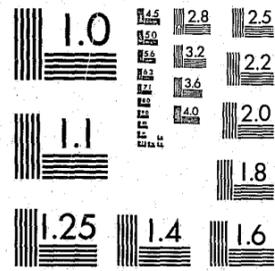


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EXPERIENCE GAINED WITH A TIME-STUDY

dr. M.J.M. Brand-Koolen
dr. A. Coster
L.C.M. Tigges

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Research and Documentation Centre - Ministry of Justice

Summary

Knowledge of how members of an organisation spend their time is indispensable for organisation research, job (re)structuring and various aspects of personnel management. This quantitative information is also important as an aid in determining case-loads, formations and the like. The more complex duties and jobs are, the more difficult it has become to ascertain the time allotted to the various activities with a reasonable degree of reliability.

This article describes the procedure adopted for a time-study. The experience thus gained forms the basis for a number of recommendations regarding the method and procedures for such research.

I. INTRODUCTION

For the benefit of organisations - groups of people acting in concert who pursue an object (a product or service) with specific means - more and more methods and techniques are being developed in order to optimise both the final product and the way it is produced. The functioning of the members of the team is an important part of this. Research on this subject and the practical application of its results have been adopted by industry and the authorities in general. There is ever-increasing emphasis on the importance of employee-involvement in such research. On the one hand the employees act as a source of information on the status quo and can point out bottlenecks and make suggestions for specific solutions, and on the other the introduction of changes is conditional upon their involvement.

In the past few decades there has been growing interest in a systematic approach in organisations originating from charitable movements.

Various - interrelated - causes can be indicated for this. For instance in the "quaternary" sector (non-commercial services) we see that the degree of organisation is being increased (by amalgamations of various ideological organisations). Moreover, this sector has greatly expanded in the recent past.

Lastly, the present economic recession demands that thought be given to the optimum use of human and other resources. Owing to these developments there is a greatly increasing need for policy instruments and hence for more knowledge about the functioning of those working in these organisations. It is not surprising therefore that various time-studies have been and are being made in organisations in this quaternary sector in this country and abroad¹⁾.

The authors of this article were concerned in a study for the purposes of policy-making for probation and parole work²⁾. The probation and parole agency is a welfare organisation for (former) offenders. Its range of duties is not easy: they consist of helping clients who may or may not be convicted and sentenced by the judicial authorities as the interpreters of society's sense of justice. It is in such a potential-conflict situation that the probation and parole officers have to do their work. Moreover, besides helping the client they also have to assist the judicial authorities, by making reports on clients for the purposes of the proceedings.

The national office of the Probation and Parole Agencies Association (VvRI) needed to know more about the work of the rehabilitation teams

throughout the country with a view to future policy-making and determining case-loads.

At the request of the VvRI, therefore, the Scientific Research and Documentation Centre (WODC) of the Ministry of Justice designed a research project combining a quantitative time-study with an assessment of the material aspects of the work.

The first part of this research consisted of a time-study concerning probation and parole officers. The study was focused on social workers, temporary student-trainees, supervisory and advisory specialists (mostly psychiatrists or psychologists). It therefore related to a small number of different types of jobs in which a large number of people are engaged.

The principal problems in this research were:

- to devise an analytical instrument of such a kind that it could completely indicate the various jobs. This meant differentiating between the respective parts of the job. In this study, these parts were, for example: "writing background reports" or "attending type A meetings".
- to examine how much time was spent on the respective parts of the job in such a way that the information would give a sufficiently reliable and accurate picture.
- to design these instruments so that they would be usable and acceptable for those concerned and would be in such a form that the research would be fairly easy to repeat in some years' time if necessary.

The method and procedure of developing the instrument for time-recording and the various stages this went through will be described below. Then a number of recommendations for such research will be made arising from these findings.

2. DEVELOPING AN INSTRUMENT

As described above, the time-study relating to probation and parole agency social workers formed part of an exhaustive study of the functioning of rehabilitation teams. In order to carry out such research adequately, extensive preliminary research was felt to be necessary, among other things to ascertain how time-study data could best be collected.

