New Ways of Working: A Proposed Framework and Literature Review

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Abstract. The drive towards new ways of working is of great relevance to our modern world. Many companies and organizations have introduced aspects of this new approach in recent years, while many others are on the verge of doing so. The new way of working consists of a large variety of measures enabling flexibility in time and place Expectations are often high: those who embrace such innovations aim to reduce operating costs and create more productive employees. However, it is worth asking whether these expectations are realistic. To date, very little research has been done on how the introduction of new ways of working affects operational objectives. This article is aimed to provide an overview of the available knowledge of the effects of the new way of working concept through scientific research and by developing a clearly defined framework. Some of the most important findings are outlined.

Keywords: New way of working; flexible working, telecommuting, teleworking, home working, activity related work, social ICT, flexible office environment.

1 Introduction

The current economy is fundamentally changing at some point. In the past decade we have changed towards a knowledge driven economy and information society. Organizations need to respond more rapidly to customer needs, and the pressure to become more customer centered is increasing. The value of customers and employees is becoming more prominent. And information and communication technologies are developed in a way that digital information is available at any time at many places. Parallel to this the hierarchical structures are gradually replaced by more flexible network models, and we increasingly rely on knowledge and good ideas rather than physical labor. As a result, we see that the way we work is drastically changing [1]. For example WorldatWork [2] estimated that 12.4 million American employees worked from home or remote at least one day per month in 2006, which increased up to 17.2 million in 2008. In the UK the number of teleworkers is estimated to more than double in popularity in eight years to 2.4 million workers [3], indicating that telecommuting continues to become an omnipresent work arrangement [4].

Many organizations see potential opportunities in the transition to new ways of working (NWW) and in Western Europe the number of organizations that have

implemented a form of NWW is rapidly increasing. The majority of the changes are made because they have a certain benefit in mind, without having a clear understanding of the overall effects. Assumed benefit of this new ways of working is an increase in employee productivity by better facilitating the work task with ICT and workplace design, and by providing employees with more autonomy in where or when to work. It is assumed that the employees will experience a greater flexibility in the way they work with colleagues, experience more balance in the personal work situation, and increased mobility in work hours [5]. On firm level a reduction of commuter traffic and thereby CO_2 emission is reported, while also contributing by solving the mobility problems. Another beneficial aspect is a more efficiently use of the available number of square meters office buildings [6].

Even though expectations of the NWW are high, there is a lacking of good (quantitative) and multi factorial scientific research that clarify the effects [5, 7]. Organizations adopting the new way of working have ensured that there is an arising need to measure, map and interpret the business objectives in such way that it better suit the new work situation. For example increase their focus on result outcome and impact on customer's satisfaction instead of focus on face time. Gaining knowledge on this topic can provide organizations with a better understanding and (at forehand) insight in the effects of their NWW investment or policy decisions regarding the implementation.

The magnitude of the new way of working, especially in relation to business goals is large and complex. First of all there are a brought variety of definitions on NWW, and the term New Ways of Working is often used inappropriately to refer to less far-reaching changes in office measures and working methods. At this moment no framework exists concerning the measures that should be included in the definition (i.e. teleworking, home working, internet access, management trough trust). Secondly, besides the missing framework on NWW measures, it seems like organizations use NWW arrangement to reach a broad variety of business objectives (i.e reducing cost, attracting talented employees, increase productivity). Supplementary to that, the different companies and organizations also differ in the way they monitor business objectives. For instance, productivity, especially which of knowledge workers, is very difficult to assess, since it includes qualitative factors as well as many relevant factors that are of a quantitative nature [10].

Setting a defined framework on NWW measures as well as on business objectives is necessary to frame the topic and in order to study the scientific literature. In order to investigate the effect of NWW measures the framework needs to include relationship between measures and different business objectives. This article is aimed to provide an overview of the available knowledge of the effects of the NWW measures through scientific research and by developing a clearly defined framework. The research question is: "What is the scientific proof of the relationships between different NWW measures in relation to business goals, and can we use this information in order to compose a NWW framework?" In this paper we will outline some of the main results on the effect of NWW measures in relation to productivity and present the framework of the NWW.

