

From job analysis to work profiling Do traditional procedures still apply?

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INTRODUCTION

Jobs are seen as interlinked building blocks of work within organisations. They are patches of tasks and responsibilities that, together, are intended to cover the work that needs to be done (Bridges, 1994). From this point of view, any job contributes in its own particular way to the achievement of organisational goals. It is essential for personnel managers and line managers to have adequate knowledge about the structure and dynamics of work and the relation between work and people. Many decisions they have to make relate in one way or another to the match between people and jobs. That is why many human resources management decisions need to be preceded by a systematic analysis of work, traditionally referred to as 'job analysis'. In this chapter we first describe job analysis from a traditional perspective: what is it and why and how is it used? Then, some well-known job analysis techniques and instruments are reviewed and the use of a multi method approach is recommended. The second part of the chapter focuses on changes in organisations, in work, in human resources management and the consequences those changes have for the practice of analysing work. Howard et al. (1995) claim that not since the industrial revolution the world has experienced such a vast transformation in the nature of work as is now in progress. Jobs are no longer the rather static entities they have been in the past. In fact, we believe that human resources management today requires a rather fundamentally new way of analysing work.

JOB ANALYSIS FOR SELECTION AND APPRAISAL

Many uses of job analysis have been identified. Cascio (1992), for instance, distinguishes 15 different applications within the area of human resources management. Although some methods for job analysis are supposed to be useful for many applications, in practice it turns out that specific methods are appropriate for specific areas of human resources management (Algera, 1991). In this chapter we will focus on using job analysis in selection and appraisal, areas in which the role of job analysis has become increasingly important.

Ever since World War I, industrial and occupational psychologists have been actively involved in personnel selection. The importance of job analysis in personnel selection has been recognised long ago. Freyd (1923) described personnel selection as a process existing of 10 steps, job analysis being step one. He proposed job analysis as an indispensable basis for personnel selection. Most experts today agree that without an analysis of the job and the job demands a recruitment and selection procedure cannot be done well. Job analysis has several different applications throughout selection procedures, like:

- a text for a personnel advertisement can be drawn up on the basis of it;

- it provides useful information for letting applicants know about the job content and job context;
- it provides information to be used for self-selection of potential candidates in the recruitment phase;
- a profile of job demands (criteria) can be formulated on the basis of job analysis;
- a set of selection tools (predictors) can be chosen or specifically designed;
- rejected candidates can be informed specifically about the decision in terms of the job profile produced through job analysis. By comparing the profile of the applicant with the profile of the job, a prediction can be made about his or her future performance in the job;
- selection tools, including the interview, can be specifically aimed at gathering information about the job demands;

In other words: job analysis is be a binding and crucial element in a selection procedure (Algera & Greuter, 1993).

As in selection, job analysis plays an increasingly important role in designing performance appraisal systems. This is specifically the case in the United States where any performance appraisal instrument should be based on a systematic job analysis procedure in order to satisfy legal challenges. The legal requirements for performance appraisal systems in the US are basically no different from those for any selection test. Such systems must be based on a job analysis that facilitates decisions with reliability and validity (Latham & Wexley, 1994).

WHAT IS JOB ANALYSIS?

Job analysis is usually defined as the systematic procedure of collecting and analysing information about jobs. By using some kind of structured job analysis method, or a combination of different methods, jobs are broken down into components. Basically job analysis consists of two elements: a job description and a job specification. A *job description* is a written description of the activities that have to be performed. Generally, a job description also contains information about tools and equipment used in the job and about the working conditions. So job descriptions specify the job content and the job context. The *job specification* indicates which specific skills, competences, knowledge, capabilities and other physical and personal attributes one must have to perform the job successfully. An acronym that is used to describe which types of attributes are referred to in job analysis is KSAO: Knowledge, Skills, Abilities and Others characteristics.

There are several methods of gathering information about jobs. The most frequently used method of collecting data is the *interview*. Interviews can be held with job incumbents, supervisors, human resources managers and other people who have knowledge about the job. In most cases interviews are held individually but group interviews can be quite useful too. An example of these are the so called SME panels (SME stands for Subject Matter Expert). A second way of collecting information is by *observing* someone performing the job. This method is only applicable for jobs with short cycle tasks that are dominated by physical activities and observable routines. A third method is using *questionnaires*. Through the years a lot of different types of questionnaires have been developed. There are structured, semi-structured and open-end questionnaires. A fourth method is using documentation about the job, like existing job descriptions. A final possibility of gathering job information is to perform the job itself as a job analyst.

