

# Using Technology and Constituting Structures in Professional Kitchens

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## ABSTRACT

This paper concerns on technology use in work at a female field. We study how everyday use of technology and skills for it reshapes organizational structure. We focus on a field, in which ICT has just become in common use; that is food service. We studied it through one case; a hospital kitchen. Although technology is not widely used, there exist technology in equipments (as high-tech self cooking centres) and computer applications (as recipes design). Managers' role is central in official hierarchy but cooks has remarkable role in non-official structure, with preparing the main dish with new technological equipments.

## Keywords

Food service work, hospital kitchen, organizational structure, technology related work practices, technology use.

## INTRODUCTION

Several studies (e.g., Orlikowski 2000; Engeström 1989) prove that there is a connection between the technology used by and the structure of an organisation. Humans constitute structures in their recurrent use of technology, as Orlikowski (2000) says it. We follow Orlikowski's study of 'practice lens' to examine how people, as they interact with a technology in their ongoing practices, enact structures which shape their emergent and situated use of that technology (Orlikowski 2000).

To study the constitutive role of social practices in the ongoing use and change of technologies in the workplace we look for a case in which the work practices are stable (e.g. no ongoing changes in the division of labour) and in which the change of technology used is notable. The criteria are fulfilled in professional kitchens, which reference to both private catering companies, such as restaurants and personnel canteens, or institutional

kitchens, such as those of schools, day-care centres and hospitals.

There are three types of workers in a professional kitchen: the food service manager, cooks and food service assistants. The manager's work includes planning, supervisory and monitoring tasks (such as the planning of menus, ordering the raw materials and deciding the workshift lists), furthermore, she<sup>1</sup> participates in the practical work of the kitchen. She knows everyone's work tasks and guides new workers in kitchen practices. The task of a cook is to prepare hot main dishes. The food service assistants' duties include assisting in pre-preparatory kitchen work and food preparation, baking, the portioning of food, serving meals, cleaning and sanitising the kitchen space and equipment, as well as kitchen equipment condition monitoring and tableware maintenance.

Although the first computers came into professional kitchens in the 1980s, their spread to all kitchens has been slow. Nowadays ICT<sup>2</sup> is used more since the size of kitchen units has increased, so that some tools are needed for planning, furthermore the networking of units can be supported with ICT.

There is a variety of ICT applications available for the needs of professional kitchens, which may be exploited for food production planning and instruction provision purposes: to design recipes and menus, to assess nutritional content, to manage raw material stocks, purchasing and cash register functions (Cobanoglu & Heiberger 2003; Feinstein et al. 2005).

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<sup>1</sup> We use the term she (instead of he) as most of the workers in professional kitchens are female.

<sup>2</sup> ICT = Information and Communication Technology

Besides the development of ICT applications, the equipment technologies relating to food production and food preparation have undergone vigorous development over the past few years. A typical feature of modern kitchen equipment is that a single device has a wide variety of functions. Examples are an electric kettle with a mixer cooks, mixes and chills, and multiple functions of an oven (called self cooking centre): steam cooking, adjustable steam cooking, convection, convection with adjustable extra humidity, combination cooking, and humidity control (see Figure 1). Furthermore, these devices also include ICT for making cooking programs and for collecting data from the production process (Metos 2008).



Figure 1: An electric kettle and a multi-functional oven (Metos 2008)

There has been heavy technology development in food production in professional kitchens. However, kitchen technology and the changes in processes, management and work practices have hardly been studied (O'Conner & Murphy 2004; Rodgers 2009).

In this paper, we first describe methodological issues and the case of hospital kitchen which we used for studying how using technology and constituting structures are related to each other. Second, we describe the results separately by each group of workers; they are food service managers, cooks, and food service assistants. Finally, we conclude and discuss the results about the interaction between technology using and shaping of organizational structures, based on Orlikowski's (2000) ideas.

#### **METHOD: INTERVIEWS IN A HOSPITAL KITCHEN**

During this decade we have collected many empirical materials about technology used and information needed in several types of professional kitchens, as from hospital and central communal kitchens and restaurants. For studying interaction between technology use and organisation structure, we chose one case, which gives a possibility for an interpretive study in which the role of empirical material is central.