2 Method

The first step to study the NWW measures in relation to business goals was conducting a literature review. The objective of the review study is to provide insight on what is known about the relationships between NWW measures and the business goals. This review was based on an electronic literature search in Dutch- and English-language databases (Web of Science, Science Direct, Scopus and TNO database) and by the references of the articles that were found. Because of the currency of the topic we made a selection of recent studies (published between 2000 - 2010), or the research should be adequate enough to generalize the content to the present situation. Based on literature findings a first framework is created.

The focuses of this literature study is in knowledge-intensive organizations, defined as "Companies where most work can be said to be of an intellectual nature and where well-qualified employees form the major part of the workforce" [11]. For the NWW arrangement we used the following definition: "New Ways of Working is an outlook of ways of working that corresponds as closely as possible to the needs of the knowledge worker". It leads to the creation of a productive, sustainable, inspiring working environment that promotes the performance of both the team and the individual by means of technological and social innovation".

Keywords to search on the NWW topic were selected by the use of several expert opinions and based on the topics referred to in the available general NWW literature. Combinations of keywords on group 1: NWW measures as well as group 2: business objectives were used. The search terms consisted of the following keywords: flextime, flexible measures, telecommuting, teleworker, ways of working, mobile work, computing, telecommuting, spatial flexibility, distributed organization, remote work arrangement, flexible work, task related office environment, flexibility office, desk-sharing, online collaboration, video conference, internet access, workplace flexibility, workplace concepts management on trust(group 1), employee health, sickness absence, knowledge sharing, organization attractiveness, employee engagement, effectiveness, performance, team effectiveness, team performance, work satisfaction, work life balance, work family balance, work family benefits, work family enrichment, work family interaction, work home interference (group 2).

The articles were selected by the following inclusion criteria: First, the study should be published in the English or Dutch language in a peer-reviewed journal. Or it is a description of a well founded theoretical framework published in a peer-reviewed article. Secondly, the population studied should be sufficiently representative for a knowledge or information workers, so that research generic interpretable is possible. Thirdly, central to the article should be an NWW aspect, and / or a mediator and / or a business objective. Fourthly the article should properly describe the research set-up, the type of research methods, inclusion of a representative group of subjects, and measurement instruments used.

From all papers that resulted from the search strategy in the electronic databases, the abstracts were analyzed by TNO experts. Papers that appeared not to meet our inclusion criteria were excluded. In case the abstract did not provide sufficient information, the full paper text was screened. Next, the reference lists in the remaining papers that met our inclusion criteria, were analyzed to search for more relevant papers.

The second step is to fill the 'gaps' in literature results with experts' values. This is done in meetings with both experts in social or behavioral science and experts from the field where NWW are implemented. The meetings are set up and guided according to a protocol that provokes a balanced valuing of experts opinion called MARVEL. MARVEL is a Method to Analyse Relations between Variables using Enriched Loops (MARVEL). The method is developed in order to obtain insight into the effects of interventions. It is designed as a tool for conducting a first policy intervention analysis for problems with a limited availability of quantitative data. Since this is the case with the literature on NWW, the use of the MARVEL tool will be examined in order to get a better understanding of the complex effects of NWW.

3   Results

The literature review revealed some interesting relationships between NWW measures and business objectives. The quantity as well as the quantity of the relevant studies were however somewhat disappointing. A total of 176 articles were selected. After the screening this resulted in 44 articles with useful information to underpin the theoretical framework. Based on the results a framework of definitions and principles on HNW measures were made. The results presented here outline the definitions and principals and show some of the most important findings of this review in relation to the business goal productivity.

