A Process View of Organisations: Procedural Analysis

Kostel Gerndorf
School of Economics and Business Administration, Tallinn University of Technology
Kopli 101, 11712 Tallinn, Estonia
Phone: +372-6203957, e-mail: kostel@tv.ttu.ee

Abstract

One of the most popular topic in the organisation and management during the last 15 years has been the subject of business processes.

The present paper presents fundamentals of the theory of procedural analysis. Procedural analysis is an organisation improvement method elaborated at Tallinn University of Technology in 1972–1974, the main content of which is the modelling and improvement of the organisational processes. Procedural analysis is a general methodology, theory and methods for a systematic treatment of processes in all organisations.

The method is based on the general system theory and functional approach. It means that organisation’s performance is discussed as a system of functions and business processes are discussed in relationship with organisation’s functions. An outcome of using the method is a system of procedural rules, which is a graphic-verbal model of organisation’s performance.

Discussion of organisational processes with the method of procedural analysis is a part of the organisation theory. Without analysing processes it is not possible to have a complete organisation theory.

JEL Classification numbers: L15, L20, L23, M10, M11

Keywords: system, function, organisation’s performance, business process, modelling, procedure, procedural rule, process parameters, organisation theory

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1. Introduction and Historical Background

This working paper seeks to present one possible method for analysing business processes – procedural analysis.

I wrote this paper because after reading many monographs and articles in this field I came to the conclusion that results of our research that started at Tallinn University of Technology (at that time working at the chair of industrial management and planning, Tallinn Polytechnic Institute) in 1972, are original also today and add a lot also to modern organisation theory. In 1975, I defended my candidate’s dissertation where I presented methodological, theoretical and methodical bases of procedural analysis (Gerndorf 1975, Gerndorf 1975, Gerndorf 2005). We were in the Soviet Union then and Estonia was a part of it. The world literature was then 15-20 years away from the boom of discussing business processes.

I continued with teaching at university and active management consulting.

The viewpoints elaborated years ago and presented here now have proved to be valid. Transition from planned to market economy did not change anything significant in the theory of procedural analysis either; the planned economy logic and functions were replaced by market economy logic and functions. The method of analysing processes survived, their content changed, form remained the same.

Implementation of the procedural analysis in practice has occurred via management consulting. Different consultants have used the method to a larger or lesser extent in more than hundred organisations. Represented are both public and private sector, large and small organisations in almost all areas of activity.

In the Soviet era, many firms published books with collections of their rules of procedure (see, for example, *Konditritoodete vabrik “Kalev”* and *Tallinna Liha- ja Konservikombinaat*). There are at least 15 different collections published.

Since 1974, procedural analysis has been in the curricula of the School of Economics and Business Administration, Tallinn University of Technology, in recent years as a significant component of the subject *Organisation and Management of a Company*. The number of different-level student papers prepared at enterprises and institutions amounts to several hundred. Each student paper is a Case, which has a study-methodical value.

Implementation in practice of procedural analysis on numerous occasions and during a long period means in terms of science verification of theory. The theoretical standpoint that performance of every organisation is a process that can be modelled into details has been repeatedly verified in practice.

The present paper presents methodological, theoretical and implementation methodical fundamentals of procedural analysis. The object of modelling in procedural analysis is an organisation’s performance as a whole.

There are many approaches to process. It is not the purpose of this paper to discuss individual issues with other authors writing about business processes, but to present and justify my own concept. So much the more that the author could not find any noteworthy theoretical treatment of business processes in literature.

The main principles of procedural analysis and research results have been so far published in Estonian, Russian and German. This is the first theory paper in English. Still, there is a sample of using procedural analysis – this is a system of privatisation procedures and rules of procedure at the Estonian Privatisation Agency (Terk 2000).
The concept of procedural analysis is to use its specific definitions developed over 30 years ago. The author did not keep it necessary and possible to change this, as common standpoints in the process approach discourse are almost missing.

Procedural analysis is by its principles an interdisciplinary theory. In addition to general terms it uses the terminology of system theory and organisation theory.

I hope that the table below helps you to understand the following text better.

**Table 1. Relationships of the Terms and Equivalence of Different Terminologies**

<table>
<thead>
<tr>
<th>System theory</th>
<th>Organisation theory</th>
<th>Procedural analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td>Performance of an Organisation</td>
<td>Performance of an Organisation</td>
</tr>
<tr>
<td>Subsystem</td>
<td>Function</td>
<td>Basic procedure</td>
</tr>
<tr>
<td>Sub-subsystem</td>
<td>–</td>
<td>Procedure</td>
</tr>
<tr>
<td>Component of system</td>
<td>Task</td>
<td>Operation</td>
</tr>
</tbody>
</table>

The table describes different levels of decomposing performance of an organisation and the corresponding terms in other paradigms. From the aspect of general terminology all terms in the table mean performance and processes by nature.

