

DEFINABLE FUNCTIONAL LINKAGES AS A TOOL FOR SHAPING ORGANISATIONAL SPACE IN MANAGEMENT STRATEGIES

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Purpose: The purpose of this paper is to assess the usefulness of definable functional linkages (DFLs) as a tool for shaping organisational space (SOS) in management strategies.

Design/methodology/approach: A cause-and-effect analysis is used to describe, as a model, the concept of mutual interactions with the aim of demonstrating the usefulness of the proposed solutions. A case study was used to analyse and describe mechanisms for operation in a dependent system (DS). A methodology based on advantage rules was proposed and made it possible to assess the usefulness of DFLs in SOS within the context of the dynamics the processes.

Findings: The dependent system (DS) model can be used to describe internal conditions and to refer to the environment. The application of advantage rules is the basis of business efficiency. DFLs are tools that can be used to deliver on plans and, through allocation of resources, to utilise opportunities as they emerge or to reduce the effects of adverse changes. The phenomenon investigated in the case study has a major impact on DS conditions. Administrative mechanisms shape the DS on the one hand and are essential for offsetting adverse changes on the other.

Research limitations/implications: The analyses were performed for particular time intervals and, therefore, adding further periods is proposed.

Practical implications: The analysis can be used to determine that business operation conditions have deteriorated as a result of internal administrative conditions in the DS (such as limitations). Participants DS should apply advantage rules in developing their management strategies based on DFLs. This will allow the assessment of opportunities in the context of narrowed possibilities of action, which directly affects the decision-making process.

Social implications: The phenomena described in this paper lead to job reductions and a higher cost of living, which affects the quality of life.

Originality/value The concept of mutual interactions (CMI), when set within the context of the DS model, moves the theoretical discussion towards correlations between the processes under analysis, taking their dynamism into account. DFLs are proposed as tool for shaping organizational space in dependent systems, which allow to move from plans to implementation, taking into account the dynamics of the analyzed processes, which force the introduction of necessary changes using the rules of advantage.

Keywords: management strategy, definable functional linkages, organisational space, dependent system, advantage rules.

Category of the paper: Conceptual paper and Case study.

1. Introduction

Management strategies should respond to expectations of future conditions. According to the *simple rules* approach, a strategy should aim to answer the question: “How to operate when changes in environment are happening fast and when market expectations are extremely uncertain?” (Kafel, 2013). This question was the starting point for the discussion in this paper. In this approach, the competitive advantage rules are related to (Eisenhardt, Sull, 2001, pp. 90-91):

- a) *ways of performing* activities (how-to-rules), which indicate the unique nature of a firm's processes,
- b) determination of *boundary conditions* (boundary rules), which are essential for assessing business opportunities and, at the same time, which narrow down the scope of action and help make decision-making faster,
- c) *priorities* (priority rules), which facilitate the allocation of resources between alternative business opportunities,
- d) *timing* (timing rules), which allows a firm to synchronise its activities when faced with market opportunities (or, for the sake of precision, possibilities) or even threats,
- e) *withdrawal* from business (exit rules), which indicate when managers should exit unsuccessful investments or, more broadly, projects.

The research assumption was to abandon the traditional understanding of management strategies and instead to adopt an approach where the dynamic nature of changes is reflected in the preparation of guidelines. In the behavioral approach, it is possible to model: methods of action, use cases, interactions, time perspective, communication scheme, sequencing in order to link the present with the future, and this requires an informational approach to the basis of decision making in under change conditions (Staruch, Jurek, 2019). There is a gap between the literature items describing system-dynamic modeling (Królikowska, Łatuszyńska, 2007) and the approach to necessary changes in strategic management. DFLs are to provide variants in the conditions of a rapidly changing environment. By enabling a reaction, they will improve the effectiveness of the entity's functioning. Definable functional linkages (DFLs) are therefore proposed. DFLs are systemically arranged sets of plans and the resulting opportunities for action created through mutual interactions and, in consequence, actual and/or potential flows from the existing relations which have a feedback effect on all participants of the dependent system.

