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Ageing Workers in Finland and in the European Union: Their Situation and the Promotion of their Working Ability, Employability and Employment

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1. Introduction

The ageing of the workforce presents serious challenges for ensuring and promoting the employment of people over 45 years of age. The baby-boom generation is approaching early retirement age. The factors keeping ageing workers in working life are a lot weaker than those accelerating their premature retirement. The general view is, however, rather fragmented because the interests in solving the ageing problem of the individual, the enterprise and society are not yet uniform. Talking and action seriously conflict when such factors as reorganization measures and lay-offs are targeted, not to mention how few people over 50 years of age have found work lately.

The rather grim situation in which economic issues and human values contradict each other is well worth considerable improvement. The need for active measures is based on the simple fact that the number of older people in the workforce is increasing while the number of young workers will decrease at least until the year 2025. Reorganization appears not to be able to correct or regulate the age structure of the workforce. Since it does not seem that work will decrease or end during the next 20 to 30 years, workers will be needed. A remote country with a small workforce, where work is primarily done in Finnish, is much more vulnerable to a continuous imbalance in age structure than many other E.U. Member States. When the lack of a workforce emerges, a quick remedy cannot be imported from abroad. Therefore, all domestic age groups are required in order to sustain working life in Finland.

The measures and solutions are targeted at the individual worker, the enterprise and society. All three of these parties are needed because they form a network in which the effects between workers, enterprises and society also affect each other. If one party is alienated or does not participate wholeheartedly, positive results are unattainable. Enterprises and work organizations make up the most critical party because the goal is to employ ageing people. The task of society is to create good requisites for the employment of ageing workers. The workers, as individuals, must also take responsibility. The greatest obstacle to the realization of these measures on the enterprise level is both prejudiced and practical in nature. A negative attitude towards age often acts as a hindrance, and the lack of time practically prevents commitment to improvements. Lack of information and expertise also slows down improvements. Examples prove, however, that such problems can be solved.

In this article I wish to give a synthesis of the current knowledge based in particular on the numerous studies led by the Finnish Institute of Occupational Health which, with several

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other international studies, are summarized in a book, *Ageing Workers in the European Union,* which I prepared in 1999. The article is in two parts: section 2 covers the situation of ageing workers, and section 3 the promotion of working ability, employability and employment of ageing workers.

2. The situation of ageing workers

Age structure

As the working-age population gets older, the age structure of the different economic sectors will also age. The "rejuvenation" of enterprises will be a challenge because the younger age groups will be clearly smaller than the older ones.

According to prognoses, the workforce of the European Union will be at its oldest in 2015. Significant changes will start to surface between 2005 and 2015 as the European Union moves into a period with the oldest workforce in its history.

The two largest age groups will meet in enterprises and other work organizations: 50- to 59-year-olds and 20- to 29-year-olds in 2005, and 55- to 64-year-olds and 20- to 39-year-olds in 2015. Businesses will have their largest personnel resources invested in the old and the young. The co-operation of people of different ages will become a competitive factor in the European Union and its enterprises.

A large section of the workforce will be over 50 years of age in Finland, and in the other Nordic countries as well, in 2005. The situation will continue in Finland. Its workers over 50 will proportionally be the largest working age group in the European Union, together with the workforces of the same age in Germany and Belgium, and the situation will not ease until the year 2015.

Because of the large number of workers over 50 years of age in working life, more unified policies are necessary for the workforce and for retirement management also. The policies must take into consideration the needs and possibilities of older workers.

There will be a "shortage" of young people in many countries, for example, in Germany and Italy. The situation in Finland will improve slightly by 2015. The differences between young and old age groups will grow, however, until 2015, and until then the European Union will age. The difference between the sizes of the age groups (15 percentage points) will also prevail in Finland until 2025. Therefore the shortage of workers will probably be a continuing problem, and the labour market for young people will continue to heat up. Ageing people will still be needed, however, if recruitment from outside the European Union does not notably increase once more.

The continuing imbalance of the age structure of the labour force is a European phenomenon, and it will continue at least until 2015–2025. Working life in Europe will need rules and regulations that can utilize and ensure the co-operation and contribution of different age groups.

Dependency ratios

Sweden will have the heaviest dependency ratio (ratio of 0- to 14- and over-65-year age groups to total workforce) in 1995, 2005 and 2015.

If the dependency ratio is calculated in a manner that corresponds better with the current situation (ratio of 0- to 19- and over-60-year age groups to total workforce), Finland and Sweden together will share the heaviest burden in 2015. At this point there will be nearly as

many dependents (95 per cent) as working-age people. The large older-age groups will turn Finland's dependency burden into the heaviest in Europe by 2015 at the latest.

If a dependent is defined as someone under 20 years of age and over 60 years of age, there will be one worker per dependent in 2025. In other words, the work contribution of one person should cover the costs of maintaining one dependent. Whichever age criterion is chosen to define the dependency ratio, the productivity of work will have to grow strongly if current living standards are to be maintained.

The number of workers per retiree (retirement ratio; over 65 years of age) will also change radically in most of the E.U. countries. One of the greatest changes in the retirement ratio in the European Union will take place in Finland and The Netherlands in 1990–2030.

Participation of ageing workers in working life

Between 1975 and 1991 the employment rate of ageing men decreased (over 16 percentage units) the most rapidly in the U.K., France, Finland and The Netherlands.

The employment rate of Finnish men in the 55- to 59-year age group was approximately 60 per cent in 1997, and the corresponding figure for the 60- to 64-year age group was approximately 22 per cent. The figures were among the lowest in the E.U. countries.

The employment rate of Finnish women aged 55–59 was approximately 58 per cent in 1997, and it was the third highest in the European Union after those of Swedish and Danish women. The high employment rate of women and the low employment rate of men in Finland cause the overall figure to be rather close to the EUR 15 average of the oldest age groups.

The proportion of part-time workers in the European Union equaled approximately one-fifth of the full-time workers in 1997. In The Netherlands the ratio of part-time workers to all workers is the highest (61 per cent).

