THE RELATIONSHIP BETWEEN FLEXIBILITY AND LABOUR PRODUCTIVITY IN THE SOUTH AFRICAN MOTOR MANUFACTURING INDUSTRY

BY

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SYNOPSIS

RELATIONSHIP BETWEEN FLEXIBILITY AND LABOUR PRODUCTIVITY IN THE SOUTH AFRICAN MOTOR MANUFACTURING INDUSTRY

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The purpose of this research is to determine whether a relationship between specific flexibility indicators and labour productivity exists in the South African motor manufacturing industry. The need for this research originated not only because of the very low labour productivity existing in South African industry but also

because a number of British and American companies have achieved excellent results through focusing on this relatively unknown and unresearched factor, flexibility. Flexibility is defined as expanding all jobs as much as possible and by developing the capabilities of all employees to the greatest extent compatible with efficiency and effectiveness.

The first section of the literature review focuses very briefly on the traditional methods of improving productivity, namely quality circles, worker participation and gainsharing. In the second section of the literature review a more in-depth look is taken at job design as a productivity improvement tool. The reason for this is that flexibility is very closely linked to job design yet has a nuance difference. This difference becomes obvious when in the last section of the review a number of case-studies relating to flexibility are presented. The main focus falls on three companies, namely British Leyland, Nissan Manufacturing (UK) and Pilkington Glass (UK). For comparative purposes flexibility is looked at from three different angles, namely, the situation in the company preceding flexibility, the actions taken to incorporate flexibility and the results these companies achieved through flexibility. A number of other case-studies are also presented but in less detail.

In order to best achieve the purpose of this research and due to the nature of the research subject a qualitative research methodology was used. Both the production and personnel directors of all seven motor manufacturing

companies in South Africa were interviewed and the trim and mechanical departments of each were visited. Miles and Huberman's (1984) technique of data analysis, namely the site-ordered descriptive matrix, was used to determine the relationship between flexibility and productivity in this industry.

The results of the study indicate that associations between a number of flexibility indicators and labour productivity exist. These include, amongst others, the number of tasks the operator can perform, the percentage of operators who are multi-skilled, whether operators are held responsible for the quality of their work and whether they participate in maintenance and problem-solving. Therefore to a certain extent a relationship between flexibility and labour productivity does exist.

CHAPTER 1

INTRODUCTION AND OBJECTIVE

Productivity has become the buzzword of our time. Most countries in the Western World acknowledge that they experience, to a greater or lesser extent, a productivity problem. Shaken and confused by the declining rate of productivity growth the world over, everyone, with a few exceptions such as Japan, West Germany and the United Kingdom, is searching for answers. People have, however, been seeking ways to increase productivity since the beginning of recorded history.

When primitive society divided work between the old and the young, this rudimentary division of labour resulted in specialisation and greater returns. When human effort was augmented or replaced by animal power, the result was less human work and more productivity. Technical advances from the wheel to computers either reduced the amount of human energy necessary, increased the amount of production or did both (Macarov, 1982, p 43).

1.1. South African versus international productivity

It is a well-known fact that the actual level of production per worker is much lower in South Africa than in countries such as Japan, France, Germany, the United Kingdom and the United States of America. Du

Plooy (1988, p 84) of the National Productivity Institute (NPI) reports that "since 1975 labour productivity in the South African manufacturing sector has increased at a lower level than that of its major trading countries". Despite this, remuneration per worker in South Africa increased at a much higher rate than in any of the above-mentioned countries. "Unit labour cost in the South African manufacturing sector was about 28% higher in 1986 than in 1975 ... In Japan the unit labour cost index in 1986 was lower than in 1975" (Du Plooy, 1988, p 85).

South Africa would struggle to become an industrial exporting country as long as wages increase at a greater rate than productivity improvement.

Furthermore, productivity growth is a major source of economic growth in many of South Africa's major trading competitors. As much as 60% of their economic growth is derived from productivity growth with the result that these countries are continuously becoming more competitive if compared to the South African economy where productivity growth plays a minor role in generating economic activity (Visser, 1987, p 619).

1.2. Productivity improvement

The improvement of productivity is of crucial importance for the economic wellbeing of any country. The rate at which productivity improves largely determines the extent to which various other important objectives are achieved, such as improvement of the standard of living, higher economic growth, creation

of employment, internal and external competitiveness and the curbing of inflation. Milton Friedman (1980, p 263) for example, wrote: "Nothing is more important for the long-run economic welfare of a country than improving productivity".

There have been clear signs over the last decade among employers worldwide to take control of the work place, to encourage rank-and-file employees to participate in decisions affecting their daily work, to communicate directly with each other, to encourage teamwork, and to train and support supervisors to fulfil their role (Wickens, 1987, pp 184-185; Klein, 1989, p 60).

This trend is not specific to the international community only, it reflects a trend which is gaining ground in South Africa too. Furthermore, South African employers are starting to realise that the general belief that labour is our main constraint, is not true. Also, they are starting to realise that some industrial relations problems could be dealt with by the law but that a sound employer-employee relationship is an internal organisational responsibility. It is up to management to take the initiative in fostering a new culture in their organisations and to create a management style and environment which will allow for productivity improvement (Horwitz, 1989, p 8).

As a result of this many productivity improvement programmes such as quality circles, worker participation, incentive schemes, and job redesign have now been implemented in South African

organisations - some with greater success than others - yet South Africa still lags way behind Western standards, not to mention Eastern standards (Hipper, 1989; p 55; Newall, 1989, pp 15-19).

1.3. Working practices and flexibility

Flexibility, a relatively unknown factor, has had remarkable impact on productivity in a few British and American manufacturing companies.

Pratten and Atkinson in their studies of British productivity in 1976 found that inflexible and labour restrictive practices were imposing a growing constraint on higher productivity. In another study of productivity levels in broadly comparable plants of multinational companies in the United Kingdom, Germany, France and North America, Pratten tried to assess the significance of labour factors. About a fifth of the inferior British productivity performance relative to North America could be attributed to strikes, major restrictive practices and other manning issues. Similar factors accounted for about a third of the differences between France and the United Kingdom and almost half of the Germany-United Kingdom difference (Batstone, 1984, p 143).

During the 1960's and 1970's over 4 000 productivity bargaining agreements were concluded in Britain. (Batstone, 1984, p 146; Ross, 1981, p 76). It was a means whereby workforces bargained away inflexible working in return for higher earnings. According to McKersie and Hunter (1973, p 1) they tackled the

problems posed by rigid demarcations between tightly defined jobs, unnecessary manning, outmoded payment systems and excessive overtime. MacInnes (1988, p 14) notes that these agreements were supposed to be a means whereby workforces bargained away restrictive practices or inflexible working in return for larger pay increases and was therefore supposed to emphasise the common rather than conflicting interests of employer and worker. However, as will be seen in Chapter 2, many of those agreements were fraught with problems and became known as "phony" agreements due to the underlying reason for their implementation.

In the changed economic environment of the 1980's, and with the discipline of high unemployment as well as the drop in output levels, it was to be expected that there would be a major drive by management to achieve new working arrangements and that these would achieve considerable success. A survey done by Batstone (1984, p 242) in 1983 confirmed these expectations. Of the 133 British manufacturing companies that were studied all but 14 percent said that 'major' changes in working practices had been introduced in the previous five years. There were two main types of changes:

(i) "The first is simply the need to reorganise work in the face of redundancies and new capital equipment; and

(ii) the second is attempts to improve the effective utilisation of labour time more generally, by increasing levels of effort and by greater flexibility" (Batstone, 1984).

A British Treasury article (1986, p 3) notes that the "recent work flexibility agreements often differ from earlier agreements in a key respect. They involve a general commitment to flexibility in whatever form it may prove to be necessary, rather than a commitment to remove specific rigidities named in the agreements". (The latter is still in vogue in many South African companies, for example, the 128 page agreement of May 1989 between the Chamber of Mines and the Federation of Mining Unions.)

Work flexibility, although perhaps a relatively unknown concept, is to a certain extent nothing other than management recognising its responsibility to manage work efficiently. Flanders (1969, p 373) in as early as 1969 said that "management's primary commitment is to efficiency. Its job is to organise the use of human and material resources to produce the best results with an economy of effort. Working practices which are grossly inefficient are a challenge to management that can only be ignored at the price of professional incompetence".

British companies such as Nissan Manufacturing (UK), British Leyland, Pilkington Glass, Continental Can, Toshiba and many others have taken up this challenge of eliminating restrictive work practices and increasing the flexibility of the workforce and workplace. The impact on productivity, quality, absenteeism, labour turnover, among others, have been remarkable.

For the sake of clarity, the term flexibility in this document encompasses various types of flexibility in the workplace, for example the flexible utilisation of employees, flexibility in duties, flexible working methods, flexibility in skills, and flexibility of time. However, for brevity's sake it will only be referred to as flexibility.

1.4. The purpose of this study

The above growing discussion about major changes in work organisation, working practices, and increased flexibility calls for an investigation into the extent of such changes, how these changes have been achieved and with what consequences. Flexibility on its own without for example worker participation or involvement, teamwork and respect for human dignity cannot be successful. Flexibility also has some limitations, yet they may not be insurmountable and with discussion and analysis a knowledge of them could be developed.

The purpose of this study is to determine the relationship between specific flexibility indicators and labour productivity in the South African motor manufacturing industry.

Semi-structured interviews are held with the total universal of seven motor manufacturing organisations. The relationship between the various flexibility indicators and labour productivity is determined with the aid of qualitative research methods. (See chapter 5, pp 84-106 for full discussion of this method.)

CHAPTER 2

IMPROVING PRODUCTIVITY : TRADITIONAL METHODS

2.1. Introduction

Many organisations have been leaders in realising financial opportunities from technological development and capital investment. Many of these companies however, have failed to maximise productivity by not taking full advantage of the abilities of their people (Prokopenko, 1987, p 10; Shetty, 1986, p 166; Akin and Hopelain, 1986, p 19).

The aim of this chapter is, first of all, to determine what it means to maximise or improve productivity, and what actually restrains it. This is followed by an analysis of productivity bargaining and the subsequent development of productivity improvement programmes.

The latter will not be dealt with in great detail but will serve the purpose of providing the context within which flexibility must be seen, so that it does not stand in isolation as the alpha and the omega for productivity improvement.

2.2. Productivity improvement

Basically, productivity improvement involves getting out more than was put in; in other words, producing more and better goods and services with the same inputs of labour, capital, materials and energy, or the same outputs with less inputs; hence making the ratio of outputs to inputs greater (Sutermeister, 1969, p 67; Werther, Ruch & McClure, 1986, p 12; Du Plooy, 1988, p 84).

According to Ross, Ross and Hatcher (1986, p 18) productivity improvement has, historically, focused on technology and capital to reduce the input of labour cost of production. Output was generally thought to be subject to improvement by getting more production through the application of industrial engineering techniques such as methods analysis and workflow. Although the above approach is still appropriate the movement today is toward better utilisation of the potential available through human resources. In fact, it is widely agreed among successful and profitable firms that the greatest potential for increasing productivity lies in the motivation and untapped abilities of the workforce. Even the economic experts concerned with productivity indicate that in the years ahead industry will benefit even more from investment in human capital than in plant and equipment (Shetty, 1986, p 167).

Productivity improvement in an enterprise is a function and a result of management efficiency,

synonymous with good management. Prokopenko (1987, p 12) stresses that it is a prime management objective and responsibility to increase productivity and maintain its growth. In fact, creating the conditions for higher performance is the essence of productivity management.

2.2.1 Measuring productivity improvement

According to Latham (1981, pp 2-3) increases in performance due to investment from capital or technology can be measured in traditional accounting terms (e.g. profits and costs, return on investment). The influence of an individual employee on productivity in most jobs is difficult to measure in traditional accounting terms. The influence of an organisation's human resources on productivity, however, can be measured in terms of what people do on the job. What people do can be measured directly in terms of observations by managers, peers and subordinates as to the frequency with which employees do those things that are critical to job success. What people do can also be appraised in terms of such traditional measures as attendance, accidents, turnover and grievances. What people do or do not do should be a source of concern to all organisations. Current ineffective employee practices are costing companies millions annually and should be changed.

What people do is an area that managers can influence, to their benefit and to the benefit of their subordinates. On the other hand cost increases in such items as equipment and energy are areas over which most organisations have little control (Latham, 1981, pp 2-3).

However, most organisations have not yet totally explored the development of effective human resource systems.

Worker or labour productivity usually refers to the per-person output. The published productivity figures are derived from gross production divided by the number of employees, hours worked and sometimes salaries paid. The assumption, according to Batstone (1984, p 257) can therefore also be made that the increased per-person productivity is linked to changes in human work patterns.

Worker productivity may be defined and measured in a number of indirect ways too, for example, absenteeism, turnover, tardiness, amount of work and quality of work (Compare Macarov, 1982, p 12; Kopelman, 1986, p 152).

The next section briefly considers what restrains productivity and labour productivity in particular.

2.3. Productivity restraints

Having seen South Africa's poor productivity record and the necessity and possibilities of improving productivity mentioned before, (see Chapter 1, pp 1-2) the question arises what the barriers or restraints to improving productivity are. Various researchers and specialists have suggested what they regard as the main restraints, some varying slightly from others. Lemmer (1985, pp 121-124), for example, proposed the following five major issues that tend to limit improved productivity:

(i) poor management leadership,

(ii) the barriers in the communication and motivation processes in larger organisations,

(iii) lack of productivity measurement,

(iv) the over-emphasis of physical resources and under-emphasis of how they affect labour, and

(v) the legislative limitations imposed by Government.

Furthermore, and of specific interest to this study, Lemmer (1985) includes the following inefficient work practices which also inhibit productivity:

- systematic overtime,
- inflexible job demarcation,
- artisans' assistants,
- limitations placed on supervisors by management and unions,
- customary work pace and outdated work patterns,
- overmanning to provide for excessive absenteeism, and
- inadequate training of workers.

McKersie and Klein (as quoted by Werther et al, 1986, p 381), analysed 61 plant-level questionnaires and reviewed extensive information from other sources about the industrial relations components of the productivity problem. These researchers identified three major productivity restraints: resistance to change, reduced worker motivation and inhibiting work rules.

(i) Resistance to change; not only to new technology but also the resistance to adopting new work arrangements and to aligning the social organisation to the requirements of that technology.

(ii) Reduced motivation, which could mainly be seen in the absenteeism rates.

(iii) Work-rule restraints; "This subject was frequently mentioned in survey responses, especially for plants where unions were present. The major type of work-rule problem today revolves around the issue of flexibility in the deployment of workers. They estimate that the work-rule problem may negatively impact on labour productivity in the range of 15 to 25 percent ... Work rules emerge in non-union as well as union plants ... the deployment of labour is usually done on a more flexible basis in a non-union plant" (Werther et al, 1986, p 383).

Two American consultants, Kepner and Tregoe, studied the causal factors for poor productivity. They attributed poor productivity performance by United States industry relative to high Japanese performance to five factors, of which only the following two are specifically relevant to this study:

(i) A trend towards and extreme emphasis on individualism and specialisation within Western world organisations ... and

(ii) Over-emphasis on formal division of tasks and organisation designs that emphasise formal duties and responsibilities, which has dehumanised work and reduced individual motivation as a result (Kepner, 1982, pp 2-3).

In addition to the factors mentioned by Lemmer, McKersie and Klein, and Kepner, Riley of the National Productivity Institute (1985, p 104) says that the following factors also affect outputs:

- work practices,
- machine systems, and
- skills available.

Factors affecting inputs include amongst others cost of labour and payment systems.

Visser, (1988, p 1), therefore believes the only way to cut production unit costs will be through management truly involving their people, in collaboration with trade unions, and in productivity improvement programmes. The benefits of such improvements must be shared with the workers, the shareholders and the clients. Of major importance, therefore, is the need to reduce labour unit costs in all manufacturing enterprises where wages have increased at a greater rate than productivity improvement. Only if wage increases become better aligned with productivity performance will South Africa become competitive.

2.4. Productivity bargaining

McKersie and Hunter (1973, p 9) defined

productivity bargaining as "the negotiation and implementation of formal collective agreements that stipulate both workers' gains and certain changes in work rules and practices with the primary objective of achieving greater productivity".

Lemmer (1985, p 126) similarly defined productivity bargaining as the negotiation of an agreement in which workers agree to bring about changes in their work practices which would lead to more economical use of manpower in exchange for certain benefits provided by the employer.

The literature indicates that productivity bargaining is a product of the British industrial relations system during the 1960's (Compare Batstone, 1984, p 146; McKersie and Hunter, 1973, p 5 and Ross, 1981, p 76). In general, they made an effort to use such agreements to increase flexibility in manpower utilisation which had been seriously circumscribed by rigid demarcation lines between tightly defined jobs. These union-dictated inflexibilities had led to unevenness in production and tended to exaggerate labour shortages. Due to the inflexibilities management could not achieve a 100 percent workload coverage for everybody. Unfortunately many of these agreements, although an improvement in one sense, were in another sense very restrictive in nature. (See also Chapter 1, p 5)

On the substantive side, the productivity agreements have tended to de-emphasise the use of

conventional criteria in wage negotiations; they have focused attention on improving labour efficiency in order to justify wage changes. Thus the agreements have helped to create a climate where workers begin to feel that they must earn what they receive in the way of additional wages. Although the popularity of productivity agreements in Britain declined due to too many fake agreements, growing inflation and Incomes Policy, substantial breakthroughs in covering costs and needed changes in worker-management relations were made (Batstone, 1984, p 147; Ross 1981, p 79).

2.5. Productivity improvement programmes

In the 1970's new forms of work organisation programmes designed to improve productivity and quality of working life proliferated. In many ways these programmes were revolutionary because they represented fundamental changes in how work should be organised, in how organisations might be designed, in how employees were utilised and in management-employee relationships. Some of these programmes have been more successful than others. The three most general and widely implemented productivity improvement programmes are briefly discussed below. (Job design and enrichment are discussed in Chapter 3.)

2.5.1 Quality circles

One of the techniques which has caused considerable interest over the last few years is quality

circles, which provide workers with an opportunity to put forward proposals concerning production and related issues. A 'quality circle' (also termed 'quality control circles' or 'quality control group') has been defined by Biesheuvel (1984, p 121) as: "A group of employees representing different job levels within the same work area who have come together voluntarily to contribute their problem-solving capacities, based on their own ... experiences ..." They analyse the causes of those problems and recommend solutions to management (Compare Bushe, 1988, p 131; Marks, Mirvis, Hackett & Grady, 1986, p 62; Rafaeli, 1985, p 604).

Quality circles originated in Japan in the early 1960's and were, ironically, introduced by two American consultants, Juran and Deming.

Evans in 1982 (1982, p 81) estimated that over one million quality circles were operating in Japanese factories, involving over 10 million Japanese workers, which was in the region of 80 per cent of all production workers. The success of quality circles as a strategy is now well known. The effects on quality and productivity have been dramatic. For example, in 1982 rejects and defects due to manufacturing problems were about one hundredth of the number in comparable western factories.

Following their emergence in the United States in the mid-1970's, the first circles were introduced

in Britain in 1978. It is now thought, according to the American Management Association Survey (1985, pp 30-31) that over 3 000 companies throughout the United States use them. In South Africa today there are an estimated 2 500 quality circles in operation. The Chief Executive of Toyota South Africa said that quality control circles gave employees job satisfaction through their own participation and motivative thinking, decision-making and the implementation of their own ideas. Furthermore their workers' involvement in production decision-making had a major effect on their productivity and quality levels" (Wessels, 1989, p 11).

The significance of quality circles, according to Batstone (1984, p 266) and Deming (1982, pp 108-109) is seen to lie in three areas:

(i) it draws upon and uses for management purposes the detailed knowledge and skills of those immediately involved in the production process;

(ii) it may thereby foster worker identity with management goals and interests; and

(iii) it may thereby reduce worker and union controls and may even weaken the role of the union within the workplace.

The successes of quality circles can be ascribed to its multi-faceted, holistic approach.

Not only do they enhance the quality and reliability of output but they become a means of enhancing employee participation and involvement, devolving job-related decision-making and a technique of skill development. This involves formal training input reinforced by practical application in the work environment.

2.5.2 Employee involvement and participation

Manning (1987, p 22) says that over the last ten years, many managements have realised that the alienation of its employees lies at the heart of the economic difficulties experienced. And they have accepted the importance of gaining employees' understanding and co-operation through adopting a more open management style.

It should be remembered that the subject of participation is not an invention of the seventies, but rather has reappeared in a series of waves over the course of the last century. Furthermore, participative management has become associated with a variety of workplace reforms including quality circles which, according to Beer, Spector, Lawrence, Mills and Walton (1984, p 158) has its success based on employee involvement and participation.

In 1983, Batstone (1984, p 263) in his survey of

British companies asked respondents whether management had changed its approach to employee relations in the last five years. Only a third said that no change had occurred. By far the most common change identified concerned attempts to increase employee involvement: this was so in 47 per cent of cases. No other response was so frequently given.

Basically employee involvement and participation revolve around the principle that each individual is unique and has the ability to contribute to the objectives of the organisation.

Evans (1982, p 8) by way of the following definitions distinguishes between employee involvement and participation: "Employee involvement is a range of processes designed to engage the support, understanding and optimum contribution of all employees in an organisation and their commitment to its objectives. Employee participation on the other hand is a process of employee involvement designed to provide employees with the opportunity to influence and, where appropriate, take part in decision-making on matters which affect them" (Compare Marchington, 1980, p 9; Locke, Schweiger & Latham; 1986, p 66-67).

