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Humanistic Redesign and Technological Politics in Organizations

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Abstract

The political nature of technology design and implementation is explicitly addressed in human centered projects to introduce technologies that support job enrichment, group autonomy and industrial democracy. Yet the political meaning of such projects does not simply manifest itself in pure form from the methods employed or the intentions of the humanistic actors but, rather, from the complex configuration of these and other factors present in the design and implementation context. This paper illustrates this theme in an analysis of a case study human centered project. It argues that an improved understanding of the configurational politics surrounding such projects is not only an important research area but is also of practical significance in improving humanistic and other interventions in innovation processes in modern organizations.

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Humanistic redesign and technological politics in organisations

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The political nature of technology design and implementation is explicitly addressed in human centered projects to introduce technologies that support job enrichment, group anatomy and industrial democracy. Yet the political meaning of such projects does not simply manifest itself in pure form from the methods employed or the intentions of the humanistic actors but, rather, from the complex configuration of these and other factors present in the design and implementation context. This paper illustrates this theme in an analysis of a case study human centered project. It argues that an improved understanding of the configurational politics surrounding such projects is not only an important research area but is also of practical significance in improving humanistic and other interventions in innovation processes in modern organizations.

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1. Introduction

Technologies introduced into modern organisations are political in both their origins and effects. They are socially shaped and constructed before and during the process of implementation. They also have an impact that affects the distribution of power and rewards in organisations (Badham, 1991). Recognising this political dimension of technology, a number of researchers and activists have sought to intervene in technology design and implementation to promote more "humanistic" forms of technology. These "human centred", "skill based" or "work oriented" technologies are explicitly designed and implemented to enhance the quality of working life of all employees and promote more participatory forms of job design and work organisation (Badham, 1992). For some, such initiatives are harbingers of a new humane world of work, for others, however, they are more superficial and illusory in character, often hiding rather than transforming a more authoritarian technic (Ebel, 1990).

As we have argued elsewhere, the character of such initiatives is more complex and contradictory than such one-dimensional interpretations imply (**Garrety** and Badham, 2000). Rather than viewing such projects through the simple lens of grand narratives of work humanisation or managerial domination, more attention needs to be paid to the form that such projects take in particular political and organisational contexts. Yet, with some notable exceptions (Gillespie, 1993), there have been surprisingly few detailed studies of such projects. The purpose of the present paper is to add to our understanding of such initiatives through a case study analysis of one humanistic project to intervene in the piloting and design of a leading edge "intelligent" manufacturing system. In order to improve our understanding of the complex and detailed politics involved in shaping workplace technologies, this study will draw on and further develop a "configurational process" model of workplace innovation that has been elaborated in more detail elsewhere (McLoughlin et al., 2000). This model was developed to help understand and explore the politics of post-adoption innovation, but is extended here to help conceptualise the complex politics of technology design. Following the case study analysis, the paper will draw out the implications of the analysis for our understanding of the political nature of workplace technology design and implementation.

2. The case study: a technology trial and its socio-technical risks

During the mid-1990s, a group of technologists working in the R&D division of a large Australian company developed what they called an intelligent manufacturing system (IMS). The system consisted of several interlinked computers that could be used to fine-tune a continuous manufacturing process. The units were designed to gather information from several points along the process - for example, the temperature, speed and pressure of various sections of the machinery carrying out the process. The computers could communicate with each other, and produce a set of optimal equipment settings. In this way, each piece of equipment could be finely tuned to take the overall state of the process into account. If one machine was exhibiting signs of wear, for instance, the others could be adjusted to compensate.

In 1996, the developers were ready to trial the IMS in an actual manufacturing site. They chose a factory within their company, and carried out a risk review workshop at corporate headquarters. Many possible

risks were listed. Under the category of "human factors risks", participants at the workshop identified the following possibilities:

- that the IMS "will not be simple enough for staff to handle";

- that its "continued use [would lead to] operator deskilling"; and

- that there would be "inadequate preparation of end-users".

