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Information Society, Work and the Generation of New Forms of Social Exclusion (SOWING)

Regional Case Study Report: Lower Austria

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INTRODUCTION

The region of Niederösterreich (Lower Austria) is one of the nine *Bundesländer* (federal provinces) of the Federal Republic of Austria. Situated in north-east Austria and surrounding Austria's capital, Vienna, Niederösterreich borders several European countries, such as the Czech Republic and Slovakia, as well as several Austrian *Bundesländer*, such as Burgenland and Steiermark (Styria).

Niederösterreich has an area of 19,200 km², a population of nearly 1.5m, and an employed population of some 660,000. More than 100,000 of this workforce commute to Vienna. In 1991 agriculture and forestry accounted for 11% of the working population; manufacturing industries employed 27%, and the service sector 51% of all workers.

Niederösterreich was selected for this study due to its geographical location, diversity of market structures, and particular status as political and administrative entity.

The selection of case study companies aimed at a strong representation of companies in the ICT sector, i.e. producers of hardware or software and providers of ICT services. Accordingly five out of ten companies fall into this category. In addition, we were looking for companies belonging to other sectors. Here we selected three intensive ICT users and two with low or medium ICT intensity. In order to be able to analyse differences and to illustrate obstacles to the diffusion of ICT, the aim was not to select only technological practices with high level of ICT use.

Apart from an over-representation of ICT-related businesses, the general economic structure of lower Austria was taken into consideration in the selection process. As a consequence manufacturing and tourism companies are among the sample. For these decisions the results of the SOWING company survey conducted in winter 1998/99 were a useful additional source.

In a process of intensive Internet and business literature reviews and interviews with experts during a period of nine months, more than 40 companies were contacted by mail and asked for their support. These endeavours resulted in ten companies with the desired characteristics agreeing to take part in the project. Three of the case studies (cases 1 to 3) were conducted in summer 1999; the experiences and results were used in the preparation and conducting of the remaining seven case studies between autumn 1999 and spring 2000.

The following table gives an overview of the ten case-study companies.

Producers of ICT and ICT service providers (Case study number)	User companies with high level of ICT usage	User companies with low level of ICT usage
Electronics (No 3)	Metalworking (No 4)	Restaurant chain (No 1)
Software (No 5)	Bank (No 7)	Hotel (No 2)
Internet Provider (No 6)	Logistics (No 9)	
Electronics (No 8)		
Telecommunication (No 10)		

The geographical distribution of the cases-study companies shows that they are partly situated in rural areas, partly in the metropolitan area of Vienna. The northern part of Lower Austria bordering the Czech Republic has long been an economically disadvantaged region. In the south of Lower Austria there are old industrial regions.

Geographical location of case study companies
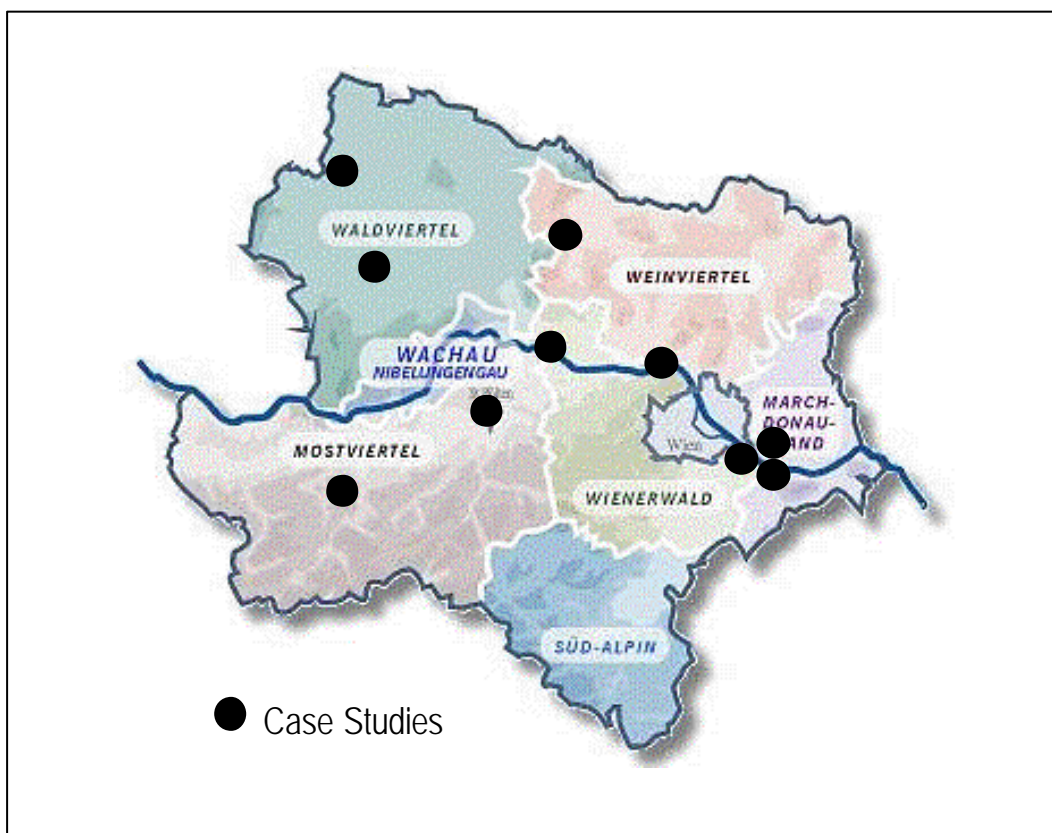
In the ten companies a total of 66 guided interviews were made with general managers, heads of department, project leaders, clerks, skilled workers. All case studies were conducted in pairs, i.e. by one researcher from social sciences and one researcher from computer science. All interviews were taped and transcribed. The written interviews were analysed on the basis of a case-study analysis grid which contained the main topics of the guidelines and in which results and quotes were filled in. This document was the basis for writing the case-study stories and for filling in the standardised case-study instrument.

In the following we present the case-study „stories" in the sequence of the case study numbers. In the concluding chapter of this report we will summarise the main findings from all case studies.

CASE STUDY 1 - RESTAURANTS

0. Description of the Fieldwork

The case study has been performed during a major transition period with respect to top management. 6 interviews have been made, a 7th, namely with a member of the board of directors, has been scheduled, but did not take place, since the board of directors resigned before the interview, and it was not possible to meet members of the new board. The interview partners were: head of personal management, head of administration, union representative in the company, ICT-responsible, and two heads of operations. The analysis and interpretations are based on the data gathered from the listed interviews.

1. Description of the Company

1.1. Sector

The expanding, Austria-wide group operates coffee houses and restaurants with the emphasis on industrial catering.

1.2. Activities, products, and production/business processes

The company provides catering for individual hotels, youth hostels and camp sites. A further important branch of business is the delivery to schools and kindergartens of over 22,000 ready-to-serve meals per day, which are prepared at two production sites.

1.3. Size: turnover and employment

The business headquarters is in Vienna. Turnover in 1998 was over €36m. The industrial catering chain owns approximately 70 sites in Austria. It employs a total of 1,500 staff nationwide.

1.4. Customer and suppliers

The company delivers to individual customers, companies, and institutions. Its suppliers are companies and food providers. There is also a relationship to contractors, such as for home delivery, to ensure in-time-services and –products.

1.5. Market and competition

The market is under continuous development. Hence, new products and services, such as home delivery, are developed to address new niches for their products. Competition is high due to changing of society in Austria to use catering services more frequently. In addition, the

company, as its primary target, has already long term contracts with public and private institutions, such as schools, to deliver daily meals.

1.6. Workforce profile

The company employs a total of 1,500 staff nationwide, with the ratio of women at approx. 56 per cent.

2. Technological Practice (TP)

2.1. Organisational and cultural aspects

2.1.1. Organisation – the core questions

The company headquarters is in Vienna and includes the whole administration, that is, wages and salaries processing, bookkeeping, computer processing and personnel. As a result there is a clear organisational division between the headquarters and the individual businesses (coffee houses, restaurants). As regards its formal structure, the enterprise follows the traditional functional and hierarchical organisation. An orientation on processes can be seen primarily in the core tasks (e.g. purchasing and stockkeeping, although also in production and delivery of ready-to-serve meals). At individual department level, too, there is specialisation in the particular area of activity. There is no evidence of experiment in new forms of working organisation with less division of labour.

2.1.2. Organisation – background information

Business decisions are made at the top level of the hierarchy and passed on to the operative level for implementation. In questions of detail, in the purchasing area for example, the individual locations, in particular the coffee houses, have the freedom to make their own decisions. The business managers place orders according to their requirements but are tied to headquarters' decisions with regard to suppliers and prices.

The various locations (industrial catering, cafes) are run by business managers (restaurant managers). Here responsibility is not necessarily limited to an individual location, but according to geography may also take in several operations. Austria's biggest airport, where the enterprise in question operates a total of five cafes and restaurants run by one business manager, could be taken as an example. Here, for example, there is also a central stockkeeping (drinks, cold-store for foods) for all five operations.

Among the typical responsibilities for a business manager are: „*First, just the organisation of the business, allocation of work, purchasing, the whole stockkeeping, the administrative work, drawing up the budget for the coming year, making job-cards for the employees and keeping an eye on costs, keeping to the guidelines that come from headquarters.*" (B1G5-1)

In this business great importance is attached to direct personal communication. Thus meetings are a fixed component of information exchange between the different sites, but also within the individual locations too. This „*well developed structure of regular meetings*" (B1G1-4)

forms a cornerstone of the communication structure in the enterprise. There are monthly meetings at the business- and section-manager levels. These serve for information exchange, agreement of menus (apart from industrial catering, where the decisions are taken at company level) and the clarification of any problems (agreement of sales figures). As the section managers are themselves business managers, the professional familiarity and a common awareness of problems among the participants is guaranteed. In addition there are daily meetings at individual business level, depending on the requirements of the enterprise as a whole. In the coffee houses, for example, this is necessary because of the two-shift system.

„We have regular meetings – that is, at least a daily five-minute meeting. One just has to. You have to tell colleagues, you're doing evening service today. It always takes place during shift changes. I come in at eight in the morning and deal with the colleagues who have been working since six o'clock. I ask what's happened: have there been any problems? Then I say, today we're doing this and that. That was then some five or ten minutes when we have a short meeting, and it's the same at the change of shifts. At 3pm here I have a shift change with the evening service. Then I have to tell people what has happened during the morning, if an appliance is out of order or if we have run out of something, which can happen. Before I let them out to the customers, I have to say, „Look, today we've run out of apple juice," so that someone isn't standing in front of a customer and doesn't know that it's not available." (B1G5-7f)

If there are technical or organisational changes, the employees concerned are involved to a great extent. Participation in business innovations has a tradition in this enterprise – something that was emphasised by most of our interview partners.

„We introduce every project in such a way that the issue is tested with a group of people. This could be business managers or area managers. It is usually also people who are particularly interested or also normal users. This has the advantage that one can weed out the mistakes and weaknesses straight away. This has proved itself well." (B1G3-16)

How should the enterprise be classified in the „information society"? It is an innovative operator of information and communications technology (ICT); technology applications are to some extent developed inside the company itself. The level of computer use is high, but this relates more to individual functions than to the business processes, as in parts of the company the networking of applications has not yet been developed very far. There is high readiness to introduce new ICT, but not every product on the ICT market is taken up, rather technology is purchased very selectively according to operating requirements.

Every workplace in the headquarters (administration) has a PC. Standard office automation and communications software is used. The overall aim of ICT application is both the simplification of procedures as well as savings (e.g. the minimisation of data inputs), the reduction of paper use for administration and communication purposes. For staff, in particular in the headquarters, the ICT use demands continuous updating of qualifications.

2.1.3. Culture

Company policy is characterised by a uniform wage structure, a developed system of social benefits, a 38.5-hour week, and fixed working hours (this means, for example, paid overtime). Its social standards mean that the company can be regarded as a showpiece company in the sector. Management consciously works on a staff-centred basis and the company policy principles drawn up by management and staff explicitly emphasis this. This is illustrated by an annual staff turnover of 25 to 30 per cent – comparatively low for catering.

2.2. Personnel /deployment of labour

2.2.1. Skills and qualifications

As already mentioned in the introduction, with regard to social standards, the enterprise is a showpiece company in the sector. This accords with the objective of the enterprise management to bind employees into the company long term and to minimise the loss of expertise resulting from staff turnover.

The unified wage structure, the developed system of social benefits and the adherence to employment law conditions is implemented in all areas of the enterprise. The regulations are firmly anchored in company agreements, agreed with a strong – female-dominated – works council.

The division in the labour market means that women employees in particular play an important role in the company. They work in the kitchens and in service in the restaurants and cafes, but also in the headquarters in administrative and business areas. What distinguishes G3 from the other enterprises, however, is on the one hand the company history, which is particularly dominated by women, and, on the other, the relatively high proportion of women in management positions. Above and beyond this, only a few years ago the company management considered setting up a declared equal opportunities policy, but consciously decided against it.

2.2.2. Training

Great weight is placed on training and further education of the employees – it is „*part of the job*" (B1G1-2) – which is promoted and co-ordinated by a department at headquarters. For a service industry, alongside the work-related development of technical applications, this is of great importance above all in customer relations.

Training takes place during working hours, with the costs completely covered by the company. If required, external events can also be attended. The structured „employee discussions" introduced a few years ago are intended to recognise and promote development potential. A major element of personnel policy which benefits women in particular is the principle of internal recruitment. Although business managers have the freedom to choose their personnel, suitable applicants from inside the company are always sought first if there are capacity problems or decisions on filling posts.

Applicants' formal qualifications carry great weight as far as administrative and business functions are concerned, and in the choice of chefs. Above and beyond this, and in other

areas, great attention is paid to social skills. Computer skills, in contrast, play only a subsidiary role in the selection of personnel for the restaurants. These are only enquired after in recruitment for management positions, i.e. business managers for restaurants, because these have to be able to use computers for administrative tasks.

„Social skills are the main thing for us, because we work with people a great deal." (B1G1-6).

As already mentioned, regular further training is considered to be a fixed part of the job and is expected of the staff – a discussion partner described the company practice as *„optimistically brutal"* (B1G1-4). Here, however, there is the chance of attending training courses a number of times if the desired learning effect is not achieved the first time. In catering *„new employees often spend a whole week accompanying others."* (B1G5-3). On the one hand this is to learn company practice and to get to know the menu and drinks, on the other, to understand the desired customer relations (for example, communication with guests, offering additional dishes such as soups or desserts).

Staff in catering are hardly trained at all in the use of computerised tills or drinks dispensers. It is expected that staff will be able to use such equipment regarded as standard to the sector. *„They have to be able to do that straight away. Because to learn it . . . we are open 17 hours a day in the cafe. It would be impossible to take a day to learn it. Actually, you have to make sure you can do it quickly."* (B1G4-3)

There is, however, training for the introduction of complex technical systems. To some extent this also concerns the introduction of e-mail.

2.2.3. Flexibility

Since the company is interested in long term relationship flexibility might be required for planning work hours, but not in terms of contract casualisation.

2.2.4. Reward policy

Incomes in general are above the national collective agreement, and the wages scheme includes small but significant seniority components. Employment of more than ten years in the company is rewarded with an anniversary bonus, a company party and a mention in the company journal.

2.3. ICT Applications: ICT as a tool, automation and organisation technology and as communication medium

2.3.1. ICT infrastructure and applications

For the whole enterprise there is a client/server network with a central data bank. Standard products are used to support personnel administration (AS/400 standard product), in bookkeeping and office administration (Microsoft Office) and also in internal/external communications (MS Exchange). On this basis there is a high level of computerisation in the company's administrative tasks. Data processing is however not fully computer integrated. These means that for various purposes restaurant managers send data to the headquarters on paper, where it is put in by hand for further processing.

Alongside standard software, the company uses applications it has developed itself, the most important being the merchandise information system in connection with the coffee houses' and restaurants' cash-register systems. Here too, a company-wide network is not possible at the moment. In addition, applications developed by the company itself are used in two production sites (production of ready-to-serve meals).

2.3.2. Character of ICT-usage

Work is currently under way on an extension of the *merchandise information system*, with data from the various operations being integrated. At the moment, data input still takes place centrally (input of delivery notes), but communication with the operations (feedback on merchandise in and out, sales figures) is computerised. This system has developed historically inside the company, has been its own development from the start and is now being maintained and further developed by a staff member at a tele-workstation.

„One project is the merchandise information system, where we have a cash-register application in the restaurants. This consists of a back-office computer, where you do the data processing and till-receipt stations, i.e. catering PCs where you do the till receipts. These data are then put into the back-office computer as reports towards the end of the day, end of the month etc. There is an additional application in this back-office PC, that is, the merchandise coming into the stores in the business is booked in. Behind the sales product there is a recipe consisting of raw materials, and you can use this to establish the debit-inventory position. That is, the stock levels are reduced by the booking of receipts on the cash registers on the basis of receipts administration. We are planning to take over the booked delivery notes, which represent the inflow of goods on site, into the bookkeeping, where today it is still booked in by hand, exactly like inventory booking, so that these data flow into the merchandise information system automatically. Further, the processing of job cards and service plans in this system is also being considered." (B1G2-3f.)

The two production plants that produce over 20,000 ready-to-serve meals per day have an integrated software solution. Here the computer department was involved in planning the production flows, that is, flow management is controlled by the company's own software, from procurement to delivery and accounting. As part of this integrated software solution, the fork-lift trucks in the finished goods store have a radio link to the data exchange. External suppliers who for example supply the customers with bread to go with the meals, are also linked through standard interfaces (transmission of delivery notes). (B1G2-7)

The picture of company-wide electronic communication is somewhat different. E-mail is indeed installed in all workstations at headquarters, but there is as yet no complete integration of all the businesses.

„Well, what is standardised is sent by fax – things that are one-way. . . . Anything two-way happens over the phone; now and then by e-mail. In-house [in the headquarters] there's a lot of e-mail. In the businesses we are only just starting to work with e-mail. It will increasingly expand. One-way things, going from here to the businesses, go as circulars. And by fax or on paper, which in future will certainly go by e-mail." (B1G3-9)

Overall, the enterprise is currently pursuing the following objectives in the use of ICT:

• Minimising data-input work (on-site input)

• Optimising links between the businesses and headquarters (direct data transfer, use of fax)

• Encouraging staff to obtain and process information themselves, through programs like Microsoft Exchange, for example

• If one looks at the various ICT functions, then in this case study it is noticeable that the technology is being used both as a tool and organisation and automation technology as well as for control and communication. Different functions are prominent in different areas and departments of the enterprise. Thus the tool function and communications medium is prominent in administration, whereas in the restaurants and production operations the use as organisation and control technology is more significant.

2.4. Characteristics of TP and processes of technical and organisational change

As the above description shows, there is a great diversity of technology practices in the enterprise. Not only is it different as regards activities and production flows, but ITC use in the restaurants cannot be compared to its application in administration either. From the computer department's point of view this differentiation expresses itself as follows: fundamentally there are three different kinds of user, *„those here in administration, those working in the catering operations and those in the production branch."* (B1G2-18). From another viewpoint, however, personnel policy for example, the common guidelines and central decision-making mean that there is a great deal of homogeneity in the company.

The degree of computerisation is highest in administration. Here office software and e-mail determine the nature of the work. Above all, the opportunity for computer distribution of information and computer filing characterise the forms of work and communications patterns, since „e-mail has been a matter of course at headquarters for five years."

„What I have noticed is that essentially I can pass on information much faster. We have different working hours. If it happens, for example, that I only begin to sort out my documents in the evening, then it might be that a colleague isn't there any more. Then I send him an e-mail. The next morning he reads it and I have the information straight away. Otherwise I would have to wait until the next day." (B1G3-10f.)

Simplification of communication by e-mail often doesn't come in the desired form, because e-mail, as the above quotation shows, proves to be a good medium only for clear information. As was emphasised in some discussions, effective communication is only possible if the limitations of electronic communications media are also borne in mind. Certainly one uses the speed of computer communications, but additionally one picks up the phone, because written messages can easily be misunderstood.

The use of new media here not only concerns computer communication. Filing and computerised marketing are further intensively utilised applications. *„E-mail is very gladly and intensively used here. Personally I also find the way it is organised is very good – sending bulletins by e-mail, because it quite simply saves a mass of paper ... and everyone can get the information they need."* (B1G3-10-f.) The e-mail system is based on

a directory system that reflects the departmental structure of the enterprise and further organisational elements. For example, it supports target-oriented filing and tracing of reports.

Computerised communications not only determines work in administration, it is also utilised for new services. The company increasingly uses the Internet to present itself to customers and to offer new products. As mentioned in the introduction, there has been an extension of the industrial catering area through the offer of home delivery. The relative geographical independence of individual functions is taken advantage of in this connection. Thus the logistics of home delivery have been outsourced to an operation in another city approximately 300 km from company headquarters. Orders for goods priced on the web site are placed there by telephone or e-mail. Delivery is planned on this basis, i.e. the routes are planned. Similarly, delivery of meals to the customers is not carried by drivers directly employed by the company. Thus *outsourcing* here has a connection with computerised communications.

If one looks at the connections between technology, organisation and personnel, then a range of interactions become apparent. Firstly, the centralised administration and savings in this area should be mentioned. From the management point of view it is pointed out that „it has a lot to do with ICT" that it has been possible to „radically splice functions together". At the whole-company level, efficiency has been increased by organisational measures made possible by ICT just as, conversely, technology utilisation has facilitated the organisational measures, centralisation for example.

The participatory introduction of innovations is in line with the use of ICT as a tool for administrative tasks. In each project new software is tested by a group of people concerned with it. In this way, the knowledge of the user can be incorporated and the ICT can be better adapted to the needs of the workplace: „*This has the advantage that you can maybe weed out the mistakes and weaknesses at the beginning.*" (G1B3.16)

2.5. How to explain TP: business logics, institutional context and internal dynamics

The technological practice in the company is influenced on the one hand by sector conditions. ICT plays a subsidiary role in service and in the kitchens. It is used on the margins as support for the existing organisation. The limited significance of information technology in the core areas of catering also explains in our opinion why technological integration for computerised data transfer between the businesses and the central administration is only now being introduced.

The high degree of computerisation of work in the central administration benefits from the ICT qualifications provided by the education system and labour-market schemes. Thus, as a rule, staff usually come with sufficient computer skills to deal with the programs used in the workplace. Internal training also sees to it that technology utilisation is not hindered by the lack of staff qualification.

The technological practice of advanced utilisation of ICT is supported by a personnel policy aiming at long-term employment. The company has a long tradition of comparatively good working conditions guaranteed by collective agreements. The relationship of trust and the regard for experienced staff is also expressed in the practice of involving users in the process

of technical innovation. These aspects of technological practice contrast with those usual in the sector and can be seen as company specific.

3. Consequences for „Social Exclusion" and „Social Integration"

3.1. Changing work: tasks, tools and skill requirements

3.1.1. Changing work and tasks

The activities of the employees in the restaurants and coffee houses have hardly changed at all. The main attention is on service, cooking, etc., while ICT only plays a marginal role. A few years ago there was a switch from electronic to computerised cash registers, which somewhat changed the billing process. *„All staff received training first, so it wasn't so much of a problem."* (B1G4-3) Staff qualifications – here primarily their professional expertise and abilities as well as „social competence" – are not affected by such changes.

For accounting and planning purposes, restaurant managers are responsible for providing headquarters with data on personnel deployment and on sales. They use MS Office for compiling and presenting this data, which was previously transferred on disk. The new system currently being developed will allow the monthly data to be „hoovered up" by headquarters. The managers of the businesses must be familiar both with the till system and the administration software.

In contrast to the restaurants and coffee houses, activities in the headquarters, i.e. accounting, personnel administration etc., is computer supported throughout. The work is thus determined to a large degree by task-specific programs and computer-communications media and filing systems. The ability and readiness to utilise such new technologies vary greatly:

„There are certainly objectors who find it hard, and only after considerable training and repeated instructions about what the system is – and here that is a working instruction. It's clear, that they then start using it. Then there are people who we actually employ as instructors because they are a bit like computer freaks. You only have to convince them not to continually develop their own systems. That wouldn't be in our interest. I think it is a question of age. Anyone who has children of a certain age can get a lot of help at home and also has fewer problems. Then there are many for whom it is in some sense a hobby. Then there are, I would say the majority, over 50%, who work on it because it is the system and they know it and use it. It is no longer a big thing. Everyone has got used to it, because, as it is so nicely put, nowadays everything is on computer." (B1G1-4/5)

3.1.2. Changing skill requirements

Lack of computer skills is just as little a problem in recruiting new personnel. According to the personnel manager, applicants can usually provide certificates confirming computer experience and skills. Either they have learned these at school or on adult education or labour-market-service courses. Rather, qualification problems are evident in other areas: *„The fact that a lot of people have massive writing weaknesses has nothing to do with the PC. It just*

expresses itself in this area." (B1G1-10). Spelling and the ability to express oneself in writing, but reading ability too, are surprisingly poor according to these statements. With the extension of computerised communication, these qualification deficiencies become more apparent and can lead to disadvantages.

As before, alongside professional expertise and ability, „social competence" and „personality" are major qualification requirements. Being able to deal with people, communicate well, fit in – this is what is primarily expected of staff. It also matters to business and departmental managers whether or not someone suits an existing team: *„If you tell me I have a choice of two applicants, one is professionally good and I prefer the other as a human being, then I take the one I prefer as a human being."* (B1G3-21)

The further development of technological practice is leading to altered demands on staff expertise, abilities and skills. As this case study shows, being qualified to deal competently with new tools and communications media may well be indispensable, but it does not represent a serious problem either for the company or staff. In comparison to other demands or changing requirements, their weight is relatively limited.

3.2.   Changing employment relations: employment security, terms and conditions

Measured against the conditions usual for the sector, the company has high social standards. Among these are the collective regulation of employment conditions in the company agreements and employment on the basis of long-term contracts. Employment on a day-to-day basis is very limited, only if the business has to deal with big events. Contracting out to self-employed or independent service providers is rare. It is, for example, the practice in home-delivery in the context of industrial catering.

Changes in the economic situation of the enterprise have accelerated the transformation in the company culture in recent years. Economic difficulties in a subsidiary company were reacted to with the setting of savings targets, which led to conflict between the company management and the works council. One gets the impression that a long tradition as a socially exemplary company and as a „women's company" is possibly coming to an end.

Thus, if employment conditions and employment security are changing, and staff are thus having to forego some things that have been special to the company, then this has little to do with internal organisational changes or the utilisation of ICT. The connection is rather the reverse: because of changed economic conditions and new company management strategies, in future it may be that ICT utilisation and rationalisation will not be as socially cushioned as they were previously.

3.3.   Do ICT matter? The relative importance of ICT for social inclusion and exclusion

In this case study we were not able to establish any immediate effect of the utilisation of ICT on employment opportunities. There were neither job losses nor serious changes in requirements that would have threatened employment. To some extent this is due to the fact that ICT in catering generally has little influence on work, qualification and employment. The company's organisation and personnel policy is opposed to any negative effects on employment arising from technological change. The objective of long-term employment of staff

and a developed training system prevent technological changes giving rise to personnel changes.

The high level of computerisation in the administration makes this area of particular interest for our study. Here it is clear that ICT determines the work to a considerable extent; the pressure to adapt to technical changes is evident. If this has disadvantageous effects for staff, then it takes place through processes of a rather subtle kind. Thus staff require mutual support in order to be able to deal quickly and competently with programs they need for their jobs. Those whom colleagues for one reason or another are not so ready to help have it harder than the others. In addition there are further differences in „resources" – children of the right age, for example. Spelling ability, the ability to express oneself in writing and a feeling for which form of communication is suitable are also called for in this company. On top of this there is the dependence on the technology, which is above all painful when there are system crashes. Different abilities in coping and coming to grips with such situations likewise determine the effects of computerisation on individual staff members. The age of employees has an effect on adaptability. Younger people are certainly more curious and thus sometimes learn more quickly, but older people, including those who have not worked with computers before, also manage to use ICT to the required extent without problems, according to the observations of one departmental manager. (B1G3-13)

The personnel manager has no intention of swapping younger for older workers, as experience is highly regarded and there is no desire to lose trained staff. *„If we have older colleagues who have been here a long time, then they get higher severance pay. In this area we also only have people who function perfectly in any case. This is a particular context in which we have not thought of wanting to exchange him or her, because we are in any case glad that he or she is there and has got things under control."* (B1G1-11/12)

Nor can the company's pending rationalisation plans be seen as an immediate threat to jobs of any particular group of employees. This is due in particular to the organisation of work in the administration. Thus, for example, particular employees in the personnel department are responsible for particular restaurants and coffee houses, *„from wage slips through to final accounting for a colleague,"* (B1G3-4) and they carry out all of the required tasks with regard to this. Now rationalisation effects are expected as a result of technical integration because „double tasks" are disappearing. (B1G3-6) The fact, however, that there are no staff who previously only put in data means that technical integration is indeed leading to savings, but is not threatening data processors' jobs.

The utilisation of ICT has thus had rationalisation effects. This also concerns computerised communications and filing: *„All the work of copying and binding, etc has disappeared."* (B1G3-11) In all, a given task can thus be fulfilled by fewer staff. As has been shown, one cannot derive a threat to the employment of any individual, possibly not properly qualified employee. Thus in this regard the ICT can be accorded relatively little effect. Other factors are far more important in this respect. For example, the company points to the process – recognisable in the labour market in general – of the displacement of employees with low formal qualifications by those with higher qualifications. Jobs that were previously occupied by people who had been to commercial school are now being applied for by *Matura-* (Baccalaureate-) level school leavers, business-college graduates or even university graduates.

(B1G1-9) The emphasis on „social competence", „personality" and „readiness to learn" may likewise have a greater effect than the increased significance of ICT skills.

CASE STUDY 2 - HOTEL

0. Description of the Fieldwork

The basis of the case study were five interviews carried out with representatives of employees and management and in various operational areas at the site of the enterprise in July 1999. Our interview partners were: vice-director of operation, front-desk manager, restaurant manager, accountance manager, works council. The discussions were carried out on the basis of a guideline, recorded on tape and finally transcribed. The analysis and interpretation were based on the recorded data, and additional observations on site.

