KPI for the Evaluation of Growth Scenarios for the Strategic Organizational Development

Felix Budde[1], Ronald Orth[1] and Lars Förster[2]
[1] Fraunhofer IPK, Division Corporate Management, Berlin, Germany
[2]Förster Leadership, Bremen, Germany
felix.budde@ipk.fraunhofer.de
ronald.orth@ipk.fraunhofer.de
kontakt@fuehrungskraft.com

Abstract: Today's world faces constant change and increasing complexity. This also influences companies in their actions. In order to ensure growth and resilience, technology companies must innovate and strive for internal adaptability within the organization. A field of tension can be observed between the values of effectiveness and efficiency. Effective actions lead to the company and its products becoming better by doing the right things. Efficient actions allow the company and its products to become less costly by doing the things right. The expression of these values in the field of tension changes over the life cycle of a company. Strategic organizational development can thus only take place sustainably in balancing effective and efficient values. Based on these ideas, a performance indicator model was developed to promote value balance by assigning concrete parameter to several perspectives. Balance is not a static condition, but the basis for healthy and above all sustainable growth. Without balance, too much of a good thing is done and destructive exaggerations are the result. The model takes a holistic, systemic and balancing position. The main aim of this paper is therefore to describe the development, application and critical evaluation of this key performance indicator model to validate the underlying research methodology. The key performance indicator model is to be understood as a thought model, with the help of which the alignment of a company and its employees is to be achieved. The model is used to evaluate growth scenarios. As part of a case study, the organization, culture and environment of an exemplary company were examined with the help of representative workshops and expert interviews. The results of the status quo analysis were able to confirm the basic principles and logic of the key performance indicator system. Based on the information about the environment and organization gathered in the workshops and interviews, the KPI model was applied as an example to evaluate growth scenarios of an exemplary company. Finally, interviews were conducted with top managers with many years of management experience to evaluate the KPI system and examine its general validity. The applicability of the KPI model could be conclusively determined for innovation-driven technology companies in the transition between the growth and maturity phase.

Keywords: Strategic Organizational Development, KPI Model, Methodology Validation, Innovation-driven Technology Company, Sustainable Leadership

1. Introduction

Today's organizations are confronted with existential transformation pressure that provoke their operational performance strength as well as strategic innovation and substitution power. The externally increasing hyper-complexity can only be met with adequate internal complexity (Beer, 19XX). The associated variety and sustainable functionality will have to reach a higher level. Examples illustrate that this is doable and that at the same time a new understanding of leadership is necessary. The actions of organizations must extend far beyond the short-term and dynamically varying success factors and anchor strategic clarity and sustainability. Leadership must therefore master the initiation and establishment of sustainable strategic future potential in addition to the operational design of an efficient and resilient organizational system. In this sense, professional leadership is organizational design and development whose status quo and progress must be clearly measurable.

The key performance indicator model presented in the following diagnoses and quantifies the initial situation of organizations as well as their development progress. It was conceived as a multi-perspective system of parameters considering the real current competitive and action environments of innovation-driven technology companies. We assume that this will be valid for most organizations in the medium to long term.

The paper focuses on the description, application and validation of the KPI model as a research methodology.

1.1 Research Background

Organizations are to be understood as complex social systems (Willke, 1999, p. 178). For Rüegg (1989) Complexity is defined by a high number of connections between the parts of a system mixed with a highly dynamic change in these connections. Therefore, the omnipresent increase in complexity influences companies in their actions. One needs to take a systemic perspective onto these systems and develop the ability to

transform (Dörner et al., 1983, p. 17; Senge, 2008; Sterman, 2000, p. VII). In order to ensure growth and resilience, technology companies must innovate and strive for internal adaptability within the organization. For this transformation is the answer to an increase in complexity.

A field of tension can be observed between the values of effectiveness and efficiency. A metaphor for the difference between these two values can be found in the way the human brain works. Here, "What you gain in speed (safe and fast execution of a routine) [Efficiency], you lose in behavioral flexibility (e.g., to change habits) [effectiveness]." Korte, 2019, p. 92. Effective actions lead to the company and its products becoming better by doing the right things. Efficient actions allow the company and its products to become less costly by doing the things right. The expression of these values in this field of tension changes over the life cycle of a company (Förster, 2005; Pümpin & Prange, 1991). Strategic organizational development can thus only take place sustainably in balancing effective and efficient values.

1.2 KPI System for the Strategic Organizational Development of Innovation-driven technology companies

Based on these ideas, a key performance indicator model was developed to promote value balance by assigning concrete parameter to several perspectives. The model takes a holistic, systemic and balancing position. The key performance indicator model is to be understood as a thought model with the help of which the alignment of the company and its employees is to be achieved. It serves as a model for evaluating growth scenarios.

The system of leading key performance indicators is intended to help align the organization, i.e. to lead, by directing the awareness of managers and employees to the important factors. This model is to be used in the further course for the evaluation of growth scenarios.