Of all part-time workers in the European Union 20 per cent are men and 80 per cent are women. Of all the female part-time workers 16 per cent are women in the 50- to 64-year age range, and the corresponding proportion of male part-time workers in the same age range is 4 per cent. Finnish women aged 50–64 clearly work fewer part-time hours than the E.U. average, and Finnish men of the same age work slightly more. In all member countries part-time work is the most common among workers aged 25–49 and second most common among workers aged 50–64.

The reasons for working part-time differ in the European Union in general and, for example, in Finland. The most common reason in the E.U. countries is that people do not want to work full-time (58.5 per cent). In Finland the most common reason is, instead, that there is no part-time work available (37.6 per cent). Another important reason in Finland is the importance of training and education. Declining health and working ability is not a significant reason for working part-time in either the European Union or Finland.

The largest employer of workers over 50 in the European Union is the service sector (approximately two-thirds), the second largest is industry (approximately one-fourth) and the third largest is commerce. The proportion of ageing workers is significant both in commerce and in the farming and forest industries. The largest employer also in Finland is the service sector. Within the service sector the healthcare occupations are the largest employers of ageing workers (17.5 per cent).

Premature departure of ageing workers from working life

Retirement of workers under 45 and between 45 and 54 years of age decreased between 1975 and 1995. The situation of 55- to 59-year-olds has remained the same but the number of retirees over 60 years of age has increased continually (1970 = 45 per cent, 1995 = 82 per cent). More working age men have retired than women, but the differences have decreased recently.

The number of actual work disability pensions has slightly decreased in the 55–59 age group in Finland, individual early retirement pensions have become notably fewer, but the number of unemployed has increased significantly in the 1990s. At the end of 1997, 27.5 per cent of the 55- to 59-year-olds were retired, and 21.1 per cent were unemployed.

Unemployment pensions provide a more important means of departure from Finnish working life than individual early-retirement pensions among the 60- to 64-year age group. Because over 80 per cent of over 60s have already taken early retirement, the general 65-year age limit for old-age retirement has, for practical purposes, lost its meaning.

Musculo-skeletal diseases, mental disorders and other sicknesses were equally important reasons for work disability within the private sector in Finland in 1997. Actual work-disability pensions and individual early-retirement pensions have clearly decreased lately.

Finnish people are considered to be keener to retire than people in other Nordic countries. The 55- to 59-year and 60- to 64-year age groups of retirees are 7 to 9 and 22 to 45 percentage points larger, respectively, in Finland than in the other Nordic countries. For example, partial work-disability pensions are less common in Finland than elsewhere – Finns both work and retire full-time. It would also be appropriate in Finland to create an environment in which partial contributions are equally valued in working life and are thought of as part of modern working life.

Working ability of ageing workers

According to current research, working ability is the sum of individual and work-related factors. The different factors of working ability change dynamically with age. This approach emphasizes the importance of the working environment, work content and the work community in addition to the resources of the individual workers as factors comprising working ability.

Working ability is the foundation for employability and employment. Employability can be improved with different support and service systems, work and retirement legislation and changes in values and attitudes. The object is the higher employment of ageing workers, which can be measured by, for example, the employment rate.

Prevalence of illnesses and health

According to the prognosis, 1.4 million Finns aged 30 to 64 (60 per cent of the workforce) will have at least one diagnosed long-term disease in 2000. The increase in musculo-skeletal diseases is predicted to be the largest among both genders.

According to follow-up studies, every other man and women will suffer from a diagnosed musculo-skeletal disease during the last 15 years of his or her work career. Approximately one-fourth of the women and one-third of men will have a circulatory disease. The prevalence of multiple illnesses also increases with age during working life.

After retirement from working life the increase in the disease prevalence slows down or

stops, even though circulatory diseases occur to a higher degree among men than among women.

The significant increase in the prevalence of disease during the last 15 years of working life means that (i) the role of occupational health services will be emphasized as a service system that both prevents and, especially, treats diseases, and (ii) working methods and practices will have to change significantly to reduce the occupational disadvantages caused by illnesses and to prevent the aggravation of disease.

Occupational changes are necessary for at least one-third of over-55-year-olds to prevent their alienation from working life because of health-related reasons.

Perceived health of ageing people

Ageing is not only the gradual loss of health, it also means changing the basis for evaluating health. Young people evaluate their health mainly according to symptoms and older people according to the weakening of their functional capacity.

According to the Mini-Suomi study, approximately 30 per cent of 55- to 64-year-olds evaluated their health as fairly good or good in the 1980s. According to the work and health interview, as many as over half of the men and women in the age range 55 to 64 perceived their health to be fairly or very good in 1997. Health status was perceived as improving significantly in Finland during the past decade.

As many as 54 per cent of healthy people (no diagnosed diseases) perceive their health as having weakened at the age of 47 years. On the other hand, only 24 per cent of healthy 58-year-olds feel that their health has deteriorated. During the last 15 years of working life the criteria for evaluating health change significantly – the fact that no illnesses appear becomes emphasized in the perception of good health.

Sick leave and ageing people

In the European Union workers over 45 have slightly fewer short sick leaves (1 to 2 days per year) and slightly more longer ones (3 to 11 days per year) than those under 45.

Men over 45 years of age in Austria take twice as much sick leave (3 to 11 days per year) as the E.U. average. The respective figures for Finnish and German men are clearly greater than the E.U. average. However, the figures for the other Nordic countries are the lowest in the European Union. In Austria men over 45 clearly take more sick leave than younger men do.

Women over 45 years of age in Austria and Germany also take the most sick leave (3 to 11 days per year); the figures for Finnish women are worse than the E.U. average. Women over 45 take more sick leave in nearly all E.U. countries than younger women do. The greatest difference occurs in Greece and Italy.

Effect of chronic diseases on work

Approximately every fifth worker over 45 years of age feels that chronic diseases hinder work (slightly more women than men).

Austrian, Finnish and German men over 45 years of age are the most affected by chronic illnesses (30 per cent). Diseases affect work the least in Sweden and Denmark (10 per cent). The situation is worse in all countries for older men, especially in Finland.

