

Towards Critical Medical Practice: Nursing Practice And An EMR System

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Introduction

Critical management studies (CMS) and critical information systems research (CISR) are characterised by an understanding of critique mainly as a form of theory which enables analysis and evaluation. This approach to critique has generated many valuable studies which identify and analyse various forms of marginalisation, domination and oppression. A persistent issue for these critical traditions includes the following: effectiveness of the critique, the question whether the critical theory translates into critical practice (McGrath, 2005), and the question whether the powerful theories succeed in transforming the material conditions of the marginalised, dominated and oppressed.

One aspect of this problem is the very conceptualisation of the relation between theory and practice. The precondition for a good theory is that it must be able to provide insights that are independent of the messiness and complexity of practice. Critical theories also contain strong judgements about a situation. A second aspect of this problem is related to ways in which the agency of the research objects (the marginalised, dominated and oppressed) is being conceptualised. The agency of these subjects is generally underplayed and the material conditions for their agency are not acknowledged. The critique suffers from a basic contradiction: The research object is portrayed as the victim of false consciousness and as ignorant about the real causes of his/her oppression. This object has then to become the subject (agent) of change. The problem critical research is confronted with is the transformation of the passive object into a revolutionary subject. This limitation goes with another one – the failure to see the way in which agency is not a uniquely human ability, but the effect of heterogeneous assemblages. The assumption that humans could idealise alternative practices and then act the ideas out in practice fails to take into account the ways in which any practice is mediated through material entities and that agency is not simply a matter of reason and volition, but the outcome of a particular heterogeneous assemblage. The possibility that matter could also act is not considered (Bennet, 2010).

This essay wants to explore a posthumanist conception of critique by acknowledging the heterogeneous nature of agency. It does not take the human subject as the centre and does not see the relation between theory and practice in terms of 'translation' or 'application'. It does not want to devalue the role of theories, but queries how critique as a form of theorising could make a difference that matters (Edwards, 2011). The article consists of an analysis of a case where an electronic medical record (EMR) information system is introduced in a hospital. The focus in this article is on tracing the effect of this system on the work of nurses. It is shown how the system entails the marginalisation and reduction of the professional expertise and knowledge of nurses. Where critical theories are able to identify, analyse and evaluate the forms and extent of this marginalisation, the focus in this article is on the ways in which the nurses enact a reality that is different from the one prescribed by the EMR. The differential enactment of reality is achieved through a heterogeneous assemblage that consists of various agents such as nurses, computer workstations, paper and meetings. The practice of the nurses is defined here as a material form of critique. It is not the traditional form of critique which articulates and evaluates the embedded ideologies, but one which enacts a reality that could be seen as emancipatory.

The material practice of EMR

In their investigation of nurses' practice, Mayère & Cooren (2011) follow a posthumanist ethnographic approach. Posthumanism refers to an approach which does not centre the human agent. In their focus on organisation-in-practice they recognise the role of heterogeneous kinds of actors in the production of medical knowledge.

The investigation of Mayère & Cooren (2011) is located by the authors within the critical framework of organisational rationalisation through information and communication technologies (ICTs) which entails among others the computerisation of medical and nursing records. They indicate that rationalisation reaches a further level by entering the terrain of knowledge work. As part of this process of rationalisation employees 'have to conduct reflexive monitoring to contribute to organizational optimization, codification and justification' (p.8). They argue that 'immaterialities' such as information and communication matter because the rationalisation takes place through material means such as 'machines, artifacts, networks, and computerized methods such as ERP (enterprise resource planning) workflow, or databases and software dedicated to quality and risk management' (p. 9). 'Mattering' refers to both the materialisation of information and its significance.

The authors focus in particular on the strategy to establish the 'paperless ward' through the implementation of electronic medical records (EMR). The paperless approach entails that there 'should be no more material support for writing and reading practices apart from computers, electronic networks, and the linked software and data' (p.10). The purpose was to reduce the amount of paperwork and to have an electronic record of all events in order to centralise and facilitate decision making and accounting processes. The project was sanctioned by the (French) government who made accreditation of the hospital dependent on its implementation. The purpose was also to reduce face-to-face communication during relief meetings when medical teams change shift. The purpose was that such cases of 'unnecessary' conversation should be reduced to improve accuracy and efficiency. It was also motivated by the belief that the ease and availability of complete and up to date information would facilitate patient care and management. The EMR system wanted in particular to eliminate 'paper reminders' that were used by nurses and physicians. Through strategic location of computer stations throughout the hospital comprehensive and accumulative information could be accessed.

