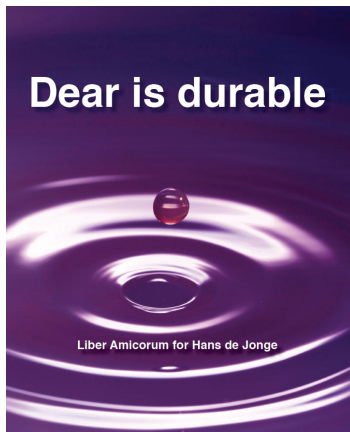


Design and management of activity-based workplaces



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Personal desk of Hans de Jonge at his home: no paperless office, no clean desk policy (just like the workplace of Hans' colleague Hugo Priemus)

Design and management of activity-based workplaces

Theo van der Voordt

As long as I have known Hans de Jonge he has always been busy with meeting staff members, students and visitors, giving lectures, chairing discussions and symposia, and sharing his views with many people, in Delft, the Netherlands, and worldwide. Due to his dynamic existence he is a person par excellence to drop a fixed, personal desk and to move along non-assigned desks, working anytime, anyhow, at any place that is appropriate at that moment. However, when Hans has a long day with appointments in Delft, he usually sits in the same room, “his” room. When he is not there, the room is free to be used by anybody who needs it. As such we may call Hans a hybrid flex-worker.

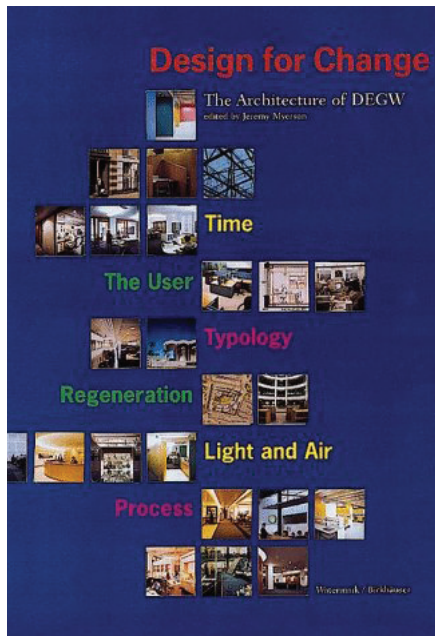
Inspiration from abroad

New offices, also called activity-based workplaces, non-territorial offices or flex-offices, provide people with a variety of different workspaces that fit with different activities. Hans’ interest into activity-based workplaces goes back to the early nineties of the past century. At that time Hans made a study trip to Cornell University in Ithaca and Harvard and MIT in Boston, all in the USA. He got familiar with the work of Franklin Becker and William (Bill) Sims and their International Facilities Management Program (IFMP). This program started in 1989 and was



Many people are satisfied with shared use of activity-based workplaces, but complains about a lack of privacy, insufficient opportunities to concentrate, and lack of storage space come to the fore as well.

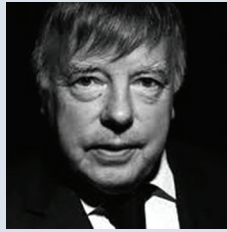
supported by a consortium of private and public sector organizations in the United States, United Kingdom, Europe and Japan. It was later renamed as the International Workplace Studies Program (IWSP). Another leading person regarding new offices is Frank Duffy, together with John Worthington one of the cofounders of the architectural firm DEGW (for an extensive presentation of the DEGW work in the past 40 years see the contribution of John Worthington to this Liber Amicorum). The picture below shows one of their leading publications on Design for Change.



Design for Change: Architecture of DEGW

Duffy is one of the early pioneers who plead for replacing traditional cellular offices with personal fixed desks – often with larger places for those higher ranked in the organisational hierarchy - by different types of activity-based workplaces. Partly because the variety of office activities cannot be accommodated effectively by 'one size fits all', and partly to use expensive workplaces more efficiently.

These international contacts inspired Hans to start a research program on New Ways of Working and innovative office concepts in Delft as well. In the mid-nineties a long lasting relationship started with both the ABN AMRO Bank (Loes Diemel) and the Government Building Agency (Wim Pullen) to document and evaluate new offices such as the DynamischKantoor Haarlem, a hotel office and various satellite offices of the GBA, and a number of innovative office environments in the ABN AMRO Bank in Amsterdam and Breda (Flexido). Geert Dewulf and Paul Vos



Frank (Francis) Duffy is a British architect and cofounder of DEGW. He is particularly noted for his work on the future of the office and the flexible use of office space.

