and de-construction of macro-actors – their relative size and transformation being a question of empirical investigation. Such transformations, extensions and interruptions of networks, they summarize in the more general notion of *translation*: “Whenever an actor speaks of ‘us’, s/he is translating other actors into a single will, of which s/he becomes spirit and spokesman. S/he begins to act for several, no longer for one alone. S/he becomes stronger. S/he grows.” (p.279).

Secondly, and closely related to the above, technology is no longer simply a means to an end, nor is it to be treated as separated from the social, or the corporate body. Instead, and in a way akin to Von Clausewitz’ famous saying, technology can also transforms ends and become politics by different means, i.e., as an integral part of what the social or the body politic it self, is

made of. It becomes a question of empirical investigation to say something more precise regarding such possible heterogeneous roles of the materials and artifacts of technology, or the 'object'. Hence, technology may also *perform the role as actor and 'subject'* participating in making up the body politic of the social (on this last point, see also Callon and Latour 1992, Akrich 1992). Thus, there are no assumptions about a given distribution of identities among human and non-human entities like machines and other materials of technology.

There are some further connections between the work of Callon and Latour (1981) and Von Clausewitz that should be considered as relevant to strategy research: In their theoretical and empirical work (the case of 'Electricity of France and Renault'), the authors are also inspired by a war metaphor. The transformation from a micro-actor to a macro-actor involves a process of 'mobilization', in which human and non-human entities are 'enlisted': "A difference in relative size is obtained when a micro-actor can, in addition to enlisting bodies, also enlist the greatest number of durable materials... We must now... examine *with the same method the strategies* which enlist bodies, materials, discourses, techniques, feelings, laws, organizations." (Ibid., p.288. My emphasis).

The authors, of course, recognize that the very notion of strategy can be traced back to the conduct of war and the practice it entails. Instead of slowly forgetting this important link, Callon and Latour (1981) draw upon the rich metaphor of war to say something interesting about what emerging strategies and corporate bodies are made of—as well as how to investigate these issues that are of such central importance to strategy research:

The authors urge us strategy researchers to reconstruct the chain of related events transforming micro-actors into macro-actors (and vice versa), by inquiring into the various strategies that transforms, extends or interrupt the network. As we have already seen, Von Clausewitz argued forcefully for an anthropology of strategy. In a similar vein, Latour's (1987) methodological rule 'follow the actors', summarize what it takes to produce these kinds of case accounts. The 'actor', or chain of association, to follow must once again be kept open for further empirical investigation. Instead of assuming a fixed distribution of roles and responsibilities between humans and non-humans, e.g. that it is humans, individually or collectively, that manages strategic technologies, such a given humanity should be recontextualized so as to become a question for empirical investigation: Who is managing whom? Is it necessarily so that humans are managing technologies? Who is acting and can claim the role as a strategic actor and subject? Can the distribution of roles and responsibilities between humans and non-humans transform and become variable as events unfold? These are important questions in a performative perspective on strategy. Latour's (1991) case on a mundane hotel management issue - how to get customers to bring back their hotel key, is instructive. By adding a heavy weight to the hotel key and the spoken statement 'please bring back the key!' formerly undisciplined hotel customers transforms into more disciplined ones. The *extended* association – consisting of both humans (a hotel manager) and non-humans (the heavy weight now being attached to the hotel key) is necessary to bring into the explanation of power and domination, the author argues. It is not sufficient to account for the humans among them selves - power and discipline became produced outcomes from such *changing associations* of humans and non-humans, as Callon and Latour (1981) also argued.

Such questions and concerns seems also to be close to Law's (1994) suggestions for strategies performed in networks of material relations. The author argues that the R&D manger Andrew would be profoundly reconfigured if suddenly stripped from all the materials and calculative tools; the desk computer, the spreadsheets, the office, allowing him to perform as a manager. In a performative perspective, it is not assumed that humans alone produce strategy. It is rather suggested here that strategy research should direct close attention towards the possible ways strategy are performed through the material relations of technology. As argued by Akrich (1992), such concerns also become difficult to attend to from a social constructivist perspective assuming that only people can have the status as actors. Notably, also with presumed relevance to strategy research, Latour has for a few decades pointed out the explorative and the unexpected in relation to technology, and most recently in a special issue on Sociality/Materiality: "If you want to keep you intentions straight, your plans inflexible, your programmes of action rigid, then do not pass through any form of technological life. The detour will translate, will betray, your most imperious desires." (Latour, 2002, p.252).

The performative perspective thus keeps the question of strategic technologies open for further empirical investigation. There are no assumptions about the 'strategic ness' of technologies - the possible existence of such entities must be empirically investigated. This can be contrasted to ostensive research in which strategic properties are somewhat naively attributed to certain technologies at the outset. To take an early example from the world of computer based manufacturing "...the primary strategic significance of CAM [Computer Aided Manufacturing] lies in the potential for reversing the trend towards more cost-efficient but inflexible productive units" (Gerwin, 1982, p.113). "What remains to be done", to paraphrase a famous saying, is to introduce the 'strategic' technology into the organization's design. An intriguing empirical

question of existence and becoming is thus transformed into a normative question of how to implement the ‘strategic’ entity⁸. In a performative perspective, the researcher is encouraged to abstain from such attributions at one’s own desk and instead retrace the steps – that is, to reconstruct the events at hand so as to enter into the process before the act of attribution has taken place. This allows the researcher to inquire into the question of how an entity is produced so as to become a strategic technology that must be introduced⁹.

The work associated with a performative perspective adds another organizational dimension to the materials making strategy. Callon and Latour (1981), Callon (1991), Latour (1986, 1991), Czarniawska-Joerges (1991), Akrich (1992), Law (1994), Czarniawska & Sevon (1996), Joerges & Czarniawska (1998), Kreiner & Tryggestad (2002) all argue that technologies can be recontextualized in *changing associations* of humans and non-humans. Czarniawska (2000) has quite recently posed the interesting question: “What kind of technology is needed to achieve the effect of ‘humanity’?” (p.282). She suggests that organization theorists and social scientists interested in identity issues should direct their attention to technology. The humanity of contemporary strategy research has made it difficult to address such questions since the identity of the strategic actor and subject is assumed to be a ready-made human, that is, an entity with a fixed identity and a fixed ontology. The question posed by Czarniawska suggests otherwise, i.e., that human actors and identities can be co-produced through interaction with the artifacts of technology. Likewise, it is suggested here that strategic technology can be yet another identity,

⁸ Such acts of ‘strategic’ attribution seems to be quite common in the more management oriented literature. For a more extensive review within the field of computer-based manufacturing, see Tryggestad 1995, especially pp.54-96.

