Boosting Efficiency Through the Use Of IT?
Reconfiguring the Management of Mass Casualty Incidents in Germany

Nils Ellebrecht, Department of Sociology, Albert-Ludwigs-University Freiburg, Freiburg, German

Stefan Kaufmann, Department of Sociology, Albert-Ludwigs-University Freiburg, Freiburg, Germany

ABSTRACT

Processes of technological innovation are often rationalised with the promise of improved efficiency. Using the example of the development and introduction of an information technology system for managing mass casualty incidents, this article shows that this hope may indeed be substantiated. Yet, an assessment of the societal impacts might show that these improvements often happen in unexpected places or ways. They invariably emerge in relation to organisational structures, cultural influences, and interests. In addition, when focusing only on the advantages of novel technologies, the problems they typically bring with them are ignored. The article challenges three improvements in efficiency usually associated with IT (time savings, improved decision making capacity, and detailed synopsis) with empirical investigations and field observations that were made during the four-year development and introduction phase. In conclusion, evaluations of the technology were neither completely positive nor negative but ambivalent: emphasis on the positive or negative effects depended on the perspectives of the different potential users.

Keywords: *Efficiency, Information Technology, Large-Scale Exercise, Mass Casualty Incident, Organisational Change, Triage, Unintended Effects*

INTRODUCTION

This contribution presents results from a four-year research project that was recently completed. The project, SOGRO ("Immediate rescue in a large-scale accident with mass casualties"), brought together hardware and software engineers, social scientists and end-users (emergency physicians, paramedics, fire-fighters) to develop an integrated system for mass casualty incident (MCI) events, with the goal of interconnecting the different organisational levels and cross-linking organisations involved in rescue processes. The main focus of this project lay on migrating a paper-based triage system to a digital one.

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For our analysis of societal impacts, we followed theoretical concepts that understand processes such as the management of MCI as a complex programme of actions (e.g., Latour, 1994, Rammert & Schulz-Schaeffer, 2002). Such a programme carefully balances different activities and elements, technical as well as social ones. Firstly, our research examined the well-established and more or less cemented structures of emergency response work. We then explored the impact of the information system (IS) on these structures. Our reasoning was that profound re-organisations, such as switching from paper-based to digital technologies require a corresponding readjustment of parts of the action programme which operates on both sides: the fine-tuning of technology to align device design, programmes, interfaces, etc. with the user's needs as well as reconfiguring social relationships, tasks and functions, organisational structures and work routines. Our research highlights the process of technological adoption and the (re-)stabilisation of (new) structures. In particular, we focused on how a newly introduced handheld device (Personal Digital Assistant, PDA) affects paramedics' work routines and how on-scene actors utilise the new possibilities the IS provides. As the development of such adaptations can hardly be predicted deterministically nor planned in detail, highly formalised processes such as emergency rescue require an experimental assessment. We empirically investigated four MCI exercises, during which the technology was used. The MCI exercises re-enacted the scenarios of a) a bus accident, and b) the collapse of a gymnasium's roof, each with about 50 casualties, c) the collapse of a stand in a sports centre with 270 casualties, and d) a collision of two airplanes on a runway with 570 casualties.

Our project work was based on a specific conception of how social science research is carried out, which most of all emphasises the scientist's role as an observer. Such a self-understanding is heavily influenced by Michel Foucault's writings and culminates in his concept of "problematisation" (Foucault, 1998). Foucault himself preferentially applied the concept to macrohistorical processes, for example when societies enunciate new problems. Articulating problems indicates insecurities and difficulties in maintaining accustomed patterns of understanding, acting, and of relations (Collier, Lakoff & Rabinow, 2004; Bacchi, 2012). It is the task of the observing analyst to generally reconstruct and reflect these external problems. If one applies this view to field work carried out in social science research on technology and innovation, then the centre of the research focus lies on (re-)articulating the problems of technology users. This also implies that the researcher has to put his own problem awareness on the back burner and should not "artificially" introduce it into the field. Quoting Niklas Luhmann (2002) the researcher's viewpoint can thus also be called a „second-order observation". A first-order observer would intervene himself, name/label/indicate problems, and point out ethical or legal concerns while a second-order observer is satisfied with observing the problems he notices in his/her field work and wishes to explain their origin and causes, if necessary on an abstract level. S/He doesn't solve problems, but mirrors problems as ambivalences back to the field. In the "Conclusion" section we will also portray the ambivalence of the problem analyses presented below.

The big advantage of the described approach lies in not being in danger of getting drawn in by the stream of dazzling success stories that accompanies almost every technological development. While technological development and its (public) evaluation use landmark parameters such as time savings, added information, detailed data, etc., we turned our focus on emerging conflicts, problems, and unexpected effects that resulted from the practical application of technology. From this perspective, the question of "efficiency" takes on a completely new meaning. Novel technologies often are advertised as being more efficient than the processes they replace. The technology developed in this project claimed higher efficiency because it sped up processes, supported decision making, and guaranteed clarity. This promise, though, fails to mention

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