The Analysis and Design of Mental Information Work: A Method Based on the Action Facilitation Approach

Titia Meijer and Robert A. Roe
Tilburg University, The Netherlands

Mental information work (MIW) can be characterized as work with information and information objects in which mental activities predominate. We examine some problems concerned with the analysis of MIW for (re)design purposes, related to: (1) the accessibility of mental activity for analysis; (2) the complexity of person–task interaction; and (3) the establishment and use of norms in evaluation and (re)design. Furthermore, we describe the structure and contents of a method for the analysis and design of MIW that is currently being developed within the theoretical framework of Action Theory and the Action Facilitation Approach. The focus of the method is on the “within-job” level, dealing with features of the actual performed work behaviour within its environment. The overall architectural level of jobs is taken into account as well. Criteria for the evaluation of work activity are defined on both levels. The method is developed in co-operation with field experts on the analysis and design of work.

INTRODUCTION

One of the traditional problems in the field of Work and Organizational (W & O) psychology is the design and improvement of work. Several approaches and methods have been developed for dealing with this problem (Wall & Martin, 1987). Developments in the ecology of work, especially the growth of the service sector and the increasing spread of information technology, seem to have changed the nature of work in such a way (Roe, Taillieu, Van den Berg, Kersten, & Van der Wielen, 1992; Roe, Zijlstra, Schalk, Meijer, Taggenbrock, & Neervoort, 1993) that one must doubt whether formerly developed methods for analysing and designing work are still applicable. For example, one of the changes is the increased “mentalization” of work activities, that has been invoked by new information technologies (NIT). By this we mean the reduction of physical components in work activity in favour of an increase of mental operations. Related to this is a change of work objects: tangible, material objects are being replaced by information objects and information systems in a great number of cases. Our assumption is that

Requests for reprints should be addressed to Titia Meijer, Work and Organizational Research Centre (WORC), P.O. Box 90153, 5000 LE Tilburg, The Netherlands.

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a new class of work, designated as “Mental Information Work” (MIW) has
emerged, defined as work with information and information objects in which
mental activities predominate (Roe & Meijer, 1990). At the present time there is
little systematic knowledge on MIW and higher mental processes in work activity.
And there are hardly any methods that are geared specifically to this type of work
(Wall, Corbett, Clegg, Jackson, & Martin, 1990). One could say that the empirical
context in which existing design theories for work have been developed and tested,
and in which they are valid, does not exist any more for these new kinds of work
(cf. Webster & Starbuck, 1988). W & O psychology is therefore confronted with a
“theoretical vacuum” (Wall et al., 1990) that should be filled by further research
on MIW. But simultaneously, the need of industry for new methods that can be used
successfully in settings that become more and more prevalent, and are of growing
importance for economic performance, should be met by testing existing methods
and developing new ones.

OBJECTIVE AND APPROACH

This paper describes a project that aims at the development of a Dutch method for
analysing, evaluating, and (re)designing MIW from the perspective of enhancing
workers’ psychological well-being. The method is based on “Action Theory”
(Hacker, 1978, 1986; cf. Fresce & Zapf, 1993), and more particularly on the so-called
“Action Facilitation Approach” (Roe, 1984, 1988). The key assumption of Action
Theory is that work behaviour consists of goal-directed activity, regulated by
cognitive plans that are generated by the worker. Actions are supposed to be
controlled by hierarchically structured regulatory processes and feedback loops. It
is assumed that workers tend to maximize the efficiency (i.e. the result obtained
relative to the effort spent) of their actions, provided that they are given sufficient
autonomy and proper means. Critical for work design on the basis of Action Theory
is the assessment of regulatory processes (in terms of levels and variety), because
of their predictive value for long term well-being and personality development
(Richter, Heimke, & Malella, 1988). The basic unit of analysis therefore is the
work activity and not the task.