The preliminary research covered seven teams that had volunteered for it. Four of them were in the General Rehabilitation Association (Algemene Reclaserings Vereniging), one in Salvation Army Rehabilitation and the other two were CAD teams (Consultation Bureaus for Alcohol and Drugs). It was agreed with the teams that the purpose of the preliminary research was to arrive at a definitive plan for the principal research project, and hence no figures from the preliminary work would be published, which is why no time-study figures are given in this article.

The preliminary research was in two parts. In the first part, a research worker stayed in each team for four weeks. During these four weeks the members of the team kept time-sheets on specially designed forms. The research workers also made observations and held interviews. The observations related to the teams' day-to-day procedures,

various meetings and discussions and diverse activities by the members, such as contact with clients, attendance at court, contact with third parties and so on.

During the - unstructured - interviews the team members' work, their opinion of this, any problems and so on were discussed with them.

In the second part of the preliminary research, some months later, an alternative method of collecting time-study figures was tried out. The experience gained with the time-sheets in the preliminary research and the various phases that occurred in developing the time-study instrument will be gone into below.

2.1. The first method

In the first part of the preliminary research an attempt was made to ascertain how rehabilitation workers spent their time by keeping time-sheets on two specially designed daily forms filled in by the social workers. On one of the forms "activities for own clients" were entered (on A-3 size). The other form recorded "activities not for own clients and other activities" (on A-4 size). Each of these categories was subdivided into various activities. Space was left for additional information (for instance location of contact). And lastly, in order to check frequency of contact with the individual clients, it also had to be stated which client had been contacted; the stage of help was also reported. The forms were provided with detailed notes.

The teams themselves played an important part in the evaluation of this time-recording period. Although it was considered that time-recording had gone well and that the results were definitely reliable, a number of defects in the form were noted during this period which made it necessary to try out an alternative method.

The principal drawbacks were:

- it was sometimes found difficult to distinguish between activities focused on the officer's "own client" and "not on his own client", for instance in the work discussions;
- the forms were too big to take outside the office;
- they were directed very much at the practical social worker in ordinary probation and parole work: the senior officers (team coordinators and work leaders), CAD-team members and the social workers specialised in working with psychiatrically disturbed clients were often unable to record the work they did under the printed categories;
- the social workers generally wanted to give more information than was possible on the form, even though it was quite detailed;
- details such as stating the place or mode of contact (at the office, elsewhere, by phone) and the phase in which the client was being helped were quite often overlooked;
- the "recorded" time often proved to be shorter than the total time worked. Some workers solved this by departing from the instructions (to fill the form in hour by hour) by first noting their activities in chronological order in their diaries and transferring them to the time-sheet at the end of the day.

As a rule these and other problems were solved on the spot in consultation with the research worker.

An important thing the above indicated however - and this was in fact raised by most of the teams themselves - was that a time-study as carried out in this part of the preliminary research required a research worker on the team. Not only was he indispensable as a source of information but also as the person who checked every day whether the forms had been handed in and completed in full. All this faced the research workers with the problem of the principal research project. This needed a fairly large sample (twenty-eight teams). The use of so many research workers would be far beyond the available manpower. It had become quite evident, however, that time-recording by the teams without the research worker being present would provide information that was very unreliable or not reliable at all. But it might still be reliable if the form was greatly simplified, i.e. drawn up in a more general way. This would not meet the purpose of the study, however, because of the very need for detailed information. Nor would this instrument allow regular repetition of the measurements in the future and in a fairly simple way. It was therefore decided to devise and test an alternative method.

2.2. The second method

In devising the alternative method use was made of the experience gained by one of the authors in systematic job analysis³⁾. Such analysis can be defined as the systematic description of jobs in such a way that similarities and dissimilarities between them can

be presented with the greatest clarity. For our purpose, the important thing was to be able to describe the rehabilitation worker's job in all its possible variations. If the activities could be listed in detail, the team members could be asked - with the aid and assistance of the research workers and colleagues - to give an estimate of how they allocated their time to these activities. The advantage of this method are evident:

- As the list takes only about half a day to complete, it is feasible to go through it while a research worker is present, thereby limiting the need for research manpower;
- the burden on the team is reduced;
- the instrument is easy to adjust and can be used for repeated measurements;
- one and the same list can be used simultaneously for investigating other aspects, for instance the relevance of the various activities to the work or the load on the worker.

