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STUDY ON THE IMPACT OF NEW TECHNOLOGY ON THE EMPLOYMENT OF PERSONS WITH DISABILITIES IN THE NETHERLANDS (FIRST PHASE)

for the International Labour Organization, coordinated by Rehabilitation International

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CONTENTS

1. INTRODUCTION

The purpose of this paper is to present the first results of the Dutch part of the study on the impact of new technology on the employment of persons with disabilities. Together with the results of five other industrialized countries these results will be the basic material for the overall report of the first phase of the international study on the impacts of new technology on the employment of persons with disabilities.

The overall purpose of the international study is to uncover approaches which are currently being taken in rehabilitation training, placement and accomodation, which will be effective in readying disabled people for employment in the high technology environment. Rationale for the study is the rapid change in employment and quality of work through technological innovation, which could have a significant impact on vocational perspectives of people with disabilities.

The first phase of the study was started in order to uncover leads for research methods on this subject, possible trends in employment and ideas for improving employment chances for people with disabilities. For this pilot study each participating country was asked to collect some background literature on the subject and study a few cases of succesfull integration of a disabled person in a large company. The literature study gives insight in employment trends and vocational opportunities for disabled in the collaborating countries. The case study provides a complete picture of the position of a few disabled workers, which will be an illustration of vocational perspectives for disabled persons.

For the Dutch part of the pilot study some research reports on the impact on automation on the labour market, together with data concerning disabled people and reports on policy towards

them were collected. Furthermore, four cases in two large companies, were studied.

On the basis of this pilot study no general conclusion can be drawn about the impact of new technology for disabled people in The Netherlands, nor recommendations can be made about possible ways of improving vocational perspectives in high technology environments. The literature study showed that no empirical data were available about the impact of automation on the employment for disabled. Furthermore, there is no question that from a study of only four cases these kind of conclusions or recommendations can be made.

The study was succesfull though, in giving an indication of possible trends in employment perspectives for the disabled. The literature study resulted in the impression that the employment perspectives of only a minor selected group of people with disabilities seems to improve by the rapid diffusion of automation in The Netherlands. The four cases seem to be illustrative for this trend. Further empirical research on these trends for specific groups of people with diabilities in a priori selected branches of the labour market appears to be of great importance.

In this paper the Dutch study will be reported. In the following chapter the methods used in the study will be described, followed by the results of the study. After discussing these results, conclusions will be drawn and some recommendations will be made.

2. METHODS

2.1 Definitions

In the present study the broad area of 'jobs in high technology environment' is limited to jobs in companies which produce new technological products, or jobs in companies which use new technological means of production. The process of introduction and further innovation of new technological production is here called 'automation'.
'Disability' is defined as 'the restriction in the persons functional capacity which results from an actual injury, disease or other disorder which produces a chronic reduction in physical or mental function' (WHO, 1980). From this definition it appears that the study concerns people with different sorts of disabilities; e.g. people with amputation as well people suffering from chronic psychological instability are included.

2.2 Literature review

Review reports concerning three issues were collected for this study: research results on the impact of automation on employment and quality of work in The Netherlands; data reports and reports on policy concerning people with disabilities in The Netherlands and research results on the impact of new technology on the employment of the disabled.
Research reports about automation and the labour market, were for a large part reviews, in which empirical results of several surveys, conducted in several companies in The Netherlands, were compiled and interpreted.
The data and policies concerning people with disabilities were

for a major part derived from annual reports of the Joint Medical Service (Gemeenschappelijke Medische Dienst), which has a very important role in rehabilitation in The Netherlands. (The exact role of this institute will be described in the chapter 'results' of this report).
Furthermore, additional literature research was done to find empirical data about the consequences of automation for disabled people in The Netherlands.