Throughout the years numerous job analysis methods and approaches have been developed. One way of distinguishing approaches from each other is to look at the way jobs are described. Job analysis methods can be task oriented, behaviour oriented or attribute oriented.

Task oriented (or work oriented) methods analyse and describe jobs in terms of results or performed tasks. They yield very specific information. Because of that the descriptions are almost exclusively applicable for the analysed job. The comparability of different task oriented analyses usually is limited. An example of a task oriented job analysis instrument is CODAP (Comprehensive Occupational Data Analysis Programs; Christal 1974).

Behaviour oriented (worker oriented) methods describe work in terms of more general behaviours necessary to perform the job. This approach gives more opportunities to compare jobs with each other. An example of a predominantly behaviour oriented method is the Position Analysis Questionnaire (PAQ; McCormick, Jeanneret & Mecham, 1972).

Attribute oriented (or trait oriented) methods describe jobs in terms of personal characteristics demanded to perform the work successfully. Examples of these attributes are capabilities, personality traits, skills and knowledge. This method seems attractive for personnel selection, because comparisons between the attribute oriented job profile and the person profile are easily made. A problem however is that the translation from job content and context to attributes is a hard one. This translation seems to be the exclusive domain of experts. Examples of attribute oriented job analysis methods are the ARS (Ability Requirements Scales; Fleischmann & Quaintance, 1984), the MJRQ (Minnesota Job Requirements Questionnaire (Desmond & Weiss, 1973) and the TTA (Threshold Traits Analysis (Lopez, Kesselman, & Lopez, 1981).

UTILISATION OF JOB ANALYSIS IN PRACTISE

In the selection literature authors have emphasised repeatedly the necessity of using job analysis in selection and appraisal. In practice however, job analysis has been proven to be much less popular than would be expected (Ryan & Sackett, 1987) One reason for this is that practitioners often lack knowledge about the topic and about the value of job analysis. A second reason could be a shortage of good and easy-to-use job-analysis systems. A third reason, related to the limited interest in practice is that for a long period there has been little research or innovation (Pearn & Kandola, 1993).

A further, factor has been that within the industrial and occupational psychology literature a fundamental doubt has been raised about the value of doing a job analysis in the selection context, by *meta-analyses* (Schmidt & Hunter, 1981). On the basis of results of this type of research it has been concluded that the validity of cognitive capacity tests can be generalised to a wide range of jobs (*validity generalisation*). In other words: differences in job content and context would be of little or no significance in predicting future work performance. Although meta-analytical research has been a major breakthrough in research and has yielded a lot of significant knowledge, the above mentioned conclusion regarding the value of job analysis seems premature. First, there has been methodological criticism against the procedure with which jobs have been grouped together into rather heterogeneous clusters. Second, incremental validity can be gained by using situation specific predictors in addition to cognitive capacity tests. Third, job analysis has more than one purpose and application in the

selection and appraisal context. Besides being the basis for designing prediction models, job analysis has an important informative role. Finally, the development of currently popular selection methods such as assessment centres and situational questionnaires makes the use of molecular job analysis necessary. The relevance of job analysis for designing appraisal systems seems almost self-evident, especially since an increasing focus on fairness in performance appraisal has emerged in many countries, for example the US, Canada and the UK (see Fletcher, this volume).

Since the mid-seventies there has been considerable attention in the United States to the topic of fairness in selection and appraisal both in literature and in practice. The aim is to decrease the probability of adverse (or 'disparate') impact of selection and appraisal decisions on minority groups. A selection procedure can be defined as having adverse impact when proportionately fewer members of one (for instance) ethnic or gender group can meet the criteria. (There has been quite a 'litigation explosion' that has put organisations under pressure to ensure that their selection and appraisal procedures are legally defensible. Arvey (1988) and Greuter & Algera (1989) discuss the topic more specifically. Cascio (1995) discusses the impact of the US 1990 Disabilities Act.