Nattrass (1987, p 7) explains further that employee participation is not getting employees to share in managing the business. That might be a vision, but the first step is to get them to start managing their own jobs. This involvement is accomplished by

reversing the historical trend toward more division of labour and giving employees or groups of employees more responsibility for a whole task. Thus employees gain more control and influence over work goals and methods, a sharp reversal from the historical pattern of hierarchical control. Already in the 1960's Tannenbaum and Massarika (in Sutermeister, 1969, pp 433-435) identified the following principal advantages of employee participation:

(i) higher rate of output and increased quality of product;

(ii) reduction in turnover, absenteeism and tardiness;

(iii) reduction in the number of grievances and more peaceful manager-subordinate relations;

(iv) greater readiness to accept change;

(v) greater ease in the management of subordinates; and

(vi) improved quality of managerial decisions.

Various authors such as Drucker (1980, p 15), Iacocca (1984, p 234), Crosby (1979, p 133), Peters and Waterman (1982, p 226), Ouchi (1981, p 97) and Naisbitt and Aburdene (1985, p 117) agree that strengthening participation by all organisation members is the factor that can make the difference.

Cashbuild is but one organisation in South Africa that has achieved major success and excellence mainly through an almost singular focus on total employee involvement (Koopman, Nasser & Nel, 1987, pp 148-156, 178).

However, some companies introduce participative methods on the shop floor in the hope that a greater congruence of interest will make it less likely that workers will organise. So when union avoidance is the objective to the exclusion of developing a genuine process of mutual influence between management and employees, participative methods according to Beer et al (1984, pp 53-54) are likely to fail.

In fact, it appears that in the South African environment the trade unions are the first to hinder the implementation of participative programmes. Wickens (June 1989) ascribes this to the fact that the unions want more participation for the shop stewards and union representative and not for the shop floor employees. They feel that through participation their power and influence could be lessened rather than strengthened. They would have less control.

Critical to the success of participation and employee involvement is the supervisor - whether he or she has the right skills and attitude to handle their new role.

The reason why many companies' efforts have failed is because the supervisors on the shop floor have not been given the necessary skills to handle their new role. Often the best operator becomes the team leader or supervisor without necessarily having the leadership skills to do the job.

Furthermore, the longer-term success of employee involvement and participation is only possible if management changes other aspects of the work system to encourage the delegation of authority and responsibility, and the improvement of the content of the job themselves. Many programmes have failed because management was not prepared to support fully the spirit of the programme and to rethink other aspects of the work system.

Regarding the importance of worker participation Loubser (1989, p 2) said that a country with insufficient skilled labour, with too small a market to justify massive automation and a population suffering from too low a standard of living has no choice but to involve the worker in the growth of their business or slide back to being a third world country.

Although a great deal more could be said about employee involvement and participation suffice it to say that it has a crucial role to play, and forms an indispensible part of any productivity improvement programme.

2.5.3 Gainsharing and profitsharing

The idea of paying a bonus to employees based upon improvements in the operating results of an organisation is an old and well-established one.

Gainsharing plans have been used for years and there are many varieties. In many cases, they are simply economic incentive plans and are not part of a broader management philosophy regarding collaboration and participation. In these instances the plan may have some marginal value in encouraging co-operation among people. Beer et al (1984, p 145) believe that the real power of a gainsharing plan comes when it is supported by a climate of participation and when various structures and processes involve employees in decisions that will improve the organisation's performance and results in an organisation-wide bonus. The Scanlon plan, for example, involves more than a bonus based on company-wide savings in costs.

The Scanlon plan is a total, organisation-wide, productivity improvement plan. It focuses the attention of workers and management on productivity with everyone sharing in the benefits of improved productivity (Ross et al, 1986, pp 18-19; Welbourne and Gomez-Mejia, 1989, p 19-21; Moore and Ross, 1978, p 1). It has three elements: co-operation, involvement and the sharing-of-benefits formula.

The Scanlon Plan is undoubtedly the best known

company or plant gainsharing plan. It was developed by Joe Scanlon, a union leader, in the mid-1930's. Scanlon believed, according to Lawler, (1983, p 147) that the opinions and ideas of people lower down in organisations were ignored, even though they were of value and that the average worker was a great reservoir of untapped information concerning labour-saving methods. To correct this situation Scanlon suggested that organisations used a suggestion system that involved an elaborate committee structure.

Moore and Ross (1983, p 17) later renamed the Scanlon Plan productivity gainsharing. They said that it involves a measurement of productivity combined with a calculation that offers a mutual stake in the sharing of any increases to total organisational productivity, usually with all those responsible for the increases.

Profitsharing on the other hand, is a system under which the firm pays a reward to employees in addition to their regular wages, based upon the profits of the company. While not output or input related, it is usually based on a definite formula specifying how much of the profit is to be distributed and how it is to be computed, usually at the end of the fiscal year (Welbourne and Gomez-Mejia, 1989, p 20).

Gainsharing approached in a participative way can create a fundamental change in the psychological and economic ownership of the firm. Therein lies

its primary motivational and satisfaction value. However, only a management that embraces values consistent with participation can make it work.

Gainsharing plans depend heavily upon employee acceptance, input and co-operation to make them work. Which, in turn, depends heavily on a reasonably high level of trust and understanding on the part of employees. In a unionised environment this is difficult to achieve when the plan is management owned and management initiated (Hatcher, Ross & Ross, 1987, pp 155-157).

There are only a handful of companies in South Africa that have started down this road, probably due to a lack of know-how and because few success stories exist. Furthermore, it could also be because strong union resistance could be expected, the earlier costs could be greater than the benefits and the difficulty they anticipate with devising calculations.

Although in South Africa there are not so many examples where gainsharing has led to increased productivity, evidence exists in literature. Greater research and experimentation however need to take place in South Africa.

Progressive management in the nineties faces the challenge of addressing the productivity lag through the improved use of all resources in the organisation, including human talent. Although the

entire organisation will be involved in a productivity effort, the responsibility is primarily management's, because top management alone can stimulate and sustain the drive to make more effective use of the abilities of every member of the organisation.

None of the interventions already discussed or those to come can be implemented successfully on their own, disregarding the others. They are all interwoven and to a certain extent interdependent. Neither does the researcher want to create the impression that the productivity improvement programmes discussed in this chapter are out-dated, or no longer of any use.

Also there is no best system or organisational design. What is best for one company may not be best for another company. Each company must seek its own solution.

CHAPTER 3

JOB DESIGN

3.1. Introduction

The aim of this chapter is to discuss another productivity improvement method, job design, which is closely related to flexibility. A brief background to the historical development of job design is given, and thereafter the reasons for and influences on job design are considered. This is followed by a discussion of the various methods of job redesign and the benefits that could be expected.

3.2. Historical development of job design

The modern industrial work organisation is the result of a long historical development. The purpose of this section is not to give a comprehensive description of every job design development that occurred, but rather to highlight the ones that had the greatest impact on job design as it exists today. As these theories and models are well-known and documented they will not be discussed in detail.

3.2.1 Scientific management

Early managerial approaches to job design focused primarily on attempts to simplify an employee's

required tasks as far as possible in order to increase production efficiency. Taylor (1911, p 52) wrote the following about scientific management: "The man in the planning room, whose speciality under scientific management is planning ahead, invariably finds that the work can be done better and more economically by a subdivision of labour. Each act of each mechanic, for example, should be preceded by various preparatory acts done by other men". Taylor's original ideas therefore involved reducing tasks to their simplest forms and then rewarding workers with money on the basis of units of output. He believed that workers were largely economically motivated and that the best way to maximise output was through this piece-rate incentive plan (Kopelman, 1985, p 237; Champion & Thayer, 1987, p 66).

According to Kiely (1986, p 7) this approach to simplified job design reached its zenith from a technological standpoint in assembly-line production techniques such as those used by automobile manufacturers. On auto assembly lines the average length of the work cycle originally ranged between 30 seconds and 1½ minutes. This meant that workers would repeat the same task on average at least 500 times per day. As workers became better educated and more organised, they felt that the division of work had been carried to extremes. Too much specialisation and fragmentation of tasks had resulted in boring, monotonous and meaningless work.

Champion and Thayer (1987, p 68) go further by

stating that employees had become such small cogs in the big machines, that it had become impossible for any single person to see any connection between his own job and the overall process of which it was a part. It was therefore impossible for him to identify with his company or with the products it manufactured. A fragmented job of this kind could be learned in a day or, at most, a few days. But the thought of standing in the same place during an entire life to execute the same simple movements could scarcely be described as a happy prospect.

Workers began demanding more from their jobs. This demand was shown, according to Steers and Porter (1983, p 483), not only in recurrent requests for shorter hours and increased wages but also in higher labour turnover, absenteeism, dissatisfaction and sabotage. Robertson and Smith (1987, p 7) add to the above also alienation of workers and strikes as reactions to the nature of work.

In 1939 Mayo's Hawthorn effect resulted in a marked change of emphasis - namely from concentration on the individual towards the effects of social organisation (Blackler & Brown, 1978, p 12).

3.2.2. Socio-technical systems theory

The socio-technical approach to organisations was developed during the 1950's by a group of researchers at the Tavistock Institute in England. Trist and his colleagues attempted to identify and understand the interactions that take place between

the social and technological elements of organisations. They did their research in the British coal mining industry and found that the traditional method of coal getting (short wall method) involved small groups of miners (two or three) working closely together. These groups enjoyed a high level of discretion, in that control over the task was wholly internal to the group. Each coal miner was called on to execute a variety of tasks, often substituting for his mate. Furthermore, group members experienced a sense of contribution inasmuch as they completed the entire cycle of operations necessary to hew a given face (Davis & Trist, 1974, p 26).

Technological innovation brought about mechanisation and mass production methods, making it possible to work a single long wall. The production unit was organised around the cycle group of about 40, divided into three shifts. Within each of the shifts, individuals were restricted to narrowly defined work roles. Operational problems at one stage of the process were carried forward to later stages and because of the inflexible nature of the production process it was highly sensitive to disruption both at the production and social-psychological levels. Davis and Trist (1974, p 29) found that miners became extremely frustrated and developed various defensive manoeuvres, for example, go-slows, absenteeism, formation of cliques and individual competition.

The generality of the socio-technical theory as

pointed out by Proctor (1988, p 269) when examining the socio-technical work setting introduced at Digital Equipment Corporation, as well as its applicability in office setting as indicated by Ranney (1986, p 132) are but two of the theory's advantages.

3.2.3. Herzberg's motivation theory

Herzberg, in his study on "motivators" and "hygiene" factors, in the late 1950's, was one of the first to attempt to link job characteristics with human motivation, satisfaction and performance. He, however, did not describe the specific content in jobs that led to satisfaction but rather referred to processes (for example, achievement and recognition) which resulted from behaviour, in other words, he tended to talk in terms of outcomes rather than means. According to Robertson and Smith (1987, p 59) "a further methodological shortcoming of Herzberg's approach lies in its emphasis on satisfaction and dissatisfaction criteria to the extent of neglecting behavioural criteria such as performance, absenteeism and labour turnover". A rigorous theory of job motivation should, therefore, include both behavioural and satisfaction criteria.

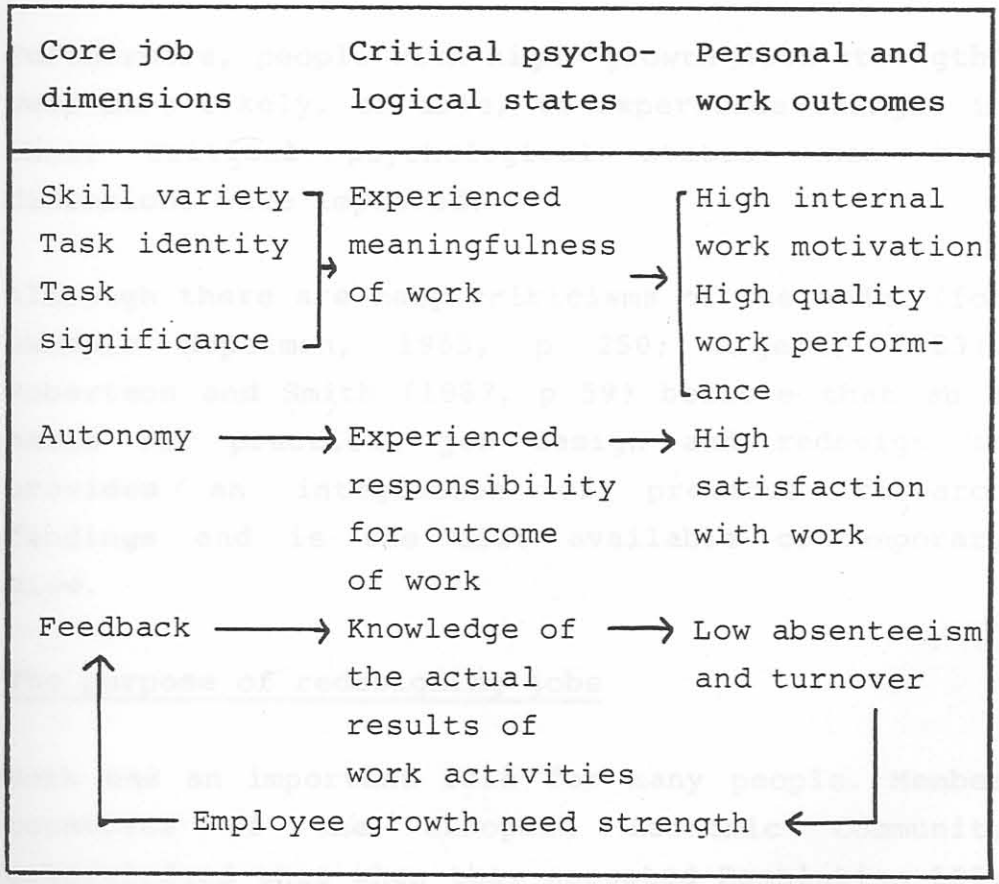
3.2.4. Hackman and Oldham's job characteristic model

The most widely used and influential contemporary model that attempts to explain the combined links between job characteristics and personal and work outcomes such as motivation, satisfaction and

performance is the job characteristics model developed by Hackman and Oldham in the mid-1970's (Champion & Thayer, 1987, p 68; Kopelman, 1985, p 242; Kiely, 1986, p 7).

The core of the job characteristics model is a set of proposals concerning the relationships between a specific set of job characteristics, a set of intervening psychological states and various personal and work outcomes. (See figure 3.1. below for the main components.)

FIGURE 3.1 : The job characteristics model (Hackman and Oldham, 1980, p 90)



According to the above model the psychological states, for example, experienced meaningfulness, experienced responsibility for the outcomes of work, and knowledge of the results of work, have a critical influence on motivation, performance and job satisfaction. The researchers then tried to determine what would lead to the creation of those critical psychological states, and found that the answer lay in designing the job tasks so that they would be high on the following core job dimensions: skill variety, task identity, task significance, autonomy and feedback (Hackman & Oldham, 1980, p 88; Robertson & Smith, 1987, p 58).

Furthermore, people with high "growth need strength" were more likely, or able, to experience changes in their critical psychological states when core dimensions were improved.

Although there are many criticisms of the model (for example Kopelman, 1985, p 250; Algera, 1983), Robertson and Smith (1987, p 59) believe that as a basis for practical job design and redesign it provides an integration of previous research findings and is the best available contemporary view.

3.3. The purpose of redesigning jobs

Work has an important role for many people. Member countries of the European Economic Community acknowledged this when they accepted Resolution 565: "... some working conditions have an adverse effect

on health and attitudes, therefore, there is a belief that some work should be dramatically changed to take into account worker attitudes" (Robertson and Smith, 1987, p 72).

The above Resolution further recommends the following objectives:

(a) the removal of soul-destroying jobs, as social progress depends on the interest workers take in jobs;

(b) that government authorities, together with employees and work organizations, promote the humanisation of working conditions;

(c) more opportunities should be given to workers to participate in the design of methods and conditions of work;

(d) assembly work should be eliminated and consideration given to job enlargement, job enrichment and autonomous work groups; and

(e) pay structure should be re-examined in the light of these proposals.

Robertson and Smith (1987, p 138) believe that "job redesign can improve productivity by as much as 16 per cent and can also bring about increases in job satisfaction".

In essence job design arises from the idea that many

people have a psychological need to extend their skills and competence. By designing jobs in a way that makes this growth possible an organisation can encourage their employees to become motivated by their job. However, it is important to remember that the degree to which motivation, performance and satisfaction will increase is dependent on the individual employee's need to grow and develop.

Part of the driving force behind the changes in job design in Sweden has been the fact that managers believed that work reform could increase productivity and profitability. However, the increased job satisfaction and more interesting and more stimulating tasks that resulted from the changes were soon seen as worthwhile ends in themselves (Compare Kiely, 1986, p 13; Ketchum, 1984, p 251; Ranney, 1986, p 132).

Hackman (in Steers and Porter, 1983, p 497) goes further when he says that work redesign can help individuals regain the chance to experience the kick that comes from doing a job well, and it can encourage them once again to care about their work and about developing the competence to do it even better. These payoffs from work redesign go well beyond simple job satisfaction. Personal growth is without question a central component of the overall quality of work life in organisations, and the impact of work redesign on the people who do the work, as human beings, should be neither overlooked nor underemphasised.

3.4. Main influences on job design

According to Robertson and Smith (1987, pp 94-96) the following are the four main contextual influences on job design:

(i) The job itself: Many jobs are inherently predictable and well defined and the scope for redesign is limited, for example the job of the ticket office staff member.

(ii) The technology: The technology of an organisation often places constraints upon the way that jobs can be designed, for example, mass production organisations which essentially use production lines to manufacture cars.

(iii) Management attitudes: Management attitudes, values and styles also determine job design. For example where management favours specialisation and reliability they will tend to produce jobs designed on the production line approach.

(iv) Employee and union attitudes: Employees can sometimes limit their own jobs. This is often found among older workers who resist change. Unions, too, can prevent workers from accepting job redesigns since it might weaken their foothold.

3.5. Methods of job redesign

Job or work redesign occurs whenever a job is changed, irrespective of what caused the change. Hackman (in Steers and Porter, 1983, p 492) says that work redesign is used to refer to any activities that involve the alteration of specific jobs with the intent of increasing both the quality of the employees' work experience and their on-the-job productivity.

Kopelman (1985, p 249) says that there are no simple or generally accepted criteria for a well-designed job. Champion and Thayer (1987, p 67) agree that there is no single strategy that is acknowledged as the proper way to go about improving a job (see also Hackman & Oldham, 1980, pp 67-68).

Several types of changes can be utilised when jobs are redesigned. Firstly, the possibilities of expanding or enlarging the task of an individual at a work station will be discussed. Thereafter the methods of job rotation, job enrichment and autonomous groups will be discussed.

3.5.1. Job enlargement

Herzberg (1966, p 39) saw job enlargement as a "horizontal expansion of an employee's job, giving him or her more of the same kinds of activities but not altering the necessary skills". Job enlargement therefore involves the widening of the job to bring

in additional skills and allows employees to complete a whole job, or a much larger part of a job. So work no longer consists of short-cycle operations whose contribution to the final product seems indistinct and remote. According to Champion and Thayer (1987, pp 69-71) there are basically three ways in which a job at a work station can be expanded:

(i) lengthening the work cycle,

(ii) integration of production and auxiliary tasks, and

(iii) decentralisation of authority and responsibility.

Each one will now be examined further.

(i) A longer work cycle

This basically involves enlarging the job through the addition of more production tasks. For example, in one manufacturing plant in South Africa a shoe is manufactured in a production system manned by more than 20 persons each at their own stations. Thus every operator does a twentieth of the job. The process is reworked so that each operator does five or six tasks and has a job five to six times larger than before. This is, however, not so easy in other situations such as the automobile assembly line, as was pointed out

by Blackler and Brown (1978, p 19). There has been much discussion of individual adaptability and individual preferences regarding the length of task cycles and it is often maintained that there is no disadvantage to short-cycle jobs, and that many workers even prefer them. However, if workers are not accustomed to any longer work cycles they do not know any better. In the 1970's it was found by the Swedish Employers Confederation (1975, p 56) that for a great majority of people, the work cycle in light assembly can be lengthened up to 20 - 25 minutes with no loss in efficiency. Naturally more time was needed for training. However, the return on investment has been highly satisfactory.

(ii) Integrating production and auxiliary service tasks

The job, according to Champion and Thayer (1987, p 70) is enlarged by including occasional duties previously carried out by service departments, for example, the machine operator becomes responsible for regular preventative maintenance and lubrication of a machine, repairing routine breakdowns, weekly check-ups, and inspection of key components. This adds to the variety of the machine operator and comes quite naturally to him. The object is not that they must have specialised knowledge, but to do the regular maintenance. This corresponds with what Wickens (1987, p

53) termed as prescribed and discretionary elements of work.

MacInnes (1988, p 13) also included this aspect, of production workers doing maintenance work under the concept of flexibility.

(iii) <u>Decentralisation of authority and responsibility</u>

This would involve giving individual operators full responsibility for quality. Special control measures are abolished, the operators check the work and evaluate data on a continuing basis, and decide when corrective measures are needed. This change can be made more or less overnight, and unconnected with any other change (Compare Shetty, 1986, p 173; Ackoff & Deane, 1984, p 243 and Chapter 4, pp 64-66).

Operators generally experience this change positively since they are no longer closely controlled by others. A major determinant of the extent to which authority and responsibility can be expanded is, of course, the increase that can be brought about in workers' skills so that they can handle more demanding work (Champion & Thayer, 1987, p 70).

3.5.2. Job rotation

Job enlargement is not the only method of alleviating monotony. Job rotation basically refers to the movement of individual workers around a variety of tasks and is probably the most rudimentary type of job redesign (Kopelman, 1985, p 239; Ketchum, 1984, p 249; Hackman & Oldham, 1980; p 97). Robertson and Smith (1987, p 96) stress that its main disadvantage is the limited amount of change it produces, while the main advantage is the little retooling or restructuring that it requires (Compare also Hatcher, Ross & Ross, 1987, p 156).