1. Description of the Company

1.1. Sector

The hotel part of the enterprise (NACE Code 55.1) offers two different service products at the location: a five-star hotel for business travellers and a four-star hotel for tourists.

1.2. Activities, products and production/business processes

The business is marked by the particular location: as the only hotel at an international airport, it not only includes advance bookings among its customers, but also travellers who have problems with connecting flights and who book overnight, as well as airline staff.

1.3. Size: turnover and employment

At €11.5m (1998), the hotel business accounts for some two thirds of the enterprise turnover. Further services are catering, a high-class restaurant for business customers, and a bar as well as facilities for conferences and seminars. At the moment there are about 120 people employed, some 45 of these in Food & Beverages (restaurant, bar, kitchen).

1.4. Customers and suppliers

Customers are not only (commercial and individual) travellers with advance bookings, but also travellers who have problems with connecting flights and who have to stay overnight, as well as airline staff. Suppliers are companies providing products and services for operation.

1.5. Market and competition

The enterprise in this case study thus distinguishes itself by its special location, which guarantees high capacity utilisation, by the linking of two hotels of different standards, and having an exclusive position with respect of competition, since competitors are far out of distance to be attractive for all kinds of customers.

1.6.   Workforce profile

From the about 120 people employed, a third of them are working in the restaurant, the bar, or kitchen. The great majority of staff are employed full time; some 20 people are employed as auxiliary staff, mainly during functions. There is a high ratio of employees with vocational qualifications, some 75 per cent, with a rising trend.

2.   Technological Practice

2.1.   Organisation and cultural aspects

2.1.1.   Organisation – the core questions

The ownership structures are somewhat complicated but, precisely because of this, important to an understanding of the case. There is the owner of the real estate, an international hotel chain as the franchiser and another international hotel chain with a total of 55 locations as the franchisee. The last of these is responsible for the running of the hotel. This ownership structure affects innovation and technological practice, as investment has to be agreed by all three parties involved.

The structural organisation of the enterprise is characterised by division into function areas and by its hierarchical levels. Management at the top has a special department for sales. At the next level are the functions of food and beverages (F&B), reception and reservations, floor management, administration and technology. The restaurant manager and the *maître de cuisine* are under the F&B manager; the reception manager oversees the reception and the reservation department. Administration, reservation and floor management are headed by women, the other leading positions and top management are filled by men.

The division of functions is most marked between hotel and catering. In other functions, reception and reservations for example, there are overlaps. Thus at weekends staff at the reception also take over reservations. There is a strict division of labour within the individual functions, such as in administration: individual positions are responsible respectively for accounts receivable, accounting and current accounts.

2.1.2.   Organisation – background information

Co-ordination of the individual tasks varies according to the function area. Co-operation by technical link, by integrated computer system, only occurs in one area: in reservations, bookings are entered in the Fidelio system and on arrival of the guest a specific room is allocated at reception using Fidelio. Orders between restaurant service and the kitchen are made on paper; records of working hours are provided to the wages department on lists. Otherwise telephone and face-to-face communication predominates.

In the everyday course of business there is room for decision-making in the individual task areas. Thus the restaurant manager has autonomy in buying and ordering of food and drink (there is no centralised buying in the concern). The reservation manageress usually makes the decisions on which rates (or special conditions for particular customer groups) are open or

closed for booking, depending on the capacity take up. Investments require decisions of the owners, with all three owners having to agree. This can lead to delays where there are differences of interest. But the relatively frequent changes in the position of the managing director also result in decision-making weaknesses. The managers stay in this position only for about three years. They are primarily interested in showing the highest possible short-term profit. As a result there is a reluctance to commit to high-cost investments with only medium or long-term advantages.

Financial reporting plays a pivotal role in the running of the enterprise. Every 15 days the hotel makes bookkeeping data and performance indicators available to the company centre. The main object of attention is the assessment of operating profit. If there are problems here, then turnover and costs are checked (B2G1-27). The management can influence operating profit through personnel costs in particular. If capacity utilisation in one month does not come up to budgetary expectations, then fewer than planned personnel are employed: *„If I see that the month is 10 or 15 per cent below my target, then I send 10 people, 15 people on holiday for one or two weeks. We have a very high staff turnover. Then I just don't fill a job for four weeks."* (B2G1-27).

Work within the company is run on a hierarchical basis. The superiors give instructions to the employees and check up on them. Technical means are relied on to some extent. The reception manager can follow the way in which staff work at the check-out through user log files, and discover mistakes in this way. If this happens he talks to the staff member about any possible lack of experience.

Alongside the hierarchical direction, targets and detailed rules for the fulfilment of tasks are significant to a limited extent. Thus in the evenings the restaurant manager is obliged to aim for a specific average price per guest. Serving staff can also be instructed, for example, to sell an expensive wine. Working standards in the F&B area (B2G1-16) are set down in a 140-page document. The area manager instructs new employees in these standards. Knowledge of and adherence to them are checked.

The high staff turnover and frequent change of personnel at the top of the enterprise indicates an enterprise culture in which long-term connections, mutuality in social relations, loyalty etc. are of relatively little significance. What is characteristic is that the enterprise management does not attempt to reduce the recognised disadvantages of the high turnover rate by raising pay and improving working conditions. The company's economic situation would offer a certain leeway for both of these. Above all, there are a number of particular jobs in service, reception and administration where employees stay only for a very short time. Although this is recognised, no steps have been taken to ameliorate the situation. Certainly however, those in authority are well aware of the costs of this turnover. They feel it personally in the amount of time they themselves have to spend on training.

There are measures to motivate employees, however. Thus two „colleagues of the quarter" are regularly chosen and receive a 2000 schilling prize. A company outing is organised twice a year, and individual social benefits, like free parking spaces are awarded. If planned profits are achieved, an annual bonus of almost one month's wages is paid out to all employees.

The organisation cannot in general be categorised as being „family friendly". There is no part-time work, but rather full-time or auxiliary employment. Overtime working is frequent and working hours to some extent socially unfavourable. In service, account is taken of the family obligations of women – they are not employed in the evenings. An early rise up the hierarchy is certainly possible, but is conditional on total commitment: *„Most of us have done five years' tourism school. After that it is quite simply commitment. How much time you are prepared to invest or how far you are ready to do 14 or 15 hours. And that over a few years."* (B2G1-6). Even the position of a departmental manager can be tied to working hours that practically exclude a family life.

2.1.3. Culture

Seen as a whole, the company is typical of a classical functional organisation structure. The peculiarity consists in the running of two different hotels in one location. The internal communication requirement is rather limited, co-ordination is formalised, partly carried out by computer. The degree of division of labour is somewhat high; the extent of flexible employment of staff is limited. The fact that the (male) management personnel have risen to the top early on through a high level of commitment may be due to the performance principle. On the other hand, for the award of „colleague of the quarter" it is said that here it is sympathy which is decisive. At the same time there is an attempt to ensure a high degree of formalisation of quality of service through written standards. The company cannot be characterised as a community in which loyalty counts and social relations are built on the principle of reciprocity. The individual staff strategies follow the „gold-digger mentality" at the top; frequent change is part of this.

There is a works council in the company. Negotiating relations are not conflict-laden. If management, for example, sees dismissals as necessary, as a rule it does not lead to conflict. *„It isn't usually a pitched battle. We have a relatively harmless works council. Mostly it is cases where the works council, too, says, OK, that's justified."* (B2G1-29)

2.2. Personnel / deployment of labour

2.2.1. Skills and qualifications

Many of the employees (some 75%) have completed vocational training. Frequently this is at hotel and catering college. In the F&B area, of 45 employees only 10 are without vocational qualifications. The majority had completed an apprenticeship. In service, foreign languages and friendliness are important. Management has had good experience with employees from Iran, Iraq and Tunisia. For one thing, they can speak several languages, for another, foreign workers have the advantage that *„one can still polish and tidy them up a bit"* (B2G1-7).

Formal qualifications alone, however, are not decisive for employment and promotion. Even with higher formal qualifications one does not go directly into management positions. *„Basically, you have to start at the bottom"* (B2G1-8). The most important criteria in taking on staff are appearance and social skills. In comparison to these, computer skills are almost insignificant. One does not necessarily have to have these on joining: *„We do not have such high technology that one cannot learn it by oneself . . . If you are interested in it, if that is your only shortcoming, then you will have worked it out within two or three*

months" (B2G1-22). If staff are recruited for reception, however, it is expected that they are already familiar with the Fidelio standard system. But here too, lack of experience is not an insuperable hurdle: *„It is not necessarily a precondition. I think they should have basic computer skills, because the development goes through the keyboard not the mouse. They should know where „enter", „cursor" and things like that are. They learn that anyway"* (B2G2-8). As far as standard procedures are concerned, one can already carry out check-in and check-out after the first day. It takes two to three months, however, until one is familiar and completely confident with all the ins and outs

2.2.2. Training

Training and further training is an important topic in the enterprise. The high turnover alone means that new people are continually having to be trained. This is carried out partly by superiors, as for example in the reception, where it is arranged so that experienced employees work alongside newcomers and provide induction and support. In addition, there are various courses on offer in the enterprise. The company also supports individual further training by the employees with financial contributions to cover the costs of the course. If these exceed a particular level, the employees must commit themselves to remain with the company for at least a year or pay back half of the course costs (B2G1-19).

If previously personnel were employed either in one or the other hotel, which also resulted in different wages and salaries, efforts are now being made towards greater standardisation. The employment contracts for all employees are signed with one employer and management is trying to achieve the most flexible possible utilisation of personnel. In practice, however, the differences between the hotels put limits on this. Reception staff are differentiated on recruitment according to which hotel they are intended for. In service, too, it is true that when there are staff shortages someone will be „borrowed", but because of the different qualifications demanded there is no systematic flexible allocation of staff. Whereas in the four-star hotel it is only necessary to work at the buffet breakfast, the five-star hotel offers dining à-la-carte and a high level of service. Only on the „floors", for reasons of fairness, is a rotation between the two hotels adhered to, because the newer building is easier to clean. There is functional flexibility between reception and reservation. During the weekend the reception staff take over reservation work. For training reasons when they first start, staff in the reservation department work for some time in reception or change from reception to reservation. But reservation staff are not transferred to reception in periods of high demand.

Wages, even if usual for the sector, are nevertheless regarded as being very low. Gross wages and salaries at the lower level in the hierarchy are between 13,000 and 15,000 to a maximum of 17,000 schilling. Heads of department earn between 18,000 and 25,000 schilling per month. Low income, to some extent together with long working hours, is quoted as grounds for the high staff turnover.

2.2.3. Flexibility

Demands in temporal flexibility are high. Overtime work is performed regularly, due to the high workload. However, in terms of contracts, the management tries to establish long term relationships under the conditions mentioned above (in particular with respect to wages). advance bookings among its customers, but also travellers who have problems with connecting

flights and who book overnight, as well as airline staff. Nevertheless, fluctuation has the usual high rate, according to the type of business.

2.2.4. Reward policy

A ‚best of quarter employee'-program has been established. This system leads to honors for particular employees who receive some extra money for their achievements.

2.3. ICT applications: ICT as tool, automation and organisation technology and as communication medium

2.3.1. ICT infrastructure and applications

Information and communications technology (ICT) is the indispensable basis of the working process in several areas of the business. Reservation and tasks in reception, from check-in to billing, are processed with the aid of the „Fidelio" standard program. In administration, standard office software is used for personnel accounts and bookkeeping. In contrast, technology plays a more limited role in the restaurant. ICT is used only to a limited extent for internal communication. Thus, management sends e-mails to the heads of department, but these do not communicate through this medium. There is no network, and e-mails are sent by modem and telephone line.

External communication is partly by electronic mail. The majority of bookings, however, still come by fax. With clearance from the person responsible in the administration, the company management can access the bookkeeping directly on the administration department server.

The technical infrastructure is described as old and partly outdated. Whereas the restaurant manager has few problems with the fact that the till system is not state-of-the-art, the situation in the reception is critical. The system frequently crashes (recently several times a month), which can lead to serious problems in attending to guests, as no rooms can be allocated and no bills written without the computer. The reason for these difficulties is the lack of memory space. An ever growing problem is the fact that the system is not year-2000 compatible. This is already obstructing bookings for next year (these have to be collected in a file) and makes a system crash likely at the turn of the century. Those concerned are pushing for an update of the system, but this has so far been thwarted by the lack of an investment decision. „*It is just that very many people have to give their consent before anything can be invested. For our part we can only continue to point out that it is necessary and that we need it because we work with it.*" (B2G2.22).

The company has a two-person department responsible for equipment. This includes the building, including lighting, air conditioning, etc. and the ICT hardware. Software servicing is usually carried out by external contractors by modem. Staff generally ring the internal technician when there is a computer problem, although he is not responsible for software but nevertheless provides support as far as possible.

2.3.2. Character of ICT-usage

How can the enterprise be classified in the „information society"? It is an information and communication technology (ICT) user – on its own estimation „*rather behind the times*"

(B2G1-10). Measured against potential technology available, penetration in the business processes rather limited, as will be mentioned in detail, and in recent years there has been little innovation in this area. The state of technology in the enterprise is described as a problem by several of the discussion partners.

ICT use in the company comes in different forms. It serves first and foremost as a tool in administration, reception and reservation positions. As a rule, however, according to the technician, the available functions are only actually used to a limited extent, particularly in administration. There is a system link between reservation and reception – the reception staff work with the data that has been entered by the reservation, as a rule without further direct communication. ICT plays a subsidiary role in internal communications. The capacity to oversee working activity is utilised to some extent in order to track possible staff weaknesses in handling computers.

ICT application in the company is characterised by partly outdated systems, by running problems caused by system crashes, and by a low level of internal networking of the workplaces. The implicit objective of the company management can be given as the maintenance of the operation as far as possible without investment.

2.4. Characteristics of TP and processes of technical and organisational change

ICT is not of the same importance for every area in the company. Whereas the receptionists' jobs and many administration tasks are fully computer-processed, in service or on the floors such technology plays a subsidiary role or none at all. The utilisation of new communication media also varies: Management distributes information by e-mail; the heads of department and employees do not use this medium for internal communications. Bookings come in to some extent by e-mail, but a www application for reservations is only in its infancy. This variation in the importance of ICT also results in different technological practices.

On the other hand, the company displays a quite consistent picture of the organisational, cultural and information technology conditions. Just as little as in staffing policy, where the high turnover is indeed seen as a problem but does not lead to counter-measures, do the company's information technology weaknesses give rise to any fundamental reforms. The principle of long-termism does not, it seems, enjoy all that much significance in the business strategy. In the technical infrastructure, though in other working conditions too, the short-term orientation is noticeable: so long as the operating profit is less affected by the deficiencies than by the investment that would be required to solve them, there is no reason for change.

2.5. How to explain TP: business logics, institutional context and internal dnamics

The staff and heads of department affected have thus far not been in the position to get through to the company management with their concerns for an improvement in the technical infrastructure. Above all, the readiness of the owners to approve investment funds, which is necessary but hard to achieve, is slowing down or blocking investment in the ICT area. In one section, the differences of interest also play a part: the two hotel chains involved each want their system to be used in the company. This question has already been wrestled over for one-and-a-half years. The frequent changes in the position of manager, which suggests short-

termism to management staff as a whole, completes the pattern of the innovation processes in this company.

3. Consequences for „Social Exclusion" and „Social Integration"

3.1. Employment: job losses and job gains

The company culture is marked by short-term perspectives: there are regular changes in management, and the employment turnover is very high. Wage levels or efforts to improve working conditions, however, play a subsidiary role in this respect. The ratio of employees with vocational qualifications is high. Formal qualifications, however, are not the deciding factor in staff recruitment and promotion. What counts in taking on staff is appearance and social skills, and, for promotion, readiness to work very long hours. Computer skills are important, in particular in dealing with standard systems at reception, but one does not necessarily have to have these on joining – they can be acquired on the job. Turnover is very high and means spending a lot of time on training. As a consequence, job losses or gains are not related to ICT, but rather to work conditions and constraint given through the type of business.

3.2. Changing work: tasks, tools and skill requirements

3.2.1. Changing work and tasks

Formal qualifications are of increasing importance in the company, but are not seen as the deciding factor. Appearance, personality and social skills are to the fore in recruitment. Lack of computer skills in itself is no reason for someone not being taken on, although ICT have changed work and tasks over time. In the reservation and reception area ICT forms the indispensable basis of the working process. In administration too, the standard office software shapes the activities. In other areas ICT plays a subsidiary role. Communication takes place only to a limited extent electronically. However, the ICT equipment at the reception is inadequate: there are often system crashes which hinder room allocation and invoicing. Those affected are pressing for updating and extension of the technology.

3.2.2. Changing skill requirements

As already mentioned above, although computer skills have become more important lack of these skills in itself is no reason for someone not being taken on. Equally, there is no known case of anyone giving up or losing their job in this company because they did not make the mark in ICT. Further, the quantitative rationalisation effect of the use of technology is so far not so serious that it has led to the loss of jobs. On the contrary, an investment in technology, in the form of a third monitor position in the reception of one of the hotels, for example, could produce additional jobs, as more staff could then be taken on in peak periods (see below).

3.3. Changing employment relations: employment security, terms and conditions

Initially this study was surprising in that the company's secondary staff is relatively small. As this relates to the precarious employment of auxiliary staff for functions, it was not significant to our subject. The overwhelming majority of staff are employed on contracts covered by full social insurance and labour law. The connection with the question of social exclusion, however, is established by the high rate of staff turnover and the criteria for access to employment in this company.

3.4. Do ICT matter? The relative importance of ICT for social inclusion and exclusion

The immediate consequences of the technological practice are pressures on the company employees. Together with the low wages and salaries, these may contribute to the high turnover. If one sees social exclusion as a process that begins with a descent down the social scale into poor working conditions and continues with job loss then, because of the low incomes, a short period of employment in this company could be seen as part of an individual social descent. Against this, however, is the fact that young first-time employees are often taken on. Furthermore, this is only conceivable for staff in administrative jobs, where other sectors pay considerably higher wages. Such a case would primarily be expected when employing the AMS (labour-market service) as an intermediary, also against the will of the person concerned. However, the company has given up recruiting new staff from the AMS, among other things because the people who were sent were not oriented or interested in working in the hotel and catering industry.

In some departments with a high ratio of women, such as 'housekeeping', working hours are regular and socially favourable. The working hours for other staff, however, are not family friendly. These staff are confronted with long working hours and frequent overtime, but also with the practice that staffing levels are adjusted to capacity utilisation by means of short-term mandatory adjustment of hours or holiday. This can lead to disadvantages for women with family commitments (which, however, it was not possible to investigate in our survey). What is quite apparent is that staff in supervisory positions have only very limited opportunities to reconcile career and family.

CASE STUDY 3 - ELECTRONICS

0. Description of the Fieldwork

The company has allowed interviews with several areas of interest for the project. Hence, we interviewed: the executive manager, a responsible from human resource management, ICT, development and production, and work council. The recorded interviews have been transcribed. The analysis and interpretation have been based on these data, official documents handed out to us, and personal observations when being guided through the site.

1. Description of the Company

1.1. Sector

The general sector is electronic manufacturing – NACE-code 32.20-00.

1.2. Activities, products and production/business processes

The electronic contracting company came out of a management buyout of an industrial company's production department in 1997. The parent company gave an undertaking to provide orders (primarily inductive elements) for 75 per cent of the turnover for a three-year period. A development department for special products was newly established in order to be able to offer customised products.

1.3. Size

Today, the company employs 190 people (starting point: 148) and has a turnover of 29m euro (1999). On the basis of a successful entry to the market, the company was able to establish itself within two years as the number two in a dynamically developing sector in Austria. Turnover in 1999 was 30 per cent higher than planned. Currently, there are 178 employees.

1.4. Customers and suppliers

The customers are assemblers and producers of electronic appliances. Suppliers are companies delivering all required hard- and software components required for product development, engineering and production.

1.5. Market and competition

The market is highly competitive. Quality and pricing are the most crucial assets to stay in business. However, the strategy of the company, namely to integrate development, engineering, and production activities within the location, seems to be of advantage for the company due to its flexibility.

1.6. Workforce profile

At present the company employs 178 people, some 35 per cent of them women. This figure breaks down as seven managers, 55 skilled workers, 52 unskilled or semi-skilled workers, 38 master craftsmen, technicians and developers, and 26 administrative employees. Broken down according to qualification levels, there are 51 people with only basic school leaving qualifications, 94 with apprenticeships or technical college, 31 with polytechnic or general further educational training, and two with university degrees.

2. Technological Practice

2.1. Organisational and cultural aspects

2.1.1. Organisation – the core questions

In the process of company foundation, the site in Vienna was transferred to the province of Lower Austria and only qualified core personnel from the parent company were taken on, although on lower wages. The hierarchic, function-oriented organisational structure made way for a customer-oriented process organisation. This organisational form not only permits a close linking of development and production, but demands an integrated organisational and technical infrastructure. This is reflected in the company structure in the form of the integrated „customer-order fulfilment" department, which incorporates the logistics, printed-circuit and system development, and manufacturing sectors.

There are two „performance centres" in production and development. One manufactures printed-circuit boards, the other produces complex control-technology products. Both are supported by the logistics, finance and quality and service sections. There is a separate sales department for customer relations. As a rule, manufacturing is customer-specific: i.e., despite the fundamental modular concept there is no production-line product manufacture in the narrow sense.

2.1.2. Organisation – background information

Alongside the customer-oriented process organisation, it is noticeable that the company is not a pure production operation, in that it also offers customers development services. These can start with the specification and reach from design through to manufacturing and finishing. Paramount in this is the co-ordination of manufacturing and development activities and co-operation with the customers. All work is carried out on the same site.

The logistics department is of crucial importance here, as this is responsible for contract specification, materials procurement and contract completion. The man responsible for logistics describes his area as follows: „*I am responsible for the process between the receipt of contract and delivery, through to invoicing. I have complete purchasing responsibility in goods purchasing, transport, storage and a bit of computing, i.e. really logistics.*" (B2G3-1.) Computer support is provided by a small group of four workers. Two of these maintain the business system and the (self-developed) logistics system, and one each maintains the hardware and the network.

Customers' first contact is with sales and marketing and the developers, and then with the developers and the production staff. This is not only to support sales and marketing, but also in order to provide customers with the opportunity to communicate directly with the developers, and thus minimise the information-loss that occurs in traditional organisational structures: *„Sales and marketing go to purchasing, and purchasing goes down the other side of the house – but these 'Chinese whispers' can only give rise to problems",* as one of the two performance-centre managers put it (B2G1-2f). True, this procedure is against the trend to one-stop shopping (one employee with prime responsibility to the customers for a contract), but it permits specialist communication with customer representatives, in particular when the product specifications are being directly laid down in the contract.

The organisation in performance centres makes for ease of internal co-ordination between the development and production departments: *„I can really take both, sit them down at a table and say 'You solve the problem for me now, and you don't get up until you have solved the problem',"* said one manager (B2G1-4).

The company structure is characterised by a shallow hierarchy (three layers) and „lean" management (management board and managing director). Control structures exist on the one hand through process-oriented responsibility in the performance centres and, on the other hand, computer-supported through the monthly Excel tables which provide an overview of productivity and error rates. Employees work flexible hours, in contrast to many production companies in the sector. At the moment there is a lot of overtime and thus higher holiday entitlements which will be run down in periods when there are low orders. This requires „flexibility" on the part of the employees. This demand is accepted by the works council, so that it is possible to react to capacity fluctuations with the aid of the flexible working model. In addition, shift working is being planned, which is seen as a reserve for a further expansion phase. If the introduction of shift working is not sufficient then the company can still expand on the same site.

Even in a dynamic, transparent company with good labour relations, formal company agreements are necessary according to the shop steward: *„Firstly, the company agreement is there to lay down the rules of the game, how things should go in the company so to speak. And on the other hand it also has a protective function, because to some extent it is not clear to the employees that they are subjecting themselves to someone else's order, inasmuch as . . . they take up employment and so are naturally, in essence, exposed to the freedom of action of the company. That means if the employer says, OK, there is no more flexitime now, then there is just no more flexitime, if there's no agreement there."* (B2G2-9f).) This is not seen this way by everyone, however, but occasionally interpreted as a relapse into large-scale company relations.

Functional flexibility, i.e. changing workplaces and jobs, is limited in that there is a high level of specialisation in the individual core areas. It is only in the production department that workers can change from one workplace to another. Circuit developers can also work on tests (programming of test cases) and, vice versa, test engineers can be involved in development, depending on the order situation. What is not possible is the employment of production technicians in the context of development activities.

2.1.3. Culture

Company culture is characterised by an open information policy on the management side, and – according to management – a very loyal workforce. The latter is recognised by the managing director: „*The people have been really stretched, but have done their utmost, been totally committed, and we have had almost no staff turnover. We have had perhaps five resignations in the year. One can deduce from this to some extent that the people are actually satisfied.*" *(B2G4-7.)* The satisfaction is explained among other things by the pleasant working atmosphere: „ *. . . it has just become more informal . . .*" (B2G5-2).

Monthly team discussions – CIP[1] teams – are intended to help raise company performance. In the CIP teams the usual roles are ignored inasmuch as company managers become ordinary team members. This suggests a conscious and open approach to the (in any case) shallow company hierarchy. At the moment there are six CIP teams operating, each with seven people. The course of the process includes brainstorming and putting ideas into practice by the CIP team, when necessary with reference to organisational and/or technical expertise.

A management analysis of the development of the business has shown that turnover must increase if staff levels are to be maintained. This is based on the fact that the same turnover can be achieved with ever fewer staff. As the sector is showing high growth rates, above all conditioned by the current collapse in Asia and the boom in mobile communication technology, this growth seems to have no limits in the immediate future.

2.2. Personnel / deployment of labour

2.2.1. Skills and qualifications

Half of the personnel are longstanding workers who have „grown into" the company after completing their apprenticeships, and half have relevant post-school (technical college) qualifications. The company employs semi-skilled workers in production. There have previously been bottlenecks in development. Thus, for example, the company spent five months looking for a hardware developer before the personnel manager decided to take on a school-leaver and train him on site. Contact with the region's labour market service is lively and has been found supportive in seeking and recruiting staff.

Management personnel philosophy is characterised – in accordance with company principles – by the promotion of flexible working. This has not yet been sufficiently implemented however: „*In practice we have not come quite as far as we would have liked. So there is still more to do.*" (B2G4-6.)

As has already been indicated, flexible employment of test engineers and developers has already been achieved. In production, too, there is functional flexibility inasmuch as two manual-assembly workers can where necessary replace one skilled worker on an automatic production line. This is achieved through training measures which take place predominantly in-house and directly on the machines.

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[1] CIP stands for „continuous improvement process".

2.2.2. Training

The information necessary for planning the training is gathered in discussion groups. Then a training concept per worker is drawn up and the employees are offered training measures. As well as the employee, the immediate superior or manager responsible is involved in this. The agreed targets are put into practice in consultation with the people concerned.

The personnel manager states, however, that staff have to participate actively in their training: *„For me it is just that each worker is responsible for their promotion in the company or for their knowledge. He is the one who can say, there I still need something, or there I know enough, there I don't need it. That means he must actually say, good, I should do that but I don't have the background. Then the training will be chosen and discussed with him, how he can do it as regards time. Then it will be carried through."* (B2G5-9.)

2.2.3. Flexibility

Overall, personnel policy is oriented on continuity and moderate expansion of staff levels. This is well documented by the

v   rise in staff numbers from 148 to 190 within two years;

v   reduction in agency workers and taking them onto permanent jobs – in peak times there were 40 agency workers in the company.

Staff turnover has been low, despite the reduction in the wages of longstanding parent company employees at the time of the foundation. An individual bonus system is aimed at increasing motivation.

With regard to gender-specific division of labour, it should be noted that the majority of those employed in manual assembly are women, whereas the assembly machines are largely minded by male skilled labour. Each machine is allocated a woman, however, whose dexterity – regarded as being gender-specific – is employed in re-setting it. *„The development area is exclusively male."* (B2G2-6.)

2.2.4. Reward policy

An individual bonus system is aimed at increasing motivation. The latter has to be intrinsically high due to the facts that personnel and employment policy places high demands on technical and social skills of the staff, and management expects staff to determine their own qualification requirements. However, staff are offered individual counselling by the personnel manager in the definition of goals and the means of achieving them.

2.3. ICT Applications: ICT as tool, automation and organisation technology and as communication medium

2.3.1. ICT infrastructure and applications

The ICT infrastructure is constantly being adapted to company requirements and has so far been successively extended. Assembly machines and manual assembly equipment are currently being used in the production department. The development department is predominantly supported by CAD software. In the administration and production workstations, either

standard software packages or successful self-developed software products are used. Thus, for example, the records person is supported by dedicated ICT and attempts to use this support as comprehensively as possible: *„Speaking for myself, I make do with six files, the rest are actually in the mail in Outlook."* (B2G3-4.)

The company is banking on the openness of technical systems where it is a matter of compatibility with customer data, that is, for example on the industrial design-system side. This is despite the fact that the firm's own products using the most diverse software packages or data banks are being used to support company processes and activities. For historical reasons, the PPS is also written by the company itself. This PPS now serves as a central element in a whole-company information architecture which is realised by means of an intranet. The PPS covers all material flows. It is therefore already activated on the opening of contracts in order to keep the customer contract available in an integrated and transparent form. Thus during work on a contract it will be transparent whether.

- there have been changes in the market,

- communication between stores and forwarding is functioning, and

- when and how invoicing takes place.

2.3.2. Character of ICT-usage

As regards technology, the company classifies itself as a user and provider of innovative technologies with upgrade potential in internal company networking. At the moment this potential is exploited with the aid of an intranet.

While in the production area data must first and foremost be quickly available, what counts as the first commandment in the business area is stability and the ability to trace things back. Although the company is not the customer of a maker of whole-company information systems and, because of the direct support of the processes, prefers self-developed systems to bought „solutions", it can be regarded as highly technologically developed in the sector. Alongside the industrial openness to the customers of the ICT employed, the compatibility or integrability of the company's ICT has been a maxim since 1985 (i.e., in the period when it was managed by the parent company, too*): „In 85, 86 we were already only buying automated machines if they had data compatibility, i.e. the ability to exchange programs and status information."* (B2G4-10.) Thus the CAD systems are coupled with the PPS system for integrated process support of development and manufacture.