Relevancy for the content of the job to be performed has become a major demand of selection and appraisal systems and procedures. *Job relatedness* of predictors and criteria is something that has to be proven by (human resources) managers. Thompson & Thompson (1982) specified the following considerations if job analysis is used as evidence in legal proceedings:

- A formal job analysis must be performed: It is not enough to rely on informal knowledge about a job that 'everyone' knows that may be based on inaccurate stereotyped notions of the job demands. It must also occur before choosing a selection system, rather than as a retrospective analysis after the event.
- It must be well documented: It is not enough to simply carry around job information in the analyst's head.
- It should be collected from several, up-to-date sources. This will probably entail using different methods of analysis.
- The sample of people interviewed should be sufficient in number to capture the job information. The sample should present the full diversity of job incumbents (e.g. ethnic minorities, females, people with and without formal qualifications) to ensure the validity of the data.
- The job analysts should be properly trained in the different techniques to ensure that they collect objective information and are as free from bias as possible.
- The job analysis should determine the most important and critical aspects of the job and it is upon these that the key attributes and selection and evaluation for the job should be based.

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These demands are rather strict. Recently however, there seems to be a shift in the US provisions in favour of the employer rather than the employee (Latham & Wexley, 1994).

MULTI METHOD APPROACHES TO JOB ANALYSIS

There is no one best way for doing a job analysis (Ash, 1988; Dunette, 1976; Levine et al., 1988; Dunnette, 1976). Every method has its own strengths and weaknesses. Algera & Greuter (1993) mention frequently appearing shortcomings such as too little attention of job

analysis methods to cognitive processes, like decision making, assessing, problem solving, prioritising, etc. and too little attention to the context of the job. A way of overcoming specific shortcomings of separate methods is to combine different approaches in one procedure. An approach that leads to good results in practice is using interview techniques with more structured job analysis systems. A nice example of using a combination of job analysis methods is presented by Kandola (1990). Below we will describe a combination of two interview techniques (CIT and Repertory Grid) with a computerised structured job analysis system like PAQ and the Work Profiling System (WPS; Saville & Holdsworth, 1995).

Critical Incidents Technique (CIT)

Four decades ago at the American Institute of Research, J.C. Flanagan developed the Critical Incidents Technique (CIT; Flanagan, 1954). The CIT is an interview technique used to investigate actual episodes of on-the-job behaviour. A critical incident is an event that:

- has actually happened
- had an effect that was of crucial importance for being successful in the job
- is not frequently occurring
- is relatively short lasting
- has directly involved the respondent him or herself
- has happened not too long ago

The procedure is aimed at collecting observed incidents that are very important to job performance in the sense that they make the difference between success and failure, for example dealing with a serious complaint of a customer. The incidents are recorded as notes, stories or anecdotes about how a job holder handles certain situations and from these a composite picture of job behaviour is built up. The interview itself can be structured as follows:

Introduction

- Explaining goal and approach
- Explaining the technique
- Explaining follow up after the interview

Interview

- Warming up, focusing on the general objectives of the job
- Thinking up Critical Incidents:
 - Let the interviewee in 15 minutes describe globally several critical incidents. The incidents should be related to job objectives. Incidents with positive outcomes as well as negative outcomes should be included.
- Analysing the Critical Incidents
 - a. Globally
 - b. Probing the situation
 - c. Probing the role and the judgement of the person involved
 - d. Analysing behaviours and personal attributes involved

Example of a Critical Incident (Cascio, 1995)

On January 14, Mr. Vin, the restaurant's wine steward was asked about an obscure bottle of wine. Without hesitation, he described the place of vintage and bottling, the meaning of

the symbols on the label, and the characteristics of the grapes in the year of the vintage.

The situational character of the CIT makes it very useful for developing assessment centres and appraisal systems, also because assessment and feedback on the level of behaviour can be done. This is probably the most important reason why this method is so popular.

Repertory Grid

The repertory Grid is a technique developed from the Personal Construct Theory of George Kelly (1955). Kelly described a construct as being like 'a basic dimension of appraisal', providing a bipolar basis for classifying information about the environment. In job analysis it is used for identifying the specific skills and characteristics possessed by effective job performers, which differentiate them from less effective. The Repertory Grid is usually applied with managers. They are asked to compare employees in order to identify the skills associated with success.