Austrian, Greek, German, Portuguese and French women over 45 years of age are the most hindered by disease in relation to work. The situation of Finnish women is approximately

the equivalent of the E.U. average. Except for Sweden the situation is worse for women over 45 than for younger women in all E.U. Member States, especially in Greece.

The occupational drawbacks created by chronic illnesses should be reduced by integrating the worker's health status into work tasks and working methods in a more appropriate way. The roles of both occupational healthcare and occupational safety will also be emphasized as it becomes increasingly important to be familiar with the tasks of a worker and the conditions in which he or she works so that weakened health status and work can be integrated.

Life expectancy

Life expectancy grew between 1970 and 1997 from 69.8 years to 77.1 years in Finland. The importance of the quality of these additional years of life, has, however, been emphasized lately. For example, WHO (the World Health Organization) maintains that the increase in healthy and functional years of life was the most important goal of health policies in the last century.

The growth of life expectancy in Finland has been directed towards retirement age instead of towards active working years. The expectancy of years in retirement grew from 13.5 to 20.7 years between 1970 and 1997, and the expectancy for active working years has remained approximately the same, at 56 years. In other words, over seven additional years of life have been transferred entirely to retirement age instead of being extended into working life. This result has provoked discussion on whether retirement age should be more directly bound to life expectancy.

Physical functional capacity of ageing people

The number of functionally capable Finns (without physical, mental or social limitations) decreases after the age of 45 years. Approximately 70 per cent of people under 45 years of age have no functional disabilities, whereas the corresponding figures for 50-year-olds and 60-year-olds, are approximately 60 per cent and 40 per cent, respectively.

Cardio-respiratory capacity decreases between 20 and 60 years of age by approximately 30 per cent. Individual differences are, however, great, and they depend on the amount of aerobic physical exercise.

Physical work requires ageing workers to be physically fit. Only one-fourth of women over 55 years of age have adequate cardio-respiratory capacity in relation to the demands of physical work. Heavy work does not maintain cardio-vascular capacity.

In safety occupations (for example, firefighting and rescue work) the heaviest tasks should be replaced with lighter ones with age. The cardio-respiratory fitness of nearly half of firefighters over 50 years of age is fair or poor, which is a risk to a firefighter's own and his or her colleagues' safety in demanding field work.

Cardio-respiratory capacity weakens significantly between 52 and 62 years of age among both men and women, even though individual differences are great, as are the differences between muscle groups. For example, the maximum isometric strength decreased by 40 to 50 per cent among men during a period of over ten years.

The weakening of the musculo-skeletal system takes place in both physical and mental work. Therefore modern physical work does not contain loading factors that would strengthen the musculo-skeletal system. For example, the dynamic condition and endurance of the stomach muscles and upper limbs of female cleaners over 45 years of age are often in poor condition.

Finland is the most physically active country in the European Union in all age groups among both genders. Among men over 55 years of age, 42 per cent are physically active in Finland, 29 per cent in Sweden and 23 per cent in Germany, whereas the least active men are found in Italy (5 per cent) and Spain (9 per cent). The physically most active women over 55 years of age live in Finland (43 per cent), Sweden (30 per cent) and Ireland (20 per cent), and the least active ones are from Greece and Luxembourg (3 to 5 per cent). Physical activeness decreases notably with age among both men and women also in the active countries.

Mental functional capacity of ageing people

The most significant changes in mental functional capacity from the point of view of working life are related to the slowing of perceptive functions and speed. These changes can well be compensated for, however, by ergonomic arrangements in the work environment, a better organization of work and personal aids.

Many characteristics of mental functional capacity can be strengthened with age. These opportunities of "mental development" are related, for example, to many cognitive functions and also to learning motivation, work commitment and life control.

The distinctive signs of wisdom also strengthen with age. For example, the ability to perceive, understand and evaluate the essential in different problems and the ability to give good advice and devise working solutions for these problems are increased. Wisdom serves problem-solving, and it should be a quality of increasing value in today's complicated working life.

According to research there is no clear connection between age and work performance. Older workers have proved to be as productive and professional as younger ones in several studies.

Apparently the coping mechanisms that develop with experience ensure that work performance does not weaken with age. The more creative use of work experience can significantly improve ageing workers' ability to cope in working life. Every worker should be allowed to use methods of adaptation and compensation creatively to ensure and promote his or her ability to cope.

Social functional capacity of ageing people

Social functional capacity can improve with age because a person learns to know his or her own limitations and possibilities with age and is able to change his or her behaviour accordingly. Ageing people are able to adjust their behaviour according to that of others better than younger people can. Moreover, ageing does not reduce skills based on the tolerance of others, self-knowledge and knowledge of human nature. Ageing people abandon models of behaviour that have proved to fail and choose better methods for action on the basis of their experience.

Ageing also provides an opportunity to develop one's interactive skills. The social ability to convert, for example, one's "own will" to "our will" can improve with age. Active social interaction also includes problems of integration between differently thinking, knowing, feeling, believing and acting individuals. Therefore social activity and its success is also always defined by others.

The socially active role of the individual changes towards the end of his or her career. According to a Finnish follow-up study, different trends can be seen in the way men and women in the different age groups between 51 and 62 years are active in, for example, clubs

and associations. The activities increased among women (from 18 per cent to 24 per cent), whereas they decreased among men (from 21 per cent to 17 per cent) in 11 years.

Education of ageing people

The educational background of ageing workers is significantly lower than that of younger workers. Primary school is the background for 56 per cent of the workers aged 55–64. In Finland the differences between the educational levels of younger and older age groups are among the biggest in the OECD countries.

The educational level of Finns aged 45–64 is somewhat similar to that of the OECD countries in general. The lowest educational level can be found in Portugal, Spain and Greece, where 70 per cent of the population has an educational level of vocational schooling or lower.

According to the OECD prediction of an increase in education, Austria, Germany, Great Britain, Finland, Sweden and The Netherlands, among others, will have a high educational level in 2015.