In the 1970's job rotation in Sweden was found to be successful when it fell into the following two categories; temporary multi-skill training and spontaneous job rotation (Swedish Employers Confederation, 1975, p 65).

(i) Temporary multi-skill training

The intention of systematic multi-skill training is not that rotation becomes a permanent part of operations. The idea is to increase workers' familiarity with jobs adjacent to their own in the production process, so that they can take over such jobs more efficiently when required by absenteeism, personnel turnover and changing production systems. Real job rotation would therefore occur when a co-worker is sick, quits or retires and someone must fill in, in order to

avoid shutting down the entire production line. For best results, it is advisable to set up a regular routine for systematic multi-skill training, so that workers will learn to handle jobs other than their own. Many Swedish companies have shown success with such limited-period multi-skilling programmes. Although Wickens (1987, pp 43-45) also stresses the importance of multi-skill training through rotation less emphasis is placed on the length of time rotated.

Hewlett-Packard in 1988 experimented with job rotation, so as to relieve monotony on their assembly line. Smith (1988, p 4) however says that although line workers found the work far more enjoyable, they had to abandon the system due to poor quality standards.

(ii) Spontaneous job rotation

This is generally known as group work. When an especially heavy work load materialises at one work station, and another is clear for the moment, one would see the person at the latter spontaneously move to help out at the former. When the work slows down at one person's position, he will take the initiative in moving to where the work is piling up. It is a natural and continuous give and take within a group of people. The objective is to attain an established production target and it works better than any rigid arrangement unilaterally

decided by management could possibly do (Swedish Employers Confederation, 1975, p 68; Ketchum, 1984, p 247). Wickens includes this concept of spontaneous job rotation under flexibility (1987, p 44).

3.5.3. Job Enrichment

Job enrichment on the other hand, means a vertical expansion of an employee's job, requiring an increase in the skills repertoire which would lead to increased opportunities (Herzberg, 1966, p 39; Champion & Thayer, 1987, p 71). As Kopelman (1985, p 237) described it, job enrichment "seeks to improve both efficiency and human satisfaction by means of building into people's jobs, quite specifically, a greater scope for personal achievement and recognition, more challenging and responsible work, and more opportunity for individual advancement and growth". Myers (1970, p 12) simply describes job enrichment as increasing the proportion of planning and controlling and reducing the doing part of the job.

Job enrichment usually involves flexible working methods which, some argue, are not consistent with highly standardised conveyor belt methods. It is believed that the cost of job enrichment under these circumstances are too high, for example, where highly efficient automobile assembly lines are replaced with individually manoeuvred wagons such as was done at Volvo in Sweden (Blacker & Brown, 1978, p 82; Gyllenhammar, 1977, p 43).

3.5.4. Autonomous working groups

It is interesting to note that Robertson and Smith (1987, p 97) say that autonomous working groups carry job enrichment to its logical conclusion. Not only is the job enlarged to include a wider range of operative skills but it is also enlarged by giving employees responsibility for basic management activities, such as deciding upon the methods of work and the scheduling and planning of work. Therefore, a small group of about six employees will schedule, plan and perform complete assemblies or whole units of work. An example in South Africa is the venturecom approach used by Cashbuild (Koopman et al, 1987, pp 40-67).

3.6. Benefits that could be expected from job redesign

Managers in South African companies and in particular motor manufacturing companies frequently want to know how much productivity gain could be expected from work redesign. Researchers such as Champion and Thayer (1987, p 79) answer a 15% to 20% improvement in productivity, while Ranney (1986, p 125) claims a 30% to 40% gain in overall productivity, dramatic increases in organisational and technological flexibility, high commitment from the workforce and excellent quality records. However, the form of potential gains will vary significantly according to the technology used. The magnitude of possible gains will depend on how well the company is already performing and on whether the aspects of performance that can be improved are

strongly influenced by employees' attitudes and skills. Finally, whether potential gains ever materialise depends on the quality of redesign ideas and their implementation (Robertson and Smith, 1987, p 138).

According to Steers and Porter (1983, p 484) considerable evidence came to light in the 1960's and 1970's in support of positive behavioural and attitudinal consequences of such job enrichment efforts (Lawler, Hackman & Kaufman, 1973, pp 49-63; Maher, 1971, p 68; Myers, 1970, p 23; Vroom, 1964, p 19). In general, such efforts tended to result in:

(i) significantly reduced turnover and absenteeism;
(ii) improved job satisfaction;
(iii) improved quality of products; and
(iv) some, though not universal, improvements in productivity and output rates.

On the negative side, the above researchers said that the costs often associated with such programmes were:

(i) increased training time and expense, and
(ii) additional retooling costs where dramatic shifts toward group assembly teams were instituted.

Locke et al (1986, p 71) supports the above when they suggest that job enrichment is not as effective as other approaches in producing improvements in

productivity; however, redesigning jobs can bring about improvements in factors such as job satisfaction, personal relationship at work, turnover and absenteeism, and employee health as well as performance improvements. (See also Kiely, 1986, p 7 and Gupta, Jenkins & Curington, 1986, p 116.) For many people outcomes such as these are ends in themselves regardless of direct productivity improvements.

CHAPTER 4

IMPROVING PRODUCTIVITY THROUGH FLEXIBILITY

4.1. Introduction

As seen in the previous chapters there are a number of ways to improve productivity - some have been more successful than others. A great deal has been written about them, they have been thoroughly researched, implemented and recorded.

It appears that the 1980s has delivered an additional factor that could improve productivity, namely flexibility.

In this chapter this relatively unknown and unresearched productivity improvement method, flexibility, is discussed in detail.

(i) Definition of flexibility

Wickens (1987, p 44) defined flexibility as "expanding all jobs as much as possible and by developing the capabilities of all employees to the greatest extent compatible with efficiency and effectiveness". It certainly did not mean moving people rapidly from section to section, for that would have detracted from team working.

Further implications of flexibility can be seen

in the 1987 agreement Nissan concluded with the Amalgamated Engineering Union (AEU). The actual wording of the working practices clause is as follows:

"(a) To ensure the fullest use of facilities and manpower, there will be complete flexibility and mobility of employees;

(b) It is agreed that changes in technology, processes and practices will be introduced and that such changes will affect both productivity and manning levels;

(c) To ensure such flexibility and change, employees will undertake and/or undertake training for, all work as required by the company. All employees will train other employees as required;

(d) Manning levels will be determined by the company using appropriate industrial engineering and manpower planning techniques;

(e) Employees will be prepared for work at their place of work at the start and end of their normal working day/shift" (Agreement, 1987, p 11).

As seen above, flexibility does not solely relate to the work people actually do but also

to the number of those employed to do it.

Atkinson (1985, p 32) distinguishes between

- numerical flexibility,
- functional flexibility and
- financial flexibility.

Functional flexibility covers the tasks performed within a working environment, as discussed above, but numerical flexibility is concerned with the ease with which the number of workers employed can be adjusted to meet fluctuations in the level of demand. The numerically flexible firm is the one which always deploys exactly the right number of workers at each stage of the fluctuation rather than suffering shortages at one point or overmanning at another. Financial flexibility encourages and supports the other two.

Atkinson's flexible firm consists of a core group of employees surrounded by peripheral groups, and it is mostly required from the core group to deliver the functional flexibility. It is clearly not possible to employ temporary workers on the full range of skills developed by the core group.

Recent case-studies such as British Leyland, Nissan Manufacturing (UK), Pilkington Glass (UK) and others

have proved that flexibility and the removal of restrictive practices have led to improved productivity, less labour turnover and absenteeism, more job satisfaction and less grievances and strikes.

Although flexibility might appear to be nothing other than job redesign, since it encompasses job enlargement, job enrichment and job rotation, it has a nuance difference. The main purpose of job redesign, as it appears in the literature, is to improve the employees' quality of working life, for example, reducing monotony, giving the employee more skills and reducing job dissatisfaction. Flexibility as it is introduced in the case-studies mentioned has as its main purpose the improvement of productivity, efficiency, profitability and competitiveness of the organisation, with the resultant increase in job satisfaction as an additional spin-off.

This chapter will focus on flexibility as implemented in, among others, British Leyland, Nissan Manufacturing (UK) and Pilkington Glass (UK). These organisations will not be dealt with separately but together under the following headings:

(i) situation preceding flexibility,

(ii) actions taken to implement flexibility, and

(iii) results of flexibility.

4.2. Situation preceding flexibility

4.2.1. British Leyland

British Leyland was formed in 1968 after a great number of mergers. The company was a single business in name only, for each of its constitutent parts consisted of the proudest individual names in the British motor industry: Austin, Morris, Jaguar, Rover, Triumph and Leyland.

When Sir Michael Edwardes took over British Leyland in 1977, the company had run out of money. Industrial disruption and strikes had resulted in a production loss of 250 000 vehicles in just 10 months, (this was a quarter of the company's total planned production for that year). There was not enough money to pay the wages and there was no possibility of going to the government for immediate funds. Loan facilities of £80 million was needed to see them through this crisis period. (Edwardes, 1983, p 13)

At the same time there was an unprecedented level of competition within the European motor industry. Serious weaknesses existed in the British car industry - too many manufacturers, too many models, too many plants and too much capacity. Other severe weaknesses included poor quality, bad labour relations, unsatisfactory delivery record, low productivity, and too much manpower. (Edwardes, 1983, p 35).

Meanwhile, disputes had run at more than two million man hours for every single month in 1977. They were

dealing with 17 different unions across 50 factories. None of the factories was achieving targeted rates of production.

Furthermore their fixed costs had to be met by at least £100 million a year. Overmanning in the factories had to be dealt with, which meant that many thousands of jobs would be lost in the company. According to Edwardes (1983, p 60) even the de-manning of 17 000 employees only brought jobs into line with the reduced scale of operations. It did not tackle the fundamental problem of poor productivity.

During 1978 and 1979 some progress was made, however Edwardes (1983, p 73), says "the real problem was that management was still striving to get into the driver's seat, having been out of it for many years ... (they) had to win the hearts and minds of the workforce. It was all a question of deciding on the right objectives and having agreed upon a strategy, then sticking to it".

Productivity had to be improved by something like 150% in just a few years.

Quality and consistency of production had to be improved immeasurably.This meant that the number of disputes had to be cut to something like one fifth of what had become the norm in their 34 car plants.

4.2.2. Nissan Manufacturing (UK)

As seen in the British Leyland case, British industry was in a downward spiral characterised by inflexibility, poor co-operation, low productivity due to lack of trust, low rewards, and poor security.

When the British government first imposed a statutory pay freeze in 1966 no automatic pay increases were allowed. However, from 1968 they allowed two exceptions - increases could be granted where low pay could be demonstrated and where productivity improvements were negotiated. Thus followed a period of fake productivity deals. One specific example was the plumber-millwright amalgamation. Wickens (1987, p 39) explains, how each plumber was trained in those millwrighting skills he lacked and each millwrighter in the plumbing skills he lacked. Ticks were put in boxes to show that the training in each module had taken place and at the end of it a multi-skilled craftsman with a higher rate of pay emerged. However, in practice each craftsman still did the job he knew best and little cross-fertilisation took place.

Traditionally, British industry has created rigid demarcations within the skilled and between the skilled and non-skilled employees. (MacInnes, 1988, pp 13-14; Atkinson & Meager, 1986, p 26; Wickens, 1987, p 42)

Furthermore, shop stewards have frequently told managements that they fail to utilise the talents of their workforce. However, trade unions, in fear of

losing power, have been the first to prevent this flexibility.

Although many human resource professionals were sceptical that agreements on paper would really result in changes in practice, it was, according to Wickens (1987, p 40) mainly the development of new technology and the harsh economic realities of business life which led to significant changes in both management and union attitudes.

As clearly seen in the above, the main difference between British Leyland and Nissan's situation leading up to flexibility, was that British Leyland was an existing company while Nissan was a newly created company. British Leyland had to bring the changes into an already explosive situation whereas Nissan had the advantage of a new plant, new employees, new personnel philosophy and therefore could bring in new working practices.

According to Norman and Fillingham (1987) it is easy to instal new arrangements in new companies because the unions and prospective employees have virtually no choice. However, it appears to be more complicated with older existing companies where entrenched practices and attitudes have to be converted into a new way of working. Removing restrictions to flexibility usually requires a crisis before the need for change can be accepted.

4.2.3. Pilkington Glass (UK)

Another excellent example of an older, existing plant was the Cowley Hill Works, in St Helens. It was started in 1876 as a Plate Glass factory and from 1930 to 1980 the number of employees on site fluctuated around 3 000. Modern efficient manufacturing methods were hampered, not only by the old plant and a site that had been designed for something very different from a modern float works, but also a relatively old workforce with a strong sense of 'the way things had always been done'. In many cases they had not only worked in the plant themselves for over 20 years but often their fathers and even their grandfathers had worked there before them (Norman & Fillingham, 1987).

The site was inhibited by a folk memory of overmanning, strict demarcations between jobs and a highly developed internal hierarchy with strong departmental boundaries.

According to Norman and Fillingham (1987) by 1984 the Works was struggling to maintain an output from two float lines with 1 400 people, while its new sister plant at Greengate was achieving the same output with just one float line and 400 people. Clearly drastic steps needed to be taken. The crisis came to a head when one of the site's two float lines became due for a major cold repair. If Cowley Hill was to survive as a two-production line operation, it had to convince the Pilkington Board to invest almost £10 million against the promise of a more productive and efficient future.

The crisis was the impetus the site needed. It provided the opportunity for local management to negotiate-in a package of enabling agreements.

With the new Greengate Works the development was very different. In the mid-seventies, Pilkington recognised that big companies typically have big company systems which emphasise stability, develop bureaucracy and are fine for big ventures and high growth. However, they reduce the speed of business response needed for more uncertain market conditions (Norman & Fillingham, 1987).

Therefore, when they established the new Greengate Works they realised from the outset that they could not afford any restrictive practices and needed a totally flexible workforce.

4.3. Actions taken to incorporate flexibility

In this section, the various actions taken by the companies to incorporate flexibility are analysed.

4.3.1. British Leyland

During September 1978 1 800 machinists at Leyland's truck factory in Bathgate, Scotland, went on strike because they wanted to be paid a premium for operating the new machinery which was installed as part of a £22 million modernisation programme. While management saw this investment as providing tangible evidence that they were prepared to give that marginal factory a

future, a section of the workforce saw it simply as a bargaining counter for more money (Edwardes, 1983, p 76).

Edwardes used the announcement of the company's results for the first six months of 1978, as an opportunity to get the message across that management would not give way to disorderly industrial action, such as the Bathgate strike which lasted six weeks and cost £30 million. He told the workforce that the Board would rather see the factory closed for six months or more, than give way on a matter of principles (1983, p 77).

The situation improved in 1979 and although they had an official toolroom strike involving ± 3 500 stalled workers the impact was far less. Management had realised that direct communication between themselves and the shop floor was vitally important. There was no other way to win the hearts and minds of the men at all levels. Politically motivated shop stewards could not be relied upon to present a balanced view to employees. They had a vested interest in the outcome, which was independent from and usually in conflict with the interests of the business and its employees. During the strike 100 senior managers spent considerable time on the shop floor - walking and talking in all 34 factories to explain the company's position, and why the demands could not be met (Edwardes, 1983, p 90).

Management had learnt not to compromise on principle, and it mattered greatly that no concessions were

contemplated or made. This did not go by unnoticed by the unions and employees.

It was, however, not until early 1980 that new work practices were introduced. Edwardes (1983, pp 125-127) had said that after months of fruitless negotiation, these new work practices were their most important industrial relations move since the war. A new wage deal was implemented at the same time. Neither was welcomed with open arms by the union officials or sceptical shop stewards. Management, however, firmly believed that their strategic 'Recovery Plan' had no hope of succeeding without a massive change in the way people were prepared to do their day-to-day work. The Recovery Plan included closing certain factories and plants, reducing manning levels and cutting excessive costs.

Two key areas of change were needed: First, the ability to move workers from one job to another (particularly to cover absenteeism at the start of shifts), which meant introducing flexibility in the use of skills, so that, for instance, maintenance did not require four people from four different unions to carry out repairs. The second was the end of anomalous cash buy-outs for 'practices and outcomes' which were widespread and had been negotiated on a factory-by-factory basis - practices which could not be retained if the company was to recoup its lost competitiveness (Edwardes, 1983, p 126).

Furthermore, management desperately wanted to shorten the laborious negotiation process, by writing into the

agreement management's right to change work methods. However, after several hundred hours were spent by management and stewards arguing the inclusion management implemented the new work practices regardless of opposition. They did so by announcing that anyone who reported for work on a particular day was deemed to have accepted the change in employment conditions (Edwardes, 1983, p 127).

With this "30 years of management concessions (which had made it impossible to manufacture cars competitively) were thrown out of the window, and our car factories found themselves with a fighting chance of becoming competitive" (Edwardes, 1983, p 127). Soon the results were forthcoming.

4.3.2. Nissan Manufacturing (UK)

When the Nissan plant in the United Kingdom was opened in November 1984, Ishihara stated that their management philosophy for the car plant was based on the following four major pillars: First, to have open and frank communication within the Company. Second, to realise single status for all employees. Third, to provide equal opportunity for promotion for every employee. And last to have complete flexibility in production operations (Wickens, 1987, p 20). Although all four were regarded as important and interdependent this study focuses mainly on the fourth pillar, flexibility.

When Nissan started recruiting employees for the new plant they emphasised flexibility and in their

recruitment literature explained what it meant. It was covered in detail at all stages of the hiring process and extracts from the agreement between the company and the union were sent with all offer letters to candidates. If candidates were not prepared to be flexible, they had every opportunity of withdrawing. And if the selectors discerned reticence on the part of the candidates, they were likely to be rejected.

(i) **Main actions taken at Nissan**

(a) One of the actions taken by Nissan, was to have only two job titles, namely manufacturing staff and technicians that covered all the manual tasks within the car plant (Wickens, 1987, p 46).

(b) Secondly, Nissan was determined to have no job descriptions which would limit the work people were doing, rather than expanding their level of flexibility and capability. Wickens (1989) said that the end result of a system which provided precise details of the responsibilities of each job only served to restrict (rather than expand) what people did. In the end hundreds of job titles, numerous grading levels, many steps from top to bottom and the preservation of the system would become more important than responding rapidly to changing technology, processes or market conditions.

(c) Thirdly, flexibility meant that

manufacturing staff would have total responsibility for the quality of work they produced. Nissan does not employ many quality inspectors. Each member of the manufacturing staff is expected to validate the quality of his own work and not pass on unacceptable quality to the next stage of the process.

(d) Fourthly, these employees are responsible for keeping their own areas clean and painted. Naturally, they are thus less inclined to dirty it.

(e) Probably the most important element of flexibility they established related to maintenance. In the United Kingdom, the following generally happens when a breakdown occurs on the assembly line: the maintenance team is called in to handle the situation and the production workers leave the job and return only when the problem is solved. Wickens says that the maintenance men in the United Kingdom generally regard it as an erosion of their skills if an unskilled man is seen as being able to contribute, and the semi-skilled have little incentive to increase their responsibilities. Strangely enough it has not only been the trade unions that have discouraged job expansion but management too (Wickens, 1989).

> At Nissan, however, a different situation exists due to flexibility. Every craftsman is multi-skilled - or at least is undertaking a training programme, which will result in genuine multi-skilling. Beyond the need to work safely, there need be no limitations on the range of tasks employees can perform, although it has to be recognised that not everyone has the same capabilities. Training programmes for the craftsmen of the future have to take this requirement into account from the very start. So when a breakdown occurs and the maintenance people arrive, the assembly workers help the maintenance team for they know more about that particular part of the job than anyone else (Wickens, 1987, pp 44-45).

But flexibility does not simply mean flexibility between manual workers. In Nissan they have developed the concept that there are no restrictions - this could be as informal as managers shifting furniture, spending long periods in the production areas and filing their own papers to more formal arrangements of moving between jobs.

"Once you start on the path to flexibility, there is no logical limit, other than the fact that the cost of training everyone to do everything is disproportionate to the benefits. If managers are not flexible, however, you

cannot expect people on the shopfloor to respond" (Wickens, 1987, p 53).

(ii) Trade Union Reaction

Regarding the reaction of trade unions it is to be expected that some trade unions regard flexibility as the most serious challenge to trade unionism in decades. According to Wickens (1989) they regard Nissan's philosophy of flexibility and teamwork as anti-union. Furthermore, it appears that most of these remarks are forthcoming from the more left wing, militant unions. Nissan does not see how providing people with fulfilling, meaningful jobs could be anti-union.

The mainstream trade unionists, however, accept these workplace realities. While they may not always be happy with the pace of change and are protective of jobs, their attitude is moving from one of resisting change to one of negotiating change and getting the best deal they can for their members (Wickens, 1987, p 54).

The Trade Union Congress (TUC) in an internal document circulated to all trade unions in October 1986 stated that by giving workers increased responsibility for quality and output, job satisfaction could increase. By weakening job demarcation lines, jobs could become more interesting and it was important for the unions

to acknowledge this and not be seen to be opposed to it (Wickens, 1987, p 54).

4.3.3. Pilkington Glass

After many years of investigation, management discussion and consultation with the unions, Pilkington announced that it was decentralising the negotiating agreements. Further they needed every employee to be committed to the success of the enterprise in which he or she worked, in other words, teamwork. Plants had to remove restrictive practices, reduce manufacturing costs and increase productivity by 10% to 25% (Chaplin, 1989).

(i) Greengate Works

The new factory, Greengate Works, was established with a single, integrated reward structure covering four unions, and a manning level which would have been 50% higher if existing agreements and practices had been followed as in their other factories They resisted the inclusion of any restrictive practices and stressed flexibility in duties. The anomalies of the complex pay structures were replaced by a single 10-grade salary system, with time off instead of paid overtime (Norman & Fillingham, 1987).