Position Analysis Questionnaire (PAQ)

The PAQ was developed by Ernest McCormick, one of the important pioneers in the field of job analysis (McCormick e.a., 1972). It has been one of the best known job analysis questionnaires for many years. The PAQ is a predominantly worker oriented questionnaire. It contains 194 items (which McCormick calls *job elements*) of which 187 relate to job activities and the rest of them to other information. The items are divided into six categories that make up the job data section of the PAQ: Information Input, Mental Processes, Work output, Relationships With Other Persons, Job Context and Other Characteristics. Recently the following computer-processing options have been added to the PAQ: item analysis, showing the highest percentage's scores; dimension scores, providing scores of the job on 45 underlying clusters of elements; human attribute scores; and estimates of aptitude requirements. The validity of the PAQ is based on research that has tested the "gravitation hypothesis", a supposition stating that people tend to gravitate into jobs they are able to perform successfully.

Work Profiling System (WPS)

A more recently developed job analysis system is the Work Profiling System (Saville & Holdsworth, 1995). The WPS is a job analysis system containing three different questionnaires respectively related to the following job groups: 1. *Managerial and professional*, 2. *Service and administrative*, 3. *Manual and technical*. These three questionnaires each consist of a *job content* part (establishing the main tasks) and a *job context* part (physical environment, responsibility for resources, remuneration, etc.). The WPS is an integrated computerised job analysis system offering many output options. The WPS Technical Report provides a detailed and comprehensive picture of a job. Alternatively the WPS can print out a number of simplified, modular reports that are appropriate for different applications. The WPS report options are:

1. Job description: a summary of the key job tasks and responsibilities
2. Person specification: a summary of the key human attributes that a job requires

3. Assessment methods: a selection of appropriate tests, personality questionnaire scales and interview questions that could be used to assess candidates for the job
4. Individual development planner: a tailored development plan for job incumbents
5. Performance review form: a tailored appraisal document for the job
6. Person-job match: a facility for matching candidates against the key requirements for a job

Recent developments in the WPS, incorporated in the 1995 update of the system, are discussed later in the chapter.

TRANSFORMATIONS IN WORK AND ORGANISATIONS

The content of work and the concept of jobs is changing fast. This is caused by changes in organisations, work design, technological developments and views on managing human resources. To explore the context for applying job analysis in the future, we will shortly describe some important changes below.

Changing organisations and work processes

For almost any organisation the *complexity* of their environment is increasing. Demands of customers have become increasingly important. As customers, we nowadays require of products and services high quality, low prices and uniqueness. Furthermore, as customers, we constantly want new products and services.

In the beginning of the century, under the influence of the technology and insights of Scientific Management (Taylor, 1911), companies emerged with a high degree of labour division. Tasks were analysed and divided into sharply demarcated sub tasks. Researchers worked out how each sub-task could be performed as efficiently as possible.

Tasks were divided into sub-tasks that resulted in very simple, short-cycle activities. Work became horizontally divided (a carpenter should hammer, not carry around planks) as well as vertically (thinking and doing, control and operation, supervision and operation). This labour division was carried through to such an extent that it resulted in *management as a profession*: processes became so complex that co-ordinators became necessary. Tasks became so simple that people had to be hired for thinking, deciding, assessing, prioritising, etc. It also led to *functionally organised organisations*: work units were formed that performed tasks of only one type, for instance the Quality Control department. Finally it led to *staff departments*: tasks that required a specific knowledge were pulled out of the primary process of the organisation, which resulted in departments like the personnel department.

The conditions that made the above processes useful and logical have changed. The current conditions do not allow such a high degree of labour division. Put simply, in the past, organisations had simple tasks and complex processes, which led to inflexible and slow production processes, that were however very efficient and thus very suitable for mass production. Nowadays, customers demand flexibility, speed and continuous product innovation, which demands that production processes be kept very simple but highly flexible. These simple processes lead to complex, broad, integrated tasks. So there is a *reversion of the process of labour division*, leading to complex tasks and simple processes.

The most important catalysts in the development of customer demands and competition between companies have probably been developments in information technology and communication facilities. The first has made new products and services possible, whereas the latter means that customers will instantly have knowledge of new possibilities.