The approach of Action Facilitation (AF) specifies a number of principles for
supporting the worker in the search for efficiency. Although originally developed
for the (re)design of interfaces for computerized work tools, it has been generalized
to the (re)design of work in general, so-called “within-job design” (Roe & Meijer,
1990). AF looks for support in every phase of an action, that is, orientation, design
of action programmes (planning), decision making, execution of action, supervi-
sory activity, and use of feedback. It thereby supports the regulation of the work
activity, and at the same time the regulation of the worker’s psychophysiological
state and work load. In addition, AF tries to avoid unnecessary negative affective
outcomes of work by demanding that an action should be allowed to run its course,
thus preventing its interruption by outside events that do not belong to the task.
The methodological basis for our method stems from three sources:

1. The work analysis methodology of Matern (1984), which provides the basic methodological orientation.

2. The TBS-GA (Tätigkeits Bewertungs System für Geistige Arbeit [Evaluation System for Mental Work Activity]) of Rudolph, Schönfelder, and Hacker (1987), some basic notions and principles of which have been incorporated in our method. The TBS-GA is an objective work-centred expert method especially developed for mental work. It aims at enhancing human growth in work by analysing objective characteristics of the work (including the social and technical context), as well as mental demands and levels of psychological regulation processes. Among the criteria for evaluation and design are the enlargement of control and responsibility, complexity and completeness of the task, social interaction, and feedback. Apart from describing the actual situation (in 60 scales and a profile of work characteristics), the procedures lead to concrete guidelines for re-design. Whereas the TBS-GA is very comprehensive with respect to "architectural" factors, it does not explicitly recognize the "within-job" characteristics of the AF- approach. In this respect our method is different, as it focuses on action facilitation.

3. The approach underlying the RHIA-instrument (Leitner, Volpert, Greiner, Weber, & Hennes, 1987). RHIA stands for "Regulations Hindernisse in der Arbeit", that is, "Regulation Hindrances in Industrial Work". The notion of Regulation Hindrance (Semmer, 1984) refers to a wide variety of factors in the work situation that can hinder work activity, while AF concentrates on factors explicitly related to the conscious, goal-directed aspects of the action itself.

DESIGN PROBLEMS DURING THE DEVELOPMENT OF THE METHOD

In our project we were faced with several theoretical and methodological problems, some of which are typical for the specific domain of MIW. Three of these problems will be discussed here. They relate to: (1) the lack of direct access to mental activity; (2) the complexity of the interaction between the worker and the environment; and (3) the difficulty of establishing norms for "good" work.

The Accessibility of Mental Activity for Analysis

To some degree the problem of accessibility of behaviour and regulation pertains to the analysis of every type of work. An analysis focusing on regulatory processes as demanded by Action Theory suffers from the difficulty that these processes
cannot be observed directly, neither in manual physical labour nor in mental work. As they depend on the competencies and work strategies of the individual worker, these processes cannot be deduced or inferred from recorded data solely (Matern, 1984). One has to rely on a combination of observations and information provided by the worker. In the case of MIW the problem of access is more serious, as those parts of the workers’ activity that involve the muscular apparatus and become manifest in concurrent transformations of physical objects are less prevalent and hence offer less opportunity for observation. We deal with these problems in the following way. First, we opt for a broad set of data collection methods, the results of which will be carefully integrated. Second, we include in the analysis a wide range of external factors that affect mental work activity, like, for example, social and technical conditions and constraints, objects and results as materialized components of mental processes, tools and materials, time arrangements, and interruptions (Facaouer & Frieling, 1986). Third, if possible, we choose analysts with expertise in the domain under analysis, or ask them to acquire additional knowledge required for performing the work that has to be analysed (cf. Resch, 1989).

Person–Task Interaction

The second problem is common to all activity-oriented methods of analysis. The essence of the problem is the difficulty of separating situational and personal factors and their reciprocal and partly simultaneous influences during the unique process of interaction that takes place when work is being performed. The analyst is typically confronted with a “blurred” situation that should be “cut” into time episodes, situational states, and human operations with the help of analytical tools. In the case of MIW, the task of the analyst seems to be harder, because of the reduced accessibility of mental work. Compared to other types of work there is less correspondence between occurrences in the outer world and mental activities at the side of the worker. In fact, a transformation of the external work object may follow only after a complex series of mental states and operations that may remain hidden for the analyst. This seems especially true for jobs at higher professional levels. We try to find a solution for this problem by using a model of the work activity as an analytic tool. This model is a process model, which depicts the activity in terms of time and strategy, rather than a structural model (such as is used in the literature on stress). The latter lists components that are supposedly invariant across people in particular job categories.

