Changing Places

The challenges of boundaries and scalability in the workspace

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1. PERSONAL BACKGROUND

In this workshop, I am offering some of my personal views based on my experience of working with and for large organisations.

I am a freelance consultant, working mainly with the Inland Revenue Business and Management Services Division. This large organisation (over 1000 people) is in turn responsible for delivering business systems - computer systems and non-computer business products - to an even larger organisation, the Inland Revenue operational divisions. Typical computer systems have thousands of users and millions of records.

Previously, I worked in systems integration. Consider a typical large computer company, such as Bull Information Systems or Motorola. The process of bidding for and delivering a major contract – perhaps for £10 million or more, with work over several years - required us to establish consortia and many sub-contract and other supplier/customer relationships.   For example, Bull might find itself working as sub-contract to ICL on one project, prime contractor with ICL as a sub on another, and in competing consortia for a third.

My perception is that large organisations pose three challenges for us when we consider the nature of co-operative work, and the systems that might support it. These are:

- The need for information management and control

- Setting the boundaries of the workspace.

- The extension of systems to large numbers.

2. INFORMATION MANAGEMENT AND CONTROL

Large and complex teams need to share information, but also to control it. For example, ISO 9001 states

"The supplier shall establish and maintain documented procedures to control and verify the design of the product in order to ensure that the specified requirements are met."

In the public sector, there is also the requirement for accountability: it is not enough to make a decision, the decision must also be recorded.

The need for control and accountability has often been met by controlling physical documents, signed by whoever is allowed to authorise them. A controlled circulation list is part of the document: if a change is authorised, each person holding a copy is issued with the new version. Because change is controlled, everyone can work with confidence knowing that the document they hold is the current version. A large project can require hundreds of change-controlled documents.

Paper documents can be an ineffective way of sharing information. Important changes may be avoided because of the sheer difficulty of updating the documents. A change-controlled document is likely to be written in a formal style, which is difficult to understand. In practice, the documents are supplemented or even supplanted by other forms of information sharing such as meetings and telephone calls, and the actual decision-making process may be different from the documented process.

The mechanisms for sharing and creating the information in the first place are changing: increased use of email makes it easy to disseminate information but much more difficult to control who is getting it and what version they have. If you already have the decision on a computer and you have circulated it to whoever you consider to be interested then you may not see any point in printing it off, signing it and controlling the circulation list.

There is also increasing demand for richer ways of sharing and understanding information. For example, the Inland Revenue and its information technology partner EDS has moved away from its old structured method, SSADM, which placed great stress on documents and control but meant that projects took a long time. Now they use a 'Rapid Applications Engineering' method, similar to methods known as Joint Applications Development (JAD) or Rapid Applications Development (RAD). This brings end-users into the development process to participate in joint decision-making with the developers. But if you have hundreds of developers, how are they all going to share the interchange? And how will that interchange be documented and controlled?

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3.   THE BOUNDARIES OF THE WORKSPACE

In a large organisation, what is the workspace? Consider the annual process of changing the tax return. At least 120 different tax specialists have to review and update their particular area of it. Requirements for the computer system have to be changed. Different project teams work on the software for capturing the returns, for reconciling the captured data with the database, placing it in the data warehouse, producing the work lists for enquiries and many other aspects. Software houses need to change their programs as well. The printers have to adjust their orders for paper and ink. I could add many more stakeholder groups.

Now let us look at my other example of a large organisation. I am putting together a bid for part of a major system. My client is the prime contractor. He is considering my offer, and a competitor's. I am weighing different bids from my sub-contractors: maybe PC suppliers, elements of the software, specialist interface devices. And I am considering whether to bid with this client, or with one of his competitors.

So where will we set the boundaries for the workspace? There is my immediate project team to consider, but I also have to share aspects of the work across boundaries. I may need to hide other aspects of the work, for commercial or security reasons.

In a big project, even the terminology may not be shared between the different groups. For example, 'technical' means 'to do with the computer' for the programming parts of my Inland Revenue project, but it means 'to do with tax law' to the tax specialists. I worked at one time on private mobile radio systems: we had 'switch' meaning 'device that sets up multiple radio connections', 'device to make X.25 wide area network connections' and 'on/off control on an electrical or electronic device'.

These boundaries can vary by project, by date, by security clearance, by role. I do a lot of work with the Inland Revenue Forms Unit. For 50 weeks of the year I can come and go as I please, with my own pass. For two weeks each year I have to be escorted at all times when I am on the premises, and try to avoid turning up: the two weeks before the Budget.

Is improved technology for co-operative work in the small sub-teams going to mean bigger problems for co-operation between teams?

Charles Handy, in 'The Age of Unreason', describes an increasingly fragmented structure to organisations. He sees small core teams, a contractual fringe, and a flexible workforce. If his vision is correct, boundaries to the workspace will need to accommodate the occasional worker, the 'portfolio worker' and the sub-contractor just as easily as the core team.

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4.   THE EXTENSION TO LARGE NUMBERS.

My final challenge is the problem of large numbers. I referred earlier to the hundreds of documents in a large project, and to the multiplicity of different sub-teams and groups.

For example, the recent Self Assessment system had over 1,000 computer development personnel, and probably about the same number again within the Business and Management Services division. Can the co-operative environment support these numbers?

This issue is not just about physical connection – it is also about scalability in the quality of the discourse. For example, the telephone network connects nearly all of us - but conference calls and multiple callers just do not work as well as one-to-one. It can become hard to disentangle an email as it expands with the replies, comments and previous responses – three or four are not a problem, but 90 or 100?

Although I have just asked for access across boundaries, this too can be a problem. As we make it easier for people to share information, is there a tendency for them to overload each other? In a small community, it is relatively easy to establish rules for use of the medium – in a large one, there may have to be policies and sanctions for violating them.

Even our workshop today has had to acknowledge the difficulty of scaling a technology to large numbers. Despite our thousands of years of experience of the technology of a gathering of people in one place, our organisers have had to limit the attendance to 50. Could an electronic equivalent have offered more places?

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5.   CONCLUSION

I am not here to give you any answers, but just to try to persuade the researchers to consider these issues. When you are investigating your new technologies and models, can I urge you to ask yourselves:

How will this meet the need for information control and accountability?

Can this work across changing boundaries?

Will it work for large numbers of participants, and maintain the same quality of experience irrespective of the numbers?

6. REFERENCES

Handy, C (1989) *The Age of Unreason* Business Books Limited, London

BE EN ISO 9001:1994 *Quality systems Model for quality assurance in design, development, production, installation and servicing* British Standards Institution, Chiswick

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