(ii) Cowley Hill Works

The actual challenges for Pilkington lay in their older, existing plant, the Cowley Hill Works. As already mentioned in section 4.2.3. p 57 the crises they experienced with the second float line resulted in management negotiating-in a package of enabling agreements. These, together with the introduction of enhanced voluntary redundancy terms, allowed an acceleration of de-manning and a removal of many of the demarcations and barriers which had prevented an operation of an efficiency similar to that of the Greengate site.

The package of changes which was eventually accepted by the workforce included:

- a move to single status with all employees being rewarded on a salaried basis through a common job evaluation scheme,

- an annualised hours approach with time off in lieu of alternative hours worked rather than paid overtime,

- one multi-union forum for consultation and negotiation, and

- a more open management style.

According to Norman and Fillingham (1987) these changes, although radical at the time, were

perhaps the easiest part of the change in Cowley Hill. Actually achieving what the enabling agreement made possible was to prove a much taller order. To achieve the same levels of output with less than 900 people which only a few years previously had been the norm with over 3 000 employees, required dramatic changes in attitudes amongst all who worked at Cowley Hill.

Flexibility was to be the key - flexibility of skills, flexibility of working time, and flexibility of approach.

Chaplin's (1989) and Norman and Fillingham's (1987) thoughts on the three types of flexibility are summarised as follows:

(i) Increased skills flexibility was felt throughout the works. In the craft area there were to be only three core jobs: building, electrical and mechanical craftsmen, where previously there had been 21 separate trades. In the mechanical area in particular no less than 14 separate trades were amalgamated into the single job of mechanical craftsmen. In the staff area the great variety of clerical jobs were arranged into generic groupings. All of this was only possible through the introduction of new technology on both shopfloor and particularly in the office, coupled with a massive programme of retraining and planned experience.

Jobs were therefore redesigned for maximum flexibility and mobility, providing efficiency and job satisfaction. Rotation of tasks within a work group within a single job title was strongly encouraged. In fact they managed to reduce 205 jobs to 67 jobs on site, and they wrote broad job descriptions that were drafted together by union representatives and local management. They therefore devised fewer but bigger jobs and gave operators more responsibility and accountability. Process workers were trained in routine preventative maintenance and were encouraged to do their own quality inspection. Furthermore they devised a level of reward that would reflect the flexibility of the employees.

(ii) Flexibility of working time was also an essential for the new Cowley Hill Works. Over half the site's employees were continuous shift workers and the old traditional British manufacturing four-set shift systems were creaking under the strain of an average 39 hour week and demands for production cover with the reduced manning. Consequently five- and six-set shift systems were introduced with an onus on the work group arranging their own cover. In addition, paid overtime was abolished and a 'time off for time worked' system introduced. As a result the

capacity of all concerned for finding more efficient ways of operating developed enormously.

(iii) To make the above work successfully Pilkington realised that they needed a more flexible approach towards the business. Supervisors had to approach their role more as man-managers and business managers with a cross-departmental view. The position of being purely a technical specialist, which many had held in earlier years, was no longer an option. Over 120 employees passed through a supervisory assessment centre, to help the plant identify those employees with the flexibility of approach which first-line supervisors would need in the "new" Cowley Hill.

Once the euphoria of negotiating the original enabling packages had subsided it became clear that to make the new flexibility system work, more had to be done to change the attitudes of employees on site. The attitudes that prevailed tended to reinforce existing demarcations. There was a view that any extra effort or change should be met by extra reward and the ceilings on output set by the pre-package productivity bonuses remained a cultural norm (Norman & Fillingham, 1987).

To overcome these cultural obstacles, the plant began a planned programme of attitude change, which included

customer care training, communications training and a programme to promote site identity. This had the effect of raising the sights of those who worked in Cowley Hill, and demonstrating that there are long-term benefits for everyone to be found by putting flexibility into practice.

According to Norman and Fillingham, (1987) getting flexibility into Cowley Hill was not without its difficulties. Line managers and supervisors themselves did not always find the concept easy to handle in a real-life work situation. Some put operators and craftsmen onto the tasks that they knew best, while others were tempted to take flexibility to an absurd extreme so that employees did not have the time to build up an adequate core of skills and experience in a particular activity. Between these two traps, management were looking to steer a course of planned and controlled development of flexibility of skills and attitudes amongst all Cowley Hill employees.

4.4. RESULTS OF FLEXIBILITY

Having reviewed why the various companies decided to encourage flexibility, and having analysed what they actually did to ensure a flexible workforce, a brief look is taken at the results the companies obtained.

4.4.1 British Leyland

Edwardes, (1983) in his book, does not write much

about the specific results they achieved, however the name of the book reflects the major turnaround that was achieved and the fact that the company was saved from extinction. Edwardes however does make specific mention of the dramatic productivity improvements achieved.

Productivity, which had declined steadily over the years, increased dramatically. Whereas they were producing 5,77 cars per man in 1977, 7 cars per man in 1980, they were producing 17 cars a man in 1981 and 25 in 1982 (1983, p 127).

Furthermore they experienced increased employee involvement, improved communications between management and employees and greater teamwork. British Leyland saw that through the involvement of employees, the elimination of restrictive practices and management regaining control of the workforce, they could increase productivity, their products became more competitive and they could regain some of the overseas and local market. Jaquar's 100% increase in sales in the USA in 1982 was to illustrate the point. Edwardes (1983, p 291) in reflection on the improvement of productivity at British Leyland stressed that it was up to managers to argue the case for the removal of restrictive practices, so that unions would see the need to forego concessions they had gained over the years. Those who did not - whether managers or employee representatives - would put themselves and their company in jeopardy.

4.4.2. Nissan Manufacturing (UK)

It appears that the change in the trade union's approach was a major contributing factor to the successes achieved in Nissan.

In 1983, for example, the Engineering Employers Federation called for full flexibility between and within trades and occupations. The Confederation of Shipbuilding and Engineering Unions (CSEU) responded in 1986 when they stated that they would be prepared to recommend to constituent unions that they co-operate with employers in eliminating demarcations and other restrictive practices in exchange for a reduction in the working week.

Both parties had therefore realised it was in their mutual interest to survive. This meant that at plant level real changes had to take place, requiring considerable effort by all, to overcome traditional attitudes and practices.

Despite many obstacles, many companies started moving in the direction of greater flexibility, and for the majority it meant real flexibility and real improvements in productivity. According to the 1984 IDS study, the main triggers for this movement were:

(i) the weakening of the trade unions' bargaining power;

(ii) the desire for craftsmen to learn new skills

and then enhance their earning potential; and

(iii) companies' requirements of a highly skilled flexible workforce, capable of effectively and efficiently maintaining increasingly sophisticated equipment and systems.

Flexibility in Nissan gave rise to the following intangibles: responsibility, commitment, innovation and pride.

In Wickens' own words, "Nissan's results speak for themselves. Quality standards exceed Nissan's world-wide targets, schedules are always met, the commitment of all staff can, according to most visitors, virtually be felt, improvements in productivity are constantly made by the people actually doing the job, turnover and absenteeism is low, lateness is virtually non-existent" (1987, p 187). Furthermore they have not lost a single car to schedule due to labour unrest, nor have any formal grievances been recorded since coming into existence (Wickens, 1989).

Regarding flexibility in Nissan, MacInnes (1988, p 23) said that there were no doubt some impressive individual examples of companies successfully adopting flexibility strategies, and that the new Nissan plant at Sunderland was but one.

4.4.3. Pilkington Glass (UK)

According to Chaplin (1989) the success of their

interventions at Pilkington Glass was partly due to the fact that they challenged every assumption and preconception they had in the workplace. Furthermore, they faced up to external perspectives, examined the standards which they set for themselves and their employees and restructured their business.

Through their actions, which as seen in section 4.3.3. pp 66-71 were flexibility, together with changes to the pay structure, management style, manning levels, multi-unionism, worker participation and team building, translated productivity gains into increased output and reduced costs (Norman & Fillingham, 1987).

4.5. OTHER EXAMPLES WHERE FLEXIBILITY HAS BEEN IMPLEMENTED

In this section a few more examples of companies that have implemented flexibility are given. Three British examples, two American and one South African example are discussed.

4.5.1. Ford Motor Company (UK)

Until its 1985/86 negotiations, Ford had 516 different manual worker titles. In the negotiations of 1985 Ford offered a 3 per cent increase plus additional awards if agreement was reached on changes to work practices, based on the following principles:

- versatility and flexibility;
- the acquisition and use of new skills; and
- the elimination of inefficient lines of demarcation.

This meant that electrical and mechanical craftsmen were to acquire a comprehensive listing of additional skills, which introduced radical changes in the Company's practices. Similarly the production operators would be required to perform all the tasks, should process and operating conditions call for it. They were to undertake any necessary training programmes, and flexibility and mobility within and between departments was seen as essential. Operators were also to keep their immediate and surrounding work areas clean (Wickens 1987, p 49).

The 516 different manual worker titles were reduced to 52. Ford is now claiming a 50 per cent increase in productivity for the period 1986/1987 (Wickens, 1987, p 49).

(By 1985 Chrysler who had 150 different job classifications had not managed to reduce their numbers drastically. In his autobiography Lee Iacocca (1985, p 321) writes the following about different attitudes to work, "Whereas the attitude of the Japanese worker is 'How can I help?', the attitude of his American counterpart is, all too

often, 'That's not my job'".)

4.5.2 Caterpillar Tractors (UK)

The November 1985 deal between Caterpillar Tractors and the Amalgamated Engineering Union (AEU) significantly advanced the cause of flexibility. Reducing the 51 job titles to 12, it also provided that within each of five pay groups, flexibility would be limited only by individual capability. Specific examples included flexibility between assemblers, adjusters and testers, multi-skilling of craftsmen and co-operation on sharing job knowledge and experience. Once craftsmen became multi-skilled in both electrical and mechanical work, they received a higher rate of pay. (Wickens, 1987, p 49)

4.5.3 Vickers and Cammell Laird (UK)

Finally, not even the most traditional areas of British industry were exempted from flexibility. Vickers and Cammell Laird, following their 1986 privatisation, negotiated a comprehensive package with the CSEU, which included, according to Wickens (1987, pp 50-51) a statement that no prior notification would be required for implementation of flexibility, as it was an ongoing procedure.

As seen, these agreements were usually stated in general terms. There were no minutely detailed agreements stating which trade or craft was to do which specific aspect of another trade or craft.

Wickens (1987, p 49) states the following clearly, "if you have an agreement which provides for total flexibility, anything else specified will be restrictive in nature".

Many other British examples exist, for example, Rothmans International Tobacco; Scottish and Newcastle Breweries; ICI; Findus, at Long Benton; Colemans of Norwich; Inmos; Babcock Power and Anglesey Aluminium, which will not be discussed in this research paper.

4.5.4 Lechmere Incorporated (USA)

Toward the end of 1987 Lechmere experienced a shortage of labour at its new store in Sarasota. In order to deal with this shortage they offered the Sarasota workers salary increases based on the number of jobs they learnt to perform. Cashiers were encouraged to sell records and tapes. Sporting goods salesmen got tutoring in forklift driving. That way Lechmere could quickly adjust to staffing needs simply by redeploying existing workers. Also the pay incentives, along with the prospect of a more varied and interesting workday, proved valuable lures in recruiting. According to Alster (1989, p 36) the Sarasota store now has a work force that is 60 percent full-timers, versus an average of 30 percent for the rest of the chain. Chaddock, Lechmere's senior vice president for personnel, says the Sarasota store is substantially more productive than the others. (It is interesting

to note that Gupta, Jenkins and Carington (1986, p 116) in their study of 154 American companies found that 89,5% of the companies said that skill-based pay increased workforce flexibility to a large extent. (Compare also Lawler and Ledford, 1985, pp 33-34 and Tosi and Tosi, 1986, pp 57-66).

It was mainly a labour shortage that drove Lechmere's managers to try training workers in more than one skill.

Alster (1989, p 36) warns that "a flexible work force is not an all purpose 'Mr Fixit' for companies that want to increase speed, efficiency, quality, productivity and job satisfaction".

4.5.5 Motorola (USA)

Many manufacturers have found that teams of cross-trained workers are vital to quality improvement. They can detect flaws in each other's work, apply problem-solving techniques more effectively, and fill in for each other as needed - which is critical in just-in-time systems that function without mountainous buffers of inventory and work-in-progress.

In 1985 Motorola experienced problems regarding the quality of their products, so much so, that the International Trade Commission remarked on the relatively high failure rates reported by some purchasers (Alster, 1989, p 37). The company

shifted responsibility for detecting defects from inspectors at the end of the assembly line to individual production workers. Then, because workers who understand the entire production process are the most adept at defect diagnosis, Motorola overhauled its compensation system to reward those who learnt a variety of skills.

The defect rate fell by 72 per cent, from 1 000 per million parts in 1985 to today's 233.

In 1988 the company was one of three winners of a federal Malcolm Baldridge National Quality award.

Similarly, there are many other examples of successes achieved in American companies due to the flexible utilisation of their workforces. These include General Motors, National Steel, USAA (an insurance and financial services company), Arlington Heights (a cellular phone factory), IBM, Kodak and Ford's Range Steel plant.

Finally, having considered both British and American examples, a South African company that has, among other things, included flexibility in the company culture, is examined below.

4.5.6 Bell Equipment Company (SA)

Bell Equipment originated in 1950 and attributes the company's success to the following factors: open communication, everyone can make a contribution, family and team spirit, management by

walking around, customer service, single status, promotion and pay based on merit, profit-sharing and the flexible approach of employees.

At Bell Equipment they spend as little time as possible on drawing up job descriptions and grading jobs as these have the nett effect of putting employees in boxes and promoting the attitude 'it is not my job if it is not in my job description'. Instead Bell believes that they need a flexible approach which would promote a feeling of team spirit and an attitude of 'can I help you with your job so the whole company can benefit'(1988).

An illustration of the flexible utilisation of their workforce lies in the following example. In order to satisfy their customers the company selects their best vehicle service engineers, who show the interest, and spend R30 000 training them as helicopter pilots. The technical engineer therefore flies out to the customer, services his vehicles and returns. No unutilised time is lost. In this way they can offer their customers a competent technical reaction unit that reacts extremely quickly, minimises the customers' downtime and reduces company costs. Furthermore they are able to retain the engineers' services for a far greater period of time in his particular field.

4.6. SUMMARY

This chapter focused on flexibility as another factor in productivity improvement. Three main case-studies, British Leyland, Nissan (UK) and Pilkington Glass (UK) were discussed as well as a few other British, American and South African examples.

One of the main opponents of flexibility has been MacInnes (1988, pp 12-15) who claims that there are two problems with the flexibility theme: Firstly, the researcher mentioned believes that the empirical evidence for the actual spread of flexibility is unconvincing, and secondly that the reason why companies should implement flexible working is not clear. Atkinson (1985, pp 153-154), after his study of 103 firms, concluded that the main constraints on flexibility were union demarcation, inadequacy of skills, the resulting costs of training and shortage of training resources. MacInnes (1988, p 8) adds to the above constraints the need for higher quality supervision, the indispensability of flexible workers and the greater bargaining power given to the flexible workers.

Although the above criticisms and constraints exist it is believed that the flexibility of the 1980's is being confused with the general type of productivity agreement of the 1960's and 1970's. A 1986 British Treasury article (p 3) argues that the 1980 agreements signal a complete change in labour

practices from the attempt to defend traditional positions against encroachment by market forces to the attempt to develop the potential of the organisation and its employees fully. The evidence, as seen in this chapter, is that flexibility agreements are now quite widespread and are achieving excellent results.

The greater range and complexity of new technology, combined with the need for higher quality or faster throughput, puts a premium on the general skill level of the workforce, its commitment to the organisation and productivity and the overall quality of its people.

The above reasons and the examples of the success of flexibility in many companies around the world, provided the stimulation to investigate the existence of flexibility and their possible success in South African companies.

CHAPTER 5

RESEARCH METHODOLOGY

5.1. Basic approach : qualitative research

This study has attempted to utilise appropriately a qualitative research method. According to Patton (1980, p 327) "the purpose of qualitative analysis is to provide useful, meaningful and creditable answers to the research questions posed by the researcher".

Typically, qualitative data consist of detailed descriptions of situations, events, people, interactions and observed behaviours; direct quotations and exerpts from documents. Quantitive measurement relies upon the use of instruments that provide a standardised framework in order to limit data collection to certain predetermined response or analysis categories. Qualitative measures describe in depth people's experiences, situations and events (Merton, Coleman & Rossi, 1979, p 12; Bailey, 1982, pp 62-63).

Regarding its advantages, qualitative data are attractive. They are sources of well-grounded, rich descriptions and explanations of processes occurring in local contexts. With qualitative data one can preserve chronological flow, assess local causality and derive fruitful explanations. Furthermore,

qualitative data are more likely to lead to serendipitous findings and to new theoretical integrations; they help researchers go beyond initial preconceptions and frameworks (Miles and Huberman, 1984; Patton, 1980; Van Maanen, 1983; Guba, 1979). The findings from qualitative studies have a quality of "undeniability" as Smith (1978) has put it.

However, the demands of conducting good qualitative research are not small. Qualitative measures are longer, more detailed and variable in content (Patton, 1980, p 28). Collecting data is a labour-intensive operation (often making it expensive), and field notes can take many months to complete a thoughtful analysis. Furthermore, the bulk of data collected makes it unlikely that a sample of more than a few dozen cases can be managed. So usually there is a serious question of sampling involved or otherwise stated, the generalisability of qualitatively derived findings. Also, given the fact that words are slippery and ambiguous, the possibility of researcher bias looms quite large. The replicability of qualitative analysis is a concern (Miles and Huberman, 1984, pp 15-16).

"The most serious and central difficulty in the use of qualitative data is that methods of analysis are not well formulated" (Miles, 1979, p 11).

Interestingly, more and more "quantitative" methodologists, operating from a logical positivist stance (for example Campbell, Bronfenbrenner,

Croubach and Snow, 1982, p 28) are using naturalistic and phenomenological approaches to complement tests, surveys and structured interviews. On the other side, an increasing number of ethnographers and qualitative researchers are using predesigned conceptual frameworks and prestructured instrumentation, especially when dealing with more than one institution or community (Mishler, 1979).

So without our realising it very clearly, the paradigms for conducting social research have shifted beneath our feet, and most people now see the world with more ecumenical eyes.

It is important to note that this approach necessarily involves orderliness, thoroughness, and explicitness and therefore a certain degree of formalisation of the analysis process. This methodical and structured way could be seen in Miles and Huberman's (1984, p 20) approach to qualitative data analysis, which is briefly outlined in the following section.

5.1.1 Miles and Huberman's qualitative data analysis approach

Their approach as seen in the following figure comprises mainly four components:

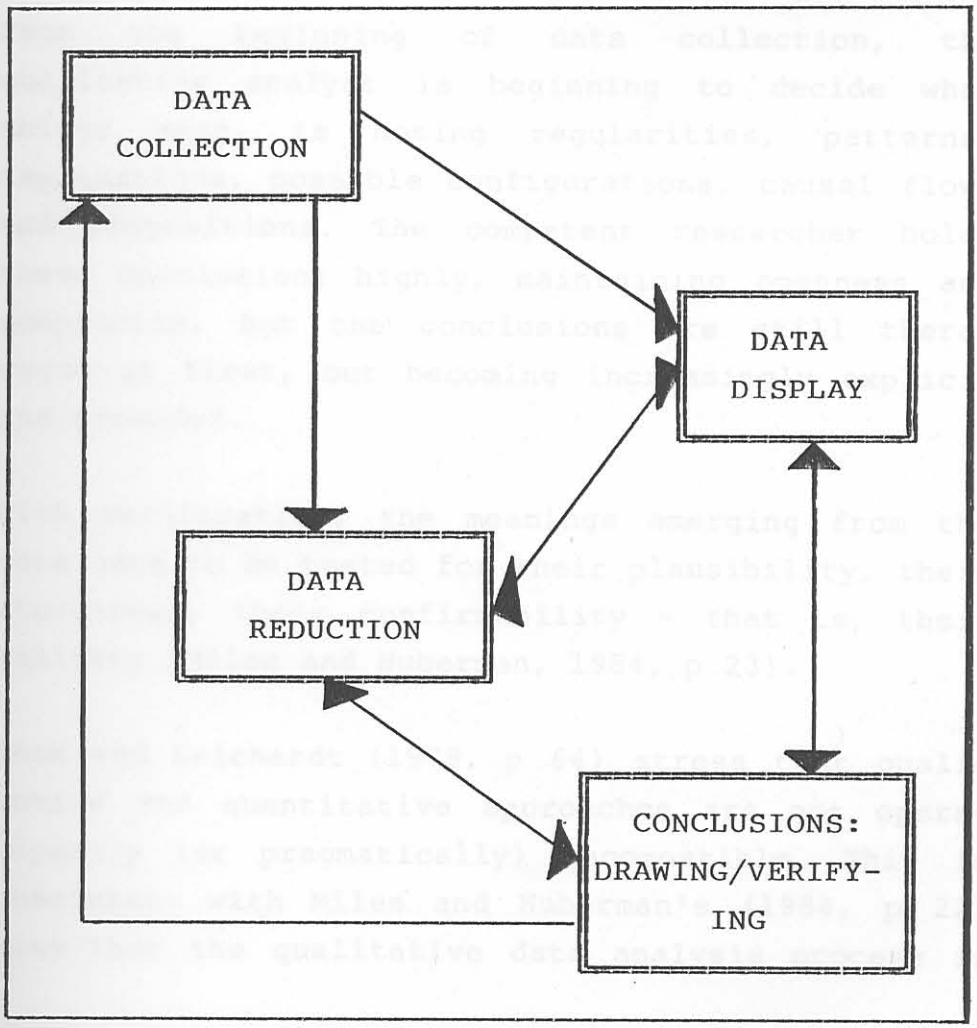
(i) Data collection

(ii) Data reduction

(iii) Data display

(iv) Conclusions and verification

FIGURE 5.1: Components of qualitative data analysis.



