DEVELOPMENT OF ICT IN PROFESSIONAL WORK

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Abstract: ICT plays a critical role in many organisations of today. It is important in well-tried systems development methods as well as in recently improved object-oriented methods to support development of information and communication technology in many different organisations. The methods provide prescribed and formal ways to perform the development. This paper reports the results from two different studies performed. The first is an ethnographical study in the NU health care organisation in Sweden and the second is a case study carried out at the Wing of Såtenäs, an airbase within the Swedish Air Force and at Volvo Aero Corporation. The aim of this paper is to describe and analyse the character of professional work and its impact on development of information and communication technology. Professions consist of special competences and attitudes to the work they are performing. The professions of the health care workers and the flight technicians can also point this out.

1 INTRODUCTION

The development of information and communication technology can be made in many ways. Some development projects are characterised by a hard systems approach, where the system is clearly specified from the beginning. This approach has been the predominant way to develop systems from the beginning. Other development projects have a soft systems approach, where systems developers and people from the user organisation in various degrees are working together in the process of the development (Checkland, 1993), (Dahlbom, Mathiassen, 1993). Systems development methods are often used within development projects, both well tried as well as the recently improved object-oriented methods. Methods are important because they give experience and inspiration in collaboration between systems developers (Mathiassen, Munk-Madsen, Nielsen, Stage, 2001).

In the development process ICT aspects can be found on of how different professions and occupational competencies have an impact. In this paper the development of ICT for professional work is considered, in difference from systems to support pure administrative routines. To develop ICT for more knowledge-intensive work demands a deeper understanding for the complexity of the work. This problem of complexity is going to be of more and more importance as both the knowledge-intensive organisations and the intensity of the knowledge increase (Alvesson, 1993). A definition about knowledge-intensive work and professions is therefore needed.

In different professions there can be used different "languages" and how they talk to each other are important to stress. Different professions are characterised by different cultures, which also can have an impact on the ICT development. Some professions can have more experience of ICT and its facilities than others. Professional workers are often influenced by its profession's prestige, authority and monopoly (Schön, 1991).

An ethnographical study has been performed in the NU health care organisation in Sweden. Another study is performed as a case study carried out at the Wing of Såtenäs, an airbase within the Swedish Air Force. The aim of this paper is to analyse the character of professional work and its impact on systems development.

2 RESEARCH METHOD

The ethnographical study is performed at a health care organisation in Sweden, the NU Health Care (Johansson, Lundh-Snis, Stahl-Falck, Svensson, 2001). Ethnography has been the method for

collecting and analysing data from the empirical settings (Hammersley, Atkinson, 1995).

The case study has been carried out at Volvo Aero Corporation, where the development, manufacturing and maintenance of jet engines take place. Interviews and studies of the work practice have also been made at the wing of Såtenäs (Johansson, 1999), (Johansson, Snis, 1998), (Johansson, 2003).

3 THE ANALYSIS OF WORK

In this chapter an analysis is done due to the character of professional work in the studies performed. The impact of the professional work on ICT development is analysed in the two cases.

3.1 The Work in the NU health Care

Often the personnel in the NU health care, in ICT development projects, experience that the IT personnel express the specification of the ICT in their own technical words. Words and expressions are used, which the health care personnel do not fully understand. However they think that the IT personnel have got a good understanding of the problems, that they only express themselves in their own words. But the problem is often that the IT personnel not have the fully comprehension of the work activities and the systems under development, which will be supportive to the organisation. Instead they have a good knowledge of the technical requirements of the system. The IT personnel know very well how the new system should be adapted to the network and so on.

Doctors and nurses belong to different professions. They work with different activities. They also have different perspectives on the use on ICT.

The work in the health care is complex and often unique situations will occur. The doctors and nurses have to take care of patients with different injuries and diseases. In the work they have to find out diagnoses and treatment for the patients based on different criteria. Though this work does not only need knowledge, it also requires experience to find out treatments for complex injuries and diseases. They also have to type every kind of treatment and other information about the patient in the medical records.

Of cause there is progress within the knowledge in the different professions. Expert knowledge within specific areas is to be taken into account. Therefore some documents have to be rewritten and updated and distributed throughout the health care organisation.

3.2 The work in the Aircraft Maintenance

Sometimes standard systems are implemented and used in different organisations. They are used as advanced support to make organisations more efficient. This objective was also obvious for the Air Force in the maintenance work a couple of years ago. An attempt to adapt a standard system to for saving all the information about the aircraft has failed. Even though a group from the information department was involved in the adaptation process, the system was never implemented. A reason for this failure can be that it is too difficult to implement a standard system in an organisation with complex information handling.

Different professions have its own ranger's district. This can be proved when the flight technicians have suggested photographing faults in order to easier understanding of the faults. But to analyse faults further is a work for the control engineers, so the control engineers do not want the flight technicians to take pictures.

It is not always easy to localise the faults occurred at an aircraft. Often the flight technicians need to use their sense of smell, hearing and sight to understand what is the fault with the aircraft. The trouble-shooting and trend analysis system gives an indication about what the fault has to do with. The flight technicians have to localise the real faulty component. It is rather difficult to use and handle this trouble-shooting and trend analysis system. Today there is only a few of the flight technicians who can handle the system. It is difficult to do the right things in right sequence to not destroy any of the data in the system. In practice there are volunteers of the flight technicians who have special interest to manage the evaluation process with the computer. These dedicated volunteered flight technicians have a lot of work to do with the evaluation of the data. It takes almost the whole days to analyse the data from all aircraft at the company. They will be very skilled and capable to do the evaluation work. It demands creativity and innovation. But as a consequence they have difficulties to maintain their knowledge and competence in doing the real maintenance work with the aircraft, because they seldom work with the maintenance work at the aircraft.

4 DISCUSSION

Each systems or technology development project is more or less unique (Sommerville, 2001). Methods therefore need to be adapted to each development situation. It also means that methods and describing techniques are important to develop unique systems and technologies. ICT for professional work is characterised by unique and complex information use as in the cases of health care and aircraft maintenance. Methods are used to specify what to do in developing ICT.

No one of the methods used in development projects in the studied organisations take any special consideration to the character of professional work. This can be proved by both of the described cases in this paper. The fact that the handling of information is very complex causes an impact on the ICT development is evident. Above all it has an impact on the analysis phase. It is much more difficult to understand and describe a complex use of the information. The systems developer must get a deep understanding of the work performed in the organisation. For example the different frames of references between the health care personnel and the IT personnel should be taken into consideration. It is important not at least in professional organisations to analyse the work activities to get a good basis for the development of new systems and technologies. In order to understand the professional work in a deeper way, participative observations could be performed.

5 CONCLUSIONS

The professional work is often characterised by very complex handling of information. The cases have shown some implications in the use of the ICT. The methods should take into account the increase of professional work and that it requires a deep understanding of the unique and complex work activities. Especially the analysis phases should be improved in respect to the importance of to deeply understand the work performed in professional or knowledge-intensive organisations.

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