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The ADVIAN® classification — A new classification approach for the rating of impact factors

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ABSTRACT

A new classification scheme for the impact analysis based on an impact matrix is presented. In contrast to the state-of-the-art methods the impact factors of a social system are not grouped into 4 or 5 groups but ranked according to different criteria. The criteria include for instance the driving impact factors as keys for improvements to the system and the driven impact factors that may be indicators for the improvement success. The ranking for each criterion is on a scale from 0 to 100, independent of the number of impact factors.

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1. Introduction

Many authors from different fields in business administration like strategic management, performance measurement or scenario analysis refer to important resources of organisations as drivers, key values or key success factors (e.g. [1–5]). They should serve as 'adjusting screws' of the organisation. For intervening activities organisations must be able to reflect which resources they should influence to improve organisational results. However, to understand an organisation as a system of resources [6,7] one does not only have to classify the resources as drivers but also to classify them according to other criteria. For instance, resources that mainly depend on other resources are good indicators of the success of changes to the organisation. But, most authors argue along with [4] and identify drivers with reference to their importance without a more detailed specification.

If we want to distinguish specific resources or influencing factors as drivers for instance, we need to find a way to identify them in a comprehensible manner. Some interesting approaches can be found in the literature on impact analysis. A system is classified by its impact factors (resources) and their strengths [5,8]. However, we state that the question of how resources can be qualified as drivers is not indisputably solved. Realising the mutual impacts of resources in organisations and the different importance of single resources (drivers and non-drivers) within social systems on the one hand, and the insufficient demarcation and methodology on the other hand, the aim of this paper is to develop an advanced methodical access.

In another paper we have already introduced an enhanced method for data processing in the cross impact analysis [9]. This method (ADVanced Impact ANalysis, ADVIAN®) considers direct and — even more important — indirect impacts. This is only the first step in order to classify the impact factors (IFs) according to several criteria. Every existing reference on cross impact analysis so far suggests a classification scheme (see [5,10,11]). However, these schemes are often not universal and are valid only for a specific number of impact factors or the classification is very rudimentary and divides the IFs in groups rather than giving them a

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specific order. In this paper we will suggest a more universal classification method that is independent of the number of IFs, allowing the classification of the IFs according to different criteria and finally to find the driver resources.

In Section 2 we will summarise the most important methods given in literature for the classification of the impact factors. Section 3 will present the new approach for the classification according to different criteria.

2. Classification of impact factors — state of the art

In this section we will summarise the most important classification approaches from literature. A short example shall be used to resume the state of the art of the classification of IFs. The same example is used in our previous paper on the ADVIAN® method [9]. This example is taken from Götze ([12]; example: automotive industry). Fig. 1 shows the impact matrix (IM) of cross impacts from the IFs on the other IFs. The impact strength varies between 0 (no impact) and 3 (strong impact). The sum of the values in the rows is the active sum (AS) and is the sum of all impact strengths of a given IF on all other IFs. The sum of the values in the columns is the passive sum (PS) and is the sum of the impact strength from all other IFs on a given IF. The ratio AS/PS and the product AS*PS is given as well in Fig. 1. These numbers are used by some authors to classify the IFs in more detail (see below).

2.1. Classification by the active and passive sums

An easy classification of the IFs can be done by their active and passive sums. An IF with a high active sum has a strong impact on the other IFs in the system. However, the passive sum also has to be considered. In order to take both into consideration a so-called system grid is made with the active and the passive sums. The system grid is a diagram with the active and passive sums as axes and an allocation of different sectors. There are different approaches as demonstrated in Figs. 2 and 3.

Referring to [2] Götze uses the maximum possible values for the active and passive sum as axis boundaries (Fig. 2) [12]. For the example in Fig. 1 the maximum possible active and passive sum is 27. The system grid is divided into four sectors as shown in Fig. 2. The mean value of the active sums (8.4 in the example, equal to the mean value of the passive sums) is used for the sectioning. The same approach can be found in [10] but with the maximum of active and passive sum as the boundary for the axes. Fig. 2 shows the 4 resulting sectors. Sector I contains the ambivalent elements (IFs) with an active and passive sum above the average. Sector II is the sector of active elements with an active sum above average but a passive sum below average. In Sector III the buffering elements are to be found. Those elements have an active and passive sum below average and don't have much influence on the system but are also not influenced much by the system. Sector IV is the sector of the passive elements (passive sum above average and active sum below average), which means elements that are strongly influenced by the other elements of the system. Additionally, the line of equal active and passive sum is included in Fig. 2. According to von Reibnitz [2] all the elements above that line are considered as relatively active because their active sum is higher than their passive sum.

A slightly different classification scheme is described in [13] as presented in Fig. 3.

Here, the maximum of the active and passive sums is taken as boundary for the axes and the sectioning is done by taking half of this maximum (see Fig. 3). The sectors are labeled in a way similar to the example above. The sector with a high active sum and a

	IF1	IF2	IF3	IF4	IF5	IF6	IF7	IF8	IF9	IF10	AS	AS/PS
IF1	x	3	1	3	0	0	2	2	0	1	12	1.33
IF2	1	x	3	0	2	1	0	1	0	0	8	0.53
IF3	0	2	x	0	3	2	0	0	0	0	7	0.58
IF4	0	3	3	x	0	0	2	0	0	0	8	0.80
IF5	0	0	0	0	x	0	0	2	0	0	2	0.33
IF6	3	0	0	0	1	x	2	1	0	0	7	1.17
IF7	1	1	1	1	0	2	x	1	0	2	9	1.00
IF8	0	0	1	1	0	0	0	x	0	1	3	0.30
IF9	1	3	0	3	0	0	0	0	x	2	9	9.00
IF10	3	3	3	2	0	1	3	3	1	x	19	3.17
PS	9	15	12	10	6	6	9	10	1	6		
AS*PS	108	120	84	80	12	42	81	30	9	114		

IF1	Legislation
IF2	Gross national product
IF3	Standard of living
IF4	Level of costs
IF5	Demand for mobility
IF6	Environmental awareness
IF7	Energy technology and alternative energy forms
IF8	Public transport system
IF9	International trading
IF10	Availability and price of crude oil

Fig. 1. Impact matrix for a simple example (automotive industry, taken from [12], p. 146).

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