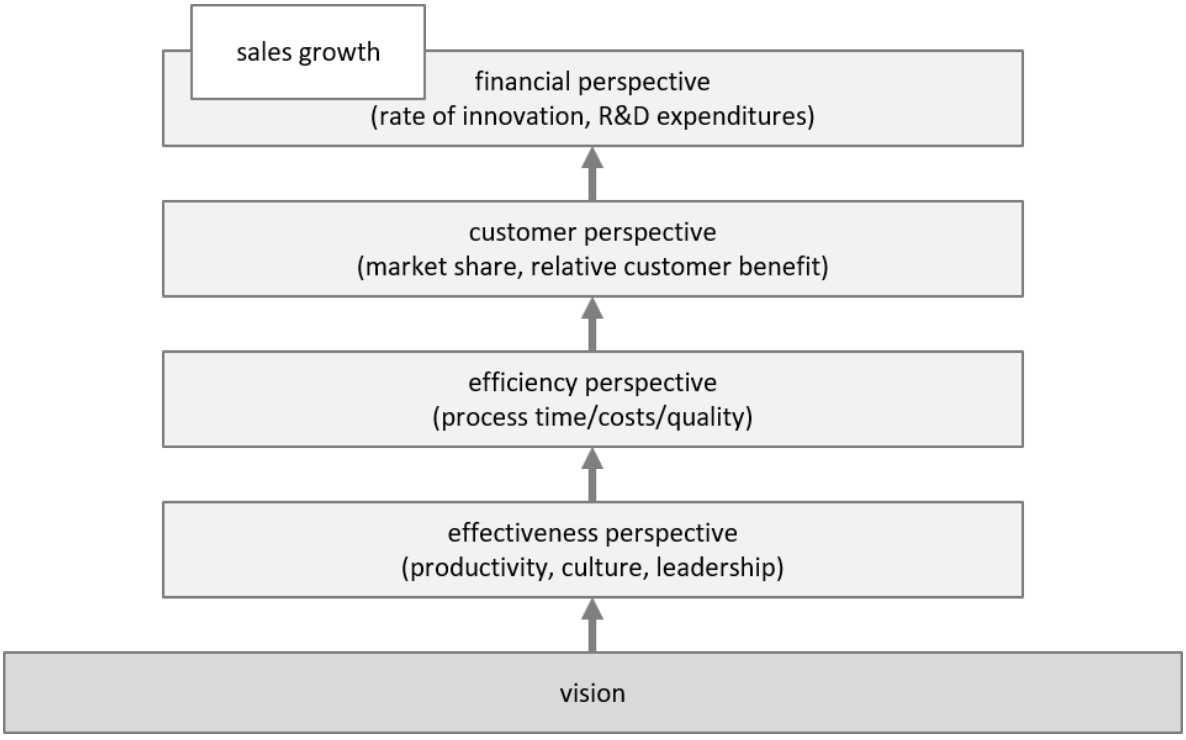

Figure 1: Multi-dimensional KPI model logic

In business practice, classic business management targets and control variables dominate. Development and employee-oriented indicators are hardly ever defined (Gebhardt, Hofmann & Roehl, 2015, p. 27). However, corporate success is multidimensional and cannot be defined by a single indicator (Sackmann, 2017, p. 379). According to Malik (2009, p. 186), financial ratios should be replaced or supplemented by pre-control ratios of earnings that look further into the future. This means that key performance indicators are needed to evaluate different perspectives: market position, innovative strength and productivity (Malik, 2006).

The field of tension between efficiency and effectiveness should be developed in a maximally positive way (Förster, 2005). The systemic understanding pleads for viewing complex systems in their entirety. All

relevant aspects of organization and production as well as internal and external aspects must be included. All elements are still interconnected in the system. There are numerous relationships and dependencies. Thus, efficiency and effectiveness are interdependent and positively related. Efficiency and low costs in production result in the long term from the strengthening of quality, service, innovation, exchange and cooperation, enthusiasm and a focus on solving customers' problems (Peters & Waterman, 1982, p. 321).

The system of performance indicators follows the following logic (see Figure 1). It is composed of four perspectives based on the model of the Balanced Scorecard (BSC) according to Kaplan and Norton (1997): Effectiveness, Efficiency, Customers, and Finance. These four perspectives each look at specific areas that are important for measuring the performance of a company.

The system strikes a balance between short-term (operational) and long-term (strategic) goals, monetary and non-monetary, between lagging indicators and leading indicators, and between external and internal performance measures (Kaplan & Norton, 1997, p. VII).

The scope of application is to be defined as innovation-driven technology companies. The indicators were chosen to promote the development of organizations into growth companies and to balance efficiency and effectiveness.