The structure of the paper is inspired by the theory of procedural analysis, whereas theoretical explanations are illustrated with models of industrial enterprises’ performance as a process on different levels of decomposition.

The paper ends with some conclusions which in the author’s opinion have wider and critical importance.

2. **Previous Approaches to and Problems of Business Processes in Theory and in Practice**

Dealing with of business processes for the development of organisations and managers is a trend of growing popularity worldwide. Many different concepts, methods and techniques have been elaborated over time. An essential component of many methods is development of business processes.

The more well-known and prominent methods for dealing with business processes on the basis of literature are:

1. IDEF, *Integrated Computer Aided Manufacturing Definition*
2. ARIS, *Architecture of Integrated Information Systems*
3. SIPOC-model, *Supplier-Input-Process-Output-Customer model*
4. Six Sigma method
5. Statistical Process Control
6. *Quality Cost Method PAF*
7. Total Quality Management
8. Business Process Reengineering
9. Business Process Improvement
10. Critical Path Analyses
11. Value chain
The concept of „business processes“ in titles of articles and monographs has been associated with the following concepts: „mapping“, „management“, „visualization“, „reengineering“, „modelling“, „implementation“, „benchmarking“, „description“, „improvement“, „documentation“, „development“, „analyses“, „control and design“

This is definitely not a full list. There is a special journal Business Process Management Journal, not to speak of numerous articles in other journals and serials.

All these have a common feature – they try to discuss a company or its part, or a problem as a process and on the basis of this make suggestions for increasing efficiency.

Working through the enormous literature on the subject enabled to draw two conclusions and formulate the problems arising from these.

First. Discussions of business processes in literature have a clearly practical orientation. The subject of discourse of business processes is not designing of the theory. Surprisingly I could not find in any of the articles, or in any of the book titles or contents the word “theory“. One could assume that an extensive approach contains many critical theories that systematically lead to modelling of the business processes. An exception of course is IT, but this is a separate sphere, which after all does not embrace organisational processes integrally, discussing substantially only data processing.

A more specific study indicated that based on the problem setting under different methods, these need not contain a theory — and this is not intended. Methodology and theory are not discussed there.

Process approach has turned into a purely technical issue, the solution of which requires concrete methods and techniques. Different methods compete in the market with each other; their principal idea, however, is basically the same — good recommendations in the style „do it this way, then efficiency etc. will grow better“. Authors of many conceptions are management consultants who propagate their ideas and experiences and who do not need to present a theory. The above methods do not pretend to be science and theory and in the context of practical improvement of management definitely fulfil the objectives set. Many methods certainly contain theoretical approaches and scientific elements.

Secondly. Practical orientation in discussing business processes allows hoping that it might be possible to find from literature numerous examples on business processes from different areas of activity and on firms using different business models. One expects to find different versions of business processes, their analyses and improvement possibilities. It would be good to know what is the best practice in this field.

In real life it is the other way round; concrete examples can be found in a minimum amount in literature. I do not believe that the reason for that is only keeping a professional secret by the consultants.

While explaining business processes only some starting points are provided (client satisfaction, quality assurance, value creation etc.); the respective elementary process scheme and everything that follows is kept by the authors to themselves. And how the processes should be treated and modelled further remains unclear. Some examples.

First, all methods applied with the purpose to inspect, ensure, provide, raise etc. the quality. Here belong primarily TQM and its developments, for instance SIPOC, Six Sigma, ISO standards etc. All these methods postulate the importance of describing...
the processes and for the achievement of the objectives based on improvement of the processes. However, processes have been much discussed neither in literature nor in firms’ quality handbooks. For example, Six Sigma provides one simple scheme and no developments. However, business process management is described quite thoroughly. My question here is how can one write about process management when h/she has not presented a model of the process?

More general TQM discourses do not present examples of processes either. And where provided, they are kind of irrelevant or side-processes, for example „how to document travel on duty“, „using a copy machine“ etc.

The same applies to the Balanced Scorecard. One simple scheme. How to implement a strategy as a process – this must be conceived by the implementers themselves.