Alongside the (contract) process-driven ICT support, there is the remarkable decision of the person responsible for ICT to equip logistics and planning workers autonomously with online query language and reporting tools, as this means control by the end user (with a minimal amount of standards as regards evaluations). This approach introduces a change in working conditions to the effect that the scope for flexibility in the fulfilment of tasks can be extended and thus qualitatively high-value work results and an increase in worker productivity can be achieved.

The company is not attempting to provide external access through its provider, as the costs of the necessary precautionary measures to secure files and developments are regarded as being too high. For internal communication, outside the contract-related communication, traditional

media such as e-mail are predominantly used. Nevertheless, information via the intranet does not reach all staff to the same extent nor with sufficient accuracy. According to management, further training measures and tuning of information to the employees' respective fields of activity still have to be carried out.

The principle of openness of information is not only supposed to hold internally, but also externally for the customers. The data-processing manager describes this as follows: *„We are planning the following in our data processing: we want to speak in the words of the customer. That means that the customer's order number is also our contract number. Thus, if a customer rings up and says I have placed an order with you under No. 4711, then the person dealing with it now goes into our system and looks for contract 4711. He will find the customer order because we haven't converted [it] into an internal manufacturing order."* (B2G3-3f) Only on the production side are there problems with this procedure. In components management the handling is analogous to that in production and ordering. Thus if a customer gives a component as a „board", then this item is entered in the internal system under „board". Simple protective mechanisms prevent customers being confused with one another. This type of procedure calls for great mental flexibility on the part of the staff, as different terms are used according to customer.

According to management, the company has not had good experiences with outsourcing. Thus in the long term the wages and salaries accounting which has previously been outsourced is to be brought back in-house. In-house development in this area, however, is new territory for the computer team.

As regards the ICT provision and use in the company it can be said in summary that essentially all activities of the integrated process chains are software-supported, whether by standard products in the administration, in development and for communication, or through the company's own self-developed software utilising existing solutions and tools. What is outstanding are (i) the targeted and integrated utilisation of the available ICT, and (ii) the opening of ordering to the customers, which demands increased effort from staff in dealing with customers.

2.4. *Characteristics of TP and processes of technical and organisational change*

The change in company size by going independent as well as the extension of the organisation through the development department not only brought an extension of the content of the work and tasks for the individual workers, but also an acceleration of the ICT innovation cycles. This led to pressure on the computer personnel and the system users concerned. System changes and the introduction of new features put pressure on staff as the ICT changes often take place under time pressure, so that time for training is too short.

Maintenance measures can also be perceived by staff as pressure. In this area, communication with users is currently being worked on: *„So we are not managing to communicate the corrections, and actually only get nothing but stress among the staff."* (B2G3-4).) An easily recognisable and easily activated information function is intended to provide a remedy. Ideas for improvements also come from the CIP team meetings, above all with regard to ICT

support at the workplaces. At present, the gathering of ideas is not itself ICT supported, for example over the intranet. The results are administered by each team in their own files.

The prevailing technological practice before going independent has on the one hand been changed – end-users get more powerful tools – and on the other hand continued – support for the business processes is typified by self-developed software. The first requires higher participation and higher qualifications among the end-users, the second more knowledge in the company as well as increased flexibility and readiness to achieve results during periods of rapid expansion.

2.5. How to explain TP: business logics, institutional context and internal dynamics

The current technological practice has developed out of that of the parent company by taking over particular systems and methods, such as the PPS and the integration of process knowledge, and has been extended by the necessary ICT support, in particular the development work which came on top of the core processes. The way of doing things can be characterised as consistent insofar as software, as before, is purchased or developed to meet particular tasks and the integrability of the individual components and part solutions is paramount. From the point of view of the staff and the management there are, however, problems in the case of changes in the ICT. Thus, satisfaction and productivity fall when new features are introduced which because of particular orders or requirements are carried out without appropriate preparation in training of those concerned. In the maintenance of existing ICT, changes also lead to delays in providing the necessary information to the staff. The solution to these problems and the extension of ICT support is currently being worked on.

3. Consequences for „Social Exclusion" and „Social Integration"

3.1. Employment: job losses and job gains

There is a particular situation of the company due to its start through management buyout. By that time losses have been caused through inflexibility of willingness to change location and contract, as well as highly ranked skills. Those affected did not join the new company. Gains have been due to skilled developers and engineers, joining the new company and its highly motivated staff.

3.2. Changing work: tasks, tools and skill requirements

3.2.1. Changing work and tasks

The increased customer orientation brings with it changes in organisation and content. Thus, for example, taking over customer order numbers into the internal contract processing and the description of components in the customer's terminology places higher demands on the staff concerned. This has indeed been recognised by management, but has not (yet) been reflected in any measures. *„There have been changes for the staff, because in tasks where previously because of years of training they knew their components, they now face stress situations in that the change here is much faster, much quicker."* (B2G3-3f.)

3.2.2. Changing skill requirements

It can be said that (i) the process-oriented handling of contracts, (ii) the integration of development and production in performance centres, and (iii) the partly flexible employment of workers facilitate a shallow and transparent company structure. True, intensive involvement and great commitment is demanded of the employees. High skill requirements at the level of work structure, content and assignment cannot only be found at the individual workplace, but also with respect to supervision and leadership. In contrast to the parent company, the attitude to the functional roles of the company hierarchy (for example in the CIP teams) had to be changed, in order to support the company's striving for openness in regard to information and involvement.

A further aspect of the technological practice is worthy of note, and probably also deserves a more detailed investigation than was possible in the context of our survey: the above mentioned adjustment to technology in which the information on the changes lags behind the actual situation in the workplace. The stress resulting from this skill development on the job – in cases of pressure of deadlines and high pressure of work – can lead to the exclusion of one person or another.

3.3. Changing employment relations: employment security, terms and conditions

The decisive personnel-policy course was fixed on the foundation of the company, when it started business with selected personnel from the parent company: „*We picked out the best staff. We didn't take everyone on, because there just wasn't room for everyone. Naturally, in the take-over process we kept experience and flexibility in mind,*" said the managing director (B2G4-6.) The choice of staff was essentially made by the supervisors, but also in agreement with the works council. The moving of the original manufacturing site and the wage and salary reductions influenced the decision of many staff not to transfer. The rapid increase in orders also contributed to greater demands. „*There was a great deal of stress on the staff, much more than in the [parent company] period. We got into an expansion phase – built up 50 people in a few months. That was connected with Saturday work, overtime, etc.*" (B2G4-7.) In this period up to 40 agency workers were employed – a measure that with hindsight would not necessarily be repeated: „*That is not the right way. You have give just as much training to agency workers*" (B2G5-12).

There were further organisational changes in transportation, too, which was completely contracted out, and involved the dismissal of one agency worker on a loan contract and one on a permanent contract. This led to a conflict of interest with one employee, as he wanted to remain as a driver, i.e. wanted to be employed in his original job profile, for which however there were no prospects inside the company. The company therefore made efforts to transfer him to a transport firm.

From the company's point of view, there were sometimes excessive wage expectations in recruitment for vacancies. „*I have had some interviews where people have come who have already been employed in another company for 30 years. These people come with expectations where one says: you can forget it. The demands they raise are substantially excessive. In the normal labour-market sector, our semi-skilled workers that is, it is not*"

bad." (B2G5s-5.) In this case, readiness to make concessions on income is a precondition for access to employment.

3.4. Does ICT matter? The relative importance of ICT for social inclusion and exclusion

The expansion of production meant that a threat to jobs, which in general nevertheless results from technological development, was not apparent. *"Every six months we write off half of the hardware – we don't need it any more. On the other hand, software is exploding to double the amount every three years. That means that the trend is away from purely manual production, that this is becoming ever smaller, though it is also being exported to the east. On the other hand, a great number of jobs are arising . . . where software is generated."* (B3G1-9). The women's manual assembly jobs still exist, because there are still no efficient assembly machines for this size of component. In the long view, in relation to production figures and turnover, however, they are falling. As has been mentioned, the women employees are qualified to maintain the assembly machines. As a rule, however, skilled workers are employed there.

One possible form of segregation in the company surveyed appears insidiously and not immediately noticed by those concerned. It concerns the continuous digitalisation of information and the access to information related to it, both in records and information processing. Namely, it affects individual workers differently and indeed according to the degree of integration of their workplace in the ICT infrastructure and the use of it in their daily work. If a workplace is already embedded in the intranet, for example because it is part of administration or accounts, both access to and dealing with information represents no problem for the worker concerned. Nor should the reorganisation of record-keeping represent an obstacle for this group. If the workplace is only indirectly linked to digital processes, for example in the context of the programming of automatic production lines, where an intranet terminal is to be found at the workplace of the person responsible for production, then the workers must have continuous access to this terminal and the intranet, and also be used to looking for information in this way. Workplaces with no access to information via the intranet, for example in the manual assembly of printed-circuit boards, could remain excluded from information intended for everyone.

The company's responsibility to provide information thereby turns, even if unintentionally, into an obligation on the staff to collect it. This can actually lead to the „two or more classes of staff", already spoken of by the managing director, differentiated by differing knowledge and access to knowledge. Just the provision of selected information (by printouts or their own PCs), such as for example productivity figures in the manual assembly area, for those indirectly affected, are measures that increasingly demand self-sufficiency and information skills, i.e. new qualifications where necessary.

The following personnel and social consequences can be drawn in summary:

- On the foundation of the company there was a selection of qualified and widely adaptable staff (wages, location, social framework).

- In the first two years of its existence, the company experienced rapid expansion. This led to permanent high demands on the staff, from the technical viewpoint and as regards working hours.

- Technical changes mean that production calls for progressively less use of labour. The employment level is thus only maintained by an expansion of turnover. In particular, manual work in the production department could be under threat in the long term.

- The employment of ICT is subject to rapid change, primarily in the workplaces of the developers. This leads to stress if the information is not available in time and the necessary training is not undertaken. Staff see themselves faced with continuous ICT changes as well as the obligation actively to further improve their qualifications.

CASE STUDY 4 – METALWORKING

0.   Description of the Fieldwork

The fieldwork for this case study included tours of the company, workplace observations and 10 detailed interviews. Discussion partners available to us were the works manager, the production manager, the computer manager and a departmental manager as well as people from customer services, contract processing and materials planning, the shop steward, a master craftsman and production-line manager, a product developer and a quality controller. All discussions took place in an open atmosphere and were very informative. They were all tape-recorded and fully transcribed. The written version of the interviews formed the basis for the interpretation and evaluation.

1.   Description of the Company

1.1.   Sector

The company is part of the metalworking industry, ÖNACE group 29.2 „Manufacture of miscellaneous machines of non-specific application", class 29.22 „Manufacture of hoists and conveyors".

1.2.   Activities, products and production/business processes

The company involves a production plant for three different components of the end product. Manufacturing consists of mechanical production (sheet-metal working, machining etc.) and assembly, which forms the main emphasis owing to the increasing buying in of components. Over 40,000 orders are worked on and delivered annually. The individual production lines produce between 15,000 and 22,000 parts per year. Alongside production, numerous product-development activities are based at the site. These include, on the one hand, development activities for the plant as a skill centre for particular products and, on the other, activities for the whole concern.

1.3.   Size: turnover and employment

Turnover in 1999 was ATS 420m. Approximately 260 people are employed.

1.4.   Customers and suppliers

Most of the plant's customers are other businesses belonging to the same concern. As a rule, these buy standardised components for the assembly of complete systems. Customised manufacturing is rare. A large number of suppliers, primarily from Austria, provide parts for the plant.

1.5. Market and competition

The European group this company belongs to is one of the largest in the world in this sector. For the company, in addition to intense competition on the world market, there is internal competition between sites and businesses within the group: this includes on the one hand location decisions for investment, on the other hand, on low-cost delivery to other group businesses: *„If we are more expensive than an external [supplier], then parts will be bought in from the external supplier"* (B4G5-8).

1.6. Workforce profile (gender, age, educational profile)

At the time of the survey, the company employed 18 women and 166 men. Of these, 93 were skilled workers (including one woman), of which 23 had master craftsmen's certificates.

33 white-collar workers are employed at the plant, a third of them in product development. Three of these have college degrees, 21 technical college diplomas and nine have commercial apprenticeships.

The number of white-collar workers has remained constant over the last 15 years, while the number of manual workers has risen by 50 per cent.

2. Technological Practice (TP)

2.1. Organisational and cultural aspects

2.1.1. Organisation – the core questions

In rough outline, the course of business can be described as follows:

Redevelopment and further development of products, partly for the company itself, partly for the whole group, is carried out on the basis of projects in the product development department. After completion of a development, the product information is „deposited" in the production planning system (PPS) for contract processing. Customer-specific customised developments are rare; in such cases, the (variant) development is derived from an existing order. Orders mainly arrive by fax and are entered in the PPS by people in the order processing department. In cases of uncertainty, obviously incorrect orders etc, enquiries are usually made to the customer by e-mail. Checks on consistency and integrity are carried out in the PPS. The three order-processing workers deal with more than 40,000 orders per year.

In production planning, the delivery deadline is considered a fixed point on which planning is based. In 97 per cent of cases, delivery can be made on time. The production lines are given contract bundles for the whole week. The task of order processing is also to achieve a relatively even production utilisation through appropriate planning in of the orders. The weekly plans also allow for additional flexibility, both for order processing personnel and for the craftsmen. The ratio of short-term rush orders added to the weekly plans is estimated at five to eight per cent (B4G8-S3).

Co-operation between product development, order processing, materials planning and manufacturing takes place through information filed with the PPS or through the processes controlled by the PPS. The positions have access appropriate to their tasks or receive print-outs (of the weekly plans). There are direct requirements for co-ordination through personal discussion or telephone enquiries if, for example, there are uncertainties in the documentation for individual products (order processing confers with development) or where it concerns the planning in of urgent orders (order processing and production). Above and beyond this there is important communication that is not foreseen in the formal course of things: thus in materials planning in the processing of PPS order proposals, information from other departments is taken into consideration – as for example with large orders that will come in soon but which have not been taken account of in the PPS, or for blueprint changes that will render the (bought in) components in the stores worthless.

In the production department, the master craftsmen, who are responsible for the whole process of a line from component manufacture to packaging, distribute the weekly plan to the work-stations and explain any peculiarities when handing it out. Here, the discussion partner for the master craftsman is the team leader. The working groups are relatively independent with regard to the distribution of work. They only report completed orders back to the PPS. Rush orders are „slipped" into the weekly plan by the master craftsmen on the production lines.

With the exception of particular administrative functions that are looked after by company headquarters, all the business's functions are concentrated on site. This gives rise not only to a social but also a spatial closeness between production, product development and order processing. The merging of order processing, previously separated according to product lines, into one department led to greater spatial distance between product development, order processing and production of a particular line – the personnel are now housed in a neighbouring building. The loss of the immediate daily contact with production was regarded as a disadvantage, although by no means a serious one. Actually to continuously see the products and components and also to communicate in a non-planned way with the developers and those responsible for production was regarded as an advantage for order processing.

The increasing outsourcing in manufacturing, though also in the IT area, has lead to an increase in co-operation over greater distances. There is a special situation in product development, inasmuch as this takes on both the jobs for the site but also those of the group as a whole. In the process there is close co-operation with development centres in other European countries and further abroad. The international co-operation on a common project calls for close contact by telephone and e-mail, as well as travel once or twice a month. Experience shows that the use of communications technology has not replaced travel-related meetings.

2.1.2.   Organisation – background information

The manager (works manager), who is responsible for the site, makes the strategic decisions and reports to the group management. Subordinate to the management are order processing, production, materials administration – including goods inward – quality management, development and administration. Alongside the hierarchical company structure, there are profit centres covering the three manufacturing areas.

The running of the company takes place on the one hand hierarchically through the management spheres of responsibility. On the other hand, the reporting provides performance figures for the individual units. The master craftsmen manage the production, with the day-to-day work being co-ordinated by the appointed team leaders. There is a high level of independent organisation both by the master craftsmen and the teams. The workers practice job rotation in order to even out the work load and maintain skill-levels. There is no detailed reporting back to the PPS on the progress of work, but exclusively reporting of completed orders. The workers are paid on an hourly basis.

The company has a tradition of decentralisation of operative decision-making insofar as it can be numbered among the pioneers of cellular manufacturing or group working in Austria. Manufacturing is given a framework plan that allows the master craftsmen and the teams wide room for manoeuvre in everyday division of labour. This elbow-room is used to guarantee rapid delivery times and to make it possible to work on additional rush orders. The relative independence of production is occasionally impinged upon if it is a question of whether an additional order can still be met within a short time or not.

„We've tried that out a number of times and said, no, there's no way that can be done. So we're not doing that order. A firm no. We're not doing it. Then in less than a day the order came from the highest level: That's got to be done! The customer needs it, because it's a hospital that's going into operation, and so on and so forth." (B4G9-S10)

The integrated production lines and the just-in-time principle mean that it has been possible to reduce the production time from cutting to integrated assembly from 10 weeks to five to seven days. Here it is noticeable that the new products have fewer manufacturing stages. Above all they demand less skilled work (turning, drilling, etc). The buying in of components and concentration on assembly work, however, means less flexibility. Problems with the bought-in components arise when there are changes in requirements, since short-term changes are not possible. In emergencies, however, most components can be manufactured as they were previously by the company itself. It is the objective of forward planning, i.e. through advance information from the customer, to extend the current tight planning horizon.

The incorporation in the international group, to which the company belongs as a manufacturing plant and development centre, determines the organisation. On the one hand this concerns dependence on central decision-making and the competition between units within the group for investment and orders. On the other hand, the economic success of the plant is continuously assessed by the strict accounting within the group. Finally, there are restrictions because of uniform procedures or technologies covering the whole group. This will be mentioned later in relation to IT application.

2.1.3. Culture

The company culture is shaped by the long service of most of its employees and the plant's social integration in the region. The company offers job security – redundancies are as good as non-existent – and there are also promotion opportunities because of the emphasis on internal recruitment for higher positions. In recruitment for management attention must be paid to whether the people „fit in in the region", i.e., they should feel at home here, but also not be too dissimilar to the type of people found here. In the working process the homogeneity of the

workforce expresses itself in the informal nature of communication. The familiarity makes agreement with one another easier. It is the basis for close relations that not least represent the social foundation of a decentralised organisation.

A further characteristic of the company culture arises from the fact that in its recent history the production plant has been faced with continual uncertainties. *„We had to fight . . ."* (B4G5-8). The struggles experienced, the success won and the certainty that it will continue to be a constant struggle have above all moulded the company management. The pride in the common achievement is clearly noticeable. The search for innovation and the readiness for change have become a matter of course for many. So far it has also been possible to make sure that nobody has fallen by the wayside in the process: if one component area of manufacturing was dropped, the workers found jobs elsewhere in the company. In this sense the company can be characterised as caring – there is no policy of hire and fire. Against this background, staff levels are also only raised cautiously and with the aid of agency workers, in order not to face the risk of having to make anyone redundant again.

So far it has also been possible to prevent the group guidelines from affecting relations in the company too much, „that only the figures are important". High demands are made on the employees, but at the same time the effort is made to ensure that they feel in good hands in the company. *„At the moment our colleagues are so committed to the plant that I don't want this commitment to be disrupted by someone who is only interested in figures and has no time left for people."* (B4G5-S6)

2.2.   Personnel / deployment of labour

2.2.1.   Skills and qualifications

The production department employs skilled workers and semi-skilled workers. The team in a flexible production system consists almost exclusively of skilled workers. Alongside the mounting of parts and the minding of automatic production, these activities also include programming the machinery. This also applies to mechanical production on numerically controlled machine-tools on which skilled workers also work. In the assembly areas on the other hand, the majority of workers are semi-skilled. This work is largely routine and can be learned in one to two days. The group's strategy of increasing outsourcing has led to a reduction in in-house manufacture of components. Work in mechanical production has thereby fallen and workers have been transferred to assembly work. For recruitment, this means an increased take-up of semi-skilled and fewer skilled workers. The level of formal qualifications in the production department is thus falling. However, the recruitment of semi-skilled workers does not mean that people are being taken on without vocational qualifications. *„We look for . . . young, committed people who have previous training – for example, mechanics, joiners, agricultural machinery mechanics. People who have learned a related trade and as semi-skilled workers with us will also have very good chances of promotion."* (B49-6)

The reduction in skilled demands is partly compensated for by opportunities to plan one's own activities and through the challenges of self-organisation. Workers have to ensure the availability of the materials themselves, restock the stores after a visual check, etc. To this end,

they regularly access information in the PPS. Skilled workers transferred to assembly work are to some extent appointed as team leaders in order to give them more demanding work.

In the white-collar area, there is a tendency in the other direction. Here, a higher level of qualification is demanded than previously. A technical college diploma is increasingly a precondition, and the proportion of college graduates is rising. *„We often talk about it; today we would have no chance in this company, I'm convinced,"* said a longstanding woman staff member without a higher school-leaving certificate (B4G6-17). The increasing demand for formal qualifications is only partly due to the increased demand for qualification in the work. One departmental manager said that the work did not necessarily demand a higher level of education, but that they were more flexible in utilisation of personnel and technical training was useful in contact with customers (B4G7-17).

2.2.2. Training

Apprentices are trained as fitters in the company.

Once a year in the course of drawing up the budget a training plan is produced which lays down the further training aims and measures. Training is provided in connection with technical changes, if a new system is introduced or additional software is used in the workplace. Instruction is also provided over one or two days where the need for it becomes apparent. In other cases, if for example it is a matter of additionally mastering Excel, *„our motto is 'learning by doing'. What I need in Excel I taught myself or my son [taught me] at home."* (B4G6-S14). True, it is emphasised that each and everyone can receive the training they need for a new task. On the other hand, knowledge of Office software is taken as a prerequisite. In general, the employees have to actively seek courses (for example in foreign languages) and the company's financial support. This can have the effect that those who are less keen on training, or those who find it harder to attend a course, fall somewhat behind. In one discussion the supposition was made that younger people attended a course more readily, but older people needed an incentive.

Computer training has not always been able to take place when it was needed. Sometimes what has been learnt has been forgotten again by the time it is needed. Individual learning, learning by doing, is supported by mutual assistance. It is very important to be able ask someone if one just „gets stuck".

„. . . and then for a year you don't do anything, and then you forget what it was you did." „And who do you ask then?" „Yes, then there are these two or three people who know Access anyway" (B4G7-S11).

2.2.3. Flexibility

The staff at the plant consists almost exclusively of full-time workers. Part-time work is a rare exception. Agency workers are currently used to a limited extent to cover peaks. In the past they also stayed engaged for longer periods, if the company management did not want to increase permanent staffing because of uncertainty over the sustainability of an expansion. AT one time, between 25 and 30 agency workers were employed.

There is a large degree of outsourcing of IT services to small companies and self-employed programmers. The build-up of staff for IT functions in the companies is restricted by the group management, as it expects them to use central resources. For this reason alone, the numbers in this area have to be kept low.

2.3. ICT applications: ICT as a tool, automation and organisational technology and as a communication medium

2.3.1. ICT infrastructure and applications

The production planning system represents a central element, created in co-operation with a software house. A further element is networking inside the group, which serves primarily for reporting and information exchange (by means of a web solution in the intranet). Product development is mainly supported by CAD software and a group-wide (suppliers) information system in which technical drawings are filed. In addition, all the current communication technologies are used in the department for product development (ftp, e-mail, phone, fax, etc). In the administration and production workplaces, either standard software packages or successful applications developed by the company itself are employed. The introduction of a completely networked outsourcing solution using a company-wide information system is envisaged. Today, the PPS serves as the central element for a –company-wide information architecture realised by means of an intranet. The PPS covers the whole materials and order processing flow. It is therefore already activated on receipt of the order in order so that the customer order is kept integrated and transparently available. The job stages are set out so that the staff can to some extent be guided by the system.

The base technology on the site is a PC LAN with a high-performance server in the production area and a dedicated production-planning host. Modern net technology with fibre-optic cables and robust platform solutions facilitate centralised data control and the efficient exchange of data with the national company headquarters for the purpose of data reporting and wage and salary accounting. Additionally, Office software as well as a stand-alone databank is used for the purpose of quality control, which has been developed over several years.

2.3.2. Character of ICT usage

- tools

In several places (order processing, materials planning etc) PPS functions are used as tools for dealing with special tasks. Alongside this, several white-collar workers use Excel or Access for additional overviews or assessments. They have to some extent customised these tools themselves and use them autonomously. In manufacturing, too, the PPS is used as a „tool" to get information on stock levels or delivery dates. The CAD applications for product development also have the character of tools.

- automation

A flexible manufacturing system is employed in the production department for sheet-metal working. Both the working of the material (cutting, stamping, welding) and its transport are automated in programmable machines and handling systems.

In the white-collar area, the application and further development of ICT has led to considerable productivity increases. These are illustrated by the following example: In the ordering of material, considerable savings have been achieved by sending faxes to the suppliers direct on PC. One-and-a-half or two years ago, letters or faxes were printed out on a company form, signed and sent by post or fax. This was a significantly greater amount of work. Exceeding of the agreed delivery date is registered by the system, which automatically sends out an urgent query by fax.

The group's central drawings databank saves the developers from copying and sending plans. One person was employed in distributing technical drawings who is now responsible for a completely different area, namely – along with drawings maintenance for the data bank – for safety at work (B4G3-S10).

- organisation technology

As has been described, the PPS represents the information technology backbone of the company. Not only is production planned through the PPS, but it also directs the company process as a whole including taking of orders and materials provision. The completion of orders is initiated through the PPS – whether it is manufacturing through the weekly plan or materials provision through orders. This does not mean, however, that work would be determined by instructions provided or generated by the system. Rather, in all jobs there is room for manoeuvre to change or omit plans or tasks from the PPS on the basis of one's own experience and in view of current requirements. *„Production planning actually takes place in the PPS, but one doesn't keep to these deadlines. There is an incredibly wide grey area that the master craftsman controls himself."* (B4G8-S4).

In 90 per cent of cases the order advice from the PPS is revised in the materials distribution department, with the reliability of the suppliers, the intended minimisation of stockholding, the expected size of the order etc. being additionally taken into account.

The common technical drawings data bank in the group can also be regarded as organisation technology. The versions of components and product plans held there are so to speak officially valid and binding on all. All companies and development departments, and the suppliers as well, have immediate access to them. When plans were distributed on paper, it was possible for the drawings to have different status in different places. Now the guidelines have to be adhered to more closely.

- communications medium

E-mail is used internally, in particular for sending texts, plans, set-ups etc. Only a few people use it to send messages to other people in-house. Personal contact (one looks in on the office) or the telephone is preferred for this.

E-mail plays a very important role for communication within the group – and thus also with customers – even if the orders come in by fax. Queries regarding uncertainties take place by e-mail. Orders to suppliers are also sent by fax, with outstanding questions being resolved in parallel by e-mail.

E-mail does not replace the personal contact through meetings in the co-operation among the international „virtual" development teams. An example of the project work mentioned to us

was the e-mailing of specifications of the product to be developed. Each recipient interpreted the information in their own particular way. From the answers, it was then noticed that there were differing understandings in different locations. It then needed a lot of writing in order to arrive at a common viewpoint. In a case like this a meeting is more efficient and often the only really reliable solution.

2.4.   Characteristics of TP and processes of technical and organisational change

The company's technological practice is firstly characterised by the fact that the PPS has been adjusted to the procedures and the particular demands of the business. This has occurred in particular with the aim of maintaining flexibility and keeping to deadlines. The PPS is on the one hand extended through management instructions, and on the other hand staff work with a high degree of individual responsibility with support tools like spreadsheet applications in distribution. On the NCMs in manufacturing as well, as a rule the programs are written or adjusted by the machine minders, who are skilled workers.

The PPS supports the decentralised organisation. The workshops' room for manoeuvre and the independent organisation of the work teams is allowed for on the one hand by framework-planning and dispensing with detailed reporting back, and on the other by the ability to access information. *„If there are six people in a work team, then the terminal will certainly be consulted 20 times a day"* (B4G9-S14). On the other hand, without team work and a certain amount of independent organisation, an essentially more detailed planning and job description would be necessary.

Above all, this technological practice calls for high qualification on the part of the end user. The required training has to some extent to be suggested by the employees themselves. This is not entirely unproblematic: *„One learns a particular area relatively quickly. But if it is a bit in depth or if it is also interdisciplinary, then it needs a good deal of experience." (B4G8-S6) „And only a few people know it properly. Most come to it superficially. And if those few people aren't there, then it can all very quickly come to a halt somewhere or other."* (B4G8-S7)

Personal information exchange benefits the quality of the processes, as can be seen from the example of materials planning: *„We are sitting in an open-plan office. The person taking the order rings up and says, watch out, we need this in the immediate future . . . Or he puts a note on the desk and I . . . you then keep it in there [points to his head] too, and then you know there's a rush coming, and you're more cautious."* (B4G6-S3) This kind of information transfer and early warning is not computer supported, because this information is only available when an order is placed: *„If we only know from the customers that we can expect a boom, then I still don't have any orders in the computer system. And then my colleagues only inform me verbally, so that I have a bit of advance warning."* (B4-G6/3)

2.5.   How to explain TP: business logic, institutional context and internal dynamics

The business logic is influenced by management efforts continually to foresee developments and to initiate actions that will maintain the site in its tradition and skills. A typical example is the struggle for product development tasks: *„We have even had to fight to keep*

responsibility for product development" (B4G-S8) on site. Personnel policy and the company culture, both internally and as regards external co-operation, are important for the survival of the company.

Important development phases have been supported by co-operation, for example with universities: *„And I think that this (new manufacturing) would not be the way it is if Prof. W. and his people had not helped us out so much."* (B4G5-S9).

