Telework: Dispersed Organizational Activity and New Forms of Spatial-Temporal Coordination and Control (*)

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1. INTRODUCTION

Inspired by futurists proclaiming growth and acceptance of flexible work-arrangements, several authors predicted in the mid-eighties that telework would spread quickly. So called «teleworkers» would make up a large part of the workforce in the beginning of the nineties (Toffler, 1980; Kinsman, 1987; Steinle, 1988). Although telework received a great deal of attention ever since, in popular business magazines and research literature alike, no universal, unambiguous definition of telework can be given (Jackson, 1990; Huws, Korte & Robinson, 1990; Steinle, 1988). Most definitions refer to work performed «at a distance from the central office» (most notably at home), relying largely on electronic equipment. The definition has been subject to considerable debate since Nilles, Carlson, Gray & Hanneman (1976) coined the concept «telecommuting», the American synonym for telework. Nilles et al. suggested that IT-based remote communication provided an important condition for substituting physical travel and as such a valuable alternative for the daily commute to work. Since individual workstations became cheap enough to allow wide proliferation, telework could save thousands of barrels of oil a day and significantly reduce overhead costs for companies (Bailyn, 1989). However the idea that transport or telecommunications costs are a significant factor in the choice of whether or not to adopt remote working patterns has not been supported by practice or research (Huws, 1990; Bailyn, 1989; Olson, 1987; 1988; Kraut, 1987).

In spite of optimistic predictions telework does not seem to catch on very quickly. Contrary to expectations neither the increase of «information work», nor the availability of information technology as such, have yet convinced society to accept telework readily. Some enthusiasts expected that telework would spread quickly because there is a higher demand for flexible work options that support a number of trends on the labour market (e.g. the increasing number of

«dual career couples» and employment among women). Even those who assumed the need for telework would increase because the advantages of flexible work options (e.g. higher productivity, less overhead costs, decreasing absenteeism) outweigh the disadvantages (expected loss of control, social isolation of workers) were overly optimistic.

Still most of the authors argue that the potential for telework is considerable, although change will be more gradual. «Managerial resistance», «social isolation of workers» and «employment conditions» are seen as the toughest problems to overcome (Gordon, 1988). In the United States, as in the Netherlands and anywhere else in Europe developments are slower than expected because the advantages of telework do not outweigh the social and organizational problems linked with such a radical relocation of office space (Olson, 1988; Dürrenberger, 1989).

Several authors suggested that it is not useful to approach telework from an isolated perspective whether economical, technological, social or organizational (Steinle, 1989; Jackson, 1990, 1992; Van der Wielen, 1991). Our research also suggest that in order to gain insight into developments that influence the growth and acceptance of telework it is important to take a broad perspective on the subject as telework seems to have implications for almost every aspect of organizational functioning. According to the literature on the subject, telework not only has a distinct impact on supervision, communication and coordination of activities but also on the quality of working life and organizational values, norms and working habits. Furthermore, telework arrangements do not seem to be confined to organizational boundaries but are expected to have far-reaching consequences for the private life of the employee as well (Becker, 1981).

In this article telework is considered against the background of major environmental changes influencing the organization of work in order to develop a meaningful framework in which flexible work-arrangements can be studied. Our analysis is based on literature regarding fundamental changes in the nature of work and organizational restructuring caused by turbulent environmental conditions. An attempt is made to re-conceptualize flexible work arrangements in terms of dispersed activity patterns that have particular

spatial relations and a specific structuring in time. Telematics can be understood as an important facilitator of change in sofar the use of technology makes it possible to overcome organizational time and place constraints that can, in combination with flexible processes, create a competitive advantage (see Porter, 1985).

Special attention is given to the influence of organizational culture on the acceptance of telework. While storage, retrieval and communication capabilities of high-tech tools on the one hand and the interest of employees in alternative work schedules on the other, make flexible work options more feasible and desirable, development is unlikely to occur if organizational norms, customs and habits are not addressed (Perin, 1990).

2. A FUTURE OF RAPID AND COMPLEX CHANGE

Global competition, shorter life cycles of products and services, pressure to speed up product development and rate of innovation, deregulation, the unification of the European Market and especially a turbulent financial sector challenge modern management (Taillieu, 1989). Increasing uncertainty and complexity makes it difficult for management to decide how environmental changes should be interpreted, what environmental conditions should be considered important, and what problems deserve immediate attention. Emery and Trist (1965) characterized these conditions as «turbulent» and emphasized the difference between a dynamic, but more or less predictable environment and a highly dynamic, complex environment that is unpredictable in nature. An important feature of turbulent environments is that it's dynamic properties arise from interaction between organization and environment, and also from interaction between events in the environment itself.

The organizational capability to adapt to environmental changes and to reduce uncertain environmental factors is closely related to the concept of «flexibility». Organizational flexibility, here regarded as the result of a delicate balance between adaptation and resistance, tells us about the capacity of an organization to give an ade-

quate and timely response to challenges and threats from the environment.

In order to achieve the required flexibility in variety and speed of response, many firms redistribute their activities and change their organizational structure. On the one hand we observe a considerable loosening of traditional hierarchical structures towards more independent (smaller) units, on the other hand we identify the belief of most firms that, given the greater complexity, it will be important for psychological and economic reasons to maintain the corporate cohesion and a strong sense of corporate identity (Taillieu, 1989).