The process approaches so far have been focused on measuring outcome of the process (achievement or non-achievement of the objective; comparisons with quality standards etc). In that case it is not necessary to describe the whole process but to find outcomes from the process that deserve measuring. Process per se, i.e. process itself recedes into the background.

It is absolutely necessary for discussing processes to construct a model which would explain the nature of the process, stages or development phases. I assert that a jumble of arrows without a clear beginning and end cannot be a process model. A phenomenon is a process because its parts act in a certain order.

A real multitude of opinions is dominating in the identification of processes. If this is at all written about in a considerable manner, then by presenting various lists not connected to each other.

Some lists contain tens of uninterrelated processes without explaining why just these processes. They do not mention either in which organisations these processes occur. The processes are not described as a process, either verbally or schematically. With such approach, each list can always be increased, still not hitting the main point of the phenomenon.

It is recommended to use the UML (Unified Modelling Language) technique for describing processes. This is the only method elaborated in detail for schematic representation (in flowchart) of processes. This method still was initially conceived as groundwork of programming. Using a large number of symbols makes it difficult to follow a flowchart. It is impossible to express with symbols the exact content and language nuances of the processes. The Estonian practice suggests that top managers, not to speak of others, do not take to this method. There simply is neither time nor directly need to go deeper into and discuss over the scheme.

The author is of the opinion that the process approach is in a kind of deadlock today. There are two reasons for that:

1. There is no general theory for discussing processes. This is also the reason for the insufficient theoretical argumentation of the methods and techniques so far. We need a comprehensive theory for the systematic treatment of organisational processes.
2. The essence of business processes per se has not been studied on a satisfactory level. There is no theoretically motivated understanding of the essence of processes in an organisation and the method for their systematic modelling.

This paper is an attempt to solve these problems through theory and methods of procedural analysis.
3. System Theory as a Methodological Basis for Procedural Analysis

System theory as a methodological basis in this context means treatment of organisation’s performance as a system, using a classical input-output principle based model (Figure 1).

**Figure 1. General System Model**

![General System Model](image)

Considering that there are several different approaches to system theory, we shall next explain how the system theory is interpreted and used as a methodology for procedural analysis.

System is defined as follows. System is a set of interrelated processes, which is acting for the achievement of the objectives. According to the definition, performance of an organisation is a targeted system, hence a social system.

A system consists of subsystems, which are also processes by nature. Subsystems may be connected both sequentially and in parallel (Figure 2).

**Figure 2. Relationship of Subsystems**

Sequential

```
A
  ↓
  B
```

\(\text{Input}_A\)

\(\text{Output}_A\)

\(\text{Input}_B\)

\(\text{Output}_B\)

\(\text{Output } A = \text{Input } B\)

Parallel

```
C
  ↓
  D
```

\(\text{Input}_C\)

\(\text{Output}_C\)

\(\text{Input}_D\)

\(\text{Output}_D\)

\(\text{C and D are independent}\)

In a sequential relationship of subsystems output of subsystem \(A\) is input to subsystem \(B\). There is a causal relationship between them. It means in the performance of processes as an activity that \(B\) is possible only after \(A\).

In a parallel relationship (\(C\) and \(D\)) subsystems are independent. Inputs and outputs are not linked, there is no causal relationship. \(C\) and \(D\) (Figure 3) can be part of one system only when they are conjoined by previous (Version 1) or next (Version 2) subsystem or both (Version 3). In the contrary case they belong to different systems.

The number of sequential and parallel parts in a system is not limited.
Input is a precondition, basis, starting point, starter for a subsystem to work. Output may be a final result of subsystem’s performance, input of the next subsystem or its part. Inputs and outputs are joined into a whole by movement of information. Inputs and outputs determine the sequential or parallel nature of the subsystems, i.e. indicate causal relationships and sequence of subsystems in time. Procedural analysis neither investigates, formulates nor measures inputs and outputs.

**Figure 3. Versions of Linking Parallel Subsystems**

![Diagram showing different versions of linking parallel subsystems.]

Feedback indicates transfer of the process to the next cycle; the process starts all over again and is repeated. By nature it is a circular process.

Subsystems are identified by way of decomposing, which will determine different levels of modelling of the system with the direction from general to concrete (Figure 4). On every level of decomposing a model for the respective process must be constructed. The number of decomposition levels is not limited. The lowest subsystem is called system element, which is the smallest part of the system to be modelled.

**Figure 4. System Decomposition and Different Modelling Levels**

![Diagram showing system decomposition and different modelling levels.]

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Based on the sequential and parallel relationships it is possible to describe all processes, including performance of every organisation.