It follows that DFLs are a way of shaping organisational space which – in dependent systems (DS's¹), allows for moving from links to interactions that allow to plan and carry out actions designed as a response to identified development opportunities which take into account the existing relationships (Bernat, 2017). This results in the need to adopt a multi-stage and

¹ Dependent system.

multi-level approach to the final goal, while maintaining the option of modifying or withdrawing from previously developed intentions, and even plans in progress. This applies to all participants of the dependent system, hence it requires interaction in the context of the adopted implementation solutions and coordination in terms of capabilities. Business process modeling is also done with digital support (Staruch, Jurek, 2019), DFLs are a form of information support. This, in turn, directly affects the way that organisational space is shaped and conducting activities as response to a system of links and relations, including legal relations (and including those between a dependent system and the environment), which are part of the concept of mutual interactions (CMI) (Bernat, 2011). The important question then is: what should be the predominant management strategy that should be adopted for shaping organisational space within the context of the theory and practice of management strategies (Obłój, T., Obłój, K., 2015) and how to interpret the consequences of multi-level and multi-directional links that create relations and require interactions (Bernat, 2016). This is where work in the field of early warning systems comes to the rescue for which information systems are the attitude (Majewski, 2012). This is the context of the discussion in this paper.

It is important to limit the influence of the human factor on the decision-making process, which can be decisive in critical situations (Stańczyk, Sus, 2013). This requires a rational approach to support the decision-making process. Only then will the decisions be consistent with the real state, hence the withdrawal from the planning approach to the evolutionary one.

2. Methods and materials

Management can be divided into reactive and proactive. The former eliminates the effects, and the latter consists in anticipating the future. Both are about adapting the company to the environment. Depending on the reasons forcing the change, the following possibilities can be distinguished: withdrawal, submission, consolidation and investment (Wawrzyniak, 1999). Both the repair processes and forward-looking solutions include o increasing the efficiency of management, better use of resources or reducing operating costs, which is related to the aforementioned adaptation to the needs (Zakrzewska-Bielawska, 2008).

The management strategy can be analyzed from different perspectives. One of them is the dynamics of changes that generate uncertainty and variability that result from the complexity of the processes under study or entire economic and economic systems, described as a dependent system. This requires - especially in management strategies - balancing needs and expectations, but also differentiating the capabilities of individual participants of the DS. From this relationship result in definable functional linkages that take into account the limited possibilities of action and the plans adopted as a result of the decision-making process (including consultations, negotiations and agreements). The decision-making procedure is also

important in this case. Highly reliable organizations require strategic management that offers a set of methods and tools to evaluate decisions not in terms of results, but in terms of preparing the organization for change (Romanowska, 2013). Thus, it is necessary to include the information base in the behavioral approach to strategic management.

The paper studies the influence of the market regulator on changing the conditions of the conducted activity. As an example of the difficulties of shaping the organizational space, let us use the problem of CO₂ emissions (Bernat, 2021). The analysis looked for discrepancies in the assessment of the Emissions Trading Mechanism (EU ETS) and the effects of this mechanism in the context of the general situation (Krzemieński, 2020), which is further complicated by changes in priorities over time, and which impose changes the operation. Definable functional linkages can be helpful here.

The analysis of changes in CO₂ emission prices in the years 2020-2021 seems to confirm the significant impact of *this priority on the ways of performing* activities in the context of the set boundary *conditions*. An example of this will be limiting the supply (Krzemieński, 2020) - the number of permits - and thus the use of the administrative method, which methods narrow of possibilities, and thus actions.