Norms for Evaluating Work

Design is the result of a process of optimization with respect to a number of criteria that provide an operational representation of the design goal. Ideally, criteria can be used for evaluating work as it exists, as well as for designing work. Norms are
specified values, in terms of fixed measurable units, of these criteria. Norms can represent either a base-line (minimum norm), an "optimal level", or a "maximum" level of the criterion-variable. Typical for Action Theory is that design criteria do not relate to characteristics of the job per se, but rather to the activity of the worker evoked by the job, and the outcomes resulting from the activity. The reason for choosing these "activity related" and "outcome" criteria stems mainly from the perspective we (and action theorists) take in conceptualizing work behaviour. The kind and character of the work activity deployed by the worker whilst coping with the demands put upon him/her by the work and its environment, and the underlying regulative processes are seen as the main source of variation in well-being outcomes. This idiosyncracy can only be accounted for when the evaluation criteria are conceptualized at the same "transactive" level. This means that no criteria that are fully defined outside the person can be used, like for example "system criteria" used in classical ergonomic perspectives (cf. Campion & Thayer, 1985). While the design focuses on tasks and environment, to be sure, it is evaluated by looking at work activity and the effects on the worker. The criteria relate to: (1) aspects of activity regulation, such as "completeness of activities", "action facilitation" and "absence of regulation hindrances"; (2) personal outcomes of the work, such as "endurance" and "personal growth" (Hacker, 1986), and, more generally, well-being. The use of outcome variables poses a problem because of the indirectness of the effect, especially in the case of conditions that lack a material substrate. While physical conditions may have a direct, dosage-dependent impact on the individual, non-physical conditions typically do not. The connection between the working conditions and the outcomes is, therefore, harder to establish. Moreover, people tend to compensate for aversive or complicated work characteristics by means of diverse coping strategies and effort. This creates a problem with regard to norm setting: as research has not yet produced regression functions, and as no clear ideas exist among experts about the effects of working conditions on outcomes in the case of MIW, there is no good basis for setting a minimal or optimal norm. We seek the solution for this problem in the involvement of workers as evaluators. By asking their judgement about criteria and norms we may also account for possible differences among workers, and between workers and experts in the importance assigned to different outcome variables.

THE METHOD

The method under development will serve as a supportive tool for analysing MIW with the aim of work (re)design. It must yield a description of the actual work in terms of situational conditions, human activity, and outcomes on the one hand, and provide recommendations for design on the other hand. Two types of application are aimed at. In case of existing jobs the analysis is based on workers' real activity, and recommendations for redesign are produced (corrective design). In case of designing new jobs, the analysis starts from the projected conditions, tasks, and
worker characteristics, and tries to yield design recommendations based on predictions of activities and outcomes (prospective design).

Domain
In principle the method should cover the whole domain of MIW, which contains jobs that vary considerably in skill level, have a different mix of routine and creative components, and are to be found at different levels in the organization. On the one hand, one finds jobs with an emphasis on the processing, maintenance, and control of information, that is, on data-entry, data-processing, data-collection, and data-retrieval, like many office and administrative jobs in which VDUs and computer-based tools are regularly used. On the other hand, there are jobs with predominantly creative activities, such as technical, scientific, and artistic jobs.

Level of Analysis
The focus of the method is on the “within-job” level (Roe & Meijer, 1990), that is, it deals with features of the work environment, tasks, and work activity confined by the job. Aspects of the organization and collective activity are taken into account, but the allocation of functions to organizational units, and the division of tasks across jobs, are left out of consideration. Similarly, technology is only looked upon as it manifests itself at the level of the job. It is the opinion of the authors that the method should be used in the context of a multi-level design process, and in combination with methods that cover the “higher” level of the sociotechnical system.

Scope
In terms of content, the method covers:

1. The objective conditions of the work, including the social and physical settings and objective tasks.
2. The flow of the actual work activity and its regulation.
3. The outcomes of work activity, both “personal” outcomes such as stress, fatigue and workload, satisfaction or well-being, and “organizational” outcomes such as productivity and sickness rates.
4. The needs, preferences, and expectations of workers, concerning the activities, sociotechnical aspects, and learning/career aspects of the work.

Users
The method is to be used by expert analysts in cooperation with workers. Analysts can be work and organizational psychologists, ergonomists, personnel administrators etc. The analysts must be familiar with the theoretical basis,
definitions and procedures of the method, as laid down in the manual. The participation of the workers is essential, both during the data-gathering stage, and in the final stage where (re)design proposals are to be evaluated.

Data Collection Methods

The methods used for data collection include:

1. **Document-analysis.** Examination of written material relating to the job (job description, career ladders), work processes (flow of material, products, technical support), and work outcomes (productivity data, sickness rates, turnover rates).