4. Functional Approach as the Methodological Basis of Procedural Analysis

The functional approach to organisation’s performance in this context means that functions performed in this organisation are:
– identified;
– interrelated as a system;
– arranged into a system model.

System theory and functional approach are interlinked and all together form an integrated methodological basis of procedural analysis.

There are an infinite number of treatments of organisation’s functions; it can be stated that in one way or other, all business surveys are dedicated to one or another kind of treatment of some functions.

Treatments of functions so far have focused mainly on the methods used (equations, decision-making techniques, measuring indicators). This is of course necessary, but fulfilment of the given function in the context of organisation has receded to the background. Relationships with other functions are almost neglected, owing to what the limits and capacity of the functions rest with each author. A typical example is marketing, which is often discussed to be composed of such components as sales, product development and many others.

In this paper we define organisation’s function as follows.
Organisation’s function is a specialised and relatively independent area of activity (domain) for the realisation of a business idea that requires specific skills and results from division of labour. These are, for example, financial performance, manufacturing, marketing, sales etc. dependent on the specific characteristics of the company. Usually appropriate structural units have been established for the performance of organisation’s functions.

Functions shall be identified by dividing the system (organisation’s performance) into subsystems based on the functional principle.

Based on the system theory, functions are linked as a process. Functions are examined in the context of system theory, i.e. a system of functions shall be created. Hence, methodologically it is a decomposition using a deductive method in theory, i.e. subsystems (processes, functions) are derived from higher-level systems (processes, functions). It is important to note that the relationship of subsystems (processes, functions) is process-like, not hierarchic.

By organisation's performance we mean here the relationship of all functions as a process. This means also that under study is organisation as a whole, not some of its parts.

Fulfilment of functions in organisation is a process that has its own inner logic. This cannot be changed (you first have to „buy”, then you can „sell”). Fulfilment of each function is a process, in terms of system theory a subsystem.

The literature does not provide a definite list of company’s functions; every author has his own conception. Functions as a whole and in mutual relationship and as a process have not, as far as the author knows, been discussed with any noteworthy results in theory.
Organisation may create new functions, rearrange them, outsource or remove them. Still, more-or-less certain, depending on the area of activity, is the list of functions without which it is not possible to realise the business idea. Outsourcing of functions does not change the situation; function simply is performed outside the organisation. Every company decides itself which functions to perform, how and to what extent.

Functions can be performed in several ways. Every organisation has its specific features. This is verified by that reengineering is possible. Every organisation is unique; also the system of performing functions is unique.

The idea of procedural analysis in this case consists in that performance of every function is discussed in an organisation in relationship with performance of other functions, whereas performance of each function consists of three parts (see Figure 5). The representation on Figure 5 is a theoretical basis for the shaping of the content of functions, or in other words, subsystems of each system in general are planning, execution and control.

Figure 5. Theoretical Basis for a System to Work and Perform Functions as a Process

![Diagram]

Adjusted to an organisation it means that performance of this organisation as a whole and performance of all functions of the organisation is:
- planned (in general terms, containing for example a functional strategy, action plan, specific plans, objectives, etc);
- plans are carried out with the help of organisation;
- results are controlled (in general terms, comprising for example accounting, analysis, assessment of the results etc).

The results achieved serve as the basis for planning in the next cycle. The above can be extended to all human activity and in general terms means that „a person
in general first thinks (planning), then will carry the ideas into life (implementation) and finally will see what comes of it (control)“.

On the other hand, under specific functions the process matter will develop according to their specific inner logic. Relevant stages are presented nearly always in theoretical descriptions of the respective function.

The discussion of organisation’s performance and functions using the above logic is directly targeted at the process of implementing the objectives (plans, business idea, strategy etc.) rather than at the objectives themselves. In that sense there is a difference in principle, for example, from MBO (Management by Objectives) where objective is important and the process leading to this is not discussed. In other words, procedural analysis is dealing with the process of achieving organisation’s objectives irrespective of what the objectives are.

5. Initial Model – Company’s Performance as a System

Next we shall explain the theory and methods of procedural analysis at the example of a company.

Using the general system model (Figure 1) we can develop a model for studying the performance of companies (see Figure 6).

Figure 6. Company’s Performance as a System

The main content of input-output analysis for a company is comparison of the given objectives/resources, on the one hand, and of the results achieved, on the other hand; more precisely: optimisation of resources and maximisation of results. Management is conducted through feedback consisting mainly in financial accounting and analysis. Procedural analysis does not deal with input-output problems.