Participation of people of working age in training arranged by the employer has increased in all age groups; however, it decreases in all age groups with age.

Participation in training arranged by the employer differs only slightly between the under-45s and over-45s in the European Union. Older men and women participate slightly less in training lasting more than five days a year than younger workers do.

There are notable differences, however, between E.U. countries in how workers participate in training that promotes working ability. In Finland, Denmark, Great Britain and Sweden more than 20 per cent of men over 45 had participated in personnel training (over five days per year) by the end of 1995, whereas the corresponding figure was only 5 per cent, for example, in Portugal and Greece. In contrast to the other E.U. Member States, the training of older men is not less common than that of younger men in Finland and Sweden.

Women over 45 years of age also receive the most training in the Nordic countries and the least training in the Mediterranean countries. Training is more common among older women than among younger women in the Nordic countries, whereas the situation is reversed in other E.U. countries. The results of the participation of men and women over 45 in the Nordic countries are positive.

In Finland 31 per cent of the over-55-year-olds participate in personnel training, whereas the respective figure for 30- to 44-year-olds is 54 per cent. The need for training is the most acute between the ages of 30 and 44 years, after which it declines. Every fifth person over 60 maintains that he or she needs additional training. The need for training does not, therefore, disappear with age.

The process of lifelong learning and education have not been realized as yet in all age groups, and ageing workers have been the last group to become a part of this process. Current policies and principles do not provide enough encouragement and support to the participation of ageing workers in adult education, for there is a large number of passive people within the age groups. Training is generally designed for young people with a good basic education. Methods to support the learning of ageing people and the evaluation of the attitudes of trainers in adult education are needed.

The training of ageing workers is also very much dependent on the attitudes of the employer and management. All age groups have growing needs for training to cope better with work. Ageing workers could act as "instructors" for younger workers more than they do today. It is also possible to transform experience into knowledge and know-how.

Age discrimination

Directly experienced age discrimination seems to be rare in the European Union. Of men over 45 years of age, 3.3 per cent perceive discrimination and for women the corresponding figure is 3.6 per cent. The percentages are slightly higher for older workers. There are, however, notable differences between the E.U. countries. The most age discrimination is reported by older men in France (9.4 per cent) and Austria (8.7 per cent) and by women in Austria (10.8 per cent). The proportion for Finnish workers over 45 years of age is 2.2 per cent for men and 4.4 per cent for women. These figures do not, however, reliably portray indirect age discrimination in working life.

Physical work environment

According to exposure to vibration, noise, heat, cold and impurities in ambient air, it seems that physical work conditions do not change with age in the European Union. Any differences that have been detected indicate a reduction in exposure among older workers in comparison with younger workers, but the differences are regrettably small.

Accidents at work leading to sick leave of three days or more occur more seldom among older men than among younger men, but accidents that lead to death are more common among older men in the European Union.

Physical load is systematically less common among older workers than younger workers in Denmark, The Netherlands and Sweden. In Finland, France, Germany and Italy physical load is less common among older workers, but clearly not systematically so. In Greece physically burdening work is notably more common among older workers than among younger workers.

In general, the favourable changes in physical load with age have been more notable for men. The clearest difference between genders occurs in relation to poor work postures. Physical load has eased the most in relation to the handling of heavy loads.

Mental work demands

Mental load (use of computers, work with tight schedules, complex tasks and learning new things) seems to be lighter for older workers than for younger workers in the European Union. The differences are similar in trend and magnitude among the genders, except for complex tasks, which are more common among older men than among younger men and less common for older women than for younger women.

The differences between age groups are greatest in relation to the use of computers and learning new things. This trend is not necessarily positive from the point of view of ageing.

Work in the Nordic countries is, however, demanding for ageing workers in respect to learning at work. Finnish men and women over 45 years of age are not included in the top group of the European Union with respect to work content except for their view that their work includes learning new things. From a positive point of view, therefore, a majority of people may find themselves learning new things at work despite their ageing.

Possibilities for ageing workers to influence their own work

Most workers over 45 years of age (70 per cent) are able to influence how they take breaks and decide on order of work, methods and speed. They have fewer possibilities to take breaks than other workers, however.

The possibilities of workers over 45 years of age were good in general in the European Union at the beginning of 1996. In the future, attention must be directed towards the one-third of ageing workers that has insufficient influence over their jobs. Better integration of work and ageing should be the right of every worker.

Demands for skill at work

Job demands correspond with the skills of 80 per cent of workers, and the situation is better for older workers than for younger workers in the European Union. The demands are more often too high than too low in relation to the skills of workers over 45, but this type of imbalance is relatively rare.

The skill–demand relationship is better among workers over 45 years of age than among younger workers in most E.U. countries, except for men in Austria and women in both Greece and the U.K.

Skills correspond with job demands best among older workers, and the favourable trend between age groups is a positive factor for the European Union. These results indicate that most workers are either able to modify their job demands according to their skills and/or their skills have developed to meet the demands. In other words, opportunities to develop, and also development, have occurred. It is possible, of course, that management may see this issue in a different light. It may also be that personnel training has had a significant role in improving the skill–demand relationship in many countries.

Working hours and ageing

In this report favourable working hours in relation to ageing have been determined according to the following criteria: (i) working hours should decrease rather than increase with age; (ii) the number of night shifts should be as small as possible or decrease with age; and (iii) irregular day work, for instance at weekends, should decrease with age.

Generally speaking, long working hours are more common among older men, and irregular work hours are more common among older women in nearly all the E.U. countries. Heavy shift work (5–31 days per month) seems to be rarer among older men than among younger men in most of the E.U. Member States. Heavy shift work was not common enough among women in the examined data that a comparison could be made – a positive result as such for older women. There is, however, much to be done in E.U. countries to make the flexibility of work hours more favorable for ageing workers.

Perceived working ability of ageing workers

The working ability index developed by the Finnish Institute of Occupational Health has been used to determine the perceived working ability of ageing workers in both broad longitudinal studies of ageing workers (e.g. in the municipal sector) and in cross-sectional studies of different occupations in Finland and other countries. Working ability can be classified as “poor”, “moderate”, “good” and “excellent”. The rating of “poor” (7–27

points) strongly predicts work disability retirement and "excellent" (44–49 points) predicts continued participation in working life.