This development has been and still is accompanied by continuous reduction in costs. This concerns decisions to buy in components as much as the reduction of fixed costs, independent of whether or not this concerns development, production or IT. It is therefore seen as important that the number of employees does not increase, despite the increase in turnover. The reduction of fixed costs *„has been the driving force, rather than the worry that we will develop a bloated organisation. The worry is that we ourselves have too many fixed costs that we can only influence in a limited way if we no longer need them."* (B4-G5/10)

As regards individual peculiarities of the technological practice, namely the individually organised use of Excel or Access at some workplaces, the following attempted explanation can be derived from the interpretation of our discussions: because of the minimisation of fixed costs and because of group regulations, as few IT personnel are employed as possible. There is thus no large internal IT department to look after all the applications and all the wishes of the staff. In order to provide certain additional functions, staff have created help functions on the basis of Excel or Access. On the one hand this means a certain autonomy in the shaping and adaptation of technology in the workplace. On the other hand, it involves disadvantages with regard to software ergonomics, as differently organised desktops crop up and it is necessary to switch between a large number of applications – sometimes involving additional data input.

When there are changes, those responsible expect staff to show increased flexibility and readiness to work. Problems are primarily dealt with by *„neighbourly assistance": „. . . you just ask a colleague"* (B4-G8/8). Staff also indicated that curiosity in relation to ICT was very useful.

As long-term job perspectives are somewhat rare in this region, staff are usually ready to show a high level of commitment in the workplace. Above and beyond this, the management has excellent experience with young people from the region, as *„these young people who come from the area and also suit the mentality of this area, and thus really underpin what we have made our slogan, namely excellent co-operation between office and workshop, between operatives and staff."* (B4G5-S3)

The speeding up of business, which among other things can be seen from the ever more rapid product changes, calls for a flexible organisation and qualified personnel. It is all the more important that the employment of IT supports this flexibility and involves as few rigidities as possible. This is to be feared with the introduction of an enterprise resource planning system prescribed by the group headquarters. This could have a lasting impact on the technological practice.

3. Consequences for „Social Exclusion" and „Social Integration"

3.1. Employment: job losses and job gains

The numbers employed have increased continually over the years, above all in the production area. Recently, new intakes have followed a new policy, namely to increase the ratio of semi-skilled to skilled workers. This became necessary because of the shift from machining/manufacturing to assembly work. Nevertheless, people with a trade were preferred in recruitment. An apprenticeship as a mechanic or joiner is thus, if not a precondition, nevertheless an advantage. The local labour market provides enough applicants to make a detailed selection possible. More women are now employed in the manufacturing department than previously, conditioned by the growth of the assembly area. If workers with a trade are preferred for semi-skilled positions, this is somewhat to the advantage of men and is disadvantageous for women job-seekers.

The number of white-collar workers has remained more or less the same despite the enormous increase in turnover. The higher demands with regard to formal qualifications are an issue in new recruitment, but in no way threaten the employment of (older) workers with lower qualifications.

The company has no experience of problem groups on the labour market, with long-term unemployed or people rejoining the labour market. There was once a programme, but it was not needed.

Various jobs have been lost in the company through restructuring. One example of this is the buying in of manufactured components, which are needed in greater numbers, instead of making them on site. In the process, jobs were saved and the skilled workers employed on them were moved to assembly. Nor will the current closing down of electronics manufacture lead to redundancies. Since staff levels in this department have already fallen over a long period from 30 to the present eight, the workers here, like their colleagues before them, will be moved to comparable jobs in the company. It is primarily the expansion of assembly work which makes it possible to take up the labour that has been made redundant in other areas. As a rule, transfers take place without loss of wages.

The rationalisation effects of the use of IT have not led to job losses. Jobs are taken up by the expansion of turnover. Purely arithmetically, handling the enormous growth in turnover and increase in quantities with the same or a less than proportional increase in staff obviously means a considerable (fictional) labour saving.

3.2. Changing work: tasks, tools and skill requirements

3.2.1. Changing work and tasks

Work in the production department has shifted towards activities with lower qualification requirements and increased monotony. In the framework of cellular production and team work, the attempt is made to offer skilled workers demanding activities. Master craftsmen are,

for example, appointed as team leaders. For the white-collar workers, manual activities (copying of plans, sending of plans or orders) have diminished.

3.2.2. Changing skill requirements

In production, the average qualification requirements have fallen. The increased employment of semi-skilled workers had already led to a reduction of the average wage bill. Skilled workers in the assembly department are faced with lower skill requirements in comparison to machining/manufacturing. The planning tasks, the tasks of team leaders or the allocation of special cases, for which a good understanding of technical drawings is important, pose higher demands than the routine mass-production assembly work.

The use of I&C technology does indeed have an effect on the workers. Thus queries have to be made on the PPS. As a rule this does not represent a problem. Individual work teams can also divide up the work so that the few people who are apprehensive about the system do not necessarily have to use it. Programming NCMs is part of a skilled worker's job and is also covered in training.

In the white-collar area, the comprehensive IT support has not led to a reduction in the importance of knowledge and experience. True, through plausibility testing or the generation of orders etc. the system has „taken over" individual tasks in order processing. The employees, however, need comprehensive knowledge of products, customers and procedures in order to be able to process orders effectively using the PPS. In the course of things the experience-guided working is underpinned by informal communication across department boundaries.

IT experience is very important in the white-collar area. Here it is primarily a question of the application knowledge of the PPS, through Office programs, e-mail, and/or CAD. IT specialists need both technology experience and company-specific experience. But the required confidence with the company-specific IT applications or networks for example, does not necessarily rule out outsourcing. Because of the rarity of network crashes, network specialists are used for other tasks. *„And then there is an emergency, which happens only once in a blue moon, and then he doesn't know what to do either. If the nets are so stable, we can certainly get a better service from companies that deal with such interruptions on a daily basis."* (B4G2-S6)

International qualifications are necessary for all posts for which co-operation with customers or other companies in the group is important. First and foremost here is knowledge of English. In addition there is the understanding of other cultures.

Good communication skills are required in many posts in the company – whether it is having to get together to discuss things with others in-house, negotiating with customers on the urgency of orders, discussing problems with suppliers, co-ordinating with others in the work team or having to adjust stages of work in an international project team. On site, communication is made easier by social proximity, between the various groups of employees as well. Over greater distances, the predominant use of e-mail can lead to the „instinctive connection (to customers)" breaking down. To this extent, the mix of communications media poses new challenges for the employees to choose the right medium for the respective purpose and situation.

3.3. Changing employment relations: employment security, terms and conditions

Employment conditions and employment security have not essentially changed. As before, the company rests on a core staff of longstanding employees. Experience and loyalty are highly rated. The employment of agency workers cannot be interpreted as an extension of a casual labour force or a switch to more flexible forms of employment. On the one hand, the proportion of agency workers was previously much higher, on the other the use of (more expensive) agency workers instead of creating new positions represents a signal to the core staff that contracts of employment are seen as lasting and thus are only given when there is a high level of certainty of the long-term requirement.

The contracting out of production, i.e. the buying in of components, and the employment of outside companies and freelancers is an important savings strategy for the company which is supported by a corresponding programme in the group. In information technology areas, in particular, IT service providers or local, small companies or specialists are increasingly used. Employment, in some cases through contracts for work or other forms of contract are thereby replaced (or rather, avoided).

3.4. Does ICT matter? The relative importance of ICT for social inclusion and exclusion

The company is technologically integrated to a high degree; working processes are heavily penetrated by ICT. ICT is thus of enormous importance for work in this company. The effects on employment, i.e. on the opportunities for employees to find a job and on the dangers of losing one, are however only indirect. Here the following aspects should be considered:

- All communication with customers takes place in English by e-mail

- The production planning system does not always support processes in a job- or role-specific way, so in some circumstances staff have to work with the company's own software.

- Development activities are group-wide and standardised. The group's own information system controls the development processes and interface design.

- Organisational changes have to some extent led to the merging of departments (for example, order processing). If previously the proximity to the production process favoured context-sensitive action, communication with the master craftsmen now has to suffice.

One indirect effect of ICT on employment chances may be the limited training and the great importance of informal forms of learning. Thus, support from one's own children, looking around and trying out in the system, mutual help in the office and the workshop are indispensable for coping with the technology successfully. Here, those for whom these things are not accessible or who find it difficult could be at a disadvantage. In the fieldwork for this case study, however, it was not possible to find indications of any problems in this respect.

The emphasis on formal qualifications in recruitment has an essentially more direct effect than use of ICT. Thus even the reduction of the qualification level in the production department has not opened up opportunities here for problem groups in the labour market – unemployed people without vocational qualifications. „*Training is important for us"* (B4G9-S7). As not

only the example of the recruitment of semi-skilled workers but also the choice of white-collar personnel shows, training is also important if the activity does not necessarily require a particular qualification. One reason for this is management's interest in „reserve qualifications" for organisational changes. In this respect, people with higher training qualifications are regarded as being more flexible.

With regard to another labour market problem group, older workers, the high level of employment security in this company should be highlighted. Redundancies are very rare and the workers' experience is rated very highly by the management. On the other hand, there is no explicit age limit for new intakes. In the production department „45-year-olds [are taken on] too", although the ideal image is of „young, committed people with previous training."

CASE STUDY 5 - SOFTWARE

0. Description of the Fieldwork

Standardised interviews were carried out at two locations of a software company with preliminary discussions taking place at the headquarters and the rest at a regional site. The choice of interviewees was based on the preliminary discussion with the software company manager. Further desired discussion partners were chosen on the basis of the initial information. The discussions were carried out on the basis of a guideline, recorded on tape and finally transcribed. The analysis and interpretation were based on the recorded data, and additional observations on site.

1. Description of the Company

1.1. Sector

Software development

1.2. Activities, products and production/business processes

The location studied, a „software projects" profit centre within the group, develops customised standard software. It is more or less the extended workbench of the customer department based in the company's Austrian headquarters.

Products include dialogue-oriented applications based on databases. Recently these products have increasingly been developed as web-based software. Programming a special module for an international provider of standard business-management software plays a large role, which will be dealt with in greater detail below. Alongside this, the company has long had close relations with large, Austria-wide membership organisations and service providers in the NPO sector. As a result of the participation of a German concern in the company, administrative applications for special branches of industry have increasingly been developed and marketed.

Alongside the project-related development of software, the company studied also operates as a service provider and supports companies in the field of computer infrastructure. This means that alongside project-specific development and maintenance of software projects, customers are offered additional computer support services (e.g. project development/management, purchasing of hardware and software, support . . .).

1.3. Workforce profile (Gender, Age, Educational profile)

More than 100 people were employed at the location studied – a very young team, seen as a whole, with an average age of under 30. The proportion of women is approximately 40 per cent. One peculiarity of the company is the personnel policy, which is heavily influenced by the

marginal geographical position. Within the company, the problem that there is hardly any qualified personnel available on the regional labour market is solved by recruiting grammar school and vocational technical school leavers and training them up inside the company as software programmers and developers. More than half of the staff have completed a four-month training within the company. This also reflects the company's growth process, which has been able to double staff numbers within the last five years. With these personnel numbers, the company, which maintains further Austrian sites, is among the major representatives of a rapidly changing sector.

2. Technological Practice (TP)

2.1. Organisational and cultural aspects

2.1.1. Organisation – the core questions

All employees in the regional location studied –with the exception of three auxiliary workers – are directly assigned to software development. The actual programming and design of software tools takes place in the framework of respective projects. After completion of the products, the development projects as a rule automatically become maintenance projects, which also includes support. The scope of activities here ranges from „old" large-scale accounting applications to web-based systems.

Software development is oriented on classical models and instruments, i.e. tasks are distributed by the project leader on the basis of a duty roster or similar job list and subsequently developed in group working.

„One-man jobs are the absolute exception here" (B5B1-7), if for example software changes have to be undertaken in the context of a maintenance project or interfaces are programmed for the transfer of old data. As a rule, however, the tasks are clearly distributed within the project teams, with the clear division of labour being envisaged in the various departments, which appear both in the company headquarters in Vienna as well as in the location studied. The first-level support, i.e. all activities that take place directly with the customer or on the customer's premises, are as a rule overseen by headquarters. The actual development or improvement of products takes place in the location studied. There are also a limited number of software developers at headquarters who can be called upon to support these activities in particular cases.

Customer requests/requirements are received in the respective departments at headquarters and transmitted to the executing departments by electronic media (Lotus Notes for communication as well as administration), i.e. tasks which will subsequently be worked on are downloaded into a data bank.

There are three different tasking scenarios:

Scenario 1: another part of the company (other than the profit centre studied) is responsible for customer contact and the project itself. The location studied delivers a finished product to order.

Scenario 2: The location studied (profit centre) is responsible for handling the content of the project, which includes product development and product definition.

Scenario 3: the overall responsibility including sales lies with the location studied.

Communication and co-operation play a decisive role, as the length of individual projects (including follow-up maintenance) can stretch over several years and as a rule this work involves two to five staff members at the site (i.e. without customer contact with headquarters and project management).

A formal platform, which is very important for communication and for the administration of project data and project control, is formed using technical project-planning tools. According to project requirements and on the basis of discussions, staff communicate using a Lotus Notes database in which all information relevant to the project (decisions, milestones, minutes . . .) are recorded. The high degree of formalised communication however does not replace the parallel informal personal communication, which is important precisely in the grey areas (brief queries, mutual support . . .) which would go beyond the bounds of formal documentation but are of ubiquitous significance for the success of the project.

Because of the organisational and physical separation, agreement with the respective customer department by formalised means of communication – by e-mail (Lotus Notes) or phone – is of great importance for the efficient processing of customer enquiries. Only in exceptional cases, i.e. in complex tasks, can personal discussions at headquarters or a direct customer/development team contact take place. These long-established processes underpin the efficiency in communication and the ongoing administration and documentation of information, and display a high level of utilisation of information and communication technology in the company.

The biggest department, which is developing a special module for a an international provider of standard commercial software, occupies a special position. Here, co-operation with the development department of this international company takes place on the basis of a technically very clearly defined joint platform, i.e. staff at the company studied have direct access to the customer's system. This close technological contact, however, is not reflected at the organisational level. Here the company's development department has a great deal of freedom in the determination of its activities as long as the quality is maintained and the deadlines are met, which it has always been possible to achieve in the past.

This form of co-operation between sites however has a special status. Otherwise all development activities take place at the site studied, with the headquarters, which is responsible for customer contact, being able to provide support from its own software department on projects where the time factor is critical. Staff do not see their concentration in one place as a disadvantage however. Some teleworking posts have been established, mainly for women employed part-time in customer care tasks, which they can deal with from home. This is welcome, as some activities can only be dealt with in the evenings (e.g. installing software for customers). Overtime is worked primarily in phases of projects where the time factor is critical, otherwise work can be completed in the time allocated, however with some parties commenting critically that the pressure of work in responsible positions is increasing.

2.1.2. Organisation – background information

The formal organisation is very strongly customer-oriented, i.e. at the headquarters and at the site studied dedicated departments have been established for the major customers (NPO, industrial customers, providers of standard commercial software), with direct customer contact as a rule taking place through the department at headquarters and all project-specific activities being carried out at the site.

The classical shallow hierarchical structure, with departmental heads and staff is increasingly under pressure from the everyday project work, as projects with (part) project heads and project teams very often exceed departmental boundaries. This means that the departmental head is responsible for all departmental questions not directly related to specific projects, but for all other questions project leaders have independent responsibility and decision-making powers for individual projects.

This organisational division of various decision-making powers and responsibilities hardly gives rise to problems, however, except perhaps in the phase of project definition, where someone responsible for a project may wish to use the resources of a department whose manager (because he is responsible for another project) might not wish to make them available to the desired extent.

„There are these problems at first when it comes to the question of planning and allocating resources. Over time you get to know who you want and who you don't want, and why; that is, it is not a question of getting somebody, but a question of getting person X again. Now, as a specific example, we have someone who has done a very successful Java project and was previously a maintenance programmer for me on a C++ client application. And I was very happy and the customer was very happy. And I wanted to have him again. But Java is a brand-new modern technology that he has only recently learnt. It was to be expected that there would by a massive influx of Java projects. I didn't get him – these are things that will escalate." (B5G8-7)

According to those interviewed, however, if the decision is taken in the project-definition phase, no major difficulties occur.

Traditional control and guidance methods are used to meet targets. Among these are very a precise project definition with laid down deadlines and tasks (deadline plan, milestones) and a running project control. All staff keep records of hours on the project activities and these data are automatically extracted and assigned to the projects in the framework of an internal accounting system. Resulting from these records there is a monthly „project summary" which is drawn on for the regular meetings.

There are monthly project meetings (of steering or co-ordinating teams) where those responsible provide the area managers and a representative of management with information on project development. Above and beyond this there are regular meetings with the clients to report on the course of the project and further activities and where any necessary decisions are taken jointly with the client.

2.1.3. Culture

It was clear from the interviews that there was a very friendly and collegial climate at the location. Because of the geographical situation, working together, mutual support and regional identity are important elements of the company culture. As a rule the company accepts the needs of staff returning from parental leave. This primarily relates to working hours, but also concerns the installation of equipment for a temporary home tele-working position.

This is also displayed in the staff loyalty to the company, where high levels of overtime and weekend work are accepted in intensive project phases, which owing to flexible working hours that can largely be decided by staff, can be run down individually. Turnover is also very low, although the organisational and age structure leave little room for promotion chances and a change in the content of work is in the long term not possible for many employees.

Here, however, the fact that the increasing pressure of work primarily affects areas with most responsibility, and so puts the overall picture in context, should not be overlooked.

„OK, the phrase 'to be married to the company' is not without reason. And it is well known in the informatics sector particularly that you have to be committed and that an eight-hour day is not really possible . . . you have to be flexible." (B5G3-5)

For staff with families in particular there is often a problem in expanded task areas and increasing responsibility.

A characteristic part of the company culture has long also been the existing and growing mutual distrust between the site in an outlying regional situation and the headquarters in Vienna. One aspect that illustrates this opposition is the salary discussion, i.e. the question of who earns more. Here, suspicions can be seen in both directions, which to some extent leads to the impression that staff from the headquarters are given preference in promotion, which in any case is only rarely possible because of the low turnover and the young teams.

2.2. Personnel / deployment of labour

2.2.1. Skills and qualifications

As the company being studied is a pure software producer, technical expertise is of immediate importance. Here two major areas should be differentiated: on the one hand knowledge of the various technologies (e.g. programming languages and their structures), and on the other hand the methods how these technologies can be utilised within the context of a project.

Staff require *„a very profound knowledge of the subject, i.e. people also have quite deep specialist knowledge".* (B5G1-6) This includes the respective programming languages and the mastery of analytical tools for project definition.

The type of programming language used is very dependent on the clients and their technical infrastructure, but also on the length of the client relationship (e.g. longstanding projects are still based on an „older" technology) and, as in informatics as a whole, changes are frequent. This means that staff *„don't learn something and assume that you will be using it for five years. In programming there is certainly not a tool that you use now and will be using*

for the next five years. So we are really developers. And not some kind of user, if you want to put it like that.” (B5G2-13)

In the actual project work, i.e. working as part of a team, key qualifications like continuous learning ability, knowledge and information acquisition and, above all, practical experience in running and implementing projects are of decisive significance. How comprehensive these demands can be is very well illustrated by the following assessment: „*People have to acquire their experience in project work, i.e. they have to learn that the mastery of technology alone is not sufficient to run a project successfully … In the final analysis it is not a question of passively acquiring knowledge, but of being actively involved in making something out of it. Of informing myself from various sources, of looking at how others are dealing with technologies, what sort of experience the others have, how we can profit from it. … And on the other hand it is actually what I call process knowledge. To know how software development projects run. What is important in project management, what is important at the non-technical level of projects. Of course, that's another factor again.”* (B5G1-13)

Above and beyond this, because of the many different projects, there is a growing responsibility for some of the staff to acquire core qualifications as (part) project managers. The company is attempting to solve the problem of finding people qualified for this by giving young employees responsibility at a very early stage. As most of the development projects are continued as maintenance projects, here the possibility arises of testing the leadership qualities of staff in connection with taking on responsibility.

„*Through the maintenance projects you find out how much you can entrust to someone. To what extent they are capable of solving new customer requirements within an existing project intelligently. And then you just try a new project where they do the analysis for the first time. Perhaps together with someone as well … and it's very similar in project management. Sometime or other every project manager does their first project.”* (B5G8-4)

2.2.2. Training

„*In our business what counts is the level of knowledge of the staff. We actually live from knowledge, so training is naturally an essential issue, also an issue that demands a relatively large amount of money if one adds it up, not that there are now unbelievably high costs. But it is just quite a fundamental thing.”* (B5G1-12)

This statement illustrates the great importance of training. Because of the outlying regional situation (near the border with the former Eastern bloc) the company initially had difficulties finding qualified personnel. Thus, relatively early on it started having technical college and school leavers tested by external consultancy companies for their suitability for software development, and over several years „*Training people up from scratch”.* (B5G1-5) At the start there is a several-months foundation course, which is primarily for introduction to programming and getting to know the various tools for project planning and work.

After this foundation course the trainees are introduced to the daily working process – more or less on-the-job training – in their field of work, and after a relatively short time (one employee spoke of about six months) they have to take responsibility and work independently.

One member of staff who had gone through this internal training route summarised his experience as follows: *„The first four months were focused on the technology. Of course, with example exercises from our area … You get the specialist knowledge simply in that they sit you next to an experienced programmer and then let you take over jobs. These are not chewed over in advance, but are the easier jobs, so that [you] grow into it."* (B5G2-5)

Further training within the company consists of various elements that include external and internal courses as well as the passing on of knowledge, experience and organised exchange of experience. *„We are trying it at the level of external courses which we carry out here, where we now buy a course for particular subjects. We have the level where our staff attend training and courses, seminars and conferences on various subjects and that is then passed on internally. And we also naturally attempt to build internal platforms on various subjects where the exchange of experience etc. takes place."* (B5G1-12)

A personal programme for each staff member is developed in annual discussions together with the superior, where the departmental manager establishes *„which training he is thinking of and which training the colleague is thinking of. So that one just practically brings a certain amount of continuity into the level of training."* (B5G2-11)

The measures are announced over an internal network-accessed training database, where on the one hand staff can see what is on offer, and on the other hand can forward requests to participate in courses to their superiors. The decision on possible training measures is then sought in joint discussions, with the workload on the department and the financial context having to be taken into consideration. A fundamental requirement is integrated learning in the daily process of work and the extension of qualifications on one's own initiative: *„A developer is encouraged to extend himself a bit and to say, OK, then I'll learn the tool for the contract or for the project."* (B5G3-4)

Some three-quarters of all training measures concern technical-organisational issues (new programming languages, demands of project management, new versions in software products being used …), a quarter *„are targeted on the person: presentation methods, negotiating skills, specific customer care discussions, other seminars that we offer internally."* (B5G1.13)

Staff with primary access to further training measures are those whose area of responsibility is expanding or where it can be seen that technological changes will take place (e.g. old host environments are replaced by web-based applications).

## 2.3.	ICT-Applications: ICT as tool, automation and organisation technology and as communication medium

### 2.3.1.	ICT infrastructure and applications

The company as a whole has a virtual LAN to which the site studied is also linked. Work is carried out on a PC infrastructure within a local LAN and, as mentioned above, there is a site-net link with the headquarters.

A „demand database" (developed in Lotus Notes) on which all data relevant to the various projects is summarised and which is used for project controlling is of pivotal importance for activities on the site. Drawing on this database is an administration system which supports the record of staff hours and automatically forwards and allocates them to the respective projects. The standard Lotus Notes package is used for communication as well as for data processing. Staff can inform themselves of training measures, seminars and courses through a training database. Here there is also the opportunity to apply for courses, and the system forwards such requests to the respective superior. For all the applications used, it is to the company's advantage that it is simultaneously a user and a developer, and a company-specific adaptation of the standard tools is thus possible without any great effort.

### 2.3.2.	Character of ICT usage

As mentioned above, the site has a central demand-database holding a multitude of project-specific information for processing the various projects. All job stages to be made in the various phases in the course of a project are recorded in this database and serve to provide an overview of the tasks to be scheduled. Jobs that staff have already completed are documented in this database in order to be able to follow the progress of work.

„There is this demand database where what everyone has done is really documented. Which demand in there has come from headquarters. Then everyone writes in what he thinks about it." (B5G2-5)

In this way, through the automation of basic tasks, the database not only supports transparent development, but optimises the organisational progress of work in the various project phases. After the completion and take-over of the product, the database serves for problem solving (change and defect) and for further development, and thereby assists customer support.

A second interesting application as regards the automation of tasks, it the training database, where staff receive a clear, quick overview of the training activities a year in advance and have the opportunity of declaring their interest in a training measure directly on the database. The superior responsible for deciding on training is then automatically informed.

Whereas immediate personal communication still dominates at the location, information and communication technology, above all in the form of Lotus Notes, is of major importance for the company-wide, largely formalised communication.

„I can hardly think what it was like before there was Lotus Notes. The clients have Lotus Notes, too. And internally it is simply the means of communication. Of course a lot takes place over the phone, as before, because a non-verbal medium like Notes is just not suitable for some things. Notes is just a bit of a jazzed up e-mail, I would say."

„In Notes, additionally, I can also do database histories on documentation, e.g. the Change-and-Defect management databases, the whole maintenance databases. Every change is minuted, what the task is, what has to be done, what has been tested." (B5G8-8)

This example very clearly shows the innovative use of this communications medium, which in addition finds a use in documentation and project transparency.

2.4.   Characteristics of TP and processes of technical and organisational change

As the company being studied is active in the core sector of software development, all staff with a few exceptions (porters, cleaning staff) are in daily contact with information and communications technology, which represents the main working tool. To this extent, technological change, which takes place regularly as a result of version changes in development tools (program languages, software), is not a problem for staff as there are regular parallel training measures attended by the staff concerned.

There have been short-term problems, mainly resulting from the rise in staff numbers and the associated growth of the departments, which was necessary because of the order situation. As mentioned above, induction into the company is supported by a several-months training programme.

2.5.   How to explain TP: business logic, institutional context and internal dynamics

The business logic is shaped by the customer structure, on which technological changes and tasks are based, and by the necessary innovative approach to new tools – currently primarily in connection with web-based applications.

In one business area the parent company is increasingly pushing to offer software products on the market, which for the company being studied, with a longstanding, stable customer structure, still largely represents new territory. According to the wishes of the group headquarters, a market-standard instrument is to be developed and subsequently marketed on the basis of a product that is being used and further developed at one industrial customer's.

3.   Consequences for „Social Exclusion" and „Social Integration"

3.1.   Employment: job losses and job gains

Company development has been characterised since its foundation by continually expanding employment. This employment growth has above all benefited young graduates of vocational and general higher education who were qualified for the special work as software developers in internal training courses. With regard to the hypotheses discussed in the SOWING project, this predominant staff recruitment pattern means that long-term unemployed or older people have hardly any chance of participating in the expansion of employment in the company. One of the related reasons however lies in the outlying geographical situation and the related „meagre" labour-market supply.

For women, however – approximately 40 per cent of the staff on the site – there is a very good chance of acquiring professional experience in an innovative sector. The studies have shown that a career break for parental leave is possible, because of the niche-jobs currently still available, where the technological requirements of the customer may hardly change over several years.

3.2. Changing work: tasks, tools and skill requirements

3.2.1. Changing work and tasks

The following can be stated regarding the exclusion processes in the company, which are largely caused by rapid changes in jobs and technologies affecting the software development sector particularly. Because of the specific history of the company, a special client structure has developed characterised by longstanding large-customer relationships. For this reason the pressure for change on the type of work and on qualifications is not so great as in other comparable companies in the sector. This leads to the situation where the exclusion mechanisms, such as difficulties in returning after a „child break" have so far had little effect. It has also been possible to create favourable conditions for continued employment of women, such as the reduction in working hours and no particularly pronounced flexibility, in the servicing of large customers in the NPO sector. In this regard, the company should be seen as a thoroughly positive exception.

However, such situations are „islands" and the working conditions described can be characterised as such precisely in the software sector – and they are in the process of being reduced in this company too. On the one hand this is because of the market development, on which the company must to a certain extent position itself. On the other hand, however, because of the entry of the international software group, the form of project work typical for the sector, with its attributes of deadline pressure, long and flexible working hours, short lifetime of knowledge and qualifications, training on one's own initiative, has already taken over large areas of the company and will increasingly penetrate it in future. These developments could lead to exclusion effects for employees with care obligations and other limitations on their flexibility. The possible scenario can also be inferred from the answer of an interview partner on the question of the effects of this development: „*That is the thing that divides staff into two groups. The one, who just do something additional themselves so that they can commit themselves appropriately or be one step ahead. And the other group, who only do something if they are urged to. The pressure on each individual will become more intense and I think this fragmentation will become more drastic . . . That is, anyone who after eight hours or whenever says, I just want to do my regular hours, that just won't be possible. You have to be flexible.*" (B5-G3)

3.3 Changing employment relations: employment security, terms and conditions

Employment conditions in the company have not changed in recent years. Recruitment of new staff was necessary due to the rise in orders. There is continued job security, also because the location occupies a stable position within the group. Above and beyond this, the long-term connection to major customers and the co-operation with a major international group for standard business software creates a stable order situation that underpins this positive trend.

On top of this is the location, which because of its marginal geographical situation and the absence of competition on the labour market offers employees opportunities for shaping the working environment themselves, which women with care obligations take up in relation to working hours.

3.4 Does ICT matter? The relative importance of ICT for social inclusion and exclusion

Although it is not yet possible to estimate how strongly and in what form and with what effects the above-described trend in the company will occur, the contours of future development seem to be traced out. Information and communication technologies – the company is, after all, active in the core area of this industry – naturally play a decisive role here in the interaction with rapidly changing customer requirements.

CASE STUDY 6 – INTERNET

0.   Description of the Fieldwork

A total of six interviews were carried out at three of the „company network" sites. Half of the interviewees belonged to the operation at the centre of the case study, namely the Internet provider. The choice of interviewees was made after the assessment of the preliminary discussion with the manager of the core company.

1.   Description of the company

1.1.   Sector

Telecommunications services, training and company-related services.

1.2.   Activities, products and production/business processes

The main activity of the companies in this case study is in the sale of Internet access, in the design and maintenance of web sites and in training customers. In addition, various office services are also offered to companies and local authorities in the region. The operation at the centre of the study was the first local provider in one of Austria's economically weak regions (because of its proximity to the border) and derived from regional job-creation and technological upgrading policy initiatives.