It means also that procedural analysis does not deal with problems of business administration, for example, what are concrete strategic choices, how to optimise resources, how and with which measures to measure results, how to cut expenses etc. Procedural analysis neither measures nor calculates. These problems are dealt with by many other process approaches. Procedural analysis does not examine inputs and outputs of company’s performance.
Procedural analysis defines its target problems as follows. Procedural analysis investigates company’s performance as a process, i.e. what should company do to turn input into output. This is the task of company’s employees, primarily its top management. Everything done by the employees for the achievement of results are called from the aspect of procedural analysis company’s performance.

Its content in the context of procedural analysis is shaping of the structure of company’s performance and management of the process for the achievement of the objectives. The process must interlink the resources used and ensure efficiency of the performance. As mentioned above, procedural analysis does not directly measure it. Management is an organic part of processes that consists in the fulfilment of management functions in different stages of the process. Management cannot be separated from the work process. Management is not therefore a separate function but a part of all functions. Management is integrated into process. Manager in organisation cannot be treated as an operator of a technological process, who outside the process is monitoring, regulating and adjusting the process on the basis of input and output.

Procedural analysis raises its key question as follows: What is the structure of company’s performance as a process like, and how can this process be modelled, studied and improved? The same question can be asked about all other organisations, not only companies.

The modelling theory is based on the above general system theory and on functional approach.

By theory we mean general principles in a given context, which determine the architecture of the processes so that it could be implemented in all organisations.

The object of modelling therefore is performance of an organisation as a whole, from input to output. This means that a model must enable to present as a process all obligations and rights of this organisation’s workers.

From the aspect of research methods the so-called research with a model is used, i.e.

1) a model describing organisation’s performance as a process is constructed, i.e. description of organisation’s performance (descriptive model);
2) the model is studied for various purposes and conclusions are drawn about the organisation;
3) the model is improved;
4) amendments to the model are transferred to organisation’s performance, i.e. change will occur also in practice.

The above means that the model is constructed in a particular organisation, i.e. this is applied research. A deductive approach in theory will turn with implementing the theory in practice into an inductive approach.

Explained in the paradigm of process analysis it means that first the processes are described like they are at the moment, then necessary changes are made to the processes and the changes are put into practice. Essentially it is close to the problems of change management.
6. Basic Procedure of a Company – Relationship of Functions

Based on the above described methodology and using this for decomposing company’s performance (Figure 6) we get a relationship of functions as a process, i.e. process is performance of functions. Selecting industrial production as area of business activity we can represent the relationship of a manufacturing company’s functions as a process, which is called basic procedure (Figure 7).

The basic procedure for a particular company is devised during field studies. The basic procedure depicted on Figure 7 is a theoretical generalisation based on empirics of basic procedures of many analogous companies.

Basic procedure indicates subsystems of organisation’s performance and is therefore the most general functional model of an organisation.

Basic procedure determines the place of every function as a subsystem and the most general and basic relationships with other functional subsystems.

The application of procedural analysis so far suggests that basic procedure can be devised for performance of every organisation.

Basic procedure determines the architecture of organisation’s performance as a system. For a particular company this serves as a basis for further modelling.

Basic procedure indicates which functions are performed, how the functions are related and in what sequence they are performed. On the level of this generalisation all manufacturing companies have a lot in common. A further detailisation brings forward specific features of each manufacturing company.

Irrespective of the size or area of activity, performance of every company is subjected to its specific, business idea-based logic.

Basic procedure shows the cyclicality of organisation’s performance. A suitable cycle for modelling is a financial year. Cyclicality gives meaning to the modelling of process in general – there is no reason to investigate single activities.

The „backbone“ of basic procedure is basic process, the content of which is determined by the company’s area of activity. At the example of a manufacturing company these are sequentially connected subsystems:

– Elaboration of a general strategy, financing, budgeting
– Production
– Marketing of goods
– Accounting and reporting

The other subsystems have an assisting and servicing significance. Their internal client is subsystem „Production“, their input is strategy and output is production input. Basic procedure indicates that also performance of manufacturing companies can be discussed as consisting of three components: planning, implementation and control.