⁹ Going along with Grant’s (2002) concern regarding strategic research into (un)related diversification, I would like to believe that a performative perspective could add some additional insights into this issue too. For example, it is to the benefit of diversification research to consider technology as one important dimension discriminating between related/unrelated diversification. The performative perspective not only emphasizes the possible significance of technology, but also does it in a theoretical distinct way so as to avoid the kind of essentialism associated with prevailing attributions and distinctions between what is related or not.

co-produced in interaction with humans and non-humans, rather than a given entity to be introduced. The difference between the perspectives is summarized below:

-In the planning- and critical perspectives it is the researcher that defines strategy (and reasonable practitioners agree).

-In the process- and practice perspectives it is practitioners that define strategy (and researchers collect their definitions).

-In the performative perspective, it is humans together with materials and associated artifacts of technology that define strategy through practice.

By attending to the association between humans and non-humans, also a possible significant explanatory resource has been added to the repertoire of strategy research. To take a classical example, the repeated observation of deviations between plan and outcome has been a puzzle within strategy research for years. Since the planning perspective has restricted the explanatory resources to dematerialized cognitions among humans, it becomes difficult to recognize the possible significance of material entities when providing an explanation for cognitions that deviate from the plan. Since the process-, practice- and critical perspectives only recognize collectives consisting of human actors, it becomes difficult to investigate the possible significance of non-human actors when explaining deviating outcomes.

One claim is that explanations of deviations between plan and outcome can be obtained if the association between humans and non-humans is included in the explanatory repertoire.

A second claim is that the exclusion of the non-human actors can render strategy research incapable to account for the production of strategic technologies and associated outcomes. The very same exclusion can also render representatives of the critical perspectives inadequately

equipped to account for the production of ‘controlling’ or ‘self-disciplining’ human identities as well as their boundaries and limitations.

Finally, the third claim is that the given humanity of contemporary strategy research may not be obtained for free. All four perspectives can perhaps participate in producing the kind of costly humanity as suggested by Von Clausewitz - by their exclusion of the association between humans and non-humans. So these are the three major tasks confronting this author - to provide for explanations that substantiate the claims made.

The aim of this article is thus to qualify the claims outlined above by inquiring into the possible significance of materials in the production of strategic outcomes, such as strategic actors, technologies, and identities. In order to reach the aim, I have chosen to proceed in different ways: In the next section (section 2) I move from the library to the field, reporting from own studies of the introduction computer-based manufacturing technology. The claim is furthered through an analysis of how various materials performs strategies in practice. As a way of concluding (section 3), an attempt is made to sum up some implications for research and practice.

2. THE FIELD STUDY - RECONTEXTUALIZING STRATEGY THROUGH PRACTICE

2.1 A short note on methodology

Written texts are also artifacts, not just the symbolic representation of a reality ‘out there’. They are negotiated – materials. The text presented in the subsections that follows is the temporary result of such negotiations with actors from the field – that is, a text co-produced in interaction with other texts. The notion of ‘inter-textuality’ (Tryggestad, 1995) summarizes this negotiated material character of texts. After visiting the humans at the factory site, I sent back a paper

transcript from our conversations (each conversation usually lasted between 2-4 hours). When safely returned, I discovered that the transcript had not simply passed through their hands, but had passed through a process of editing as well. The transcript carried different traces, like the stroke of a pencil, sometimes combined with added hand written comments. Comments were on different topics, often of a ‘factual’ character, but more important for the present discussion, the returned transcripts also carried with them comments with a bearing on the issue of representation: “Misunderstandings that do not *correspond* with reality”¹⁰ (as in a correspondence theory of truth), “The report does not present an *image* of our reality as it should do” (as in a normative theory of truth). “*Sensitive issues* that can hurt more than help” (as in a pragmatic theory of truth), “Reference to *personal engagement*” (as in an objectivistic theory of truth, now opposing a subjectivistic counter-position from the field it self), “*Critique* that can be misunderstood” (as in a consensus theory of the truth), “We are just about to reconsider our *security policy*” (as in a relational theory of truth – without further access there will be no more truths produced).

In one instance, the transcript had not simply passed through the standard edition procedure, in which the stroke of the pencil turned out to be the one most frequently in use. In this particular case, the editing process seemed more complex and extensive: The whole transcript had, in addition to the standard editing with pencil strokes, also gone through major rearrangement using a cut-and-paste procedure. The bits and pieces of the original transcript were glued to new blank sheets of paper. It must have taken hours to rearrange the text in this way. The effect was a rather different account of the introduction of computer-based machinery:

¹⁰ All quotes are translated from Swedish by the author. The company names are fictitious. Emphasis added by this author.

In the original transcript the actor was quoted as saying: "We [engineers] know that nobody will look back and wonder why there never was built an FMS [Flexible Manufacturing System]. The counterproposal was pure frame-up". In the reconfigured, or better still – recontextualized text, this part of the transcript was simply cut out. The original transcript included the following passage: " The floor space for new machines in the NC [Numerically Controlled]-machine shop was blocked by other machines put in place by the shop manager". This passage was slightly edited into: " The floor space for new machines in the NC-machine shop was blocked by other machines."

So, written texts are negotiated. They are materials that trace associations between humans and non-humans, like scissors, glue, blank sheets of paper, not so blank sheets of paper, and transform engineers into the readers, the writers and the editors that together with heavy machinery and social scientists constitute the world of computer-based manufacturing. From a methodological point of view, computer-based machine tools should be treated with the same openness than pages from a text: They too can be used in different ways. They too can be modified, as if being edited. They too can be capable of tracing networks. They too can take part in negotiations – they too can make a difference. Hence, an anthropology of strategy should aim at tracing the associations of strategies in the making by reconstructing the chain of related events.