2.3 Case study

In the case study, cases were included of four persons with different sorts of disabilities, working in lower graded jobs, in two large companies in The Netherlands. The two companies were included because they were large companies, connected with the collaborating researchers and because they agreed to participate in the study. The selection of the four cases was done by a contact person within the two companies, who also arranged the interviews. These two contact persons were asked to select disabled employees within the company who were, at the time of the study, working in the company. Preference was given to persons with different kinds of disabilities, with a job of a lower education grade (no vocational training or some vocational training demanded).
The following four subjects are studied concerning each of the four selected persons:

- the nature of the job and the organization of the company
- workers' profile
- evaluation of the employment
- vocational integration process.

These four subjects are believed to be the four main aspects which represent the overall employment position of the disabled.

The information about these subjects is gathered by interviewing the disabled, his direct manager and his medical or social supervisor. In one company, the supervisor appeared to be a member of the central medical service and in the other company a social worker of a division of the company. Furthermore, in each company a member of the personnel department of the division concerned was interviewed.

The interviews consisted of selected questions about the four subjects. In the following scheme the subjects most attended to in the various interviews are pointed out:

Scheme 1 subjects and persons interviewed

interviewer/ subjects	disabled worker	direct manager	social/medical supervisor
nature of job		x	
workers' profile	x		
evaluation employment	x	x	x
vocational integration process			x

The member of the personnel department was interviewed about the organization of the company and the company policy towards disabled.

The questions of the interviews were formulated partly open ended, partly closed and were asked face to face. For the open ended questions the interviewees were encouraged to give detailed answers. For the closed questions the interviewees were asked to chose the best answer out of a prepared number of possibilities.

3. RESULTS

3.1 Background literature

3.1.1 Automation and work in The Netherlands

In empirical reports on the social impact of automation on the labour market, trends of changes through automation in employment, organization of companies, work content and skills required are concluded. These trends will be described briefly in this paragraph*.
The employment for people with higher (intermediate and high level) education, especially for the technically trained appears to be stable. The number of higher level jobs doesn't tend to decline as a result of automation. The employment for people with lower education (primary school, with or without some lower grade vocational training) appears to decrease. In offices as well as in the printing industry the number of lower level jobs like typing and data input appears to decline as a result of the introduction of personal and integrated computers. In the factories a large number of simple production work, like assembly and manual operation of machines disappears as a result of the introduction of CNC-machines, industrial robots and process computers (stand alone or integrated groups).

Most companies tend to changes the organization from production oriented to market or client oriented. In production oriented organizations the production structure is adapted to the chea-

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*Pot 1985 and 1986, Huygen & Pot 1987, Vaas & Van Klaveren 1987, Brouwers & Pot 1987.

pest possible way of making large series of products. In a market or client oriented organization production must react rapidly on changing needs of the market, different quantities of various (versions of) products have to be supplied in short time. This policy calls for a flexible production process. This trend can be seen in offices, printing industry, manufacturing, and process industry.
One of the consequences is that the organization becomes flexible. As a result working hours of employees can become variable and their tasks can change rapidly. In many of these companies employees are being enlisted on a temporary basis and also temporary employees are being enlisted from employment agencies. In some companies work is transferred to other specialized companies or to home workers (tele work). These changes concern especially the employees with lower education.

The content of jobs changes considerably, in manufacturing, process industry, offices and in printing industry. The effect depends to a large extend on the organization strategy in companies. In the following the effects mostly shown in the report will be described successively for manufacturing, process industry and offices and printing industry.
In most manufacturing companies only programming and operation tasks remain. On the one hand these tasks can be separated in different jobs (polarisation). In this case operation jobs consist of standardised tasks, which soon can be done by routine; the programming jobs are highly qualified jobs, with complex tasks, demanding much mental effort. On the other hand the programming and operation tasks can be integrated in one job. In this case jobs consist of diverse tasks of diverse levels. From empirical research reports it appears that there is in companies a trend to polarise jobs.
In process industry many operations are being taken over by the

