Chapter 6
Before the Internet: The Relevance of Socio–Technical Systems Theory to Emerging Forms of Virtual Organisation

Ken Eason
Loughborough University, UK

ABSTRACT
Virtual organisations, in which the technology mediates the interactions in the social system, are an emergent form of socio-technical system. This chapter reviews the concepts and techniques of the 50 years of socio-technical systems theory development that preceded the internet to examine their relevance for the study of the virtual organisation. It first examines the socio-technical system concept of work organisation in relation to the quality of working life and relates these issues to contemporary forms of virtual organisation. It then examines work organisations as open systems and explores the implications of task interdependencies for the delivery of operational work. It questions whether socio-technical concepts are appropriate for emergent forms of virtual social community and concludes that many socio-technical characteristics are also likely to be found in these forms of organisation. The chapter then examines the implications of a technology that mediates communications between people in the social system. It concludes with a plea that we go beyond the design of technical systems to support virtual organisations and, in the tradition of socio-technical systems research, concern ourselves with the joint design of the social and technical components of virtual organisations.

INTRODUCTION
The widespread adoption of the internet means that, for many people, the computer is now a major means of communication with other people far and wide. As a result many forms of human organisation have an increasingly virtual character; the people who co-operate in the organisational endeavour are not necessarily in face-to-face contact. These developments can be classed as new forms of socio-technical systems in which emergent and virtual social systems are dependent upon and mediated by the internet and all the tech-
Before the Internet

The technical applications it has spawned. It is important now to be examining the socio-technical nature of these virtual communities and the implications of the forms of interaction that mediate human communication in these communities.

There is a danger that, in the excitement to study new phenomena, all that has been learned about the operation and design of socio-technical systems in the past 50 years might be overlooked. The aim of this paper is to examine some of the major concepts in socio-technical systems theory to emerge before the internet and to evaluate their relevance to the new forms of virtual organisation that are now appearing. This paper will focus upon the contributions of what has become known as the Tavistock Institute tradition of socio-technical systems theory, an approach to understanding operational work systems developed originally by Emery and Trist (1960) and Rice (1958) at the Tavistock Institute of Human Relations in London and expanded by others around the world in the subsequent half-century, see for example, Herbst (1974), Pasmore et al (1982), Pava (1983), Mumford (1987), Cherns (1987), Weisbord (1990), Clegg (2000) and Klein (2005). Other theorists have approached socio-technical systems issues from different conceptual bases but the purpose here is to evaluate the current relevance of the rich vein of research and practice that the Tavistock Institute work has inspired.

THE EMERGENCE OF VIRTUAL ORGANISATIONS

We may define virtual organisations as enterprises in which people engage in a collective mission remotely from one another through the medium of information and communication technologies. Some enterprises started as virtual organisations in order to exploit the capabilities offered by the internet, i.e. they have never existed as ‘bricks and mortar’ organisations where staff worked and customers visited. In the commercial world, Amazon and eBay are examples of such organisations and in the social networking world, FaceBook and Twitter have developed in a similar way. The majority of organisations, however, originally operated and offered their services from physical premises and may be on a journey to becoming progressively more virtual. Several authors have used maturity models to define the stages through which organisations tend to pass as they become more virtual. Reporting specifically about the stages that government departments go through to implement e-Government, Layne and Lee (2001), for example, describe the following:

- **The catalogue stage**: having a website presence on which services are listed with information about how to access them by visiting, writing or telephoning government offices. In the private sector, companies may use the internet as a ‘shop window’ that customers can browse, perhaps before visiting a shop.
- **The transaction stage**: offering citizens the opportunity to submit tax returns, renew licenses, make benefit claims etc directly through the internet. In the private sector, when companies enter the transaction stage, customers can buy goods and services over the internet.
- **Vertical integration**: reviewing all the functions in a particular division and using the technology to integrate them more effectively.
- **Horizontal integration**: using the technology to integrate across departments and perhaps with other organisations involved in delivering services.

In the first two stages the organisation may remain largely unchanged. However, when vertical and horizontal integration take place, the organisation may become progressively more virtual. For example, ‘back office’ functions may be outsourced, call centres may be established,