Finally, the author has used the editorial freedom to dramatize the text, i.e., to include those cases and events that is interesting and relevant to the task at hand. Three cases are presented in the subsections that follow, each of them with a particular bearing on the way materiality performs strategy in practice:

2.2 Strategies transforming plans into anti-plans

The planning perspective is rather silent when it comes to the issue of anti-plans. In practice, anti-plans seem to be an important feature in performing strategies. Anti-plans are not confined to cognitive processes located in humans' brains, nor are they simply a logical deviation from the original plan. Anti-plans are more complex than that because they do not only include cognitive processes with a deviant logic, but also material entities of diverse kinds. One significant feature of anti-plans is that they enlist materials that are deviant from the ones included in the original plan. Deviant logics are closely associated with deviant materials. Together they form the body politic of anti-plans. So this is also an emerging organizational entity that the process-, practice- and critical perspectives have yet to account for. The engineer who did cut-and-paste operation was confronted with such an anti-plan when planning for a highly automated factory. This is what happened:

In 1986 the engineer was working on his version of a flexible manufacturing system (FMS), at Techno Inc., within the department for rationalization studies. The project comprised the installation of an FMS consisting of 14 numerically controlled (NC) machines, an automated stock room and an automatic tool transport system by robot. The total cost for the project was budgeted to 70 million Swedish crowns for phase 1. Full-scale operations were scheduled to 1994. According to the engineer heading the project, the object was to obtain cost reductions in the flow of material. Such an object would be in line with the overall strategy of the corporation, to cut down on operating expenses. The project leader hoped for an 80 million Swedish crowns (SEK) gain in reduced capital tie-up, and 65 million in lowered production costs. Among other things, he counted on being able to rationalize the work force, going from 73 to 23 people at the future NC workshop, and rationalizing away the better part of the 110 employees working at the Basement workshop.

While the project was under development, complete technical specifications were made. The machine manufacturers had to make modifications in existing machinery. Among other things, tools, palette handling and memory capacity were to be changed. The existing memory capacity was of only 200 articles whereas the project leader was of the opinion that Techno's need was of over 2000 article numbers. Once phase 1 had been completed, it would be possible to process 2500 different components of all sizes, all the way up to 2 meters in diameter. The existing 140 machines at the Basement workshop would, with the help of increased automation, be reduced to 30 NC-machines and 10 conventional machines, which would then be placed in the NC-workshop. All new investments would be put into the reorganized NC workshop. In due course this would make it possible to shut down the Basement workshop.

The project management held a meeting at which the leader's plan was discussed. At the meeting the engineer from the rationalization office handed over a written copy of the plan to the managing director of the Basement workshop. After the meeting, the latter took the plan with him to his workshop and presented it to the machine operators. Later, or as the project leader expressed it: "...[when I]...came down to the shop-floor I was not exactly met with kind treatment – I could no longer show my face down there."

Subsequently, two groups with different views on the project were formed and an anti-plan was formulated. The manager of the Basement workshop led the group behind it. By now, he had turned the machine operators into his allies. Their anti-plan included a central computer system to handle communications, and a technical concept allowing the machine supplier to deliver the standard machines instead of having to redesign them.

To the project leader's great disappointment, the machine supplier chose sides in this controversy, supporting the anti-plan. The project leader in turn countered the anti-plan by

establishing contacts with a Japanese machine manufacturer in 1988 for the purchase and integration into an FMS of ten NC machines. This anti-anti-plan was thus of smaller magnitude than the original plan and more in line with the anti-plan. It was developed in co-operation with the Japanese machine manufacturer's own experts who took full responsibility for the system to work according to specifications.

The project leader had also altered the wording of his written investment calculus so that the number of employees due for rationalization was left unspecified. He did so to "soften the emotional reactions... the organization wasn't quite ready for an FMS". The project leader had also made room in the NC-shop for the new machinery. This room was however occupied by the actors behind the anti-plan who one day put three Swedish NC machines there. This last anti-plan enlisting deviant machines turned out to be too heavy to counteract. It was the end of the engineer's FMS-plans: "This was the greatest disappointment of my life", was the project leader's commented this result of three years of hard work. And he added: "I only did what I judged was in line with the strategy of the corporation – to rationalize operations - that is what we are here for!"

Despite the fact that the engineer could make a legitimate claim to have been acting in line with the overall strategy, both plans, the original as well as the anti-anti-plan, became marginalized by an opposing collective. The anti-plan made the difference: machines turned to be heavier and more durable than written project proposals and policy statements. In this case, their weight can be not only associated with steel and the forces of gravity. Also the humans engaged in making their presence at the shop-floor, the market institution that carries the weight of the company supplying the machines, the contracts, the money, and the juridical aspects that go with the

market exchange added weight to the anti-plan. Together, the weight of the associations making up the *action net* (Czarniawska, 1997) of the anti-plan turned out to be too heavy to counteract.

In the end, the edited and ‘softened’ project proposals did not make that much of a difference. But the first written proposal, i.e., the technician dream of large-scale automation, made all the difference. This was the *inscription* (Callon 1991, Latour, 1992 Akrich 1992) that later traveled around in the workshop, the one that got betrayed – reenacted or recontextualized - by readers who acted upon it when mobilizing the anti-plan that carried the day. The engineer-editor becomes less quixotic in the performative perspective: this actor knew all too well that paper inscriptions can perform in unexpected ways, that they can make a difference in the world of computer-based manufacturing. This actor had come to know that the identity of humanity can transform during the course of events, from being an object for automation, as given in the technician dream of the original plan, to the anti-plan of an emerging collective consisting of acting subjects and deviant materials and logics. Strategy – *the body politic*- is made of such shifting associations that mobilize heterogeneous actors, that transform engineers into editors, and plans into anti-plans with deviant materials and logics.