A detailed work-list was drawn up by the research workers and several senior probation and parole officers, based partly on the experience gained in the meantime. It was divided into five main headings subdivided if necessary into sub-headings and finally into individual activities.

The main and sub-headings were:

- I. Contact with clients
 - A. At the office
 - B. Visiting clients away from the office
 - C. Accompanying clients

- II. Contact and work for clients
 - A. At the office
 - B. Away from the office
- III. Work for clients'/groups of clients' families
- IV. Reporting and reports of discussions
- V. Job guidance, job discussion and other internal and external meetings
- VI. Miscellaneous.

All main and sub-headings were further subdivided into individual activities. For instance, the sub-heading "Accompanying clients" was specified by destinations:

- public prosecutor, examining magistrate, advocate
- court hearing
- persons or agencies dealing with employment or education
- persons or agencies dealing with housing accommodation
- financial assistance agencies
- social welfare institutions
- medical services
- penal institutions
- other persons or institutions.

To check this method, the assistance of the seven teams that took part in the preliminary research was obtained again. It was important to ask the same teams to do this, because in this way the two methods

could best be compared both as regards the experience gained with them and the results.

The opportunity was also taken to examine whether other aspects (relevance, satisfaction, work-load) could also be investigated with this list.

The team members were unanimous that the work-list gave a good idea of the work and would therefore be a very good instrument for obtaining a picture of the work involved and the allocation of time. But problems were met with in filling in the list. There was psychological resistance to estimating how time was spent. Persuasion was often needed to get the list completed. The members of the teams stated on several occasions that a reliable picture was obtainable only if they had started noting their activities in chronological order in their diaries some weeks beforehand.

Comparison of the results obtained with these two methods substantiated the team members' views. Though the two methods compared very well on the whole, two essential parts of rehabilitation work, contact with the clients and background reporting, were somewhat inflated: the second method showed more time being allocated to this work.

To sum this up: experience showed that the - much more detailed - list used in the second instance was far preferable to the more general list used in the first round. It was also evident that some form of preparation by the workers was necessary to obtain a sufficiently reliable picture.

2.3. The third and "definitive" method

For the principal research the obvious way was to choose a method that would combine the advantages of both those described above. It was therefore decided to use the detailed work-list from the second phase - after eliminating several imperfections - together with preparation in the form of daily time-records. (The list is added to this summary in annex 1). Times were recorded mainly in chronological order for two weeks in specially designed diaries. The diary had one page per day, divided into two parts (See annex 2). In the first part, the worker noted his time in chronological order and in his own words. In the second part the time was systematically noted for the activities which had been somewhat overestimated with the second method: contact with clients (per individual contact) and external reporting (e.g. background reporting). Two weeks later the work-list was completed (by systematic notation), for which the workers referred to their diary entries. In addition, the second part of the diary (the systematic part) was handed in to the research workers in order to verify, for instance, what degree of agreement there was between client-time in the diaries and in the work-list.

It is perhaps needless to add that the principal research project was presented to the participating teams with a clear explanation of object and procedures.

The work-list was completed by the participants themselves, where necessary with a research worker's assistance. It could be checked

that nothing had been omitted by calculating sub-totals and total time on the spot.

This method proved to work well.

The teams on the whole thought the work-list gave a good and especially exhaustive presentation of their activities, though it was of course sometimes difficult to fit a very specific activity into the list. It is never possible to ascertain fully whether the completion of the lists was reliable. It was generally found, however, that the teams had collaborated very well on the whole. Moreover the diaries had been kept in great detail and the information had been transferred to the work-list very meticulously. Besides this, the material gave an indication; the time devoted directly to the client was in fact mentioned twice: once in the list and once on the diary counterfoil. Although a number of individual variations were found, these were not systematic. Lastly, comparison with the preliminary research figures showed that the client time and the time spent on external reporting were closer to the results of the first method than of the second, as was expected.