3. RE-DISTRIBUTION OF ACTIVITIES

There are several ways in which companies can reduce the negative effects of environmental complexity. The first one is to exit turbulent business areas for instance by extending the mass-production model to Third World countries and concentrate on fast-growing markets (Poire & Sabel, 1984). The second possibility is to reorganize internal structures and processes to reduce complexity. According to Galbraith (1977) organizations have several possibilities to do so. These mechanisms include for instance: delegation of authority to lower levels in the organization; increasing the capacity of information channels to ensure that information is there where it's needed; encouraging the use of various forms of lateral communication by creating links or liaison roles between groups at the same level; or creating divisionalized structures.

A third possibility to reduce environmental complexity is achieved by external regulation. It is suggested that organizations have three ways to influence their relationship with the environment directly: (a) first by internalization of activities and increase control over the environment, (b) secondly by cooperation with other actors in the field and increase influence over transactions that are taking place and (c) thirdly by the externalization of activities and so releasing organizational control with respect to non-essential activities (Van der Wielen, 1991).

The concept of internalization is similar to the concept of assimilation or incorporation (Pfeffer & Salancik, 1978; Katz & Kahn, 1978). To re-

duce problematical dependence organizations incorporate or absorb activities from other organizations. Pfeffer and Salancik (1978) distinguish two forms of internalization: «horizontal expansion of production» and «vertical expansion of production». Horizontal expansion is seen as a method for attaining dominance to increase the organizations's power in exchange relationships and to reduce uncertainty generated by competition, while vertical expansion is seen as a method of extending organizational control over exchanges vital to its operations. Internalization can be seen as a form of intense cooperation where at least one organization loses its control structure and identity.

Cooperation with other organizations is also used as a strategy to reduce uncertainty resulting from the unpredictable actions of others, although it's less far-reaching in it's consequences than internalization. Environmental turbulence requires some relationship between dissimilar organizations whose fates are basically positively correlated. This implies a relationship that will maximize cooperation (Emery & Trist, 1965). Cooperation is achieved through agreements that are more flexible by nature and are directed at exerting influence where and when needed.

Externalization of activity is a strategy aimed at reducing complexity by relocating and reorganizing the existing activity pattern of the organization. Externalization is achieved by reducing or eliminating activities that are not seen as vital to organizational survival and thereby creating strategic flexibility and considerable reduction of costs. An important consequence of this strategy is that externalized activities are no longer under direct control of the organization.

Externalization can also be aimed at achieving operational flexibility. The ability to manoeuvre can be enhanced by relocating operational units and increasing efficiency and productivity of the organization as a whole (Van der Wielen, 1991; 1992). From an organizational point of view flexible work options belong to this category.

4. DISPERSED ORGANIZATIONS

By redistributing organizational activities organizations aim to increase flexibility, reduce

cost and create new strategic opportunities. The overall impact of the new corporate strategies and forms is to delegitimize bureaucracy, weaken the power of hierarchy and loosen the employment relationship (Moss-Kanter, 1991). Large bureaucracies adopted rigid structures because they perceived the future as stable and certain. As the environment posed few threats, there was no need for systems that were high on responsiveness. As adaption was not a major issue, decision making could be highly centralized and control procedures highly formalized. In growing but relatively stable markets these characteristics were optimal. In an environment of rapid change, requiring constant innovation, a more «organic» or «integrative» organization that defies the bureaucratic model is probably more effective (Moss-Kanter, 1991).

The redistribution of activities causes existing boundaries between different internal organizational units to disappear, while at the same time the external boundaries of the organization become more and more blurred because of the geographical distribution of activities on a larger scale. According to Moss-Kanter (1991) «there is more detachment of what was once "inside" the corporation's protective shell (for example employees being replaced by contingent workers, and staff departments being spun-off as independent contractors) and more attachment to what was once "outside" (for example, closer, more committed relationships with suppliers, customers and even competitors)» (p. 73).

These developments seem to give way to the development of new organizational structures characterized by temporal and spatial dispersion (Van der Wielen, 1991; Van der Wielen & Taillieu, 1992). It is suggested that dispersed activity patterns or «dispersed organizations» have a design structure that is different from «concentrated organizations». The performance of concentrated organizations depends largely on coordination of activities between employees who cooperate regularly on a certain time and place in order to reach organizational goals. Dispersed organizations however are being characterized by a relative absence of time- and place constraints with respect to the interaction between operational units. Important elements of the design structure of dispersed organizations are the low visibility of behaviour, flexible inter-

dependence between different parts and vague organizational boundaries.

Coordination of activities within this specific structure demands for different management styles, methods and skills. Employees are relatively invisible to management, which hampers traditional styles of direct supervision (Gordon, 1988; Van der Wielen, 1992). Although the lack of visibility of workers should not be a problem in cases where work results are easily measured, it could cause significant problems when more complex, mental work is performed and when objective or quantifiable work performance standards are missing.

Also there is a possibility that adequate communication between workers, units and organizations are hampered or prevented by physical distance. Should this be the case then it is also likely that the gathering of information, needed to take decisions, is endangered. Furthermore it is probably necessary to coordinate the work and the workers more explicitly.