As already stated the data collected appears mainly in words rather than numbers and may have been collected in a variety of ways, for example, observation, interviews and extracts from documents. Data reduction refers to the process of selecting, focusing, simplifying, abstracting, and transforming the raw data that appear in written-up field notes; while data display refers to presenting information in a compressed, ordered, spatial format, so that the user can draw valid conclusions, and take the needed action (Miles and Huberman, 1984, p 22).

From the beginning of data collection, the qualitative analyst is beginning to decide what things mean, is noting regularities, patterns, explanations, possible configurations, causal flows and propositions. The competent researcher holds these conclusions highly, maintaining openness and scepticism, but the conclusions are still there, vague at first, but becoming increasingly explicit and grounded.

With verification, the meanings emerging from the data have to be tested for their plausibility, their sturdiness, their confirmability - that is, their validity (Miles and Huberman, 1984, p 23).

Cook and Reichardt (1979, p 64) stress that qualitative and quantitative approaches are not operationally (or pragmatically) incompatible. This is consistent with Miles and Huberman's (1984, p 22) view that the qualitative data analysis process is

actually no more complex, conceptually speaking, than the analysis modes used by quantitative researchers. They, too, must be preoccupied with data reduction (computing means, standard deviations, indexes), with display (correlation tables, regression printouts), and with conclusion drawing/verification (significance levels, experimental/control differences). The point they make is that these activities are carried out through well-defined, familiar methods, have canons guiding them, and are usually more sequential than iterative or cyclical. **Qualitative researchers on the other hand, are in a more fluid and a more pioneering position.**

5.2. Conceptual framework

Typically qualitative research involves a loosely structured, emergent, inductively grounded approach to gathering data. However, Miles and Huberman (1984, p 27) believe that when one is interested in some better understood social phenomena within a familiar setting, a loose, highly inductive design is a waste of time. Usually the researcher has a fairly good idea of the parts of the phenomenon that are not well understood and knows where to look for these things, - in which settings, within which processes or during what class of event.

Finally, the researcher usually has some initial ideas about how to gather the information - through interviews, observations, perhaps even a

well-validated instrument. The abovementioned researchers as well as Patton (1980, p 28) suggest that from the outset, at least a rudimentary conceptual framework, a set of general research questions, some notions about sampling, and some initial data-gathering devices should exist.

Advantages of this method include the fact that the research

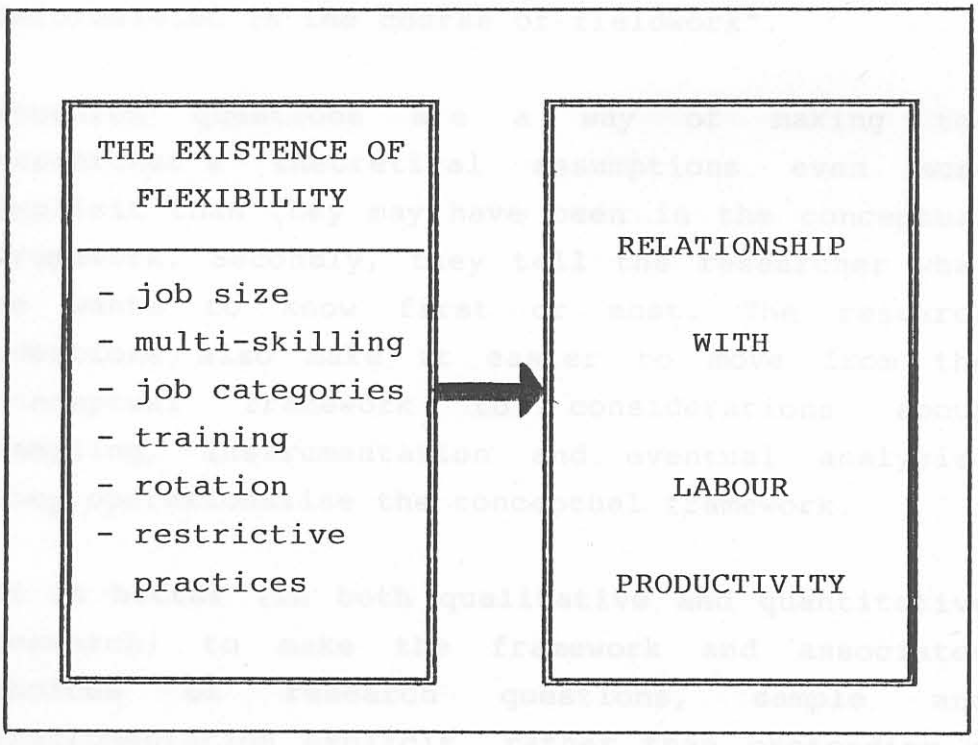
- can be completed over a shorter period of time,
- comparability across sites is improved,
- less information overload is experienced, and
- more in-depth site-sensitive information can be obtained (Miles & Huberman, 1984, p 29).

A conceptual framework basically explains, either graphically or in narrative form, the main dimensions to be studied - the key factors, or variables - and the presumed relationships among them.

Although these frameworks are focusing and bounding devices they need not be blinding and limiting. As qualitative researchers collect data, they revise their frameworks, make them more precise, replace empirically inefficient factors with more meaningful ones and reconstrue relationships.

In this study use was made of a very simple conceptual framework to map the territory being investigated.

FIGURE 5.2 : Conceptual framework of this study



As seen in the above figure the study was to focus on the existence of flexibility in the South African motor manufacturing industry as determined by certain indicators such as multi-skilling, rotation etc. Furthermore, the aim was to see whether there was any relationship between the existence of flexibility and the level of labour productivity.

5.3. Formulating research questions

According to Miles and Huberman (1984, p 35) this is a direct step from the elaboration of a conceptual framework, and represents the facets of an empirical domain that the researcher most wants to explore. "Research questions can be general or particular, descriptive or explanatory. They can be formulated at the outset or later on, and can be refined or reformulated in the course of fieldwork".

Research questions are a way of making the researcher's theoretical assumptions even more explicit than they may have been in the conceptual framework. Secondly, they tell the researcher what he wants to know first or most. The research questions also make it easier to move from the conceptual framework to considerations about sampling, instrumentation and eventual analysis; they operationalise the conceptual framework.

It is better (in both qualitative and quantitative research) to make the framework and associated choices of research questions, sample and instrumentation explicit, rather than pretending a sort of inductive purity, typical of qualitative social research (Miles & Huberman, 1984, p 36; Van Maanen, 1983, p 59; Krippendorff, 1980, p 26).

In this study two important research questions are considered:

(i) To what extent does flexibility exist within the South African motor manufacturing industry, and

(ii) is there any relationship between the extent to which flexibility exists and labour productivity.

5.4. Sampling

Sampling involves not only decisions about which people to observe or interview, but also about settings, events and social processes (Wright, 1979, p 57; Kerlinger, 1973, pp 117-118). Multiple-site studies also demand clear choices about which sites to include.

In this research the danger existed that one could sample too narrowly and therefore the total population was involved. In fact, the total population represented a whole industry.

For the purpose of this research it was decided to focus on the South African motor manufacturing industry. The main reason for the selection of this industry was the similarity with the companies where flexibility had been implemented, namely, Nissan (UK), British Leyland and Ford. The idea was therefore to determine whether flexibility existed in the South African motor manufacturing industry as it did in similar overseas companies and whether it

would have a similar impact. However, the most important reason for the selection of the South African motor manufacturing industry is because it is going through a very difficult but interesting period where some are achieving excellent results through the efficient utilisation of their people while others are struggling to place their relationships with their employees on a sound footing. A clear need for an investigation into the different results obtained through different approaches became apparent.

For comparative purposes the study focused on one department within all the companies, namely the trim and mechanical department which involves mainly assembly work. The primary responsibility of this department is to ensure that all the different parts which constitute a vehicle are fitted into the body shell up to a point where a complete unit is produced. This department constitutes the most labour-intensive department in the companies and involves short, routinised operations on a mechanised, moving line. The work is therefore physical and repetitive by nature, involving little variety. Walker and Guest (1952, p 12) in their study on the vehicle assembly line, described the characteristics of the average mass production job as follows:

- "mechanical pacing of work,
- repetitiveness,

- minimum skill requirement,

- predetermination in the use of tools and techniques,

- minute subdivision of product worked on, and

- minimum mental attention required".

Due to the way the work is organised and because of the assembly line, workers are closely linked to each other; for example, an absent worker can influence a number of other workers. This is the same for a slow, new, untrained or an uncaring, irresponsible worker who fits parts incorrectly making the next workers' job more difficult. The workers are therefore highly interdependent on each other. This is why this type of department is ideal when studying the issue of flexibility.

The data was collected from two different sources, namely, the production and personnel directors at each company. By using two different sources the reliability and validity of the findings were enhanced.

5.5. Approach to the collection of data

The seven South African motor manufacturing companies were approached by way of a letter to their respective Chief Executive Officers, Chairmen or Managing Directors asking for their participation

in the research and their permission to visit their factories and speak to the production and personnel directors. They were assured of the confidentiality of the study. All the companies responded positively and interviews and tours were set up, which took place over a period of three months.

5.5.1. Instrumentation

There are both arguments for and against prior instrumentation in qualitative research. Miles and Huberman (1984, p 43) suggest that for an exploratory, descriptive study where the parameters are unknown, heavy front-end instrumentation is inappropriate. And with a confirmatory study, with relatively focused research questions and a well-bounded sample of persons, events or processes, well-structured instrument designs are the logical choice. They go further by saying that within a given study, there can be exploratory and confirmatory aspects that call for differential front-end structure. Also a multiple-site study requires more front-end preparation, for example, standardised instruments, so that findings could be laid side by side during analysis and cross-site comparisons made.

Minimal prior instrumentation puts the emphasis on construct and contextual validity, where qualitative studies can be especially strong. The heavy prior instrumentation emphasises internal validity, generalisability and manageability, all worthy causes. However, the amount and type of instrumentation should be a function of one's conceptual focus, research questions and sampling criteria (Blackler & Brown, 1978, p 50).

Based on the particular aims of this research two approaches to the collection of data were selected, a semi-structured and an unstructured approach.

In the absence of a well-developed, valid and reliable questionnaire regarding flexibility, a rather simple interview guide was developed to determine whether flexibility existed in the South African motor manufacturing industry.

This interview guide (see Annexure 1) comprised the semi-structured approach while the unstructured approach mainly involved the observations made during a tour through the trim and mechanical department.

The questions in the interview guide were derived from the literature, and more specifically, from the chapter on flexibility in Wickens' book (1989, pp 39 - 54), and as covered in this dissertation's literature review (see Chapter 4 pp 61 - 66). By considering what was done to enhance flexibility in Nissan (UK) questions were formulated that would indicate whether flexibility existed within the departments of the companies researched.

The relationship factor, namely, labour productivity, was selected based on the results of flexibility as recorded in all available literature on flexibility.

In designing the interview guide the following features as stressed by Patton (1980, p 200) and Miles and Huberman (1984, p 46) are important:

(i) It must be a guide not a schedule, and must have latitude for asking and sequencing the questions and to segment them appropriately for different respondents.

(ii) The guide must be developed after initial fieldwork (to clarify context), has been done, but prior to deeper and broader data collection (therefore tested before used).

(iii) The guide must be a way of ensuring that the minimum data is collected from the respondents and must provide some basis of reliable and valid comparison between the respondents from which certain patterns, correlations, and deductions could be made.

In designing the interview guide the purpose was therefore not to create an absolutely valid and reliable questionnaire that would withstand any test on either. According to Miles and Huberman (1984, p 46) the issues of instrument validity and reliability in qualitative research relies largely on the skills of the researcher. The latter was interviewing, observing and recording, while modifying these from one field trip to the next.

Regarding the question of how valid and reliable the researcher is likely to be as an information-gathering instrument, the following can be regarded as the researcher's best investment:

(i) Some familiarity with the phenomenon and the setting under study,

(ii) strong conceptual interests,

(iii) a multi-disciplinary approach, as opposed to a narrow grounding or focus in a single discipline, and

(iv) good investigative skills, including the ability to draw people out, and the ability to ward off premature closure (Miles & Huberman, 1984, p 47; Patton, 1980, p 260; Van Maanen, 1983, p 58).

5.5.2 Data collection

With the aid of the abovementioned guide the production and personnel directors at each company were interviewed separately. Where either person was not available the manager(s) just below these levels were interviewed. The interviewees were briefly informed about the purpose of the interview and the background to the research.

Throughout the interview the confidential nature of the information was emphasised. The assurance was given that under no circumstances would the companies be referred to by name in the final report, but that a coded format would be used.

In the semi-structured interviews that followed any misinterpretations on the part of the interviewee were clarified. Due to the open-ended, in-depth, intensive interviewing approach followed, much other valuable information came to the fore during the interview. This information added richness, quality and even explanations to the study.

The tours through the trim and mechanical departments in the company of the production directors presented a further opportunity to observe and question the existing work practices, to get a better understanding of the complexities of the situation and to verify the information obtained during the interview. This information complemented and extended data collected during the interview.

Detailed notes were taken throughout the interviews as well as during the tour of the departments. After the visits the observations and impressions were summarised.

It is accepted that the reliability of the responses during the interview can be questioned as well as the notes taken, seeing that it did not take place in a controlled environment. However, everything possible was done to record and reflect accurately the true responses and situation.

Furthermore, by having interviews with people from different functions within the same company, namely, production and personnel, very interesting perspectives were obtained giving a more detailed scenario. Although the production director was the main source of information (due to his first-hand experience of work practices in his trim and mechanical department), the personnel director could enrich and verify the information and was more able to provide the information pertaining to, for example, job categories and training. The result was that, in fact, each company's data was produced and verified by two knowledgable respondents thereby improving the validity and reliability of the findings.

5.6. Data analysis

According to Patton (1980, p 297) there is typically not a precise point at which data collection ends and analysis begins. The first step of analysis involved converting the field notes into logical detailed reports which took on the format of a table. In so doing the field notes, which contained only half of the actual content, were improved considerably by adding the missing content, as well as the researchers' reflections and commentary on issues that emerged during the process.

Seeing that seven sites or companies were studied it was decided to cross-site analyse the data, of which the aim was to increase generalisability and to determine the kinds of social structures to which a theory or sub-theory would be applicable.

Although there are no agreed-upon data display methods, and analysts are encouraged to invent their own, it was found on reviewing the data, that the site-ordered descriptive matrix of Miles and Huberman (1984, pp 158 - 165) would be a functional method that would provide valid answers to the questions asked.

Miles and Huberman (1984, p 160) describe this matrix as one that "contains first-level descriptive data from all sites, but the sites are ordered according to the main variable being examined, so that one can see the difference among high, medium and low sites. Thus it puts in one place the basic data for a major variable, across all sites".

The first step in building the first detailed report was to place the companies in order of labour productivity levels, ranging from the company with the highest labour productivity, to the company with the lowest labour productivity.

Seeing that labour productivity figures were not available from any independent institution such as the National Productivity Institute (NPI) or the National Association of Automobile Manufacturers of South Africa (NAAMSA), the figures were obtained from the interviewees and the following formula was used to determine the labour productivity for the individual companies:

Labour productivity=

$$\frac{\text{Average no. of cars produced per day}}{\text{No. of operators in the trim and mech. dept.}} \times \frac{100}{1}$$

The term, "cars" in the above formula, refers to passenger vehicles and therefore excludes light and heavy commercial vehicles. Jobs in truck assembly, for example, differ considerably from their equivalents in car assembly. Cycle times are much longer, mechanical pacing is much less and each vehicle is different in line with customer requirements. Truck assembly is therefore more enriched than car assembly under normal circumstances. Regarding the number of operators only direct operators in the trim and mechanical departments were taken into consideration. Indirect operators as well as operators in other departments were excluded. For comparative purposes both the number of cars and the number of operators reflect average figures taken over a period of a year.

The average number of cars produced per day greatly varied from company to company. All companies strove to produce the highest quality and volume of vehicles possible.

Because of the confidentiality of the study and especially the sensitivity regarding the number of cars produced by the different companies the researcher agreed not to reveal this information.

After the interview guide and the detailed report had been read carefully the flexibility indicators were selected and the information systematically arranged into these categories.

Having done this the detailed report was refined again, because it appeared that the information had been abstracted too much and valuable, rich information was lumped together too grossly into categories. More categories were decided on and the raw data summarised into brief phrases, sentences and direct quotes. These were put into the various categories with the emphasis being placed on not losing rich information. This second detailed report was reviewed again and the inputs checked against the original field notes. When working through successive iterations the findings became conceptually crisper and more inclusive. (The second detailed report is included in Annexure 2.) To ensure that companies remained unidentifiable certain data had to be withheld from the detailed report in Annexure 2. This was, however, done in such a manner that the final results were not influenced in any way.

The next step was to construct a summarised report which would be in a more refined format for the reader. This report gives the reader a readily accessible overview of the detailed report, the existence of flexibility, and secondly, the relationship between flexibility and labour productivity across all the companies. (See full summarised report in Annexure 3 and sections of report in Chapter 6.)

In creating this summarised report, which is more focused and simplified, the researcher was forced to decide on the conceptual basis of the decision rules. Since Miles and Huberman (1984, p 164) stress that the decision rules for data transformation and entry must be explicit, the decision rules are given below:

(i) Companies were ordered again according to their labour productivity levels - from highest to lowest.

(ii) Where numbers, percentages or "Yes/No" answers were given these were used; therefore the shortest possible reflection was used.

(iii) Where the answer given was definite yet did not reflect the full picture or was not a true reflection or where the information was uncertain and needed further qualification, the data was put into brackets.

(iv) Detailed information that was interesting but not crucial was ommitted.

(v) Information was described in such a way that

patterns could be seen for the three different categories, and would eventually give rise to the emergence of possible explanations.

From the summarised report it became possible to see patterns for higher and lower labour productivity and explanations regarding flexibility began to emerge. The report required well-grounded data from the companies and did not allow vagueness or premature abstraction to occur.

There is a direct link between the interview guide used to collect the raw data and the rows in the matrix. As far as possible raw data was kept without running into excessive size or complexity. Naturally, valid ordering (which was not difficult in this study) is crucial to the use of this method.

In this study the interest lay in the ramifications of two variables, and since the labour productivity variable was a well-known, simple, quantitative variable and was easily ordered, a second variable was chosen, namely, the relatively unknown flexibility variable. Not only could the extent to which flexibility exists be determined but also whether labour productivity is related to the existence of flexibility, by using indicators of the existence of flexibility.This produced a very rich report allowing many patterns to come forward. This would not have been possible had the only aim of the research been to determine whether a statistically significant correlation at the 0,05 and 0,01 level between flexibility and labour productivity existed. However, by making use of qualitative methodology it was possible not only to identify clear and meaningful patterns indicating where associations do

exist, but also to explain and expand on the data collected and analysed. This would not have been achievable with a quantitative technique. (The nature of the research subject and the variations in ranges as seen in the results, causes a quantitative technique such as the Spearman rank-order coefficient of correlation to be less applicable.)

The qualitative method of site-ordered descriptive matrix is therefore very useful when studying the relationship between two variables thought to be associated, but where the direction of causality is unknown or ambiguous.

CHAPTER 6

RESULTS

6.1. Introduction

This chapter focuses on the findings of the study done in the seven South African motor manufacturing companies. Meaning is given to the results as displayed in the summarised report (see annexure 3 and the sections of this chapter) which had as its basis the detailed report of Annexure 2. The results are systematically discussed in categories which correspond with those in the interview guide and summarised report.

As mentioned in Chapter 5 (p 99) the companies will be referred to by their coded names. These codes do not only refer to the particular company but also reflects their position in terms of level of labour productivity. The codes are in alphabetical order from A to G which thus reflects the descending order of labour productivity. Therefore company A has the highest labour productivity and company G the lowest. For example, the code, company C, not only refers to a particular company but also indicates that this company had the third highest labour productivity. For brevity's sake, the results will be discussed according to code, without specifically mentioning the company's position in terms of labour productivity.

6.2. Size of job

TABLE 6.1: The relationship between size of jobs and labour productivity

	SIZE OF JOB INDICATORS				
COMPANIES	NO. OF TASKS	MAINTE-NANCE: THINK/ CALL FOR HELP	LENGTH OF JOB CYCLE (MIN.)	% MULTI-SKILLED	USE SKILLS MATRIX
A	6-10	think	2,7	90%	yes
B	6-10	think	7	80%	yes
C	6-10	think	3	80%	yes
D	5	think	7	90%	yes
E	5	call for help	3	50%	no
F	2-4	call for help	3,5	50%	(yes)
G	2-4	call for help	7,5	30%	no

(Note: Brackets indicate that data either needs further qualification, was uncertain or did not reflect the true situation)

(i) As seen in the table above the operators in the three companies (A, B and C) with the highest labour productivity could on average perform six to ten tasks. Operators in companies D and E with moderate labour productivity could perform an average of five tasks while in the two companies with the lowest labour productivity, namely companies F and G, operators could

perform two to four tasks. There is therefore a clear pattern here that in companies where operators on the trim and mechanical assembly line can perform a greater number of tasks the labour productivity is higher. An association exists between these variables. This corresponds with the results that Nissan (UK) achieved through multi-skilled operators (refer chapter 4, pp 64, 73-74).

(ii) Furthermore, table 6.1 shows that when a small technical problem occurred on the assembly line operators in the four companies with the highest labour productivity (companies A, B, C and D) were expected to think and come up with causes and possible solutions to the problem and therefore participate in problem-solving. This was not the case with the three companies with the lowest labour productivity (companies E, F and G). When the problem occurred they were merely expected to call for assistance. Here too then a clear pattern emerges, namely that labour productivity is higher where operators participate in maintenance and take an interest in and responsibility for the efficiency of their work. In both Nissan (UK) (refer chapter 4, p 64) and Pilkington Glass (UK) (refer chapter 4, p 69) the participation of operators in maintenance was regarded as important for efficient production.