Between 10.02.2020 and 15.02.2021, CO₂ prices increased at auctions from 25 euros/t to 40 euros/t (Ceny uprawnień do..., 2021), hence the impact of investors on the carbon trading market should be analyzed (Dania: Unia Europejska..., 2021). The European Commission reports that “greenhouse gas emissions in the EU-27 in 2019 fell by 3.7% year-on-year, while GDP increased by 1.5%. Compared to 1990, emissions fell by 24%”(KE: Emisje gazów cieplarnianych..., 2020) This illustrates the discrepancies between the assessment of the general situation of the DS and its individual participants. In the case of a DS participant, the assessment of the situation will be a derivative of the current state and the past translating into specific ways and time of reaching the designated *boundary conditions*, taking into account plans to *withdrawal* from existing solutions in connection with new *priorities*. This generates broadly understood SOS consequences, which can be optimized by to DFL.

An example of the real consequences of SOS - in *the context of timing* - will be the decision of 2019 of Arcelor Mittal Poland to close the raw material part in the Krakow branch of Nowa Huta, which resulted from many reasons, although the most important was the cost factor. The withdrawal rule -as the company stated- resulted from the fact that production became unprofitable because: a) the EC increased the duty-free quota for the import of steel products despite the decrease in demand for steel products in the EU, b) energy costs are constantly increasing in the EU, and the introduction of additional fees as part of the capacity market in January 2021 will only deepen this trend, (c) there is an imbalance between EU and third-country steel producers who, unlike steel industry the EU do not bear the costs associated with the EU ETS (ArcelorMittal Poland zamknie..., 2020).

This example illustrates the anticipatory action resulting from the prepared analyzes, where financial variables in terms of profitability of production and their impact on the future condition of the entity were taken into account. This makes it necessary to change the priorities resulting from the application of the EU ETS mechanism. As a consequence, it leads to an interaction known as the phenomenon of "carbon leakage", i.e. the transfer of production outside Europe to countries where the EU ETS does not apply. The European Commission is still working on proposals for a solution to prevent this phenomenon, and at the same time it has not proposed any compensation mechanism for existing disparities to EU producers, which shows the consequences of the lack of synchronization (timing) of activities.

In addition to the phenomenon of "carbon leakage", which results in the relocation of activities to areas where there are no such restrictive environmental requirements, speculation in allowance trading should be mentioned. Their rising price adversely affects the competitiveness of the EU economy, and this contributes to the difficulties and "collapse" of profitability, because processes that last over time require the intervention of the market regulator. For example, "the price of CO₂ emissions in 2021 alone increased by 150 percent. This year it has come very close to 100 euros" (Tabaka, 2022), which affects into operating costs. The cause-and-effect analysis illustrates the impact of administrative mechanisms on the internal conditions of the DS and the consequences resulting from it.

This allows us to conclude that the internal situation of individual participants of the DS affects the way of performing activities. This is the main danger resulting from the difficulties that may arise at various stages of the implementation of the plans. This requires solving identified problems resulting from the boundary conditions set by the market regulator.

3. Discussion

The information necessary to identify threats is analyzed in the context of the existing risk. This approach is well described in the literature on the subject, but there is no approach to managing change or even failure. The diagnostic system should combine the element of strategic analysis with the analysis of the environment, taking into account economic and technical factors, but also constitute the basis for the response to external and internal threats (Zelek, 2003). These risks can also be classified in various ways, and the typology of risk areas includes: financial, strategic, compliance and operational (Majewski, 2012). It is necessary to link strategic risk with planning and allocation of resources and market dynamics, which are to be ensured by DFLs. It is also necessary to take into account the regulator's influence on the market.

In the dependent system, feedback is extremely important as confirmation of the occurrence or lack of interaction and the intensity of the existing dependencies. Thus, the role of interactions is growing, which provide both financial institutions and other participants of the DS with the necessary knowledge about entities and the actions they take. In the ongoing considerations, the analyses refer to the issue of emission reduction in the context of the EU ETS enforcement mechanism. Launched 17 years ago, the EU CO₂ emissions market as a tool of climate policy covered about 40% of greenhouse gas emissions (Jorgensen, 2021). In the first place, this concerned the generation of electricity, the production and processing of non-ferrous metals, the mineral and paper industries. This means a number of consequences for DS participants in the context of timing.