III. PRACTICAL RECOMMENDATIONS

This final section enumerates several factors again which are important for organising a time-study.

3.1. Motivation and collaboration of the subjects

Unless one is going to check all the workers' activities with a stop-watch, the feasibility of a time-study stands or falls by the collaboration of those who ultimately have to fill in the lists.

The motivation of the ^{subjects} begins, firstly, with properly introducing the research. It is important to indicate clearly what the research is about, what will be done with the results, how reporting will take place, whether there will be any reporting back of one's own figures, and so on. Experience has proved that personal introduction gives far better results than introduction in writing.

A second point is the research method. It must be such that the work that has to be done for research purposes does not interfere too much with the normal jobs. It is also important for lists, diaries and other instruments that are used to be of a handy size and easy to complete.

In addition, it is important that those completing the forms should experience the method as credible and reliable. For instance, our research showed that the workers can make a rough estimate of how they spend their time, but that they themselves believed it could never be reliable without a form of time-recording in chronological order.

A third factor of importance is monitoring during the research. While the research is taking place (for example in a number of weeks) it must be possible at all times for the workers to contact the research institution to seek advice on any problems that may arise. It may also be advisable to ring up sometime in the middle of the period to see whether everything is proceeding according to plan. And lastly, after the research is finished, any promises, such as reporting back for instance, must be carried out.

3.2. Establishing the job-components.

It is advisable to draw up the work-lists together with people who know the subjects well. Group discussions with a number of those concerned are a good means for this. Observations by the research workers can also be very useful. Simply adopting the object of the work, for instance as laid down in official regulations or the like, is not enough because such regulations are often characterised by far too high a level of abstraction and give insufficient insight into the day-to-day work of those concerned. Such insight can be obtained only if the overall range of jobs is analysed into a number of concrete, individual jobs and actions. These are most easily recognisable for the workers, and this means there will be fewer problems in indicating the correct category. As all the time will be noted, every activity will have to be included. Any "miscellaneous" residual categories should not be too great, or else the results will be useless. Moreover, there should be as little overlapping as possible. Unfortunately, this cannot always be avoided. For example: a client has a talk with the social worker together with his mother. Should this be entered under contact with the client? Or as contact with members of the family? In such cases there are clear instructions regarding the category this must be entered under. Double entries must never be made; otherwise the total time spent will not work out at the correct number of hours. It is important to examine what degree of detail is to be applied. The more concrete the jobs included in the list, the more detailed the total will be. But there are limits to detailed specification, because the lists will otherwise become too long. The purpose of the

research will decide how detailed the forms have to be. It is also possible to split up some job-components more than others, depending again on the purpose of the research. A warning must be given about over-detailed specifications which are practically indistinguishable to the worker. In the preliminary research, for example, we distinguished between job discussions about one's own clients and about other clients. In practice, these times could not be separated because during a discussion both one's own and other clients were dealt with together. It is then afterwards impossible for the worker to check how much time he spent on his own clients and how much on other workers' clients. If the activities are to be specified in detail, it is advisable to distinguish between headings and sub-headings. First, this has advantages in drawing up the list: all activities can be grouped as far as possible per heading. Second, in filling in the list, because a general view is obtained by those completing it, and third in totalling the time spent because in this way there can be a certain built-in control.

3.3. Time-recording

In some circumstances a rough estimate of the time spent may suffice for the purpose of the research. But in many cases more precise and more reliable measurement will be considered necessary. In such cases a certain period of time-recording will be necessary. A choice can then be made between systematic and chronological recording. Systematically, it is assumed that all times are entered according to the proper, predetermined categories. This has big advantages in processing and also saves the trouble of transferring data from a