The cooperation between geographically dispersed units could have consequences for the cohesion between different operational units. Whenever members of organization spend little time with each other, questions can be raised concerning the identification of workers with organizational goals. Low commitment of workers might result in pursuing personal goals that interfere with the «mission» of the organization. Especially workers who perform boundary activities can be exposed to serious pressures from the environment to deviate from overall strategic goals set by management (Taillieu, Schruijer & Syroit, 1989).

We argue that the concept telework is closely related to the dispersion of organizational activity in space and time. One could state that any given form of organization implies particular spatial relations and a specific structuring in time (Urry, 1985). Typically for telework arrangements is the fact that geographical concentration of activities, synchronization and co-presence are not seen as methods for achieving coordination and control. As such we agree with Urry (1985) that it is space rather than time which is a distinctly significant dimension of contemporary organizational structuring. The need for spatial proximity which derived from the time taken to convey information or decisions, is transformed

by high-tech tools and organizational restructuring. New information technology suggests new options for alternative work schedules and employment arrangements (part time work and job-sharing without career penalties, parental leaves, shorter work weeks and longer vacations, flexitime schedules) that transform spatial and temporal organization of activities.

The temporal-spatial organization of activity is not a specific area of social science which can be pursued or discarded at will. It is at the very heart of social theory and should therefore also be regarded as of very considerable importance for the conduct of empirical research in the social sciences (Giddens, 1979). With the exception of the recent works of geographers social scientists have failed to construct their thinking around the modes in which social systems are constituted across time and space (Perin, 1988). A closer look at work place and time and all that they imply socially, symbolically, and functionally is therefore needed.

5. ORGANIZATION, TIME AND SPACE

Mass-production industry depended upon the synchronization of activity, its correct sequencing and an agreed rate of work. Rigid bureaucratic structuring, the ability to routinize and repeat activities proved to be the key success factors for mass-production industry. As the scale of industrial mass-production developed so did pressure towards synchronization and coordination of punctual and regular, dependable activity. Work organization came to depend increasingly upon a highly rational, structured, formal and quantitative approach to time and space (Starkey, 1989). A strong labour morale based on punctuality, precision, diligence, discipline, obedience and conscientiousness supported the driving force behind economic success (Erneste, 1989).

According to Giddens (1984) bureaucratic power relies on physical and temporal coordination of activities. He argues that the «... time-space "packing" of groupings of individuals in confined locales where continuous supervision in circumstances of co-presence can be carried on is obviously highly important to the generation of disciplinary power» (p. 157). Physical co-presence for instance signals the employees' subordination while distance from the office can be seen as a symbol of self-management (Perin, 1988). On the other hand temporal and locational boundaries offered employees a certain amount of protection (Zerubavel, 1981). «Hourly pay and a rigid schedule of hours is "precisely" the aspect of bureaucratization that protects the modern individual from being entirely "swallowed" (...). It is precisely the rigidity of the temporal boundaries of our professional commitments that allows us to claim some privacy» (p. 166). As such, time-space separation is not strictly confined to organizational work. Demarcated settings, in different sectors of social life have «compartmentalized» modern society as a whole (Giddens, 1984). The resulting functional and spatial splitting of offices from workplaces and of different workplaces from each other in terms of the different labour forces and labour processes employed, determines the respective causal powers of different social classes.

Ideas about spatial and temporal structure are closely related to the values and norms of the organization. Norms and values reduce the variability and instability of human actions to uniform and dependable patterns (Katz & Kahn, 1978). All organizational activity can not be tightly specified, norms and values guide behaviour to increase efficiency and effectivity of work processes. Values and norms have temporal and spatial components that help integrate complex work processes and thereby facilitate the flow of work (Schriber & Gutek, 1987).

Organizational values and norms apply for instance to the adequacy of the allocation of time for tasks and various aspects of scheduling (including punctuality, deadlines, and the sequencing of tasks); temporal buffers in both the workday and in planning; the synchronization and coordination of work with others through time; the perceived amount of routine in the job over time; temporal boundaries (both within the workplace and between work and non-work time); the amount of autonomy over the use of time at work; the speed and pace of work; the awareness of using time as a resource and the future orientation of the organization (Perin, 1990). Values and norms about organizational power and prestige are reflected in the use of

place and time: the «top floor» for instance indicates high status in a social or functional hierarchy; the manager who keeps a desk between him/herself and subordinates emphasizes her/his authority; controlling the time allocations of others indicates social status (Jaques, 1982). As such coordinates of space and time have served as surrogates of performance and discipline: time-span and presence for instance are indications for performance, visibility is an indication for status, hierarchical position an indication for reward and privilege, and homework an indication for overwork.

Managerial resistance to alternative, flexible work arrangements is closely related to the limiting assumptions of bureaucratic hierarchy and the mid-19th century beliefs about work discipline and control, which hinge on all workers being together in the same place, at the same time. According to Perin (1990) managers and employees are still acting on a system of organizational norms, values and habits which both they had little reason to question until now. The strength of organizational norms may even prevent organizations of conceiving another solution to existing problems in bureaucratic organizations: «Because remoteness itself signifies authority, prestige and status, that prerogative is culturally inappropriate for those not actually having those attributes, no matter how functional the arrangement may be. Not only fearing that they will lose control over the work of the home-working subordinates, managers may also be fearing this loss of symbolic deference to their authority. Managing employees at branch, regional or satellite offices can reflect this same cultural tension usually resolved by amplifying and exaggerating the aristocratic power and prestige of "headquarters" which is reciprocally a subtle form of degradation» (Perin, 1990).