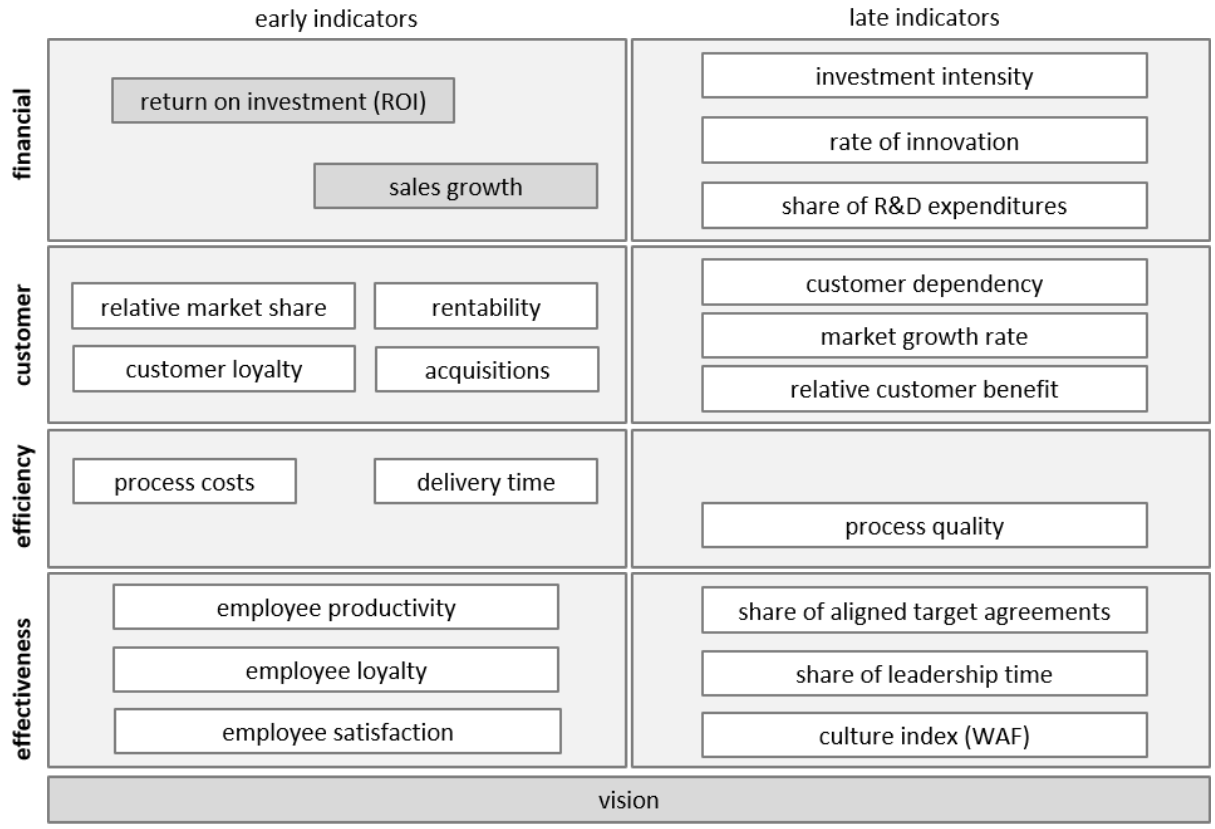

Figure 2: Detailed KPI model

The basis of the system is the conscious vision and profession of leadership. The management influences the organizational culture and the orientation of the employees with its vision. Leadership and corporate culture have a far-reaching influence on the way employees act in the company. The vision thus provides indicators against which the organization can be aligned. The effectiveness perspective includes leadership metrics that are primarily intended to measure organizational culture and alignment by leadership, in order to lead to high employee productivity. The efficiency perspective measures the process parameters of production, i.e. times, costs and quality, and therefore provides a statement about the company's professionality and efficiency. These factors are reflected in the customer perspective in market share and customer satisfaction. A look at the financial figures then shows the results of the other three perspectives in the form of sales growth. The investment intensity and the innovation rate are also included here.

The task of these key performance indicators is to focus the attention of the company on those factors that should lead to a competitive breakthrough for the organization (Kaplan & Norton, 1997, pp. 157-158). The leadership metrics thus manage to balance efficiency and effectiveness. They contribute significantly to directing the focus of managers as well as employees to a vision, a common goal. The performance measurement system helps organizations to become more mature as they grow and vice versa. It contributes to balancing the multidimensional success variables and is suitable for securing strategic considerations.

Figure 2 shows the detailed system of management parameters with its dependencies. In the figure, only simple causal effects are displayed, which is on purpose. In spite of the requirement discussed earlier to understand systems as dynamically complex and subject to feedback, a modeling in the form of an effect graph was deliberately omitted here. Although such a representation would emphasize the complexity of the interrelationships, it would also greatly reduce the informative value and comprehensibility of the picture. Also, such a modeling requires a much more extensive data base than is available in this work.