Duffy was president of the Royal Institute of British Architects (RIBA) from 1993-1995. In 2008

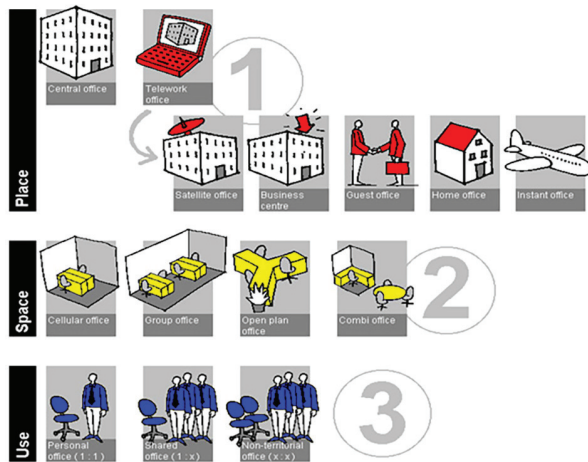
he received the British Council of Offices (BCO) President's Award for Lifetime Achievement. In 2008 he was named by *Facilities Magazine* as one of 25 Pioneers of Facilities Management in the UK.

In the 1960s, Duffy introduced the landscape office concept (*Bürolandschaft*) into the English-speaking world. His doctoral research at Princeton was focused on mapping the relationship between organisational structures and office layouts. In the 1970s, he was one of the pioneers who introduced North American practice in Space Planning and Facility Management into Europe. He coined the concept of "Shell, Services, Scenery and Sets" i.e. the analysis of buildings and building components in terms of layers of longevity in order to facilitate the accommodation of technological and organisational change. This concept was later elaborated by Stewart Brand in his book *How Buildings Learn: What Happens After They're Built* (Brand, 1994).

In the 1980s Duffy and his DEGW colleagues initiated the ORBIT (Office Research: Buildings and Information Technology) project on the impact of advances in Information Technology on office design. This research had a substantial impact on British office projects such as Broadgate and Stockley Park and on office design worldwide. More recently Duffy's interests have focused on the challenges that increasing reliance on virtual communications is bringing into urban design – asking the question: "In an increasingly virtual world what arguments can architects and urbanists use to justify spaces and places?"

Source: Wikipedia

were the pioneering researchers at that time. They were quite soon joined by Theo van der Voordt and graduation students like Michel Beunder, Frederik van Steenberg, Richard Lohman, Anouk van den Brink and many more. In 1999 the Delft group presented a small booklet called *The Office, The Office, and nothing but the Office* at a CoreNet conference in Delft. This publication tried to shed more clarity in the many names of innovative office design and presented a typology of new workplaces.



Typology of new workplaces regarding place, space and use (Vos et al., 1998)



Center for People and Buildings

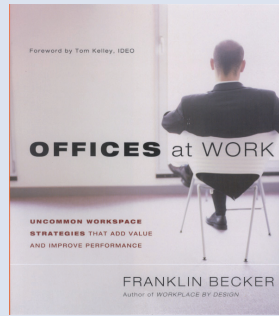
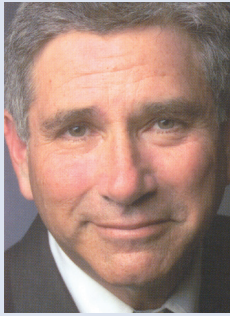
In 2001 the triplet TU Delft – ABN AMRO – GBA joined forces to established a new knowledge centre, called the Center for People and Buildings (CfPB), to connect research and practice by developing and sharing knowledge about work environments (see also the contribution by Wim Pullen in this Liber Amicorum and the CfPB website www.cfpb.nl). One of the CfPB's first activities was to organise a conference on "New work environments: better performance?." In 2003 the CfPB published a state of the art book about *Costs and benefits of innovative workplace design* with a focus on its impact on employee satisfaction, (perceived) productivity support, cost savings and investment costs. Since then CfPB has published numerous reports and papers on Pre- and Post-Occupancy Evaluations from a huge number of activity-based work environments. Furthermore, many tools have been developed to support organisations in reorganising their work environment, such as:

- The Satisfaction Index: a benchmark tool to compare percentages of satisfied employees on 19 aspects of the work environment;
- The Space Utilisation Monitor (SUM): a tool to measure occupancy ratios;
- PACT: software to define the number of required workplaces per type of place;
- The Accommodation Choice Model: a step-by-step plan to guide organisations through a (re-)design process of their work environment from the first initiative to the building-in-use;
- The Workplace Game: a game-like tool to raise awareness and understanding of innovative workplace design, to support a positive attitude, to cope with resistance to change, and to develop behavioural rules.
- The Workplace Guide: ingredients for contemporary workplaces, meeting spaces and facilities, with descriptions of 30 different places, each illustrated with 3 photographs.
- The Work Environment Diagnosis tool WODI (WODI Classic: an extensive questionnaire; WODI-Light; WODI-labs): a tool to collect data on employee satisfaction, perceived productivity support, and prioritised aspects of the work environment;

The table below presents a selection of books and papers that helped to build a body of knowledge on the drivers to change work environments and experience and use of activity-based workplaces. Due to limited space the table focuses on the work by Franklin Becker, Frank Duffy and other DEGW people, and contributions from Delft (*Italics*).

Key publications in activity-based work environments

- 1983 | Duffy et al., Orbit Study: Information Technology and Office Design
- 1990 | Becker, The Total Workplace: FM and Elastic Organisations.
- 1992 | Becker et al., Evolving workplace strategies. Investigations into the ecology of new ways of working.
- 1992 | Duff, The Changing Workplace.
- 1993 | Becker, The Ecology of New Ways of Working: Non-Territorial Offices
- 1993 | Duffy & Lang, The Responsible Workplace: The Redesign of Work and Offices.
- 1994 | Becker et al., Implementing Innovative Workplaces.
- 1995 | Becker & Steele, Workplace by Design. Mapping the High-Performance Workscape
- 1995 | Becker et al., The Ecology of Collaborative Work.
- 1995 | Becker & Joroff, Reinventing the Workplace.
- 1996 | Duffy & Powell, The New Office.
- 1996 | Becker et al., Work Smart: New Strategies for Gaining Competitive Advantage.
- 1997 | DEGW, Design for Change: Architecture of DEGW.
- 1997 | Worthington, Reinventing the Workplace. With a 2nd edition in 2005.
- 1997 | *Beunder & Bakker*, Innovative Working Practices in Office Buildings. In Dutch.
- 1997 | *Vos & Dewulf*, Do People Work Better in an Innovative Office? In Dutch.
- 1998 | *Dewulf & Vos*, (Im)possibilities of Innovative Offices. In Dutch.
- 1998 | *Dewulf & Vos*, Points of Attention in Introducing Innovative Workplace Design ('Dansen op het ritme van veranderingen', in Dutch).
- 1998 | Duffy et al., New Environments for Working.
- 1998 | Sims, Joroff & Becker, Teamspace Strategies. Creating and Managing Environments to Support High Performance
- 1999 | Horgen et al., Excellence by Design: Transforming Workplaces and Work Practice.
- 1999 | *Vos et al.*, The Office, The Whole Office and Nothing But The Office: a Framework of Workplace Concepts.
- 1999 | *Vos & Dewulf*, Searching for Data: A Method to Evaluate the Effects of Working in an Innovative Office.
- 2000 | *Van Meel*, The European Office. Office Design and National Context.
- 1999 | *Van der Voordt & Vos*, Evaluation of Office Innovation. Model and Methods. Original title? In Dutch.
- 2001 | Becker & Sims, Offices That Work. Balancing Communication, Flexibility and Cost.
- 2001 | *Vos & Van der Voordt*, Tomorrow's Offices through Today's Eyes. Effects of Office Innovation in the Working Environment.
- 2001 | *Van der Voordt & Beunder*, The Red Thread. Lessons from Innovative Office Projects at ABN AMRO Bank. Original title? In Dutch.
- 2003 | *Van der Voordt*, Costs and Benefits of Innovative Workplace Design.
- 2003 | *Frankema*, Office Innovation from an Economic Perspective.
- 2004 | Becker, Offices at Work: Uncommon Work Space Strategies that Add Value and Improve Performance.
- 2004 | *Van der Voordt*, Productivity and Employee Satisfaction in Flexible Offices.
- 2004 | Allen et al. (DEGW), Working without Walls
- 2005 | *Mallory-Hill et al.*, Evaluation of Innovative Workplace Design in the Netherlands.
- 2005 | *Volker & Van der Voordt*, An Integral Tool for the Diagnostic Evaluation of Non-Territorial Offices.
- 2006 | *Martens et al.*, Workplace Guide ('Werkplekwijzer'). In Dutch.
- 2006 | *Van der Voordt & Maarleveld*, Performance of Office Buildings from a Users Perspective.
- 2007 | *De Bruyne*, Effective Implementation of Office Innovation. Original title? In Dutch.
- 2008 | *De Bruyne & De Jong*, The Workplace Game: Exploring End Users' New Behaviour.
- 2009 | *Brunia & Hartjes*, Personalization in Non-Territorial Offices
- 2009 | *Maarleveld et al.*, Measuring Employee Satisfaction in New Offices – the WODI Toolkit
- 2009 | *Ikiz-Koppejan et al.*, Accommodation Choice Model. Original title? In Dutch.
- 2009 | *De Jong et al.*, Effects of the Workplace Game: A Case Study into Anticipating Future Behavior of Office Workers
- 2010 | *Van Meel et al.*, Planning Office Spaces. A Practical Guide for Managers and Designers
- 2010 | *Gorgieviski et al.*, After the Fire. New Ways of Working in n Academic Setting,
- 2012 | *Van der Voordt et al.*, Evidence-Based Decision-Making on Office Accommodation: Accommodation Choice Model.
- 2014 | *Riratanaphong*, Performance Measurement of Workplace Change.
- 2012 | *Van der Voordt et al.*, Post-Occupancy Evaluation of Facilities Change.
- 2014 | *De Been & Beijer*, The Influence of Office Type on Satisfaction and Perceived Productivity Support.
- 2015 | *De Been et al.*, Framing of Governmental Work Environments. Original title? In Dutch.
- 2015 | *Van Meel*, Workplaces Today.
- 2015 | *De Bruyne & Toolen*, The Workplace Game.
- 2015 | *De Bruyne & Beijer*, Calculating NWoW Office Space with The PACT Model.
- 2016 | *Brunia et al.*, Accommodating New Ways of Working: Lessons from Best Practices and Worst Cases.