6. CASE STUDY

A case-study was performed to explore the implicit and explicit values, norms and habits associated with spatial-temporal dimensions of current work processes and organizational characteristics.

The present study investigates two major questions. In the first part work patterns, values and norms associated with the spatial-temporal dimensions of management and control were examined to the consequences of reducing standard work time and locations. Secondly, respondents were asked to give their opinion about the desirability, feasibility, advantages and disadvantages of telework for their own job.

Data were collected by means of an opinion survey at the head office of a large multinational energy company in the Netherlands. The head office comprises about 250 employees responsible for policy development and provision of staff services to the national branches of the company. Given the attention «telework» received in the media, the company management on instigation of the works council, decided to conduct a pilot-experiment. The researchers were given the opportunity to conduct a preparatory study to asses the perceived impact of telework-arrangements on work and organization. In this study telework was conceived in a broad sense: any work arrangement that allowed more work time and workplace flexibility applied.

7. METHOD

7.1. Subjects

Of the total number, 202 employees were considered candidates for a flexible work program and thus invited to fill out a questionnaire. Excluded were employees with little opportunity to engage in a flexible working program e.g. security, catering and maintenance personnel. The respondents in the sample consisted mostly of highly trained professionals performing a wide variety of tasks including policy development and policy preparation managers, personnel managers, computer programmers, system analysts, clerks and secretaries. Complete anonymity was promised to all respondents.

7.2. Instrument

An opinion survey questionnaire was developed for this study based on the review of available literature and a set interviews with 20 employees of the company. Interviews provided

necessary background information about work arrangements, work processes and the formal structure of the company. The questionnaire consisted of 174 items, of which 117 statements dealt with norms, values and habits regarding current work practices and work arrangements and 57 statements concerned the expected advantages and disadvantages of telework.

The statements regarding norms and values of current work practices, work arrangements and the consequences of telework were divided in 11 a-priori dimensions, including task characteristics, e.g. variety, autonomy and identity; the time structure of the task, e.g. scheduling, planning, deadlines; required cooperation and mutual adjustment for task performance; required communication and decision-making latitude; visibility of performance and characteristics of the appraisal system; co-presence and visibility regarding promotion and reputation; job commitment and organizational cohesion; mutual trust between superior and subordinate; leadership style, supervision and coordination; integration work-home; and hierarchical position and status.

8. RESULTS

The questionnaire was sent to 202 employees by company mail. Within two weeks 146 employees returned the completed questionnaire, a response rate of 72.3 %. The sample consisted of 35 female (24.0 %) and 111 male (76.0 %) respondents. The respondents varied in age from 24 to 58 years, with the average age being 40 years. In general the respondents were highly educated: 12.4 % followed post-academic courses, 27.6 % had a university degree, 40.7% possessed a bachelors degree and 19.3 % received some sort of vocational training.

Analysis showed that age, education, sex and nature of work are reflected by the salary groups. Three salary categories (high, medium, low) can be used as a parsimonious expression of the characteristics of the sample. Respondents in the low salary category are predominantly young, female and their tasks consist mainly of clerical activities. They also have lower educational levels. Respondents in the high salary category can be characterized as «policy makers», being predominantly older, male, highly educated,

performing tasks that involve policy preparation and development. Respondents in the middle salary category can be characterized by being relatively older than the low salary category, predominantly male and highly educated but, in contrast with the high salary group, their tasks encompass mainly advise and consultation in the field. Results of the analyses of variance performed on the 15 sum scores according to different salary categories are shown in Table 1.

Reliability analyses on the eleven a priori dimensions regarding norms, values and habits of current work practices yielded 15 sum scores with alpha's between .64 and .83. A principle components analysis with varimax rotation showed three factors. The three factors were labelled «Collaboration & co-presence», «Assessment of performance» and finally «Supervision & control» (Table 1).

8.1. Collaboration & co-presence

The different sum scores of this factor describe the perceived need of employees to cooperate and meet regularly in order to acquire the information needed to perform the tasks. The need for cooperation and information is related to the nature of the task, task structure and preferred work location.

Table 1 shows that overall employees report to be moderately dependent on co-presence for cooperation ($M=3.07$). Results on the individual items indicate that teamwork is generally important but co-presence is not considered necessary. Respondents in the high salary category report to need more co-presence for cooperation than respondents in the two lower categories ($F=5.76$, $p<.01$).

The respondents report the necessity to reach informal consensus before decisions are formalized ($M=3.81$). Again respondents in the high salary category report to be more dependent on informal decision making than the two lower salary categories ($F=3.81$, $p<.001$).

