



White Paper

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# From Birds to Businesses – How Economies of Synchronization Boot Business Performance

# Management summary

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## Economies of Synchronization as an alternative model for the modern age

In today's rapidly evolving business landscape, companies are constantly seeking innovative strategies to fuel economic growth and enhance operational efficiency. While economies of scale and scope are well known and exploited, the global business environment has become more volatile, uncertain, complex and ambiguous (VUCA). These VUCA conditions challenge the alignment of business processes, requiring organizations to make fundamental changes. To achieve a leap in performance under VUCA conditions, large enterprise organizations must adapt accordingly and require a higher degree of adaptive orchestration for robust and successful operations.

Therefore, we introduce a new concept in this white paper: Economies of Synchronization (EoS). Economies of Synchronization represent a paradigm shift in the pursuit of performance potentials for a more sustainable growth. Stemming from the inspiration of the synchronized flight patterns of birds, this concept harnesses the power of natural phenomena to optimize business processes in analogy to bionics. Unlike economies of scale, which rely on size and volume, Economies of Synchronization focus on harmonizing activities and resources. Through the application of synchronization principles, businesses can realize a multitude of advantages in today's new competitive landscape. These principles serve as the linchpin of an alternative management concept, offering a pathway to unlock remarkable benefits:

**Minimize resource needs:** Synchronized processes minimize waste, eliminate redundancies, and optimize resource allocation, resulting in significant minimization of resources. This resource minimization not only leads to energy savings and increased sustainability but can also reduce operating costs and increase profitability.

**Maximize the output:** Coordinated alignment of processes, systems and teams can make operations smoother and more efficient. Synchronized operations enable faster response times, reduce wait times, and minimize potential bottlenecks that can affect work performance. This contributes to maximizing the possible output.

**Increase organizational agility:** Synchronization enables improved communication between teams and departments, increasing coordination, thus, driving faster and more efficient responses to market dynamics and customer needs. This cultivates an environment that promotes innovation, collaboration and creativity.

Based on the outlined benefits, Economies of Synchronization are a powerful enabler for organizational ambidexterity: Through harmonizing strategy, business and operating model, previously occupied resources in unsynchronized collaboration activities are freed up, allowing them to be redirected into exploring new and future-proof businesses with empowered teams and leadership. To harness the outlined benefits, a methodological approach appears useful. Therefore, this white paper outlines a conceptual management instrument that guides companies through the implementation process. This instrument not only ensures that synchronization efforts are aligned with the company's strategic positioning but also provides a mechanism for monitoring and measuring success. By following this structured approach, companies can embark on a journey towards greater efficiency and sustainable growth.

# From nature to corporate management

## Nature's ingenuity as origin for Economies of Synchronization

The concept of economies of scale has been used for decades. By increasing production volumes, companies have been utilizing the concept, hence increasing efficiency and saving costs. Against the background of finite resources and the increasing relevance of a circular economy, it is now necessary to critically question and complement this concept, which has proven itself over many years. Therefore, the research question follows: What other concepts of "Economies of..." can companies strive for in order to continue to grow economically?

A look at nature could give us some food for thought: For example, the V-formation flight of birds offers an inspiring approach. A study reveals that 25 birds can fly 70% further in a V-formation through the downstream than if they were alone [1]. Another study shows that birds in these formations assume aerodynamically optimal positions. Specifically, birds flying in V-formations coordinate their wingtips to move in sync, allowing them to efficiently utilize the updrafts generated by the wings of the preceding bird. This coordinated flying can result in energy savings of up to 20% when compared to a situation where wing movements are uncoordinated, referred to as being "out of phase". In addition to increased flight efficiency, communication as well as navigation and orientation within the flock flight are optimized. [2]

**Mastering Synchronization in nature: Birds achieve a 20% increase in efficiency and can fly up to 70% further in a V-formation.**