(iii) Of the seven companies four companies (A, C, E and F) had an average job cycle of approximately

three minutes. Companies B, D and G had job cycles of seven minutes. No clear pattern could be seen here. There is however, an explanation for the longer cycles in two of the three companies, seeing that they build more sophisticated cars. Furthermore, those two companies place more emphasis on quality rather than volume and therefore the speed of the line is less important than in the true mass producers. It was also ascertained that the job cycle and therefore the speed of the line was influenced by many factors, for example, the number of lines, whether the lines are dedicated to certain models, the volumes required, the motivation of the workforce, the availability of supplies and the layout of the factory which determines the amount of space for parts at the assembly point. (The lengths of job cycles in table 6.1. are those for passenger vehicles in all the companies. The job cycles in light and heavy commercial vehicles are longer in all the companies seeing that a smaller volume of these vehicles is required and produced).

No association between the length of the job cycle and labour productivity could therefore be found. As far as the researcher could ascertain there is no study in literature that has proved a significant relationship to exist between the length of a job cycle and labour productivity. In Sweden (chapter 3, p 41) a study did however find that a job cycle in light assembly could be lengthened up to 20-25 minutes with no loss in

efficiency.

(iv) Regarding the percentage of operators that were multi-skilled it appears from table 6.1. that the four companies A, B, C and D with the higher labour productivity had more operators who were multi-skilled (for example 80% to 90% of their operators) than the lower productivity companies (E, F and G) who had between 30% and 50% of their operators who were multi-skilled. Multi-skilled refers to operators who are trained to do more than three tasks, and is therefore cross-trained. All of the companies stressed the cruciality of multi-skill training, specifically in the light of absenteeism which has a major impact on productivity. Companies A, B and C said that their higher percentage of multi-skilling was achieved through a planned programme of training.

A clear pattern therefore emerged from the data, namely that where companies had a higher percentage of multi-skilled operators the labour productivity was higher. An association therefore existed between the degree of multi-skilling and labour productivity. This corresponds with the successes achieved with multi-skilling in Swedish companies (refer chapter 3, pp 43-44), Nissan (UK) (refer chapter 4, pp 64, 74), Pilkington Glass (UK) (refer chapter 4 pp 68-69, 75), Ford (UK) (refer chapter 4, pp 75-76) and Caterpillar Tractors (UK) (refer chapter 4, p 77).

(v) Five of the seven companies (A, B, C, D and F) made use of a skills matrix (sometimes called a versatility chart or an inventory skills chart) whereby the different tasks an operator was able to perform were ticked off alongside his name. This is done for each team which enables the team leader or supervisor to do line-balancing. Furthermore it facilitates training in that it not only indicates which skills an operator has, but also in which tasks the team has too few trained operators. As can be seen in table 6.1. the two companies (G and E) that do not make use of the skills matrix have the lowest and third lowest labour productivity respectively. The company with the second lowest labour productivity has recently implemented a skills matrix which is not yet working effectively. Companies A, B and C make use of quite an elaborate system, which is either computerised or manually completed by team leaders or supervisors, but with the emphasis on making it as visual and meaningful to the operators as possible. **It does therefore appear that a positive association exists between the degree of labour productivity and the existence of an efficient skills matrix.**

6.3. Job categories and descriptions

TABLE 6.2 : The relationship between job categories and labour productivity

COMPANY	JOB CATEGORY INDICATORS			
	NO. OF CATEGO-RIES	CATEGO-RIES RE-STRICTIVE	JOB DE-SCRIPTIONS RESTRIC-TIVE	SATISFIED WITH CATE-GORIES
A	8	no	no	no
B	7	no	no	no
C	9	no & yes	no	no
D	9	no & yes	no	no
E	9	yes	no	no
F	8	yes	no	no
G	9	yes	no	no

(i) As can be seen from the above table there does not appear to be an association between the number of job categories for which different pay scales exist and labour productivity. Four companies (C, D, E and G) have nine categories of which two are covered by an industrial council agreement. Companies A and B which have the higher labour productivity do have fewer job categories than the above four. However, company F which had eight categories had the second lowest labour productivity. Therefore a definite pattern could not be found.

All the companies had a great number of job titles and descriptions within these categories. Without exception all the companies emphasised their dissatisfaction with the large number of categories and job titles and that they would like to reduce both.

(ii) With regard to the restrictive nature of these categories it appears from table 6.2. that companies A and B, with the higher labour productivity, did not find these categories restrictive. The reason for this was that operators were expected to perform tasks and help out where necessary irrespective of their job category, because that was the culture of the organisation. Companies C and D said the categories were to a certain extent restrictive. Although operators were expected to do any other tasks which could be in a higher or lower category they said that they could not keep them in higher categories for long periods since they then wanted higher pay or promotion. The categories were therefore restrictive when it involved an operator working for a long period in a higher pay category. Companies E, F and G with the lower labour productivity reported that the categories and job titles were very restrictive in that operators not only wanted higher pay and promotion for doing tasks in higher categories but also tended to be unwilling to do other work. The reaction was often that it was not their job. The latter is naturally also an indication of a culture,

commitment and attitude problem. It is for all the above reasons that the companies would like to reduce further the number of job categories. The motor industry union, National Union of Metal Workers of South Africa (NUMSA), is strongly resisting any reduction in the number of categories and job titles. **The data therefore reveals that a pattern does exist between the degree of restrictiveness of job categories and labour productivity. An association can be seen where companies with higher labour productivity experience their job categories as less restrictive than do companies with lower labour productivity.**

(iii) None of the companies found their job descriptions to be restrictive. The reason for this was because descriptions were not detailed and specific but were short and meaningless. In fact where job descriptions existed they were seldom used, since emphasis in assembly line jobs in the motor industry have been placed on operator procedure manuals, which explains the steps to perform a given operation. The job descriptions would become extremely restrictive if the union was to enforce them exactly as they existed in documents. **No association could therefore be found between the restrictive nature of job descriptions and labour productivity.**

In the literature it appeared that job categories and titles were very restrictive in

nature and that great emphasis was placed on reducing their numbers (refer Wickens, chapter 4, pp 62, 74; Chaplin and Fillingham, chapter 4, pp 68-69 and Bell, chapter 4, p 81). A possible explanation for the differences in extent of restrictiveness could be that in the South African motor manufacturing industry the attitudes of operators are less hardened and that unions have not focused much on the actual work operations and job categories and descriptions.

6.4. Compensation system

TABLE 6.3. The relationship between compensation systems and labour productivity

	COMPENSATION SYSTEM
COMPANY	REWARD FOR EXTRA SKILLS
A	operators: no team leaders: yes
B	cperators: no team leaders: yes
C	operators: no springers: yes
D	yes: 10c ph for more skilled
E	operators: nc springer: 15c ph more
F	operators: no springers: yes
G	operators: nc springers: 5c ph more

(i) As seen in table 6.3 none of the companies except company D rewarded operators for acquiring additional skills. Company D paid the operator who had more skills 10 cents per hour additional to the pay received in his job category. The other companies all mentioned that the ideal would be to have a flexible pay structure whereby operators could be paid extra for each additional skill acquired. However, they regarded the additional administration that it would involve as a major restraint, although companies A, B and C were sure that the actual benefit would outweigh the cost by far.

Where companies such as C, E, F and G made use of springers, slipmen, reliefmen and repairmen they were paid between five cents and 15 cents per hour extra (within their categories) because of their multi-skilledness. (As seen above these people are named differently at the different companies so for comparability and confidentiality they are referred to as "springers" throughout table 6.3. Companies A and B who made use of team leaders also paid them more within their categories.

No association between paying for additional skills and labour productivity could be found in the data.

Four examples could be found in literature where employees were rewarded for additional skills obtained, namely Pilkington Glass (UK) (refer

chapter 4, p 69), Caterpillar Tractors (refer chapter 4, p 77), Motorola (refer chapter 4, p 80) and Lechmere Incorporated (refer chapter 4, p 78). It is still a very new concept and the administration costs are sometimes considered to be too high.

6.5. Detecting quality defects

TABLE 6.4 : The relationship between the responsibility for detecting quality defects and labour productivity

	DETECTING QUALITY DEFECTS
COMPANY	WHOSE RESPONSIBILITY
A	supervisor and operator production is responsible your own car
B	operator, supervisor and inspector production is responsible
C	at the source: operator everyone
D	foreman and inspector everyone through profit bonus
E	inspector everyone supposed to be
F	inspector
G	inspector

(i) In the above table a clear association could be seen in the degrees of labour productivity and who is responsible for detecting quality

defects. In companies E, F and G (who had the lowest labour productivity) the quality inspector was responsible for the quality of the vehicles. In companies A, B and C where labour productivity was higher, the operators and supervisors were firstly responsible for producing quality work and because of their higher levels of flexibility and multi-skilling they were more equipped to detect quality defects. These companies emphasised that the production workers (the source) were responsible for quality and not the inspectors. One of these companies went further by having both individual and group inspection on the line and by encouraging the concept of putting together your own car. The latter involved an attitudinal approach whereby the operator was encouraged to perform his tasks in such a manner as if it was his or her own car he or she was making. The operator's responsibility for quality was so highly regarded in this company that every operator was given the power of stopping the line if a quality problem occurred. Company D followed a slightly different approach. Here the supervisors and inspectors were primarily responsible - the inspectors for detecting the defects and the supervisors for training the operators to do a quality job. The supervisor's performance was rated against the number of quality defects that occurred in his section. However, the operators were encouraged to do a quality job because they took pride in building high quality cars and because it would influence

their profit bonus for which everyone in the company qualified annually.

The importance of giving feedback on quality to the individual operators was stressed by all the companies, however it did not occur sufficiently in all the companies. Quality circles and similar team approaches existed in at least three companies; however, in some with more success than in others. This finding regarding operators' responsibility for quality strongly corresponds with those of Wickens (refer chapter 4, p 63), Chaplin and Fillingham (refer chapter 4, p 69) and Alster (refer Chapter 4, p 80).

6.6. Training for flexibility

TABLE 6.5 : The relationship between training for flexibility and labour productivity

	TRAINING FOR FLEXIBILITY				
COMPANY	NO. OF DAYS	WILLING-NESS	POLICY	WHO TRAINS	TYPE OF TRAINING
A	> 2	very eager	yes thinking	team leader	on-the-job, holistic:literacy, productivity improvement training 6M

TABLE 6.5 : The relationship between training for flexibility and labour productivity (cont.)

	TRAINING FOR FLEXIBILITY				
COMPANY	NO. OF DAYS	WILLING-NESS	POLICY	WHO TRAINS	TYPE OF TRAINING
B	> 2	very eager	yes	team leader, super-visor & co-workers	on-the-job, shop-floor manage-ment
C	1-2 hrs 10 days	(eager)	yes	super-visor & co-workers	(skills) co. clo-sure provided skills
D	2	(eager)	yes	team leader & super-visor	techni-cal skills, 6M, problem-solving
E	> 2	(willing)	yes	super-visor	trained pool, cross-training training allow-ance scheme
F	> 2	(willing)	yes	co-workers, super-visor & springers	techni-cal skills
G	> 2	(willing)	(yes)	super-visor	skills

(Note: Brackets indicate that data either needs further qualification, was uncertain or did not reflect the true situation)

(i) The data in the above table reveals that in all seven the companies it takes the average operator two days or more to learn his tasks. Learning the actual operation or task could take a few hours but learning to do the operation to standards of quality, and within the set period of time as well as to problem-solve could take up to three weeks. On the more sophisticated cars the learning period was even longer. The learning period is also influenced by the speed of the line, the degree of complication of the task and the learning potential of the operator. **No association between the number of days it takes to learn a task and labour productivity could be found.**

(ii) **A clear association between the level of eagerness to undergo training for other tasks and labour productivity was found. For example, in companies where operators had a higher level of eagerness to undergo training, labour productivity was higher too.** As seen in table 6.5 the operator's motivational level was classified into three different categories of willingness. Companies A and B's operators were found to be very eager to undergo training whilst in companies C and D with lower labour productivity they were found to be eager. In companies E, F and G (the companies with the lowest labour productivity) operators were willing to undergo training but were not eager. However, this is a generalisation for there were

individuals in the latter companies who were very eager to learn other tasks. All the companies except A and B stressed that they had many employees who felt comfortable in their jobs and did not want to move from the job or the team that they knew well and felt comfortable and secure in. This was most frequently found amongst older workers. The willingness was also influenced by the fact that the additional training could lead to the operator being promoted into a higher category. This would mean overtime and therefore those operators who generally were not committed to the company or toward co-operating with management were, in fact, not unwilling to undergo training.

All seven companies emphasised the importance of training and cross-training operators. They also all felt that they were not doing nearly enough training. One company, in particular, sets monthly targets for cross-training which, due to many constraints, are not always achieved. Many constraints exist within the industry, amongst others, the time it involves, the cost of taking people off the job for training and the availability of other skilled operators to hold down the job of the operator who is receiving training. However, most of the companies realise that these costs are very low when considering the long-term survival and growth of their company. One company, in fact, mentioned that they were losing cars to schedule every month

due to insufficient cross-training. Wickens (refer chapter 4, p 64) also mentions the cost of cross-training and that companies cannot train everyone to do everything.

(iii) All the companies affirmed that they had training policies which aimed to train operators for as many tasks as possible and to train them to the limit of their potential. Company A furthermore stressed that its aim was to train in such a way that it improved the thinking ability of operators, rather than just to perform a given task efficiently. **No definite pattern could be found between the training policy followed by a company and its particular labour productivity.**

(iv) **Regarding the identity of the trainer, no significant association could be found with labour productivity.** In three companies (A, B and D) team leaders were training the operators. In all the companies (except in Company A where the team leader did all the training) the supervisor was involved in training the operators. In companies B, C and F skilled operators were also used to train other operators. In company F springers assisted the supervisor with training.

(v) As can be seen in table 6.5 all seven companies did extensive skills training which mainly occurred on the job. This related to the actual skills needed by the operator to perform the

operations. Company C did the least skills training because of the availability of skills and the high unemployment prevalent in its region. Companies A, B and D - with higher labour productivity, did a great deal of indirect training; for example, productivity improvement training, literacy training, problem-solving, shopfloor management and general management training. Companies E, F and G with the lower labour productivity focused mainly on technical skills training. **A pattern does therefore appear that the companies that do more holistic training and stimulate the operators to use both their cognitive and motor skills, have higher labour productivity than do companies who focus only on manual skills training.**

One company made use of an extensive training evaluation concept. With this concept they evaluate and indicate on the skills matrix not only which operations the operator can perform but also how well the operator can perform the tasks. This matrix with the ratings per person per task is made visual within each team area. It assists the team leader and supervisor in line balancing and also creates motivation and group pressure toward acquiring more skills. Although the researcher expected to find more direct influence between training and labour productivity, the reason for its absence could be because all forms of training make some contribution - often in very indirect ways.

6.7. Mobility, rotation and absenteeism

TABLE 6.6 : The relationship between job rotation and labour productivity

	ROTATION INDICATORS		
COMPANY	RESTRICTIONS ON MOBILITY	ROTATION POLICY	ABSENCE
A	none	yes team leaders, balance themselves	relief system, group pressure, divide work coloured jackets
B	none	yes team leaders, skills matrix	team leaders divide work, increasing cover
C	none	yes skills matrix, management	springers: cover, matrix:divide work & rotate
D	none	yes (programme : 1984) 3 jobs	springers: absentee cover
E	some	(yes) personnel dept.	springers share jobs
F	(none)	yes classification audit	absentee cover springers, poolmen & supervisor

TABLE 6.6 : The relationship between job rotation and labour productivity (cont.)

	ROTATION INDICATORS		
COMPANY	RESTRICTIONS ON MOBILITY	ROTATION POLICY	ABSENCE
G	(none)	no formal policy, (programme), (small scale: promotion)	springers, maximum cover

(Note: Brackets indicate that data either needs further qualification, was uncertain or did not reflect the true situation)

(i) As can be seen in table 6.6 none of the companies had formal, written restrictions, created by the company or union, on the mobility of operators. Informal and indirect restrictions were, however, visible in companies E, F and G, which were mainly created by the unions, shop stewards and operators themselves. These took the form of discouraging operators from rotating if required to by the company and requesting higher pay or promotion if it involved rotation into a higher pay category irrespective of period of time. Supervisors and team leaders in these companies were pressurised by shop stewards when they rotated operators to different departments or sections. **Thus a relatively clear pattern emerged indicating that there is an association between the degree of restrictions on mobility and labour productivity to be found in the data.**

A partial explanation for this could be that in companies where higher labour productivity is prevalent, management have stronger control over the workforce and therefore do not allow themselves to be restricted by workers, shop stewards and the union.

(ii) Six of the seven companies have a rotation policy. Company G tried to incorporate a rotation programme so as to improve its cover for absenteeism but it was rejected by the union and shop stewards. Rotation now occurs on a small scale in this company and according to the production director it is inefficient. In all the companies including company G there is a natural form of rotation which occurs when an operator is promoted or when an operator is unhappy in a particular team. Neither of these is however done specifically to improve flexibility or multi-skilling. The four companies A, B, C and D with the highest labour productivity said in different ways that rotation of operators was a necessity in managing their departments effectively. In the other three companies (E, F and G) the rotation that management wanted was in different ways jeopardised either by shop stewards, the union or operators themselves. With the latter it manifested in their attitudes, commitment and culture.

(iii) As seen in table 6.6 companies A and B relied on team leaders to arrange rotation and see to line

balancing. Company B and C made use of an effective skills matrix (also named versatility chart) to determine who needed to be rotated. In company C rotation was encouraged amongst managers too. The Managing Director regarded it as so important that 63% of their managers have been in their jobs for less than two years. Company D tried a rotation programme in 1984 but found that operators (especially older employees) were not very keen on rotation mainly because they wanted to remain in the jobs that they felt comfortable and secure in and usually did not want to leave their team. Furthermore, it seemed as if people never really knew one job well. Obviously this was a far too structured and rigid approach. When they changed their approach to one where the objective was to have every operator trained in three jobs and every job could be done by three operators the programme was accepted and started to show results.

From the data it appeared that in company E the rotation was managed and monitored through the personnel department while in company F they often had to do a classification audit to see where operators were and whether they were still in their right job categories. This is an action instituted to monitor movement which would obviously have been unnecessary if they did not have the restrictions of job categories.

Possibly due to the above reasons no clear association between the rotation policy followed by a company and its labour productivity could be found in the data.

(iv) Absenteeism was probably one of the most serious labour problems that production managers and supervisors had to contend with. This became evident not only in the emphasis given to it by those interviewed but also in the extensive planning, programmes and costs that were involved in counteracting its effects. (This is essentially due to the nature of production, for example, an assembly-line situation.) To a greater or lesser degree all the companies made use of absentee cover (or as it was called in other companies, reliefmen, slipmen, springers and poolmen). Absentee cover involved having more people than were necessary (overstaffing) so as to make provision for absenteeism. These people were usually highly multi-skilled and could therefore be used in a great number of jobs. Naturally a major problem occurred when these operators were absent - however they were usually selected because of good attendance records.

As can be seen in table 6.6., companies A, B and C had significantly lower levels of absentee cover because they firstly had less absenteeism (which is due to a number of reasons) and secondly, because tasks were shared amongst operators. The latter was possible because the operators as seen in 6.2. (iv) and 6.7. (ii) were more multi-skilled and underwent more rotation. Companies D, E and F made extensive use of absentee cover, and company G in fact made provision for maximum absenteeism. These

companies can therefore be said to be overstaffed and it is understandable that their labour productivity is lower than that of companies A, B and C who have less absentee cover. On days when there was less absenteeism these operators were often underutilised, and because of their higher skills and higher pay increased the company's labour costs. However, these companies rationalised that this extra cost was minimal in comparison to losing volume and stopping the line and production because of a few absentees.

Regarding absenteeism, a clear pattern emerged, namely that companies with less absentee cover had higher labour productivity. An association therefore exists between these two variables.

This finding corresponds with Edwardes' interventions at British Leyland (refer chapter 4, p 60) and the recommendations made in Sweden (refer chapter 3, pp 43-44) regarding the importance of rotation so as to cover for absenteeism.

6.8. Adaptability of operators

TABLE 6.7 : The relationship between operator adaptability and labour productivity

	ADAPTABILITY INDICATORS	
COMPANY	OPERATORS	MUST CONSULT
A	very adaptable	no
B	very adaptable	no
C	very adaptable	no
D	very adaptable	(no)
E	very adaptable	(yes)
F	quite adaptable	(yes)
G	(very adaptable)	(yes)

(Note: Brackets indicate that data either needs further qualification, was uncertain or did not reflect the true situation)

(i) Adaptability was classified into five different categories and as can be seen in the above table six of the seven companies said that their operators were very adaptable to unpredictable changes in their workplace. Company F said that their operators were quite adaptable and that this would improve if they had more flexibility. Although company G reported that their operators were very adaptable it is seriously doubted whether this is a true reflection of the situation. The level of adaptability is interdependent on the multi-skill level of operators which was discussed in 6.2. (iv).

However, an association between adaptability of operators and labour productivity could not be found in the data.

This could possibly be ascribed to the fact that some of the companies did not want to admit to less adaptability or it could be that the operators have not been exposed to major changes which would indicate their adaptability.