3.1   Definitions and Principles

A selection of NWW measures is made to focus on the most common and more important most potential measures for successful implementation of NWW. The measures for the framework are selected together with representatives of four different companies (KPN, Rabobank, Philips Real Estate, and Veldhoen + Company) that apply NWW in different forms of execution. The following measures were selected:

- Working from home
- Activity-related working: the use of work locations within their organization that correspond most effectively with the specific task they are carrying out at a particular moment. Ideally, employees should use a different workspace for each distinct task.
- Satellite offices: the use of offices outside of their own organization to carry out their tasks, for instance at the customer's premises.
- Mobile working: carry out work tasks while travelling (e.g. commuting or on business trips).
- Flexible working hours: carry out the work tasks inside and outside standard working hours.
- Using internet access.
- Use of social network services for example LinkedIn or Facebook.
- Use of video conferencing for communication and/or activities (e.g. meetings) with internal and external people working at other locations.

- Use of collaborative tools to carry out joint activities/tasks that involve internal and/or external collaborators (e.g. Wikis, social text, document sharing).
- Management based on trust: To achieve a working relationship between employer and employee that centers on mutual trust and commitment, rather than rules and workers' rights. This new kind of working relationship creates space for employees to be enterprising, thereby leading to a general rise in the achievements and boosting the competitive position of the organization as a whole. The employees are self-motivating and take initiatives while the managers give space and offer autonomy, as well as providing clarity about duties, frames of reference and levels of authority.

3.2 Relationship between Flexible Working and Productivity

The found studies on the relationship between flexible working and productivity, 7 studies in total, are difficult to compare since they differ in objective, definitions and use different measurement methods. Even though some evidence is found, we did not find strong convincing evidence on the effects of flexible work on productivity.

One of the found studies consisted of a review study of 80 academic articles concerning flexible work [12]. Their study showed little clear evidence that telework increase satisfaction and productivity. In 2007 a meta analysis was conducted on telecommuting [13]. They suggest that telecommuting is likely more good than bad for individuals and found small but favorable effects on perceived autonomy, work–family conflict, job satisfaction, performance, turnover intent, and stress. On the contrary, they found that telecommuting also had no straightforward, damaging effects on the quality of workplace relationships or perceived career prospects. Inconsistent results are also found in the study of Beauregard and Henry [14]. Some studies found no effect of teleworking on productivity [8] or even negative effect [14]. One studies reported that telework is more likely to cause an increase of work overtime, which should not be defined as an increase of productivity, but as a risk factor for health [15].

Another interesting study that was found focuses at productivity on business level [17].and tried to explore the relationship between teleworking adoption, workplace flexibility and firm performance by studying 479 small and medium sized firms. They concluded that the contribution of teleworking to firm performance is very significant and suggests that teleworking can increase organizational flexibility and generate sustainable competitive advantage.

3.3 Relationship between Flexible Office Environment and Productivity

According to De Croon et al, [18] there is a lack of consistent evidence for the effect of flexible office environment on the productivity of employees. The exact implementation of the physical office environment and the match between workspaces and work tasks or activities of the employees mainly account for the success. Employees report an increase in communication as being one of the biggest benefits of the flexible office environment compared to traditional owned workplaces [19]. It is unknown whether an increase in communication will result in an increase of job performance [20] and it is assumable that this relies on function type. The study of

Robertson and Huang [21] suggest that when an office work environment is ergonomically designed and coupled with training, it provides employees with a high degree of environmental control and knowledge, which may positively influence individual performance, group collaboration and effectiveness. Results of the study revealed that satisfaction with workstation layout had a significant relationship with individual performance, group collaboration and effectiveness. These results are underpinned by the results of 2008, where the effect of workspace design was studied. Optimizing the workspace design in order to support group and individual work, in combination with providing ergonomic training and information to employees significantly reduced the business process time [22].

3.4   Relationship between Flexible Work Times and Productivity

A review of Beauregard and Henry [14] reveals that there is no conclusive evidence for the existence of a relationship between working on flexible hours and productivity. Some studies show that self rated productivity is higher when employees experience more flexibility in work times. Other studies show that with minimal flexibility, (e.g. agreement on the specific hours at forehand), an optimum of productivity was achieved. At firm level flexible work hours seem to result in positive productivity effects. A few explanations for the increase in productivity is that employees choose the best moment to perform the job, have better balanced work and privet lives causing less interference and reduce traveling time [14].