The chosen metrics for identifying healthy growth and their relationships to each other can be found in many places in the literature (Förster, 2005; Kaplan & Norton, 1997; Klein, 2013, 2015; Malik, 2013; Nußbaum, 2019).

The system thus takes a holistic view of the processes in technology companies and considers balanced, effective and efficient values without ignoring customer and financial aspects. In the figure, the core variables of the system are highlighted in bold. According to Malik (2013), these variables are of central importance for the success of companies.

1.3 Objectives

This section aims at clarifying the objectives of this paper. Based on the prior context, the following question arises: “How must organization development of technology companies be designed, to enable and promote growth in an effort to be financially sustainable?” To address this question, the KPI model shown before was developed as the respective research method. To find out if this method supports the research question, the model needs to be questioned and critically evaluated.

The main aim of this paper is therefore to describe the development, application and most important the critical evaluation of this key performance indicator model as a research method.

2. Methodology

To validate if the developed KPI model is able to support the research question stated in the introduction the method was applied to a practical example. This was done with the intention to validate the model methodology in a real application case.

The subject in the application of this model are innovation-driven technology companies, i.e. companies that deal with modern technology (Duden online, 2020b) and thus inevitably need innovations to grow and survive. The unit of investigation of the case study will be defined more precisely in the following. In terms of systems theory, this defines the boundary of the system under investigation. The example company is a technology company of medium size and structure. The company develops, designs and manufactures semi- and fully-automatic machines for the production and testing of micro-optical and opto-electronic components for photonics applications. The machines are produced in single and small batch production. The company can be categorized as an SME with round 150 employees. In recent years, the company has experienced strong growth in sales as well as the number of machines produced and of employees.

2.1 Overall Approach to Method Application and Validation

The overall approach of the method validation is shown in Figure 3. Firstly, a literature review was conducted. With the help of the information found the model itself as well as the individual performance indicators were derived. This part of the development followed a top-down-approach. As part of a case study, the organization, culture and environment of an exemplary company were examined with the help of representative workshops and expert interviews. Based on the information about the environment and organization gathered in the workshops and interviews, the KPI model was applied as an example to evaluate growth scenarios of an exemplary company. Finally, interviews were conducted with top managers with many years of management experience to evaluate the KPI system and examine its general validity.

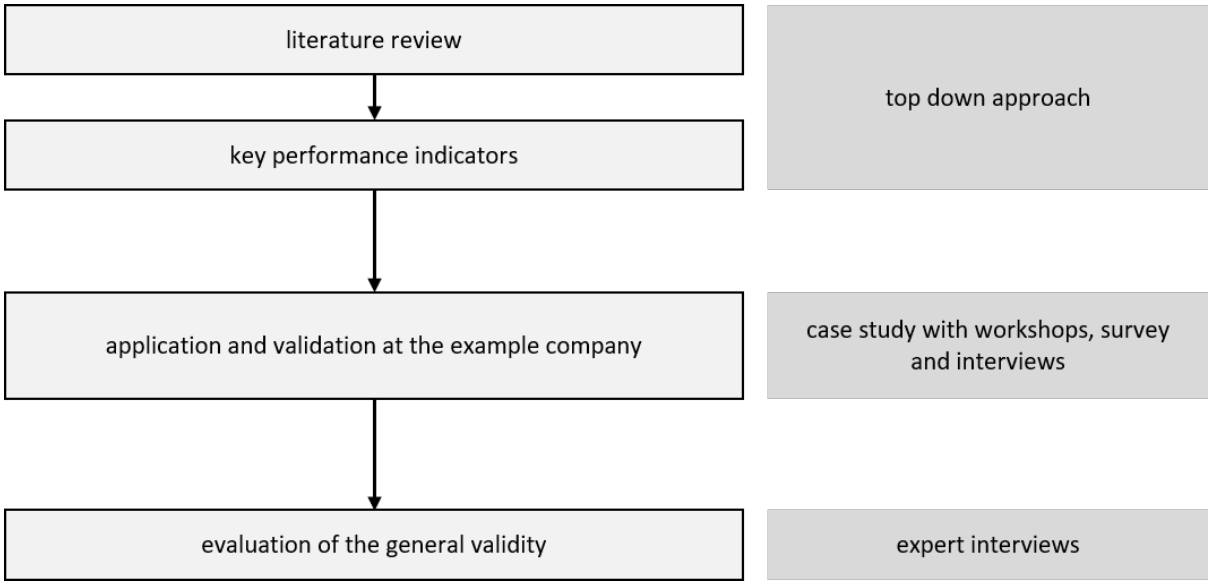

Figure 3: Overall approach to method application and validation

2.2 Application Case Study

In the following, the way in which the case study was conducted will be described. The presentation of the methodology should make the decision for the chosen approach transparent and comprehensible.