Hence, it is further suggested that strategy is to be considered as an organizational achievement in *its own right*, constructed from diverse materials and humans - and with relations, and indeed with possible complex ramifications, for the focal firm:

Strategy does not exist in the order of things, rather the achieved order of the successful anti-plan must be laboriously constructed. Part of this work of constructing the emerging new order includes the drawing new fresh boundaries and distinctions between formal/informal and inside/outside. More specifically, the question of what firms are is not to be separated and treated

independently from this question of what strategy is made of – the two are considered to co-exist and co-produce each other, although *in variable degrees*: In this case, strategy initially emerged within the formal boundaries of the firm, only to trespass these very same boundaries as events unfolded. The original plan came to represent the formal institutionalized arrangements of the focal firm, such as the department for rationalization and the associated strategy, while the subsequent emerging anti-plan came to represent the emerging deviation, trespassing these boundaries. However, explaining how this boundary between the two is negotiated and settled so as to make the day for the emerging collective of the anti-plan, it is not sufficient to look for explanations ‘inside’ the firm, nor is it sufficient to stay within the formal boundaries of the firm and associated strategies. In order to explain the success of the collective of the anti-plan, it is necessary to bypass such formal boundaries and distinctions, in effect extending the network, so as to account for the enlisting of deviant machinery and associated suppliers. Failing to attend to this trespassing that extended the collective through the enlisting of deviant materials and associated suppliers, makes it difficult to account for both the success of anti-plan as well as the defeat of the plan.

So, it seems to be a matter of empirical investigation to say something more precise regarding how the boundaries (e.g. formal/informal, inside/outside) between strategy and the firm is constructed, negotiated and settled in the process, the point being made here that this is a matter of degrees, that materials matters in negotiating these degrees, and perhaps of equal importance, that *degrees may change* through the course of events and thus over time. Neither plans, nor successful anti-plans exist in the order of things, nor will they endure forever. Hence, strategy is considered to be not only a successful organizational accomplishment, it is also an order to be

considered as of a temporal kind. This concern with the variable boundaries and temporalities of strategy can also be taken further in the next case.

2.3 Strategies transforming non-humans into subjects and humans into objects

Managers play the role as humans in the planning perspective. Humans play the role as managers in the human centered perspectives. Humans, not machines, play the role as subjects and actors with identities in these perspectives. Humans tend to be endowed with the capacity to control other humans by their formal position, sheer will and/or cognitive capacity in the planning faculty. In practice, human managers do not always control, and if control is exercised, this may have less to do with human cognitive capacities and/or management that manages at the human interface and more to do with the material associations, such as *machine delegates* (Latour, 1992). Hence, the claim made here is that the humans are often transformed into objects of control, and their identity is co-produced at the machine interface.

An assembly worker sits in front of a computer-based machine. Together, they sub assemble electronic components on a printed circuit board. Red light beams are crisscrossing the hands that are interacting with the components to be assembled on the machine table. Suddenly a buzzing sound catches the attention of both the visitor and the worker interacting with the machine. The human hand retraces the component that is missing from the predetermined sequence of assembly. When the missing component is put in place, the buzzing sound disappears. Order is reestablished. The order is inscribed into the red light beams: if the hands fail to short cut them in an predetermined sequence programmed into the machine, the machine will produce a buzzing sound. Order is inscribed into the human body through the human-

machine interface. It is transformed into a prescription of what constitutes proper human behavior when interacting with the machine.

What has been delegated to this machine is not just an order of assembly sequence. The machine has also been given the role of the shouting humans called foremen and shop floor management. These humans were more fragile, because they needed to eat, sleep and do other things than just watching each and every move of the hands on the machine table. The machine never sleeps, does not eat and is constantly monitoring, buzzing and beeping each and every time the hands are out of order. This machine-management-subject has its own red eyes, its own shouting voice, and is transforming human assembly workers into objects of control. Through the machine-delegate Tayloristic control has reached a level, which will threaten the shop floor managers that Fredric W. Taylor tried so hard to please in his writings. The worker says, “It is just a job”. The director of the factory says “The strategy we are working along is to be able to do unmanned manufacturing – replacing humans by technology and capital! What we are working on is to replace what you see here. A total production concept by which perhaps we have a supervisor and the rest is machinery. Without the guys, it ticks and turns by itself!”

In the case described above, the supervisor is already in place. The machine delegate performs the role of supervisor. However, the director of the factory did recognize that there were costs and limitations associated with the strategy of automated control. The humans, at least the guys, tended to go elsewhere. They were trained for the job, then they went to other work places to practice and that was unfortunate for operations, he explained. So management seems somewhat frustrated. Just when strategy at last seems safely confined and in perfect control inside the boundaries of the firm - perfect control became undermined through the humans exiting the firm.

Indeed, a strategy confined to the boundaries of the firm - in formal control by the human manager and self-proclaimed strategist, seems to be an extreme case – and indeed one that is very much akin to what strategy research since long has defined and taken for granted as the operational or tactical! Albeit, in this case, the strategic ramifications of such taken for granted distinctions between what is strategic and what is tactical and operational for the focal firm becomes problematic as the strategic ramifications increases as more and more humans exit. When there are no longer any humans left in operations, when there is an emerging end to both operations and the human-machine interface, formerly operational concerns also has transformed into an emerging strategic concern – now advocating the technicist dream of total control through reliable automatons (as opposed to the unfaithful humans that had already left).

The assembly worker remaining and interacting with the machine delegate was a colored middle-aged woman. She did not master the Swedish language so well. Perhaps the inscription of total control is a rather local and precarious achievement that goes along with the female colored middle-aged human body that does not speak the native language so well. The younger white native males ('guys') refused this inscription. They went elsewhere. Yes, there seems to be limits to the technicist dream of total control through machine delegates. And the humans who exit suggest one such limit. When there are no humans left at the interface, when every body has gone elsewhere, there is no body left to be inscribed. This marks the end of strategy, including the technicist dream of total control. But in this case, strategy still performs through what is inscribed into the human body that remains at the interface. There seems to be an uneven distribution of human beings in this case: *some bodies* are more objects, more of a pure mediator of the inscription of control, than others.