(ii) On the question whether companies would have to consult with unions regarding changes in technology and the production process (which would affect output and manning levels) a definite pattern appeared. As seen in table 6.7 companies A, B, C and D which had the higher labour productivity said that they would bring about the changes without consulting with the unions. They would not let themselves be dictated to regarding something which they felt was a management prerogative. Company E said that they would not consult with the union regarding small changes such as changes in tools and layout, but would consult if the changes meant reductions in manning levels such as in the case of robots. Company F would normally consult with the union since they saw it as part of their programme of encouraging union and employee participation. In fact this company cannot change the speed of the assembly line without the attendance of a full-time or part-time shop steward. Company G would also consult with the union, since the shop stewards

demand a say in nearly all aspects of production that impact on labour. Companies E, F and G remarked that unions would not reject the incorporation of robots into the workplace, or for that matter any other technological changes such as mechanisation as long as it did not reduce manning levels, or lead to redundancies. Changes were welcomed if it reduced human error, made work physically lighter, improved quality of working life and improved safety conditions.

The data indicates therefore that an association does exist between whether a company consults with unions regarding technological changes and their labour productivity level. Those companies that do not have to consult with unions about technological changes appear to have higher labour productivity and vice versa. Nissan (UK) (refer chapter 4, p 50) makes provision in its agreement with the AEU for no interference from the union regarding changes in technology and it experiences constant improvements in productivity (refer Chapter 4, p 74).

6.9. Restrictive practices, importance of flexibility and resistance expected

TABLE 6.8 : The relationship between restrictive practices, importance of flexibility, resistance expected and labour productivity respectively

	RESTRICTIVE PRACTICES, IMPORTANCE AND RESISTANCE EXPECTED		
COMPANY	NO. OF RESTRICTIVE PRACTICES	IMPORTANCE OF FLEXIBILITY	RESISTANCE EXPECTED FROM
A	> 50	necessity	(supervisors)
B	< 10	necessity	unions
C	> 50	necessity	(supervisors) follow-up monitoring
D	< 10	very	older operators, matriculants, plant layout
E	> 50	very	(management), black foreman
F	(< 10)	very	unions, training facilities
G	(< 10)	very	unions, militants, shop stewards

(Note: Brackets indicate that data either needs further qualification, was uncertain or did not reflect the true situation)

(i) From the table 6.8 it can be seen that no clear pattern regarding the number of restrictive practices and labour productivity could be found in the data. The number of restrictive practices ranged from less than ten (in companies B, D, F and G) to more than 50 (in companies A, C and E). The reason for this could possibly lie in the meaning of restrictive practices not being specified clearly enough, leading to misinterpretations. In some cases the categories and titles were seen as restrictive practices while in other instances only specific practices (such as the changing of the line speed and using black males in upholstery department rather than coloured women) were counted.

(ii) All seven companies emphasised the importance of flexibility in their companies. Companies A, B and C went so far as to say that flexibility was a necessity without which they could not obtain their required production levels. No association however appeared.

(iii) Regarding the implementation of higher levels of flexibility the various companies mentioned a range of problems that could resist this implementation. Three companies (A, C and E) said that they expected most resistance from supervisors, foremen and management mainly because of a fear of the unknown. Furthermore, they would have to encourage and promote the concept and it might lead to additional

monitoring and disciplining which they find difficult. Companies B, F and G expected resistance from shop stewards, unions and militant operators. Company D saw plant layout, the level of education of operators and older operators as presenting the most resistance. Company F felt that lack of sufficient training facilities could also restrict the enhancement of flexibility in their company. **No pattern emerged from the data relating expected resistance and labour productivity.**

6.10 SUMMARY

As can be seen from the summarised matrix and the discussion above there are associations and patterns to be found between certain flexibility indicators and labour productivity.

CHAPTER 7

CONCLUSION

In this final chapter the results of the research are examined and conclusions are drawn. The latter part of the chapter focuses on final comments.

The purpose of this study was to determine the relationship between specific flexibility indicators and labour productivity in the South African motor manufacturing industry.

The study indicated that labour productivity is higher in those motor manufacturing organisations where:

(i) the operators can perform a greater number of tasks;

(ii) the operators participate in maintenance and problem-solving;

(iii) there is a greater percentage of operators that are multi-skilled;

(iv) an efficient skills matrix is used;

(v) job categories are not experienced as restrictive;

(vi) operators are responsible for detecting quality defects;

(vii) operators are more eager to undergo training in other tasks;

(viii) more holistic training is given and where operators are stimulated to use both their cognitive and motor skills;

(ix) less absentee cover is used to deal with absenteeism; and

(x) companies do not have to consult with unions about technological changes or production process changes that could influence manning levels.

7.1. Final comment

The reason why relationships between certain flexibility indicators and labour productivity could not be found could be ascribed to the fact that many other factors which could not be isolated from the study, could impact on the companies. These factors include amongst others the nature of the ethnic groups geographically available to the companies; the culture of the organisation; the militancy and influence of union representatives; the age and type of physical facilities of the different companies; the degree of sophistication of the cars built in the

various companies; the extent to which other productivity improvement programmes (such as quality circles, green areas, teamwork programmes) are utilised; the ownership and international connections of and pressure on the various companies, and the complex nature of labour productivity itself.

No doubt people would be more willing to implement flexibility if it could be proved beyond doubt that flexibility improves productivity. However, all the factors mentioned above could have an influence on both labour productivity and flexibility making it unrealistic to prove that a causal relationship between flexibility and labour productivity exists. Therefore the aim of the research was not to prove a causal relationship but to investigate whether a relationship existed.

The impact of flexibility on aspects such as job satisfaction, employee morale and commitment, labour turnover, absenteeism, strikes and stayaways needs to be further investigated.

Furthermore, seeing that this study is only exploratory in nature, more detailed investigations need to be done to develop a workable model for the implementation of complete flexibility within the work situation.

As can be seen from this research the qualitative research method has many advantages, one of the main ones being the fact that it presents the opportunity for investigating complex relationships and being

able to reach meaningful conclusions without narrowing or simplifying the research subject to such an extent that the final conclusions are irrelevant and meaningless.

Seeing that this study has shown that a relationship between flexibility indicators and labour productivity exists it is hoped that companies will opt for flexibility and a progressive strategy which reflects the realities of work in the 1990's and the role that employees can play between now and the end of the century.

ANNEXURE 1

INTERVIEW GUIDE

Company: .....

Interviewees and titles: .....
.....
.....

Date: .....

---

1. SIZE OF JOBS AND MULTI-SKILLING

1.1. How many different tasks do you estimate your average operator can perform?

Probes:
1
2 - 4
5
6 - 10
> 10

1.2. Could you explain to me what happens when a small technical problem occurs on the assembly line where the operator is working?

Probes:
- Can he fix the problem himself?
- Does he call for assistance?

- Is he encouraged to think about solutions?

1.3. What is the average length (in minutes) of the operators' job cycle in this department?

1.4. What percentage of your operators do you estimate are multi-skilled? Or otherwise stated, trained to do a number of different tasks/cross-trained?

Probes:
- Do you have a policy regarding multi-skilling?
- And if so, what is it?
- Do you use a skills matrix?

2. JOB CATEGORIES AND DESCRIPTIONS

2.1. Approximately how many different job categories, for which there are different pay grades, do you have in this department?

Probes:
- Are you happy with the above number?

2.2. Do these job categories in any way restrict operators from performing tasks in other categories?

Probes:
- And if so, how?
- Attitude of workers/culture of organisation?

2.3. Do the many different job descriptions restrict operators in performing tasks other than in their job descriptions but within the same category?

Probes: - And if so, how?

- Attitudes/culture?

3. COMPENSATION SYSTEM

3.1. Is your compensation system structured in such a way so as to reward those who learn a variety of skills?

Probes: - And if so how, and whom?

4. DETECTING QUALITY DEFECTS

4.1. Where does the responsibility for detecting quality defects in this department lie?

Probes: - Quality inspectors at end of line

- Supervisors

- Every individual operator

- All

- Feedback regarding quality?

5. TRAINING FOR FLEXIBILITY

5.1. How long (in days) do you estimate that it takes the average operator to learn his job?

Probes:
- What influences this length of time?
- Who does the training?
- When do they train?

5.2. To what extent are operators willing to undertake training for other tasks, as required by your company?

Probes:
- Refuse
- Half-hearted
- Willing
- Eager
- Very eager
- What influences this willingness?

5.3. What is your company's policy toward training of operators in this department?

Probes:
- Train operators for as many jobs as possible?
- Train operators to the limit of their

potential?

5.4. What main type of training does the company give these operators?

6. MOBILITY, ROTATION AND ABSENTEEISM

6.1. Do you have any restrictions (created by the company or union) on the mobility of employees?

Probes: - And if so, what are they?

6.2. Can operators therefore be transferred from one work station or department to another, accepting that he or she has the capability to do the other job?

Probes: - How does this occur?

6.3. Do you have a policy regarding rotating operators from one work station or job to another?

Probes: - And if so, how does it work?

- And how is it viewed by the operators?

6.4. Could you explain to me what happens when an operator is absent from work?

Probes: - Who fills in for him?

- Is the work divided among operators?

- Do you plan for full cover?

7. ADAPTABILITY OF OPERATORS

7.1. How adaptable would you describe your operators to be to unpredictable changes in the workplace?

7.2. Can your company change technology and the production process, which would undoubtedly affect the output and manning levels, without consulting with the unions?

Probes:
- And if not, why not?
- Robots, new lines, tools?

8. RESTRICTIVE PRACTICES AND IMPORTANCE OF FLEXIBILITY

8.1. How many restrictive practices, as specified in your agreements with the unions, do you think you have?

Probes:
- > 100
- > 50
- < 50
- < 10
- Types?

8.2. Do you think it is important to have a flexible workforce?

Probes: - And if so, why?

9. RESISTANCE EXPECTED

9.1. If you were to attempt implementing greater flexibility in your department from whom do you expect to get resistance?

Probes: - Operators

- Unions/shop stewards

- Supervisors

- Management

- (Training limitations)

- (Quality of people)

10. LABOUR PRODUCTIVITY RATE

10.1. Number of direct operators in trim and mechanical department?

10.2. Average number of cars produced per day (taken over a one year period)

10.3. 1988 Labour productivity rate.

FLEXIBILITY INDICATORS	COMPANY A	COMPANY B	COMPANY C	COMPANY D	COMPANY E	COMPANY F	COMPANY G
1. Size of the job (no. of tasks, maintenance, job cycle, multi-skilled)	- Op. can perform 6 - 10 tasks - When minor problems occur the op. can fix them - Usually presses a knob indicating what kind of problem he has and also calls the team leader - The team leader is versatile and knows all the jobs. He can therefore identify the problem and take countermeasures. He provides flex. to team and is paid more - The op. is encouraged and trained to think about problems and solutions and to participate in problem-solving	- Op. can do 6-10 tasks - Use skills matrix to determine who can do which tasks and how well the op. can do each task - When small problem occurs op. can fix it - Usually calls team leader or supervisor. Op. participates in solving the problem - because he knows his job best of all - Op. is encouraged to think and to make suggestions - Job cycle is 7 min. - A visual chart shows which tasks each op. does and how long each task takes and therefore how loaded he is	- Op. can do 6-10 tasks - Also use skills matrix to see who can do what - Depending on the size of the problem - op. can and may fix it - if within safety regulations - Because co. has 1 line (which is not dedicated) they need versatility - Speed of line 3 min. - 80% are multi-skilled. 100% of employees can do more than 1 operation - achieved through planned training - Also part of flex. is checking his own quality - Got different types of versatility i.e.	- Op. can do 5 tasks - When problem occurs op. calls foreman/ first line supervisor - Op(s) are taught first-line trouble-shooting. Don't want him to do too much on his own, because it could be dangerous and could lead to more damage. But he is trained to problem-solve and think - Can also call springer to help out (1 per section) - Job cycle is ± 7 min. - 90% are multi-skilled - Consider multi-skilling very important, especially on technical side	- Op. can do ± 5 tasks. Where there is a shorter cycle he does more but on a 20 min line he only does 1 or 2 big jobs - When a problem occurs the springer helps out - he can do most jobs. Op. does assist in helping springer with problem - Mainly 3 min. lines - +50% are multi-skilled - Most cross-training is at Grade 2 and 3 where there are Assemblers A and B - Springer can do Grade 1-5 jobs - Set annual targets for cross-training - People aren't	- Op. can do 2-4 tasks. - When problem occurs they usually call the springer. If it's a problem with tools they call the foreman - Op. can't really fix the problem himself - Job cycle is ± 3,5 min. - Different systems run at different speeds. Speeds are determined by volume required and space for materials - About 50% of their people are multi-skilled - Recently implemented skills matrix - not yet working effectively	- Op. can do 2-4 tasks. Same job on one model (i.e. window-winder) differs from that on another model - When problem occurs, foreman is called Seldom the op. will offer his opinion and the foreman won't usually ask him either. He is expected to think, but no direct effort is made to get his participation. - Job cycle is 7,5 min. However quality as important as volume. Rather take longer than have poor quality. Never yet been able to increase speed, always have to slow

Abbreviations:

op.	= operator	superv.	= supervisor	involv.	= involvement
op(s)	= operators	I.C.	= Industrial Council	co.	= company
flex.	= flexibility	QC	= Quality Circles	ST	= short term
no.	= number	admin.	= administration	dept.	= department
Q	= quality	prod.	= productivity	min.	= minutes

FLEXIBILITY INDICATORS	COMPANY A	COMPANY B	COMPANY C	COMPANY D	COMPANY E	COMPANY F	COMPANY G
Size of the job (cont.)	- Job cycle is usually about 2,7 min., however it depends on the particular model. Trucks take longer - About 90% of op(s) are multi skilled. This was achieved through planned training - Team leader uses skills matrix and with op(s) decide on line-balancing	- This enables team leader and op(s) to balance line themselves when absenteeism occurs - 80% of op(s) are multi-skilled. Skills chart shows multi-skilling clearly and also motivates op(s) to be trained for more tasks	zonal, inter-zonal and intershop - Zonal is working well. Got 20 op(s) doing 50 operations - Others not working so well yet. Mainly due to high security need of people - 20-35 workers in a zone - under 1 superv.	No negative attitudes re helping out and doing other work, accepted as a way of working/culture - Not doing multi-skilling for increased job satisfaction (like Swedes) but to improve productivity (like British) - Also use a skills matrix	working very hard. Not busy all the time. Don't want to do extra. Very set in ways. Spend many years working out short cuts, don't want to do job differently. Doing job fast because of repetition, get satisfaction from short cuts		down line. Have never been able to make their target of cars, and don't think they will - 100% workers can do at least 2 jobs - Springers (Grade 5) are multi-skilled and comprise ± 30% of op(s).
2. Job categories (i.e. descriptions, titles, restrictions)	- Many different job titles, descriptions & 8 categories - Don't let these restrict them in any way - Get on with getting the work done, without publicising to the union what they are doing - Op(s) are prepared to help out and to be used where needed irrespective of job title/category - Don't see the many titles as a restriction - Has to do with the approach of	- Actually have 7 job categories and many job titles - Would like to reduce both categories and titles. Had a go-slow when tried to reduce categories - Categories are currently not restrictive as op(s) are expected to work within any category needed - Titles are not restrictive either. Part of their culture that they must help out where needed - This is rein-	- More than 200 job titles and 9 categories as seen in I.C. agreement - However not restrictive, because of versatility they do not adhere to categories. Do not even pay more if job in higher category is done - this could become a problem later if union picks it up and if op. is kept in position too long without promotion - Want to reduce categories and titles	- Many different titles and categories i.e. Assembler A and B - Don't restrict them - Allowed to do more tasks than in description, however, if placed in higher position for long time - must be paid more - Must reduce titles and categories	- 9 job categories - Fall under the I.C. agreement - Too many job titles and grades/categories - People can usually do lower job but not job in higher category. Can't do the latter for long because they will have to pay op. extra - In this way the categories are restrictive and would like to do without them	- Actually have 8 job categories - Originally started with 23 grades - down to 8 - Job descriptions are broad and not restrictive - Job grades are restrictive in the sense that op(s) cannot work at higher levels for long periods without extra pay or promotion - Op(s) won't refuse to do other work - however very unwilling - "not my job" - Want to reduce	- Basically 9 categories but many job titles - People tend to be unwilling to work on other jobs and to do extra - They want to reduce the no. and broaden the bands. This means that some jobs will be upgraded and some downgraded. Unions don't want any jobs to be down-graded - less pay - Unions only want 3 grades: unskilled, semi-skilled and skilled

FLEXIBILITY INDICATORS	COMPANY A	COMPANY B	COMPANY C	COMPANY D	COMPANY E	COMPANY F	COMPANY G
2. Job categories (cont.)	the workers, loyalty and commitment - Would like to reduce no. of categories	forced by their strong team approach.				categories and titles	- Management don't want 3 because grade 2-5 will be in 1 grade, which is unacceptable
3. Compensation	- Op. is not paid more for extra skills. However team leaders who can do more tasks are paid more - Benefits would be higher than costs	- Compensation system not structured so that more skilled op(s) are paid more - Currently paying per grade - Would like to pay according to skill level-many benefits - Team leaders are paid more	- Not paying for more skills. Would like to do it. Benefits would definitely outweigh cost - Springers paid extra	- Compensation system is structured for more skills i.e. 10c/hour extra for more skilled people	- Compensation not linked to skills, except for springer who gets 15c/hour more. Admin. of system would be too high.	- Springers are paid more, but assemblers with more skills than others not - Would be ideal Admin. too much	- Only springers are paid more for their skills (5c/hour) - Would like to have system for all op(s)
4. Responsibility for detecting quality defects	- The responsibility for detecting defects lies with the supervisors and op(s) Q is responsibility of production not inspection dept - Have both individual and group inspection - Encourage "your own"-concept - Every op. can stop the line-if there is a Q problem - When a problem is picked up ask 5 x "why" and you'll get to the root of the problem	- Op., superv. & inspector are responsible for Q - Production is responsible for Q, not Q dept. - Individual op. is given feedback re Q defects he is responsible for. Defects are brought back to section and op. to repair. - Op. is encouraged to check the parts and to check his own assembly work before end of job cycle - Strong team approach to improve Q	- Everyone is responsible for Q - Q at the source is important. Each op. inspects his own work. Use matrix checklist for this - Checking himself has resulted in big improvements in Q - Have weekly meetings re Q and versatility - Q has improved because of versatility - recognises defects because he knows other jobs. - Once every 2	- Q inspectors are responsible for detecting defects. Foremen are responsible for training operators to provide Q work - their performance is related to the no. of defects in their section - Everyone gets a profit bonus based on prod. therefore unions are less antagonistic about prod. and Q and working harder since all are benefiting	- Responsibility for defects still with inspector. Trying to get away from Q control but op(s) are not very Q conscious - Feedback is given to foreman and not enough to op(s) Everyone is supposed to be responsible	- Responsibility for Q and detecting defects lies with Q inspector - Many Q problems experienced in final product	- Responsibility for Q is at end of line by inspector. But all try to prevent it: however, system not working - Feedback is given to op. re Q but not systematically enough

FLEXIBILITY INDICATORS	COMPANY A	COMPANY B	COMPANY C	COMPANY D	COMPANY E	COMPANY F	COMPANY G
4. Responsibility for detecting quality defects (cont.)	- Show people the impact of the mistake - QC have been successful in improving Q		weeks QC meetings - not working well - spend a lot of time brainstorming problems and too little on solving problems - Try to feedback Q info to op(s).	from it. - People take pride in product			
5. Training for flexibility (length of time, eagerness, policy, trainer, type)	- Takes more than 2 days - People are very eager to learn and undergo training - Company does mainly on-the-job training by team leader - Tend to train op(s) for as many tasks as possible, as well as to the limit of their potential - Aim is to create thinking people. Employ them for their hands & brains - Team leader who knows all the jobs (and is an extra person) trains others - Follow a holistic approach - training the whole person - Training con-	- Takes the average op. much more than 2 days to learn his job. To do to highest efficiency standard i.e. to reach U-level on ILU-concept could take up to 3 weeks (Also because of longer job cycle, jobs are bigger and therefore take longer to learn) - Op(s) are very eager to learn new tasks - skills matrix encourages this - pride - Company has policy to train op(s) for as many tasks as possible and to the limit of their potential	- Most jobs could be learnt within 1 to 2 hrs. However, for efficient performance at least 10 days - Most workers are eager to undertake training, however there are some (specially older ones) who want to stay with the job they know well - gives them security, and they are happy as they are. But others must at least be given the opportunity to learn other jobs. - Company does train for as many tasks as possible and to limit of poten-	- It takes average op. not less than 2 days to learn his job but to do it well (100%) a lot more than 2 days - Most op(s) very eager to learn other jobs - except older people, who are comfortable in their present jobs - They do train for as many jobs as possible and to limit of potential - In their co. ethos they say that they will develop everyone to the limit of	- Takes op. more than 2 days to learn tasks. It takes 5 days for new people, however depends on time of line too. In sewing it takes 3 weeks (If they had women it would have been less!) - Some are very eager to learn but most are just willing - They tried to have a pool of men who were cross-trained (rather than cross-training everyone) but it didn't work. People wanted to be part of a permanent team, with same place of work - Did cross-training from	- It depends on the job - but usually takes more than 2 days - People are willing to undergo training (a few are very eager) but mainly because it means more money - It is their policy to train for as many jobs and to limit of potential - Some people prefer not to be trained on too many other jobs, want to remain where they are and in the team they are used to (security) - A lot is spent on training i.e. have a	- It takes the average op. more than 2 days to learn his job. Actually ± 2 weeks. Give op. more time to learn and do completely right - rather than have damage/ poor quality - People are willing to learn new jobs and because it is done after hours they get paid overtime (Will be promoted into a higher grade and get paid more) - The supervisor trains the op(s) - First of all training for the needs of the co. and