These changes currently are a major focus of managers. Many recipes for improving organisations are related to the process of reversing labour division, like Sociotechniek (De Sitter & De Hartog, 1990), semi autonomous work groups and Business Process Re-engineering (Hammer & Champy, 1993).

Changes in work

Coinciding with these organisational changes, work itself has changed (Bridges, 1994) in the following ways:

- Technology has changed virtually every workplace in a drastic way and will continue to do so in the years to come. Many workplaces have been *informed* (Van der Spiegel, 1995). More and more people have become used to working with computers, expert systems and computerised performance support systems Winslow & Bramer, 1994).
- There is an increasing emphasis on working with data, information and knowledge. Drucker (1993) talks about the Post industrial economy as an “Information Age”, Tapscott (1996) talks about the “Digital Economy”. There has been a significant shift in workplaces from manufacturing and transporting things to manipulating and transforming of data and information, a development which management writer Peter Drucker (1993) has been emphasising for a long time. He used the label *knowledge work* to describe this new way of working.

In Drucker's vision, those workers that are not educated enough, will become service workers.

- *New communication technologies* change work. Because of new communication facilities, time and distance are no longer effective buffers against change. Tapscott (1995) describes the influences of things like the Internet and groupware technologies on work, which will probably be enormous.
- There are *change-driven changes*. The changes mentioned above have caused more changes by the way organisations react to them. Organisations seem to be caught in a spiral of ever increasing competition.
- *Simplification of work processes* is a major change factor.
- Organisations are limiting their activities to those parts of the business where they have special competence and are *outsourcing* the rest to external vendors.
- In order to be able to produce in a flexible manner, work is being packaged more and more in *projects*, carried out by temporary task forces.

New ways of managing human resources

Human Resources Management is a movement or trend in personnel management that has become influential since the early eighties (Fombrun, Tichy & Devanna, 1984; Beer, 1984). Until that period personnel management in many cases was seen as a necessary evil with no relation whatsoever to organisational strategy. Through the influence of HRM-thinking, managing human resources today has become a top priority of both line and top managers in most organisations. There are four key aspects of HRM:

- *coherence*: there has to be coherence between different personnel management activities.

- *development orientation*: personnel management should be focused on developing individuals.
- *strategic*: personnel management should be derived from the organisational strategy and aimed at achieving organisational goals.
- *line responsibility*: managing human resources should primarily be a responsibility of line management.
- The extent to which these prescriptions have been realised in practise is, however, very patchy.

Jobshift: workplaces without jobs?

A job analysis can only be useful when or if a job is reasonably stable and not in a period of rapid evolution. Recently Bridges (1994) observed that jobs have lost that stability for good. He argues that the very conditions (mass production and the large organisation) that created jobs two hundred years ago are disappearing. He thinks we lose the need to package work into jobs. Bridges describes several disadvantages of working with the concept 'job':

- it encourages hiring personnel by cutting work into turfs and by giving managers a level of power commensurate with the number of turf areas for which they are responsible.
- it discourages accountability, because it rewards people not for getting the necessary work done but for doing their jobs.
- it is a rigid solution to an elastic problem, because the work that needs to be done changes constantly.
- jobs are change inhibitors: conventional jobs inhibit flexibility and speedy response to the threats and opportunities of a rapidly changing market.

Many organisations are concentrating on their most important tasks and outsourcing the rest to temporary and contract workers or to external vendors. Bridges' observation: in a job-based organisation, work is not done but passed around.

Furthermore, Bridges proposes that new ways of dealing with employment insecurity have to be found. Employability, vendor-mindedness and resiliency in his opinion need to be central focuses.

Next, new ways of packaging work have to be developed. Bridges proposes: self-employment, freelance work, part-time work and working as full-time employees but under fluid and idiosyncratic arrangements. With the latter he refers to flexible job profiles, sets of competencies and working with role in stead of job descriptions. Pritchard & Murlis (1992) also refer to roles, rather than to jobs. They define 'role' as an entity within the organisation which takes account of the organisation's requirement (the 'job') as well as of the characteristics of the person doing the job. They operationalise the role concept as:

- Achievements and outputs required by the organisation.
- Skills, knowledge and expertise required in the role.
- The competencies which characterise the role.