The technician dream of the director implicitly assumes that the human-machine interface can be stabilized; the humans will be the mere ‘supervisors’ of automatic machines. But as the case of the machine-management-subject indicates, such roles can be *reversed*: humans become supervised objects at the interface and/or refuses such inscriptions by leaving the interface. In the technician dream of self-appointed human strategists, such unstable technologies and interfaces are wished away. In practice, the human identity seems to be less stable than the technician dream assumes.

There are very few limits of strategy in the technician dream. The material entities of technology are not allowed to make a difference. They are just instruments and strategic means to facilitate strategic ends as defined by humans. The essentialist conception of strategy assumes likewise, that the ‘strategic ness’ and the ‘controlling’ is a given property of the technology – a stable attribute of the entity to be introduced. I have suggested above that one limit of strategy is defined by the extent to which humans exit or enter the machine interface. The case also suggested that humans could be transformed into objects when they enter the interface. But can humans not become objects *and* subjects *at* the interface? This case does not tell that story – and this is also what makes it sound similar to stories told from a critical perspective – in the critical perspectives, *only controlled human objects are allowed to be produced at the machine interface* – not at all any free speaking human subjects are allowed to be produced here. However, this question should be considered in some more detail if one seeks to qualify the difference that the materials of technology can make, and hence, the boundary and limits of strategy and humanity:

There is this other story that should be told *at* the interface, that of the variable identity of technology. What will take place if we allow the humans to interact with such an entity? Will the

machine still perform as a management-subject? Will the humans still become objects at the interface? Will the boundary and limits of strategy be redefined once more? In short: Will the variable identity of technology make a difference? These are important questions. If there can be answers to those questions they should be able to further qualify the boundary and limits of strategy, including that of the technician dream of total control of humanity. The claim made here is that the variable identity of technology can be *the* significant instance where the strategy is confronted with its own limitations. These limitations may thus be of a different kind than the ones that are defined by the humans who exist. Hence, the next story seeks to add to the variable identity of humans, a variable identity of non-humans:

2.4 Strategies transforming non-humans into a strategic subject and a common object

Instead of taking the ‘strategic ness’ of technology for granted, a performative perspective strongly urges strategy research to provide for explanations of this state of affairs. The question of how an artifact becomes a strategic technology is a central one. The task is thus to open the black box of ‘strategic’ artifacts so that the process of making them strategic is rendered visible. The process of making an artifact into a strategic technology might go like this:

The *first step* is that of *observation*. In the late 1960s, through the 1970s and the 1980s, the international society of manufacturing observed an entity that was named Flexible Manufacturing Systems (‘FMS’). Once it was named, it started to circulate while the observers tried to come to terms with what it was. One keen observer was the senior editor of the American Machinist “ Buzzword of the half past decade, the term flexible manufacturing system, unknown when the concept was invented, seems to be on everybody’s lips. Machine-tool companies have organized whole divisions around it, technical societies have organized lengthy seminars about

it, the British have launched a magazine for it, and the Japanese have initiated a trade show to display it. Yet, if you ask someone who actually owns and operates one to talk about it, you're likely to end up discussing the "line" or the "cell" or even the "machine". Fact is, nobody's quite precisely sure just what "it" is." (Jablonowski, *American Machinist*, 1985, p.125). The Swedish engineering scientists also made similar observations regarding 'FMS' a few years earlier. They were professors in manufacturing and members of a governmental investigation on the information technology and society when they made one such observation. "The technology is already established in the country and demonstrates a good *vitality*" (quoted from The Governmental Investigation "Computer and Electronics Committee" (CEC in SOU, 1981, p. 51, my emphasis). Thus, an entity is first observed and granted an existence as alive, yet it is still uncertain what "it is" that is being observed. "Is it strategic"? , "Is it common"? , or something else?

The *second step* in making an entity into strategic technology is that of *generalization*. Like most other authors on 'FMS' at the time, the senior editor in *American Machinists* argues that 'FMS' – although still rather undefined, - yet is defined by one essential characteristic, that of being strategic through "... the *strategic benefits* that flexible manufacturing *promises*..." (Ibid., p.140, my emphasis). Through the promises and benefits that is inscribed into it, 'FMS' becomes a strategic artifact. By now, 'FMS' has transformed from being a rather unsettled identity with a rather uncertain essence, to become an entity with a far more settled identity, being strategic in essence. Hence, through the ostensive definition that now slowly emerges, the 'FMS' essences also becomes more stable: 'FMS' is transformed into being a strategic object, which means that in due time it will serve strategic ends. In Sweden, the artifact 'FMS' is generalized into a national strategic research project and a technology policy for diffusion in order to maintain

competitive advantage. The state's technology policy and the industry are now mobilized by CEC in order to introduce the strategic object into the industry under names such as 'spearhead research' and 'strategic projects'. The state committed it self two years later by allocating funds to a program named 'The program for flexible manufacturing systems'. The purpose was to develop and diffuse 'FMS' to industry. One of the engineering scientists in CEC, a professor in manufacturing systems, became head of the new strategic program.

The *third* and final step in making an entity into a strategic technology is that of *swapping properties* with humans, in effect making it into a subject. The strategic object and means is now transformed once more, to become a strategic subject that will not settle for common knowledge, but demands scientific expertise. " From a societal-economic view it is of importance that external expertise can be utilized...the fast technical development towards larger and more complex systems *presents such high demands* on different kinds of specialized knowledge, experience and foresight, that individual companies will face increasing difficulty in maintaining sufficient knowledge in order to efficiently develop and apply computer support in their production" (Ibid., p. 56, emphasis added).

In 1985, two years after the state had established the 'FMS' program, the board members at INOX Incorporated were contemplating similar issues: Should they vote for an FMS? Did they have the advanced competence that such a system demands? Or should they support one of the two other alternatives based on common machinery that they were familiar with?

In the written investment proposal they had in front of them, the head of manufacturing argued that the members of the board should vote for the FMS because it was of "strategic importance".