2. **Object analysis.** Examination of information objects and systems, forms, procedures, and reports used by the worker, and identification of entries or transformations made (or used) by the worker in comparison with other workers.

3. **Questionnaires.** Systematic collection of self-reported data on personal work outcomes (health complaints, workload, stress and fatigue, tendency to leave, well-being, competence, aspiration, negative carry-over) and on needs and preferences (activities, technical support, co-operation and social support, use of knowledge, amount of routine work, feedback), and expectancies (changes in job content, job structure, career possibilities).

4. **Self-recordings.** Examination of the worker's appointment calendar, diary, log book, and similar sources of information, with regard to the pattern and frequency of work activities over time (especially for unstructured work).

5. **Observation and observation interview.** Study of the job in situ, focusing on the actual activity in its social and technical context, procedures, materials and information used, sequence and duration of activities, interruptive factors, etc.

6. **Semi-structured (individual) interviews.** Collection of detailed data on specific aspects of the job, and work activities (worker), and general data on the formal aspects of the job, work processes, productivity, and well-being (supervisor).

Criteria

Two sets of criteria are used: (1) outcome criteria, including “personal growth” and “endurance” as defined by Hacker (1986); and (2) activity-related criteria, that is, “completeness of activities”, “action facilitation”, and the “absence of regulation hindrances” on the within-job level. The rationale for using these criteria has been described in the section “Design Problems during the Development of the Method”.

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Stages of Analysis

The overall structure of the analysis is depicted in Table 1. There are seven major stages, each of which is described briefly below. The description focuses on the corrective use of the method. In the case of prospective use, the order of procedures is basically the same, but the iterative nature of the design process might be more profound. Moreover, the information used is mainly based on projections rather than actual operations, and among the participants are future workers rather than current ones.

**Stage 1. Orientation.** During this stage the method is introduced. Documents on the production process and the relevant jobs are gathered and reviewed. A preliminary interview is held with the direct supervisor of the job incumbent, focusing on the formal aspects of the job (structure, responsibilities, history, social and technical embedding, learning, and career possibilities). Also, the main problems with respect to productivity, sickness leave rates, turnover, and working conditions, if any, are identified. The result is an inventory of points of analysis, an overall description of the job to be analysed, and a number of indicators for problems with well-being.

**Stage 2. Data collection.** Data collection is mainly concentrated in this stage. Sometimes a flexible or iterative process of data collection is desirable, depending on situational circumstances and the complexity of the job (Resch, 1989). Work behaviour is assessed in a kind of “subjective activity analysis” (Ulich, 1981). First, a semi-structured interview is conducted with one of the workers, concentrating on the activities performed, goals to attain, procedures to follow, materials used, people involved, constraints met, etc., including time aspects. Thus, questions pertain to the What, Why, When, With Whom, With What, and If–Then of work activity. This phase is supported by a chart-technique, that is, the analyst writes the reported activities on small charts, one activity per chart, and shows them

<table>
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<th>Stage</th>
<th>Description</th>
<th>Participants</th>
</tr>
</thead>
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<tr>
<td>1.</td>
<td>Orientation on work process and job</td>
<td>Analyst, manager(s), union-representatives, supervisor</td>
</tr>
<tr>
<td>2.</td>
<td>Collection of data on work and context</td>
<td>Analyst, supervisor, worker</td>
</tr>
<tr>
<td>3.</td>
<td>Work and job description</td>
<td>Analyst, worker</td>
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<td>4.</td>
<td>Data-analysis</td>
<td>Analyst</td>
</tr>
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<td>5.</td>
<td>Work and job evaluation</td>
<td>Analyst</td>
</tr>
<tr>
<td>6.</td>
<td>Development of (re)design proposal</td>
<td>Analyst</td>
</tr>
<tr>
<td>7.</td>
<td>Participative consolidation</td>
<td>Analyst, worker, worker representatives</td>
</tr>
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</table>
to the worker. These "activity charts" serve as a facilitator to recall and verbalize the (preceding and successive) mental activities by the worker. They promote the workers' reflective awareness of their own expertise. Together, throughout the interview, the charts serve as an overview of job activities, and as an interactive tool in the communication about the aspects of the work activities, such as frequency, duration, relative importance, order of execution, etc. The interview is followed by observation of the work in situ, concentrating on the same aspects of work mentioned in the interview. During "naturally" occurring pauses, actual work performance, and/or retrospectively, subjects are asked to verbalize their action-related cognitions and accompanying emotions. In addition, work objects are studied to find indications about the complexity of the work, mental demands, and levels of regulations required. In the case of non-sequential work with high autonomy levels, subjects are asked to keep a time record and to show agendas or calendars, so as to assess the time structure of the activities more accurately. Finally, questionnaires dealing with personal outcomes and needs and preferences concerning activities and their aspects, are administered. The result is a set of raw data on the goals, structure, content, and conditions of the work, abilities required, and effects. This stage is supported by forms and procedures, interview schemes, instructions for observation, etc. Different subprocedures adapted to specific classes of MIW (i.e. "event-driven", "process-oriented" and "project-work"), which put different requirements to the analysis, are still being developed.