The case of this study is a Finnish hospital kitchen. In 2007 there were 22 000 professional kitchens in Finland. They produced 797 million meals (Nielsen 2007). In Finland the work markets are strongly segregated to women's and men's work (Kolehmainen 1999;

Tilastokeskus – Statistics Finland 2008). Food service is a female field: 73 per cent of workers in 2005 were women (Tilastokeskus - Statistics Finland 2008).

Our case is an institutional food service organisation, a hospital kitchen which produces 3000 portions daily for patients and personnel. There works the head of the food services, 4 food service managers, 16 cooks and 36 food service assistants. The technology situation in the kitchen is good: there are several programmable and time-controlled vats and programmable ovens. Computers are used for recipe planning, production instructions as well as for ordering the patients' meals and the raw materials for production.

Empirical material for our study was collected by using theme interviews. The themes were formulated based on expansion of activity theory (which includes original model's subject, object and tool, and the expansion of workers' community, division of labour, and social norms) (Engeström 1987) and technology users' action space (Wong & Tiainen 2002). The used themes were:

1. *technological space* including technical equipments and applications, technical knowledge, and the use of technology,
2. *domain space* including kitchen work practices and knowledge about food preparing and servicing,
3. *social space* including kitchen workers, their division of labour, and social norms.

Seven workers were interviewed in spring 2007. The interviewees were one food service manager, three cooks, and three food service assistants. All the interviewees were female, since food service field is so female in Finland.

The analysis was based on Orlikowski's (2000) practice lens, in which she studied technology-in-use and organizational structure by focusing on facilities, norms, and interpretative schema. We analysed which equipments and applications the interviewees talked about (facilities), how they told about their use and learning to use them (norms), and in which context they talk about the equipments and applications (interpretive schema).

#### **RESULTS: KNOWING, DOING, AND TEACHING TO USE TECHNOLOGY**

We analysed interviewees' talk about their use of technology individually. As they were lots of similarities in each work role, we describe the talk by work roles.

##### **Food service managers: expected to know everything**

In the official structure the manager is at the top of the hierarchical structure. This is legitimated by their work tasks which include planning tasks, supervisory work and the development of workers' skills (e.g. the use of equipment and work processes). Planning work is done with the aid of a computer and it is done in an office, not in the kitchen. As the manager is not present in the kitchen, she is not participating in food preparation in

practice, so she does not have the routine of practical work and also her practical skills are not kept up-to-date. For example, managers do not know how to use high-tech self cooking centres (i.e. ovens), as one cook described:

”The ovens could be used more versatile... In our case the reason might be that the managers don’t know how to use them, so they cannot guide the cooks.”

Everyone, including the managers, expect that it is the manager who is to teach the others how to use the equipment. That cannot be done since the manager has only theoretical knowledge about them. The lack of practical skills weakens the manager’s ability to make the personnel familiar with the use of new equipment, which also weakens her position in the non-official organisation.

For planning tasks the manager uses a computer, which isolates her to an office, out of the kitchen. Her computer skills are better than her other skills. She describes that this is the manager’s area/space and she keeps it to herself as others are allowed to use computers only to a minimum level – “only a few of the workers can print receipts from the computer”, she states.

According to the manager’s description it is enough for workers that they can do one specific task with a computer:

”The workers have been taught to use a computer. Almost everyone here can take those lists out from a computer. Besides the salad group, they take the distribution lists which include what items need to be send to departments... There are good guidelines at the corner [near to the computer]. Just only few workers cannot take them the lists]; some older workers, who are scared that they break the computer.”

The level of needed computer skills is similar in the workers’ description, as the following quotation presents:

”The only [thing] what I do is to take the lists from there, but don’t ask what programs are used here, I don’t know. I can take the lists and that’s it.”

However, the planning work is invisible to other workers and they do not appreciate her computer skills, so this does not improve the manager’s position.

