# Chapter 14

# Organisations

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## Summary

Systems engineering for organisations presents many socio-technical challenges. These challenges are not just problems of better specifications and better technologies, but also of understanding, supporting and changing the real world practices of the people working in organisations.

## Background

Engineering information technology for organisations is a socio-technical problem. This is because IT is often developed as a part of organisational change projects, because IT impacts the ways people work and interact, and because IT must be adequately supported within an organisation. Therefore, systems engineers need not only understand and configure technology, but must simultaneously be able to understand and configure organisations.

The word organisation can be used as both a noun and a verb. Socio-technical systems research views organisations in both of these senses, both as a thing and an activity. Organisations are not static, objective entities, but are enacted, constantly being held together by the actions, talk, writing, decisions, and so on, of those working in and around them. Consider a University; you could point at various departments, lecture theatres, sports facilities, libraries and so on, but what makes it a University is not just its buildings and equipment but also the work of those within it (such as staff and students, etc.), and those around it (such as Government departments, funding agencies, etc.). For

socio-technical systems engineering, it is important to see organisations in both of these senses; systems must fit with and support both what the organisation is, and what the organisation does.

## Organisational Models

An organisation will usually own models and descriptions of its organisational structure and of the roles, responsibilities and processes that take place within it. However the realities of an organisation will hold differences to those representations. The reasons for this include:

- Organisations are complex and difficult to represent.

- Organisations constantly change and so the representations quickly date.

- The ways in which people work are contingent upon contextual factors such as the time and resources available, their training, and whether there are other competing demands.

- Much of the work of an organisation is (rightly or wrongly) seen as too mundane or unremarkable to model.

- Representations of organisations are often aspirational, signalling what the organisation is seeking to become.

Therefore it should never be assumed that a model of an organisation is accurate. This is not however to say that such representations should be abandoned, but that they should be seen as indicative rather than descriptive. Problems can be caused when information technologies are implemented that support the organisation-as-modelled but not the organisation-as-practiced. Socio-technical systems engineering needs to account for both of these.

## Work Practices in Organisations

Organisations often employ many people, and they are often distributed across different sites. A routine challenge faced by organisations therefore is how work can be kept orderly between employees; how people can collaborate, work cooperatively around shared resources, minimise conflict and overlap, etc. This is handled by a combination of formal contrivances and more informal, social practices. For example:

- Organisational work often involves following plans. These allow for work to be scheduled, articulated and tracked. However these support, but do not ensure orderliness. For example a plan cannot provide remedies for all contingencies. Plans are routinely followed dynamically and remade as work progresses. Questions can repeatedly arise as to what exactly can be done to satisfy the plan, what parts of the plan are achievable given the time available, and what is missing from the plan.

- Some organisational work follows defined processes or workflows. For example call centre workers follow scripts, health professionals follow clinical protocols and workgroups may be coordinated through workflow systems. To follow these, it is often necessary to do work that is not defined by the process itself, for example extra work or checks may be needed between steps and people may need to backtrack or look ahead in a process. To diverge from or abandon these is also often done for good reasons, perhaps because they do not fit with the current problem being addressed, or because the necessary resources are not available.

- Although projects, plans, procedures and so on may be presented as abstractions, as manuals, as flowcharts, and so on, just what it takes to realise them is a practical matter that must address the contingencies that will inevitably arise. Socio-technical systems engineering must therefore pay attention not only to the formal aspects of the division of labour, but the practical ways in which this is handled.

## Knowledge and Information in Organisations

The development of information technology for organisations usually has to somehow rationalise the information held and used by that organisation. This can often prove a complex task and will inevitably have partial coverage. The reasons for this include:

- Organisations routinely deal with myriad forms of information, from formal documents to informal notes, from statements of fact to opinions and comments, from processes and workflows to know-how about how something was done before, and so on. Information is made and remade at different times and in different places across the organisation. Documents are often re-written, copied between, marked-up, collected together and so on, and so information becomes held in different versions for different purposes in different places.

- Information is often made meaningful by its context, for example by it's positioning on a desk or in a folder. The meaning of any document or other form of information is not necessarily made clear by that document itself but through its featuring in routine work, through talk and activities around it and through its bundling with other documents.

- Computerisation also often removes the physical affordances of documents, meaning for example that they cannot be handed around, collected together, talked across, and so on. There is rarely one single information system used, but information will be spread across multiple technologies, many of which will overlap and conflict with each other and many of which will be short lived. Attempts to implement a single system for an organisation will often see other technologies developed around it, for example people often use spreadsheets and word processors alongside enterprise systems.

- Information technology is extremely valuable for organisations, but it is not the case that all of the knowledge within an organisation can be formalised. Attempts to formalise information can lead to frustrations and often informal, local stores of information emerge (such as notepads, collections of print-outs, cheat-sheets etc.) to support the work. Technology support for knowledge work therefore needs to address the needs and practices of workers, not just concentrate on the logics of information.

## New Technology and Organisational Transformation

Although new technologies are routinely touted as transformational, the reality is that organisational change is not determined by technology. New technologies in organisations go through a process of domestication, in which the people that work with them develop ways of using the technology that they find convenient and suitable for what they must achieve in their work. In this there is often a strong push towards making new technologies into tools to achieve "business as usual". For example, the introduction of new technology in financial services, whether telephone banking, video-links or Internet banking, especially in the context of customer-facing work, has not re-written the relationship between the bank and its customers but necessitated the development of new routines and competencies in customer interaction.

## Working Across Organisations

Large organisations or enterprises are usually made up of multiple sub-organisations. Organisations also rarely work in isolation from other external organisations, for example they may work in partnerships, sub-contract, interact with regulatory bodies, have close relationships with suppliers etc. Organisations therefore are rarely discrete entities but overlap and have fuzzy boundaries. Information technology can cause problems here in that it tends to congeal the boundaries around an organisation; in the process of making information available within and unavailable without an organisation, IT entails that "within" and "without" become much more tightly defined.

## Retrospective

Organisational issues are often problems of the kind that can be tamed, but not solved. Ethnographic work has served to highlight these problems, and ethnography as an approach within socio-technical systems engineering remains useful as it can address the unique ways in which organisational problems emerge and must be tamed during the systems engineering process. The papers on this topic therefore do not offer solutions but serve to sensitise their readers to the kinds of organisational issues that manifest.