A case study based qualitative approach was chosen to validate the KPI model. Case studies are suitable where corporate activities and structures are to be recorded and analyzed holistically. In contrast to quantitative methods, case studies allow the analysis of highly complex issues. The company as a complex social system is a suitable object of investigation. (Meyer, 2003, pp. 476-478)

The case study has two objectives. First, the case study will be used to gather evidence that confirms the model assumptions. Second, the model will be applied to the company in the case study as an example. The subject of the study is first of all an example company of medium-sized size and structure.

Figure 4 shows the methodological procedure of the case study. The example company was analyzed to determine internal strengths and weaknesses. External opportunities and risks were collected in an environment analysis. The findings of the company and environment analysis are incorporated into a SWOT analysis. Based on this, scenarios are then developed, which are evaluated using the KPI system.

During that pilot application, several workshops and interviews were held. Approximately 10% of the workforce took part in the workshops. The participants were deliberately selected according to their area of activity, employment duration at the company and job level.

2.3 Validation Expert Interviews

In the following, the methodology used for validating the research method will be described.

It is advised for confirmatory case studies to examine several cases in order to analyze the transferability to other cases. The cases considered should be either very similar or just very different (Meyer, 2003, p. 476). In order to be able to make statements about the general validity of the indicator system, a few identical or several completely different companies should be surveyed.

The criterion according to which various cases are to be examined in the context of this work is the position of the companies in the life cycle. The approach followed was to survey companies in different phases as far as possible. In consequence, a statement can be made about in which phase the model can be applied in companies.

The main case study regarding the application in the example company is supplemented by further expert interviews. The aim of the interviews is to evaluate the key performance indicator model on the basis of the

experiences of the interview partners. The interview partners were managing directors and top managers, who were able to contribute their experience from companies at different stages of development. Each interviewee was asked to take the perspective of the type of company they represent.

This evaluation allows a statement about the general validity and applicability across the life cycle. The aim is to investigate whether the system of indicators can be applied solely to growth companies as intended, or whether it can also be transferred to companies in other phases.

The interviews were conducted as semi-structured discussions lasting between 0.5 and 1.5 hours. After an introduction and classification of the company by the interview partner, a presentation of the management metrics system took place. A large part of the interviews consisted of the evaluation and criticism of the key performance indicator model by the interview partner. Experts from companies in the pioneer, growth and maturity phases were interviewed. The interviewees all have many years of management experience in top management.

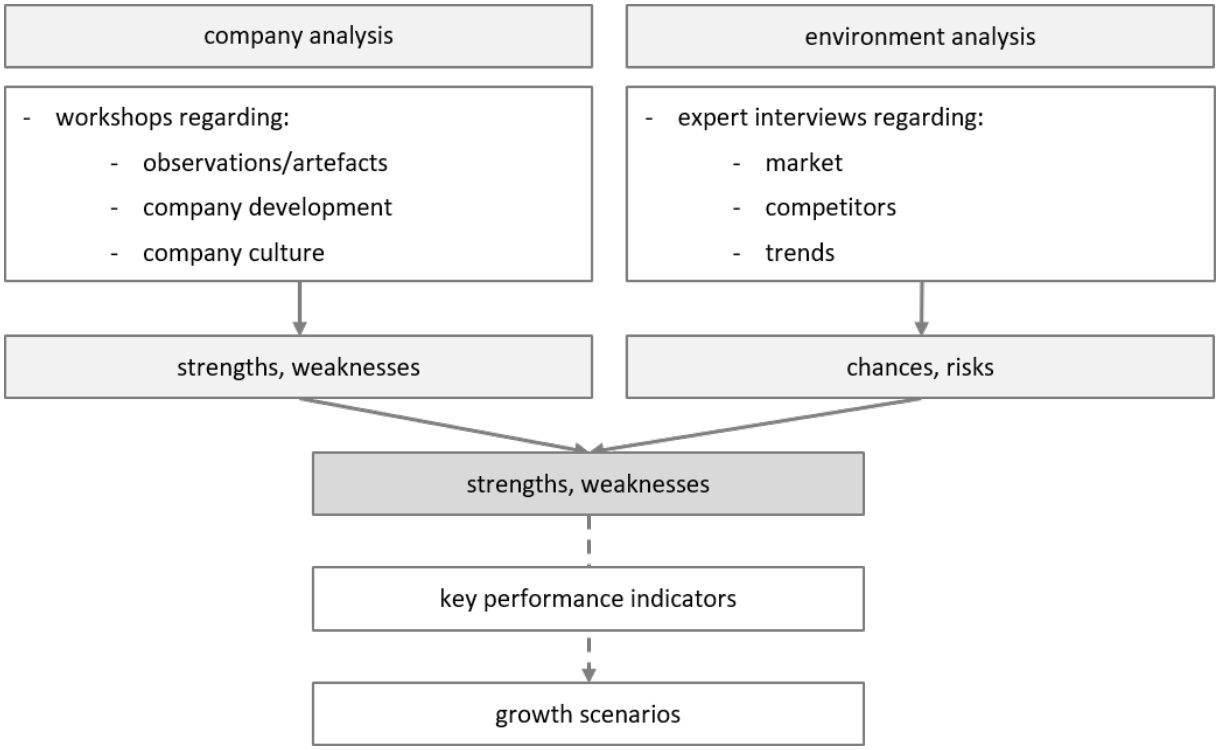

Figure 4: Methodology of the case study

3. Results

After focusing on the methodology for application and validation of the research method the key finding with respect to the central research question are presented.