The provider has few staff and works closely together with other companies, regionally distributed „tele-offices" and another associated company. This co-operation is needed because the limited personnel resources mean that not all necessary tasks (e.g. training, expensive home-page design) can be carried out directly at the provider's. This interlinkage also has its origins in the regional policy initiative to which the foundation of the companies goes back, however.

1.3.   Size: turnover and employment

If one concentrates in this case study not simply on the sales of Internet access but includes the associated activities (web design, training), then a total of 20 staff are employed at nine sites. Turnover figures exist for the Internet provider – here turnover was some €300,000 in 1998.

In recent years staff numbers have increased at all plants and sites. Contracts for services are issued for activities that can be separated off – examples of these are scanning in of pictures, input of larger address lists or the translation of German text into English for individual web sites. In training there is close co-operation with local educational institutes (e.g. schools), which make space available (PC training rooms) and provide teaching staff.

1.4.   Customers and suppliers

The regional orientation is reflected in the customer structure. Two thirds of all local councils in the region are company customers, i.e. they are represented at least by a web site, use the opportunity for electronic communication and offer links to regional companies and private accommodation. Above and beyond this, more than 500 companies and over 2,500 private individuals in the region use the services of the Internet provider.

1.5.   Market and competition

The Internet business has been a hard-fought market for some years. The liberalisation of the telecom sector has led to the emergence of new, Austria-wide providers who, alongside the usual services, offer very favourable tariffs for e-mail and Internet access. For the regional provider this competition is particularly felt among the private individuals, as its size means that it cannot fully keep up with the price competition. In the market segment for companies, which as a rule have the more extensive demands (homepage, e-mail addresses with company names, on-line shopping opportunities, database polling) the competitive situation is more favourable, as the regional consultants can better accommodate customer requirements. The company sees one of its strengths here, as it takes account of local requirements and with local partners is able to offer additional services (homepage design, training).

The „tele-offices" go back to a regional policy initiative aimed at bringing jobs to the structurally weak region. It was hardly possible to achieve the aim of bringing job opportunities to the region by means of teleworking. The six „tele offices" therefore offer diverse services to local trades people or councils, rather than bringing orders into the region. An exception to this are the orders from the Lower Austria provincial government.

1.6.   Workforce profile (Gender, Age, Educational profile)

Even though the various fields of activity are not gender-specifically occupied – for example women are active in technical areas such as support and web-site design – the proportion of men in the company is significantly higher than the proportion of women.

The tele-offices are as a rule occupied by a manager and a secretary.

The age structure is a reflection of a young sector. The average age is around 30, although individual „older" workers are involved.

Most staff have graduated from vocational colleges. In one of the co-operating companies two apprentices are being trained, as the labour supply is limited because of the geographical situation and there are not enough qualified personnel available.

Most staff in the tele-offices are employed on a 20-30 hour week, as they as a rule have other obligations (e.g. support of relatives in companies or on farms, housewives or mothers). In general staff are able to organise their working hours flexibly (with the exception of Support), but have to take account of customer requirements (e.g. homepage design), i.e. overtime is worked in periods of heavy orders, which is then compensated in weaker periods.

2. Technological Practice (TP)

2.1. Organisational and cultural aspects

2.1.1. Organisation – the core questions

The companies and the network equipment are on the one hand legally interlinked, on the other hand incorporated in a division-of-labour structure. Thus from the Internet provider's perspective, a range of tasks are outsourced to the partner companies.

The provider is responsible for the sale of internet licences and the accounting (bookkeeping, invoicing). Alongside this, the design of „simpler" home pages is offered. The major task-area comprises first-level support, with telephone accessibility during the usual five-day office hours being guaranteed. Support can also include the installation of Internet software for customers, as customer satisfaction is one of the most important criteria.

A second company, closely linked to the provider and approximately 30km away, sees itself on its own definition as a consultancy company with the focus on telecommunication and the new media. It takes over customer consultancy for the provider (e.g. which tasks should be done with which technical tools) and home-page programming on demanding presentations. Above and beyond this, data bases for regional policy and economic activities are created in the context of research projects.

The division of labour between these two companies can be summarised as follows: *technology, one site, services the other site.* The design of web sites, which is very important for the service offered by the Internet provider, can be used as an example illustrating the tasks and division of labour.

In order to ease the creation of simple web sites, the provider has been working for some years using a standard homepage where the individual elements (text, photos etc) can be incorporated in the predefined design. This „simple" preparation of homepages can be carried out at the individual „tele-offices" or at the provider's. The person who establishes contact with the customer is responsible for this task and can thus also book the income to their account. For more time-consuming web sites (e.g. flash-programming, online shopping) there is a specialist at the „service provider", i.e. these tasks are worked on there, in individual projects, with the presentation form, functionality (e.g. e-commerce) and the desired content having to be clarified with the customer first.

The (six) tele-offices, which are distributed throughout the region on geographical criteria, provide services for regional businesses. This goes from electronic address administration, through the design of mailings to the setting up of simple homepages and the provision of training.

„The on-site tele-offices are actually intended to cover various areas. In telematics and training in the rural area: to bring the Internet to the people and to use and apply it, or to promote the new technology as a whole, this was the basic task at one time." (B6G5-1)

There is close co-operation between the companies, resulting from the labour organisation division of tasks (e.g. central first-level support). Above and beyond this, customers who have been acquired through a tele-office, for example, are passed on to the provider, where an Internet account is set up.

2.1.2. Organisation – background information

With regard to the formal organisation, we are looking at an enterprise that is a legally interwoven network of independent companies or associations. The decision-making structure is correspondingly decentralised, even though two „centres of gravity", the two regional policy initiatives from which the network originated, can still be recognised. Because of the small size of the companies, some central positions, and in particular their occupants who have been in this business for years and have built up the enterprises, have acquired considerable importance in practice. The control the central positions exercise over the peripheral establishments is thus limited inasmuch as the „tele-offices" were initially built up with regional authority subsidies and then encouraged to ensure their survival by providing services to the surrounding economy.

On the organisation of the „service provider", it is said: *„There is a very shallow hierarchy. There is one manager. Otherwise we are a team that organises itself around projects. There is a telecommunications/telematics area, there is no department and no departmental head, but one seeks to bring the necessary people together as needed."* (B6G2-2)

2.1.3. Culture

The history of the company's origin is very important for the company culture too. The regional policy background and the personality of the founder still shape the enterprises. In addition, the pronounced regional and local roots, the close relationship to the local councils and companies, as well as the numerous personal relationships in everyday life also play a major role. The particular character of the people in the region, which also has to be taken into account inside the company or network, was also mentioned in the interviews.

Staff motivation plays a major role: *„I try to keep to the 40 hours with the staff in one form or another. Simply because, I actually live from motivation, that sounds so general, but it just doesn't help if someone comes in in the morning and is in a bad mood. Then he's no good for me. And in a project, if one person is in a bad mood, in a team like that it's a catastrophe. So staff often work much more in the first 40 hours, and so there's the week after, where they say, it's two in the afternoon, particularly in the summer, the sun's shining, now we can call it a day."* (B6G2-7f)

2.2. Personnel / deployment of labour

2.2.1. Skills and qualifications

Technical expertise is one of the most important demands on staff as the sector in which the provider and „service provider" are active is subject to rapid technological change.

As this rapid change cannot be covered by traditional training, most knowledge has to be honed in the workplace, i.e., permanent further training is a matter of survival for the provider. This concerns first-level support and web-site design in particular. There must be rapid reaction to technical changes (e.g. new operating systems) with further training.

„If I want to get into the Internet, our people simply have to know the problems that can arise from A to Z. If someone has difficulties with e-mail queries, you have to be able to deal with it, that is, they must know what's going on if this or that isn't working on someone's web site. And these are just things that are standard queries we get. If the line goes down then you're the first to notice that anyway." (B6G1-14)

The private use of these media has proved itself in that *„ the error messages come in just the same, and then you more or less know, what I did at home might work. That is learning by doing."*(B6G6-2)

Alongside this, mutual support is important. In the enterprise studied, two members of staff have specialised in different operating systems, (Windows 3.11, Windows 95 and higher) and are thus able to pass customer queries on to the respective person. Above and beyond this, „looking over someone's shoulder" contributes to the extension of knowledge, as solution routes can be understood from specific situations.

„Above all at the beginning, if one cannot yet answer so many questions from a technical standpoint, it is important that if the customer really asks something you are far enough advanced to say, I don't know, you must ask my boss. And that you don't just say something or other in desperation." (B6G3-4)

Ultimately the exchange of experience with dealers is important for support, because here experiences of new products can be exchanged.

Alongside technical expertise, which is needed to answer customer queries, key qualifications such as social skills (sensitivity, understanding of people, communication skills) are necessary. These requirements are being increased by the fact of the non-homogeneous customer structure, as a result of which the nature of the queries and requirements can vary widely.

„If it is someone who knows more, then you notice after the first five words that he knows what he is doing, or if it is really only a user who gets his mails once a week." (B6G6-4)

Not only in customer service (support), but also in web-site design, direct customer contact with the appropriate sensitivity is paramount: *„Because they want to know what they have just paid for. It's not as if you can just wave something or other in front of them. It must also have a point."*(B6G3-4)

However necessary key qualifications may be, alongside technical knowledge, the following quotation also shows that it is also a question of responsibility, consideration of the consequences of actions and above all a realistic estimation of one's own capabilities.

„We had an apprentice who thought he could do everything. It's sometimes like that, that you have to hold people back, to say he shouldn't do that, and that is something he's not allowed to do, and he hits something or other and then just does something

stupid. Afterwards you can hardly repair it, or only with difficulty. And people must know where their limits are . . . As far as computing is concerned, they have a relatively large amount of authority, don't they? He can go into the server, can do that, and he must do it, because when I'm not there he must be able to do it. But he must know exactly, if he is unsure of himself, that he doesn't do it. And doesn't say, 'it'll be all right', like at home. If I am sitting at home on a better computer then I just try it. If it doesn't work, well, OK, then I just reverse it and do something else . . . And now we have people who are rather reserved. If someone says he can do everything, and he is so perfect, then he is sometimes a bit overconfident. I mean, it is maybe good in an interview if you say you're good and you can do everything, but I'm not always quite so sure. I've had my experiences with people who are so good." (B6G6-21f)

In the tele-offices jobs have to be canvassed for and diverse requests have to be dealt with, so *„there we need people who are problem solvers"*. (B6G1-6)

2.2.2. Training

The above-described requirements on staff mean that staff training is of major importance. Thus a great deal is invested in training measures (B6G2-9), and courses attended are recognised as working hours. Courses are offered concerning the basic aspects of the job, such as sales seminars or „better telephoning".

But the course-based training is only one aspect – mutual support also plays a major role in acquiring the necessary skills. Learning, training on the job, is specifically emphasised for customer support on the telephone.

„So, sitting behind Mr Auer and watching what he does – more or less . . . if you are at your own workplace and a colleague is sitting opposite you, then you just have problems explained to you – what could happen if – and that's actually the quickest way to learn." (B6G5-3)

Because of the very individual fields of work, staff are responsible for training measures relevant to their own workplace.

„With us it is just that every member of staff has the responsibility themselves, and has the opportunity to say, I'd like to do that. And we also encourage that." (B6G2-9)

It is true that this goes for specialisation, but on the other hand it also promotes the principle of the „individualist" (B6G5-16) in the face of which occasionally a common strategy has been regarded as being more sensible.

The lack of regional training opportunities was mentioned as a disadvantage, as the relevant training institutions are not in the immediate vicinity of the company. Long distances thus have to be travelled if someone wants to attend a course.

2.2.3. Flexibility (including „casualisation")

On top of flexibility arising from co-operation in the network, the company makes use of a range of „flexible" workers. As far as possible, activities are farmed out to people who are not directly employed by the company, but who work on a fee basis. Housewives are employed for data input, secondary-school teachers for training. In this way it is attempted to farm out

any jobs that do not require high qualifications and do not have to be carried out in the company.

2.3. ICT Applications: ICT as tool, automation and organisation technology and as a communications medium

2.3.1. ICT infrastructure and applications

The utilisation of technology is of major importance for an Internet provider in providing optimal support for internal and external applications. Technical difficulties that impact on the customers can ultimately endanger the enterprise. Thus the load on the infrastructure is constantly monitored in order to be able to expand capacity in good time.

As to the infrastructure, the Internet provider has recently benefited from the extension of the lowest tariff to a 50km radius. This has meant that only the maintenance of two technical hubs with more than 30 modems each is still necessary. As is usual for local providers, the enterprise is not isolated, but can participate in the necessary technical infrastructure of an Austria-wide provider. The second-level support is also located at the headquarters of the nationwide provider.

The provider works in the framework of a traditional network solution (PC network) together with the co-operating enterprises/locations, for which the technical hubs are set up (at the provider, the „service provider"). The organisational headquarters is at one of the provider's two locations. Internally, standard Microsoft products are used primarily for communication and filing.

The ICT infrastructure reaches as far as staff members' homes – i.e., there is the basis for tele-working from home.

„All staff automatically have free Internet access at home, with a private and a company e-mail address. At the moment, in the context of an attempt at an ADSL we have one staff member linked to our net, but we have not yet created a dial-in possibility into the network because there was no need." (B6G2-11)

2.3.2. Character of ICT-usage

- tools

MS Office programs are used as „tools" in office workplaces.

- organisation technology

Internal co-ordination and information transfer are supported by technical tools.

„My favourite example: Before, if I was away from the office for a day and came back, there was a pile of memos – call that, call them. What do you do? You take the bits of paper, put them to one side, and the way it goes, I open the window and they are blown away and somehow you then forget about it. Today, I know when I come in I have five e-mails: call, call, call, call, call, and I can't throw them away." (B6G2-6)

Alongside the electronic filing, the definition of a standard homepage for rapid design of simple customer web sites should also be classified as organisation technology. Further, the central

address administration supports the rapid distribution of information, which however is standard in connection with electronic communication.

- communications medium

Most communication between the individual locations is dealt with by e-mail.

„It is just a matter of speed. If you have to work together a lot, then you have the problem, I ring up at Z. and want to speak to Mr R. 'Sorry, he's on the phone', you know that. That's natural, if you're on the line, he can't help it, he's talking. And so it is often easier, if I don't write a long 'Dear Mr . . .' but here the real strength of such an e-mail shows. I write three sentences: 'Ring customer Huber about a new homepage.' And the telephone number. I don't need to explain anything, because we both know the story. That's how far the communication goes, and that makes it really efficient." (B6G2-6)

Internally, too, at the individual locations, e-mail is used in an innovative way to distribute information in the shortest possible time.

„What is always theoretically discussed is reality here. If I schedule a business meeting, then that's an e-mail affair. Then I don't send an apprentice and say, here's a mail, but because we are continuously online it is no problem. We have an internal netserver, so internal mails are delivered immediately. Even if I say, the meeting starts in five minutes and I can't make it now, then I quickly write an e-mail, put it off for another half-hour, and I know everyone will come." (B6G2-6)

The exception here is more extensive information which cannot be presented simply. In this case the basic information is sent by e-mail and details cleared up personally or on the phone.

Otherwise, the other tasks require a good deal of personal communication (e.g. support, web-site design, feedback from customers). These processes can only be supported by technology to a limited extent.

2.3.3. Optional: other interesting aspects

Owing to the network character and the spatial distribution, the case study is particularly interesting for questions of the interaction between ICT and organisation. Here it is apparent that new technology is not only of great value for internal communication and agreement, but also for appearance towards customers. However the technical potential cannot be seen as the cause for the choice of the organisational form of the network. This would have happened in this way in any case, because of regional policy and other considerations, even if one must also concede that the idea of tele-working and the technological component that goes with it also played a major role in the regional initiative from the beginning.

2.4. Characteristics of TP and processes of technical and organisational change

As a supplier of technical services, technological change is very important for the case-study enterprise. Technical innovations have thereby to be quickly adapted to and the requisite qualifications for their use ensured. For some of the employees, their own use of the technology in their private sphere provides the basic knowledge required. Above and beyond

this, learning processes are important in particular for support, as here it is also a question of experiential knowledge. The spatial and social proximity are important prerequisites for successful training on the job.

Organisational changes have been necessary in some areas owing to the rapid growth of customer demand and the associated increase in staff numbers. For the „service provider", the leap from three to 12 staff and the associated spatial separation into several offices led to the need to introduce organisational structures.

„Suddenly there are 12 people spread over three offices – four including the secretary's office – I want to transfer a call, he isn't there, I don't know where he is. So it was necessary to set up at least minimal structures, like an in-out list, like a calendar, which people fill out, like a genuine weekly business meeting, where people sit next to each other and say, this week this and that is planned, because it is no longer possible to do it any other way. This was the main pressure that came internally. The growth itself was an external pressure, because we were working to capacity." (B6G2-11)

2.5.   How to explain TP: business logic, institutional context and internal dynamics

In the telecommunications service provider branch it is to be expected that a correspondingly advanced technical infrastructure is to be found for internal processes too. Thus in particular the use of e-mail for internal communications is correspondingly the usual practice. The spatial division of the enterprise units makes electronic communication appear even more important. Communications between the provider and the „service provider" are „up to 99 per cent by e-mail", according to the manager of the latter. (B6G2-5) Others emphasise the necessity of complementing this over the telephone if there is something to be clarified.

Even if work has in some areas become independent of location, home tele-working still plays a subsidiary role. The link between the enterprises and the region is also part of the business strategy: the spatial and social proximity to the customers is used as a competitive advantage.

The institutional circumstances are very important for an understanding of this case. After all, the foundation of the Internet provider, the tele-offices and the service provider enterprise, goes back to regional policy initiatives. Public subsidies and public contracts are the prerequisite for the existence of the tele-offices in particular. The connection to political institutions and the commitment to regional development are important features of the company network. Against this background it could be argued that the information and communications technologies do indeed facilitate the spatially distributed work in a network structure, but cannot be seen as the cause of this specific form of organisation.

3.   Consequences for „Social Exclusion" and „Social Integration"

3.1.   Employment: job losses and job gains

In the structurally weak, rural region the shortage of ICT specialists that the companies face is not surprising. It is difficult to get experienced, qualified personnel, among other things because

it is not possible to offer them high wages. School-leavers are therefore taken on and apprentices are trained.

„ … who simply at home have more idea of computing than some HTL [college] *leavers. And those are exactly the ones we pick out for ourselves, but they don't want to go to school. They say, I want to get into working life. And we tell them, with pleasure, we are giving you the chance to work in an innovative company … And I have to say, now with experience, that is the best you can actually imagine."* (B6G2-2f)

3.2. Changing work: tasks, tools and skill requirements

3.2.1. Changing work and tasks

Alongside business management tasks, the following job areas are significant in this case study: technology, customer support, marketing and design of web sites. Like the technology or services on offer, the jobs are very young. To this extent, no changes resulting from technological change can yet be established. For our study, it is rather the challenges these activities pose that are of interest as such.

3.2.2. Changing skill requirements

In customer support it is a matter of having a comprehensive knowledge of possible problems that could crop up at the customer's. This involves technical expertise, which however can only be realised in association with experiential knowledge. There are thus chances for employees who are able to gather experience as private users and above all in the enterprise training process. In customer support, as in technology, the constant exchange of experience with other people is very important. Here private as well as professional personal networks are an advantage. As a whole it is indispensable for technology and marketing always to be state of the art. In web-site design, alongside graphics skills, it is important that one can „get on well with people ". Customer contact is of major importance and thus all the abilities necessary for successful customer support.

Access to the new workplaces is relatively open; certificates are not accorded any great significance by management. However we noted a very high level of formal qualifications in the company. Many staff have graduated from vocational colleges, business college or university. More serious consequences than the lack of formal qualifications may be „unsuitable" personal characteristics. Anyone who doesn't fit in with the team, that is, who is not accepted by the others, or who displays too little will to work, will not keep their place in the company for long.

3.3. Changing employment relations: employment security, terms and conditions

In the core areas of the enterprise, staff are employed on the basis of employment contracts and enjoy the usual social security that goes with this. Employment security is high. Alongside this, however, there are also activities that are carried out externally: *„We farm a lot out. We put out a lot on contracts for services, i.e., the whole training, that is all farmed out to three secondary-school teachers. Or data input, for example, there we have our*

housewives who tap in our addresses. So we attempt to farm out all work that is not too highly qualified." (B6G5-3)

The network is thus supplemented by „flexible" workers who enjoy no social security on the basis of this activity. As a rule it involves secondary jobs for well-insured employees, as in the case of the secondary-school teachers, or marginal employment of women, who are mainly active in the household and presumably jointly insured as dependants of their spouses.

3.4. Does ICT matter? The relative importance of ICT for social inclusion and exclusion

Hardly any employment consequences of ICT can be derived from this case study. It has been possible to create additional jobs in a structurally weak region through the establishment of the enterprises described. Furthermore, through presentation on the Internet and entry into e-commerce, it has been made possible for the customers in the region to extend their business activities. The experience shows, however, that the original plans to bring work into the region by founding a tele-house or the tele-offices on the basis of ICT have not been very successful.

The expectations that peripheral regions would profit from technologically facilitated location-independent work have thus not been fulfilled. The companies, however, provide an important infrastructure and service for the development of the region, and thereby offer employment for some 20 people (in the areas covered by the case study).

CASE STUDY 7 - BANK

0. Description of the Fieldwork

Interviews were carried out at the headquarters of a regional bank according to standardised guidelines. The selection of interviewees was made on the basis of a preliminary discussion with a member of the board. After evaluation of the preliminary discussion, the selected interview partners were interviewed in two rounds. The discussions were carried out on the basis of a guideline, recorded on tape and finally transcribed. The analysis and interpretation were based on the recorded data, and additional observations on site.

1. Description of the Company

1.1. Sector

It concerns an economically independent bank in the form of a public limited company, which however is part of an Austria-wide (largely co-operative) umbrella organisation which takes care of particular functions for all member banks.

1.2. Activities, products and production/business processes / Size: turnover and employment / Customers and suppliers / Market and competition

The business sector of the bank being studied is limited to a particular, regionally demarcated part of the federal province of Lower Austria. Alongside its headquarters, the bank has 13 branches. The products/services offered include the whole range of payment transactions and the further spectrum of usual banking services such as credit, leasing and factoring, deposits business, savings and loans business and insurance, securities and overseas business.

The customer spectrum reflects the regional orientation of the bank, the main customers being small and medium-sized enterprises and private individuals. The competition situation in the region is marked by three large regional institutions which have a an 80-90 per cent market share. Alongside this there are numerous Austria-wide major banks. The advantage of the regional banks over the big banks lies in *„continuous personal contact with our customers"* (B1G1-3). The big banking business, in contrast, is primarily limited to large companies in the region or subsidiaries of large groups.

As it is offering its own Internet banking product, the bank studied is „relaxed" regarding the introduction of new technology in the sector, under the catchword electronic banking, and the new competition situation resulting from changes in customer behaviour.

1.3. Workforce profile (Gender, Age, Educational profile)

In all the bank employs 130 people at all sites, more than half at the headquarters, where all back-office activities are located. 110 staff have white-collar status, and 20 blue-collar status, primarily part-time cleaning staff. Of the some 110 white-collar workers, almost 20 work part time. Among the white-collar workers, the majority (over 60 per cent) come from middle or higher vocational schools (commercial college, commercial school). 50 per cent are women. Slightly more than half of the white-collar workers are employed in the front-office area; eight people are field representatives. The average age is 33, after *„a relatively large number of young staff"* (B7G1-1) were taken on at the beginning of the 90s (1992/1993). Staff numbers have been largely stable in recent years, with the exception of a few retirements whose posts have not been re-filled.

2. Technological Practice (TP)

2.1. Organisational and cultural aspects

2.1.1. Organisation – the core questions

The tasks carried out in the bank can be divided into back office and the front office tasks. Alongside this, the field-work, that is, looking after customers on site, plays a role.

In the back office, the processing of receipts is an area where the work has undergone many changes in recent years. Previously, receipts were processed by hand. Now the relevant bookkeeping data are processed and saved electronically. Every day the receipts are recorded at headquarters on a scanner and the data filed in the system. Subsequently all receipts have to be checked for accuracy at headquarters, i.e. the statements on the receipts are compared with those in the system. As most customer receipts are still filled out by hand, the level of subsequent processing, using data masks, is very high, at 90 per cent. The receipts from the individual branches come into the headquarters by courier every day. It takes four staff a whole morning to scan in the up to 800 receipts that come into the headquarters every day (or 1200-1300 at the end/beginning of the month). The introduction of information systems had led to no great time savings in these jobs, as the receipts from almost every branch are now recorded and processed centrally. The afternoon is taken up with information services (follow-up research, customer and branch enquiries).

A second area where the introduction of new information systems has led to changes is the front-office area. Here, tasks such as counting of cash, printing of statements and cash withdrawals have been made increasingly customer friendly in recent years. Staff are technologically challenged inasmuch as they have to acquaint customers with the new equipment. Above and beyond this, the increased range of services offered have brought new demands in customer consultancy. Internet banking in particular is a product that is to be sold to the customers, as the internal administrative work (processing of receipts, transfers, statement requests) is thereby reduced and on the other hand the running of the business can be organised more efficiently. Further technological changes concern an extended range of services in the functionality of the programmes used (better querying, faster preparation of

data, better communication thanks to Lotus Notes), which however has not fundamentally changed the necessary qualification requirements.

Something similar can be seen with the outside representatives in direct contact with customers. Here, too, the additional services are to be promoted, alongside Internet banking, primarily telephone banking. In this, tele-banking is differentiated from the usual Internet banking (bookings over www technologies) inasmuch as in the former cases, with (commercial) customers, software to support the processing of tasks (wage/salary transfers, transfers to social security and the inland revenue) is installed on site. Here it is not necessary to be online, but the processed data is only transmitted after the necessary preparation. Apart from this, the software programs in this area have changed and outside representatives can call up data – such as credit conditions and customer information – over the company intranet. These activities do not however take place directly at the customer's premises; there, data is still gathered in traditional form. The use of laptops is indeed possible but they are not used, because the hardware is several years old and of limited functionality. The access to customers could change in coming years through the spread of electronic communication. At the moment, however, only few customers have e-mail, and above and beyond this, from the point of view of the legality of signatures, submitting offers via e-mail is not possible, and so the traditional post is used.

One business area that has very clearly felt the changes is the computer department. This is responsible for the installation and maintenance of hardware and software and for first-level support both for staff and customers. Above and beyond this, in discussion with field representatives, tele-banking applications are directly installed at the customer's. In technical system questions internal training is offered and occasional database polling carried out for departments. The computer department is here in close contact with the central accounting centre, which is located in western Austria and services all the bank institute's sites throughout Austria. The design and maintenance of the bank's own homepage, however, is not the responsibility of the computer department. The technical infrastructure is likewise made available through the central accounting centre, with the marketing department being responsible for content.

2.1.2. Organisation – background information

The formal structure of the bank is characterised by a classical functional organisation with clearly demarcated spheres of work and a shallow hierarchy. The structure of the individual departments is divided into fundamental tasks such as personnel, computing, organisation and typical banking areas such as sales, credit administration . . . The individual branches have their own managers.

There is a high degree of specialisation in the departments. Only in the computer department, which is also responsible for company organisation and operations, are tasks to some extent worked on as a team. This specialisation goes together with a centralisation of individual tasks, such as for example the scanning and correction of receipts. The automation of individual tasks (credit contracts . . .) takes place through the use of software products, as they are „relatively complicated" (B7G1-11). For credit contracts, the data gathered by outside representatives or front-office staff in the branch are required, and as a rule are transmitted

electronically using Lotus Notes. Further processing is then guided by the software system at headquarters.

There is division of labour above all in the marketing of tele-banking to commercial clients (as a rule small and medium-sized companies) with the outside representative being responsible for marketing and sales. The establishment, installation and support of the software packet is subsequently undertaken by someone from the computer department, to some extent also directly at the customer's.

As far as they represent strategic decisions, technological and organisational changes are dealt with and decided on in working groups, which can sometimes also include the whole sphere of the umbrella group (that means, also with representatives from other federal provinces). Decisions and planned changes are discussed at information evenings, which as a rule take place every two months and at which the board, the branch manager and, when necessary, departmental managers take part. Individual advisory and service teams meet monthly to exchange experiences. The information is then passed on to all workplaces by Lotus Notes.

2.1.3. Culture

The company culture is characterised by long-term, stable employment and labour relations, which are also strongly marked by the bank's regional roots. Changes have thus far not resulted in rationalisation and personnel reductions. The personnel policy aims for good customer service and the slogan „*quality before quantity*" (B7G1-2) expresses the fact that staff cuts are seen as a reduction in customer service. This is also evident in working hours, with hardly any overtime having to be worked other than in the computer department, which has been heavily stretched in recent years as a result of the Year 2000 change and the introduction of new systems.

Although some of the staff work part time, management prefers a personnel policy of full-time jobs, not least for organisational reasons. This could lead to the displacement of employees with children. Occasional examples of part-time employment can therefore be seen as the exception to the rule of normal working hours.

The clear division of labour linked to the allocation of specific working content, though also of working tools, to some extent leads to problems for staff who wish to follow technological trends. As an example, the use of the Internet, technically limited to a few workplaces, can be mentioned. On the one hand, there is a justifiable business objection to „open access" to this medium, on the other, familiarity with the standard browsers in connection with a future change of version can make learning easier, precisely with major standard software providers. Above and beyond this, a process of change in the choice of media in connection with customer communication is foreseeable.

„We have Internet access in house, but we don't have open access to it. That is, if you need something, then you just go there and say, can I look at that page? Something that is very common is just not available. Independent e-mail is also not allowed. This is only possible through headquarters – I don't know if this will work. That is, in this area, in my opinion, there is just too little training. Too little training how this would work at all, that I can send e-mails to a customer myself." (B7G6-2)

2.2. Personnel / deployment of labour

2.2.1. Skills and qualifications

Since contact with the customers is an important factor for the bank as a service company, in the front-office area in particular, alongside knowledge of the job, the staff's social skills are of particular importance.

In a several-years training programme all staff receive a basic training in the range of services and the various services provided by the bank. The different products offered in the front office here represent a particular problem, as „*actually one bank worker cannot keep every product in their head*" (B7G2-11). Thus, on the one hand, part of the required staff qualifications is to establish customers' wishes through targeted questioning so as to be able to pass them on to a specialist department where necessary. On the other hand, they must also handle the bank's own software programs in order to be able to deal with customer requests quickly. This means that alongside specialist knowledge of the product range, sufficient computer skills are also a basic requirement.