**Stage 3. Job/work description.** The description of the work is first done in domain-specific terms, i.e. kind of tasks, responsibilities, roles, and training time, called the "formal description of the job". Next, an "actual description of work activity" is made, consisting of statements about work events and processes, frequency and duration of task performance, relative importance for the job, sequence of tasks, tools, material and information involved, co-operation, and communication aspects. These descriptions serve two goals: (1) getting acquainted with the job and work processes; and (2) derivation of performance requirements in terms of kind and level of information-processing activities (see Stage 4). The manual provides checklists of frequently performed mental actions, and guidelines for writing tasks statements and forms. In case of uncertainties, the work description can be checked for accuracy and completeness in a review session with the worker(s).

**Stage 4. Data analysis.** The analysis consists of the integrative processing of the data, with two primary focuses, i.e. "profile analysis" and "action facilitation analysis". Both are supported by "subanalyses" that highlight specific issues from an integrative point of view, allowing for easier inferences for both main analysis goals. The main analysis consists of:
1. **Profile analysis.** On the overall job level, the data are integrated and transformed into scales (TBS-GA scales). This is done on the basis of expert judgements by the analyst, supported by definitions, procedures, and examples, given in the manual. It leads to a profile of work and demand characteristics of the actual situation.

2. **Action facilitation analysis.** The AF-analysis focuses on the various stages in the actions and their embedding in the work situation. Activity-related conditions and constraints (e.g. information, social, time-structure, complicatedness, tools) are examined in relation to three main aspects of the work: time pressure, job interdependencies, and severity of consequences of interruptions (or delay, errors) for task performance.

The "subanalyses" refer to:

1. **Activity-structure.** The focus is on the factors that contribute to the preparation of actions, that is, transparency of tasks (anticipative results, clarity of procedures and methods), the control over actions (complicatedness), and the completeness of actions.

2. **Task situation.** Special analytical points are the degree of freedom and level of control for the execution and planning of action, stemming from task context factors (technical, informational, social, organizational).

3. **Time-structure.** The time dimension of activity is a special focus point in the analysis of the complexity and degrees of freedom in the planning and decision making phases of actions.

4. **Objects.** Features of the objects and the character of their transformations form indicators for the complexity of actions and problems in all phases of action regulation; they include transparency of operations, anticipation, completeness of actions, etc.

5. **Social context.** Special attention is directed towards the degree to which co-operation and communication are required, and the kind and complexity of social communication activities. This subanalysis can form a kind of object analysis, for example in cases of counter work.

6. **Performance requirements.** The focus is on the kind of information-processing activities (orientation, perception, decision-making, knowledge operations) and level of required mental performance (problem-solving operations, abstraction in processing operations) as well as basic mental requirements (memory, perception, and concentration).

7. **Needs analysis.** The subjective needs and preferences for (not) performing specific activities, including reported reasons, are analysed on characteristics of the aspects of the work activity that are experienced
as (non-)satisfactory. The same is done for the needs concerning technical support, co-operation and social support, use of knowledge, amount of routine work and feedback, and for the expectancies (job changes, career possibilities).

Stage 5. Job/work evaluation. The evaluation of the work consists of three parts:

1. Comparison of the actual work, demand and context characteristics with a normative “minimum profile” identifying changes that are minimally required in view of well-being; this comparison also estimates the potential design space (freedom for design) for every characteristic: the bigger the difference between the actual situation value and the highest possible value on the characteristic-scale, the greater the potential design space.

2. Comparison of workers' needs, preferences, and expectancies with the opportunities and possibilities offered in the work. Workers' needs are taken as indicators for analysing the current situation (degree of need-fulfilment) as well as for evaluating changes brought about after redesign. They also serve as an identification of redesign requirements related to the fulfilment of human needs: they point out directions for redesign recommendations.