3.1 Application

As part of the application case study, the organization, culture and environment of an exemplary company were examined with the help of representative workshops and expert interviews. The results of the status quo analysis were able to confirm the basic principles and logic of the key performance indicator system. Based on the information about the environment and organization gathered in the workshops and interviews, the KPI model was applied as an example to evaluate growth scenarios of an exemplary company.

3.2 Validation

The following sections describe the results of the validation expert interviews. The perspectives of pioneer, growth and mature companies will be presented.

3.2.1 Pioneer company perspective

The model matches with the experience of the interview partner from the pioneer company. In its current form, its applicability is seen primarily for somewhat more mature companies. A large number of the parameters cover important aspects of organizational development, e.g. proportion of management time, delivery time and employee satisfaction. The conflict between creativity (effectiveness) and coordination (efficiency), which is the basis of the model logic, is also observed in the pioneer company. In principle, the logic of the model can thus be confirmed.

However, there are shortcomings in the application in the pioneering phase. The parameters are not directly applicable in the pioneer phase, since the corresponding values are not systematically recorded to the required extent. For a pioneer company, qualitatively described, tactical milestones as well as further pre-control variables (burn rate, monthly R&D expenditures against liquid funds, etc.) are missing. Other important aspects in the pioneer phase are liquidity management and funnel management. The latter helps to generate a forecast of expected sales by documenting and forecasting orders and potential sales. In addition, in the pioneering phase, order growth instead of sales growth is the key performance indicator. Basically, it is becoming apparent that due to the considerable up-front investments made by the pioneering company in the initial phase, other key performance indicators are required that are not currently covered by the model.

In contrast, employee satisfaction and loyalty, for example, are very important parameters in the early phase, since a small company depends on every single employee. This results from the lack of competence redundancies in the system. Furthermore, customer acquisition, as it currently exists in the KPI model, is a central point. Due to the still small number of customers, every installation at the customer's must be a success, the customer must be fully supported. The young company lives and learns from the customer feedback generated in this way. Hence, the delivery time is not to be neglected.

Applicability would be increased if the thought model could be adapted to each phase. The efficiency perspective could further be supplemented by the parameter of "product functionality".

According to the interviewee, the metrics system is suitable for use in the growth and maturity phase. On the one hand, the inclusion of such key figures is only possible there in a systematic way. On the other hand, early indicators and qualitative milestones are missing for the pioneering phase. The model is not generally valid; each phase requires a different approach to organizational development and correspondingly different leadership personalities. However, a generalized model with adaptable variables would be conceivable.

3.2.2 Growth company perspective

The example company was viewed as representative of companies in the growth phase. In the main study, the current organizational culture was examined and classified using the outlined culture model. In the process, it was possible to confirm the changes and influences by various management personnel. It also became clear during the workshops that the company follows the life cycle model, changes in corporate culture and communication were observed. It was also clear that the company was striving for efficiency while neglecting the well-established value of effectiveness.

The expert interview with the management revealed that the complexity of the company and its environment makes it difficult to create a fixed, rigid model. The variability and the amount of internal dependencies pose great challenges for the KPI model. For the application in the concrete case of the example company, the system of key figures is too huge and unmanageable. There are too many key figures that would deal with too many topics. Also, the causal relationships in the system are not clear. Thus, the model needs a clearer structure and more concise message in the case of application in the growth company.

3.2.3 Mature company perspective

In the interview with a top manager, the key figure system was examined from the perspective of the mature company. Initially, the model fully corresponds to the experiences of the interview partner, and the changes over the life cycle could be confirmed. The developed model logic was said to reflect reality, however, most of the time companies do not act according to this logic. In practice, the first step is to look for areas of growth, and only then to clarify the manner of implementation. Profitability is more important than the implementation process involving employees. However, the parameter "employee competence" or a "strengths" perspective is

missing from the key performance indicator model. This would make it possible to emphasize and raise awareness of the importance of resources and competencies.

The applicability of the system in the mature company depends on the acceptance of the model logic. The system should first be used as a basis for discussion in order to reach a consensus on the management system in top management. The structure of the KPI system then supports organizational development in the mature company, and the implementation and recording of the KPIs is part of everyday life there. However, it could be supplemented by a parameter that actively promotes willingness to change and "restlessness" in the workforce. Particularly in mature companies, employee satisfaction and loyalty tend to be high. Here, the addition of a "provocation box" suggests itself, which challenges precisely this satisfaction and could promote efficiency and the will to change in the efficiency-dominant mature company.