One area that is acquiring ever greater significance with regard to the optimisation of the running of the business is Internet banking. In order to achieve confidence in this area, the company requires all staff to run their own banking business through this tool. Workplace monitors which can be used for these tasks are available to all staff in their working environment. The confident handling of the various software products here requires staff to have regular dealings with this, which in dealing with new products, services and technologies, however, is linked with a „*certain timidity*" (B7G2-10).

„*Here it has become clear that if the colleague does not actually use it and deal with it intensively and continuously, once-off information or training is too little.*"

(B7G5-6)

In general, ICT skills, starting with the use of standard software products, through electronic communication and up to browser use in the Internet, are seen as the basic preconditions for daily work. According to the departmental manager, staff should therefore also have a PC at home in order to acquire the necessary skills and reduce their uncertainty.

The use of further new forms of automation has led to multiple changes in the banking sector. The introduction of cash points, receipt printers, coin counters etc, on the one hand calls for staff to know how the equipment works, on the other hand, above all older customers have to have the equipment explained to them, and this, as is often emphasised, „*not once but umpteen times*" (B7G2-18). Here, alongside technical specialist knowledge, above all social elements come into play.

„*I don't need to tell a young customer; he wants to do it himself. But a rather conservative or older customer, who actually wouldn't like to do it anyway, I have to show x number of times! It doesn't work any other way. Here, I don't think you need staff who have a complete training – this is my personal opinion. I don't want to be premature, but here it is important that I am friendly and can deal with people. I don't*"

need to be a securities specialist. But I have to get across how he can make it work and – this is important – why he should do it." (B7G2-18)

Similar demands can be seen in work in the field. Here too, alongside knowledge of product diversity, specialist knowledge is called for, above all for the sale of new software products (tele-banking) to commercial customers, linked with basic technological knowledge. How extensive specialist technical knowledge should be, at what point the specialist department should be involved, is here still unclear.

"You also have to say that the customer consultants in principle don't want to get involved with that at all, because they just say we are here for sales and don't want to be some kind of computer specialists. But they need it for the application." (B7G5-6)

Receipts scanning primarily requires accuracy, it was emphasised in the interviews. The technical demands are easily learnt as the products are user friendly.

A skill that is of increasing importance, but at the moment only employed very variably at individual workplaces, is use of electronic communications media. The wide fields of application and the necessary skills for this, from simple acquisition of information (reading a circular) to communication with branches and customers, will lead to increased demands on the staff in coming years (acquisition of media skills), as has already been seen other sectors.

2.2.2. Training

Training largely takes place through the association's own training establishment, an „academy". A comprehensive ten-seminar foundation course, which in the past was only prescribed for particular jobs, is in future to be taken by all employees. Alongside banking seminars such as „financing" or „securities", this foundation course also includes personality seminars and sales training. These seminars run over a period of approximately five years and more or less form an internal training qualification usual to the sector. Information systems are making themselves felt here too. Before each seminar, staff have to prepare themselves using self-study programmes (on the basic courses, i.e. not on personality seminars), which is supposed largely to take place at home. The precondition for participation in these seminars is the successful completion of a computer-supported multiple-choice test.

Alongside this „foundation course" there is also a range of internal and external training measures which can be adjusted to the respective specialist departments. For external specialist courses it is usual to allow participation by one staff member who then at the same time has the job of passing on the new knowledge within the company.

Alongside training in such things as telephone skills, information and communications technology plays a major role here. An internal training room with PC practice places with test programs to practice dealing with the various software products is available for this. This test environment, however – it is the unanimous opinion – can only provide the starting impetus. Subsequently for complete familiarisation, it is necessary to deal with the software programs regularly, to use them in the daily working environment, which as mentioned above is difficult in some areas as one has to overcome colleagues' timidity in using these tools.

Internet banking can be mentioned as an example here, where the company's „wish" is that all staff should also use this product for their own accounts. However there is no reflection on the

difficulties that arise or the inadequate infrastructure, and at management level not everyone is in the same boat in this respect.

„I would by no means stipulate this for a member of staff, because the waiting times are so long. I have already spoken with the computer department and they told me in no uncertain terms that if there are codeable receipts then please pass them on in this form straight away. This is cheaper than Internet banking." (B7G8-6)

„Learning by doing" is also seen as very important for electronic communication using Lotus Notes. On the one hand this medium currently has an information character, and on the other hand to some extent tasks like holiday applications, attendance and work books are filed in databases. Lotus Notes is thus a tool that will acquire greater importance in future, also in view of increased communication with customers.

Mutual support plays a major role in day-to-day learning. Experienced staff show the inexperienced how to use the various information and communications systems in specific working situations.

2.3.   ICT-Applications: ICT as tool, automation and organisation technology and as communication medium

2.3.1.   ICT infrastructure and applications

Daily tasks are characterised by the use of a wide range of information and communications technologies. The various branches are linked through a client/server network. In all, more than 15 different software products are used. On the network structure it should be mentioned that the total data storage takes place through the association's central accounting centre, which is also responsible for the technical infrastructure in connection with Internet presentation of the various sites.

Standard software is used for office automation, which is important in everyday correspondence above all with the customers. Legal contracts, however, still have to be in written form.

In personnel administration, in bookkeeping and controlling, the modular standard business product SAP is used, with the application and the data here too being physically located in the accounting centre in western Austria; the bank studied uses this provision for carrying out various tasks, however.

There are three scanners available for scanning in receipts at two locations (the headquarters and one branch). The subsequent processing takes place at four monitor workstations at the headquarters.

Lotus Notes is used for internal company communication, though also for some database applications. Examples of database applications, the logic of which support company operations (workflows), are the overview of absences from work, holiday administration, working handbooks, job descriptions and organigrams.

As already mentioned above, two Internet applications are maintained, which have likewise led to a noticeably more efficient organisation company operations. On the one hand, Internet

banking, a www-based product which facilitates account activities such as transfers, statement requests etc. online through the usual browsers. On the other hand, there is telephone banking, in this case with software being installed locally at the customer's premises – as a rule commercial customers – with which account activities such as wage/salary transfers, payments to the inland revenue, social security, etc can be prepared and then transmitted online as a batch.

In the company's intranet, above and beyond this, the necessary databases are available in order to obtain current company book queries, customer information or share prices.

2.3.2. Character of ICT-usage

Information and communications systems are employed in varying shapes and forms in the bank.

The use of scanners to electronically prepare receipts so as subsequently to control data transfers and money flows supports processes previously associated with more personnel effort and a large amount of writing. This was primarily the case because the majority of receipts data-input/recording did not take place centrally as it does now, but had to be prepared in the individual branches.

Data collection is as a rule carried out on the basis of data sampling, which means that not all the receipts information is recorded. Some information, such as for example the purpose (reason for the transfer) is not recorded. A picture of the receipt is saved, however, and then transmitted to the various banking institutes through the central office. The bank thus saves the previously usual despatch and postage costs, with the exception of the branches' incoming receipts. There is no additional personnel effort associated with electronic communication, as it can be automated.

Various database applications have the character of information and communications system tools. Employees no longer have too look through files, but can often execute software-supported searches. Examples here are the investigation of unclear account movements (purpose of transfer not clear . . .) or customer data needed for credit agreements.

In the organisational linking in of the activities of field representatives, the attempt is made to use information and communications systems to optimise operations. The necessary data have to be entered into a database application; systematic support is provided for the following stages. In the meantime, this kind of access to data and information saved in electronic form has come to represent an indispensable component of work without which many activities could no longer be carried out at all.

„Yes, I need it [the PC] *everywhere. I need it for each query of customer accounts in the securities area . . . So if the computer isn't working for half a day, I can tidy up my desk, but not solve very much because I don't know what's at the bottom of it if I can't see a customer account, have no balance, no conditions. It is THE tool! What can I do without a PC? Well, I can't do anything."* (B7G6-7)

Some workflow applications used primarily in association with Lotus Notes can be described as advanced. Holiday planning should be mentioned as an example here, where staff make entries in Lotus Notes which are then automatically passed on to the responsible superiors.

Above and beyond this, the technical centralisation of core tasks, such as for example data storage or the www presence through the Austria-wide accounting centre, supports the optimisation of company operations.

The Internet, which will be of major significance for work in the banking sector in future, is used in different ways in the bank studied. Thus, in one subsection, already proven services of another bank in the same umbrella organisation are accessed: *„buying and selling securities in the Internet."* (B7G1-3) Two www-based possibilities (Internet- and tele-banking) are available to customers to initiate account activities themselves, which are subsequently executed steered by the software. On the other hand, direct communication with customers through existing technology has not yet been completely exhausted.

Here, too, however, the problem comes to light that anyone who does not deal with the technology regularly has difficulty with the operations required.

„Inside the department, for example, we have the problem that we need tele-banking once a month because we pay the local council tax by tele-banking. We have automated it. But if you go into that once a month, you need a crib note each time so you know how it works again. So they may say that's user-friendly, but if you are not working with it continuously any technology is a problem, I think." (B7G5-5)

There will certainly be further changes here in the coming years, with the bank studied, which is part of a small „market participant", profiting from the experience of the „global players" but also being challenged to make new services available to its own customers itself in order not to suffer a market disadvantage.

„We are simply lagging behind in computing. That has to be said. As we are more or less the first sector, it cannot afford these developments, to push forward, because development costs a lot of money." (B7G6-5)

Communication with customers by electronic media plays hardly any role in the bank, although the technical possibility is available. The reasons lie on the one hand in the management, which has so far not promoted this form of customer contact. On the other, however, there is also a certain timidity in the application of computing on the part of the staff. Finally, the absence of controls in sensitive issues such as granting of credit, also impose limitations.

3. Consequences for „Social Exclusion" and „Social Integration"

3.1. Employment: job losses and job gains

The employment situation in the bank has proved relatively stable in recent years despite the organisational and technological changes. The bank has been spared the market pressure felt by the big Austria-wide and international banks. One reason may be the regional security of the geographically restricted customer base and the customer relations built up on the basis of long-term trust. This basis of trust is also found among the staff. Among this are the social benefits, which in banks have always been above average. Examples can be found in the weekly working hours, additional wage components and further training measures. The oft-

quoted human resources are highly rated in the bank. The relatively large core staff, however, significantly restricts the opportunities for promotion or switching jobs within the company. At the moment, total staff numbers are falling slightly through natural wastage (retirements), as these posts are not being re-filled. Possibilities for change primarily occur if employees occupying important posts leave the bank. This happens above all because, on account of the low average age, positions in the hierarchy have been taken and there are hardly any promotion opportunities.

A possible problem area, which may however have its course in organisational questions, is the possible exclusion of women with care obligations. In the past, the opportunity to work part time has repeatedly been an issue, which above all threw up organisational questions in relation to the division of labour and became a problem for women returning from parental leave. And this despite the fact that more than 15 per cent of employment in the white-collar area is on a part-time basis.

3.2. Changing work: tasks, tools and skill requirements

Staff see themselves faced with numerous technical and organisational changes. The increased importance of electronic communication and the Internet has found its expression in new products and changed organisational processes. In most jobs this has led to the introduction of new tools and increased qualification requirements. Changed general economic conditions linked with an increased range of services called for increased flexibility by the staff. This is also one of the reasons why the several-year training programme, previously limited to particular groups of employees, will in future have to be taken by all white-collar staff – on the one hand to raise formal qualifications, and on the other to improve the staff's social skills.

One group of personnel who may experience greater change through the technical linking in of the customers are the field representatives. If a large part of the tasks (credit preparation, information on insurance or savings and loans) can be technologically supported by Internet applications, and if this is called up by the customers themselves, then under-employment could arise here, which could bring organisational decisions in its wake. The extent to which fundamental changes will arise here in the coming years depends above all on customers' Internet activity.

3.3 Changing employment relations: employment security, terms and conditions

The banking sector has traditionally always been a secure employer. In recent years, above all as a result of technological innovation and the social establishment of the Internet, major changes have emerged which mean that many jobs no longer appear secure in the coming years. The farming out of activities directly to the customers (printing of receipts, transfers via the Internet, withdrawals from cash points, in-payments to automatic tills) means that tasks in the front-office area are being reduced.

In the bank studied, which sees its strengths in its regional orientation, these technological changes are indeed covered by the services offered (Internet, telebanking), but traditional business with customers continues to be of great importance, so there is still job security. Only one field worker noted in the course of a discussion that his activities could in future be carried

out by external consultants, as is increasingly being pursued in the banking and insurance sector.

3.4   Does ICT matter? The relative importance of ICT for social inclusion and exclusion

As indicated by the above description of activities, information and communications technology is playing an ever greater role in the administration of daily work. Above and beyond this, the introduction of technical equipment such as cash points or cash-counting machines, has led to reduced customer contact.

Nevertheless, no displacement effect could be seen in the regional bank studied. The employment situation remains stable. On the other hand, however, with the exception of one additional computing worker, no additional jobs were being created.

The utilisation of the products employed has not posed any major difficulties for the staff interviewed, although it was repeatedly mentioned that the use of these technologies is „lagging behind" in comparison to leading enterprises in the banking sector. It is hard to estimate the extent to which fundamental changes are to be expected here, as most customers (private, regional small and medium-sized enterprises) still carry out their banking business in traditional ways and make little use of new information and communications technology (tele- and Internet banking in particular).

CASE STUDY 8 – ELECTRONICS AND TELECOMMUNICATIONS

0. Description of the Fieldwork

The fieldwork for this case study included tours of the company, workplace observations and seven detailed interviews. The following groups of people were available to us as discussion partners: the personnel manager, a production manager, the computer processing manager, a product developer and a person responsible for logistics. All discussions took place in an open atmosphere and were very informative. They were all tape-recorded and fully transcribed. The written version of the interviews formed the basis for the interpretation and evaluation.

1. Description of the Company

1.1. Sector

The company is a manufacturing and development enterprise in the electronics and telecommunications sector.

1.2. Activities, products and production/business processes / Size: turnover and employment / Customers and suppliers /Market and competition

The company manufactures both cables and inductive construction elements as well as mains-adapter plugs, and niche products for guidance and drive technologies. In 1991 it was spun off from an international group as until then a pure production plant, and set up as an independent enterprise after a management buyout. Because of the low wage costs, two production plants were set up in the Czech Republic, which testifies to the continuous growth in the field of adapter plugs. Even though these sites were initially only conceived as an extended workshop, they are now being progressively developed into independent production plants. Product development, however, remained at the Austrian site. The central stores, situated at this site, will possibly be relocated to the new sites, as manufacturing will be stepped up there in future.

Production is very customer specific, which makes itself felt in small order sizes and high re-tooling times, which however also represents one of the company's strengths. The development of new products and the shortest possible processing and delivery times are the main deciding factors for the company's success.

The enterprise has a single-owner structure, with the owner also being the sole managing director. A trust has been set up between the operative management and the managing director.

1.3. Workforce profile (gender, age, educational profile)

The company employs some 650 staff, with approximately 170 employed at the main site and some 480 at the Czech sites. This also illustrates the rapid growth of the company: at the time the company was spun off / set up, it had a staff of only some 240. This development has also had direct effects on the age structure of the staff. The Austrian location is staffed largely with younger employees. In management, this lack of a historically developed age structure of experienced and younger staff is seen as a problem, among other things with regard to passing on experience.

2. Technological Practice (TP)

2.1. Organisational and cultural aspects

2.1.1. Organisation – the core questions

The decision-making processes are very heavily influenced by the managing director and owner, who has a management committee made up of specialists and managers at his disposal. With regard to company structure, finance, personnel, operating, quality control and marketing with the associated project management are directly subordinate to company management. The areas of technology, distribution (inductive components, mains adapters and electric assembly units), and cable systems are subordinate to the marketing department. The organisation is run on a patriarchal basis, that is to say decision-making power rests in the hands of the managing director. However, only in the rarest cases does he assert his directive powers against the interests of the managers and specialists. At the same time the organisation represents an ad-hoc organisation, as activity is more purpose-related rather than along strategic guidelines. The background for this development should be seen in the extensive influence of the owner on the one hand, and a dynamic of being driven to recognise market opportunities on the other.

2.1.2. Organisation – background information

The operations organisation is essentially determined by processes linked to development and production, which are continually monitored by operations management. At the moment, lower and middle management commutes between the sites, as until now there has been no operations management at the extended workshops, but only administrative work is carried out at the sites in the border areas. The establishment of newer areas, such as logistics, will lead to company concepts and processes having to be developed or optimised in order to cope with the continuous market pressure.

The constant market pressure and the rapid development of the company also leads to it not being possible to prepare decisions in the long term on the basis of strategic considerations, but means that they are heavily influenced by day-to-day events. Above and beyond this, there is great lack of transparency at the moment concerning responsibilities in particular areas, as there no explicit agenda for organisational development or strategy formation is defined. The monthly meeting between the company management and the experts may not necessarily be of

assistance here, as a lot of work is carried out by people wearing two hats and the completion of some tasks is exclusively due to the disproportionate commitment of the staff.

The latter can be explained by the regional particularity, i.e., the fact that the company is not situated in a core-industry area, but rather represents one of the region's biggest employers. This is one reason why many staff voluntarily display disproportionate commitment to maintaining the site and company competitiveness. According to statements in the interviews, this commitment to some extent obscures the problem of a generally tight and overstretched personnel cover, but results in high pressure of work and performance.

A further characteristic is the high density of communication between the company units and among the staff, as meshing of activity between marketing, sales and project processing demands constant interaction because of the rapid customer-friendly processing. Above and beyond this, on customer-specific products customer requirements are also to be negotiated in the team. „*They are thus constantly in competition with Chinese manufacturers. Thus, they have to be absolutely state of the art technologically and in switch technology, otherwise they can't keep up, because as soon as a competitor saves a component and uses a different switching technology, he has his nose in front. And so, as it seems, we now have our nose a little bit in front. In order to meet the prices customers demand for mains adapters … i.e. if Nokia now says, I need 80m mains adapters per year, then they can more or less imagine the sort of pricing pressure that gives rise to, and the technological possibilities that will be tried here in order to get the business with lower prices. And they are constantly under this pressure not only in the area of enormous unit numbers, but also in the area of intermediate unit numbers.*" (B8G3-3f)

2.1.3.   Culture

Cultural aspects of company organisation can also partly be explained by the history of the company, as an independent company structure has only been necessary since 1991, and management in the direction of independent further development actually only since 1996. The parent company from which the management buyout originated ensured orders for the company for a very long time. As a result, the company had a long time to develop its own independent product range. Above and beyond this it was not successful with its first own products, but only achieved the breakthrough into the mobile-phone accessory market with integrated mains adapters. On the one hand this had the effect that high-quality products could be developed in peace and quiet, i.e. from within, and that for a long time there was no real market pressure for the introduction of independent and competitive products.

Now, after some four years' presence on the market, the costs spiral is beginning to turn, that is, the company is constantly having to produce more cheaply and in large quantities in order to maintain its competitiveness, not only technologically but in its price structure. The pressure this has created for the organisation to adapt to changing market circumstances precipitates frequent organisational changes which are often based on decisions taken on impulse by the owner. At the moment the company is on the verge of a modern company culture to be carried out from an integrative viewpoint, with it still being unclear how much of the current company culture can remain.

2.2. Personnel / deployment of labour

2.2.1. Skills and qualifications

There are 650 workers in the company, 170 of whom are employed at the site in the region and 480 at the outlying sites, predominantly active in production. At the Austrian site, the number of semi-skilled production workers has fallen from the original 180 to approx. 60, while in the largely qualified white-collar area there has been a doubling, from approx. 60 to 120 employees.

There are hardly any problems in filling middle and lower white-collar positions from the regional labour market, as the region has appropriate vocational higher technical colleges. Because of the outlying position, however, there are difficulties in filling of top positions and specialist functions.

2.2.2. Training

Training in the company displays the characteristic features of SMEs. Training is purpose-driven and reduced to the absolute minimum. Although as an ISO-certified enterprise the company draws up training plans for each year, the practical demands mean that these are often abandoned.

Brief user training is usually carried out in relation to ICT. The development of other skills is largely left to the staff themselves in the context of learning by doing. Weaknesses in this approach however are recognised by management, too. *„I miss that a bit – training in the sector. I think I do certain things in Excel that I could do better or more quickly with proper training."* (B8G3.12) Many people also use their spare time: *„I just do it, if something new comes in, so that I sit here for four hours on a Saturday and play around with the software. It's possible to learn it for yourself."* (B8G3-13)

2.3. ICT applications: ICT as a tool, automation and organisation technology and as a communications medium

In computer equipment the company is not oriented on the fastest possible introduction of the latest developments, but rather takes the route of utilising and developing tried and tested systems for as long as possible. At the respective sites there are local networks linked by satellite, as there is no appropriate terrestrial connection with the border regions. *De facto* there the applications are divided into two worlds: The production planning system, which is host-based and is available for feeding in planning and working data. Above and beyond this there is a local PC network (LAN) which at the same time is used for administration, quality management and other miscellaneous operations. Internet access is selective, only for staff in particular areas.

The production planning system is based on a special solution from a software house, which it is intended to discontinue in the future. The PC-LAN world on the one hand has CAD products and, on the other, Office products including e-mail. Special workstations are employed in the CAD area, as not only representative functions, but also construction and simulation features are employed in development. Here the application of technology is

predominantly as a tool. The general strategy is to buy in standard products which are then customised. This strategy is pursued both in production planning and in all other departments.

E-mail is increasingly being used as a communications medium in the field of internal co-operation. ICT as an organisational technology plays a role above all in networking with the Czech production sites as well as in running projects and in sales. The utilisation of ICT is targeted; the solutions have developed so that, in close co-operation between management and the computer department, it has been possible to buy and successfully customise solutions that have already been market tested. Regarding product development, this takes place in tune with market demands and where necessary employs innovative products in a targeted way.

The administrative staff do indeed have all standard products for office support, but receive hardly any support in the customisation of these tools in order to develop working support appropriate to the workplace. The implementation of workflow management solutions is being considered to automate organisational processes in future.

2.4. *Characteristics of TP and processes of technical and organisational change*

The form of introduction of technologies already outlined has a tradition, although the development of the software has been characterised by a number of technological leaps. In 1993/94, a Novell PC network was set up, the advantage of which lay in the central data storage and was therefore not immediately perceptible on the part of the user. In office communication above all, the terminals at the periphery were able to transmit and receive data to and from the host by means of terminal emulation. Something similar took place in 1997 when the NT network with a TCP/IP link to the host first permitted distributed processing at the data storage level. The site connection in 1997 made it possible to operate the whole enterprise on a networked basis across sites and by means of terminals (with a host-link).

It is worth mentioning with regard to TP that outsourcing has been and is primarily used in the development of ICT, and thus there is a minimal number of specialists available within the company. Thus, for example, two computer specialists are sufficient at the site. These also have other responsibilities at the same time, so that they are not exclusively available for ICT issues. The Internet link was set up at the main site in 1998. E-mail was then introduced in 1999 with a full site-connection on a PC-LAN basis, so that with the aid of an exchange server e-mail is now used as the communications medium throughout the administrative branch.

The medium caught on within two weeks without any employee explicitly having to receive training at their workplace. Rather, the opportunity of electronic communication was taken up by staff independently and enthusiastically. Alongside pure data storage, we can thus now speak of a communications-oriented ICT culture, with the introduction of external and internal links through the Internet and e-mail being decisive events for the staff.

The initially PPS-oriented solution (host) has extended in the direction of total-company information management and system, so that the wage and salary accounting, financial bookkeeping and the materials management now runs on the host. According to those responsible, outsourcing has generally proved itself through the appropriate adaptation of the seller or developer, so that responsibility for the end-user can be taken care of within the

company itself. In future, owing to higher Internet frequencies and band-width requirements, satellite transmission will be replaced by other solutions.

Precisely for the very customer-friendly manufacturing in important sub-sections, the use of ICT has in the meantime become an indispensable basis without which it would not be possible to maintain this type of production: *„We now have these communications possibilities which help us enormously. Speed, speed of information, is the absolute trump card. If they get information quickly, can pass it on quickly in-house, then they prevent additional costs, and from my point of view even loss of quality, and so on. In general, I think that the flow of information is on the one hand very necessary, but on the other hand, I have to say, it also involves a certain danger. But for us speed of information is incredibly important. That is, that the information from the market, from our customers, can be distributed very quickly to the positions responsible in house, so that the speed of reaction etc. is raised. So in future, it won't be the one who is better who wins, but the one who is faster."* (B8G3-4)

At the same time, however, various interview partners in the company indicated that internal e-mail communication had also led to an unmanageable flood of information, which in some sections has resulted in a loss of efficiency. Reducing dealings with ICT to the necessary level is seen as an important problem. These statements clearly show that from the point of view of the user and those responsible, the speed of information exchange is appreciated.

In sales and marketing above all, these dangers are not limited to internal communication, but can also lead to severe complications in customer contact. The danger, above all in dealings with customers, shows itself dramatically in accessibility problems, which signifies an important organisational change caused by technology:

„It is a catastrophe when I listen to our sales engineer over there [meaning in the US] during breakfast, who in principle does nothing for an hour except listen to voice mails and then send voice mails. In some circumstances it takes three or four weeks before he can speak to this woman or that man personally. So it's a catastrophe. People sit at their desks and have the voice mail turned on, otherwise they would be continually interrupted. So this is the quintessence of the whole thing." (B8G3-7)

In new contacts, the sales staff thus gets no answer at all in up to 20 per cent of cases, although contact has demonstrably been established by means of voice mail. Making contact thus forms the actual problem as, despite new information technology, the relevant person cannot be reached. Setting up personal contact thus takes centre stage and becomes the main activity in sales. As a result, one member of staff believes *„the slip of paper is coming back"* (B8G3-7), as information that can be sent in written form is presumably picked up more readily, and then only if it is kept very brief, i.e. a maximum of five sentences. Only then can the necessary contacts be made. According to this the constant cultivation of customers calls for increased efforts: *„So in future it will also be necessary for the people who* deal with the countries or deal with the customers, to cultivate them continuously." (B8G3-10)

Finally, the build-up of information shows itself as an organisational change in the sense of an information hub in the sales area: *„The salesperson of the future will thus no longer be a sales person, but an information centre: the faster they get information and the faster*

they can convert information into sales-promoting measures in the company, the quicker they will be successful." (B8G3-5) The installation of workflow systems is seen as a further assistance to the successful handling of orders both in order to reduce sequential working-off time as well as to use the system actively for quality control.

In the application of technology, it has been shown that both school training in computing and contact with computers in one's spare time makes employees' use of ICT easier, with the basic readiness to work with computers being regarded as independent of age. As a result, the way in which they perceive the application of technology is essentially dependent on employees themselves. Company technological practice is characterised by the fact that software is adopted for ease of use, that is that the organisation switches over „by itself", as it was possible to show in the case of reporting, where ultimately the organisation manages without paper in some areas. The introduction of workflow management, too, is intended to be technology-driven, that is, that the process definition should only be undertaken with the introduction of the technology, and indeed, together with the technology manufacturer and the experts in the company.

3. Consequences for „Social Exclusion" and „Social Integration"

3.1. Employment: Job losses and job gaines

As has been mentioned, the losers in the development of the company are unqualified Austrian workers. For reasons of competition and cost (considerable wage differentials), labour-intensive production was transferred to the neighbouring Czech Republic immediately after the establishment of the company. It was possible to make good some of the job losses in Austria through the expansion of the company. The newly created jobs relate predominantly to qualified white-collar positions. These are mainly occupied by male workers.

This exchange or loss of jobs has no connection with the introduction of information and communication technology.

3.2. Changing work: tasks, tools and skill requirements

Overall, staff readiness to help in the use of ICT is very high, despite the individual initiative required to provide assistance. Introduction is mainly promoted by „key users", who then take further employees along with them so that finally the introduction of the technology among the staff proceeds by word of mouth, mutual assistance and learning by doing under high pressure of work, without any explicit transition phase. Basic training is indeed offered, but takes place in parallel to the introduction of the technology.

A further problem is dealing with the tools as a communications medium, conditioned by the lack of strategic and operative guidelines in the use of ICT: *„Unfortunately, yes, in-house the e-mail is also misused. And the worst: that recipient quantities are given, and it is actually of no interest at all to 50, 60, 70, 80 per cent."* (B8G3-8) It is seen as a potential danger that the good communications culture that has so far existed on a face-to-face basis could be shattered, because e-mail can turn into *„an emotionally frigid information*

exchange which no longer has any spiritual content". (B8G3-8) Countermeasures only exist if there are regular discussions as soon as the people involved are present in the company.

3.3. Changing employment relations: employment security, terms and conditions

Employment conditions and security of employment have changed fundamentally as a result of the transfer of production. Although the company is based on a core staff of longstanding employees from the region, as a result of the type of activities a shift in favour of more highly qualified labour can be seen at the site studied. Experience and loyalty are almost taken for granted, as it is difficult for directly employed labour in the region to find long-term guaranteed employment in the private sector.

The transfer of production represents a competitiveness-determining savings strategy by the company important to its survival. This primarily affects new recruits, who have to meet higher qualification requirements. In existing contracts nothing is usually changed.

3.4. Does ICT matter?

As the company is extensively technologically integrated, labour processes are also heavily penetrated with ICT. Without the application of ICT, the transfer of production would not have been possible in this form. Consequently ICT is of enormous significance for work in this company. The effects on employment, that is on employees' opportunities of finding a job and on the danger of losing it, can however only be indirectly related to ICT. ICT primarily affects internal data exchange and customer communications.

Indirect effects of ICT on employment chances may exist as a result of the limited training (also conditioned by a snowball system or time pressure) and through the great importance of learning by doing and informal types of learning. Employees who are essentially not open to technology and independent learning of how to deal with technology may thereby be disadvantaged. However, no indications of such problems were found during the field work.

CASE STUDY 9 – LOGISTICS

0. Description of the Fieldwork

A total of five interviews based on standard guidelines were carried out at the headquarters of a courier company. The choice of interviewees resulted from a preliminary discussion with the manager. After evaluation of the preliminary discussion, two rounds of interviews were held with the selected interview partners.