computer and controlling and programming tasks remain. These tasks can also be separated or integrated. In the reports, there was also found a trend of polarisation of jobs. The control jobs are jobs with mainly simple, but highly responsible tasks. The programming jobs consist mainly of very complex tasks.
In printing industry the remaining tasks are the input of data, coding or decoding data and controlling data, and making up, composing, editing and revising. Just like in the factories, these tasks can be separated or integrated after the introduction of automation. The offices as well as the printing industries concerned in the reports appear to separate the simple data-entry, typing, coding and decoding and controlling tasks from the complex making up, composing, editing and revising tasks. Here also a polarisation trend is concluded.

Automation has drastic effects on the skills required from the employee concerned. In all reports reviewed automation appeared to have impact on the level of the required qualification as well as the character of these qualifications. This was found in manufacturing, process industry, offices and printing industry. The exact effect appears to depend to a large extend on the way jobs are being composed (polarised or integrated). In surveys concerning companies with a polarisation trend, the level of skills required for the function of (lower graded) employee has declined. The level of skills required for other functions (higher graded) has risen. The character of required skills is for the lower graded mainly the ability to do some simple manual operations, which can be trained on this job. The skills required for the higher grade are mainly technical or planning, which require a specific education and regular retraining- or refreshing courses. Both levels of jobs require high flexibility of the employees to switch to new tasks and new worksites and (mainly for lower graded jobs) shifting working hours.

3.1.2 Employment of the disabled in The Netherlands

In The Netherlands the social security system appears to play an essential role in the statistics of disabled and the policy for employment of disabled. Therefore, in this paragraph this system concerning private companies will be described in short, before the presentation of the statistical data and policy.
Two social security acts, important for the disabled are:

- The General Disablement Benefits Act (AAW)
- The Incapacity Insurance Act (WAO).

Under the General Disablement Act the residents who are disabled and are as a result of the disablement no longer capable of earning a minimum wage, get a benefit (to approx. 80% of the minimum wage). Furthermore disabled residents can receive provisions to improve their working capacity (for example an adapted chair or aids). These benefits and provisions are financed by the General Disablement Fund, which contains premiums on income, which in case of wages of employees are paid by the employees. Under the Incapacity Insurance Act wage earners who get disabled and as a result are no longer able to earn their wages as before, receive supplemental benefit on the benefit under the general act (to approx. 70% of the last wage). Both benefits are supplementary on the income the disabled persons receive at present. The acts are to be carried out by occupational associations of companies (b.v.). Most of these associations are being advised by the Joint Medical Service (Gemeenschappelijke Medische Dienst), hereafter called GMD. The GMD gives advises about the amount of benefit the disabled are entitled to and the provisions needed. (Lately the GMD also intermediates between companies and disabled to find jobs for the disabled).

Data

The data available about disabled and to be presented here only

concern the disabled who receive a benefit under the two acts mentioned. Disabled who are earning the same wages as before their impairment are not included in the statistics. Also, disabled who, according to the GMD, could earn the same wages as without the impairment, but who are unemployed, are not included.

The total number of disabled persons according to GMD data is 725.991 in 1986. Tables 1 and 2 show the age and income percentage according to GMD data. It is evident that the vast majority of the disabled is past middle age and enjoys full income supply. The employment category at the time of disablement is shown in table 3; 83.9% was employee.

The main diagnosis of these individuals is given in table 4. The nature of the disability is musculoskeletal or psychological in about 50% of the cases, while circulatory and unidentified symptoms are responsible for 10.6 and successively 14.6 of the impairments. Unfortunately the level of education for the 1986 disabled population is not known. This information is only available for a sample of disabled persons from 1980 (table 5) (Aarts e.a., 1982). Clearly the majority of the disabled has a lower education level. In respect with this study it is interesting to see how many people get reintegrated in one year (table 6). Of the cases which were closed by the GMD in 1985 a little less than 50% did get a job.