3.5   Relationship between Collaborative Tools and Productivity

The European commission [23] has conducted a study on the effects of ICT on firm productivity, measured in terms of turnover growth. They report a growing consensus that ICT does have positive effects on labour and total factor productivity. For a long period of time it was unclear what the relationship was between ICT investments and the productivity of a company. The conclusion of the study states that there is limited evidence for the existence of the relationship, although the causality remains unclear [23]. In the study of Kratzer et al, [24] an increase in creative productivity is seen when team members have autonomy on which communication tools they are able to use (face-to-face or collaborative tools). Productivity (expressed by creativity) of the team was lowest when team members constantly were space dependent (face-to-face) or constantly place independent (collaborative tools). However, other study report otherwise [25]. For meetings where decision making plays an important role, it is suggested to use face-to-face meetings in stead of ICT systems. Although the quality of the results is similar, the face-to-face groups were more efficient [26].

3.6   A First NWW Framework

Based on the literature and expert opinions a framework, and definition of NWW measures could be made (figure 1). This framework shows the NWW measures on the one side and the business objectives on the other side and the effects found in the literature review are displayed using black dotted lines. Only productivity effects are presented in this paper.
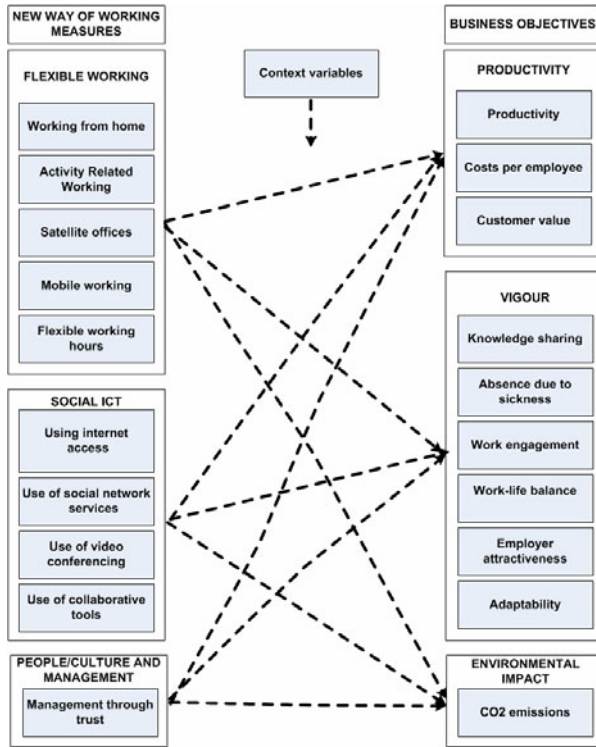
Fig. 1. Simplified framework of the relationships between NWW measures and business objectives

This framework is input for the experts meeting and MARVEL method. The MARVEL results are not available at the time of publication of this paper.

4 Discussion

From the literature review we gained inside in the effect of some critical factors that influence the extent in which NWW measures affect business goals. The lack of a coherent framework, no standardized definitions and the brought variety of scientific research found, caused a great difficulty to compare and interpret the research findings. For the business objective productivity, a wide variety of different measures were found, and almost no objective measures. For knowledge intensive work it is of great importance to focus on quantity as well as quality productivity outcomes. We suggest using the definition defined by the Q2 model of Rhijn et al. [10], in which productivity is defined as a function of the ratio between outputs and inputs both in terms of quantity and quality. They define quantity as an aspect related to efficiency, 'doing things right', whereas quality is associated with effectiveness, 'doing the right things' [27].

The framework that is presented provides us with a first outline of the relationships between NWW measures and business objectives. An important factor that is not included in this framework and might affect the relationships between NWW and business objectives is the interaction effect between NWW measures. The success of NWW appears to be associated with the correct interaction of the implementation of NWW measures. For instance a good combination between the use of ICT resources, establishment of the physical environment and management style is of great importance for the success and actual outcome on business objectives.