After the workshop, the technology developers summarised these concerns into a single statement of risk - that "end-users do not adopt the technology". It was to address this risk that the technology developers engaged the services of a group of socio-technical experts[1]. Over the next few months, these experts negotiated a contract with the company, which stated that their main task would be "to reduce the risks of user opposition or lack of involvement" in the forthcoming trial. To this end, they had to ensure that the equipment was "useable" and that operators "accepted" the need for the trial. At the same time, however, the socio-technical specialists were mandated to apply and evaluate "leading edge human factors and organisational methodologies". It was this mandate that provided the opportunity to carry out the research reported in this paper. As outlined in more detail elsewhere (**Garrety** and Badham, 2000), the case study has the advantage of drawing on the insight and involvement of action researchers but combined this with observations and interview data obtained from an ethnographic researcher with no "active" role to play in the project (Badham et al., 1995).

3. The socio-technical experts and their tools

While the company technologists initially perceived the socio-technical project as a matter of assisting in the implementation of the IMS trial, the Australian socio-technical research team identified the project as a major opportunity to trial advanced socio-technical methods for intervening in the technology design. Although they were effectively locked out of the initial design of the IMS prototype, they were in a position to facilitate users and developers in a critical evaluation of it. This would involve making recommendations about the human/machine interface and the allocation of functions between humans and technology. Users would also be encouraged to explore job design issues relevant to the future development of the IMS technology within the company.

The socio-technical team leader set about organising the project. The details will be outlined later in the paper. In this section, we introduce the major socio-technical tools - or, as the contract would have it, the "leading edge human factors and organisational methodologies" - around which the intervention was organised. To aid the credibility of socio-technical design as a practice, and to supplement the Australian expertise, overseas experts were flown in and employed to carry out a series of workshops near the IMS test site in late 1997 and early 1998. The tools and techniques used in these workshops reflected the professional backgrounds and interests of the experts. A US socio-technical researcher/practitioner acted as a facilitator at the first workshop, bringing to it a strong focus on group discussion and breakout techniques. US socio-technical design principles, however, were placed in the background so that two other tools could be highlighted - a Scandinavian "envisionment" approach, and a Swiss "allocation of functions" methodology. The former is based on a "collective resource" approach to technology design, which explicitly creates a space for worker/user control of the process. In so-called "future workshops" potential users are invited to speculate and even fantasise about their ideal workplace. Metaphors and games are used to stimulate the users' imagination, in exercises described as "design by doing" and "design by playing". They may also build cardboard mock-ups and prototypes. The overall aim is to generate ideas that are not constrained by perceptions of what is and is not "practical", and to create a design process that is meaningful and enjoyable. The next stage, with the assistance of technology developers, is to refine those ideas, select the most feasible and desirable, and to turn them into tangible objects (Ehn, 1988; Greenbaum and Kyng, 1991).

The Swiss allocation of functions (AOF) method is much more highly structured than the loose, imaginative envisionment approach. It is relatively new, and because of its structured nature, has the possibility to provide concrete tangible outcomes. Because of these factors, the socio-technical experts decided that this approach would be the major socio-technical tool employed during the intervention. AOF is a normative framework drawing on socio-technical systems design principles combined with action regulation/activity theory. It operationalises a set of norms and principles drawn from this theory into specific design criteria (Grote et al., 1996). The method was specifically developed in response to critiques of socio-technical theory that claimed that it has failed to develop specific criteria for technology design and development. It

also addresses concerns raised by people interested in human/computer interaction and ergonomics. These critics claim that human factors issues have been relegated to secondary interface design when they should have a more primary role in determining system functionality. The AOF method integrates an analysis and set of principles for the human-machine system with compatible analyses and principles of the work tasks of the human operator and the work system.