According to the longitudinal study of the municipal sector the averages of the working ability index decrease notably between 51 and 62 years of age among both men and women regardless of the nature of their work (physical, mental, or combined physical and mental). Workers in mentally demanding jobs have higher working ability indices in general than workers in physically demanding jobs.

In the study of municipal employees the working ability index showed a 29 per cent decrease and a 10 per cent increase in the working ability of employees who continued to work in the same place for 11 years. It did not change among almost 60 per cent of the workers despite ageing. Decreases and increases in working ability did not depend on the nature of the work or the gender of the workers.

Again in the longitudinal study, "poor" working ability increased with age similarly for both men and women, except in a few cases. It did not change notably between 47 and 51 years of age, but it then increased many times between 52 and 58 years of age. The increase was the greatest among physical workers in general. The work ability index was "poor" for over 25 per cent of the municipal workers after the age of 58 years in such occupations as supervision (kitchen), unskilled labour and domestic work among the women and in such work as fitting, unskilled labour and transportation among the men. A large proportion of male teachers over 58 years of age also had "poor" working ability (23 per cent).

The examples of different occupations reveal differences in the proportions of "good" and "poor" working ability among different aged workers. Two-thirds of construction workers aged 50–54 report at least "good" work ability and approximately half continue to do so in the 55- to 59-year age range. Between the ages of 55 and 59 years only 14 per cent of construction workers have "poor" work ability, whereas the respective figure for municipal workers is almost twice as high. A four-year follow-up has indicated, however, that working ability weakens significantly with age. Nearly two-thirds of the workers reported "moderate" or " poor" working ability after the follow-up. Cross-sectional studies may, therefore, assess working ability too optimistically.

The results of working ability studies have concretely proved that individual differences increase strongly with age within an occupational group. Individual changes are emphasized after the age of 55 years, and, at this age, the working ability of people with the same occupations and of the same age can vary from "poor" to "excellent" in physical, mental, and combined physical and mental work. The findings underline the need for individual solutions to work with age, as well as the possibilities to restore, promote and maintain working ability.

The working ability index has thus far been translated into 12 languages, and it has been successfully applied in very different cultures. It enables international studies of the working ability of ageing workers to take place, for instance, in the E.U. countries.

3. Promotion of working ability, employability and employment of ageing workers

Ageing and the work-orientation matrix

A matrix constructed to depict the relationships between ageing and working life describes problems, solutions and goals from the perspective of the individual worker, the enterprise (or organization) and society (Figure 1). The nine fields of the matrix can be read vertically, horizontally and diagonally.

The vertical level is divided according to the worker, the enterprise and society to stress

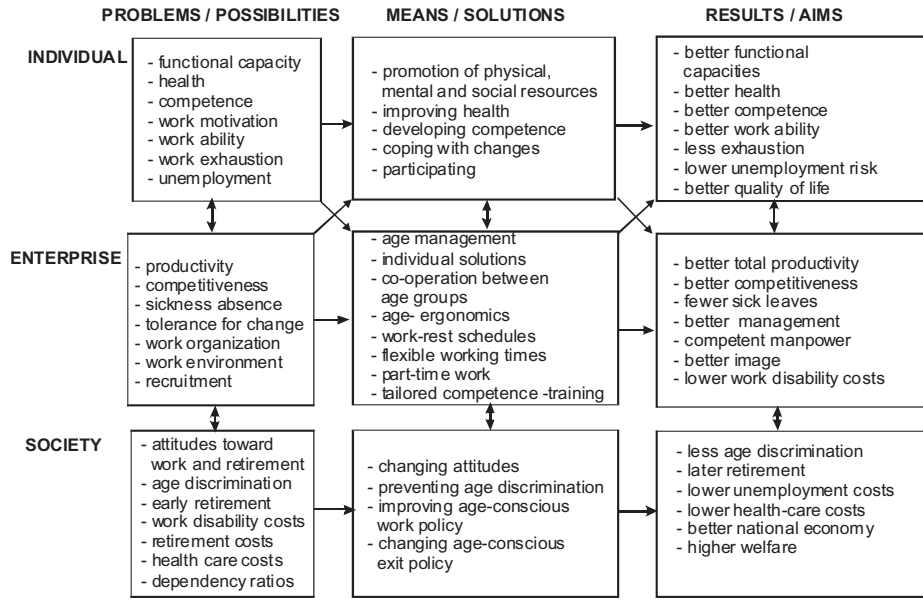

Figure 1: Orientation matrix – aging and work

the fact that the responsibility of keeping ageing workers in working life can be shared by these groups and therefore the measures needed to solve the problems can be better planned and more focused. On the horizontal level the dimensions of recognizing problems, choosing solutions and setting goals depict the fact that solutions can be found and objectives can be brought into focus from the point of view of the individual, the enterprise or society. The horizontal level of the matrix emphasizes action. The diagonal arrows between the worker and enterprise dimensions depict the strong connection between the two. Companies would not, indeed, exist without their workers.

The key words of the matrix have been chosen on the basis of data from several Finnish and foreign studies and from practical experience aimed at projects concerning ageing workers. The words are not arranged according to their significance, and they must be prioritized before any processes are initiated. The words are also mentioned only in one field even though they can be linked to others as well. The differences interact. The better the goals of the individual and the enterprise are met, the better society's objectives and results succeed (depicted in the lower right-hand corner of the matrix). The company is the most important, however, because it is responsible for the realization of the individual's participation in work. The necessary actions for an enterprise are also of a long-lasting and demanding nature, and they often require broad commitment from the company, the employees and supporting organizations.

The main message of the matrix is that, despite its complexity, the situation as a whole can be controlled, and the change in age structure can become a workable entity both in Finnish society and in the European Union (E.U.). Different countries already have data and experience on how the fields of the matrix can be made to function.