The system has various effects, either by design or by means of the way in which it was realised. These effects could not be traced to any particular intention other than the agency of the heterogeneous assemblage. One effect was the regulation of access to information. Through the use of access codes some kinds of information were only accessible to physicians who are placed in the exclusive position to take important medical decisions. Through this division of labour, nurses are interpellated as executioners of physicians' decisions (p.32). In the process it promotes the expert knowledge and power of physicians and marginalises the knowledge nurses may contribute.

Another effect was the way data and knowledge are enacted. Data is defined as something that pre-exists the decision making process and is captured in a neutral and context-independent way. The assumption was that, once all the data has been fully captured and organised, proper decisions could be taken.

The EMR also follows a linear process from diagnosis to decisions, treatment and planning which do not provide for the complexity and unpredictability of medical practices.

Alternative material practice

From the account of Mayère & Cooren it is clear that the EMR could not meet all requirements of the complex and fluid nature of the nurses' practice such as the way information is generated and stored through particular work processes. This led to the need for what Berg (1996, p. 424) calls the 'repair work' of medical practitioners. They found that, in contrast to the ways in which a computerised system such as EMR produces knowledge in a singular way, '[c]onversations, reading and writing activities are mobilised in the production of collective sense making required for dealing with highly complex and changing situations' (p. 35). In this process various artefacts, such as the paper-based memory device is persistently used as a necessary means to maintain vigilance in a complex and changing situation.

The particular nature of nurses' work is described in this report as 'watchfulness' or 'vigilance'. This entails the continual administration of medication, the monitoring of the changing condition and progress of patients, and the discharge process. In order to ensure watchfulness a variety of processes and kinds of organisation is needed where various material artefacts are assembled and kept at hand. 'Setting up material grips help focussing on the question to be solved from step to step. The material signs are actants that tell what has already been done and what has to be done' (p. 24). 'All along these combined processes, watchfulness is produced through cooperation with material elements that play an important role in distributed cognition' (21).

It is clear that the EMR that wanted to eliminate the dependence of some of the material artefacts could not adequately enable the constant need for watchfulness (p.17). The fluid nature of the practice caused the EMR to be constantly behind, with the result that it could not be relied on to provide information that is relevant and on time. This is particularly the case with the administration of medicine which is a complex process involving a variety of actants (p. 20).

Because of the particular requirements of nurses' practice, they found new ways to bypass, add on to, or work around the EMR. Paper is an important agent within these practices. While it was the purpose of the EMR to replace the 'paper reminders' in order to achieve the 'paperless ward', medical personnel (nurses and physicians) found paper an essential device and agent that enables them to fully participate in the complex practice. The 'paper reminder' started as a computer printout of a Word document which contains basic patient information. As the patient progresses through the processes of medical care, handwritten notes are added and additional pieces of paper are attached. Such notes provide information about the physical location of the patient, information about the last diagnosis and treatment and the current prescription. It acts as a live record of ongoing treatment and changes in the patient. Nurses found the use of paper reminders necessary because they are always at hand in the pocket, they could be used to add notes related to ongoing treatment and changes to the patient's condition identifying the most relevant elements. It acts as a depository of the unpredictable and fluid nature of daily medical practice.

Here is one example of how the paper reminders contribute to the promotion of watchfulness in the discharge practice:

Lets[sic] focus on the preparation of the discharge itself. The nurse takes an envelope, writes the name, the code of the patient, his/her room number. She prints a predesigned to--do list, writes the departure[sic] time, and checks the required items, made of medicine, documents that will be given to the patient or send[sic] to the next establishment, the pharmacy, or whatever. The nurse will quote the assembled items all along[sic] the completion of the process. The paper list is a material reminder: the

nurse will be interrupted; she will have to wait for an additional item, check whether something else is needed. The list is a very loose scenario, it has to be specified according to the different information gathered previously or that can be asked for or told by different actants. The list and the envelope are the sentinels and depository[sic] of the work on hand. They also form a collective grisp[sic] on the ward life: by looking at the envelopes, other nurses or physicians will check the future departure[sic] and thus confirm what has been previously mentioned in relief meetings. (p.18)

The 'paper reminder' also fulfils an important role at the relief meetings where incoming staff is briefed. These meetings provide the occasion to synthesise and convey key information. The 'paper reminders' are used as the basis of these meetings because they are the deposit of the most important and up to date information. This continued to happen even though these pieces of paper were officially prohibited and their use was discouraged by the head nurses.