Coordination of work requires a certain degree of mutual adjustment and ad-hoc, informal consultation is considered important to gather the necessary information ($M=3.23$). Results on the individual items indicate that face to face consultation with colleagues is frequently used to coordinate work, obtain information and

TABLE 1
Sum scores of questionnaire items regarding current work pratices by salary category (N=146)

Factors Components a)	Number of items	α	$\overline{\text{X}}$	S.D.	Salary categories			F-ratio b)
					Low	Middle	High	
Collaboration & co-presence								
co-presence & cooperation	5	.82	3.07	.88	2.76	3.19	3.31	5.76*
informal decision making	3	.72	3.81	.80	3.50	3.89	4.06	7.30**
ah hoc & informal consultation	9	.83	3.23	.68	2.97	3.34	3.47	8.87**
undefined task structure	6	.70	3.00	.72	2.79	3.05	3.28	6.18**
prefer working central office	3	.69	2.36	.95	2.12	2.40	2.56	3.02
Assessment of performance								
presence & commitment	10	.64	3.00	.50	2.94	3.03	3.13	2.07
overwork & appraisal	4	.65	2.46	.81	2.37	2.51	2.53	0.59
need to visualize results	3	.64	3.14	.80	2.80	3.15	3.56	14.32**
presence & promotion	4	.64	3.13	.76	3.17	3.31	2.99	1.84
autonomy & independence	5	.67	3.85	.66	3.65	3.74	4.16	8.95**
Supervision & control								
supportive leadership style	5	.67	3.80	.60	3.78	3.87	3.72	0.71
control & feedback process	4	.65	3.30	.71	3.33	3.22	3.30	0.25
trust in relation supervisor	2	.72	3.91	.85	3.88	3.86	4.00	0.38
absence of performance criteria	3	.65	2.76	.87	2.61	2.96	2.84	2.07
strict division home - work	2	.76	2.66	1.10	2.73	2.67	2.56	0.29

a) All items are measured on a 5-point scale; the anchor points are «completely disagree», «disagree», «do not agree – do not disagree», «agree», «completely agree».
b) Significance level: * p<.01; ** p<.001.

explore new ideas. Furthermore the results show that the high salary category requires ad hoc and informal consultation more frequently than the two lower salary categories (F=8.87, $p<.001$).

Some respondents report that their task is clearly structured while others report they have a very unstructured task (M=3.00). Results indicate that work processes are less well defined and less easy to predict for respondents in higher salary groups than for respondents in the low salary category, although the goals in each salary group are mostly clear (F=6.18, $p<.01$). With respect to the time-place restrictions in their work, employees overall report that deadlines and time schedules are not applied rigidly. Respondents of higher salary groups emphasize this point significantly stronger. Finally, the head office is not regarded as the only workplace and respondents overall do not have a negative attitude towards working at home (M=2.36).

8.2. Assessment of performance

This group of scales consists of items that examine the assessment of performance in relation to physical presence/absence in time (working hours) and place (head office). The sum scores include items relating to physical presence/absence as indicators for commitment and reward (e.g. influence of visible results on perceived involvement and appraisal), need to demonstrate performance (e.g. call management's attention to results, impression management), the influence of presence/absence on promotion, and the relation between autonomy and the independency of spatial and temporal norms.

In general employees do not show a uniform

direction with respect to the relation between actual presence and commitment (M=3.00). Respondents agree that most employees show a high degree of organizational commitment: individual employees do not make a sharp distinction between work- and leisure time and are willing to do overwork when required. Part time employees are not regarded as less involved and respondents report that employees in general show adherence to company rules regardless of their presence or visibility. Although not significantly different, the higher salary categories emphasize a stronger relation between presence and commitment.

Respondents report a weak relation between overwork and appraisal (M=2.46). Neither overwork at home nor overwork at the office automatically results in more favourable impressions or positive performance appraisals. No significant differences between salary categories were found. Performance appraisals reflect the quality of the work, supervisors in general can assess performance correctly and appraisal is some what dependent on the relationship with the supervisor.

Furthermore, respondents report that it is moderately important to visibly show results and bring them to attention of their superiors (M=3.14). This is very important for the higher salary categories and less important for the lower salary categories (high M=3.56; middle M=3.15; low M=2.80; F=14.32, p<.001).

With respect to the relation between presence and promotion, respondents do rather agree that visibility or co-presence in the office as such, *increases* chances for promotion (M=3.13). Furthermore, they agree that part-timers have less chances for promotion than full-timers and moderately agree that physical co-presence receives to much emphasis in their company. Although respondents in the high salary group agree less with the relation between presence and promotion, no significant differences were found between salary groups. All respondents report a high degree of task related autonomy (M=3.85). Employees indicate that they can work several days without contacting supervisors and that they do not necessarily need to be present at the office in case unexpected events occur. Especially employees in highest salary category re-

port to have a very high degree of autonomy (F=8.95, p<.001).

8.3. *Supervision & control*

Sum scores of this factor construct reflect the relation between subordinate and supervisor with respect to leadership style, methods to achieve control, employees' confidence in their supervisor. Supervision and control methods are related to the definition of performance criteria and norms regarding the boundary between the work place and private life.

Respondents do agree that the leadership style is very supportive (M=3.80). Mutual adjustment is considered an important coordination mechanism. Subordinate and supervisor reach consensus on performance goals and priorities while upward and downward communication channels are used easily and frequently. Employees report to inform their supervisor in case agreed-upon deadlines can not be met. Salary categories do not differ with respect to perceived leadership style. Control is not exclusively focused on output and sufficient feedback on performance is given during planned meetings (M=3.30). No significant differences between salary groups were found.

All respondents report high mutual confidence and trust between superior and subordinate (M=3.91). Salary groups do not differ on this issue.