Basic procedure as a model is an intermediate stage in implementing procedural analysis.
Figure 7. Basic Process of Manufacturing Companies

INPUT

WORKING OUT A GENERAL STRATEGY, FINANCING AND BUDGETING

PRODUCT DEVELOPMENT

OBTAINING MATERIALS

PERSONNEL MANAGEMENT (STAFFING)

OBTAINING AND MAINTENANCE OF EQUIPMENT

MARKETING

TRANSPORT AND LOGISTICS

PRODUCTION

MARKETING OF GOODS (SELLING)

ACCOUNTING AND REPORTING

OUTPUT
7. Procedures and Operations

All subsystems represented in the basic procedure consist of sub-subsystems, which are found also by means of decomposing. From the aspect of procedural analysis we get a relationship of procedures.

Figures 8–17 depict decomposing results for all subsystems. Essentially, these charts indicate major components of the function and their relationship as a process.

The following comments explain the charts.

1. The charts are a theoretical generalisation of empirics. There definitely is no company exactly like presented here.

2. In the composition of each subsystem we can distinguish planning, implementing and controlling procedures.

3. Participating in the performance of each subsystem are several structural units of the company. For example, participating in the implementation of procedures of the subsystem „Obtaining materials“ (Figure 10) are in addition to purchase department also production department, top management, lawyers, raw materials warehouse, quality specialists, accountants, etc. From this draws an essential conclusion: performance in a subsystem as a whole is much more extensive and diverse than performance of the respective structural unit. Fulfilment of a function as a process involves many structural units.

4. Depending on the business idea, business model, area of activity, size of company and conception of the owner/managers, every company has its specific system of performing functions and procedures. Functions can be rearranged, changed, added or removed, depending on the need. The systemic nature and relationship of procedures should be preserved.

By further decomposition the procedures are divided into subsystems. The result will be a system’s element, which in terms of procedural analysis is operation.

Operation is an integral part of organisation’s performance as a process performed by one employee, which is a task of this worker. Hence the operations are determined on the basis of division of labour.

Procedure is defined through operations. Logically related operations that are performed in a certain order, which form a kind of fixed whole and which have a fixed place and independent significance in organisation’s performance, are called procedure.

Performance of every organisation is based on performance of more-or-less regulated procedures. Procedures are mostly determined verbally or formed in the process of everyday work. The number of operations in a procedure is not limited.
Figure 9. Relationship of Procedures, Subsystem "PRODUCT DEVELOPMENT"

WORKING OUT A GENERAL STRATEGY, FINANCING AND BUDGETING

WORKING OUT A PRODUCT DEVELOPMENT AND RESEARCH STRATEGY AND POLICY

TECHNICAL INVESTIGATIONS

MARKET RESEARCH

PLANNING PRODUCT DEVELOPMENT

PREPARING INITIAL TASK FOR A NEW PRODUCT

WORKING OUT CONSTRUCTION OF A NEW PRODUCT

WORKING OUT NEW PRODUCT TECHNOLOGY

DOCUMENTATION

INTRODUCTION OF THE PRODUCT

PRODUCTION
Figure 10. An Example of the Relationship of Procedures, SUBSYSTEM "OBTAINING MATERIALS"

WORKING OUT A GENERAL STRATEGY, FINANCING AND BUDGETING

WORKING OUT A STRATEGY AND POLICIES FOR PURCHASING MATERIALS

KEEPING RECORDS OF POTENTIAL SUPPLIERS

DETERMINING THE NEED FOR MATERIALS

CONCLUDING PRELIMINARY CONTRACTS

CONCLUDING PURCHASE-SALE CONTRACTS

RECEIVING AND STOCK RECORDING MATERIALS

SETTLING ACCOUNTS

RAISING AND RESOLOVING COMPLAINTS

GIVING OUT MATERIALS FROM WAREHOUSE

KEEPING STOCK RECORDS AND ACCOUNTING

WAREHOUSE INVENTORY

PRODUCTION
Figure 11. Relationship of Procedures, Subsystem "PERSONNEL MANAGEMENT"

WORKING OUT A GENERAL STRATEGY, FINANCING AND BUDGETING

WORKING OUT PERSONNEL STRATEGY AND POLICIES

PLANNING NEED FOR PERSONNEL AND TRAINING

STAFFING (CONCLUDING EMPLOYMENT CONTRACTS)

PERSONNEL TRAINING

INSTRUCTING PERSONNEL ON SAFETY

Subsystem "PRODUCTION" PERFORMING WORK TASKS

RECORDING WORKING TIME AND DETERMINING REMUNERATION

AWARDING BONUS PAYMENTS

FORMALISING HOLIDAYS

INVESTIGATING ACCIDENTS AT WORK

INFLECTING DISCIPLINARY PUNISHMENT

TERMINATION OF EMPLOYMENT CONTRACT

PRODUCTION
Figure 12. Relationship of Procedures, Subsystem "OBTAINING AND MAINTENANCE OF EQUIPMENT"