The paper reminders also fulfil a central role in the process of decision making. According to the legal procedure and regulated by the EMR, medical decision making is the sole responsibility of physicians. When the process of decision making is traced a different picture appears from what the EMR wanted to regulate. Within the ongoing practice knowledge emerges as open, situated and distributed. The process of decision making (officially by the physician) can be traced and could be followed back to notes and cues on 'paper reminders'. The comments and notes and annotations as they emerge from the nurses' daily practice fulfil therefore an important role in the generation of information and cues that would lead to the final decision making. The result is that the clear separation between the roles of physicians and nurses is blurred as decision making becomes a collective process.

The materiality of the practices (in the form of i.a. paper reminders) contributes to their effectiveness in the light of the dominant way in which the EMR came on the scene. The paper reminders are taken to be significant not only because they defied the official practice, but mainly because they contribute to important aspects of nurses' work.

The practice of critique

Although the alternative practices of nurses could be identified, analysed and evaluated by means of various critical theories, attention is drawn to the way the practice itself is a material form of critique through which reality is enacted differently.

The investigation of Mayère & Cooren (2011) into the 'paperless ward' is located by the authors within the frameworks of organisational rationalisation through information and communication technologies (ICTs) through the computerisation of medical and nursing records. As part of the process of rationalisation employees 'have to conduct reflexive monitoring to contribute to organizational optimization, codification and justification' (p.8). In their critique on the process of rationalisation Mayère & Cooren (2011) argue that that rationalisation is unpredictable and that it limits communication actions. They seem to draw on Habermas' (1984) distinction between system and life world when they portray the EMR as limiting communicative interaction. The computerised processes of rationalisation in general and EMR in particular have been criticised because they attempt to exert control from a single position (Berg, 1997).

The case could also be located within the critical framework of feminism that analyses the sexual division of labour in the medical field where women's work is defined as caring and given a low status (Riska, 2001).

But none of the agents seems to draw in an explicit way on these critical theories. It is a form of critique that is not informed or illuminated by critical theories and where critical researchers have not played a role. We do not encounter in this case critique in the traditional sense as formulated within critical management studies by Alvesson & Deetz (2000) as

interpretation, critique and transformative redefinition. It is not such a conscious and intentional process.

The focus on the heterogeneous practice itself as a form of critique affirms the agency of subjects without centring the human. Although the case of the paperless ward could be analysed by means of these critical theories, this section explores the emergence of critique as a material practice. In this article the research of Mayère & Cooren (2011) is used and interpreted in a selective way to extract a material conception of critique, or to be more precise, to conceptualise critique as an alternative material practice. It is used to demonstrate and further investigate the way in which (sociomaterial) practices could be critical. It is argued that the nurses engage in a practice that is different from the practice of the EMR-assemblage described above and that this alternative material practice could be seen as a form of critique.

The alternative material practices enact critique in the following ways:

- It undermines the processes of computerised rationalisation
- It asserts the legitimacy of 'subaltern' forms of knowledge which contribute to the good of the practice
- It affirms the ability and unique contribution of nurses to participate in decision making processes based on situated and changing forms of knowledge
- It broadens communicative interaction
- It acknowledges the agency of participants in practices that could not be prescribed by an imported information system

Diffraction

The alternative material practice with its empowering implications for the nurses does not yet constitute critique. Critique is not just the enactment of a preferred reality as argued by Alcadipani & Hassard (2010). If such a preferred reality where a particular group is empowered becomes oppressive, the critical process itself would be implicated. Critique could only be achieved when the indeterminate nature of reality itself is acknowledged and the subsequent implications of different enactments of reality on each other could be traced.