diary to a systematic statement. On the other hand, it is very inconvenient indeed for the workers to have to keep on looking up the correct category. Verification also proved much more troublesome because it is difficult after the event to ascertain whether all the time worked has been properly accounted for. The advantages of chronological time-records are that it suffices for the workers to make brief notes which they can decipher themselves, that they do not yet need to consider what categories the activities are put in and that they can always check whether all the time has been accounted for. If chronological time-recording is chosen, it is important to design separate, easy-to-use forms for this. For instance, in diary form. There seems to be no point in pre-printing times in such diaries; some activities such as meetings may take up a lot of time, while others such as telephone calls are fairly short. If desired, additional information can also be used in the diary as a kind of internal check. In stating the time spent on certain jobs many workers will be inclined to base their entries on what may be socially desirable. The time spent on activities which a person himself regards as important will obviously be felt to be longer than that spent on those regarded as less important. Specification on the diary counterfoils can thus force an internal check. But it must of course be realised that every single minute will not be accounted for even with chronological time-records. There just happen to be little things such as walking along the passage, having a chat with a colleague and so on which inevitably vanish in the records and result in a deficit in minutes.

A final important point is what unit the times are to be noted in: minutes, 5-minutes, quarter-hours, half-hours, hours? Noting small units (minutes or 5-minutes) undoubtedly provides the most exact records. On the other hand it involves a lot more work. If it is desired to round off the times into longer units, it is better to do this at a rather later stage (for instance when the times are being totalled) because errors in rounding off will then be much smaller.

3.4. From chronological to systematic data

If times have been noted chronologically, they will have to be converted into systematic data. Basically, there are two ways of doing this. Firstly, the chronological data can be coded by the systematic list. In this case the subjects (with a researcher's help) are asked to note the corresponding number on the systematic list against each activity in their diaries. This method has the advantage of simplicity. It has the drawbacks, however, that there is no possibility of an internal check on the data (see below) and that the workers will not be completely free in making their notes (in this case the diaries are taken along to the research institute and hence clients' names, for instance, cannot be noted in them).

In the second method the procedure is just the reverse: in this case the diary data are transferred to the systematic list. After this, the total time is first added up per activity and then per (sub-) heading, in order to find the total time worked. The advantage of this method is the possibility of an internal check: when all totals are complete the worker has a review of the time he has spent which he can check - more or less by intuition. If he has the impression

something is wrong, he can re-check his figures to see if any mistakes have been made. A check with colleagues is another means of verification. The disadvantage of this method is that it is rather cumbersome and requires a lot of adding up on the spot. Aids for this work are: calculating machines and tables for converting minutes into hours.

3.5. Full-timers and part-timers

Part-timers are a particular complication in analysing the material. On the whole, the total time noted will be about forty hours a week. If activity A, for instance, takes 10 hours, this indicates something about its importance. Part-timers distort this picture because their total working time is different. The simplest and, as far as is known, the most widely used solution of this problem is simply to omit part-timers. The more part-timers there are, of course, the more doubtful this solution becomes. In the study we have described, for example, 46% of the workers were part-timers. Their jobs varied from 2 to 72 hours. The work of the probation and parole agency could obviously hardly be investigated if all these part-timers were disregarded. Another possibility is to add part-timers up to make full-timers. Actually this is feasible only with "twinned jobs", in which two persons each do half of a whole job. But if there are a comparatively large number of part-timers with different numbers of hours and a varying range of duties, this solution is most unsatisfactory too. In many cases the best way will be to include part-timers in the research as independent units. The work-ratio (number of working hours a week) will of course have to be noted. But this makes it much more difficult to analyse the material. In considering the number

of hours spent on specific activities, the ratio will invariably have to be taken into account. It could be considered turning the share in the various jobs of every worker involved in the study into a percentage (based on total working time). This then gives an overall picture of the percentage time allocation for each worker, and averages and so on can be worked out for these percentages. The problem with this solution, however, is that part-timers then weigh as heavily as full-timers, though their share in the total work is smaller. This problem can be solved by working out the percentages per group instead of per person. This method can also be used quite well for comparing sub-groups (e.g. differentiated by age or job). Difficulties arise, however, if the differences found between sub-groups have to be checked for significance, which is necessary if a sample is being studied, because all one has is the percentage distribution of the groups, whereas tests of significance require the use of individual data. This problem could be solved by calculating percentages per person, but this again has the drawback of over-weighting the part-timers. We could not find a solution to this problem in the literature. We have therefore thought out a procedure ourselves⁴⁾ which consists of weighting all the individual data for every test with a factor equal to

$$\frac{\text{average time worked by whole group}}{\text{average time worked by sub-group.}}$$

This ensures that the average total time worked is equalised for the sub-groups being compared, while the data are left untouched as far as possible (because the factor will usually be very close to 1).