A second factor that might affect the relationships in the NWW framework is the way in which the NWW programs are implemented in organizations. Researchers suggest that this is of great relevance for the success outcome, but how involvement affects the business objectives remains unclear [28]. This is partially confirmed by study of Lee and Brand, who showed that higher group cohesiveness is perceived when employees experienced more personal control over the physical workspace [29] and it might increase productivity as well. A third factor that influences the effect of NWW and should be taken into account is the differences in individual characteristics. The individual characteristics such as need for autonomy [30], age [31] and privet family situation [14]. might effect on the relationships shown in the framework.

The above discussed interfering factors (referred to as context variables) show the complexity of the framework. We see the NWW framework as a base which needs further research in order to gain more scientific insight. MARVEL is a first attempt to fill the framework, but is expected to lead to a priority of hypothesis that should be researched in the coming years.

5   Conclusion

The objective of this research study was to investigate whether it is possible to establish relationships between HNW measures and business objectives in an integrated theoretical framework. All together the literature research increased the understanding of the existence of relationships between the NWW measures and business objectives and has resulted in an initial outline and scoping of the NWW framework. For a small number of the hypothetical connections, the scientific literature provided conclusive information on the effect of a particular NWW measure on business objectives. However, this still left a large number of hypothetical relationships in the model for which there is no or relatively little scientific evidence. The advantage of the framework is that it concretizes the aspects of NWW in a set of measures and relates these to operational objectives, expressed as business objectives. It also defines the gaps in knowledge and highlights the particularly complex nature of the issue.

References

1. Manoochehri, G., Pinkerton, T.: Managing Telecommuters: Opportunities and Challenges. American Business Review 21(1), 9–16 (2003)
2. WorldatWork Telework trendlines (2009),
   `http://www.workingfromanywhere.org/news/Trendlines_2009.pdf`
3. Office of National Statistics. Labor market trends (October 2005),
   `http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=550`
   (September 27, 2006)
4. Golden, T.D.: Avoiding depletion in virtual work: Telework and the intervening impact of work exhaustion on commitment and turnover intentions. Journal of Vocational Behavior 69, 176–187 (2006)
5. Virick, M., Da Silva, N., Arrington, K.: Moderators of the curvilinear relation between extent of telecommuting and job and life satisfaction: The role of performance outcome orientation and worker type. Human Relations 63(1), 137–154 (2010)
6. Vink, P.: Aangetoonde effecten van het kantoorinterieur: Naar comfortabele, innovatieve, productieve en duurzame kantoren (Proofed effects of office environment). Kluwer, Alphen aan den Rijn (2009)
7. Knight, C., Haslan, A.: Your place or mine? Organizational identification and comfort as mediators of relationships between the managerial control of workspace and employees' satisfaction and well-being. British Journal of Management 21, 717–735 (2010)
8. Hill, E.J., Ferris, M., Märtinson, V.: Does it matter where you work? A comparison of how three work venues (traditional office, virtual office, and home office) influence aspects of work and personal/family life. Journal of Vocational Behavior 63, 220–241 (2003)
9. Helminen, V., Ristimäki, M.: Relationships between commuting distance, frequency and telework in Finland. Journal of Transport Geography 5, 331–342 (2007)
10. Rhijn, G., van, H.K., ten, K.-E.L., Oeij, P.: Productivity assessment and improvement in knowledge intensive organizations and work processes: The Q2 model. In: 16th World Productivity Congress and European Productivity Conference, "Productivity at the Crossroads: Creating a Socially, Economically and Environmentally Responsible World", Antalya, Turkey, November 2-5 (2010)
11. Alversson, M.: Knowledge work and knowledge-intensive firms. Oxford University Press, Oxford (2004)
12. Bailey, D.E., Kurland, N.B.: A review of telework research: findings, new directions, and lessons for the study of modern work. Journal of Organizational Behavior 23, 383–400 (2002)
13. Gajendran, R.S., Harrison, D.A.: The Good, the Bad, and the Unknown About Telecommuting: Meta-Analysis of Psychological Mediators and Individual Consequences. Journal of Applied Psychology 92(6), 1524–1541 (2007)
14. Beauregard, T.A., Henry, L.C.: Making the link between work-life balance practices and organizational performance. Human Resource Management Review 19, 9–22 (2009)
15. van Echtelt, P.E.: Time-greedy employment relationships. Four studies on the time claims of Post-Fordist work. Gildeprint, Enschede (2007),
    `http://dissertations.ub.rug.nl/faculties/ppsw/2007/`
    `p.e.van.echtelt/?pLanguage=en&pFullItemRecord=ON`
16. Butler, E.S., Aasheim, C., Williams, S.: Does Telecommuting Improve Productivity? Communications of the ACM 50(4), 101–103 (2007)