The method has traditionally been applied in two workshops, each lasting two days, supported by expert psychological analysis of the work tasks and work system in the production area in which the technology is being designed to operate. The objective of the first workshop is to shift the attention of developers and users away from a "technology centred" focus on the development of the technology and its impacts towards a "work-oriented" focus on production requirements and their associated human and organisational needs, so that the technology can be shaped with those needs and requirements in mind. It promotes work-oriented design concepts that place job enrichment, individual and group autonomy, and organisational autonomy and flexibility at the centre of prospective organisational design. These concepts are promoted at the level of corporate strategy, interdepartmental relations, work groups and job design as well as in the allocation of functions between humans and machines and the design of human/machine interfaces. The purpose of the first workshop is to introduce this perspective to both users and developers, persuade them of its value, introduce the basic allocation of function principles and obtain some common understanding and agreement on the socio-technical character of the work system into which the technology is to be introduced. The objective of the second workshop is to take users and developers through a systematic process of deciding the appropriate allocation of functions between operators and technology in the new system according to the specified criteria. Detailed "work packages" are created, that define for the developers the user requirements for the new technology.

4. The configuration-process model of tool use in process design

As we noted above, our primary aim in this paper is to document and explore the detailed politics surrounding the design of workplace technologies. In this case study the focus is on the form taken by the project to apply a generic socio-technical method or tool to create a more "human centred" workplace technology, i.e. a technology that places humans rather than technology at the "centre" of the production process (Badham, 1991). Before launching into our case study, we briefly introduce a conceptual model for analysing the case study - a model that we believe is useful for appreciating and understanding the details of such processes. The model was initially developed to capture the complex processes associated with the introduction and operation of new production systems (Badham, 1995; Badham et al., 1997). Such operations involve the mutual configuration of three organisational elements:

(1) intrapreneurs;

(2) operators; and

(3) the technology itself.

This is so that they can transform relevant inputs into outputs in a specific organisational environment, which is in turn shaped by broader social, economic and political contexts. In the present paper, the socio-technical tools themselves constitute the relevant technological element, the "operators" are the users of the socio-technical tools, and the intrepreneurs are the socio-technical project managers, as well as any other actors (factory supervisors, technicians, human resource personnel, etc.) involved in initiating and supporting the project as it unfolds. Inputs into the configurational process include the socio-technical systems on which the tools are to be "used", plus other sundry resources such as project funding, rather than the raw materials of production. The output would be a socio-technical (re)-design rather than a manufactured product. The model is presented in diagrammatic form in Figure 1, below.

Within this configurational-process model, socio-technical practitioners, in order to effectively influence the design of technologies, are inevitably involved in identifying and addressing the complex, contingent and political character of their work. The nature and effect of generic socio-technical technologies and techniques, or of given operators and users of such techniques, cannot be understood in isolation from the local processes of "making out". In these processes, technologies and people are welded together into workable systems by "intrapreneurs" who obtain resources, exert discipline and work across boundaries to ensure the operation, survival and development of such systems. Key macro events and broader power relations and structures can also have impacts on the development of configurations. Tools, operators and intrapreneurs may be influenced by the profitability of the relevant organisation or organisations, or

changing knowledge and career structures. While the influences on particular elements of the configuration may overlap, it is clear that tool or technology configurations may by influenced by national R&D policies, international technology and professional associations. User configurations may be linked to internal and external labour markets, education and training institutions, and local work cultures. Configurational intrepreneurs are directly affected by their own labour markets, intrapreneurial culture and professional associations, product markets, as well as the objectives, structure and resources of the organisation. Further details of the model are explained and illustrated in the case study below.

5. The IMS socio-technical project - applying the configurational-process approach

The configuration-process approach provides a framework within which to examine the complex political processes involved in socio-technical work. As far as possible, we tell the story of what happened in the IMS project through the categories contained within the model - the technology itself (in the case, the socio-technical tools), the intrapreneurs (the socio-technical experts and their allies in the company) and the operators (the people in the company invited to make the tools part of their ongoing work). These categories do, of course, intertwine. Indeed, the intertwinement - or mutual configuration of technology, intrapreneurs and operators - is a major feature of the configurational model. Highlighting each category in turn, however, enables us to impose some order on our analysis. It also helps us to draw out and make explicit the factors contributing to the complexity of the process itself.