From basic problems to structural solutions

The basic problem in interweaving ageing and work is that human resources and work requirements develop in different directions. Changes in human resources are individual and can vary, for example, in relation to the different types of functional capacity (physical, psychological, social), in different directions in different phases of life. Physical functional capacity is the most age-dependent of these factors. The core of the problem, however, is not the weakening of physical capacity with age because it is a natural biological fact. Instead, it is that job demands do not follow the natural biological changes of the human body. They are negotiable issues and regrettably do not fall into the sphere of physiological regularity. Many work requirements change in a negative direction as the workers become older, and only a few become more positive. Even if some demands are altered in a positive direction, the changes are very limited. The primary conclusion is that work does not change even though workers do, for example, as a result of the ageing process.

The *basic problem* can be illustrated by the ratio between the physical capacity of the individual worker and work requirements in a physically demanding job (Figure 2, top). Decreasing physical capacity and the fact that job demands do not change eventually result in a situation in which energy reserves decrease until they only barely meet the daily demands at work. The decrease in resources means that the same work burdens the ageing worker more than before, and his or her chances to recover from the strain decrease significantly. The increased overload and the reduction in chances to recover first lead to physical pain and symptoms and, if prolonged, to absence, sickness, a decrease in working ability and often inability to work. The intersection between human capacity and work requirements is individual, but it appears often to occur between the ages of 51 and 58 years in physically demanding jobs. The situation deteriorates faster for ageing women than for ageing men (Figure 2, top).

The *solution to the basic problem* lies both in decreasing the physical demands of work and in strengthening individual physical capacity. The need for decreasing physical work demands is about 20 per cent between the ages of 40 and 60 years. The demand varies depending on the nature of the work. If a job burdens both the cardio-respiratory and musculoskeletal systems, the work load needs to be reduced more considerably. If the strain is more local in nature, it is more important to reduce the burden on the strained muscle group than to reduce the general strain level. Physical strain can also be reduced by decreasing its duration. Physical capacity is reduced by approximately 20 per cent between the ages of 40 and 60 years; this amount of reduction can be considered natural. If a person's physical capacity decreases more severely, it needs to be strengthened through physical activity. The goal is thus not to use physical activity to prevent physical capacity from decreasing in order to maintain the current workload. Instead, it is to prevent physical capacity from decreasing too much and especially to prevent the decrease from beginning too early (Figure 2, bottom). These two measures can be used to prevent the deterioration of physical capacity among ageing workers towards the end of their working life. With these measures, the reserve between physical capacity and work can also be maintained at relatively the same level until the end of working life.

If physical strain cannot be reduced, another alternative is to include tasks that are not physically demanding in the job descriptions of ageing workers.

The main problem in psychologically demanding occupations is not the premature reduction of psychological capacity with ageing, but more likely the increasing number of psychological demands and their increased level of difficulty. Changes in psychological

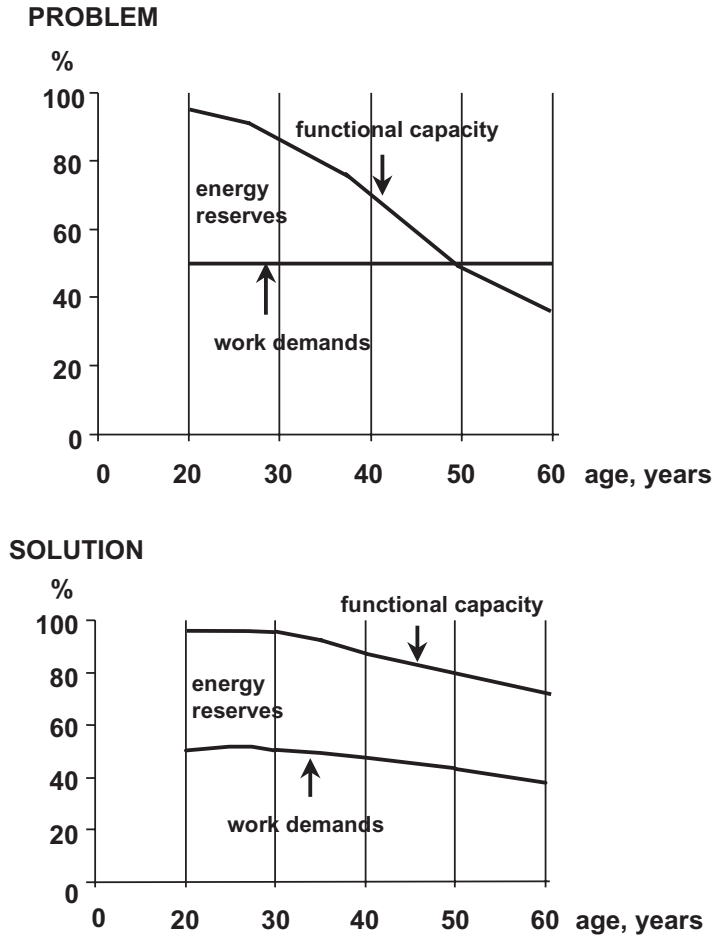

Figure 2: Physical work capacity and work demands during ageing

capacity with ageing can first be seen as a decrease in perceptive functions and psychomotor speed. If an occupation demands swiftness and accuracy, it may, with ageing, lead to increased strain and lack of stamina at work. The basic solution is similar to that described for physical tasks. Occupations that demand swiftness and accuracy in perception and also speed in the use of data should be reduced with age. The situation is better with psychological capacity than with physical capacity in that many cognitive skills are strengthened at an older age. Replacing psycho-motor work demands, for example, with tasks demanding cognitive problem-solving skills would mean a better integration of work demands and human qualifications with ageing.

The solution of the basic problems thus requires two actions: (i) adjusting the work load; and (ii) strengthening individual capacity. Both are required because changes that would alter only work load or individual capacity enough to maintain the balance between demands and

capacity until old age are very rare. The changes brought about in human capabilities by aging are relatively well known. However, future changes in work load are much more difficult to estimate. Ageing employees feel that both physical and psychological demands become much greater with ageing (Huuhtanen *et al.*, 1997). This feeling may arise from an actual increase in work load or from the fact that the same work has become more difficult because of decreased functional capacity.

