

Fundamentals of business engineering and management

A systems approach to people and
organisations

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organisations

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with contributions from J. in 't Veld and P.Ch-A. Malotau

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Preface

Background details concerning the realisation of this book

In order to see this book in its true perspective one needs to briefly consider its underlying developmental history which takes us back to 1968. That was the year when two professors were simultaneously appointed to teach a subject known as “business management” at the University of Technology in Delft. They were the engineers P.C.A Malotaux and J in ’t Veld who were respectively affiliated to the departments of Business Engineering and Management Studies (Malotaux) and Industrial Organisation (In ’t Veld).

The common ground that they shared was this. They were required to teach students drawn from all the university’s technological disciplines and faculties everything that they might need to know in their future (very divergent) areas of professional practice about Management Science.

Over the course of 30 years some 20 academic staff members (including technological business administrators, economists, sociologists, psychologists, mathematicians and engineers drawn from different disciplines) have been affiliated to these departments and have contributed both to the scientific developmental sides of these fields and to their operational applications. In extensive final dissertations resulting from fieldwork within all kinds of companies more than 450 students have implemented the theoretical concepts developed. On top of that sustained contact was, and still is, maintained with graduates in their various fields of work. Such interaction has, of course, been most instructive which has meant that in turn the theoretical concepts developed could be perpetually extended and adjusted as could the way in which they could be applied to resolve problem situations in a wide diversity of technological and other companies. After all, it was all about establishing practical, applicable knowledge!

The Dutch-language course readers were not only used at the university in Delft but they were also listed as obligatory reading by many colleges providing polytechnic level courses in engineering throughout the country.

In 1993 Professor Malotaux and Professor In 't Veld retired but the co-operation between the “Business Engineering and Management” and the “Industrial Organisation” departments was perpetuated in the fields of education, research and theory development.

In the late nineties the authors selected certain of the existing and relevant key topics for inclusion in the present book. All these topic areas were partially revised, some of them were even rewritten and a number of totally new topics were added.

The focus throughout has been upon what technologists and colleagues drawn from other disciplines need to know in their everyday practice about business management insight and problem analytical and problem resolving oriented approaches.

The target group in question is a varied one comprising, above all else, technologists drawn from all kinds of disciplines who may be employed in all types of companies in all kinds of functional capacities. Moreover, in practice, also managers with other scientific backgrounds but with an affinity to a systematic approach to management problems, have proved to be interested. This book aims to provide such people with the fundamental insight they need into how, in broad outline, companies are structured and how they operate. It will also help them to learn how to recognise, analyse and tackle business functioning problems.

The business management approach adopted in this book may be described in the following way:

1. As being directed towards processes and the relevant accompanying functions
2. As dealing with the application of the Systems and model approach
3. As being interdisciplinary

1. Directed towards processes and the relevant accompanying functions

Companies are purposeful organisations set up in order to make “something” happen. To that end people undertake activities within processes and which are organised in such a way that the goal in question can be achieved. If those processes do not proceed well or if they are not properly organised or attuned to each other then something will be wrong. In such cases one must try, preferably in a systematic way, to establish what constitute the missing links and to find ways of improving matters.

In this respect a company is primarily viewed as an organised collection of functions that have to be fulfilled in which the onus is upon activities or processes. The way in which they are equipped and mutually structured is, in each case, the basic angle of approach.

2. The application of the systems and model approach

The Systems and model approach is what is implemented as a “method” and as a “language” because of the opportunities it provides to examine organisations in a systematic way with the help of unequivocally defined concepts. This approach opens up the way to keeping attention directed towards the organisation in its environment while at the same time looking from that standpoint at the various parts of the organisation. It also enables one to study organisations from the angle of different

professional disciplines and approaches. Together with the fundamental process approach the systems approach forms what amounts to a universally applicable set of instruments for analysing organisations and for getting to the bottom of problems in the functioning of business processes and, of course, to dealing with such issues.

Even though the methodology – especially in technologically oriented businesses – tends to be developed and applied it has emerged that it is just as applicable to the service providing sector for organisations such as hospitals, transport companies, trading organisations and so on. If one thinks about it this is logical because all organisations are under pressure to operate in a “goal-oriented” and “business-like” fashion.

3. Interdisciplinary

Though the process approach is often chosen as the main analysis mode, the view of people and organisations adhered to certainly may not be termed monodisciplinary in a technological or economic sense. Organisations are co-operations of people set up for people. If one only looks at the technological functioning of processes or at economic profit one will generally find that little can be resolved. Organisational phenomena emerge from the field of tension between what is technologically possible, economically profitable and socially and psychologically acceptable. This demands an approach that needs to be realised in an integrated way and from different perspectives. It is an approach that may be briefly characterised in the following way: “as paying attention to the organisation and to its environment, the basic conviction being that in all cases it is all about activity for people and with people”. With the systems approach it is always possible to integrally introduce many different disciplines and specialist fields.

The desire voiced at the outset of the development of the business management approach reflected in this book to the effect that the approach should remain applicable to all kinds of organisations brought with it, and still brings with it:

- the need for a certain distancing from various concrete kinds of companies by turning them into abstractions
- a need to focus upon the general constants which may be said to lead to the fundamentals of business management

This book is therefore no manual. The aim is rather to help the reader to develop his insight and understanding. It should be emphasised that the many examples provided throughout the book constitute guidelines for independent analysis and for the finding of solutions to problem situations in all kinds of business processes.