The performance indicator system can serve as a thought model for the individual pioneer at the beginning and later as a moderation basis for consensus finding or a design system for the entire management in the mature company. The model presents many facets that need to be considered from different perspectives throughout the life cycle.

Whether the growth was sustainable often only becomes apparent decades later. For the growth phase, one could be fully operational and any strategy is defined by the market. One either hollows out future potentials or synchronously creates more of them in balance and extends the phase of the organization or founds new companies.

4. Discussion

Finally, the results will be interpreted to critically discuss the research methodology of the KPI model. First, the model's benefit will be considered, and then its universal validity will be examined.

4.1 Validation Outcomes and Model benefit

The results of the as-is analysis were able to confirm the basic principles and logic of the key performance indicator system.

Finally, interviews were conducted to evaluate the system of indicators and to examine its general validity. The criterion for the investigation was the phase allocation of the interviewed companies. The comparison with the experts' experience shows that the model is suitable for the organizational development of companies in the growth and maturity phase. However, the representatives of the example company expressed doubts about the attempt to represent the immense complexity of organizational development in a model. The application for companies in the pioneering phase, on the other hand, can be ruled out. The applicability can thus be conclusively determined for innovation-driven technology companies in the transition between growth and maturity phase.

Overall, it can be seen that the system of indicators is too detailed for the pioneering phase and also for the growth phase and is too strongly oriented to concrete variables. In contrast, it is more suitable for the maturity phase. In summary, the critical assessment was reflected in the experts' assessments. Instead of the meticulous interpretation of individual parameters, the system should be understood more as a thought model. The system supports organizational development at the transition between the growth and maturity phases. However, in concrete application, it poses difficulties in dealing with the complexity inherent in the system in connection with the requirements of everyday challenges. Finally, it would also be interesting to examine the generality of the model on the basis of a company in the degeneration phase. Here, however, no possibilities for interviews have arisen.

Furthermore, the model benefit is to be discussed. The key performance indicator system is essentially a thought model, a mental support for decision-making. The system parameters make it clear where action is required in the company.

The model can provide support in that it stimulates reflection and helps to recognize interrelationships and to classify them in the network of variables. It supports the application of systemic thinking to one's own strategic problems. It directs awareness to the dynamics of possible future scenarios and helps to find one's way in

complex systems. The system of parameters can serve as a thought model and help to play through options in organizational development.

The model does not have to be interpreted in a static and mathematically precise way. It is a tool for reflection, for playing through options for action and future scenarios. The system and its management parameters should be understood dynamically. The parameters can and should be adapted to changed conditions as needed.

The model is not a detailed representation of the inner processes of an organization. It only allows a certain degree of reliance on the interdependencies outlined in it. On the one hand, it illustrates the complexity of the interrelationships of strategic organizational development, but it cannot fully represent the complexity inherent in the system. This would require a comprehensive analysis of the interdependencies of many different levels in several companies.

The KPI system may be too detailed and overloaded for the practice of medium-sized companies. Small owner-managed companies tend to act more intuitively and less to support their strategy by elaborate data collection. The complexity of the system "organization" brings difficulties. A simple representation of the effects of different factors is almost impossible. A complex representation, on the other hand, depends too much on assumptions and may be too detailed for practical use. One possibility would be to assess connections in a case study and develop an impact graph from it (see Berner, 2017; Brüger, 2018). With the help of a weighting of the variables, the core variables with high relevance in the company under consideration could be identified. Another more holistic and general modeling takes place through the Strategy Map by Malik (2013, p. 180).

One could also pursue the question of why executives in the start-up and growth phase work so little consciously on their organization and thus shape the path of the future, but are rather driven operationally. Neurologically, after all, it's like any preventive action. And so is recognizing complexity. Do executives in particular lack complex thinking and understanding? Is the KPI model also an indicator of leadership maturity in a hyper-complex world?

4.2 Outlook

Conclusively, perspectives for further research can be identified as the KPI system as discussed in this paper still leaves much room for adjustments and further investigations. The modeling of an efficiency graph with a comprehensive analysis of all variables offers itself. It is conceivable that in this way, the complexity of the issue under consideration in the company could first be shown and then made controllable. Weighting and reduction of complexity could be achieved by analyzing the number of relationships between the variables. The management metrics system probably cannot live up to its claim. The subject is too complex, too large, to be covered by a single model. Instead, it is important to use the model as an orientation and to test one's individual scenarios against it.

References

Berner, K. (2017). Systemische Prozessmodellierung und -optimierung. Als Grundlage der Zertifizierung nach DIN EN ISO 9001:2015 gezeigt am Beispiel eines produzierenden Unternehmens des Mittelstands (Arbeits- und Systemgestaltung, vol. 6). Aachen: Shaker.