Moreover, synchronization examples can also be observed in the realm of sports. A comparable phenomenon is present in cycling. Slipstreaming, also known as drafting, is a technique where cyclists ride closely behind one another to reduce wind resistance and conserve energy while maintaining the same speed. This, in turn, increases the potential and leads to a competitive advantage. The amount of energy saved depends

on several factors, such as the distance between cyclists, speed or the alignment. If two people are in a pace line at 40 kph, the person in front uses the same amount of energy as if they were riding alone, while the person behind will use about 33% less energy, according to an experimental study. [3]

### **How could we transfer this practice of nature to the world of corporate management?**

This is not an easy task as historically companies are typically organized in process silos. Process silos describe a fragmented structure in which business processes are carried out in isolation and separately from one another [4]. Corporate processes include all types of business processes, such as production processes or sales processes. Organic company developments often lead to the formation of new departments, teams or functions and thus characterize the historical growth of process silo-heavy organizational structures. The advantages of separate processes lie primarily in simplified control over tasks and responsibilities, as well as an increased degree of specialization of functions or employees for a specific area. However, these advantages are limited and can have disadvantages in the long-term.

The fragmentation of processes can lead to different departments or teams working in isolation and not sharing information effectively. This can consequently result in duplication of work, inefficient use of time, data inconsistency and, most of all, ambiguity. Together with diverse backgrounds in cultures and professional experience, this contributes to different interpretations and conclusions drawn from the same situation and information.

These ambiguous views highlight the importance of effective communication and alignment within teams. When team members are not synchronized in their understanding, it can lead to confusion, misunderstandings, and ultimately, ineffective decision-making. Therefore, fostering clarity and shared understanding among team members is crucial for achieving successful outcomes and avoiding unnecessary hurdles in the workflow.

The limited exchange of information and ideas between different departments or teams can also mean that new ideas are not fully recognized or used, as innovation is increasingly promoted through multidisciplinary collaboration. Furthermore, process silos limit the view of the entire value chain. As a result, potential optimizations of the process chain across departmental boundaries are overlooked. Suboptimal decisions and ineffective processes are the result. [4] Overall, process silos limit the ability to react flexibly to changes or new requirements. Furthermore, companies are being challenged by crises such as the COVID-19 pandemic and the energy crisis in Europe, reinforcing the emergence of a VUCA age. Therefore, also processes need to be designed for resilience. Subsequently, companies are establishing more decentralized organizational elements, which can lead to more silos by default. They are increasingly recognizing the importance of integrating, consolidating and aligning processes, as well as the targeted flow of information between them, in order to overcome the disadvantages of process silos.

**Mastering Synchronization in sports: Cyclists use synchronizing techniques to reduce wind resistance and save 33% of their energy.**

Synchronization means creating an optimized bundling and alignment of corporate objectives and activities as well as the associated competencies and resources. In order to establish and control this principle in companies and measure its success, a new methodology is required. For this, the white paper gives insights on the concept of "Economies of Synchronization", sheds light on the needs and applications for synchronization, and presents an example on the effects of targeted synchronization in practice.

Accordingly, the paper presents a rough method for achieving outperformance by maximizing output and improving input efficiency to close in on the performance optimum as shown in Figure 1. Looking at the two potential routes for performance optimization from a perspective of ambidexterity, the choice depends on the individual circumstances of a specific company: While route 1 implies a starting point of a recently future-proofed business through a phase of successful exploration, route 2 offers a path to reorient and streamline core business operations in order to explore new growth potentials.