FLEXIBILITY INDICATORS	COMPANY A	COMPANY B	COMPANY C	COMPANY D	COMPANY E	COMPANY F	COMPANY G
5. Training for flexibility (length of time, eagerness, policy, trainer, type)	sidered very important. All level training given i.e. literacy training through to career planning Provide schooling i.e. voluntary on Saturdays - Do prod. improvement training - also on Saturdays - paying them overtime (5 hr) Use videos to stimulate them to think about problems and solutions which they must implement themselves - "It's the small things that make the difference" - Many different training programmes for prod. improvement - Everyone encouraged to participate in different ways - 6M training done for all	- however production director feels they are still not training enough - Training is mainly done by team leader and supervisor. But co-workers are also used to train new op(s) - This is encouraged by ILU concept - Mainly do on-the-job skills training. Shop-floor management training is given to team leaders and focuses on team leadership problem-solving techniques, visual management, etc.	tial, however considering the above security need - Superv. does the training but co-workers are also used - Training could be better. No ILU-concept used. Monitoring of training not so efficient - Skills matrix motivates op(s) - Mainly do on-the-job skills training, but because of another co.'s closure no real skills shortage - Electricians also given cross-training in mechanics	their potential - Everybody has gone through 6M which has helped a lot - Have started with an employee involv. programme which they hope will lead to more commitment - Started a problem-solving course - MD very positive about training, but mainly technical skills training - Production director prefers young black matriculants who can think for themselves rather than older black workers who have to build sophisticated cars but can't read or write - Training done by team leader and supervisor	the start because of absenteeism - therefore set targets of so many cross-trained per year - However still losing cars due to absenteeism and lack of cross-training (lost 105 units in April) - Train for as many tasks and to limit of potential - Have training allowance scheme whereby every superv. must have so many people in training but this is made difficult by absenteeism - "SA more skilled than West Germans whose job cycle = 1 minute"	supervisor training centre also a centre for schooling and technical training. Production director says "not worried about cost of training for flex. because in SA we spend too little on training and have a backlog already (versus Europe). Only care for shareholders (ST) and then when in difficulty we use other methods like price increases because we didn't train." - Training is done by other op(s). superv. and springers	then for as many tasks as possible - They do have a policy to train people to the limit of their potential - Difficult to remove op(s) from line for training - so it is done after hours - Co. would like to train as much as possible - No one in market that they can steal - must train their own people - Mainly skills training
6. Rotation (restrictions, policy, absenteeism)	- No restrictions on mobility People are ro-	- No restrictions on mobility of op(s). With	- No restrictions on mobility Won't allow it.	- No restrictions on mobility - And it is poli-	- There are some restrictions on mobility	- They say no restrictions but they might	- No written restrictions, however the

FLEXIBILITY INDICATORS	COMPANY A	COMPANY B	COMPANY C	COMPANY D	COMPANY E	COMPANY F	COMPANY G
6. Rotation (cont.)	tated without publicising it to the unions - Rotation (policy) occurs all the time - must so as to increase flex. - Team leaders work while incumbent learns another job - When op. is absent, use relief system - Group pressure prevents absenteeism - The team balances system themselves - Divide work among themselves	unions becoming stronger it could become more difficult in future - Through the skills matrix they have a policy to rotate op(s) so as to increase skills per op. and enhance flex. Must do this to cover for absenteeism - Every morning they have a 5 min. team meeting before shift starts - Team leader can then see who is absent and with skills matrix shares the work amongst the others, depending on each one's load - Team leader will also stand in for absentees if work cannot all be shared - Starting to increase absentee cover, however trying to keep it to a minimum	Couldn't run the plant if there were restrictions - Policy to rotate - because of absenteeism must have rotation to give them versatility (a necessity) - They use springers if there is absenteeism and use skills matrix to divide work among themselves - Also rotate workers when there is absenteeism - Rotation encouraged among management too - 63% of managers have been in their jobs for less than 2 yrs MD believes in the necessity of this - Management is rotated and sent to business school of their choice so as to prepare them for general management	cy to rotate op(s) from work stations - When absenteeism occurs they usually call in the springers to help out - In 1984 they tried a job rotation programme but because of job security and being part of a team, people didn't really want to change/rotate (too forced) - Older op(s) disliked the rotation. Op(s) never really knew 1 job well - Now they have adapted a new method whereby every op. can do 3 jobs and every job can be done by 3 op(s) - The springer can do work in 11 areas - in spare time he is doing repair work. (Usually a grade 5 or 6 man) (Could have too many workers because of cover)	- They do have a policy to rotate but not between depts. and so long as it does not involve higher pay - Within depts. they do rotate but this goes through personnel dept. However, informal rotation happening all the time - When op. is absent the springer is called in. First use springers and then spread jobs among others. Have a big problem when springers are absent. They are however selected on their good attendance records - Not all people want to do many different jobs. Some happy to do same thing over and over = security	have many restrictions they don't know about i.e. op(s) don't want to rotate and do other jobs. Unions want to be consulted but management is resisting - It is policy to rotate otherwise they would not be able to cover for absenteeism - They plan for full-time cover by using springers and poolmen (absentee cover). Foremen help out too - Sometimes do classification audit to see where people are and if they are still in right categories - Transferring occurs extensively	op(s) themselves are restrictive because they don't want to leave their team where it is comfortable = security - No formal policy to rotate op(s). Tried it a year ago to cover for absenteeism, but it didn't work. Unions rejected it - Rotation occurs on a small scale -"nothing more than a bluff" - There is some natural rotation i.e. with promotion or people that are unhappy - Use springers to cover for absenteeism - Cover for max. absenteeism on Mondays and Tuesdays then use them in other places on Wednesday to Friday - Got too many people - When they tried rotation a year ago in Grades 3 and 5 it led

FLEXIBILITY INDICATORS	COMPANY A	COMPANY B	COMPANY C	COMPANY D	COMPANY E	COMPANY F	COMPANY G
6. Rotation (cont.)							to strikes because they wanted more pay
7. Adaptability of operators (workforce adaptability, consult with unions)	- Op(s) are very adaptable because they are thinking people - They can change technology without consulting with union - No one dictates to them what they can and cannot do. Gets on with it - Don't publicise to union	- Op(s) are very adaptable to changes - mainly due to high flex., team approach and good communication - Yes they can change technology and processes without consulting with unions - Op(s) don't mind changes, specially if it makes their work lighter/ easier, as long as it doesn't lead to redundancies	- Because of versatility they are very adaptable to change - They in general don't consult with unions re technology, production processes and manning levels. They do what they must do	- Op(s) are very adaptable - Yes, they can change processes without consulting, but normally would inform them	- Op(s) are very adaptable - For smaller things like changes in tools they do not consult with unions - If robots were brought in they would consult also if it meant reduced manpower - So they are restricted in this way - Unions don't mind mechanisation if it reduces human error and if done for safety reasons, as long as it does not influence manning levels	- Quite adaptable - More flex. would result in higher adaptability - They can change without consulting but normally would due to participation programme. Focus on union participation and not employee participation - Must consult if they want to adjust speed of line - full-time or part-time shop steward must be present - Union doesn't reject robots if it benefits the worker	- Op(s) are actually very adaptable Can't see how this is possible - specially with op(s) negative attitude - Yes, can change technology but would definitely consult with unions. Shop-stewards demand a say in all aspects affecting workers. Could bring in robots as long as it means no redundancy - No problems with unions re new models
8. Restrictive practices, importance of flexibility and resistance expected	- ›50 restrictions - Flexibility very important won't be able to run business without it - Gets resistance from supervisors - fear of change/ unknown. Once they know what it's about they don't resist	- ‹10 restrictions - Flexibility is very important - has become a necessity - Most resistance has come from unions. See flex. as something that just benefits the company and exploits the op(s)	- Probably got ›50 restrictions - Versatility is not only very important it is a necessity - No real resistance expected or received - Originally supervisors were a little negative about	- ‹10 restrictions - Flexibility very important - They don't mind changing the process if it is going to mean higher bonuses, then they all benefit and get a profit bonus - Older workers would resist	- ›50 restrictions - Can't employ coloured women in sewing/upholstery dept. Union says co. must employ unemployed black men - Flexibility very important - No resistance would really occur. However	- According to them ‹10 restrictive practices - In supervisor manual more are to be found - main restrictions concern adjusting the speed of line, overtime, free handouts and alcohol abuse - Flexibility	- Although they have ‹10 restrictive work practices, the unions reject everything management tries - a different type of restrictiveness - Very important to have a flexible workforce - Only problems expected would

FLEXIBLE INDICATORS	COMPANY A	COMPANY B	COMPANY C	COMPANY D	COMPANY E	COMPANY F	COMPANY G
8. Restrictive practices, importance of flexibility and resistance expected		- So far has managed to bring in flex. without too much involvement from union, but expecting it to become stronger in future	versatility involved a great deal of manual work to complete the charts - now done by computer and is therefore easier. Needs more following up to keep it going. Weekly meetings necessary - Monitoring and follow-up important	- Quality of people = i.e. need matriculants - Layout of plant is restrictive, Logistically the space design could be a problem	big effort to keep things going. They are at the interface and must see that flex. occurs - A lot is expected from black foreman. They don't find it easy to discipline their people - due to politics and intimidation.	- Everyone usually resists change but most expected from unions - Technical training facilities could be a problem. Already spending a lot on training, but would need to do more if they want more flexibility	be from unions and the militant workers and shop stewards. OK, so long as unions and shop stewards can stay in control of factory!
9. Other factors (teamwork, supervision, morale, facilities, attitudes)	- Teamwork is very important. Have small teams (i.e. 8 op(s) to team leader, 4 team leaders to section leader, 4 section leaders to a supervisor) - Many black team leaders - People get together regularly and often after hours for team briefs - Supervision is critical. Often had problems, specially with language then brought in Induenas (group-leaders) to communicate (somebody out of the team). They wear dif-	- Co. focuses strongly on teamwork. Brought in "green areas" which is a place with "conference" table and chairs where team can meet. Team gets together for 5 min. every morning before shift to discuss production, volumes, quality, any problems, and to monitor absenteeism. Very strict on punctuality for meeting - In green areas they make extensive use of visual charts which include	- Major problem with shortages in supplies/ parts - Planning not good enough - not enough buffer parts: inefficiency limits their productivity - Morale is good; Focus a lot on communication - Gave lunch and tour for families of workers Did an attitude survey. 65% said they liked their job at co. 71% said that other people wanted their job - unreasonably high could be because of high job security need.	- Workers are relatively happy. They are very proud to work for this company and to make quality cars. Known as a good place to work. - Management cares for its people. Fair but strict - Very successful at selection of people. Before appointing a supervisor they visit their homes to see how they live and whether they can care for their property - Culture: Have dixie-evening in township -	- Since 1986 brought in Tom Peters' programmes which has strongly influenced the company - Not so clean and not so many visual aids. Visuals are neat and special but not effective. Special recognition is given to cross-trained people. Nice photos are put up of them. Workers like it - Have meetings 1 x week for 15 min. when they stop the line for team meetings (QC) - But they are not working, people do not attend,	- Manpower levels seen as the job of industrial engineering, therefore don't allow union involvement - Using the "striving for excellence programme" to increase participative management at top level and employee involvement on shop-floor level - Have housekeeping competition every month (op can win a car) Shopfloor is very clean - May have seen more people standing and walking rather than working - Carry their	- Unions and shop stewards are in control. Management have lost control and don't know how to get it back - They have no real strategy and personnel director does not believe the one they have has any hope: i.e. to improve union relations through more communication - hoping for maturity of union No improvement yet - 75% of workers are unionised - They do nothing for the 95% non militant to make them happy. Only

FLEXIBILITY INDICATORS	COMPANY A	COMPANY B	COMPANY C	COMPANY D	COMPANY E	COMPANY F	COMPANY G
9. Other factors (cont.)	ferent colour jackets so that they can easily be found for help (more than 100 of them). They are carefully selected - QWL is important in a repetitive, monotonous job. QWL fights against dirty, dangerous and degrading work. Have carpets for people to stand on - Management cares for the people and their QWL - however discipline is still important. Do not play games with people. Fair, strict and caring. People must earn their jobs but work must be pleasant too = commitment and loyalty - HR Philosophy 6M brought awareness. Communication is critical. Got 80 Isindaba areas (green), get together voluntarily and after hours or during lunches. People are handpicked. Friendly, warm	photos of each team member, attendance records, housekeeping, quality, and no. of defects - Use skills chart and ILU-concept to monitor skills acquired by op(s), the level of the skills, to facilitate rotation and sharing of work when absenteeism occurs. Also show on another chart who is doing which operations and how loaded each person is i.t.o job cycle. - Emphasise involvement of op(s) specially in problem-solving - Also emphasise quality of supervision. They have small teams with team leaders who are given training in shop floor management. They are encouraged to take interest in op.'s problem so that op. does not run to union/ shop steward if	- People are happy, and friendly - Culture: Completely different atmosphere due to nature of workforce - Shop floor not so clean. People seen smoking. More informal atmosphere - Went through deep waters with changes - Had their backs against the wall. Got new, fresh input in 1986 when another car co. pulled out. Dispensed with old methods - Top management very enthusiastic. Versatility believed in and enforced from MD down - Visual charts not so good/ neat, too complicated. Not focused on op. level - Got "yellow" areas - Quality of supervisors very important - they've got to make versatility work - got to believe in it. Selection of supervisor very important	where co. shows a film for the workers and they bring their families and get supper too - They get housing and a good canteen at work - Canteen is for all, but races sit separately - Builds team spirit. Have separate canteen for senior management - People are treated well and union too. Good relations with workers, not seen as enemies - Pay least minimum wage in industry (but have bonuses etc) and are paying for better skilled people - HR director is a key person. Got the right approach - Proactive not IR reactive. Encourages respect for human dignity - A combination of doing many things right. - Management: strong, strict and fair. Rather autocratic and	not seen as important. Have now stopped them. - Teams of 18 are too large - Have "Our Home" project where each team decides who does what, how and where. - Culture: According to production mgr the company is seen as a "softie" A little socialistic. Give workers everything but expect less. ("Other co.(s) get more out of their people - they work harder and faster") - Morale is good, doing a lot for the community: trust fund. - They can be a lot more efficient - Factory is new, painted and concentrated on hygiene factors - Workers are politically very aware & active - recently had political protest march with ANC/ SACP placards and AK 47 replicas - White shop	food over the assembly lines. Stopped working before lunch. Have 3 canteens for different levels of employees. - Many female assemblers. Sometimes workers feel they are at an advantage = get lighter work to do and are treated better. - Attitude survey showed that 70% of workforce was happy = very positive - They have communication centres (also green). Using visual displays but not so extensively as in other companies i.e. have visual versatility training charts. No photos. Due to large teams (20-50) not enough room for all to be seated. Supervisor has own separate desk, but in same area. Don't have to meet every day, just when they have something to discuss. - Areas not ade-	concerned with the 5%. Production managers have tried everything; drained - don't know what to try anymore - They don't communicate with the workers at all, no meetings, no pep talks. Tried to introduce QC but union rejected it. No one came. Union says management has no right to communicate with employees so mgnt stopped trying - No place for people to sit and talk or put their personal belongings. Only have disciplinary rooms no place to build team areas. Superv. talks to people on line, no privacy. - No visual mgnt or multi-skill recording - Shopfloor not very clean - shows poor attitude and low commitment A lot of sabotage - people don't care for the company

FLEXIBILITY INDICATORS	COMPANY A	COMPANY B	COMPANY C	COMPANY D	COMPANY E	COMPANY F	COMPANY G
9. Other factors (cont.)	atmosphere, enthusiastic and proud. - Management wear co. jackets and are seen on the shopfloor (MBWA) - Recognition is important and not only in monetary terms; photos, guests, presentations. (Pride motivates) - Don't see workers as "adversaries" but as partners - Don't want central negotiations. Can't handle a national/8 week strike - no mother company. Can't even agree with other companies - For every 7 people needed in other companies to produce 1 car they have got one - People are 86% fully occupied - Nobody will lose his job through prod. improvement - Success due to quality of top	unhappy - Focus on communicating well and quickly	- Old factory with many limitations, but making the most of it. Can't produce any more cars if they wished to Got a long waiting list. No place to expand. People are proud of their product and of their challenge	struggle with participative techniques but realise it's all that will work in this environment. - MD is a people manager - Don't want centralised negotiations - Workforce race of an "obedient" nature (Historically ran away from whites, not like Xhosas who fought.) - Geographical location is important when considering the workforce - Also focus on work groups/ teams and participative mgnt - Have a pep talk every morning before shift. Also here where attendance is monitored - Neat work places - People don't have a negative attitude. Not striking at the moment - Proud of	stewards is new Being elected for black unions. 1 full-time white and 3 (out of 10) part-time stewards are white - One would expect people to be more committed. Could be because they have slackened on discipline - Consider foreman important however not paid much attention - They make most of own parts - own supplier. No problems there - An enormous factory with few logistical restrictions - Their ethnic labour force (due to its nature) is their main constraint.	quate or neat/ no discipline in making areas work - Got the biggest most modern plant of all, - Can produce enough cars for SA's total demand - yet they don't. They feel there are too many car co's and models Their marketing sales and quality could be their problem, Perception of co. and cars not good. Seem to have so much in their favour yet they don't utilise it - Predicted that 1989 was going to be the biggest strike year - Didn't want centralised bargaining either - Used to have productivity bargaining but it didn't work and they dropped it	- Span of control till 3 months ago too large. Now have + 14 to a team. Q of supervision is poor. They aren't leaders. Op. rather goes to union or shop steward if he has a problem. No faith in supervisor - They have 21 shop stewards and now 4 full-time ones (Due to latest agreement) - Need to change attitudes. Need 6M. Only a few have gone through it. - Intimidation is very strong. Has 2nd largest black city in SA in vicinity. Very high unemployment in region (no one fired - too much effort!) - Nature of ethnic workforce: strong-willed, stand together, natural fighters. Strong group feeling

FLEXIBILITY INDICATORS	COMPANY A	COMPANY B	COMPANY C	COMPANY D	COMPANY E	COMPANY F	COMPANY G
9. Other factors (cont.)	management and production director, top management support and their simplicity/common sense approach			waiting list for cars			

SUMMARISED MATRIX

FLEXIBILITY INDICATORS	COMPANY A	COMPANY B	COMPANY C	COMPANY D	COMPANY E	COMPANY F	COMPANY G
1. Size of job							
1.1 Number of tasks	6-10	6-10	6-10	5	5	2-4	2-4
1.2 Maintenance: think/call for help	think	think	think	think	call for help	call for help	call for help
1.3 Length of job cycle-min	2,7	7	3	7	3	3,5	7,5
1.4 % multi-skilled	90%	80%	80%	90%	50%	50%	30%
1.5 Use skills matrix	yes	yes	yes	yes	no	(yes)	no
2. Job categories							
2.1 Number of categories	8	7	9	9	9	8	9
2.2 Categories restrictive?	no	no	no & yes	no & yes	yes	yes	yes
2.3 Job descriptions restrictive	no	no	no	no	no	no	no
2.4 Satisfied with categories	no	no	no	no	no	no	no
3. Compensation system							
3.1 Reward for extra skills	op: no team leaders: yes	op: no team leaders: yes	op: no springers: yes	yes: 10c ph for more skilled	op: no springer: 15c ph more	op: no springers: yes	op: no springers: 5c ph more
4. Detecting quality defects							
4.1 Whose responsibility	supervisor & op. (production is responsible) your own car	op., supervisor and inspector (production is responsible)	at the source:op everyone	foreman & inspectors (everyone through profit bonus)	inspector (everyone supposed to be)	inspector	inspector
5. Training for flexibility							
5.1 Number of days	› 2	› 2	(1-2 hrs) 10 days	2	›2	›2	›2
5.2 Willingness	very eager	very eager	(eager)	eager	(willing)	(willing)	(willing)
5.3 Policy	yes (thinking)	yes	yes	yes	yes	yes	(yes)
5.4 Who trains	team leader	team leader, supervisor and co-workers	supervisor & co-workers	team leader and supervisor	supervisor	co-workers, supervisor & springers	supervisor

Op. = Operators
Mgnt = Management

(Note: Brackets indicate that data either needs other qualification, was uncertain or did not reflect the true situation.)

SUMMARISED MATRIX (CONT.)

FLEXIBILITY INDICATORS	COMPANY A	COMPANY B	COMPANY C	COMPANY D	COMPANY E	COMPANY F	COMPANY G
5.5 Type of training	- on-the-job - holistic: literacy - productivity improvement training - 6M	- on-the-job - shopfloor management	- (skills): co. closure provided skills	- technical skills - 6M - problem-solving	- trained pool - cross-training - training allowance scheme	- technical skills	- skills
6. Rotation							
6.1 Restrictions on mobility	none	none	none	none	some	(none)	(none)
6.2 Rotation policy	- yes - team leaders - balance themselves	- yes - team leaders - skills matrix	- yes - skills matrix - management	- yes - (programme: 1984) - 3 jobs	- (yes) - personnel dept	- yes - classification audit	- no formal policy - (programme) - (small scale: promotion)
6.3 Absence	- relief system - group pressure - divide work - coloured jackets	- team leaders - divide work - increasing cover	- springers:cover - matrix: divide work and rotate	- springers: absentee cover	- springer - share jobs	- absentee cover - springers, poolmen & supervisor	- springers - maximum cover
7. Adaptability							
7.1 Operators	very adaptable	very adaptable	very adaptable	very adaptable	very adaptable	quite adaptable	(very adaptable)
7.2 Must consult	no	no	no	(no)	(yes)	(yes)	(yes)
8. Restrictive practices							
8.1 Number	› 50	‹ 10	› 50	‹ 10	› 50	(‹ 10)	(‹ 10)
8.2 Importance of flexibility	necessity	necessity	necessity	very	very	very	very
9. Resistance expected							
9.1 Resistance expected from	- (supervisors)	- unions	- (supervisors) - follow-up - monitoring	- older op - matriculants - plant layout	- (management) - black foreman	- unions - training facilities	- unions - militants - shopstewards

Op. = Operator

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