5.1 The technology - configuring the socio-technical tools

Technological configurations are the specific constellations of knowledge, equipment and procedures that make up the structured, material, technical, non-human elements of a design or production process. In contrast to more traditional views of technology and methods or techniques, the concept of technological configuration points to the loosely systemic, complex and locally-constituted character of conceptual or material tools. In the case of socio-technical design techniques, this involves, for example, combining different formal design methodologies with varying group process techniques in different sets of facilities (with different audiovisual equipment, rooms, seating and so on). Tool configuration is also an iterative, recursive process, that involves taking into account the various meanings or interpretations that develop with regard to the tool as configuration proceeds.

It is clear from the configurational-process model that the use of tools requires much more than just a simple, unproblematic "application". In the IMS project, a major influence on the configuration process was the "input" into the system - the experimental technology to which the socio-technical tools were to be applied. In the past, the Swiss AOF method had been applied to technologies that were specifically developed or introduced for use in particular contexts. They were usually isolated human-machine systems of the sort used in batch manufacturing. The IMS, by contrast, was an experimental prototype designed to span and fine-tune a continuous process. The nature of the work system under investigation was, therefore, much more difficult to define. The somewhat amorphous nature of technology created problems for the socio-technical experts. Pre-workshop discussions were long and tortuous, as they struggled to define the "primary task" of the work system to which their conceptual tools would apply. There was a general lack of clarity and continuing disagreement over whether the socio-technical tools should be applied to the technology itself, or to the total work system, the latter requiring a broader focus on the purpose and boundaries of the plant as a whole. The final decision to focus on the plant as a whole was an outcome of the group's failure to resolve the issue to everyone's satisfaction. In the view of the Australian project leader, if the facilitators disagreed about this, the users and developers were likely to become hopelessly confused, with disastrous consequences for the whole socio-technical project. This interpretation was confirmed when the technical project leader in the plant responded to a first introduction to the AOF method by expressing concern about the concept of primary task and the confusion that it would most likely create. As the first workshop deliberately aims to inculcate the method's philosophy and introduce everyone to its associated expert language, any possible confusion could pose major problems for the effective use and transfer of the method. There was an initial inability to "translate" the method's categories in a way that "made sense" to other facilitators and user representatives. This may have been due to a clash between socio-technical methodologies, a misunderstanding due to national language differences or an inability of the different participants to explain themselves or listen effectively. There may also have been genuine ambiguity in the method's concepts, reflecting either their origin in batch production, or the study of particular workplaces. The end result, however, was that the first workshop was modified to address the overall goals of the plant - an adaptation of the tool that enabled the workshop to go ahead in the Australian context. This, in combination with the brief time allocated to the method experts to carry out the project, made the attempt to use the method to come up with precise recommendations far more complicated and difficult than had been the case in previous projects.

In addition, tool use, as represented by the workshop processes and activities, was influenced by the different group facilitation philosophies and techniques of the socio-technical researchers. There was a complex amalgam of US group discussion and breakout techniques (strongly influential in the first workshop), Swedish "envisionment" techniques (having a significant impact on the second workshop) and Swiss socio-technical analysis, philosophy and design principles. Moreover, the structure and conduct of the workshops was also influenced by the character and perceived character of the participants. Compared to user participants in Switzerland, the Australians were generally more critical of expert authority, and more prone to joking and taking a relaxed view of the tasks presented to them. These characteristics had a particularly strong effect on the second workshop.

Usually the second workshop in an application of the Swiss AOF tool consists of a lengthy and stressful attempt by the participants to create a number of detailed work packages for the technology developers. In the Australian project, other tasks and outcomes were given priority. A number of participatory "design by doing" and "design by playing" exercises inspired by the Scandinavian "envisionment" approach were employed. The workshop ended with the establishment of a project implementation team within the plant that was given responsibility for the further application and use of socio-technical tools during the IMS trial and, hopefully, beyond. These variations had both positive and negative outcomes. On the one hand, the envisionment exercises increased the interest and enjoyment of the participants, both users and developers, and avoided the frustration and difficulties involved in the application of numerous complex design criteria to the creation of specific work packages. It also allowed the workshops to achieve the objective desired by the plant manager: the creation of an informed and motivated user team. On the other hand, there were no detailed work packages that could be handed on to the designers and, as subsequently proved to be the case, there was a danger that the user team and developers would not get together later to carry out the hard work necessary to effectively reshape the technology in line with the method's criteria.