Table 1 The disabled per age category according to the GMD statistics (1986)

age category	15-24	25-34	35-44	45-54	55-64
percentage (N=725.991)	3.5	10.8	18.2	27.1	40.4

Table 2 The disabled per category of the income percentage, supplied by the GMD, according to GMD statistics (1986)

income %	15-25	25-35	35-45	45-55	55-65	65-80	80-100
percentage (N=725.991)	2.4	3.6	2.4	4.3	1.7	2.1	83.5

Table 3 The disabled per employment category at the time of disablement according to the GMD statistics (1986)

employment category	employees	non employees	disabled from childhood	miscella-neous
percentage (N=725.991)	83.9	5.4	8.4	2.2

Table 4 The disabled per main diagnosis according to the GMD statistics (1986)

Diagnosis	Percentage (N=725.991)
I. Infection	0.8
II. Neoplasms	1.9
III. Metabolic	1.5
IV. Blood	0.1
V. Psychological	24.1
VI. Nervous system	5.4
VII. Circulatory	10.6
VIII. Resporatory	3.9
IX. Digestive	2.2
X. Urogenital	0.8
XI. Pregnancy	0.0
XII. Skin	0.7
XIII. Musculoskeletal	26.7
XIV. Congenital and XV. Perinatal	1.9
XVI. Symptoms	14.6
XVII. Accidents	4.7
Unknown	0.0
Total	100.0

Table 5 The disabled per level of education in a 1980 sample (n=1904)

level of education	percentage
primary school	39
lower vocational education	42
intermediate voc. education	5
higher voc. education	6
general higher education	7
university	3
Total 100	

Table 6 Employment of reintegration cases in 1985 according to GMD statistics (N=41.091)

employment	percentage of cases
no employment	54
employment with former employer	22
employment wirh new employer	10
independent employment	12
sheltered employment (WSW)	2
Total	100

Policy

The policy of the Dutch government is to stimulate the employment of disabled persons as much as possible. In 1947 this policy was formalized in the Act on the employment of physically and mentally disabled persons. This act applied to both public and private firms. Any firm with more than 20 employees had to employ at least one disabled person if its total staff did not exceed 50, and at least one more disabled person for each additional 50 employees. This Act provided for the publication of regulations to define certain categories of firms for which this proportion can be modified, and regulations to extend the obli-

gation to certain firms with less than 20 employees. Furthermore, under the General Disablement Act, the GMD got the task to stimulate the vocational integration of the disabled by providing provisions to improve their capacity to earn their wages (Juridisch Basisboek, 1982).

The employment act of 1947 failed to improve the employment of the disabled. The main two reasons for this failure was the absence of an empirically controllable definition of 'disabled' and the lack of certain penalties for firms breaking the Act.

In 1986 a new Act on the Employment of Disabled Workers (WAGW) was approved by the Dutch parliament. Two main reasons for introducing a new act were: the failure of the 1947 act and, more important, the rapid rise of the number of disabled who had to appeal to the General Disability Act for benefits. This rise can for a large part be explained by the high job demands of the decreasing number of remaining jobs. A lot of people with a disability cannot meet these demands. As a result they loose their jobs or stay unemployed.

The Act on the Employment of Disabled Workers of 1986 makes it mandatory for firms to stimulate equal employment opportunities for disabled and non-disabled workers and to improve the capacity of disabled workers to earn their wages, especially by adapting jobs. In this Act a 'disabled worker' is defined as a person with a benefit according to the General Disability Act, or a person who receives a provision according to this Act. There is a possibility to include in the definition also a special group of disabled. At present, this possibility isn't used. The Act applies for both private and public firms. At present, the Act contains only the mandate to stimulate; employers, labour union and employers unions are given the opportunity to fill in this mandate in mutual consultation. In 1989 the Dutch Ministry of Social Affairs and Employment will evaluate the action of the firms on behalf of the disabled. Firms that did too

little can be enforced to employ a certain number of disabled persons (a quotum). The exact amount will depend on the number of employees of the firms concerned, the kind of jobs available in the firms, and their financial situation.
At present in The Netherlands there is a discussion about two subjects concerning this Act: one is about the group of disabled persons which should be included in the definition and the second is about the quotum to be enforced. Employers seem to be against a quotum, because in their opinion the government gets too much influence on their personnel policy. Labour unions seem to be in favour of a quotum because it is a mandate which can be clearly empirically controlled.