Franklin Becker is em. prof. of Organisational Ecology at Cornell University, Ithaca, New York (1972 – 2009), former chair of the Department of Design and Environmental Analysis (DEA) at the College of Human Ecology, former director of the International Workplace Studies Program, member of various editorial boards, member of the Cornell Cooperative Extension Quality of Life program, and prof. at the Medicolegal And Literary Works, LLC.

In October 2004 I had the opportunity to visit Frank Becker at the Cornell University in Ithaca for a couple of weeks, to learn more about the International Workplace Studies Program (IWSP). The mission statement of IWSP is to generate research-based information related to the planning, design, and management of facilities that can contribute to the development of more competitive and effective organizations. The focus is on new ways of working and new integrated workplace strategies. I got noticed of a considerable number of case studies on the effects of non-territorial offices and teleworking - at home, with the client, in a hotel, in a telework center – on communication, social cohesion, collaboration, attraction and retaining staff, turnover, productivity, and facility costs. Most studies include an extensive review of literature, a user survey with web-enabled questionnaires, interviews with focus groups, observations and analysis of documents.

One of the main conclusions from this work is the need for an integral approach of “The Total Workplace”. This concept refers

to: 1) integrating decisions often considered in isolation by different departments (HRM, IT, Facilities Management, Corporate Real Estate Management); 2) the awareness that the workplace is more than one’s own personal office or workstation; the entire workplace includes the site, amenities, common areas, project rooms, and support areas), a s a “series of loosely coupled settings”; 3) the awareness that the processes used for planning, designing, and managing the workplace are as much a part of the building’s quality as are its physical characteristics. A second conclusion was that in spite of all great opportunities of virtual communication due to modern technology, face-to-face contacts are still very important to tacit learning, building trust and social cohesion, and young employees’ learning on the job by becoming an “insider”.

The IWSP-research has improved our understanding of what is really going on in the offices of our times. The empirical data can be used as a mirror for managers to take well-informed decisions. However, the data don’t give a blueprint how a well performing office should be. Contextual differences with reference to organizational characteristics, working processes, the cultural and economic context, and differences with regard to demographics (age, gender, ethnics) and jobs require more or less a tailor made approach. But taking into account all key findings and lessons learned, decision makers can reduce the risk of “wrong” decisions and improve the probability of positive outcomes.