1. Working Out a General Strategy, Financing and Budgeting
2. Working Out an Innovation Strategy and Technopolicy
3. Examining and Determining the Technical Condition of Equipment
4. Identifying and Deciding Potential Technological Solutions
5. Purchasing New Equipment
6. Installing and Starting-Up New Equipment
7. Planning Technical Maintenance of Equipment
8. Organising Technical Maintenance of Equipment
9. Production
Figure 13. Relationship of Procedures, Subsystem "MARKETING"

WORKING OUT A GENERAL STRATEGY, FINANCING AND BUDGETING

WORKING OUT A MARKETING STRATEGY AND POLICY

WORKING OUT A MARKETING PLAN

IMPLEMENTING MARKETING MEASURES

MONITORING THE MARKET SITUATION

PREAPARING SALE OFFERS

CONCLUDING CONTRACTS OF SALE

PRODUCTION
Figure 14. Relationship of Procedures, Subsystem "TRANSPORT AND LOGISTICS"

WORKING OUT A GENERAL STRATEGY, FINANCING AND BUDGETING

WORKING OUT A TRANSPORT AND LOGISTICS STRATEGY AND POLICY

PLANNING TRANSPORT AND LOGISTICS

PURCHASING TRANSPORT VEHICLES

CONCLUDING TRANSPORTATION CONTRACTS

ACCEPTING TRANSPORTATION ORDERS

USING FIRM'S OWN CARS

REMUNERATION OF DRIVERS' WORK

USING ORDERED TRANSPORT

PAYMENT OF TRANSPORTATION BILLS

ACCOUNTING AND REPORTING

PRODUCTION
Figure 15. An Example of the Relationship of Procedures, Subsystem „PRODUCTION”

WORKING OUT A GENERAL STRATEGY, FINANCING AND BUDGETING

OUTPUTS OF FUNCTIONAL SUBSYSTEMS ACCORDING TO THE BASIC PROCEDURE

OPERATIONAL PLANNING OF PRODUCTION

PREPARATION FOR PRODUCTION

MANUFACTURING A PRODUCT (technological process)

PRODUCT QUALITY CONTROL

ACCOUNTING AND REPORTING

MARKETING OF FINISHED PRODUCTS
Figure 16. Relationship of Procedures, Subsystem "MARKETING"
Figure 17. Relationship of Procedures, Subsystem „ACCOUNTING AND REPORTING”

MARKETING AND OUTPUTS OF FUNCTIONAL SUBSYSTEMS

CONCLUDING OF ACCOUNTING PERIOD

ACCOUNTING FOR TAXATION PURPOSES
ACCOUNTING FOR STATISTICS

REPORTING AND ANALYSIS OF PERFORMANCE
AUDITING

PREPARING FOR AND CONDUCTING OF THE GENERAL MEETING

WORKING OUT A GENERAL STRATEGY, FINANCING AND BUDGETING
8. Procedural Rules

The model of procedure is a procedural rule. It is a descriptive graphic-verbal model that determines in addition to the contents and relationships of operations also relevant parameters of the operation.

Parameters of procedural rules are characteristic features of a process, which together determine the nature of this rule, i.e. process is described through its parameters. Parameters of a procedural rule are:

1. **Contents of operations performed**, i.e. what needs to be done (task of employee).
2. **Relationship of operations**, i.e. in which order these must be performed. Sequential and parallel relationship.
3. **Division of labour**, i.e. who performs that particular operation (official title, subunit).
4. **Time**, i.e. when, by what time the operation must be performed (Date or adverb of time)
5. **Information**, i.e. based on which information the operation is performed, which are the documents to be prepared (names and addressees of the documents).
6. **Possible alternatives**, i.e. one or other variant of action.
7. **Methods**, i.e. how to perform the operation (i.e. professional rather than organisational problem).

An example of procedural rule is represented on Figure 18. The example is of course a generalisation; but I believe it gives a clear idea of what the procedural rule actually is.

Procedural rule is a final result of decomposing and modelling organisation’s performance. Intermediate process models are also generalisations of a particular organisation; they need not have any major practical significance. Procedural rule is a concrete and detailed description of an organisational process, an instruction for everyday practice.

Modelling of individual processes does not mean anything more significant. We shall have a qualitatively new situation if we, for instance, make procedural rules for all functions (see Figures 8–17). In that case we have a quite detailed description of a manufacturing company.
RECEIVING AND STOCK-RECORDING MATERIALS

1. Materials arrive by car at the warehouse territory. **Driver** submits the accompanying documents to the warehouse manager.