From a study in ten large companies it appeared that the policy of most large companies is the formation of a social or medical team which has the task to stimulate the replacement of disabled employees of the firm (Hullenaar & Koningsveld, 1984). This team can consist of members of the personnel department, social workers, occupational health doctors and sometimes industrial psychologists. The team stimulates and advices about the fitting of jobs or possible adaptation for disabled employees. Only the line-manager has the authority to employ or reemploy persons; the medical or social team has no placement authority. The team notices job problems, relating to the impairment of workers by systematic periodic medical research, illness absence data or by signals of managers and employees themselves. The team studies the problems of the disabled employees. It decides, often together with the GMD, whether the employees concerned can return to their old job, have to be replaced in a new job or have to stop working.

In some companies disabled workers can be temporarily placed in a workshop, before returning to his (new) job. The purpose of

this temporary placement is to let the employee get used to working again and to assess his capacity. Sometimes a disabled worker gets a probation period in his (new) job (mostly a few months). This can also be the case after 'a workshop period'. Also in some companies jobs are being reserved for disabled. The possibility of placing disabled in this kind of jobs is only considered after placement in their own department appeared to be impossible (Hullenaar & Koningsveld, 1984).
Most large companies appear to have no intention to actively recruite disabled persons. Trying to keep disabled employees on their job or replacing them in their company is their main concern (IPSO FACTO, 1985).

3.1.3 Impact of new technology on the employment for persons with disabilities

In the additional search for research report in the impact of new technologies on employment for disabled persons no Dutch literature on this subject was found.

3.2 Case study

The following schemes show the main results of the case study. In the first scheme the data about the companies included are reported. The second scheme shows the results of the four persons concerned. In the first column of the schemes the subjects are mentioned. The next columns on the right contain the results of the interviews on these subjects per company or per disabled person.

Scheme 2 Data about the two large companies included

Firm	1	2
type of company	manufacturing industry	process- and manufactoring industry
products	- printers - electronic typewriter system - communication controllers - electronic keyboards - signal and power cables for computers	- various electric and electronic articles - research
size	- 5820 employee in The Netherlands in dec. '86	- approx 72.000 employees in the Netherlands in '87
company attitude towards disabled	- equal opportunities - stimulation of placement	- stimulation of replacement
company policy and framework towards disabled	- replacement stimulation by social team - workshop - contracted disabled priority on vacancies - temporary placement - income assurance, benefits in addition to GMD-benefits - disabled keep salary contract	- replacement stimulation by medical team - sometimes workshop - temporary placement - internal employment agency - income assurance, benefits in addition to GMD-benefits - disabled not able to work will be fired after three years of work incapicity
relationships	- good relationship with GMD - good relationship with employees representatives - little contact with unions	- good relationship with GMD - good relationship with employees representatives - little contact with unions about this subject

Scheme 3 Data about the four subjects included

Firm	1	
subjects	A	B
Technology		
process	- operation of computer terminals - services	- traditional tools: electronic keyboards, cables
products		- services
Nature of the job		
job type	- clerc, stock administrator tasks: - registration integration analysis accounting - lower grade administrative level - fulltime, fixed hours	- assembly worker - various assemblage tasks, depending of worksupply workshop and capacity worker - unskilled work, on the job instruction - halftime, fixed hours
wage	- salary rate, permanent contract - no difference with non-disabled - no wage benefit	- salary rate, permanent contract - similar to latest job before disability - no difference with non-disabled - wage benefit (45%)
Workers profile		
disability type	- 1980: pseudo-orthrosis os naviculare (r.): wrist impairment	- 1980: psychological decompensation, neurosis 1986: additional minor heartattack
age	41	53
sex	man	man