Many business management books are more oriented towards specific business management issues and/or are written from the particular perspective of a given specialist field. In the realm of economics, for instance, much has been written about the establishing of business strategies and policies but there attention is rarely paid to the business processes that have to be specifically realised through such policies. The psychologists highlight the human factors while in sociology it is themes such as interest groups and power issues that are central. The approach presented here, known

as the Delft School approach, takes as its point of the departure the company itself and all the processes within the company and related to it. From that point of view it may be said that all disciplines have something important to offer that cannot only be acknowledged but which in fact must be acknowledged. The approach presented here provides the space for this. In other words, it is not so much a question of “instead of” or “in addition to” but rather of “in conjunction with”.

When it came to the notion of developing an English edition of this book it was really the following considerations that were uppermost in the minds of the authors:

1. The “Delft School” ideology characterised by its process orientation, systems approach and interdisciplinary traits is really little known outside of the Netherlands. From their participation in various congresses the authors had gradually become aware that in the areas of systematics and applications there was much external interest for “their school”. Publication thus offered the perfect platform for internationally launching the mental legacy of Malotaux and In ‘t Veld.
2. The internationalisation of the student population at the University of Technology in Delft is gradually making it imperative for the university to provide many of its courses in English.

Acknowledgements

It is due to the co-operation of many individuals that this book has finally been able to materialise. Content-wise it was Malotaux and In ‘t Veld who really developed the basic philosophy underlying the Delft School in close co-operation with their various staff members, the authors of this book included, over the course of a 20-year period. Students, post-graduates and student assistants stimulated them to innovate change and to modernise through the application of methods, and the provision of criticism and praise. Translating the book into English proved to be no sinecure. Mrs Diane Butterman enthusiastically took responsibility for the translation of the whole text and all the figures, all of which ultimately led to many hours of consultation with the final editor. The student assistants did a great deal of supporting work by collecting data, and adapting figures and correcting them.

We thank them all for their contributions. Without them this book could never have materialised.

“The science of the use of usable science”

Delft, October 2002
W. ten Haaf
H. Bikker
D.J. Adriaanse

About the authors

Wouter ten Haaf began his career as a secondary school maths and physics teacher. He qualified as an electro-technical engineer at Delft University of Technology and afterwards worked in West Germany for a number of years, firstly as a micro-electronic designer. Later on he fulfilled various managerial functions there in the fields of product development, sales and general management. He returned to the Netherlands in 1981 where he became associated professor within the Business Engineering and Management department at Delft University of Technology. After the retirement of Pierre Malotaux he was made responsible for the Business Studies side of the Delft School of Business Engineering and Management. Since then, together with Henk Bikker, he has been responsible for supervising the further development of that business school. In his approach to the field it is people that are central which is something that emerges from the research into and the teaching focused upon the methodology of problem resolving, the effectiveness and productivity of co-operation and management and the processes directed towards personal growth, also in the light of the “Systems Approach”. These fields of research, which basically belong to the area of human sciences, are issues he tries to translate into the worlds of thought and experience of people with scientific and technological backgrounds in general and for (prospective) managers, particularly with such backgrounds, so that these fields become accessible and manageable for them.

He is also active in the field of social service. For 17 years he was the national chairman of a society occupied with social work. Apart from working at Delft University his enterprise ‘Ten Haaf Consultancy and Education’ provides business courses and training for people in industry. On top of that he is a course leader in the field of Business Engineering and Management at the College of Engineering in The Hague where he provides postgraduate education for managers. Apart from being a co-author he also contributed to the creation of this book by taking responsibility for the final editing.

Henk Bikker studied aviation engineering at Delft University of Technology and started working at Fokker in 1961. There he was responsible for managing one of the company’s production programmes and later for production preparation and management at another Fokker plant. He was subsequently made responsible for the project management of the F28 Fellowship Centre Division, the VFW-614 wings and the Airbus programme. As head of the “New Parts Factory” design team he introduced the product oriented production line organisational concept to a factory that had originally been organised along the lines of a functional oriented organisation. This kind of re-organisation was the first of its type and scale to be undertaken in the Netherlands. In the period that followed it was new aircraft construction that was of central importance to him in his role as head of the engineering department. That was a period when interest in innovation was growing and modernisation paths in product development were emerging. In 1978 he moved from Fokker to the Industrial Organisation department at Delft University where that same interest in innovation and modernisation paths in product development was consolidated in a research

programme. He then went on to produce numerous national and international publications on the interrelationship between product design, production and service and the scientific approach to all of that with the aid of the “Systems Approach”.

In 1994 he succeeded Jan in ‘t Veld and was made professor and head of the Industrial Organisation section. Since then much attention has been paid to the development of “New Systems Concepts”, notably where the matter of the manageability of the primary processes in industry and technological service provision is concerned. Together with Wouter ten Haaf from the Business Engineering and Management department he is responsible for the provision and further development of education and research programmes within the framework of the Delft School.

Johan Adriaanse read chemistry at Delft University of Technology. After having rounded off this engineering course he worked in the chemical industry sector for 6 years where he was involved in the field of production process development and facility re-engineering. He then joined the staff at Delft University where, for a number of years he was occupied with interdisciplinary research into organisational change. After that he became senior consultant to the Dutch Marine Research Institute (MARIN) where he carried out research into organisation patterns on board ship and within shipping companies and into the consequences of that for the redesigning of freight ships. When he returned to the university in Delft he embarked upon research into the optimisation of design and engineering processes. In addition to that he worked as an organisation advisor for the medium and small business sector.

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