1. Description of the company

1.1. Sector

The logistics company studied has specialised in the area of CEP services (courier, express and parcel services) and is the Austrian subsidiary of an international company. Since the mid-1990s, the same product range has been offered throughout the EU; letter post and parcels up to a maximum of 70 kg are carried. The Austrian headquarters, which was at the centre of the study, is also responsible for eastern Europe. In all there are nine sites throughout Austria.

1.2. Activities, products and production/business processes / Size: turnover and employment / Customers and suppliers / Market and competition

The spectrum of services includes carrying documents and parcels, the transport costs of which are based on a tariff list. Thus the customer decides the form of carriage – above all the urgency – for their document or packet. In recent years, the Internet (e-business) has acquired particular importance for communication with customers, which will be dealt with in more detail later. This may also be one of the reasons why the company has been able to achieve double-digit increases in turnover in Austria in recent years. In the express sector the company is the market leader in Austria with a market share of almost 40% (B9G1-1). 150 vehicles are in use daily, with the vehicle fleet not being run by the logistics company itself, but through subcontracts with more than 10 Austrian transport companies.

Competition in the Austrian parcels market – some 400,000 parcels are transported every day – is becoming increasingly fierce. On the one hand, international express companies are fighting for their share of the growing billion-dollar cake, on the other hand, domestic forwarding agents are investing more intensively in the development of their logistics systems. In order to be able to compete, customer-tailored logistic concepts are important, and above and beyond this, as the „interface" to the customers, staff represent a competition-related factor.

The customer spectrum of the company we studied is very broad and ranges from big customers, for whom comprehensive logistic concepts have to be implemented, to private customers with a one-off consignment.

Within the information society the company distinguishes itself as an advanced provider and user of information and communications technology. The whole logistic chain is systematically mapped, with the use of information systems starting at the portable recording terminals used at the point of collection of documents and parcels. WWW-based technology supports consignment progress-chasing, and customers can obtain information on the location of their consignment at any time from the company's web-site. Here it benefits the company that centrally designed enterprise and internationally identical www applications are employed.

1.3. Workforce profile (Gender, Age, Educational profile)

The logistics company studied employs some 150 people throughout Austria, with the proportion of women being around 80%. About 100 staff work at the location studied (Austria headquarters and airport), with staff numbers having fallen in recent years despite rising orders. Approximately a third of the staff work on a part-time basis; staff turnover is very low. Most staff have school-leaving qualifications from a middle or higher school (commercial school, commercial college). The drivers – some 150 vehicles are in use daily throughout Austria – are not directly employed by the company, as this section has been contracted out and is covered by subcontracts with transport companies.

2. Technological Practice (TP)

2.1. Organisational and cultural aspects

2.1.1. Organisation – the core questions

The company basically has a functional form of organisation; specialised departments, which nevertheless work together very closely, exist for the individual tasks.

Customer care is the first point of contact for enquiries and „concerns" of customers. In contrast to the central call centre in Ireland, which takes the majority of enquiries from the whole of Europe, customer enquiries are subsequently also processed by this department. *„Naturally in close co-operation with the field representative responsible. Then it can always be discussed whether the matter is so important and so big, or the customer so important and big, that the field representative gets very involved in processing it, or if it really stays in the customer care department."* (B9G2-4) One task of the customer care department, in a special service provision offer, for example, consists in ringing the customer directly when their document or parcel has reached the desired address. The customer is then certain when the dispatched document has arrived and does not have to enquire or search the Internet about completion.

There is a close organisational connection between the customer care department and tele-sales, which *„only works internally and only on the telephone, as the name suggests. And more or less feeds the account executives. They then get information where someone might be so interesting that a visit from the field representative might be desirable. So practically they work in this inter-departmental way."* (B9G2-4) The very close links to the field representative, who appears directly at the customer's to sell services, to arrange

preparations to optimise the logistics or to seek solutions directly with the customer, also arise from this inter-departmental co-operation. For strategically important customers, as a rule other departments (e.g. technology) are drawn in in order to be able to meet customer requirements both technically and organisationally.

External transport companies bound by subcontracts are responsible for the actual transport of the documents and letters. Internally, dispatchers look after the organisation and guidance of the transport processes and the contact with the drivers. Here the driver *has „very little room for manoeuvre. He is the last link in the chain."* (B9G2-5) This contact between dispatcher and driver only concerns the actual job area of delivery or collection of documents or parcels. In all other matters (customer questions, quality shortcomings, training measures, etc.) communication is exclusively with the subsidiary companies, as the drivers are not directly employed at the logistics company.

Alongside these strongly externally oriented departments, there are departments or responsibilities for finance, staff, computers, quality control and marketing. Individual tasks such as wage and salary accounting are contracted out, there is only an accompanying control in the company itself. The company employs people directly at the airport for the handling and further distribution of the documents and parcels.

Because of the labour division organisation with specialised departments on the one hand and highly time-critical processes on the other, communications media are particularly important. Alongside personal discussions, the phone and electronic communications are used to support the business processes and internal co-operation. Most of the transfer of information, however, is already standardised and automated, as both data on documents and parcels as well as on customers are electronically recorded. Communication with the drivers is by mobile phone, i.e. The dispatcher can call the driver directly if there are any uncertainties. As this company is the Austrian subsidiary of an international group which works more or less „round the clock", technical tools such as e-mail support communication with partners all over the world, as it would often not be possible to reach colleagues in other countries owing to the time difference.

For customer contact, most communication is as before over the phone, although it can be said that *„younger sites use e-mail more"*. (B9G1-9) The reduced number of calls to the central call centre, despite rising turnover, also points to the tendency to a falling significance of the telephone as a means of communication. Using a dispatch number customers can query important information (location etc.) directly over the Internet.

The formal means of co-operation are often insufficient to clear up problem cases in international dispatch. Personal contact and experiential knowledge are also required if the „rapid satisfaction of customer requirements" is to be achieved:

„There are particular processes we have organised in the company – who is responsible for what. If we assume that a customer comes in now and there is some problem with a delivery. Then I know I either go to the operations manager or to the team leader and say, ring up quickly and get the information you need. If it is going out of the country we could say, OK, ring Germany. There we have contact people who have been in the company a long time and have the corresponding connections. Inasmuch as, because

perhaps they have already been around a lot, and there was somewhere sometime a colleague they had worked together with. I did him a favour, he did me a favour. So one just says, ring up that colleague, he can help you.!" (B9G3f-7f)

The offices are staffed as a rule from 8:00 to 18:00 with flexible working hours. Later customer enquiries are re-routed directly to a call centre. Above and beyond this there is a central office open to take documents or parcels up until 22:00. Round-the-clock working operates only at the airport. (B9G1-7)

2.1.2. Organisation – background information

The formal structure of the company studied is marked by a functional division into technical departments and a shallow hierarchy. Internationally there is a subdivision into regions and districts for which individual managers are responsible.

Characteristic of the location studied is an occasionally high level of division of labour, associated with staff specialisation. Thus the call centre takes a customer order, records the data and transfers it automatically (by fax) to the respective dispatchers. These pass the information on to the drivers by mobile phone, who then collect the goods from the customers. The electronic recording of delivery and collection information then takes place directly at the customer's by means of portable data terminals. This data is subsequently transferred to the technical departments responsible in order to ensure tasks like invoicing or consignment chasing over the Internet.

Field workers often work together with other departments on the development of logistical concepts for major customers. *„As soon as that is a customer where a standard solution is not applicable, i.e. not covered by the dispatch software, it goes though the field worker to the sales representative who is responsible for this area, and then to the superior, i.e. to the sales manager. Then a strategy meeting is called where everyone sits down together to find a solution for the customer."* (B9G1-8)

The smooth processing of consignments is the most important quality criterion. Checks are aimed at this, such as daily evaluation of how far it has been possible to deliver the documents and parcels transported within the guaranteed time, whether there has been any transport damage or if customers were dissatisfied with the service. Direct customer contact takes place though the delivery service staff, who on the one hand are mentioned as the *„public face of the company",* (B9G1-13) but on the other hand are not directly employed by the company studied. This leads to an extra control requirement. *„We check them every evening. That is, you can see it from the collected parcels they bring with them. Because if mistakes creep in there, then we go to the company again, to the sub-contractor, and they must ensure that this is rectified."* (B9G1.13f) In the other company areas, too, the achievement of targets set by the group on the basis of an annual business plan (e.g. cost savings) is linked to regular assessments.

2.1.3. Culture

The company culture is shaped by the international character of the enterprise and by its uniform international identity. The external appearance as a service enterprise is consciously conservative.

„Well, we are very, very conservative. We want to suggest continuity, security. That is, the feeling that the customer is in good hands with us. And can rest assured. We naturally express that through a very serious appearance, also that of the field representatives, which is naturally also expressed in dress. Our obligation – conservative clothing and not clothing that is subject to particular fashion trends. Very, very strict regulations, also I would say with regard to hair. That is, for male field representatives or male staff who come into contact with customers, no long hair or beards. We do not tolerate piercing or tattoos on visible parts of the body. So this is very strict.” (B9G2-9)

These strict company culture guidelines are formally established. Particular importance is also attached to polite behaviour.

„It is basic inside the company that we address each other with first names. This goes right through from the manager, the highest to the lowest part-time worker. That is, in both directions. Thus staff members address the company manager by the first name. And in principle, naturally, with 'Sie' [the formal German 'you'] *unless it happens that sometime or another one is 'per Du'* [the informal 'you']. *Manners are very, very polite. A great deal of importance is attached to this.”* (B9G2-16)

Staff appearance, their dealings with customers and the shape of their work are subject to continuous assessment. In the group, a programme of on-the-job supervision is used in which a departmental manager responsible accompanies individual staff members over several days almost *„like a shadow”* (B9G1-7) in order to draw conclusions on possible training requirements. Information on the extent to which this is regarded as support and assistance and not as staff control is proved by annual staff questionnaires. *„In autumn last year we made an Austria-wide staff questionnaire, and there it actually emerged that staff also like being assessed. We have special assessment procedures at regular intervals. That they say, I haven't been assessed for a long time, can I have another assessment please? Basically it is regarded very positively, because one just works with them. In whatever form. Whether it is an assessment in the form of a discussion, which naturally then has to be very intensive, or whether it is 'on-the-job supervision', or whether training measures at entry level are involved. It has shown that they want attention and talking and contact with superiors.”* (B9G2.18f)

2.2. Personnel / deployment of labour

2.2.1. Skills and qualifications

Among the skills required of the staff, the behaviour towards the customers, particularly important for the logistics company as a service provider, is particularly emphasised. Not unusually for a service enterprise, „customer orientation” was mentioned in all discussions as the required key qualification for the staff. *„I like to encourage staff members to get beyond themselves and sometimes to put themselves in the customer's position, in order to have the understanding in some way or another. And that is actually very important.”* (B9G3f-8f) This applies above all to sensitive areas such as customer care, but also for the delivery staff, who are described as the public face of the company. (B9G1-13)

Generally, alongside an educational qualification (commercial college, grammar school, apprenticeship) „appearance", openness and creativity are considered to be basic preconditions for working in the company.

In customer care, alongside school education (commercial college, grammar school) staff need a good knowledge of English as the company is active world-wide and has many international connections. Above and beyond this, staff must have good character references as the company places emphasis on a „very, very serious" corporate identity, as described in the above chapter.

Alongside this, knowledge in dealing with information and communications technology is important, including the ability to adapt quickly to new systems, as alongside standard products such as Windows NT and Microsoft Office, the logistics company studied utilises a large amount of its own software, which to some extent also supports communication with customers – above all in placing of orders, dispatch and order chasing – through www-based products. Precisely the Internet has acquired great importance in recent years. E-commerce applications are increasingly utilised with the aim of optimising (extra-) company processes, with it thus being possible to achieve more efficient information forwarding and provision.

„Since we also have a great deal of our own software, staff have to be able to learn the ropes quickly and also to be motivated to learn something for themselves. True, we have standard packages like NT or Office, but precisely for delivery or for the call centre software, which has been specially developed, where one also naturally has to familiarise oneself and react flexibly to it. This means that a member of staff has basic knowledge but is also willing to learn or to adapt to new situations, as naturally here too the software is cleaned up at regular intervals or additional functions are added." (B9G3f-11f)

The integrated processes in a structure with division of labour pose great „team working" demands, that is, on staff's social and communicative skills. One reason for this is the international contact arising from the nature of the company (sending documents or packages).

The couriers, as mentioned above, are a key position for the appearance of the company to the customers. They are not directly employed by the logistics company, however, but by transport companies who take over collection and delivery of documents and packages on a sub-contract basis. As there is no direct access to these people, above all for the personnel department, delivery is analysed on the basis of daily assessment of the „error rate". Among these, for example, are deliveries that could not be made, which were delivered too late or showing transport damage. *„If errors creep in then we approach the company, the sub-contractor, and it has to make sure that it is remedied."* (B9G1-13f) Among the demands on the drivers is the requirement that they have the next five delivery addresses in their heads and choose the route on the basis of this information.

2.2.2. Training

Initial training begins with an intensive bloc (more than 20 days) which every new employee must go through, with a five-day induction course at the beginning and the remainder of the training being divided up individually. In this period, the employees are accompanied

throughout the day by the person responsible. The networked activities' requirement for organisational and process knowledge is taken account of by the fact that trainees go through all departments in the course of this training.

„In every case, importance is attached to every new staff member passing through every department. We then give absolute priority to training in the individual department being taken care of by the manager, that is the departmental head, and not by a team leader or his subordinates. And that these new staff members learn from scratch what happens with a package when the pick-up driver – that is, the person who picks it up from the sender-customer – brings it to the airport and how it goes from there. So this means they are then in the export department, they also learn export care, and work there, too. This doesn't mean that they stand behind a worker and look over his shoulder to see what he does every day, but they are allowed to work there directly themselves, naturally under supervision, go out on the ramp, on the apron, go and look at the planes. Yes, and going out with the sales representatives so that they can see how a sales discussion takes place. As I said, [they] then go through every department, with the emphasis always being differently weighted. Someone who starts in the customer care department must be very, very intensively trained, because he must have an idea of every area and may be confronted with every problem, with invoicing problems, invoice complaints, too. This means that he also has to be quite intensively trained in an accounts and billing department, in overdue accounts. And so the training plan is drawn up. But it is drawn up individually for each new staff member." (B9G2-7)

Regular feedback to the personnel department provides information on the level of training and any possible further training measures.

Additional training requirements, for long-serving staff, too, are either established in the context or staff surveys or during on-the-job supervision by superiors, or arise from technological or organisational changes. In all, the whole group has a *„very intensive and sophisticated training system"* (B9G2-9) to which great importance is attached, especially for the field representatives. There are also special training measures for call-centre agents. This was only dealt with marginally in the interviews as the main activity for the whole of Europe is essentially centralised in Ireland.

2.3. ICT Applications: ICT as tool, automation and organisation technology and as communication medium

2.3.1. ICT infrastructure and applications

The ICT infrastructure is shaped by two major components. On the one hand, a world-wide network is used for data exchange and communication. On the other hand, available network structure – the Internet – and standard browsers such as MS Internet Explorer or Netscape are used to link customers directly into the e-business world. A range of tools that simplify business relations with customers, automate activities, improve data transparency and thus ultimately contribute to efficient logistics solutions are available for this.

Each member of staff has their own screen workstation; field workers are equipped with laptops. They directly transfer the recorded data every day and thus save having to write up daily reports.

Applications for customers, which can be requested directly from the logistics company or downloaded from the company's homepage, support the consignment chasing, dispatch preparation and processing, the integrated service, tariff and delivery-time information, as well as the digital Internet delivery of documents with the highest security priority.

If documents or parcels do not already have a dispatch number are when they are picked up from customers, then this is provided directly on collection by the driver using the portable terminal. The information is then fed into the group-wide data bank and provides the customer with information on the current location of his consignment at every stage.

This high and at the same time innovative level of automation makes personnel savings possible despite the high turnover growth.

The comprehensive technical data recording within the various logistical processes supports the assessments that take place in the context of registration of service errors.

„Service errors are naturally meticulously pursued and tracked in diverse reports, and also dealt with and analysed further. This means you see quite accurately, a subcontractor had a fluctuation, had three new dispatchers. And suddenly in February we had a jump in service errors in the area of these dispatch routes . . . we have these reports on a daily, weekly and monthly basis, and we see very, very quickly and we react very quickly, too." (B9G2-8)

Electronic communication is also partly served by the company's own older online system, which is however gradually being replaced by standard tools. Email is very heavily used above all in the workplaces where close co-operation between different departments or customers is necessary.

Above and beyond this, the company studied has its own intranet for information transfer and presentation (e.g. for reports on turnover figures or ranking) in which, for example, internal job descriptions are also saved.

2.3.2. Character of ICT-usage

The use of information and communications technology is very heavily targeted at the *automation* of business tasks. On the one hand, web-based links to the customers mean that particular jobs can be devolved to the customers and thus, on the other hand, in cases of complaints (e.g. wrong type of delivery) the processing time and expenditure can be much reduced. Here we noticed that the incoming calls to the call-centres are falling because precisely medium and large companies are using the information technology tools on offer for dispatch preparation.

„And not only is the work becoming easier, but the quality is improving, too. Because certain human errors don't happen. I mean, the customer can make a mistake the same as before, but then it cannot happen that there is then a retrospective discussion of the type of delivery. When we were still filling out the consignment notes ourselves, it was

possible to tick the wrong box. Now the customers do this themselves. Naturally, this also reduces complaints in the billing department, because what the customer has sent us is what he wanted. And that's what he gets." (B 9G3f-19)

Accounting tasks have been simplified, too, through the linking of filed information, *"the point where you used to write an invoice manually no longer happens, where we collected the whole bills of lading for the week or the month, in the first stage, and then generated an invoice from them. It's all gone! So it is error-free. Communication with the customer is also essentially better as a result, because it simply prevents complaints. And it is definitely right!"* (B9G3f-19)

In future it is also intended to scan in customs documents and transmit them in electronic form, which means that one of the last areas in which manual entries on paper have to be made will have disappeared.

For an international company electronic communication is also of great importance. Above all for communicating information across different time zones, normal telephoning can lead to problems, because at the end of the working day the desired discussion partner has perhaps not even started work. E-mail makes communication in these cases easier, as the answer is there the following morning.

3. Consequences for „Social Exclusion" and „Social Integration"

With regard to one of the research objects of the SOWING project, the logistics company studied shows that the increased innovative application of information and communications technology leads to improved and faster working processes in many areas, and these demands can be fulfilled with fewer personnel despite increased turnover figures. In this the company benefits from being the subsidiary of an international group and thus strategic decisions are made at other levels and improvements, such as, for example, an external call centre or new Internet applications, can be tackled centrally and only marginally concern the location being studied.

Nevertheless, in this company with growing turnover no new employment opportunities have arisen; the contrary effect appears – staffing has fallen slightly. This is primarily because women have not been returning from parental leave, although part-time working would have been possible. This slight reduction in personnel and the more efficient organisation of processes has helped the company to meet the saving measures prescribed by the group.

The more efficient organisation of working processes, conditioned by technological and organisational changes, has led to a transfer of personnel in some areas. Hardly any promotion opportunities exist in what from a world perspective is a small subsidiary, which to some extent could affect the desired career of committed employees.

The basic precondition for all jobs is the experienced and confident handling of computers, both in dealing with daily tasks and in communication. Here in coming years, above all in connection with e-business, further demands on the staff will arise, so that this aspect will gain

in importance and changes in the software and in business processes will pose new demands on staff flexibility.

CASE STUDY 10 - TELECOMMUNICATION

0.   Description of the Fieldwork

The fieldwork for this case study took top-down route. Initially, a preliminary discussion was held with a member of the company management in which the areas of the company relevant to the project were addressed. Finally a procedure was agreed which was to concentrate above all on changes in the customer-care area. The case study included on-site visits and interviews with the managers of sales, the call centre, customer care, personnel, organisation, and IT, and with the shop steward. The interviews facilitate some revealing insights. They were fully recorded and transcribed. The evaluation and interpretation was carried out in tandem by a social scientist and technician on the basis of the transcriptions.

1.   Description of the Company

1.1.   Sector

The company is active in the (tele)communications sector, and as a provider and developer of infrastructure and applications, in particular telephony, radio and data transmission. Having been formed out of a state-monopoly in the course of market liberalisation for providers of this service in Austria, the company has been active on the free market with a strategic foreign partner for approximately a year, and is at present market leader.

1.2.   Activities, products and production/business processes

The company provides infrastructure, equipment and services for all telecommunications requirements. Its customers are businesses and households as well as private individuals. Since the liberalisation of services and the opening up of the infrastructure for other providers, the company has been attempting to gain a foothold in the free market in the sphere of new types of service provision, for example call centres. The company thus started its customer-care section in 1997. A new structure was created out of existing old organisation units, with telephone directory enquiries and customer-related services, including accounting, being integrated. With the entry of the strategic (foreign) partner in May 1999, the operative area of the service (e.g. installation of customer equipment) was hived off to the „technology" section, which includes some 2,000 workers. Management, customer services and project management remained in the customer-care section. The telephone directory enquiries department is being run as a call centre as per the 1997 plans.

1.3.   Size: turnover and employment

Turnover was ATS 1.8bn in 1998. The company currently employs 16,000 people, which it is planning to reduce to 14,500.

1.4. Customers and suppliers

Since recently the company has been operating a system of customer segmentation, i.e. key account, business customers, small office, home office and private customers are differentiated. Suppliers come from the hardware and software business in order to be able to provide overall solutions, individual applications and infrastructure.

1.5. Market and competition

The market covers all of the above-mentioned customer segments and thus the sectors in which these types of customers are to be found. To maintain competitiveness the business also involves itself with front-desk management (contact points for customers) and a separate project related to this is the merging of customer accounts with the company's order management by the end of 2000. Since liberalisation, the telecommunications sector has become a highly competitive market. The pressure the (new) competitors have put on the company is a determining factor for company policy in the current situation.

1.6. Workforce profile (gender, age, educational profile)

Approximately 1,300 people were employed in the customer care section at the time of the fieldwork (half of these male, half female), all of whom had specialist training in the most diverse areas (technical college, clerical workers). The call centre included approx. 700 employees, of which 20 per cent were agency workers. As people are constantly in the training process, it is to be expected that the number of employees will rise continuously in the coming years, particularly as call centre services will be offered externally.

2. Technological Practice (TP)

2.1. Organisational and cultural aspects

2.1.1. Organisation – the core questions

The company is characterised by several business areas, with customer care representing the one in which significant changes have been made in recent years. Customer Care covers three areas: Call Centre; service and project management; Telecom-account. The core objective is the realisation of a customer-friendly one-stop/one-shop solution, which is distinguished by offering just one contact partner for customers wherever possible and providing minimum delivery and service times for business and private customers. This concept is based on the recognition that until now there have been too many service points and contact partners for various customer concerns. Above and beyond this, customers in different regions were treated differently. A solution to this problem is currently being worked on in the order management project. This aims to support planning and create transparency. In any case, significant changes in the content of work and organisation are involved in this project.

2.1.2.   Organisation – background information

Within three months in 1997, a virtual call centre was set up with several locations in Austria and some 300 jobs – exclusive of directory enquiries which together with the old structures was turned into another organisational unit. In 1999 some 10m calls were dealt with by the call centre, approximately 15 per cent for third parties. Services for third parties are also carried out in the call centre, for which appropriate billing is made. Today, following reorganisation (information services were integrated in 1999) the call centre section employs some 700 people. At the moment technical support systems (platforms) to support directory enquiries and customer service are being integrated, so that in future all staff can be flexibly employed.

The call centre section, which is part of customer care along with project management and customer accounts, is characterised by a hierarchically shallow business structure and a profit centre with three service levels. Those responsible for the customer care section make strategic decisions together with the regional managers and managers of the call centres. Control structures exist on the one hand because of the various areas of responsibility (call centre, region, section). The section heads report from the bottom up and submit figures. The call centre managers chair team-work meetings on site and receive reports from colleagues responsible for customers and products. Here it is a question of the attempt at a decentralised organisation which will retain jobs and employees in the regions.

2.1.3.   Culture

As a whole the company is characterised by lasting and longstanding labour relations with a high level of staff loyalty. This leads among other things to the fact that the retention of jobs in the regions affected was a priority in the establishment of the call centres. The management by objectives management style is applied in an open and transparent way, although the execution of work, determined by the call centre organisation of work (three-service level – see below) is determined by the basic procedures and related communications.

2.2.   Personnel/deployment of labour

2.2.1.   Skills and qualifications

The philosophy of the call centre structure in the company consists of providing a high value service, i.e. achieving competitiveness on the basis of high quality. A correspondingly great emphasis is placed on a qualified staff. Basically, any staff member should be able to learn the necessary skills, so candidates are first sought within the company and then undergo a graded training programme. The employees are put on one of three service levels, ranging from standard tasks (such as answering telephone enquiries) to expert tasks (such as dealing with drivers on servers). Common to all tasks is the fact that their execution calls for a high level of social skills and speaking skills, and thus appropriate training has to be ensured.

The development of the call centre was carried out almost exclusively through internal recruitment, not least because of the high proportion of staff with civil-service status. On the one hand, technical workers such as telephone electricians were retrained as call-centre agents. On the other hand, staff from directory enquiries were trained for these new functions. The attempt was indeed made to employ technicians at higher levels in the area where

technical understanding and knowledge is needed for a high-grade telephone service. However, the technicians, too, had to start at the first grade and work their way up.

The length of stay in the call centre is given as from four to five years. Above all, the technicians largely see their function in the call centre as a professional demotion and so take the first opportunity to change to a more technical area. However, this is not seen as a disadvantage in the company, as experience in the call centre can also be of use in other areas.

2.2.2. Training

The company as a whole places great importance on training. A company-wide training programme is offered for all workers for employment in the call centre. The programme for call centre agents consists of several weeks training, the exact length of which depends on the level at which the member of staff is to be employed. For the highest level a total of six weeks' training is necessary, for entry-level jobs, two to three weeks. The programme covers topics such as customer orientation and negotiating skills, but also escalation management, i.e. dealing with annoyed and angry customers. Part of the training takes place in the form of courses, the rest is acquired through training on the job. In all, the company invests €7,200 – €10,000 in a call centre agent at the highest level.

The training programme for call centre jobs is matched both to the respective expertise and the additional skills of the employees. The training for work in the call centres represents a considerable investment which does not necessarily benefit the call centre itself in the long term (employees often change jobs after training), but it does benefit the company, as employees find more highly rated jobs in other areas.

2.2.3. Flexibility (including casualisation)

In relation to forms of employment, it should be noted that most employees in the company have civil-service-type status. There is thus hardly any chance of altering the terms of employment and thereby coming to an agreement with staff on more „flexible" terms of employment. Even with new recruits, the main issue is not the flexibility of terms of employment but covering requirements. One exception to this is a special area of the call centre which is exclusively staffed by short-term agency workers. From the interviews it emerged that this variant was selected in a phase of the privatisation process in which there was a short-term requirement for additional staff for special services while there was a general ban on recruitment. This dilemma was solved with the „flexible" form of employment of agency workers, and has also been retained since then. In all, however, it can be said that this is a case of an exception to a personnel policy oriented to long-term and stable employment.

2.2.4. Incentive policy

The training system and the salary structure are the starting points of a distinct incentive system. Anyone who goes in for training receives credits at each service level, which qualify him or her for further promotion and thus facilitate individual career planning. The career stages are adjusted to the salary structure.

2.3. ICT applications: ICT as a tool, automation and organisational technology and as a communication medium

2.3.1. ICT infrastructure and applications

The company as a whole is networked with WANs and a LAN. Some 1,200 server systems are used. Both area-specific and general software is used, for example for office automation. A major element in the call-centre section is a software system that on the one hand offers the appropriate task-oriented support for each call and on the other uses intelligent routing as a guide for the operator in order to direct the caller to targeted operators so as to even out peaks and ensure an even distribution of the workload. Task-oriented support means, for example, that for an incoming call from a mail-order customer, both the product catalogue and the interactive possibilities corresponding to the services on offer are available in the workplace. The operators do not thus have to activate the support themselves. Intelligent routing evens out peaks so as not to give rise to an overload of work. In the virtual call centre, operators or locations with free capacity are selected. Thus, for example, an incoming call in Tyrol can be taken by an operator in a Vienna call centre.

2.3.2. Character of ICT usage

ICT is used both as a support technology in the workplace and as an organisational technology, intended to support automated planning and development as much as possible. ICT has great significance as a communications medium throughout the company, as in-house communication is predominantly by e-mail alongside fax and telephone. ICT is currently being used as an organisational aid only in the order-management project, not however to implement new technologies such as workflow management but rather to document business processes. The call-centre area primarily runs standard processes. ICT as a surveillance instrument is currently only used for management activities, not at the immediate executive level.

Outsourcing with regard to ICT has produced results in that the software is developed externally and successfully employed in the company.

2.4. Characteristics of TP and processes of technical and organisational change

In the course of privatisation the company has been subject to several restructurings in the last four years, both with regard to organisation of labour and computer use. In the context of order management, the company has set itself a major challenge, namely no longer to handle customer orders at different offices, and in general to deliver services at the desired deadline. This has caused some problems, and has led among other things to a restructuring of the computer landscape: „*Previously we were very technology oriented and since 1997 we have been in the process of making all systems and organisational units customer oriented, which means, of course, building up an appropriate customer data bank. And to guarantee the purity or accuracy of customer data, we are also integrating the whole order management with customer accounting. Thus it can be guaranteed that the customers are accurately identified and thus receive proper service.*" (B10G1-2)

Whereas the development of order management is more market driven and thus, according to market demands, first the organisation and then the technology is adjusted, and finally the

personnel is to be trained, the development of the call centre is internally driven. So far it has been possible to train 35 operators in this area. Here, organisation and technology (with technology having largely been the driving force) have as far as possible been developed in tandem. *„In the call centre area, the introduction went as planned. If customers came in through the central access number, for example in the call centre in Vienna, and no free operators were available there, then the call would automatically be offered to all free operators in Austria. This means that it is now dependent on the load on the individual positions as to where the customer is actually dealt with – and on the skills of the individual operators. And the operator is also appropriately computer-supported."* (B10G1-3) Above and beyond this, order management is to ensure that whenever a customer queries the status of his or her order, the operator knows about it and can make appropriate arrangements. What is significant here is that such an organisational solution has only been made possible at all by the technological basis of ICT.