Scheme 3 (continued) data about the four subjects included

Firm	2	
subjects	C	D
Technology		
process	- traditional stationary, in future P.C.	- P.C.terminal, typewriter
product	- services	- services
Nature of the job		
job type	- secretary, assistant general service department tasks: - taking minutes of meetings coordinating and initiating services - intermediate allround level - fulltime, semi-flexible hours	- archivist tasks: - supervising, documentation, retrieving and sending of all kinds of documents - intermediate technical level - fulltime, semi-flexible hours
wage	- salary rate, permanent contract - less salary than non-disabled - wage benefit (10%)	- salary rate, permanent contract - no difference with non-disabled - wage benefit (?%)
Workers profile		
disability type	- 1973: 100% blindness	- 1982: lower leg amputation (r)
age	35	33
sex	man	man

Scheme 3 (continued) data about the four subjects included

Firm	1	
subjects	A	B
work history	started working at 17 years of age as an assembly worker, had two assembly jobs before disablement, in the same company	started working at 16 years of age as a sailor, then cook, waiter and fireman, at the age of 36 started assembly work at company
education	- primary school - lower grade vocational training - attending evening high school	- primary school - lower grade vocational training
vocational integration process		
retraining history	'83: ill at home because of wrist impairment '84: workshop to assess capacity '84: drop out of workshop because of knee injury, starting self-education '86: company retraining and education program in new jog	'80: ill at home becausese of neuroses and knee injury '82-'84: workshop to assess capacity '84-'85: replacement in former job '85: ill at home because of minor heart attack '86: half-time workshop
acquiring job	workshop assessment, company replacement	company replacement
aids adaptation accessibility features	none	adapting tasks and working hours
social or medical support	- GMD - personnel dept. - workshop supervisor - company occupational health dept.	- GMD - personnel dept. - workshop supervisor - company occupational health dept.
costs	not assessable	not assessable
time span	3 years	6 years

Scheme 3 (continued) data about the four subjects included

Firm	2	
subjects	C	D
work history	- started working at the age of 17 as fitter at the company until eye injury at age 21 (1973)	- at the age of 12 trainee (fitter) at the company calculator until injury at the age of 29 (1982)
education	- primary school - lower grade vocational training - rehabilitation	- primary school - intermediate vocational training - additional courses in Dutch, English, French, German, Swedish, typing, administration and documenting
vocational integration process		
retraining history	'73: injury '74: rehabilitation: braille, administrative training '77: secretary, job enrichment and additional training since	'82: injury '82: rehabilitation at company return to former job '85: replacement
acquiring job	company replacement	via company employment agency
aids, adaptations, accessibility features	- braille typewriter - braillomat - optacon - cane	- wheelchair - prothesis
social medical support	- social work dept. - personnel dept. - GMD	- social work dept. - personnel dept. - GMD
costs	considerable time investment	none
time span	4 years	3 years

Scheme 3 (continued) data about the four subjects included

Firm	1	
subjects	A	B
evaluation of employment		
worker	quality of work: - workload: satisfactory - perspectives: satisfactory - physical environment: satisfactory - social environment: satisfactory - organization: satisfactory - employment condition: satisfactory integration process: overall: satisfactory time span: too long	quality of work: - workload: unsatisfactory - perspectives: satisfactory - social environment: unsatisfactory - organization: satisfactory - employment condition: satisfactory integration process: until '85 satisfactory now: unsatisfactory because of negative attitude towards workshop
line manager	- skills required transferable to other jobs - output: more than average - motivation: average - illness rate: average	- skills required transferable to other jobs - output: average - motivation: average - illness rate: more than average
medical/social supervisor	no problems; case closed	problems; continuing social and medical support neccesary by: - personnel dept. - company occupational health dept.
employment prospects	positive	negative: - hard to retrain - limited number of fitting regular jobs in company