Finally, employees' attitudes toward work should be changed with the help of education. People should be educated about the higher outcomes the organisation is trying to achieve and show them their 'piece of work' fits in the larger pattern.

Jobs seem to lose their stability more and more. Alternatives must be found both for the concept of job as we know it as for the systems and procedures built around the concept. In

relation to the above described processes Pritchard & Murlis (1992) see as main features of organisational change:

- Delayering of organisations to yield much flatter structures
- Increasing recognition of project and team work
- Organisational flexibility
- Multiple reporting relationships
- Job flexibility
- Jobs designed to expand, not constrain
- People make jobs

How will all of this influence work? Howard (1995) thinks work in the post-industrial economy will be:

1. cognitive: the focus will be on cerebral skills rather than manual.
2. complex: organisations, tasks, and role scripts will be complex and broad.
3. fluid: jobs will be difficult to tie down, they will continuously change.
4. uncertain: uncertainty in the organisation environment causes uncertainty in jobs.
5. interconnected: through information technology work and people will be interconnected.
6. invisible: the abstraction of work from hands-on, manual labour to manipulation of electronic images on a computer screen is making work invisible.

JOB ANALYSIS IN THE FUTURE

Below we try to describe some major challenges for job analysis in order to be able to cope in the environment described above. Job analysis procedures should be able to:

- 1) *Measure dynamics of the work*: Measuring the kind, the degree and the rate of change in a job.
- 2) *Identify job families*: in the past, jobs were grouped by the tasks performed. With the rate of the changes in tasks and considering the mobility of personnel, new ways of grouping job have to be found.
- 3) *Teamwork analysis*: we think it will be necessary for job analysis systems in the future to analyse work on a team level. Team tasks will continue to show far more continuity than tasks at an individual level. Job analysis systems will have to be able to describe team tasks, context and specifications. Also they will have to be able to specify different roles to be performed in order by team members (See West and Allen, this volume).
- 4) *Strategy orientation*: within job analysis more attention for the organisation strategy will have to be built in.
- 5) *Competence, behaviour and trait orientation*: The trend towards behaviour oriented (or worker oriented) systems will be continued. However, the trait oriented approach will still remain necessary, to predict performance trans-situationally.
- 6) More focus on the "O" in KSAO. In the future more focus on the Other characteristics will be needed because workers will be more self managing. They will have more authority in and control over their work (Landy, Shankster-Cawley, Kohler Moran, (1995).
- 7) *Stronger orientation towards knowledge work*: Job analysis should be focused more to cognitive behaviours in order to be able to describe knowledge work.
- 8) *Integrated HRM systems*. The trend of integrating job analysis in computerised Human Resources Management Systems will probably be an important future development.

Some innovative systems have been designed recently. A good example of a system is the earlier mentioned recently updated version of Work Profiling System (WPS; Saville & Holdsworth, 1995) which already incorporates a lot of the answers to the developments describe above. For instance, in the new Windows-based WPS much advanced information technology is applied: the questionnaire can be administered by computer; reports can be generated by computer (supported by an expert system); competencies can be generated by computer. Further, it is a typical HRM supporting system. It can be used as a module in an integrated computer based human resource management system (HURMIS, Saville & Holdsworth, 1995). Among the advantages and possibilities of such systems are:

- incorporating a family of products (such as occupational assessment, job analysis, Expert, translating, scanning and statistical systems) within one shell (a series of modules that can be installed separately).
- interoperating products: the products can work together with one another and share data and functions
- common interface: all products work under one operating system and share tools, displays, etc.
- data sharing: information on tests, questionnaires, etc. needs to be only in one place in the system (and not duplicated).

Also, the HRM style of thinking is recognisably present in WPS. It is concentrating on outputs like: job descriptions and person specifications, performance management, remuneration and reward, competency building and individual development. Finally, it creates a possibility for working organisation oriented. The systems contains pre-tailored reports, which can be tailorised for organisations in terms of used competency models.

Although the nature of work is changes drastically and continuously, job analysis stays important. In the future new job analysis systems and new versions of older ones will continue to appear. We advise practitioners to pay proper attention to job analysis specifically to new topics like teamwork, changes in jobs, and new demands.

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