Objective performance criteria are mostly available and it is possible for the supervisor to asses performance correctly (M=2.76). The middle salary group tends to perceive their performance criteria as less clear (M=2.96).

No strict division between the office/work and private life is made (M=2.66). Respondents report that the impact of their work on their private lives is moderate. Although no significant differences were found between salary groups, respondents in the low salary category report to have less blurred boundaries between work and home than respondents in higher salary groups.

8.4. *Expected consequences and feasibility of telework*

A principle components analysis and varimax rotation performed on the expected consequen-

TABLE 2
Components scores of questionnaire items regarding expected negative consequences of telework
according to salary categories (N = 146)

| | Number of items | α | $\overline{X}$ | S.D. | Salary categories | | | F-ratio b) |
					Low	Middle	High	
Perceived negative consequences regarding a):								
cooperation & contact	13	0.90	2.88	.75	2.63	3.11	2.98	6.15**
appraisal & career development	5	0.70	2.80	.69	2.67	2.95	2.80	1.96
leadership styles	8	0.79	2.62	.65	2.49	2.79	2.63	2.55
commitment & loyalty	3	0.72	2.60	.87	2.38	2.66	2.84	3.90*
division home – workplace	5	0.77	2.46	.80	2.28	2.65	2.49	2.65

a) All items are measured on a 5-point scale; the anchor points are «completely disagree», «disagree», «do not agree – do not disagree», «agree», «completely agree».
b) Significance level: * p<.05; ** p<.01.

ces of telework resulted in five factors, all involving negative consequences of telework. Component scores are shown in Table 2.

General means for each of the sum scores indicate that respondents do not emphasize the potential drawbacks of telework. Surprisingly it is the middle salary category that is more cautious with regard to the drawbacks of telework. Especially with regard to required cooperation and contact to get their project work done. The highest salary category shows more concern about a decline of commitment and loyalty as a consequence of telework. Significant differences were found between salary groups with respect to expected negative consequences for «cooperation and contact» and «commitment and loyalty».

As to the expected consequences of telework on work processes respondents indicate that it will be necessary to formulate work goals more explicitly and that more scheduling and coordination is needed. They expect to become highly dependent on meetings to gather the required background information, therefore more explicit planning of meetings is considered important.

With respect to cooperation respondents in general do not see much problems, although the low salary category differs from higher salary categories. The former do not expect that they will receive less help from colleagues nor do they think there will be any barrier to ask for

help. Respondents expect that communication will be more formal as homework increases. Informal meetings will be replaced by postings and e-mail messages; ad hoc informal meetings will decrease; and informal contacts at the office will not necessarily intensify. According to the respondents performance criteria can easily be adapted to fit homework conditions; no changes in performance levels are expected provided that subordinate and supervisor meet regularly; result oriented appraisals will be more important and therefore the pressure to produce «visible» and «verifiable» outcomes will increase. Respondents differ from opinion whether organizational commitment will increase or decrease when employees work at home. They report that confidence and trust between superior and subordinate will not suffer when employees work at home. Respondents overall agree that leadership has to meet new demands when employees start working at home. Provided explicit agreements are made no problems are expected with regard to the possibilities of management to reach subordinates.

Disadvantages associated with integration of workplace and private life were not substantiated. Employees report that they do not foresee role conflicts when boundaries between workplace and the home become more blurred. Neither do they confirm that new sources of disturbances and interruptions eventually will replace

disturbances and interruptions experienced at the office. Finally, respondents do not expect that homework will have negative effects on the respect and status that superiors enjoy.

An overall evaluation regarding the actual implementation and feasibility of flexible work arrangements showed that respondents expect personal and organizational problems can be overcome and financial benefits will probably outweigh the costs. Furthermore respondents report telework might play an important role in the organization but they are not strongly convinced. The highest salary category was slightly more pessimistic regarding the future role of telework in their organization than the middle and lower salary categories but no significant differences were found.

Results show that the perceived feasibility of telework is determined by individual circumstances and preferences of the respondents. Regarding the feasibility of telework no significant differences are found between respondents with respect salary categories, departments, nature of work, education, sex, years in service. Given the absence of categorical effects regarding the perceived feasibility we only find variation in individual opinions therefore we can conclude that the results are not biased by social desirability.

8.5. Perceived advantages and disadvantages of telework

As a final evaluation respondents were asked to state their opinion about the expected advantages and disadvantages of telework. They overall reported that the advantages of telework largely outweigh the disadvantages. Especially work related advantages as «more efficient use of working time» and «more autonomy» and «higher productivity» are very important. Less commuting time was seen as the most important individual benefit, followed by «more flexibility with respect to opening and closing times of institutions, shops, agencies, etc.», «more time spend with family» and «more opportunities for child care». Employees in the low salary category stress individual advantages as «more opportunities for child care» and «more flexibility with respect to opening and closing times of institutions», while higher salary groups consider

these advantages as less important. Employees in the low salary category also emphasize work related advantages as «more autonomy», «higher productivity», «higher quality of work» and «increased work satisfaction» more than higher salary categories.

