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Int. J. Production Economics 52 (1997) 291–303

international journal of  
**production  
economics**

## Cellular Green-Teams in global network organisations

D.T. Wright\*, N.D. Burns

*Department of Manufacturing Engineering, Loughborough University, Loughborough, Leicestershire, LE11 3TU, UK*

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### Abstract

Information technology (IT) and communications technologies are promoting new virtual forms of business enterprises based on teleworking. Performance issues relating to organisation form, depend much on the performance and interworking of technology, infrastructure, and working practice. The cellular Green-Team approach as practiced at a heavy engineering Small-to-Medium sized Enterprise (SME) involves daily meetings and noticeboards to plan, monitor and control collaborative working across virtual autonomous business units in both office and shop floor environments. Current research involves development of an IT-based version of this system, with emphasis on capture of the qualitative aspects of corporate knowledge in parallel with existing Computer-Aided-Design (CAD)/Computer-Aided-Manufacture (CAM)/Enterprise Resource Planning (ERP)/Finance quantitative systems. In future is planned the implementation of the system in a global network of Green-Teams collaborating on engineering design tasks. This paper describes how such an intranet (i.e. corporate use of Internet technologies) impacts on organisational delivery of information, operations, structure, strategy, management style, and employees. Supporting the wider applicability of these findings, are the summarised results of a 28 company-survey undertaken by the authors.

*Keywords:* Green-Team; Teleworking; Virtual enterprise; Strategy; Management; Globalisation; Intranet

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### 1. Introduction

There is increasing pressure on organisations to compete more effectively to survive in changing global trading markets (Lambert et al., 1995). Devaluation of the Japanese Yen demands cost cutting, revenue expansion and innovation of this major group of world exporters. Western economies and firms ravaged by a decade of recession and mild growth, in benchmarking globally, seek to compete on an equal footing with the Japanese, and

must similarly embrace organisational change to achieve targeted technical and financial performance gains (Fawcett, 1992). Organisation change typically involves information technology (IT), organisation structure and strategy, and human resource (HR) initiatives, united under the umbrella term Business Process Reengineering (BPR) (Edwards and Peppard, 1994). Recently, organisation structures and management styles have undergone major changes with many organisation's featuring a core of permanent staff, with a periphery of temporary staff who build up portfolio careers, and may use IT to facilitate collaborative teleworking (Berry, 1996). The author's assert that

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\* Corresponding author.

an important point often discussed, but rarely addressed, is the impact of these changes on “how things are done at XYZ plc”.

This paper introduces a new dynamic organisational paradigm incorporating and affecting organisational technology, people, structure and strategy (Noble, 1991) – Virtual Green-Teams – as is being investigated at a heavy engineering Small-to-Medium sized Enterprise (SME) to help it better face the challenges presented by an ever changing business environment.

## 2. Network organisations of the future

A range of new organisational designs have been discussed in the literature: virtual corporations, hollow organisations, network structures, modular organisations, hybrid, quasi-firm, spiders-web, and hamrock organisation (Edwards and Peppards, 1994; Robey and Sales, 1994; Robbins, 1990). Trends include: outsourcing (Fawcett, 1992), varying ownership arrangements (vertical and horizontal integration) (Robey and Sales, 1994), lean firms, decentralised and network firms, and global enterprises (Orfali et al., 1995). The key issues include: breadth of purpose, location and management of boundaries, value creation, and mechanisms for stability and control (Robey and Sales, 1994). Lean firms, where technology automated some people out of jobs, against a backdrop of mergers and buyouts of the 1980s, resulted often in a “meaness”, where a lack of support by multiple stakeholders impinged effective change (Edwards and Peppard, 1994). Decentralised and networked organisations, where technology and defined contracts between decentralised units led to a greater effectiveness than matrix or bureaucratic organisations, rely somewhat on a strong organisational culture, co-operation, teleworking and IT, and a conscious effort to maintain ethical conduct (Berry, 1996). Global firms are supported by technology for rapid innovation dissemination, political glasnost (“openness”), and a freedom of information.

Table 1 gives an overview of the currently accepted range of organisation structures, with the increasingly common virtual organisation, reflecting

the impact of IT on structure and performance (Berry, 1996; Robbins, 1990; Constantine, 1995; Mintzberg, 1979). Previous technology advances has eliminated business sectors (e.g. punched card manufacturers). Can we look ahead 20 years to see which sectors or organisation structures may not exist?

## 3. Towards a dynamic organisational description framework

There are a number of ways of describing organisation functionality:

- in terms of physical structure (based on life-cycle stage and geography) or functional divisions and chains of command/authority/control (see Table 1) (Robbins, 1990);
- in terms of measurement of resource and activity costs or financial accounting (Wilson and Chua, 1994);
- in terms of physical flow of goods and information, or logistics/Enterprise Resource Planning (ERP)/workflow (Fawcett, 1992); and
- in terms of business processes possibly packaged as an object (as in object oriented analysis (OOA) (Jacobsen et al., 1994)).

The resultant descriptions tend to focus on past performance, and existing structure. Many authors have suggested that organisational behaviour is derived from organisational structure. Organisation's whose structure is static tend to be less reactive or proactive to the change needed to compete (Berry, 1996; Robbins, 1990). If a successful organisation needs to be able to rapidly change structure or processes, then we need a model to better describe this “strange creature”. It follows that managers will therefore need a dynamic organisation description, with the ability to be rapidly modified to reflect reality, and be useful for simulation or *what...if* analysis (see Fig. 1). Within Fig. 1 is Mintzberg's (1979) five-part contingency model of an organisation (building on contingencies of size, technology and environment of the 1960s). For different structures, the profile of the model, and the relevant importance of each aspect (e.g. strategy, technical, middle, support, and core) varies. It is useful in describing the power and functional

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