Scheme 3 (continued) data about the four subjects included

Firm	2	
subjects	C	D
evaluation of employment		
worker	quality of work - workload: satisfactory - perspectives: moderate, no promotion to be expected - physical environment: satisfactory - social environment: satisfactory - organization: satisfactory - employment conditions: satisfactory, except for low wage integration process: satistory	quality of work - mental workload: high - physical workload: satisfactory - perspectives: satisfactory - physical environment - satisfactory except for climate - social invironment: unsatisfactory - originisation: unsatisfactory - employment conditions satisfactory except for low wage integration process: unsatisfactory support; time span too long; placement: satisfactory
line manager	- skills required transferable to other jobs output less than average - motivation more than average - illness rate less than average	- skills required transferable to other jobs - output more than average - motivation more than average - illness rate less than average
medical/social supervisor	no problems, case closed	not yet known
employment prospects	unknown because of reorganisations within company	positive, probably getting a promotion soon.

4. DISCUSSION

From the literature study on the impact of automation on the employment and the quality of work in large companies in The Netherlands it appears that the rapid diffusion of automation seems to go with a trend of polarisation of jobs. In offices as well as in process- and production industry the number of higher graded jobs seems to be stable and the number of lower graded jobs seems to require a specified high education level and the capacity to keep up with new developments both in the profession as well as in the company. The lower graded jobs seem to require no special vocational education, but do require flexibility. In this setting flexibility means the ability to work with shifting working hours, to rapidly learn new simple tasks and to adjust quickly in new worksites. These trends are concluded in different research reports in various branches of the labour market.

The data available about disabled persons in The Netherlands do not appear to give a representative overview about the complete group of disabled in The Netherlands. The data about age-groups only include disabled persons who receive a benefit via the GMD. The number of disabled persons without a benefit is not known. In a survey in 1972 it was estimated that about half a million persons between 15 and 65 years of age were physically disabled in The Netherlands (CBS) (note: only physically disabled were included). By that year about 260.000 disabled persons received a benefit. (The survey hasn't been repeated). The data presented here give the impression though that most disabled are older than 40 years of age.
The data about the education level are found in a survey of which the sample appeared not to be representative of the disabled population. The data indicate however that the largest group of disabled have a lower education level.

The data concerning the type of disability also include only disabled persons with a benefit. Apart from this, these data do not appear to represent the full diagnosis of the disabled. From a report of the GMD it appears that most disabled have several impairments, often together with psychological problems (Besseling, 1986). The data give the impression however, that musculoskeletal disorders and psychological problems are the most evident type of disabilities. These disorders seem to point to wastage and stress symptoms.
The reintegration data present an even smaller group of disabled as the former data mentioned. These data give the impression though, that the number of persons with a disability reemployed in The Netherlands is rather small.

From the study on the policy of the Dutch Government and the policy of large firms it appears that there are positive intentions to improve the employment of disabled in large firms, but not (yet) clearly defined regulations. The new act on the employment of disabled workers can be the good beginning of an intensified stimulation of the employment of disabled people in large firms. The political discussion about the way to execute the act hasn't finished yet. The survey about the policy of ten large firms is not a representative survey. It seems to include only the firms with a rather positive attitude towards employing disabled. The survey indicates that most large companies are mainly concerned with replacing their disabled employees, rather than recruiting new disabled workers. The medical or social team, responsible for the replacement, appears to have little authority for the actual placement of employees. No reports were found about the effects of the replacement policy.