### **Cooks: skilled with technology**

A food service unit’s task is to produce meals and food services. The most important part is the main dish, which is commonly accepted to be the most important part of the meal. As a cook’s work is to prepare the main dish, this gives the cook the central position in the non-official organisation. Preparing hot main dishes is linked to using special equipment – electric kettles with mixers and high-tech self cooking centres. A cook’s skills in using them improve her position in the non-official organisation.

Although it is expected that the manager guides others, in practice cooks decide by themselves how to use new equipment. An electric kettle is used in a versatile way since its benefits are easy to understand.

”The programming of the casserole, it is a so great thing. It’s even usable for the making morning porridge... So it eases morning tasks remarkable. Flakes and salt are put to the casserole at afternoon and then, at the morning, it starts taking the water and cooks it. So when you learn such programming, it’s easy when you have once learned it.”

Contrary to this, self cooking centres are used in the same way as a conventional oven is used. It is used with manual control and the possibility of cooking programs is not made use of. The workers described the programming of cooking centres (i.e. ovens) like they had never thought to use it; they knew the feature but there is not obvious tasks which programming might make easier.

### **Food service assistants: not using**

Food service assistants do not use equipment in their own work. They know very well the functions and properties of electric kettles and self cooking centres. They talk about them with admiration. However, if they occasionally have to use them, they are afraid of the technology, as one of them told:

”Well, yes, I think that some ones can be so [scared of technology] that they don’t dare to touch [to devices]. They rather let others to put the devices on.”

Their talk – admiration of new equipment and the lack of their user skills – weakens their own position in the non-official organisation and improves that of the cooks.

## **DISCUSSION**

We studied how workers in a professional kitchen talk about technology use. On the one hand, the talk highlights the non-official organisation and describes the norms of the organisation. All interviewees share the assumption that everyone should have the skills to use the equipments and computer applications. Furthermore, it includes the view that those who daily use the equipments are more valued than others.

On the other hand, it underlies the existing situation. The talk includes old work practices which are not seen as a problem, as the manual use of ovens is accepted although the ovens could be programmed. Also the present hierarchy of the organisation is renewed. This is seen, for example, in the talk about the guiding others to use equipments; the manager is the one who guides; it is not co-workers job.

However, the deeper analysis presents contradictions. Every interviewee states that cooks are the ones who have skills to use equipments; they themselves describe so but also others tell that. When we focused what equipments and which features the cooks use, it was surprising since their learning is varying: For example, they use timing in an electric kettle, but no programming with an oven. In the case of the kettle the cooks get benefits immediately. This

way of using technology is called 'individual-productivity' by Orlikowski (2000).

In cases where receiving the benefits depends on changing the entire food production process (called 'process-support' by Orlikowski 2000), the cooks do not make the change. In the case of professional kitchen the managers are expected to start such replanning of processes. However, the increase of planning tasks has taken the manager out of the kitchen, and situations occur where the skill to use new equipment is missing and the knowledge of kitchen practices is out-of-date. In such a situation the manager is not capable of replanning the process.

There is a big difference between our study and Orlikowski's one. She studied IT professionals who were interested in using new technology. Just one group of them had a low interest in using technology and their technology-in-practice was 'limited-use'. (Orlikowski 2000.) In our case the workers had no special interest in using technology, just doing their job. Anyhow there was not an attitude to avoid using technology.

## CONCLUSION

We studied how technology use is talked in a hospital kitchen. Facilities they mention are cooking equipments (kettles and ovens) and computers with applications (which are almost only used by the manager). The norms of professional kitchen underlies managers role in guiding the workers, however, this does not work with new kitchen equipments. This increases cooks' position as they know how to use the equipments and they do use them. Interpretive schema is the same for all kitchen professionals; they see technology through food preparing process, in which planning part is minimal.

New planning tasks and new technology has come to professional kitchens. This has changed workers' positions; it has improved cooks' position and weakened that of others. In the present situation a cook can say: "No one has changed my job!"

## ACKNOWLEDGMENTS

The authors thank Virpi Salo and Tuija Ylä-Viteli and their students in Pirkanmaa University of Applied Sciences for collecting the empirical material in the hospital kitchen. Furthermore, the authors are grateful to Seppo Tammi for making our English more readable.

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