3. Compilation of regulation hindrances taking into account time pressure, job interdependencies, and severity of interruption consequences.

Our plan is to develop criterion-validated example profiles for minimum requirements for specific kind of jobs or groups of workers (according to some biographical characteristics or individual differences).

Stage 6. Development of (re)design recommendations. The criteria for evaluating the work are “translated” into designable features of the job, analogue to the structure suggested by Rudolph et al. (1987) in the TBS-GA. That is, when the job is evaluated by comparison of the actual job profile with the minimum profile, the deficiencies can be looked up in a table, from which design recommendations are derived. This results in general design paths, with general prognoses about the effects. Specific prognoses can be given only after more extensive empirical research. The actual design in the work situation, of course, needs some adaptations according to the specific task content, work processes, and technical and social constraints.

Stage 7. Participative consolidation. In an interactive session with the workers involved (or their representatives), the analyst first checks whether there
is a general agreement about the description of the actual work situation. Second, the proposal(s) for redesign as developed by the analyst are discussed and evaluated. These group sessions are meant to yield a final judgement of the acceptability of the observed outcomes in terms of well-being, and of the potential outcomes in the target situation. Concrete design points/elements can also be discussed, in view of their financial, technical, or social boundaries. In the manual, suggestions are made concerning the structure and processing of the meetings (e.g., nominal group techniques).

It might be noticed from this overall structure that the implementation stage of the design proposals does not belong to the scope of the method at hand, although it might be elaborated in this direction in the future.

**EVALUATION AND CONCLUSIONS**

The current state of development is that the overall structure of the method has been laid down, and first version of the manual has been written, including aids such as instruments (interview schemes, instructions for observation and checklists, job characteristic scales), identification aids (for work objects, materials and tools, index-list MIW activities, (re)design recommendations related to specific deficiencies), interpretation aids (definitions, decision trees, examples of high versus low complex activities, procedures for various analysis and processing stages), data-processing aids (forms and procedures), and miscellaneous (co-ordinating correspondence, laws).

The data-gathering methods have been tried out in a case-study setting. Adaptation was shown to be necessary, especially on the level of support given to the analyst. The collection of data was less a problem than processing them in an economic way. As the method is developed in co-operation with field experts, familiar with job analysis and design, such practical considerations have received quite some attention. After completing the manual we tested the method again in a field study on the work of radio journalists \( n = 69 \) in three different jobs on 13 locations (Schalk & Meijer, 1993).

We are inclined to conclude that the method, in its present state, meets most of the objectives and design criteria formulated at the beginning of the project, that is:

1. The analysis of MIW is feasible by using observation in combination with other data-collection techniques, especially the interview with chart technique.
2. By providing detailed aids for orientation, identification, interpretation, data-collection, data-processing and analysis, the method has the features of a supportive aid for the analyst. This tool may help to reduce
unreliability (Leitner et al., 1987), although this has to be settled in future.

3. Validating norms related to well-being should take into account the possible individual and field variation; norms should therefore be “adapted” to the actual “situated task”, that is, be applied with the participation of the workers during the research and with the information coming from the assessment of the workers’ needs, preferences, and expectancies.

4. AF is, in our view, an useful approach for dealing with the problem of designing for individual differences. “Autonomy”, frequently used as the ultimate solution for this issue, might, if used without AF, turn out to be an aversive work characteristic for workers who are not sufficiently trained, supported, or not oriented towards the actual “use” of this freedom.

A number of unresolved problems will need additional research:

1. The most severe problem is our limited understanding of the higher cognitive activity of humans in interaction with work tasks and situations. We especially need theoretical frameworks modelling the multi-causal dimensions of relationships between person–environment interactions and outcomes of work in case of MIW.

2. The question about the interrelations between the two ultimate design objectives—performance efficiency and well-being—should be resolved by specifying the conditions under which the two relate positively, negatively, or not at all.

3. Possible systematic differences in recommendations for (re)design, resulting from the application of our method to specific groups of workers (e.g. educational level) and field conditions, should be elaborated. For prospective design purposes specific prognoses of effects on well-being are needed. These can be established only after more extensive empirical research. They should preferably take the form of criterion-validated example profiles for minimum requirements for specific kind of jobs or groups of workers.

Research of this type will help to achieve a better understanding of the new type of work that we have called MIW, and help to develop the methods that are needed for shaping this work in accordance to human capabilities and limitations.

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