The indeterminacy of reality is described by Barad (2007, p. 115 ff.) with reference to the dispute between Bohr and Heisenberg about the measuring of momentum and position. Both agree that the position and momentum of a particle cannot be established simultaneously. According to Heisenberg this should be attributed to the uncertainty brought about by the measuring instruments, but according to Bohr it should rather be attributed to the indeterminacy of reality itself. Whereas Heisenberg postulates the limit of knowledge, Bohr describes the nature of reality. This ontological principle of indeterminacy has important implications for the critical project. Reality only becomes determinate through the 'intra-action' of human-apparatuses assemblages. The notion of 'intra-action' refers to the way entities are constituted through relations (Barad, 2007, p. 33). These intra-actions also produce knowledge which not simply reflects, but co-constitutes (enacts) reality. Reality could therefore be enacted in different ways depending on the particular human-apparatus assemblage. In the hospital ward this happens when the reality of illness and patient care is enacted differently by the EMR-assemblage in comparison to the nurses-paper reminder-assemblage.

If reality could be enacted differently, then the question arises about the preferred reality. It seems to be clear in the case discussed here that the way reality is enacted by the nurses is preferable to the one enacted by means of the rationalised EMR system and that such forms of bureaucratic control should be resisted. The simple replacement of one reality by the other should, however, be denied since it makes something determinate that is ultimately indeterminate. Reality is always in the process of becoming through our intra-actions.

Although these intra-actions lead inevitably to determinations, we need to be constantly aware of the effects that come about through particular enactments of reality, or through the relations between the different enactments.

Barad's notion of 'diffraction' refers to the 'patterns of difference', the 'entangled nature of differences that matter' (p. 36). In the context of the medical practices it would refer to the differences to knowledge or patient care that the enacted realities of the nurses, the physicians or the EMR make. In Barad's explanation, diffractive patterns become visible with the two-slit experiment where the interference of light waves could be detected. The diffractive patterning takes place when the waves either amplify or cancel each other. Knowledge practices such as this experiment do not reflect an objectively existing reality out there, but participate in making reality determinate (such as the determination of light as a wave or a particle in this case). Different versions of reality are enacted through the involvement of different kinds of apparatuses (such as the two-slit experiment, a computerized system or paper reminders). Applied to medical practices, the differential effects of physicians', nurses' and the EMR knowledge-generating practices need to be detected. These different practices do not reflect an objective reality, but contribute to the differential becoming of the world. The knowledge practice contributes to the configuration of the world. Different such practices configure the world in different ways. These different practices may enact patient care in different ways with different implications for medical practice. It is the task of critique to determine which of these differences matter the most in relation to good medical care.

A similar dynamic conception of reality as the basic of critique is present in the way Verran (2007) defines the 'postcolonial moment' in education. This moment is present when Nigerian pupils experience in their mathematical practices how the dominant Western reality could be enacted in a different way and how these differences open up new possibilities to life in a postcolonial era. These new possibilities are related to how realities could be enacted differently through an African logic in comparison with a Western logic. The postcolonial (critical) moment appears when pupils become able to realise the possibility of seeing and enacting the world differently. It is not only the enactment of a different reality, but also an awareness of the implications of the differences that constitutes the postcolonial moment. It shows that reality could be enacted in different ways and we are able to see what the different kinds of effects are.

Although the data is not available in the article of Mayère & Cooren (2011) to establish whether the alternative practice of the nurses could be described as diffractive, or as a differential enactment of reality, the nurses' reaffirmed practices open possibilities to interfere with the practices of the physicians and of the EMR. Further investigations should attempt to detect how the different knowledge practices interfere and what the effects are. Although the EMR is placed in a subordinate position, it would still exert some kind of agency affecting the practices in general.

Conclusion

Although the EMR has been incorporated in ecology of the hospital in a powerful way, it eventually plays an insubordinate role (p.16). The alternative material practices succeeded in allocating this agent that came with high status and credentials, to a more appropriate place within the complexity of the practice. The success of this achievement should be attributed to a large extent to the materiality of the alternative practices. Human resistance is much more durable if it is entangled in a network with material agencies. The resistance in this case study is not so much an ideological than an embodied and material activity. The physical location of the computer work stations and the piece of paper participated actively in the enactment of the alternative practice which has implications for the professional role of nurses and for the way knowledge is being constructed. A reality that is different from the dominating and officially sanctioned EMR could only be enacted when a number of heterogeneous agents are assembled in a durable way. The durability and reality of the critical, alternative practice rely on the enrolment of various agents. The focus here is on the paper memory agents, but one could also

think of the 'low status' location of computer work stations or the organisation of files in the 'treatment room'. The paper memory has become a central agent of critique because it contributes in an important way to protecting the integrity of nurses' work and professional expertise. It enables them to record knowledge as it is generated through their interaction with patients and apparatuses in a situated and embodied way.