Regardless of the well-known fact that a call centre can from a technical point of view be centrally managed, the company has attached importance to using existing on-site resources in the regions for this purpose. *„Because of this, from the start we have had some 13 different locations in our concept, with four locations being envisaged for service and the other nine, as „remote establishments", under quotation marks as „tele-workplaces". In the meantime we have come so far technologically that as long as it has access to the company network, we can practically turn any telephone connection in Austria into a call centre workplace."* (B10G1.3) Thus today some 14 people are employed in each region in computer support for the respective call centre management groups.

As a whole this means that ICT opportunities are opening up for this company – which influence the organisation long term – in this case making the retention of regional jobs possible and finally leading to training measures.

2.5. How to explain TP: business logic, institutional context and internal dynamics

The business logic is influenced by basic changes: alongside the well-known technology shift (mechanical to digital) these arise according to the assessment of a long-term employee from (i) the opportunity to site work and communication anywhere, (ii) the training of ICT specialists who replace electro-mechanical specialists, (iii) through the new forms of organisation such as call centres, and (iv) through in strengthening of business/economic thinking and practice arising from liberalisation. The internal dynamics of the company has been driven by the need to deal in a socially acceptable way with the fixed (civil service) jobs and related skills of more than half of the workers. So far, in the unanimous opinion of those responsible, natural wastage and retraining nobody means that nobody has had to be made redundant. ICT has played a significant role in the setting up of the call centre and in order management, in the skills as well as the organisational sense (see above). On the one hand, it drives customer friendly processes, supports quality management and creates new quality features. On the other, it eases the workload on the operators through targeted support. The preconditions, however, are appropriate user skills on the part of the operators. The company offers a comprehensive training programme to develop these skills.

3. Consequences for „Social Exclusion" and „Social Integration"

3.1. Employment: job losses and job gains

As already indicated the company is in a phase of permanent job cutting (from the current 16,000 employees to 14,500). These are largely employed in civil-service-type positions, i.e. they can only be made redundant with some difficulty. As indicated above, a special service with short-term agency workers has been developed in the call-centre area; mainly however there are retraining measures for existing staff: „*This was also the beginning, i.e. in 1997 the company had practically no call-centre staff, no trained operators. We got a comprehensive project running in 97, „Focus on the Customer", where we provided our staff with the appropriate expertise. And I think we did very good work in training our own staff."* (B10G1-6) With the taking on of external staff the attempt was made to increase flexibility regarding location and hours, as well as to obtain the necessary special skills, as „*naturally it is not possible to provide our own staff with the necessary preparation overnight or to transfer them from one place to another. Thus here and there we recruited staff, so to say, externally. But at rather low levels, it has to be said."* (B10G1-8) Thus the new development of the call centre predominantly used existing staff and the company achieved the necessary agility, and to a limited extent flexibility was covered by agency workers.

3.2. Changing work: tasks, tools and skill requirements

3.2.1. Changing work and tasks

The tasks structure has changed in comparison with previous staff activities, as in the call centre above all. But in the one-stop approach to customer care, too, social skills have had to be and are being acquired in addition to the technical skills. Ultimately, with the call centre, a new service-oriented organisational form has been created which was not compatible with the existing structures. The latter had arisen through the company's (state) monopoly, so that now the company-customer relationship had to be actively worked on and redefined against the background of a more pronounced customer orientation.

3.2.2. Changing skill requirements

This organisational redevelopment was initially accounted for by changes in the task structure and then through reskilling: in the merger of directory enquiries with the customer service, a further 56 staff from directory enquiries were brought up to the level of call-centre operators through the company's own training module. In all, a shift in requirements can be seen – from employees' technical skills to organisational, social and sales-oriented skills.

3.3. Changing employment relations: employment security, terms and conditions

As indicated above, the company endeavoured to allow existing staff to take part in the changes in good time and not to employ new, cheaper labour, above all in standard tasks, as a means of cost-cutting: „*We have retrained the overwhelming majority through internal training measures. In individual regions certainly, technical college leavers, graduates*

from the technical university and now from the economics university have been taken on here and there to maintain quality, but this is minimal in comparison to the retraining measures." (B10G2-3) As a result, on the one hand the general conditions (hard to terminate employment contracts of civil-service staff), and on the other hand the retention of skills and (regional) labour, have been characteristic for the fact that, as before, long-term employment conditions and a high level of job security predominate.

3.4. Does ICT matter? The relative importance of ICT for social inclusion and exclusion

ICT does not seem to play a pivotal role so much as the specific situation of many staff whose contracts cannot easily be terminated and thus who are to continue to be employed during organisational changes, or the occasional lack of ability in taking over new areas of work. Thus it has not been possible to retrain and employ all staff in other positions: *„Naturally one has also had to live with certain staff. Because of the reorganisation, staff had often not been placed according to their skills. This was why we introduced training measures and provided staff with the appropriate instruction. And if one or the other of them could not get used to the new situation, then in the course of time he also applied elsewhere, in other areas. It was made easy for him in as much as naturally, alongside the customer-care section, the whole sales section was built up and practically the whole of marketing too. Jobs suddenly emerged in many areas that, well, opened up many opportunities."* (B10G1-10)

In the call-centre area it has been noticed in the last two-and-a-half years that staff only remain in the call centre for a certain time, and there is a high turnover. This is explained by the fact that many jobs with new functions and new areas of responsibility have been created in the company, and the incentive to change jobs has become very strong. *„On top of this is the fact that call-centre staff, I would say, are very highly qualified. That means they are always in contact with the customer, have been able to build up a relatively large amount of experience, and were also desired objects for a transfer."* (B10G1-10) This turnover certainly immediately affects the call centre, but has only a moderate effect on the company as a whole, since after their employment in the call centre many staff return to other areas to take up more highly ranked positions than they would have had previously. Thus seen, this activity proves to be a catalyst for social inclusion and indeed thereby greater pressure of work and skills requirement is ultimately related to an increase in staff qualifications. Above and beyond this, these skills and the related experience remains in the company.

On the basis of the results of the evaluation and interpretation it can be said that higher skilling (instead of cheapening) of labour during changes in labour organisation and content have made it possible both to strengthen entrepreneurial skills (and thus competitiveness) and to prevent social exclusion in a lasting way, despite many fringe conditions making agility more difficult (e.g. difficult to terminate contracts).

SUMMARY AND CONCLUSIONS

1. ICT Infrastructure & Application

Five out of ten case study companies are producers of ICT hardware or software or providers of ICT services. As could be expected these were at the same time advanced users of ICT. In addition, we investigated three companies belonging to different sectors (manufacturing, banking and logistics) that use ICT extensively. Only two of the case studies showed a low level of ICT usage at least in large parts of the companies.

Consequently nearly all of the companies under study are networked through an intranet, such as a virtual LAN, in the case of global players, comprising WAN-connections. Work is mainly carried out on PC infrastructures within local LANs. There are site-net links to headquarters for reporting to external/global headquarters. When enterprise resource planning systems such as SAP are used, permanent connections allow instant access from external locations to internal processes and data. Some companies tend to outsource complete processes and infrastructures. They are not only potential customers of application service providers but also of high performance providers. For instance, a production company plans to reduce equipment, data processing skills and operation at the location to a minimum through direct links to an external data processing provider abroad. In these cases the infrastructure at the company site will be reduced to dumb browsing terminals (network computers), making the current infrastructure obsolete.

Most of the companies tend to rely on global order management, on their move from 'one-shot'-solutions to customer relationship management. In addition, their in-house processes and projects are handled through centralised data repositories, if not managed by workflow management systems. For instance, in call centres the infrastructure triggers those processes relevant for the customer at hand. However, the infrastructures are not easy to provide and often consist of in-house programmed pieces of software that have been coupled for the sake of integrating processes and/or data. The centralised data handling, mostly for planning and controlling, is of pivotal importance for on-site activities. These data repositories are mainly drawn on by administration and other back-office systems. These systems provide records of staff hours, production and sales figures, and automatically forward them to the respective processes or work places.

Besides proprietary solutions such as Lotus Notes, specific solutions are used for communication as well as for data processing. Electronic communication is used for distributing information more or less accurately. It comprises customer requests, product requirements, performance data, e.g., deviation of planned production figures, as well as offers for training measures, seminars and courses. In some cases these communication systems have been elaborated into workflow management systems, becoming part of the infrastructure, for instance allowing direct feedback that facilitates control or planning. This was used for holidays planning, for instance. Depending on the implementation of workflow support, the software

forwards feedback and requests to the respective actors. Another tool transition occurs in the field of data storage. Electronic communication tools, such as Microsoft Outlook, provide powerful means to arrange and store data at the individual work place. Hence, the role of this type of software easily changes from e-mail to storage or back office.

Both routine and challenging tasks in companies are characterised through the use of a wide range of ICT. Typically, various units of work are linked through a client/server network, and several software products are used for different purposes. In none of these cases has only one proprietary or self-developed software solution been found. Each company relied on a mixture of software technologies. Most sectors, in particular those relying on engineering and/or development activities, require solutions that are neither part of enterprise-wide resource planning tools nor available as off-the-shelf products.

In most of the companies either central data processing centres or dedicated specialists handle the introduction of ICT. ICTs are often considered as tools, but their use leads to a shift towards organisational technologies (see also the above mentioned shift from the tool character to the organisational technology character of software in the field of data storage). The area most concerned in this respect has to be considered to be the back office. A typical starting point for this shift is the configuration of demand management, e.g., through providing a central repository: „*We have a demand database where it is documented what everyone has actually done. The entries have been provided by headquarters. Then everyone types in what he thinks about it*" (a bank ICT official). Through the automation of basic tasks, the data repository not only supports transparent task accomplishment, but also optimises the organisational progress of work in the various project phases. After the completion and take-over of the product, the database serves for problem solving („change and defect" in case of the demand database) and for further development, and thereby assists customer support.

Standard software is more often used for office automation than for other purposes, such as workflow management or enterprise resource management. Management is supported through the provision of raw data or reports. The use of dedicated or integrated management support tools is marginal. Management mainly relies on self-programmed solutions (mainly based on standard packages, such as Microsoft Excel) or on standard reporting tools provided by headquarters.

In most of the companies there is the tendency to reduce the cost of data input. Raw data are either provided by machines directly, the employees (if not available otherwise), the customers or the suppliers. Data entry by customers was an important in particular in case 7, a bank and case 9, a logistics. ICT serves as a medium to transmit and arrange that data for the different purposes. This strategy is mainly part of the general tendency towards outsourcing and application service consumption (see also first paragraph of this section). However, in one case, insourcing has been observed. Because of constant problems with wage-accounting providers, the engineering and manufacturing company decided to re-integrate the system, which has been closely linked to the production planning tool.

Interestingly, browsing and web applications have rarely been found. It seems that although typical Internet applications are maintained within companies, only a small number of them

have led to a noticeably more efficient organisation of company operations. A typical application of this type is Internet- or telebanking, a www-based product which facilitates account activities such as transfers, statement requests etc. online through the usual browsers. However, most of the user interfaces in companies operate on traditional GUIs (Graphical User Interfaces) or GUI-like solutions. Besides the technical centralisation of core tasks, www-applications support the optimisation of company operations. For some sectors, such as service providers like banks, the Internet is of major significance for work.

In some sectors, communication with customers via electronic media plays a crucial role, in some others its does not. In some cases it was argued that younger businesspersons are more familiar with electronic communication. Engineering facilities rely more and more on technical communication, e.g., for exchanging design ideas and configurations of products. Other sectors, such as banks, do not enforce the exploitation of the Internet as a communications medium for customer service. The reasons lie on the one hand in the management, which has so far not promoted this form of customer contact. On the other, however, quite often not enough customers use e-mail on a regular basis. Finally, the absence of controls in sensitive issues such as granting of credit also impose limitations.

2. Organisational change and new ICT

The case study work started off with the assumption that „ICTs have to be implemented in the existing organisational framework" (Brousseau/Rallet 1998:245) and therefore have to be adapted to the organisation. At the same time however, ICT changes the way of working and influences decision-making on organisational change. In general the case study findings support this view, and they shed light on the various shapes the interrelationship between organisation and ICT can take.

In all three cases from the manufacturing industry (cases 3, 4 and 8) the production planning systems in use were either developed in-house or the result of an extensive adaptation of standard software to the needs of the plant. The range of products and the customer relationships shape the organisation and organisational technologies. Internal flexibility in the sense of reacting quickly to customer demands can, in the view of our interlocutors, only be achieved with cu

stomised information systems. Technical integration of order handling, production planning and production is required to speed up the business process but, equally importantly, the system must not be allowed to impose rigidities on the work process, which would hamper the ability to meet exceptional customer demands.

One of the impacts of ICT on the organisation stems from the fact that technology may facilitate particular organisational forms or even makes organisational options feasible. This is very well illustrated by case study 9: The logistics company does not have any internal transport function, this is outsourced to subcontractors. Therefore, most of the contacts with the company's customers (picking up and delivering consignments) are through the drivers employed by the subcontractors. Outsourcing such a sensitive function is made easier by the surveillance opportunities offered by new ICT. Timeliness and defaults are analysed on a daily

basis using the data resulting from the real-time representation of the business process in the information system.

This is not only true for outsourcing but also for decentralisation or task integration. In a manufacturing company (case study 4) members of work teams in the production area make use of the production planning system to check the availability of material and parts and use the information to take decisions on the sequence of work.

ICT however may also support organisational centralisation. This is illustrated by case study 1, a restaurant chain, where new ICT made it possible to concentrate administrative and management functions at the company headquarters more easily and cost effectively. Also case 4, the plant of a multinational manufacturing company, illustrates this point.

In several cases ICT has facilitated the particular *spatial organisation* of work. Case study 4 on a manufacturing company shows that distributed product development in a transnational company relies heavily on both communication and information technology. Not only is e-mail and file transfer crucial for the co-operation between engineers in different locations. Central databases from which official versions of technical drawings or specifications can be retrieved are equally important.

In case study 8 we looked at a manufacturing company whose headquarters, design and development and other functions are located in Lower Austria while large part of its production is carried out in the neighbouring Czech Republic. The remote production facilities are controlled from the headquarters' location using ICT. Without information systems and data transmission (via satellite) the „virtual plant" would hardly be viable and, as a consequence, the relocation abroad would be more difficult.

In neither of the cases does ICT replace travel and meetings: While they use information systems and e-mail extensively, the „virtual" product development teams have to meet to clarify things. If product specifications are only circulated and discussed via e-mail, misunderstandings may occur because the information is understood differently. Only face-to-face communication in a group meeting is seen as effective under such circumstances.

In three of our case studies the potential of ICT was used to create or to maintain employment in somewhat remote locations. The telecommunication company (case 10) operates a distributed call centre: When the call centre was established, people from downsized operations of the company were trained and taken on as call centre agents. It was the goal to deploy them in the town where they had been working previously. Now the call centre has various regional locations, and the calls are routed automatically to the least busy one.

In the 70s a software company (case study 5) set up an establishment for data entry only in a disadvantaged region. Later on it was turned into a software development unit The regional development initiative that established an internet provider company (case 6) operates several „telecottages" partly in remote rural areas. The co-operation between the different establishments of this small network company is facilitated by the use of e-mail, file transfer and CSCW applications. Besides, only in this case can it be argued that ICT has „caused" the organisational form: the setting up of „telehouses" and „telecottages" aimed at using ICT to bring jobs to disadvantaged regions. Ironically, it was not very successful in establishing telework in the original sense, i.e. attracting work from metropolitan areas. Rather, the

„telecottages" try in the main to support local business and local communities with whatever service they might need. Part of is ICT related (production of Internet web-sites).

Although ICT does not determine company organisation, daily work routines are to a large extent formed by technology. A large part of office work is carried out using information systems and PC „tools"; without access to the system little can actually be done. In a hotel (case 2) this was mentioned as a problem by the receptionists because they couldn't carry out the check-out during down-times of the system; when large groups of customers arrive they cannot speed up the checking by deploying additional staff because there are only VDUs for two receptionists. In the administration of case 1, the restaurant chain, reports and documents are filed in the information system by making use of the opportunities provided by the software for internal e-mail. As a result „heaps of paper can be saved, and everybody just goes for the information he or she needs". While the filing system was designed according to the departmental structure, thereby adapted to the existing organisation, the organisation of the immediate work process changed considerably through the intensive use of ICT.

The most important aspects of ICT impact on the work process are changes in *communication* through the use of e-mail and, partly related to this, the speeding up of business processes. Interestingly, e-mail is not first and foremost used for communication with distant co-workers; it is used to the same extent, and in some cases even primarily, in the co-operation of employees working under the same roof. For instance, in the restaurant chain company (case 1) e-mail has been used extensively in the central administration, which is located in one building only, for some five years whereas the communication with the various restaurants and cafés spread over the country is still based on fax and telephone. The data needed in the personnel department, such as hours worked, are sent in by fax and typed in by the clerks. In other cases e-mail is still little used in external communication because only few customers have it.

In internal communication e-mail is used for the fast dissemination of information concerning several or many people; it is used for short and urgent messages for which the telephone has the disadvantage of requiring co-presence; and it is used to replace notes on paper that are easily lost. All of our interlocutors stressed that e-mail is not replacing telephone communication; workers make use of the speed of electronic communication but also pick up the phone to discuss matters or to settle complex issues. There are also severe limitations on the use of e-mail, and electronic communication may cause problems such as information overflow, misunderstandings or irritation. In several case studies it was pointed out by our interlocutors that the efficient and problem-free use of e-mail cannot be taken for granted; learning is needed but apart from instruction on the technology no training was provided in any of the case studies.

By way of *conclusion* we can state that ICT is used to support organisational changes such as centralisation, decentralisation, outsourcing or relocation. ICT does shape the organisation of the work process. The most important aspects here are the dependence of workers on the information systems, the general acceleration of the pace of business processes and changes in communication practice.

If we apply the Brousseau and Rallet typology (see table below) for the cases studied in Lower Austria, the investigated sectors show a homogenous picture. According to the model, besides their different technological needs, the cases under investigation can be characterised by different organisational structures and co-ordination requirements. Most of the Austrian cases were centralised organisations with specialised operational units of work. Regardless whether call centres or production lines have to be co-ordinated, the intensity of ICT use can be said to depend on the detail to which the work process in supported by ICT applications. For instance, a fully automated production process can imply feedback on every accomplished task or feedback on fulfilled complete orders only.

The variable implementation of ICTs: Brousseau and Rallet model

		Centralisation *(and related vertical co-ordination logic)*	
		Centralised organisation	**Decentralised organisation**
Interdependence *(and related horizontal co-ordination logic)*	**Specialised operational units**	*Telematisation of horizontal and vertical co-ordination* *Intensive use of ICTs*	Computerisation of components Telecommunications systems to support mutual adjustments
	Integrated operational units	Computerisation of components Telematisation of vertical co-ordination	Low co-ordination needs and therefore low use of ICTs to support co-ordination

Source: Brousseau and Rallet (1998)

We expected to find extreme examples: for the production sector a high degree of centralisation with a high level of interdependence between the diverse units; for the service sector independent units of work with little need for co-ordination. However, it turned out that ICT facilitates the decentralisation of work, and thus, innovative forms of work and ICT use, but at the same time offers opportunities to enforce control and co-ordination of the resulting processes. The more outsourcing and decentralisation is achieved, the more important central monitoring and surveillance becomes. The ICT provider studied offers a typical example. Starting out from changes to call centre services, today comprehensive customer relationship services are handled by the call centre unit. Owing to the nature of integrated operational units, one might expect ICT use to be low (see table above). However, use of ICT has intensified, since the otherwise self-contained call centre units are integrated by a call routing system

making use, in case of need, of idle workplaces within the whole organisation. In all our findings do not really support the model put forward by Brousseau/Rallet /1998).

3. *Skill needs and training*

In relation to skills and training, the focus of the investigation was on the consequences of changes in organisation and technology for skills requirements. Changing tasks and work processes call for adaptations on part of personnel policies and on the part of the employees. It was one of the research hypotheses that, in contrast to the public debate ICT-related skills are not the primary issue for companies. Rather, management is more concerned about social skills because these are becoming more important but cannot be easily upgraded. Another research question referred to the ways of learning. In this respect, the investigation was led by the assumption that, as compared to classroom training, on-the-job training is becoming more important and, in particular, people rely on social networks of mutual support to cope with technological change. Another hypothesis was that there is a need to learn the efficient and conflict-free use of new communication media such as e-mail. Finally, it was assumed that there is little difference between younger and older workers in their capacity to cope with ICT.

In contrast to the reskilling thesis, unskilled workers dominate the production areas of the manufacturing companies investigated, and in one case are becoming even more important. The reason is that outsourcing of mechanical engineering, for instance, has increased the relative importance of assembly operations. In addition, the increasing production volumes due to concentration processes and the division of labour between companies makes standardisation of jobs easier. The situation is different in automated production areas: here there is a preference for the deployment of skilled workers who have both experience-based knowledge of the production process and programming skills acquired during vocation training. One of the case studies in the electronics industry (case study 3) showed that semi-skilled female workers are trained to replace skilled workers operating automated machines when needed, but management's preference is that the principle machine operators are skilled workers (who are male).

ICT has already penetrated work in administrative departments to a large extent. „Everything is on computer", therefore being skilled at using ICT is not seen as a big thing. Current technological or organisational change connected with ICT does not usually change the task structure fundamentally. The integration of tasks, for example in customer care as illustrated by case study 10, is facilitated by information systems that allow one employee to handle customer demands on different matters. As in the bank (case study 7) employees require a wider range of knowledge on services offered and of organisational processes. The generally increased time pressures and the enhanced importance of the encounter with customers make it necessary that employees do not only cope with the ICT systems but handle them very skilfully.

The introduction of new ICT systems is usually accompanied by (brief) training or instruction. To be able to use the systems effectively workers have to practice on their own (partly in their free time) and to get support from more experienced colleagues. In order to save on training

costs some of the companies under investigation send only one employee to a course and expect him or her to pass on the acquired knowledge to the others.

Minor changes such as the updating of software or the implementation of new features may cause difficulties. Case study 3, for example, illustrates the problem of timely information and training: workers are confronted with changed software before they receive a notice of change or the required training. This can cause stress at work given the high time pressure in most of the workplaces.

In selection of personnel the focus is often on social skills and personality: being able to deal with people, communicate well, and to fit in. In contrast, ICT-related skills seem to have less importance, and managers say that there is usually no great lack of knowledge as to how to use ICT. However, the case study showed that the knowledge of standard software, such as MS Office, widely used CAD or hotel reception systems, is taken for granted by personnel managers. Usually people do have the required knowledge and experience, so few problems are reported. In some cases it was argued that the knowledge of how to use the ICT applications in place can be trained relatively easily. Therefore lacking knowledge of particular ICT applications does not lead to otherwise promising job seekers being turned away. Of course it cannot be excluded that in individual cases the lack of knowledge of widely used standard software constitutes a major drawback in the competition for a particular job. But interlocutors argued that in general people do have a fair basic knowledge of ICT acquired either through school education, practical work experience or in training courses offered by the Labour Market Service.

It is noteworthy that according to the case study findings ICT skills may also include the ability to cope with the unofficial technological practice of the company. As described in case study 4, employees created spreadsheet applications in order to make their job easier because the information system did not provide all software „tools" needed to accomplish the tasks.

In some cases, salespersons need additional ICT knowledge. These employees in sales departments of manufacturing, logistics or financial services companies have to offer software to the customers for „business-to-business" ICT-applications. Although ICT specialists take over when it comes to detailed consultation and in particular implementation, the salespersons must have some technical knowledge of the systems concerned.

Because there is only little or brief official training for new ICT, learning by oneself, learning-by-doing and mutual support are very important in coping with technical change. Help is needed, sometimes urgently, when problems in the use of information systems or communication media occur. Usually there are unofficial specialists for ICT or for particular software among the users. Partly the support is one-sided, partly it is mutual. Official and unofficial „key users" or „user specialists" do play a very important role in most of the cases. Social and spatial proximity seem to be important prerequisites for effective support although the telephone is also used to get help. Only software developers seem to circulate queries via e-mail when they face a problem they cannot solve. This makes the mutual support less dependent on location and co-presence.

Some of the people who did not learn to handle ICT during their education and training can rely on their children. It was quite often stated by our interlocutors that those with children in

an appropriate age can cope better with ICT changes because they get private lessons at home. In other respects age did not have a major influence. Only few examples of elderly workers not being able to cope were reported, although differences in the way of learning are evident.

The rapid pace of technological change is experienced most sharply by those developing ICT and, in particular, software, and by ICT service providers (especially case 5 and case 6). It became obvious that classroom training is needed; not everything can be learned on-the-job. Therefore, the geographical location does have consequences for the accessibility of training courses.

Skill needs do not only relate to ICT or professional knowledge and experience. The diffusion of electronic communication means an increase in written instead of spoken communication. This makes it more important to be able express oneself in writing and to use correct spelling. Only in one case were people's massive writing, but also reading problems mentioned as a major problem. Still it is noteworthy that not only illiteracy, which again is an increasingly acknowledged problem in Europe, but the predominance of written communication may in itself cause problems for workers.

4.   Consequences for Employment

In terms of employment, the case studies show little immediate rationalisation effects in the sense that particular jobs disappear because of ICT. One reason is that the companies hardly employed any data-input typists; other clerical workers carried out the entry even of large amounts of data. However it became obvious in nearly all cases that ICT does increase productivity considerably. To give just a few examples: In a manufacturing company (case 4) volumes and turnover have increased enormously. As compared to the early eighties the volume of production is eight times higher but the number of personnel has only doubled. Of course outsourcing of production has played a role, but it is very indicative that only the number of blue-collar workers has increased whereas the number of office workers has remained stable. Orders, which have risen to 45,000 per year, are handled by only four people. The fictitious saving on personnel is therefore considerable. Further rationalisation is expected when orders are no longer sent by fax but entered directly into the information system by customers.

Interestingly, call centres, which have only recently emerged as a result of cost-saving attempts , are also subject to rationalisation. First, the technology applied in call centres allows for high levels of productivity. Second, the number of inbound calls are reduced by offering customers Internet-applications for the entry of orders. In the case of the logistics company (case study 9) the number of calls is already going down as a result of data input by customers and of the customers trailing their consignments themselves by way of a www-application. Also in this case increased volumes are handled by a reduced workforce.

Outsourcing and relocation work which is made easier through ICT also impacts directly on employment. The case of an electronics company (case study 8) is very illustrative in this respect: large parts of production is located in the Czech Republic while other functions

including some production are kept in Lower Austria. It could be argued at first sight that jobs have moved abroad. However, management maintained that only the competitive advantage stemming from the utilisation of low wage costs in the Czech Republic has allowed for the rapid expansion of production. As a consequence the relocation can be said to have saved and created jobs not only abroad but also in Lower Austria. It has to be noted however that the reduction of production activities in Lower Austria reduced the number of jobs for semi-skilled female blue-collar workers while the new jobs on the site are for skilled, mainly male engineers.

Many of the companies under investigation showed a high level of employment security. Partly this was a result of deliberate management strategies of internal labour markets, partly it was a consequence of the status of workers in previously state-owned companies. Taken together, seven of the ten case study companies have a policy of offering high employment security (case studies 1, 3, 4, 5, 6, 7, 10). In the telecommunications company (case study 10), the high level of employment security can be seen as the reason for the establishment of a distributed call centre. In this respect, the ICT potential was only used because the company was forced to offer jobs in various locations. Among our cases studies, this is probably the most direct relation between technology utilisation and the avoidance of social exclusion. It is noteworthy that the cause was not the technology but the contractual or political constraints on management.

Casual labour is not very widespread in the core sectors of the Lower Austrian economy. In our cases we were able to find an increase in atypical forms of employment. However, this is not necessarily a sign of casualisation, nor are the workers always used as „flexible labour". As can be illustrated with case study 4, a metalworking company, agency workers are taken on when the business expands but management is uncertain about the long-term need for personnel. Because of the policy of employment security they are careful not to expand the core workforce. Rather than the aim of casualisation, it was the strict employment security policy that has led to the increase in temporary workers. After the expansion proved to be sustainable the workers were taken over in ordinary, permanent employment relationships. Exactly the same story could be found in case study 3, one of the electronics companies.

The telecommunication company (case study 10) showed a high level of agency workers in the call centre: 20% of the call centre agents are temps. The reason is that top management of the company had issued an overall „recruitment stop" when the call centre business expanded. Local management therefore had to take recourse to agency labour for staffing a whole new call centre. As can be seen from the strategy to retrain workers who had become redundant in other parts of the company (including construction units) as call centre agents, the use of temporary labour cannot be seen as going hand in hand with ICT-based jobs.

Though skill needs are rising, a general reskilling (or upskilling) of jobs is not the real problem for unskilled people. We found that in those cases where the tasks can be fulfilled by unskilled labour and where management prefers unskilled labour, access to jobs is still not open to everybody: In case study 4, for instance, only people with a formal vocational qualification in any (unrelated) occupation are taken on for jobs in assembly that are classified as unskilled. In case 9, a logistics company, appearance and behaviour are important criteria in the selection

of drivers because of customer contact. Because of the conservative and „serious" corporate identity, men are not allowed to have long hair, beards or have visible tattoos.

What factors can lead to social exclusion? In none of the case studies did our interlocutors report the incidence of people not being able to cope with new ICT. There is considerable strain associated with changing technologies, and there is a lack of timely and profound training and instructions. However it is certainly not a widespread phenomenon that people lose employment because they cannot cope with the pace of organisational and technological development. Rationalisation effects and selection strategies seem to be more important in this respect. Even in a software company studied (case study 5), the rapid technological change did not hamper re-employment after parental leave. But this has to be seen as rather exceptional because there are long-term service contracts with large customers, which slows down the pace of technological development. After a recent takeover, changes in the business strategy that will reduce these niches have been initiated. (High) formal qualifications are very important in the selection of personnel not necessarily because enhanced skills are needed in the job but because companies use it as a signal for the ability to learn and of trustworthiness. These new forms of credentialism together with discrimination against women seem to be much more important barriers to employment for the unemployed than ICT-related skill needs.