17. Sánchez, A.M., Pérez, M., De Luis Carnicer, P., Vela Jiménez, M.J.: Teleworking and workplace flexibility: a study of impact on firm performance. Personnel Review 36(1), 42–64 (2007)
18. Croon, E.M., de, S.J.K., Kuijer, P., Kuijer, F.M., Frings-Dresen, M.H.W.: The effect of office concepts on worker health and performance: a systematic review of the literature. Ergonomics 48(2), 119–134 (2005)
19. Blok, M., Groenesteijn, L., Formanoy, F., De Korte, E., Vink, P.: Innovative Ways of Working: A Comparison of a Traditional and a Flexibele Office Environment on Office Space Use, Performance, Privacy and Satisfaction. In: Vink, P., Kantola, J. (eds.) Advances in Occupational, Social and Organizational Ergonomics, pp. 218–227. CRC Press, Boca Raton (2010)
20. van der Voordt, D.J.M.: Winst en risico's van flexibele werkplekken. Delft/Naarden: Center for People and Buildings/Centrum Facility Management. (2002)
21. Robertson, M.M., Huang, Y.-H.: Effect of a workplace design and training intervention on individual performance, group effectiveness and collaboration: The role of environmental control. Work 27, 3–12 (2006)
22. Robertson, M.M., Huang, Y.-H., O'Neill, M.J., Schleifer, L.M.: Flexible workspace design and ergonomics training: Impacts on the psychosocial work environment, musculoskeletal health, and work effectiveness among knowledge workers. Applied Ergonomics 39, 482–494 (2008)
23. Koellinger, P.: Impact of ICT on Corporate Performance, Productivity and Employment European Commission, DG Enterprise & Industry. Dynamics. e-Business W@tch. Special Report No. 01 (December 2006)
24. Kratzer, J., Leenders, R.T.A.J., van Engelen, J.M.L.: Managing creative team performance in virtual environments: an empirical study in 44 R&D teams. Technovation 26, 42–49 (2009)
25. Lira, E., Ripoll, P., Peiró, J.M., González, P.: The roles of group potency and information and communication technologies in the relationship between task conflict and team effectiveness: A longitudinal study. Computers in Human Behavior 23, 2888–2903 (2007)
26. Cappel, J.J., Windsdor, J.C.: Ethical Decision Making: A Comparison of Computer-Supported and Face-to-Face Group. Journal of Business Ethics 28, 95–107 (2000)
27. Tangen, S.: Understanding the concept of productivity. In: Proceedings of the 7th Asia Pacific Industrial Engineering and Management Systems Conference, APIEMS 2002, Taipei, Taiwan (2002)
28. Becker, F.: Workplace planning, design, and management. In: Zube, E.H., Moore, G.T. (eds.) Advances in Environment, Behavior and Design, vol. 3, pp. 115–151. Plenum Press, New York (1991)
29. Lee, S.Y., Brand, J.L.: Effects of control over office workspace on perceptions of the work environment and work outcomes. Journal of Environmental Psychology 25, 323–333 (2005)
30. O'Neill, T.A., Hambley, L.A., Greidanus, N.S., MacDonnell, R., Kline, T.J.B.: Predicting teleworker success: an exploration of personality, motivational, situational, and job characteristics. New Technology, Work and Employment 24(2), 144–162 (2009)
31. Armour, S.: GenerationY: They've arrived at work with a new attitude. USA Today (2005)