Finally, the application of the method was affected by its use in a project that had been primarily negotiated by Australian configurational-intrapreneurs (plant management, developer project management, socio-technical research group head) and, in addition to its use as an expert guide to the redesign of the technology, it was also deliberately used as a means for improving user-developer relations, and as a means for improving the skills, motivation and resources of the users more generally - a factor that also had an influence on the general conduct of the workshops where the introductory consensus building aspects of the exercise were given priority over achieving expert method generated technology design results. This interacted strongly with the differences in technology and group facilitation styles in shifting the focus and method of conducting the two workshops.

5.2 The operators

Operator configurations are made up of the local set of personnel who operate or use the design or operations techniques, and their skills, attitudes, interests and roles. In our case study, the relevant operators included the expert facilitators who communicated and applied the socio-technical tools, the company technology developers and the plant personnel whose activities were structured by the tools.

Each of the groups involved in the application of socio-technical design methods brings with them a set of skills, cultural interpretations and interests, and operates within specific organisational structures with attendant rewards and sanctions. However, the actions of these groups cannot be "read off" from their prior characteristics. The everyday techno-organisational configuration process shapes them through the interactions between the expectations and demands imposed on them by the technological configuration, the configurational intrapreneurs, themselves and other operators, as well as the characteristics that they bring to the configurational process from outside.

5.2.1 Tool operators I - socio-technical experts and facilitators

Among the socio-technical team, the different philosophies and methodologies of the US socio-technical consultant, the Swedish participatory designer, the Swiss method facilitator and the Australian socio-technical team leader all had an influence on how the tools were adapted and applied. The US researcher/consultant was responsible for focusing much of the first workshop on a well organised run through of the socio-technical system of the whole plant. The Swedish participatory designer was very influential in promoting the use of more enjoyable games, role plays and metaphorical exercises. The Swiss method facilitator set a high moral tone for the intervention, combining humour with serious commitment, and effectively convinced participants of the expert status of the Swiss method and activities. The Australian

team leader had a strong impact on the overall process, acting to ensure that the workshops occurred in a such a way that the different participants, particularly operators and plant management, felt involved, and that the needs of the various stakeholder participants in the workshop were addressed. Speculation on individual personalities and national characteristics was clearly of interest to participants and occurred during the project. There was more or less frequent banter about "Swiss" rigidity in sticking to methods and belief in expert status and "Australian" laxity in sticking with agendas and lack of respect for professional expertise.

On a more serious note, tool configuration was also influenced by the professional affiliations, interests and roles of the participating socio-technical experts. The issue of whether or not an effective intervention should be focused on creating an "expert language" or not, and whether the expertise of the socio-technical facilitator is primarily as a "process expert" (bringing together the different participants and their knowledge and interests) or a "content expert" (advising on the work psychology criteria that the technology should address), underlay a number of these differences in emphasis and was a source of tension that was not resolved during the project. The existence of conflicting "paradigms of practice" among applied social scientists involved in socio-technical projects has often been observed (Blackler and Shimmin, 1984). Pettigrew (1976), in a discussion of internal social scientific redesign agents, observed that a "major source of internal consultant ineffectiveness stems from ... (this) ... apparent inability to present a unified political force within their organisation in dealings with clients. Often major differences in values, work style and career interests disrupt consultancy units and leave clients bewildered about the range and quality of service they can expect (Pettigrew, 1976, p. 193).

