Chapter V
Socio–Technical Theory and Work Systems in the Information Age

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ABSTRACT

This chapter sets the traditional focus of socio-technical systems theory on primary work systems in a modern context where information and communication technology (ICT) has a major influence in the way work is undertaken. The chapter begins with a summary of the original work of the Tavistock Institute of Human Relations and critically reviews the major concepts to emerge from these studies. This is followed by a review of recent studies of the impact of ICT on work systems and how socio-technical systems concepts are used to interpret these findings. Finally, concepts and methods of designing socio-technical systems are reviewed in the context of current ways of designing and implementing customizable and generic ICT systems in organizations. The authors call for a recognition and evaluation of socio-technical systems as never completed but evolving over time; placing an emphasis on the emergent behavior resulting from the use of new technical systems.

Technology presumes there's just one right way to do things and there never is.

—Robert M. Pirsig

ORIGINS

Socio-technical systems theory was originally developed by the Tavistock Institute of Human Relations in the 1950s to explain how new technology impacted primary work systems (Trist et al 1963, Rice 1958). The main case studies concerned the impact of mechanisation on work systems that wove cloth and mined coal. The issues addressed were the way the new technologies of the day disrupted the social systems and work roles of the people engaging in these work systems and what kind of joint technical and social system design was necessary to create effective, integrated socio-technical systems.

INTRODUCTION

The purpose of this chapter is to set the traditional focus of socio-technical systems theory on primary work systems in a modern context where information and communication technology (ICT) has a major influence in the way work is undertaken. Today ICT also provides the means by which new communities can come together, e.g. in the use of social networking systems. However, the focus remains on primary work systems. In this case ICT is supporting people in work roles who are co-operating together to undertake the primary work of their organisation in banking, retail, local government, education, healthcare among other domains. The aim of this chapter is to re-evaluate the original concepts of socio-technical analysis and design in the light of the modern forms of work system that are made possible by ICT.

The chapter begins with a summary of the original work of the Tavistock Institute of Human Relations and critically reviews the major concepts to emerge from these studies. This is followed by a review of recent studies of the impact of ICT on work systems and how socio-technical systems analysis concepts are used to interpret the results of these studies. Finally concepts and methods of designing socio-technical systems are reviewed in the context of current ways of designing and implementing ICT systems in organisations.

WORK SYSTEMS AS SOCIO-TECHNICAL SYSTEMS

After the Second World War many companies mechanised their production systems in the confident expectation of great improvements in productivity. In many instances, however, the results fell far below expectations. The Tavistock Institute of Human Relations in London undertook a number of studies to explore why the results were so disappointing. In one of these studies Trist et al (1963) studied the introduction of longwall coal mining techniques in two coalfields in England. In longwall coal mining the traditional small coalface worked by a small group of miners using pick and shovel was replaced by a long coalface in which the coal was 'shot fired' and then loaded onto conveyor belts that ran the length of the face. What the investigators found was that, although the technology made it easier to win coal, the social structure of the work roles of the miners had been completely changed in ways that made it difficult for them to co-operate. Whereas the small team at the coal face had previously worked closely together to complete the whole mining process, there were now three shifts of miners on the longwall coalface undertaking different activities on different shifts, e.g. one shift was devoted entirely to dismantling equipment and moving it forward. Each shift now had its own specialised staff devoted to the tasks that were intended to be undertaken on their shift. The new organisation was proving inflexible and whenever problems occurred, a very common occurrence in difficult underground conditions, the work of whole shifts could be lost. The authors coined the term socio-technical to demonstrate that, whilst the technical system might be an improvement on the old one, if its use disrupted the tightly organised system of work roles that was the social system, the result would be sub-optimal performance of the overall work system.

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