

C H A P T E R 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

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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

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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

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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.

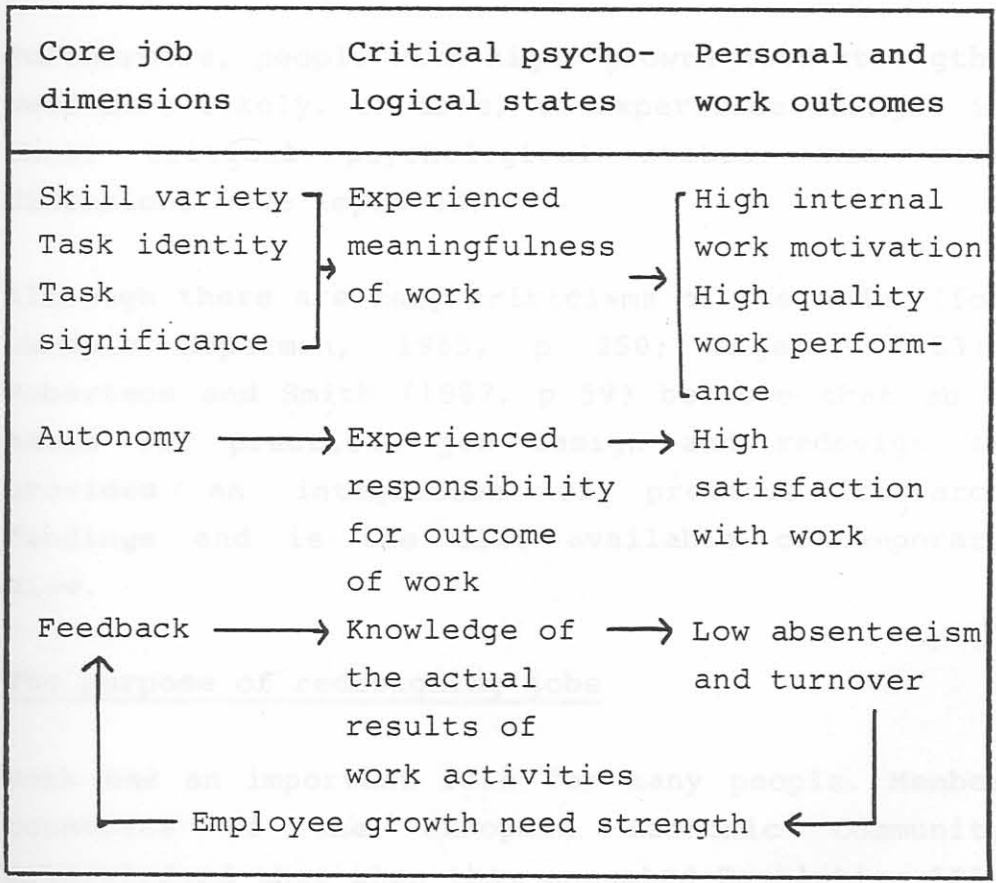
3.2.4. Hackman and Oldham's job characteristic model

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)



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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

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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

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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

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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

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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

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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) Decentralisation of authority and responsibility

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

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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

3.5.2. Autonomy 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

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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

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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.

As various chapters there are a number of ways to improve productivity through job redesign. Successful case studies. A great deal has been written about this, 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 unexplored productivity improvement method, flexibility, is discussed in detail.

1.1 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