With an FMS, both efficiency and flexibility could be united. With the two other alternatives

efficiency could be achieved, but not with the same degree of flexibility in accommodating increasing product variety. The computer-based FMS made the difference in the latter respect. Besides, the FMS was a fully automated machine, designed to do unmanned manufacturing during the whole night. The two other alternatives could not match such high levels of automation. Prior to the board meeting, the investment proposal had been scrutinized higher up at the corporate level, that is, in the Scientific Advisory Board for Manufacturing. One of the engineering scientists in the governmental investigation, the one heading the state funded FMS program, was also a member of the Corporate Scientific Advisory Board for Manufacturing. This actor now argued for its relevance. The board voted for the FMS alternative. The machinery came to the shop floor in January 1987 as one of several 'strategic projects' in the FMS program.

Hence, in order to be introduced, the entity must be made into a strategic technology. It is not an easy task to make an entity into a strategic technology. The state, the industry, the workers' union, customers and suppliers of machinery must be mobilized and enlisted. The writing and publication of governmental reports is only part of the work that had to be put into the effort. The senior editor of *American Machinist* is only telling the first part of the story when mentioning the British magazine (not to mention *American Machinist*), the machine fairs, and the FMS societies through out the world. Most OECD member states launched an FMS program as part of their technology policy during the early 1980s. OECD was routinely monitoring these programs (e.g. OECD, 1989). So, even OECD itself participated in producing the strategic technology FMS.

This entity is also a text that slowly transforms into machinery at the shop floor. It became a text in the Governmental Investigation. It became a text in the Corporate Scientific Advisory Board. It became yet another text at the company board meeting. It became a spoken text in the

discussion at the same meeting. Then it transformed into artifacts made of steel. Texts and associated inscriptions, perform strategic technology. They participate in constructing an artifact-subject that is inscribed into humans and their institutions ('state' and the 'industry') that act as prescribed by the inscription - demanding scientific expertise. The artifact-subject is made of texts and documents. These materials and inscriptions is the artifact's interface. Humans and institutions go along with the inscriptions. They are transformed into objects that are no longer capable of asking questions regarding the circumstances that produced the text that carried the day. This is what strategic technology is made of: an artifact-subject demanding expertise – humans and their institutions acting as prescribed by the inscription. In effect, when there are no longer any one that can resist – when every body, humans and their institutions, go along with the inscription, also *the macro-actor* (Callon and Latour 1981) of *strategic technology* is brought into existence.

But the task set forth for myself is not yet accomplished. The significance of the variable identity of technology has been addressed. It has been argued that humans can be made into objects at the interface of the technology-text. The reader could now rightly ask where the limits of strategy are. Is there no place left for the human subject and humanity? Of course there is. Through practice, *at the interface of FMS*, a difference between technology-text and technology-steel slowly emerges that pave the way to the human subject. I claim that human subjectivity is co-produced at the interface, in this case, at the interface of machinery made of steel. Without the machinery, there would be little place left for the subjectivism usually associated with humans and humanity:

The strategic technology further materialized into an FMS consisting of two CNC-machine tools, integrated with an industrial robot for loading and unloading of parts, an automatic quality robot designed to measure the finished parts, and an over all computer for supervision. Shortly after the arrival at the factory, the FMS started to demand different things. The humans at the shop floor listened carefully. The FMS was supposed to do unmanned machining during the night by drawing upon the scientific expertise that was inscribed into its design. In addition to scientific expertise it demanded skilled machine operators, not only at daytime, but also around the clock. It became necessary to send the machine operators to the suppliers on specialist courses. Then the artifact demanded new programs, a tool measurement machine, an automatic cleaning unit to the work pieces, and new tools. An engineer with specialist knowledge of FMS was employed during the first year. The FMS engineer introduced new, specially designed tools, adapted to the unique design of the machine. The various entities were integrated into the FMS design during this first year. There were few good parts coming out of the system, since new demands popped up as soon as the first ones had been accommodated into the design. One demand was more persistent than others. The artifact kept on demanding automatic tool change although there was nothing wrong with the tools. Or as one machine operator explained it: “He [the quality measurement robot] believed that the tools were broken”.

Non-humans (automatic cleaning units, new tools, new programs) and humans (machine operators, engineers) were added to the machine interface in subsequent steps in order to maintain its strategic significance in operations. But even with all these modifications, the lack of capacity was still present, and the lack of capacity was of great concern to management. The financial director explained that “It is quite simply too slow”. The former production manager was of the opinion that it wasn’t the technology as such that failed but the way the rest of the

management group looked upon technology. “If I had been at Inox this would have been one of the finest investments we could think of because then it would have been taken further in development. But in this case, the thinking was different. You have to put your heart into an investment... If you are negative towards something you cannot pursue it to 100%.” The technical advisor argued “None of this is black or white, but if you see it as a strategic choice of direction, I think it was a wrong choice, independently of how the market developed. This is due to the fact that the technology does not hold in this kind of situation – there are other solutions to parts flexibility and set-up times which turn out cheaper.”

The FMS cost around 13 million SEK (excluding all additional costs not accounted for in the investment proposal). The production manager pushing the investment was given notice in 1989. The automatic quality measurement robot was disconnected from the FMS in 1992. That improved utilization ratio, but the FMS were still too slow, according to management, engineers and machine operators alike. Besides, they were using too much time in order to satisfy the FMS's never ending demands for humans and non-humans. The other, more efficient, transfer line also needed attention. In 1994, the engineers decided that they would use the FMS as a ‘laboratory’ for testing of new tools in the other production line. In late summer of 1995, the FMS was thrown out. A dedicated computer-based line of machinery took its place, side by side with the transfer line that 10 years earlier was scheduled for termination.

When everything works smoothly, when humans can interact with the artifact without any struggle, they tend to take it for granted. In this case, the technology-text of FMS was close to such a condition of taken-for-granted ness. But when the artifact becomes recontextualized and dressed up in steel, that is, when the *variable materials* of technology was allowed to make its presence, also the interface between humans and non-humans has been altered.