Basic model for actions maintaining the working ability of ageing workers

Basic models for actions to maintain working ability have developed significantly during the last few years. Due to the knowledge and experience that have been gained, such measures can nowadays be better targeted, and thus their efficiency has improved. The concept of such measures has also become more accurate, and it has been expanded. These measures can, in practice, *restore, maintain or promote working ability depending on the current working ability status and the needs of the target group.*

The basic model for measures to promote and maintain the working ability of ageing workers is built on the integration of four different lines of action. Two of these lines concentrate on work and the other two on the individual (Figure 3). Actions targeted towards work concentrate on the contents of work and also on the physical work environment and the work community. The actions targeted towards the individual, on the other hand, concentrate on strengthening the health status and functional resources of the worker and developing professional expertise and abilities. The possibilities for action are also illustrated in the basic model. Correctly targeted and dimensioned measures that have been integrated improve the working ability of ageing workers and therefore lead to improved work quality, increased productivity, and also on improved quality of life and well-being. Some studies also indicated that the long-term effects carry through to the "third age" that the worker enters as he or she retires (Ilmarinen and Louhevaara, 1999).

Reduction of working time

Among the many factors as targets for working-ability actions, the reduction of working time is of key importance. There are several possibilities for reducing working hours and increasing their flexibility. The need for a reduction in working hours is, however, rather individual and depends on how much the work load can be reduced or redirected with other measures according to the capacities of ageing workers. Flexibility in working hours can be studied both from the employer's and the employee's point of view (Knauth, 1996, Figure 4). Whereas distance work (tele-working) represents the ultimate in flexibility from the employee's point of view, it is rather rigid for the employer. On the other hand, a group of employees who prefer flexible working hours (pool of flexible workers) and are not working but are ready to come to work, if necessary, represents the ultimate in flexibility for the employer. Autonomous working-hours groups in their turn represent the ultimate in flexibility both for the employer and the employee. In such a group employees can decide their working hours rather freely. The functionality of autonomous working-hours groups requires special properties for the group and the work, but, if it is possible, this kind of action should be experimented with. It could be a solution worth considering for the needs of ageing workers.

Part-time working offers a good model for reducing working hours. In Finland, the employer has the obligation to organize work so that an employee can work part-time for

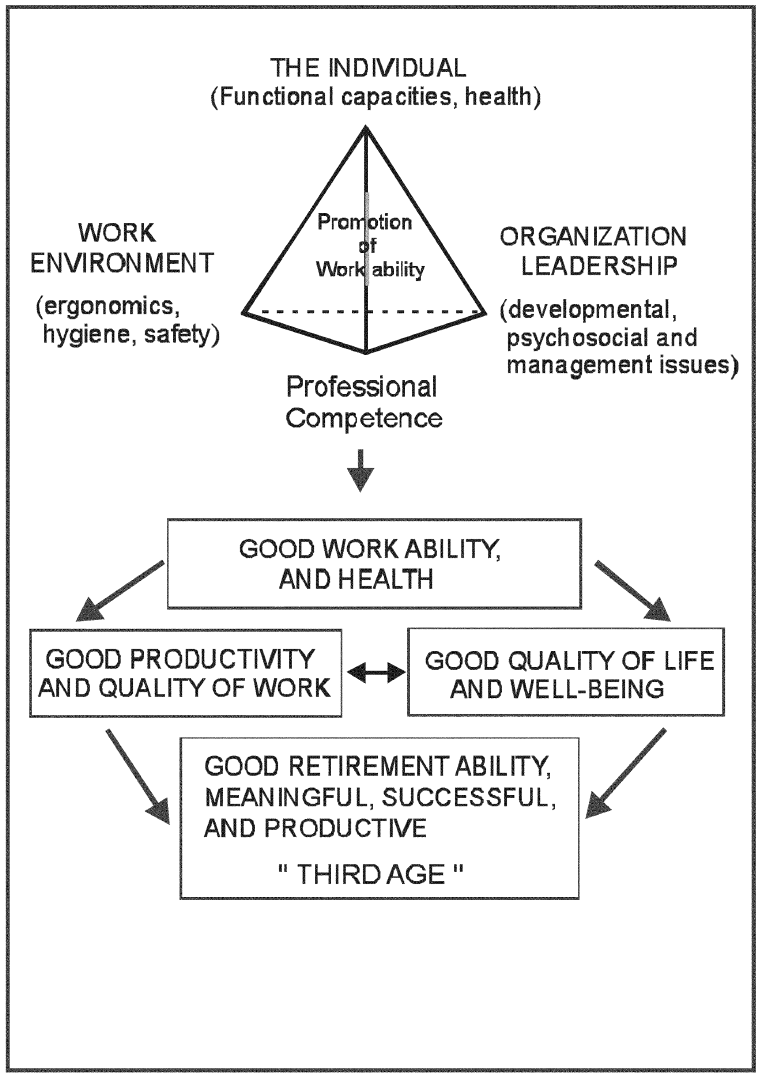

Figure 3

social or health reasons. The reduction in working hours can be carried out on a daily or weekly basis.