9. DISCUSSION

In the organization under study coordination and control of work processes is not accomplished using very rigid spatial and temporal boundaries. Bureaucratic forms of control mostly have been abandoned. Many employees already work at dispersed locations according to flexible time schedules. The coordination of work is mainly achieved by mutual adjustment between supervisor and subordinates. The participants engage in high levels of communication when projects and assignments are formulated or output is presented and take formal decisions when consent is reached. The appraisal system increasingly becomes result oriented. Deadlines are agreed upon but can be changed when sufficient justification is given. Leadership style is supportive and the relationship between subordinate and superior can be characterized by mutual confidence and trust. Cooperation and teamwork between employees of different departments and hierarchical levels is common and finally, employees have a high level of organizational commitment.

Within the limitations that apply to the external validity of a single case-study, our findings do not support Perin's observations that managers and employees are still acting on a system of organizational norms, values and habits that reflect an ideology suited for mass production technology. It is clear that over time changes have taken place to free modern office work from rigid temporal-spatial constraints that characterize bureaucratic control, in order to adapt to rapidly changing circumstances.

The predominantly project-like nature of the work, and the low degree of structure in the task requires a great deal of mutual adjustment during the formulation and the completion of an assignment, but provides a sizeable amount of discretion for individuals and groups when the actual work takes place. The managerial systems

for coordination, evaluation and control are by and large adapted to deal with a large variety of work arrangements. According to the participants, further destandardization is only a matter of degree.

Overall employees have a favourable attitude towards more flexible work options and the perceived advantages largely outweigh the perceived disadvantages. Taken in to account that work at the head office allows employees to have already high levels of discretion and autonomy, this is not surprising. Work related advantages as increased efficiency and higher productivity are generally regarded as the most important benefits. Employees suggest that special attention should be given to explicit planning, otherwise cooperation, mutual adjustment and group cohesion might suffer. Employees suggest that formal and informal meetings are required to perform their tasks although they do not regard continuous co-presence necessary when information can be provided otherwise.

Salary groups differ from opinion with respect to perceived advantages and disadvantages of flexible work. Employees in the low salary category perform in general administrative tasks that are more structured than those of employees in higher salary categories. More spatial and temporal autonomy and discretion provides these employees with additional work related benefits and personal freedom of choice. Employees in the low salary category therefore tend to have the most positive attitude towards telework. Employees in the middle salary category in general perform tasks that need a great deal of (in)formal and ad hoc consultation, like staff advise, policy implementation. These employees work mainly in project teams. They are cautious with regard to possible advantages, point out possible negative consequences and emphasize the necessity for contact, communication, mutual adjustment and availability of colleagues. Employees in the high salary category in general perform tasks that include policy development and policy implementation and have a very high degree of spatial and temporal mobility. In general they confirm the advantages of telework but expect less additional benefits from telework for their own work. They tend to be more conservative and emphasise possible drawbacks with respect to organizational commitment and office morale.

According to the employees careful modifications of procedures and work processes are needed but no drastic changes in organizational control systems are needed to implement flexible work arrangements. The modifications are less a matter of procedures and techniques than a matter of intent and social choice.

REFERENCES

Becker, F.D. (1981). Mixed blessings: the office at home. In *Workspace creating environments in organizations* (F.D. Becker, Ed.), pp. 175-202, Praeger Scientific.

Bailyn, L. (1989). Toward the perfect workplace? *Communications of the ACM*, 32: 460-471.

Dürrenberger, G. (1989). Information technology and culture: vocational territories. In *Information society and spatial structure* (H. Erneste & C. Jaeger, Eds.), pp. 55-69, London/New York: Belhaven Press.

Erneste, H. (1989). The corporate culture and its linkages with the corporate environment. In *Information society and spatial structure* (H. Erneste & C. Jaeger, Eds.), pp. 91-116, London/New York: Belhaven Press.

Emery, F.E. & Trist, E.L. (1965). The causal texture of organizational environments. *Human Relations*, 18: 21-32.

Galbraith, J.R. (1977). *Organizational design*. Reading: Addison Wesley.

Giddens, A. (1979). *Central problems in social theory*. London: Macmillan.

Giddens, A. (1984). *The constitution of society*. Cambridge: Cambridge University Press.

Gordon, G.E. (1988). The dilemma of telework: technology vs. tradition. In *Telework: present situation and future development of a new form of work organization* (W.B. Korte, S. Robinson & W.J. Steinle, Eds.), pp. 113-136, Amsterdam: North-Holland.

Grossin, W. (1974). *Les temps de la vie quotidienne* [The times of everyday life]. Paris/La Haye: Mouton.

Huws, U., Korte, W.B. & Robinson, S., (1990). *Telework: towards the elusive office*. Chichester: John Wiley & Sons.

Jackson, P.J. (1990). *Telework: new perspectives on research*. Paper presented at the conference Computer, Man and Organization II, Nivelles, Belgium.

Jackson, P.J. (1992). *Organisational change: the role of telework*. Paper presented at the conference The Challenge of Change: the Theory and Practice of Organizational Transformations, Cardiff Business School, Cardiff.

Jaques, E. (1982). *The form of time*. London: Heinemann.

Katz, D. & Kahn, R.L., (1978). *The social Psychology of organizations*. New York: John Wiley & Sons.

Kinsman, F. (1987). *The telecommuters*. Chichester: John Wiley & Sons.

Kraut, R.E. (1987). Predicting the use of technology: the case of telework. In *Technology and the transformation of white-collar work* (E. Kraut, Ed.), pp. 113-133, Hillsdale: Lawrence Erlbaum.