Although the role of critical theories to identify, describe, analyse and evaluate practices should be valued, they often fail to activate the critical agent, the subject who has to transform their practices. It is therefore of value to the critical project to investigate how subjects perform realities that are different from dominant practices. Critique is enacted here as a (socio)material practice which aims to construct a different reality. It does not aim to unmask and destroy, but to enact a reality.

Instead of the separation between theory and practice where the latter is seen as 'translation' or 'application', one should rather see practice as an essential part of theorising. This article theorises the nature of critique on the basis of practices that could be seen as critical. It draws on other theory-practices to gain insight into the nature of knowledge-construction and of reality in order to define the critical project. These practices of critique are as essential to the critical project as is experimentation to the sciences. Within each such practice the enactment of critique could be investigated and it may reveal aspects of a critical project.

It is important for critical theories to become material in the sense that this materiality accompanies critical practices. Critical practices could, on the one hand be seen as a form of experimentation where the effects of particular heterogeneous entanglements are being investigated (Barad, 2007, p. 55). If theory is seen as laboratory work (Edwards, 2011, p. 4), then it suggests other arrangements and interventions in the medical practice in order to experiment what critique is about. Critical theories are not prescriptive and judgemental, but tentative and investigative in order to trace the differences of various enactments. The task of theorising this case study is to participate in the practice by keeping it open, by preventing alternative enactments from becoming new hegemonic ones. It is a process of continuing experimenting which remains sensitive to new realities and to the kinds of effects they exert.

The argument is not that critique should aim to contain and control technological developments. Although many technological developments in organizational context are examples of rationalisation, it is not necessarily always the case. That would conceptualise technology in substantive and essentialistic ways. In this particular case a form of rationalisation is resisted not only to protect the professional integrity of nurses, but also the good of the health care practice. It illustrates how critique should not be seen as the process that destroys and deconstructs, but as the process that aims at the promotion of certain goods.

References

- Alcadipani, R. & Hassard, J. (2010). Actor-Network Theory, organizations and critique. towards a politics of organizing. *Organization*, 17(4), 419-435.
- Alvesson, M. & Deetz, S. (2000). *Doing Critical Management Research*. London: Sage.
- Barad, K. (2007). *Meeting the universe halfway. Quantum physics and the entanglement of matter and meaning*. Durham, NC: Duke University Press.
- Bennet, J. (2010). *Vibrant matter: The political ecology of things*. Durham, NC: Duke University Press.
- Berg, M. (1996). Practices of reading and writing: the constitutive role of the patient record in medical work. *Sociology of Health & Illness*, 18(4), 499-524.

- Berg, M. (1997). Of forms, containers, and the electronic medical record: Some tools for a Sociology of the formal. *Science, Technology and Human Values*, 22(4), 403-444.
- Edwards, R. (2011). Theory matters: Representation and experimentation in education. *Educational Philosophy and Theory*.
- Habermas, J. (1984). *The theory of communicative action, Vol. 1: Reasons and the rationalization of society*. Boston: Beacon: Thomas McCarthy.
- Mayère, A. & Cooren, F. (2011). The renewed materiality of ICT. Presented at the PROCESS International Symposium: How matter matters, Corfu, Greece. Retrieved from <http://www.process-symposium.com/papers2011/PROS-025.pdf>.
- McGrath, K. (2005). Doing critical research in information systems: a case of theory and practice not informing each other. *Information Systems Journal*, 15, 85-101.
- Riska, E. (2001). *Medical careers and feminist agendas. American, Scandanavian and Russian physicians*. New York: Walter de Grater.
- Verran, H. (2007). The educational value of explicit non-coherence: Software for helping Aboriginal children learn about place. In D. W. Kritt & L. T. Winegar (Eds.), *Education and technology: Critical perspectives, possible futures* (pp. 101-124). Lanham: Lexington Books.