5.2.2 Tool operators II - company personnel

As mentioned earlier, the Swiss AOF tool had previously been used in groups dominated by technology developers, with a few high-level user representatives also in attendance. In the IMS project, the workshops were mostly attended by operational personnel from the test site, including production, maintenance and pulpit control. The technology developers attended some of the proceedings, as did plant management and, for a short time, technologists from the IMS equipment manufacturer. As documented in work on participatory design, it is often difficult to keep such people interested in development projects when activities are structured by expert methodologies and processes (Ehn, 1988). Also, as the plant was being used only as a prototype site, both operators and management were sceptical about the value of the technology project for their workplace and had to be convinced of the value of the workshops. In this context, the workshops had an interestingly ambiguous effect. On the one hand, they were very successful in stimulating interest and motivation. The amusing and telling stories used by the Swiss AOF facilitator and his clear moral commitment to improving work appealed strongly to the plant personnel, and his critiques of traditional "technocentric" models were recognised by the developers and factory workers as reflecting their experiences. Moreover, the systematic set of normative criteria embedded within the Swiss tool was seen by all groups as a useful checklist and summary of human and organisational issues that should be addressed. The workshops therefore appeared to focus on relevant issues, and to provide useful tools.

On the other hand, the method is based on educating well qualified technology developers in a precise expert language, which they are then expected to apply to the process of design. In the Australian workshops, which were attended by less well qualified personnel, it was clear that the participants only had a general understanding of the criteria. They often found the language obscure and unnecessarily jargon ridden. One participant joked that one of the design principles introduced in the method "dynamic coupling" (used to refer to the degree to which user's actions are determined by the machine) had a very different meaning for him. It reminded him of highly active sexual activity!Moreover, the workshops were allowed to proceed in a very flexible fashion with the difficult analytic/development tasks devolved onto an innovation team for later work. In part this reflected a decision by the socio-technical research team leader, but it also resulted from the participants slowing down the workshop process with banter, "smokos" (Australian slang for smoking breaks) and general discussion of matters of interest to them. As participation was voluntary, and as plant personnel had a history of non-attendance at meetings, the facilitators felt that there could be no rigid imposition of unwanted schedules. As a result, facilitators were able to offer little more than a general introduction to the tools and the philosophies they embodied, based on role plays and future scenarios about the use of the technology, rather than the "hard work" in creating work packages. This led the socio-technical researchers to speculate on whether a new approach ought to be adopted to introducing Australian company personnel to the methods. In this approach, workshops would be used for introductory purposes, and the detailed creation of work packages would be delegated to individuals or sub-groups who would report back. Such decisions are clearly influenced not only by the real characteristics of the users of the method but also, as in the case in these workshops, by facilitator perceptions of these characteristics.

6. The intrapreneurs

Configurational intrapreneurs are included within the model because they play key roles in establishing and guiding the configuration, managing its boundaries and ensuring its survival. Personnel carrying out these tasks include project managers, line managers, staff officers, union officials and senior executives.

The application of the socio-technical tools in the IMS project would not have occurred without an ongoing supply of resources from intrapreneurs such as the head of the technology development team who organised funding and facilities for the project, the plant managers who provided information and the work relief necessary for participants to attend, and the Australian socio-technical team leader who mobilised the relevant experts and focused their activities in the workshops. The characteristics and activities of the various intrapreneurs directly influenced the tool configuration. For example, in past applications of the Swiss AOF tool, the expert facilitator had been involved in every stage of the socio-technical project, from "selling" the idea to companies, to organising workshops, to helping deliver the work packages. This involvement gave him/her a pivotal role in guiding projects, and a rich understanding of the context in which the socio-technical tools were to be applied. In the IMS project, however, it was the Australian team leader who "sold" the socio-technical principles to the company, and who played a key role in negotiating the content and outcomes of the workshops. The AOF expert was relegated to the role of teacher and facilitator, with little overall control of the project. This led to some tension because, as we noted above, the conditions prevailing in Australia did not necessarily "fit" the assumptions inherent in the AOF tool. One episode of tension occurred when factory personnel were asked at the workshops to evaluate the IMS according to design criteria provided by the AOF tool. The potential users, who had yet to experience the IMS "hands-on", had just heard a very favourable description of it from one of the technology developers. Unsurprisingly, they gave it a positive evaluation, one that did not accord with the expectations of the Swiss expert, who saw the IMS as potentially deskilling. He expressed his surprise and tried to initiate a critical discussion. However, the socio-technical team leader noted that the developers and users were reacting strongly against this stance, as it appeared to demonstrate "sour grapes" on the part of the Swiss expert. They had been asked to provide the evaluation, they had done so, and now it was being dismissed as being "incorrect". In terms of a strict application of the AOF tool, the Swiss facilitator was correct to pursue his critical line. However, it threatened the communication and goodwill that was necessary to carry the project forward. The socio-technical team leader cut off the discussion. One desired use of the method was sacrificed to another.