To begin with, humans went along with the technology FMS. They struggled to stabilize and kept a demanding artifact-subject as a strategic technology. But the struggle did not simply reproduce human objects that went along with the texts and the inscriptions making up the macro-actor. As the struggle unfolded, it produced something else. This something else – the now emerging human subject - was co-produced at the struggling interface. This is the significant moment, when humans started to question the ‘strategic-ness’ of the technology. This was the destabilizing moment, when they saw that the ‘strategic solution’ became an emerging strategic problem. Customer delivery was delayed. There were so many humans and non-humans that had been added to comply with the demanding artifact-subject that there was little left to be added to the other machines. In this case, the struggling humans chose side: The FMS may be strategic in principle (as in the ostensive definition given to them), but through practice it is the old transfer line that becomes strategic – not the FMS. If anything is going to be passed into non-existence, it is the FMS. And so they did, step by step, recontextualizing and redefining the identity of both humans and non-humans once more. Human subjects can question a strategic technology, and they can transform a strategic subject into a common object. Human objects cannot, because they have to go along with the text and take strategic technology for granted. One other artifact, one more interface, must be added if humans are to become subjects again. By doing comparative anthropology of technology, i.e. by comparing the transfer line already in operation with the FMS, the humans reconnected to the past. Instead of breaking away from the past by replacing the transfer line with FMS, they maintained the interface with it. The transformation from human object to human subject was facilitated by this connection to the past. Also the transformation of a strategic technology to a common object was facilitated by this connection to the past.

Hence, this last case, on the strategic (macro) actor ‘FMS’, strongly suggests that also the less modest distinction between micro and macro in strategy research became *profoundly undermined through practice*. Fragile human institutions like the government, the parliament, and the company board were all mobilized and enlisted so as to go along with the demands from the emerging strategic subject ‘FMS’. In effect, the ‘social context’ or ‘macro’ it self became *recontextualized and modified* so as to take strategic technology for granted. Yet, this case further suggested that such macro-order, once successful achieved, also could be profoundly undermined once again – through the struggling interface made of steel.

3. IMPLICATIONS FOR RESEARCH AND PRACTICE

Returning first to Czarniawska (2000), I would like to suggest a few possible answers to her interesting question regarding the kind of technology needed achieve the effect of ‘humanity’: Humanity as it were, is not simply given, but seems to be co-produced in variable degrees together with heterogeneous materials such as written texts and machinery made of steel:

In the first case, on the plans and anti-plans of strategy, it turned out that written plans does make a difference. Such materials travel, becomes betrayed and recontextualized into anti-plans. By adding the collective of anti-plans to strategic planning, the assumption of a dematerialized cognition limited to humans and their procedural rationality will not remain entirely the same. It takes more than dematerialized human cognition to complete the transformation into human objects of automation. As it turned out, adding a written project proposal to dematerialized human cognition did not carry that much weight either. Instead of completing the transformation into human objects, a collective consisting of acting human subjects emerged. In this case, the production of human subjects seems to require both written plans and proposals with the goal of

turning humans into objects, and the successful enlisting of deviant materials and entities such as heavy machinery and associated suppliers.

In the second case it turned out that the interface of the machine-management-subject were the significant one in producing a particular kind of humanity. But in contrast to the first case, the transformation of humanity into human objects did not simply stop short at the point of a written proposal. In the second case, the process of transformation was taken much further – due to an extended association consisting of a machine delegate. Hence, the production of a humanity consisting of human objects seems to require the presence of a machine-management-subject – merely discursive (verbal) management seems not enough. Strategy research can modify the assumption of a given humanity in which humans and their discourses are the management subject and strategic actor, by including such non-human actors and identities like machine delegates. Doing so will enable strategy research to downplay the search for a given humanity of human action and interaction and instead direct more attention to the significance of the material interface that produce identities such as human objects and non-human management subjects as strategic outcomes. Instead of taking humanity and human identities as a given premises for doing strategy research, it is suggested here that a given humanity should be topicalized for further investigation:

In the third case, on the strategic technology FMS, humanity became produced as controlled human objects at the interface of technology-text, and as free speaking human subjects at the interface of technology-steel. The kind of technology needed to achieve the effect of a humanity consisting of free speaking humans involves at least two interfaces, both made of steel: a struggling interface (the FMS) as well as a second interface (the transfer line) which allowed for comparative anthropology of technology. By doing comparative anthropology of technology, humans situated the present in the past. They did not advocate any radical break from history,

but reconnected to the past. And perhaps most significant for the present discussion on identities, they *swapped properties* with the non-humans while redefining what they were made of: The FMS technology transformed from being *undefined*, to become the *macro-actor* consisting of a demanding strategic subject, to become a *common object*. Humanity transformed from *controlled human objects* to *reflective human subjects*. Knowledge and skills, in the form of reflective practitioners, was produced in one and the same process of transformation. The reflective practitioners - the human subjects, can thus be explained as an outcome and effect of an immensely complex process of transformation situated at the interface of variable identities of technology.

Returning to Von Clausewitz and the complexification the author introduced by suggesting that there are costs associated with a given humanity. So, what if any, are the costs associated with a given humanity - for research and practice alike? Can a given humanity be obtained for free?

Beginning with strategy in practice, the modern technicist dream of total control through automation, seems to be closely associated with a given humanity, i.e., the human object – an entity to be controlled or replaced by an equally given, almost perfected autonomous technology. So the question of costs is actually more complex and should be rephrased: What are the costs for *simultaneously* producing these two entities, the human object and the strategic subject of autonomous technology? As Callon and Latour (1992) have observed, the history of automation is filled with failures, trying to stabilize both at the same time. The perfectly autonomous technology has yet to materialize. The cases accounted for in the last section are no exception. Even the seemingly hardest case, on the machine-management-subject, suggested a number of locally produced limitations to the technicist dream of total control, mediated through the presence and absence of the human body. In this case, as in the two others, the human object of total control is a precarious achievement – maintained for a while at substantial costs. The

technicist dream of autonomous technology, Latour (1996) equals with a crime. It is a crime because it excludes technology from the process of organizing and the network of which it forms a part - what the main character in this case, the automated train system Aramis, describes as a 'vast collectives' (Ibid.,p.296). By excluding technology, it is no longer allowed to exist in variable degrees, but is taken to exist at the outset as a stable entity with a fixed identity e.g., the 'strategic' technology FMS. But in the same moment, even humanity is produced as a given entity, e.g., as an object of automation. Neither technology, nor humanity is no longer allowed to exist in variable degrees. Thus the second crime follows from the first one, by excluding technology from the process of organizing and the collective of which it forms a part; also humans are denied access to the resources that produces their variable identities.