Each process can be modeled in four perspectives: a) functional, b) behavioral, c) organizational and d) information. The information perspective has become the subject of analyzes as an extension of the behavioral approach. These models are to enable the assessment of the consequences of decision-making possibilities and to predict the impact of changes in the environment on the company's effectiveness (Królikowska, Łatuszyńska, 2007). An example of the *withdrawal* rule will be the interruption of the construction of a coal-fired unit at the Ostrołęka Power Plant as a consequence of the EU's policy of moving away from coal and proposing the construction of an energy gas unit in its place (Orlen inwestuje w..., 2021), i.e. actions affected by priorities that boiled down to the allocation of resources between alternatives. DFLs are to enable the verification of various decision hypotheses. These hypotheses will mainly concern the consequences of implementing alternative action strategies. As a result, the ways of responding to changes in the law that disrupt the balance in the market will result directly from the analysis of cost factors.

According to the author of the study "Who emits the most CO₂ today?" "In the European Union, the largest emitter of greenhouse gases is not power industry at all, but the industry it produced in the first nine months of last year as much as 22% of the CO₂ equivalent. The aforementioned energy sector accounted for 20.3 %, households – 19.4 %, and transport – 11.3 %" (Frączyk, 2022). More interestingly, per capita emissions indicate that "Polish emission levels of 910 tonnes per month per capita are similar to the Czech (890 tonnes/month), Belgian and Dutch (850 tonnes/month). Although our energy sector is mostly coal-based, industry, transport, agriculture and households produce much more greenhouse gases in these countries than the same sectors of activity in Poland" (Frączyk, 2022). This shows the need for an indicator approach to the analyzed issues (Bernat, 2019) in order to compare *the how-to-rules* under the designated *boundary rules* and the extremely different baseline situation.

The primary role of the DFL is to provide useful information. DFL connects business analysts with managers responsible for implementing plans and monitoring and managing changes. Therefore, they simplify the decision-making process. Consequently, the DFL, as an integrator, eliminates the communication gap that exists between planning and execution. The disadvantages of DFL include problems with adapting to the new methodology.

To use DFL effectively, it is necessary to obtain a large amount of various information. The methods of proceeding for the identified possibilities result from analytical studies, and these are time-consuming.

The effectiveness and efficiency of activities can be mentioned in management control, and these depend on the efficiency and effectiveness of the information flow. Compliance with legal regulations and credibility of reports are also important (Stępień, Miciuła, 2016). Is it therefore possible for DS participants to carry out effective activities if they cannot be measured in a common, generally acceptable and practically applied procedure and using clearly interpreted indicators enabling the comparison of individual participants of the DS? Such measurements should be a starting point for assessments and an impulse for action on the analysed sustainability issues (Bernat, 2019). Such efficiency requires a coherent management strategy, and consequently time synchronization of activities (*timing*) and resources, as well as investment in education, which affects *boundary conditions*. Building the awareness of all participants in the DS and not only societies or economic entities, that they should move towards the set *priorities* requires consistent legal provisions and financing, taking into account the initial state and this may be difficult, if at all possible to achieve.

Another example of the influence of a market regulator through the use of administrative mechanisms will be the adoption of an information standard, which can be a problem in itself, let alone its implementation and universal use. This requires the publication by the regulators of the DS and the use of guidelines by its participants, and consequently the introduction of changes in many laws and many areas, such as in the analyzed case regarding environmental protection, economic activity, including accounting or professional groups participating in this process. Hence, thanks to DFLs, DS participants gain the opportunity to assess investment opportunities in the context of narrowed possibilities of action, which speeds up the decision-making process. This is how the DS works in practice, and the processes occurring over time can be described as mutual interactions (CMI) and within this concept they should be considered and interpreted. This will also require taking into account the relationship with the environment and its reaction to changes taking place inside the DS.