There does not appear to be any empirical research report about the impact of new technology on employment of persons with

disabilities in The Netherlands. However, by comparing results of the literature review on automation and the indication of characteristics of disabled, an expectation about a trend can be expressed.
The expectation is that the small group of higher educated, young people with a clearly determinable impairment seem to get better perspective through the rapid diffusion of automation and the development of new technological aids. There seem to be less barrier's for these people to get employed, because worksites can easily be adapted and the employment in these jobs is stable. For higher educated people with psychological problems the perspectives seem unclear, this seems to depend on the type of their problems.
For the large group of lower educated, older people with wastage or stress symptoms the employment perspectives seem to decrease. The employment for lower educated people appears to decline and so the competition for these jobs increases. The older people, with wastage or stress symptoms do not seem to meet the requirment of flexibility. Furthermore, for the disabled people of this group who need aids attached to the workplace, changing worksites can be a problem. It seems likely that this group will loose the competition.

The four cases studied do not appear to be representative for the disabled in The Netherlands. In the first place because the selection depended on the willingness of companies to cooperate. This could implicate that only companies with a positive attitude towards disabled are included. Secondly, only disabled persons who already had a labour contract before their disablement and were replaced are included. So disabled persons who were newly recruited are not studied. Furthermore, only 'success stories' of people who did get replaced are selected.
The three persons who are rather young, with a clearly determi-

ned impairment and an intermediate education level (or studying for it) seem to have well integrated jobs, with favourable employment perspectives. The aids needed do not appear to be attached to the workplace. It appears that in these three cases, during the reintegration period, vocational retraining as well as replacement contributed to a favourable employment.

The one person who is somewhat older, with stress and wastage symptoms and a lower education level has a sheltered workplace and unclear, probably unfavourable employment perspectives. Vocational training seems very hard and replacement in a regular job seems improbable.

Comparing the four cases studied with the data of the disabled population presented, it appears that three of the four cases seem to be part of the small group of young people, with a clearly determined impairment and a somewhat higher education level. Their employment position and perspectives seem to illustrate some positive employment possibilities for this group. One of the cases appears to be part of the large group of older people, with stress and wastage symptoms and lower education level. This employment position and perspectives seem to illustrate probably even a positive picture (considering the selection bias) of employment possibilities of this group.

5. CONCLUSIONS AND RECOMMENDATIONS

On the basis of this literature review and case study no conclusions can be drawn about the impact of new technology on the employment of persons with disabilities. There is however an indication that for a large group of disabled persons employment chances seem to decrease with the diffusion of automation. This large group consists of somewhat older people (older than fourty years of age), with stress and wastage symptoms and lower education level. Employment perspectives of this group seem to be unfavourable. There is also the indication that for a small group employment chances seem to increase with the diffusion of automation. This concerns rather young people (younger than thirty years of age), with a clearly determinable impairment and a higher (intermediate or high) education level. There seem to be good employment possibilities for this group. Through the development of new technological aids some barriers for employment of this group may disappear. The aids shouldn't be attached to the workplace though, because this would hinder the flexibility of the disabled.

Representative empirical research to the above mentioned possible trends is necessary. Empirical research on such a broad subject, concerning a very large heterogeneous group of people and the total labour market seems too general and hard to accomplish in a few years. Therefore, this research should be limited to specific groups of disabled and a part of the labour market. A priori choices are necessary about age groups, disability and education level of the disabled group to be included. Also should only a branche of the labour market or a profession group be included in such research. Furthermore a choice should be made about whether the research should concern recruiting or replacement.

Recommendations of the disabled in large companies to improve the employment of the disabled cannot be made on the basis of this study. There is however an indication that employment programs in large companies should contain a policy of searching for suitable jobs for disabled and possibilities to adapt jobs. Of similar importance seems to be that these programs contain possibility to retrain and even upgrade disabled. This can be done in special education programs outside or within the company or on the job training. These two elements: adaptation of jobs and training of disabled can establish a fitting employment position for persons with disabilities.

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