Moore, W.E. (1963). The temporal structure of organizations. In *Sociological theory, values and sociocultural change* (E.A. Tiryakian, Ed.), London: Harper & Row.

Moss-Kanter, R. (1991). The future of bureaucracy and hierarchy in organizational theory: a report from the field. In *Social Theory for a changing society* (P. Bourdieu & J.S. Coleman, Eds.), pp. 63-87, Boulder: Westview Press.

Nilles, J.M., Carlson, F.R., Gray, P. & Hanneman, G.J. (1976). *The telecommunications-transportation trade-off*. Chichester: Wiley.

Olson, M. (1987). Telework: practical experience and future prospects. In *Technology and the transformation of white-collar work* (E. Kraut, Ed.), pp. 135-152, Hillsdale: Lawrence Erlbaum.

Olson, M.H. (1988). Organizational barriers to telework. In *Telework: present situation and future development of a new form of work organization* (W.B. Korte, S. Robinson & W.J. Steinle, Eds.), pp. 77-101, Amsterdam: North-Holland.

Perin, C. (1990). The moral fabric of the office: panopticon discourse and schedule flexibility. In *Research in the sociology of organizations: Vol. 8. Organizations and professions* (P.S. Tolbert & S.R. Barley, Eds.), pp. 243-270, Greenwich: JAI Press.

Pfeffer, J. & Salancik, G.R. (1978). *The external control of organizations: a resource dependence perspective*. New York: Harper & Row, Publishers.

Poire, M. & Sabel, C. (1984). *The second industrial divide*. New York: Basic Books.

Porter, M.E. (1985). *Competitive advantage*. New York: Free Press.

Starkey, K. (1989). Time and work: a psychological perspective. In *Time, work and organization* (P. Blyton, J. Hassard, S. Hill & K. Starkey, Eds.), pp. 35-56, London: Routledge.

Steinle, W.J. (1988). Telework: opening remarks on an open debate. In *Telework: present situation and future development of a new form of work organization* (W.B. Korte, S. Robinson & W.J. Steinle, Eds.), pp. 23-31, Amsterdam: North-Holland.

Schriber, J. B. & Gutek, B.A. (1987). Some time dimensions of work: the measurement of an underlying aspect of organization culture. *Journal of Applied Psychology*, 72: 642-550.

Taillieu, T.C.B. (1989). *Trends in management en organisatie* [Trends in management and organisation]. Unpublished manuscript, Tilburg University, Department of Work and Organizational Psychology, Tilburg, The Netherlands.

Taillieu, T.C.B., Schruijer, S. & Syroit, J. (1989). *Boundary spanning activities*. Paper presented at the 4th European congress of The Psychology of Work and Organization, Cambridge, U.K.

Taillieu, T.C.B., van der Wielen, J.M.M., Poolman, J.A., Zuilichem, J. (1993). Arbeidsorganisatie & telewerk bij een energie bedrijf [Work organization and telework at an energy company], *Management Research Report*, Tilburg University, Tilburg, The Netherlands.

Toffler, A. (1980). *The third wave*. Veen, The Netherlands.

Urry, J. (1985). Social relations, space and time. In *Social relations and spatial structures* (D. Gregory & J. Urry, Eds.), pp. 21-48, New York: St Martin's Press.

Van der Wielen, J.M.M. (1991). *Telewerk: omgevingsinvloeden en verspreiding van activiteiten*, [Telework: environmental influences and dispersion of activities]. Unpublished manuscript, Tilburg University, Tilburg, The Netherlands.

Van der Wielen, J.M.M. (1992). *Dispersed Organizations*. Research paper for the Eden-Doctoral Seminar on advanced research methodology in the field of management of technology: The output and process of research. Enschede, The Netherlands.

Van der Wielen, J.M.M., Taillieu, T.C.B. (1992). Telewerk: een arbeidsvorm met een gespreid activiteitenpatroon [Telework: an organizational form with a dispersed activity pattern]. I&I, *Informatie en Informatiebeleid* [Information and Information Policy], 4: 43-50.

Zerubavel, E. (1981). *Hidden rhythms: schedules and calendars in social life*. Chicago: University of Chicago Press.

ABSTRACT

This article focuses on a set of new flexible work arrangements commonly referred to as «telework» or «telecommuting». Although it is not possible to give an unambiguous and precise definition of telework, there is some working consensus on the subject: the belief is held that information technology has made it possible to relocate many types of work involving the electronic processing of information geographically, and telework is the term used to describe workers who have been relocated in this way. An attempt is made to

develop theoretical framework in which telework can be studied. For this purpose the changes that take place in the environment of organizations have been taken into consideration.

It is suggested that as a result of the redesign process new organizational forms emerge that are characterized by a «dispersed activity pattern». Dispersed Organizations, are designed to overcome time-and-place constraints associated with rigid bureaucratic structuring and can be distinguished from existing bureaucratic organizations because they are based on a different design philosophy with regard to how, where and when work is done. Dispersed organizations are being characterized by different time and place constraints with respect to interaction between operational units. Although organizations with dispersed activities can be found nowadays in almost every institutional area, little systematic analysis has yet been undertaken. It is assumed that different forms of telework can be studied within this context. The concept of «dispersed organizations» will be discussed and illustrated with results from a case-study conducted in an energy-company in the Netherlands.