The critical perspectives has rushed from the observation of controlled humans to the normative conclusion that this state of affairs can be remedied by a radical break - replacing non-human interaction with discursive rules and analysis for free speech among the humans. But the cases suggests otherwise: if controlled speech can be co-produced at the machine interface made of steel – then that is a ground for *paying more attention* to the significance of materials in the production of more or less controlled humans – *not at all a ground for making a radical break*.

To become reflective human subjects and thus remake their identities, it requires variable materials such as struggling interfaces made of steel. Breaking away from such variable degrees of humanity by invoking a given, albeit critical one, do not pave the way for the kind of humanity associated with the reflective human subjects, but participates in making the process of becoming human subjects invisible. Breaking away from the interface of variable materials will in the best of all possible worlds not make any difference at all. Contemporary strategy research will then only continue to modernize it-self, attempting at yet another radical break with the past.

In a less perfect world, which is a more likely one, strategy research will continue to participate in making invisible, to themselves *and* others, the materials that allows us to become humans in variable degrees. As already pointed out by Callon and Latour (1981), the only implication from this kind of research will be that the macro-actors will "...purr with relief, for their structure disappears from view, whilst they allow their social parts to be sounded." (p.298). Macro-actors are good at producing invisibility too. They are the ones that produce a given humanity, by simultaneously attempting at a stabilization of both human and non-human identities. To paraphrase Clarke (1992) above, maturity or equilibrium is a condition of the macro-actor, not of the technology or the individual human mind. Neither the human mind, nor human skills and action, are sufficient to account for the transformation into a macro-actor (and vice-versa). The material associations, including their variable identities and ontology must be included in the explanation. Knowledge or 'skill contexts' are not entirely unaffected by such processes of transformation. The humanity as given in contemporary strategic research should not simply be treated as an intellectual resource and premises, but should be topicalized as part of what should be explained.

Summary and Conclusion

Failing to account for the significance of materials in the production of degrees of humanity in the past, have made contemporary strategy research as much producers of strategic outcomes, such as strategic actors, technologies and identities as providers of explanations and observations. But there is another way to follow than the one of becoming the megaphones of the macro-actors. The performative perspective invites both strategic research and practice to consider in some more detail how technologies are produced into being both strategic and common. By following the actors through their multiple transformations, we can learn more

about what made them able to do so. Humans at the interface know that the variable materials of technology can make the difference. They are co-produced as such - as knowing human subjects - at the interface. Breaking away from the interface is also the breaking away from that particular kind of humanity, paving the way for the human object and the associated technicist dream of total control. Herein lies the critical paradox of a given humanity. Strategy researchers do not exist independently of such processes of transformation, but should be included as part of what should be explained. The search for foundations in strategy research has not simply missed the given humanity, but partakes in making it into a foundation of strategy research, yet the costs of doing so remain outside the frames of contemporary strategy research. The anthropological approach that allowed Von Clausewitz to re-search strategy and address the possible significance of materials in the production of degrees of humanity is left behind.

Re-searching strategy in the vein of Von Clausewitz produce other concerns, such as strategy research less close attention to the possible significance of materials in producing strategy – what the author described as humanity, or what is here put in the more blunt language as the human-centered assumption. In particular, it has been argued through out this work, that the humanity as given in contemporary strategy research is one of those strategic outcomes that warrant further explanation. The given humanity is not obtained for free – and instead of becoming modest, strategy research seems to participate in reproducing the modern distinction between humanity and technology, the associated costs of doing so are summarized here as *Technological strategy as macro-actor*.

What could a modest research agenda look like? With Latour(1994) we could call it ‘*non-modern*’, while emphasizing some of its constructive and modest virtues: Rather than striving for purity, e.g. by maintaining modern distinctions between humanity and the materials of

technology, modest strategy research instead inquire into the process and messy work of producing such distinctions and purifications. Further more, modest strategy research, as already suggested by Whittington, Pettigrew and Thomas (2002) does not go along with postmodernism either. More specifically, I would like to emphasize that modest strategy research does not at all go along with the *technology fatalism* of the post moderns. Instead, modest strategy research keep on reminding post moderns like Lyotard about their own peculiar critical paradox: That they seem to participate in the reproduction of the techno-science they so clearly denounce. Last but not least, modest strategy research does not strive at yet another radical break with the past (the ‘after modernism’ sounding too much of the latter), but instead retrace the steps:

Strategic change then, is to be understood, not as a radical break with the past, but as the *emerging* process organizing and producing the collective achievement that *temporally* has become possible to identify as strategy, that is, a coordinated and coherent (or homogeneous) entity. Here, the temporality of strategy is important to emphasize. Such achieved coordination and coherence does not exist in the order of things, but must be laboriously constructed and maintained. Further more, in such a modest research agenda, *also the humans are to be considered in a more modest way*– neither are they assumed to be the sovereign strategy makers by themselves – but nor are they any more left alone to answer to the ‘who’ (the question of identity and agency), and ‘how’ (the question of the process producing the outcome), of strategy research. For the human practitioners, this also guarantees a far more symmetrical treatment, when strategy research attempts to explain and judge strategic success and failures. For example, instead of distributing all failures to the humans and no failures to technology (or vice versa), a more careful distribution would be allowed for.

A modest task for strategy research then, would be to continue to question these modern taken for granted distinctions between humans and technology, micro and macro and so on, by explaining how they are constructed and modified through practice. Following the actors (or associations) through their practice of constructing and de-constructing strategic (macro) actors, seems to be path of inquiry still largely unexplored in strategy research, although – or so it has been argued, also the very prospect of making modesty an integral part of the practice of doing strategy research, seems to be very much in line with it.

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