2. **Warehouse manager** controls immediately in a computer whether the materials have been ordered.

3. If the materials have been ordered, the **warehouse manager** arranges for the materials to be unloaded, if necessary, to be control measured (counted, weighed, measured) and be placed in the warehouse. **Warehouse manager** sends for a quality specialist in specified cases.

4. In case the material, or part of it has not been ordered for, **warehouse manager** notifies of the situation the **supply department manager** who will decide further action.

5. **Warehouse workers** put the materials in their place in the warehouse.

6. If the information in the accompanying documents do not correspond to the quantity of goods, the **warehouse manager** prepares a relevant report and sends it to the manager of sales department.

7. **Quality specialist** evaluates the quality of the goods that arrived, arranging in specified cases for laboratory tests. See procedural rule „Ordering laboratory tests“.

8. **Warehouse manager**:
   1. gives his signature to the driver on receipt of goods
   2. Stock-records goods in the computer system
   3. Sends not later than the next working day the accompanying documents to accounting department

9. See procedural rule „Payment of bills“.

10. See procedural rule „Making and resolving complaints in the event of disconformity of quantities“.

11. If the quality of goods does not conform to that stipulated in the contract, then see procedural rule „Making and resolving complaints in the event of quality disagreement“.

12. See procedural rule „Giving out materials from warehouse“.
9. Conclusions

Implementation of procedural analysis in practice and scientific research based on this enable to make some brief generalisations and conclusions.

1. The theory of procedural analysis has been tested in hundreds of organisations over years.

   Long-lasting and extensive application is the primary scientific confirmation of the applicability of the theory. Procedural analysis has successfully survived many vogues. Research results suggest that procedural analysis is a **universal** method; it has been used in both public and private sector, in large and small organisations and nearly in all areas of activity.

   Research findings show that procedural analysis can be used to encompass organisation’s performance **as a whole**, while at the same time it is possible to content with discussing only some functions or a few procedures. Procedural analysis is **flexible** enabling to describe all processes and, if necessary, to rearrange them systematically. Only the input-output logic must be preserved in every situation.

   The studies so far attest unequivocally: each activity of an organisation is a process; it can be modelled and on the basis of the model improved. Investigations allow expert evaluations to say that at least 80% of each organisation’s purposeful performance can be described with a procedural rule. Both, routine and creative activity are identifiable as employee’s duties.

   As the technological process in industry can be designed, so can we design the performance of organisation’s functions. Determining the procedures is particularly significant in starting newly established organisations. The system of procedural rules is part of the organisation’s intellectual capital, being unique by nature. Establishment and building up of an organisation signifies among other things also establishment and building up of procedures.

2. The system of procedural rules is a graphic-verbal descriptive model of organisation’s performance, which deals with the organisation in dynamics. Scientifically we can study everything that the model contains, both individually and in mutual relationship.

   Procedural rule as a graphic-verbal model is, as far as the author knows, an original solution to explain processes. Practically all other theories use flow diagrams in various modifications. Flow diagram as a process visualisation method has many serious weaknesses. The initial meaning of the flow diagram was process description for programmers. And for that purpose it is suitable.

   Procedural rule as a block chart is meant as an instruction for practicians. From the aspect of IT development it makes sense and has a meaning. Procedural rule is just what IT specialists need for designing data processing. This means that procedural rules facilitate introduction of computer technologies. In practical life procedural rule is primarily an instructive material for top management. It is easy to change the whole system including its architecture to meet the needs. Here the process problems correlate with change management.
Changing of processes depends on the context, i.e. one can change what in this situation and with these people can be changed.

Our research indicated that improvements of procedures must be based on the system of procedural rules as a whole. Maximisation, minimisation or optimisation of individual parts of a process usually does not give the expected result. The principle of system theory that everything in a system is related to everything is also applicable here.

3. The process-like nature of organisations’ performance is an essential supplement to organisation theory, enabling to see and understand the relationships and to investigate them. Procedural analysis is a theory and methodology of constructing an algorithm in the systematisation of organisation’s performance and in the achievement of objectives. The process-like nature of organisations’ performance is objective reality that does not depend on whether the processes are modelled or not.

The system of procedural rules is essentially a large network of interrelated tasks where we can identify various chains and study them systematically.

Procedural analysis enables to scientifically explain and describe organisations’ performance, helping to understand it better.

References