Source: Van der Voordt, T. (2004) Notes on a visit to Cornell University, Ithaca, New York. September 29 – October 31, 2004.

Lessons learned

From the may research projects by Hans’ own staff members and the Center for People and Buildings many other interesting conclusions come up. The main drivers behind shared use of activity-based workspaces are rather similar to the ones behind open plan offices: stimulating communication and collaboration and cost reduction. Related objectives are increasing productivity due to improved collaboration and a better fit of activity-based workplaces with the variety of tasks and the psychological needs of modern knowledge workers to be free when, where and how to work, stimulating innovations, supporting (change of) culture, and contributing to

sustainability by reducing the footprint. New ways of working in flex-offices are supposed to have a positive impact on these items, both from a business point of view (efficiency and productivity) and from the perspective of the employees (support of work processes, autonomy, flexibility). However, high ambitions and positive expectations are not always fulfilled in practice. In a recent paper by Sandra Brunia and Iris de Been (both CfPB) and myself we analysed the findings from over 50 flex-offices, two best practices and two worse cases. This cross-case comparison

showed that many people can cope rather well with shared use of activity-based workplaces, but a number of people complain about a lack of privacy, poor support for work requiring concentration, and insufficient storage space. Aspects that are, in general, appreciated by a high percentage of employees are the accessibility of new offices, the architecture, and the opportunities to communicate (all with over 60% satisfied employees), whereas indoor climate, privacy, archive facilities, opportunities to concentrate and sharing own ideas about the work environment are more negatively appraised (less than 40% satisfied). When people are prohibited to personalize the work environment, they seek additional ways to make the environment familiar and pleasant and to mark their identity.

The available research data reveal clear critical success factors, in particular: a supportive spatial lay-out that facilitates both communication and concentration, attractive architectural design, ergonomic furniture, appropriate storage facilities, and coping with psychological and physical needs such as privacy, thermal comfort, daylight and view. Open spaces should be alternated with enclosed rooms that are dedicated to concentration work or telephone calls and provide some privacy. Sufficient acoustic measures are needed to avoid aural distraction. Critical process factors are the commitment of managers, a balance between a top-down and a bottom-up approach, and clear instructions on how to use activity-based workplaces. Other factors that contribute to a successful implementation of a new office concept include a clear understanding of the nature of change, a thorough ex ante analysis of the organisation, its work processes and the current accommodation, clear and unequivocal objectives, strong leadership, and adequate aftercare.

All research findings improve our understanding of what is really going on in the offices of our times. The empirical data can be used by managers to take well-informed decisions. However, the data don't provide a blueprint how a high-performing office should look like. Contextual differences regarding organizational characteristics, working processes, staff characteristics with regard to age, gender, ethnics, education and function, and the cultural and economic context require more or less a tailor made approach. Taking into account all findings and lessons learned, decision makers can reduce the risk of "wrong" decisions and improve the probability of positive outcomes.

Concluding remarks

It is great to notice that the study trip of Hans de Jonge and his initiative to start a research program on new ways of working in the mid-nineties has resulted in such a huge number of research activities and decision-support tools. The research findings provide research based evidence that an appropriate work environment really matters and can make a substantial difference in high or low employee satisfaction and productivity support. Most findings are in line with the findings from former research in open plan offices. This shows that in spite of many changes in society, organisations, business processes, ways of working, and technology, some factors are constant over time and place and should always be taken into account to be successful.

Although Hans de Jonge is leaving the university and I already left the TUD in August 2015, Delft research on work environments will certainly be continued. It is a key issue in the research program of the Center for People and Buildings. One of Hans' current staff members, Salomé Bentineck, works of the experience and use of work places in higher education. Graduation students are highly interested in innovative work environments as well. My own successor, Tuuli Jylhä, co-authored papers on the perceived value of workplaces, value creation and lean thinking. This seems a sound basis to further elaborate our legacy of research on design and management of workplaces that fit with organisational objectives and end-user needs.

Dr. Ir. Theo van der Voordt is emeritus associate professor of Corporate Real Estate Management at the Department of Management in the Building Environment, Faculty of Architecture TU Delft, and senior researcher at the Center for People and Buildings.



The beautiful Campus of Cornell University, Ithaca, New York, where I spent a short sabbatical of four weeks in 2004 in the group of Franklin Becker