Dynamic modeling of systems refers to basic processes, i.e. production and sales, and in the analyzed proposal it concerns the conditions of the entity's functioning in the future. Therefore, it is important to obtain feedback that enables modification. The essence is to systematize the behavior of the subject being a response to the forcing factors. The study analyzed the administrative extortion of the market regulator, and the factors were: a) limitation, b) legal regulations, and c) costs and consequences resulting from it.

Presenting the consequences for the participants of the DS – including more broadly economies, regions or societies and their mutual relations – resulting from the proposed or partially implemented solutions requires unified procedures within the DFLs. Behind this there are interactions and feedback, as the main sources of assessment of the effectiveness of the

ways of performing priorities at a given time under the set boundary conditions, which may result in the need to apply the withdrawal (exit rule) in practice.

4. Conclusions

The possibilities expressed in the form of definable functional linkages take into account the initial situation, but also the importance of the processes implemented, which affect into DS participants and affects the order and importance of priorities, and this requires synchronization of plans and affects the ways of performing activities. This is essential for shaping organizational space and, in consequence, makes it necessary to ensure that modifications can be made during the implementation process. Therefore, interactions and their contents are extremely important information about the effects of the actions inside and outside the DS. The article is a response to the insufficient representation of the information perspective in strategic management.

The boundary conditions, although clearly defined by the market regulator, require agreement and binding decisions of DS participants confirming the will to implement. If the solutions adopted within the dependent system, implemented inside and proposed outside, are not respected by the environment, an unfavorable phenomenon of "emission leakage" appears, requiring a response from the DS. Administrative decisions, as in the case of the analyzed EU ETS mechanism, have a strong impact on entities by shaping the boundary conditions. Legal and financial solutions were indicated as the main factors forcing changes. The analysis shows that the cause of the lack of effects is caused not only by the DS participants themselves, focused on the implementation of their own, and not jointly defined guidelines, but also by the environment.

Definable functional linkages determine how to convert the indicated priorities into activities and synchronize them, so that plans are effectively implemented by allocating resources towards the use of emerging opportunities. Solutions should be treated not as limitations, but rather opportunities that that affects the participants of the DS, and thus a dependent system, and which affect SOS. Shaping organisational space has a direct impact on the competitiveness of the DS, which has its consequences in the form of acceptable or non-acceptable changes in relations with the environment. This situation is well described by the problem of loss of competitiveness. Therefore, the priority should be to include in the responsibility of all participants of the DS and its environment, including, and perhaps even especially representing the financial sector. This would be important in the context of balancing the conditions occurring or arising in the organizational space that impose changes.

DFL-based decisions that enable responses demonstrate their usefulness in helping to function in conditions that require change. The difficulty is the need for informational preparation, which will lead to redundancy. Normally attention is paid to the opportunities that come with changes. However, there are significant differences between individual participants in a dependent system. These differences include "phase shifts" that make it difficult to synchronise plans in the form of definable functional linkages for shared challenges. This emphasises timing disturbances, and these may lead to serious consequences: opportunities may turn into threats. This will result from the lack of simultaneous implementation and situational coherence with regard to the adopted priorities in the context of the initial conditions.

Management strategies allow for the preparation of pre-emptive responses in the event of the need to modify the structured groups of plans adopted in the form of definable functional linkages and the resulting possibilities of actions, so as to enable withdrawal from already implemented solutions in favor of new ones that allow to "cushion" the effects of these activities. In the context of the dynamics of the changes taking place, this will even be a necessary assumption to be accepted, so that the implementation itself also takes place in accordance with the principles of balancing the impact the DS, and this is part of the management of failure. DFLs as a tool for shaping organisational space are, therefore, a method of regulating management strategies in a dependent system with multi-dimensional and multi-level mutual interactions.

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Footnotes

¹ Dependent system - a system in which the participants influence and depend on each other, usually disproportionately in the function of possessed or potential causative capability, with the directional exchange of guidelines and implementation, and coordination of interactions as a derivative of the result and also of the interactions themselves.