The result is that the effects of the differences in the sub-groups' average working times are neutralised. But this procedure does have the consequence that any differences resulting from more overtime are neutralised as well. The amount of overtime can, however, be checked by comparing the total time worked and the time of the official work-ratio.

3.6. Additional decisions

A number of questions demanding attention in any research project of course also arise in a time-study. Questions more specific to time-studies are:

(a) How is the working time actually defined?

Especially in the quaternary sector it sometimes happens that the boundaries between work and personal activities cannot be sharply defined. This applies, for example, to meetings of professional associations. Clear agreements must be made about this. It can be decided, for instance, that in such cases day-time is treated as work and evening-time is not. In our study the solution was to treat as working time all the time qualifying for payment or compensation in time or otherwise, regardless of whether payment or compensation is indeed required. Similar decisions should be made regarding study-time, illness and leave. In this connection, it is important to ensure that the various decisions are not contradictory. If it is decided, for example, to exclude illness and leave from the study, the working hours (of full-timers) can no longer be assumed to be 40 hours a week.

(b) How long should time-recording last?

The duration of time-recording must not be too short, but not too long either. A very brief period - say several days - will not usually give a reliable picture (this is the case only if the work is about the same every day and lasts just as long, but in this event there will be no need for a time-study anyway). Too long a period also has its drawbacks because it causes research fatigue and people start neglecting their records. On the whole, it is useful to ensure that the period chosen links up as closely as possible with a natural cycle in the work. If there are many fortnightly meetings for instance, the obvious choice will be two weeks or four weeks. If the sample is big enough (or if the entire field is involved in the study) it is not strictly necessary statistically to allow for this cycle. If sub-groups are to be analysed, however, this may in fact cause problems, while it is more credible for the subjects themselves if they feel that all their activities are reflected proportionately in their notes.

The above is an attempt to indicate a number of practical and methodological problems likely to occur in a time-study. We hope it will be of assistance to those about to embark upon this field of research.

Notes

1) See inter alia:

- Bruinstroop, J., Tromp, H., Voigt, R., Map "Caseload-onderzoek": Interimnota's en eindnota betreffende "caseload" onderzoek onder maatschappelijk werkers bij voogdij- en gezinsvoordijinstellingen, Published by: De Galan en Voigt, Amsterdam 1976.
- Ericson, Stig, Assistenternas Arbetsuppgifter vid skyddskonsulenter i sundsvall: en tidsstudie, Liber Tryek, Stockholm, September 1978 (with an English summary)
- Hulshof, A.H., Schreij, H.G., 1e onderzoek naar capaciteitsnormen voor het algemeen maatschappelijk werk, Published by: JOINT, landelijke organisatie voor maatschappelijke dienstverlening, 's-Hertogenbosch 1978.
- The Home Office, London, recently made an extensive time-study relating to probation and parole board social workers. As far as is known no report on this has yet been published. The authors have the enquiry forms that were used.

- 2) Brand-Koolen, M.J.M., Spickenheuer, J.L.P., (rapporteurs), Het reclasseringwerk: de tijdsbesteding: een onderzoek naar de tijdsbesteding en het functioneren van reclasseringsteams, 1e deelrapport, WODC series "Onderzoek en Beleid", No. 9, State Publishing Office, The Hague 1978. A more extensive version of this report with the same title has been published by the WODC, The Hague.

- 3) Coster, A., Werkman, J., Systematische functie-analyse, Intermediair, 1975, No. 51
 - 4) The authors wish to thank P.J. Linckens, M.M. Kommer and Mrs. T.C. Remmerzwaal for their valuable advice.
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