Brüger, R. (2018). Handlungsbezogene Führung in Innovations- und Veränderungsprozessen. Eine systemwissenschaftlich orientierte Fallstudie aus dem Bereich Produktion und Qualitätsmanagement eines Industrieunternehmens der Erneuerbaren Energien-Branche (Arbeits- und Systemgestaltung). Dissertation. Bremen: Shaker.

Dörner, D., Kreuzig, H. W., Reither, F. & Stäudel, T. (ed.). (1983). Lohhausen. Vom Umgang mit Unbestimmtheit und Komplexität. Bern: Verlag Hans Huber.

Duden online (ed.). (2020). Technologieunternehmen. Access on 15.09.2020. https://www.duden.de/rechtschreibung/Technologieunternehmen.

Förster, L. (2005). Werteausgleichende Führung. Überwindung des Spannungsverhältnisses zwischen Effizienz und Effektivität (Arbeits- und Systemgestaltung, 1/2005). Dissertation. Aachen: Shaker.

Gebhardt, B., Hofmann, J. & Roehl, H. (2015). Zukunftsfähige Führung. Die Gestaltung von Führungskompetenzen und -systemen. Gütersloh: Bertelsmann Stiftung.

Kaplan, R. S. & Norton, D. P. (1997). Balanced Scorecard. Strategien erfolgreich umsetzen. Translated by Péter Horváth. Stuttgart: Schäffer-Poeschel.

Klein, A. (ed.). (2013). Business Development Controlling. Strategische Wachstumsinitiativen zum Erfolg führen. Freiburg: Haufe-Lexware.

Klein, A. (ed.). (2015). Unternehmenssteuerung mit Kennzahlen. Auswahl, Ermittlung, Analyse, Kommunikation (1st edition). München: Haufe-Lexware.

Korte, Martin (2019). Wir sind Gedächtnis. Wie unsere Erinnerungen bestimmen, wer wir sind. München: Pantheon.

Malik, F. (2006). Das Geheimnis wahrer Größe. manager magazin. Access on 12.11.2019. https://www.manager-magazin.de/unternehmen/karriere/a-411165.html.

Malik, F. (2009). Systemisches Management, Evolution, Selbstorganisation. Grundprobleme, Funktionsmechanismen und Lösungsansätze für komplexe Systeme (5th edition). Bern: Haupt Verlag.

Malik, F. (2013). Strategie. Navigieren in der Komplexität der Neuen Welt (2nd completely revised and updated edition). Frankfurt am Main: Campus.

Meyer, J.-A. (2003). Die Fallstudie in der betriebswirtschaftlichen Forschung und Lehre. WiST - Zeitschrift für Studium und Forschung, (8), 475–479.

Nußbaum, U. (2019). Photonik als Schlüsseltechnologie. Grußwort von Dr. Ulrich Nußbaum Staatssekretär im Bundesministerium für Wirtschaft und Energie. In Spectaris (ed.), 2019/2020 Trendreport Photonik. Märkte, Entwicklungen, Potenziale (p. 3). Deutscher Industrieverband für optische, medizinische und mechatronische Technologien e. V.

Peters, T. J. & Waterman, R. H., Jr. (1982). In Search for Excellence. Lessons from America´s Best-Run Companies. New York: Harper & Row.

Pümpin, C. & Prange, J. (1991). Management der Unternehmensentwicklung. Phasengerechte Führung und der Umgang mit Krisen. Frankfurt am Main.

Rüegg, J. (1989). Unternehmensentwicklung im Spannungsfeld von Komplexität und Ethik. Eine permanente Herausforderung für ein ganzheitliches Management (Veröffentlichungen der Hochschule St. Gallen für Wirtschafts-, Rechts- und Sozialwissenschaften, Schriftenreihe Betriebswirtschaft, vol. 15). Bern: Verlag Paul Haupt.

Sackmann, S. (2017). Erfolgsfaktoren für neue Arbeitswelten. Unternehmenskultur und Führung. In B. Spieß & N. Fabisch (ed.), CSR und neue Arbeitswelten. Perspektivwechsel in Zeiten von Nachhaltigkeit, Digitalisierung und Industrie 4.0 (p. 375–385). Berlin: Springer Gabler.

Senge, P. M. (2008). Die fünfte Disziplin. Kunst und Praxis der lernenden Organisation.

Sterman, J. D. (2000). Business Dynamics. System Thinking and Modeling for a Complex World. Boston: McGraw-Hill.

Willke, H. (1999). Systemtheorie II: Interventionstheorie. Grundzüge einer Theorie der Intervention in komplexe Systeme (Systemtheorie, vol. 2, 3rd edition, 3 volumes). Stuttgart: Lucius & Lucius.