Intrapreneurs among the plant managers also shaped the configuration process. First, the technical officer in the plant influenced the content of the workshops by ensuring that any exercises carried out in them would be clearly identified as applying to "pie in the sky" imaginary and experimental technology, rather than the actual material conditions prevailing in the existing plant. Second, the plant manager expressed a desire that the outcome of the workshops would be a motivated team ready to act as facilitators in the IMS trial. Third, as we see below, the plant manager and his deputy also influenced tool use (or non-use) through their general lack of commitment to driving the further activities of the user team beyond the IMS trial.

The importance of intrapreneurial activity in keeping projects afloat is demonstrated by events after the IMS trial. Six months after the workshops, the socio-technical team leader discovered that, despite their expressed commitment to the socio-technical project and its aims, neither the plant manager nor his deputy, who was responsible for human resource development, had seen it as centrally important.

The plant was run by an informal coalition of managers. The newly established user group fitted uneasily with this informal structure and, as the plant and production managers had not seen the project as central, there had been no attempt to resolve discrepancies, and convene the user team to address socio-technical issues associated with the IMSS trial, or other technologies. Intrapreneurial activity among the technology developers also fizzled out. The head of the development group was faced with potential closure of the IMS project. She had been advised not to continue using the plant as a test site as it was not seen to be productive enough for the company. Consequently, despite the existence of a contract with the socio-technical researchers to continue the project for another two years, plans to involve the socio-technical researchers in the further development of the IMS did not come to fruition. The technology project was discontinued.

7. Conclusion

As revealed in the case study, the nature and application of even a purportedly generic method for technology design is profoundly influenced by the local context within which it is introduced. The political nature and impact of humanistic technology design projects has been shown to be a consequence of complex constellations of techniques, users of those techniques and local intrapreneurs. At one level, this should make us more cautious about generalising about "the" political meaning of particular methods and techniques introduced into the workplace. Depending on the constellation of technical, operator and intrapreneurial factors, "human centred" design projects (like other technology design projects) will take a different political form and have a different political impact. At another level, it means that an understanding of (and effective intervention in) the introduction of such techniques needs to grasp the complex configuration of factors involved in the application site. The configurational process model is only one possible conceptual model to help researchers and practitioners grapple with this context and understand the bricoleuring role of technology design and implementation processes. The politics of technology design and technological politics in organisations more broadly is more about "making do" in context than has often been recognised in the past, and more case studies and theoretical models are required to increase general understanding of how this occurs. The domination of many "human centred" design projects by socially minded engineers, ergonomists and work "scientists", and union activists has led to the dominance of technocratic and humanistic rhetoric around such projects, and a neglect of the complex politics of making do in context. As Mangham (1978, pp. xii/xiv) has observed more generally, "Few organisation development consultants are craftsmen. Most of us are tinkers exhibiting some degree of skill but little artistry. Our practice runs well ahead of our understanding ..." (Mangham, 1978, pp. xiii/xiv). Or, as Brad Pitt put it more dramatically, in the movie The Devil's Own:"If you are not confused, then you don't understand what is going on."

Note

1. The project was conceived and led by the Australian researcher, who also facilitated the second workshop. The US researcher acted as workshop facilitator for the first workshop. The Swiss researchers introduced the AOF model and ran most of the sessions in the first and second workshops. The Swedish researcher ran a number of sessions in the second workshop.

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