4. Conclusion

In the book *Työ matkalla vuoteen 2005* ("Work Approaching the Year 2005 – Views of Finnish Working Life"), Jorma Rantanen describes the three waves of age structures

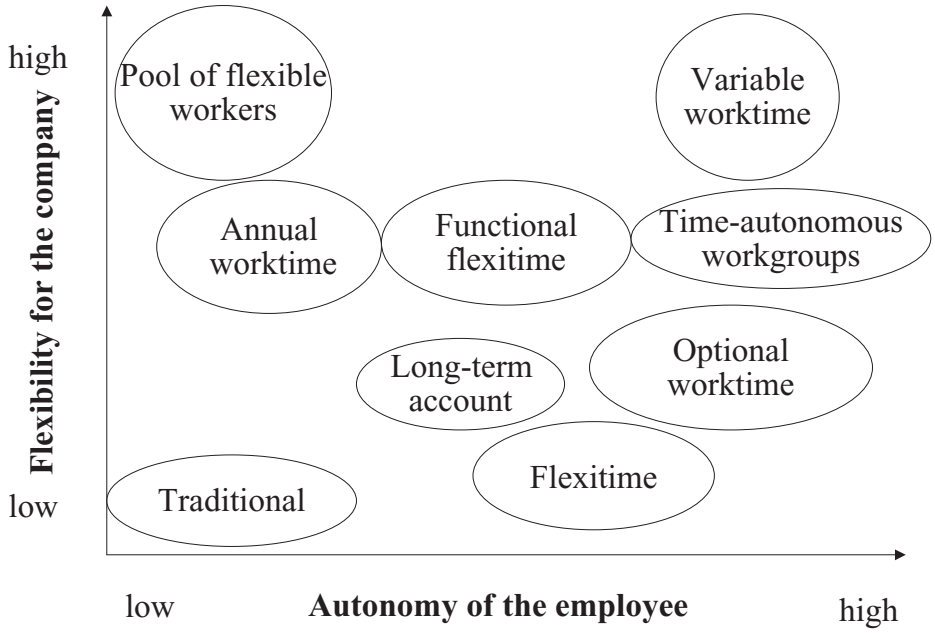

Figure 4: Flexible work schedules (Knauth, 1996)

(Figure 5) (Rantanen, 1999). In the *first wave* (ageing society), which is currently underway, the age structure is still relatively healthy. Ageing workers are relatively strongly represented, and they work with a somewhat insufficient education in "ageing" occupations. In the *second wave* (aged society) during 2000–2005, the baby-boom generation begins to age and its members become older workers (55–60 years of age) who continue in their old occupations. They begin to experience more and more age-related problems, such as diseases that reduce their working ability, and work requirements change. Ageing workers represent, however, the experience pool of working life. The change from one generation to the next becomes stronger, but there is a shortage of young workers.

The *third wave* (pensioned society) occurs in 2005–2010. The baby-boom generation retires. The main responsibility for working life begins to shift to the age groups between 35 and 45 years of age; this group received its education in 1970–1985. The oldest members of this group may also be insufficiently educated, and investments must be made in their working ability and qualifications. However, they are already a rather stressed group in working life with little time for in-depth education. The "technology gets younger – the workforce older" syndrome continues and causes constant problems. Therefore labour market practices and work cultures should be developed to support ageing workers, and re-education and measures maintaining working ability will also be topical during the first decades of the new millennium (Rantanen, 1999).

The *World Atlas of Ageing* (WHO, 1998) describes the global nature of ageing. The ageing of the earth's population is one of the greatest challenges of the 21st century. The birth rate of the world is anticipated to drop from 3.7 to 2.3 births per woman between 1977 and

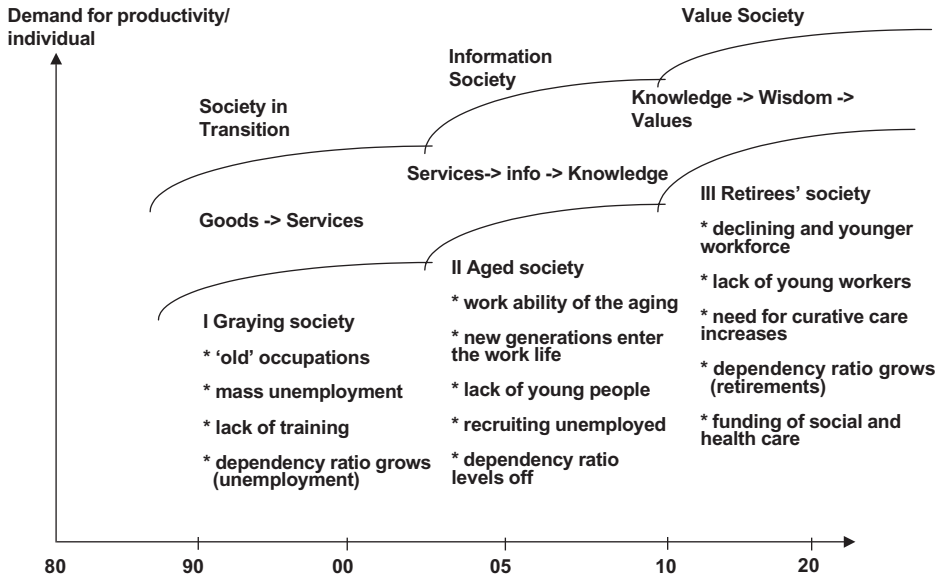

Figure 5: Three aging waves of the workforce

2025. Respectively the life expectancy of the earth's population is expected to grow from 59.5 years (1970–1975) to approximately 72.4 years (2025). The differences between developed and developing countries are naturally considerable, but, according to predictions, the differences are going to decrease. The reduction in the number of people under 15 years of age and the increase in the number of people over 65 years of age will have unprecedented economic and social effects all around the world. This numerical transition between the generations will affect economic growth, savings, investments, working life, pension systems, healthcare services and long-term treatments, family structures, living conditions, the socio-economic position of the elderly, productivity, and the quality of life. Previously, the ageing of the population was considered primarily a problem for the developed countries, but it will soon affect less-developed countries too, especially in Asia and Latin America. The problem for the less-developed countries is not so much the actual size of the older population as the speed of the change. These countries have less time to prepare themselves than the developed countries had. And even the developed countries, despite their forewarning, are facing problems, for example, with the costs of social and healthcare.

The ageing of the workforce has to be politically put into perspective with the ageing of the entire population. In most countries, national well-being will be produced also in the future by work. Dramatic changes in the dependency ratio mean that the well-being of the entire population is the responsibility of fewer and fewer workers. On the national level, the contribution of all age groups is needed and increasing pressures are targeted towards the productivity of the age groups. Therefore ageing workers also hold a key position, because of both their number and their quality. The great challenge of the 21st century is the historic ageing of both the population and its workforce.

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