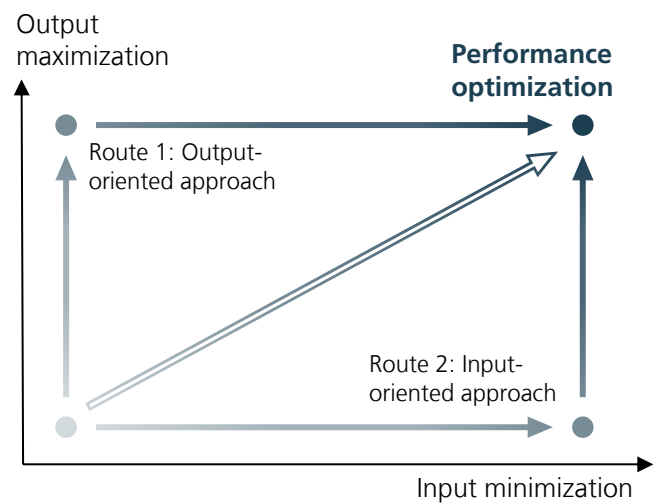


Figure 1: Synchronization for performance optimization

# From complexity to outperformance

## Synchronization as the differentiator in performance of complex organizations

As introduced, especially larger corporations are at risk of the drawbacks of economies of scale in today's more turbulent business environment. Therefore, the degree of complexity of companies needs to be defined in order to determine the required level of synchronization – for their corporate activities and their effect on business performance.

### The synchronization needs of companies

Whether and to what extent synchronization is required in companies depends first of all on the complexity of the company. The complexity of a company is determined by several different factors: Schuh et al, for example, define the following characteristics as contributors to complexity in general:

- Diversity
- Variety
- Ambiguity
- Variability

Firstly, one driving characteristic of complex organizational structures is diversity. Diversity describes the multitude and variety of areas or subsystems within the company. It can be measured by factors such as the number of employees, resources, customer groups, products produced or interactions with other institutions. Organizational diversity is significantly influenced by the company's response to external diversity in relation to its business environment. As companies strive to meet the diverse demands of their customers and other stakeholders, they face the challenge of integrating increasingly complex goals, plans and volumes of information into their structures. [5]

Secondly, a high variety in combination with the diversity of products contributes significantly to complexity. Originally simple product programs and manageable business processes have become highly complicated due to the large number of different products and variants. This high number of variants makes business processes and procedures increasingly

intransparent and complex. The variety requires a large number of functional interfaces and leads to a high number of parts for special equipment. This in turn makes it difficult to stock spare parts, as up to 50% of part numbers are required for special equipment, which may have to be kept in stock for a long time. [5]

A third aspect that contributes to a company's complexity is ambiguity. It describes the unclear definition of relationships within domains or the arrangement of these domains to each other. To capture ambiguity, indicators such as the intensity of delegation, the number of standardized processes, or the strength of organizational culture can be used. In complex organizations, ambiguity is prominent both within the organization and in its external environment. Ambiguity is closely related to uncertainty. Companies face increasing uncertainty in their business environment caused by a multitude of influencing factors and dynamic changes in the market environment. This makes it difficult to make accurate forecasts about future developments and implement appropriate adjustments. Complex companies are therefore characterized by both internal ambiguities as well as external uncertainties external in their business environment. In this context, especially internal ambiguities can be minimized through targeted synchronization measures. [5]

Lastly, variability in an enterprise represents another driver of complexity. It describes the changes in the various areas, subsystems, and their relationships over time. It is characterized by dynamic changes in product and process technologies as well as by dynamics in the competitive environment. The variability influences all other characteristics, as it continuously influences the complexity of the enterprise. Consequently, a constant solution for organizational diversity, variety and ambiguity would be inefficient. The urgency to establish corporate structures that can flexibly adapt to fast-moving markets with rapid technological and product-specific changes again leads to increased corporate complexity. This requires targeted synchronization measures to ensure dynamic company-wide realignment.[5]

As shown, the complexity of companies is shaped by the interaction of various characteristics. Accordingly, companies can be classified as complex as soon as the characteristics at hand are present within the organization. To ensure performance-oriented processing of corporate activities, effective coordination, and alignment in the form of targeted synchronization measures prove necessary in all of the listed characteristics.

### The scope of synchronization

According to an organization's complexity, synchronization can be increased in different activities in order to mitigate negative effects of historic silo processes on performance. In the context of this white paper, we differentiate three types of organizational performance:

Under proportional, linear and exponential performance as seen in Figure 2. Hereby, the expected performance output depends on the degree of synchronization and the complexity of the organization or its activities.

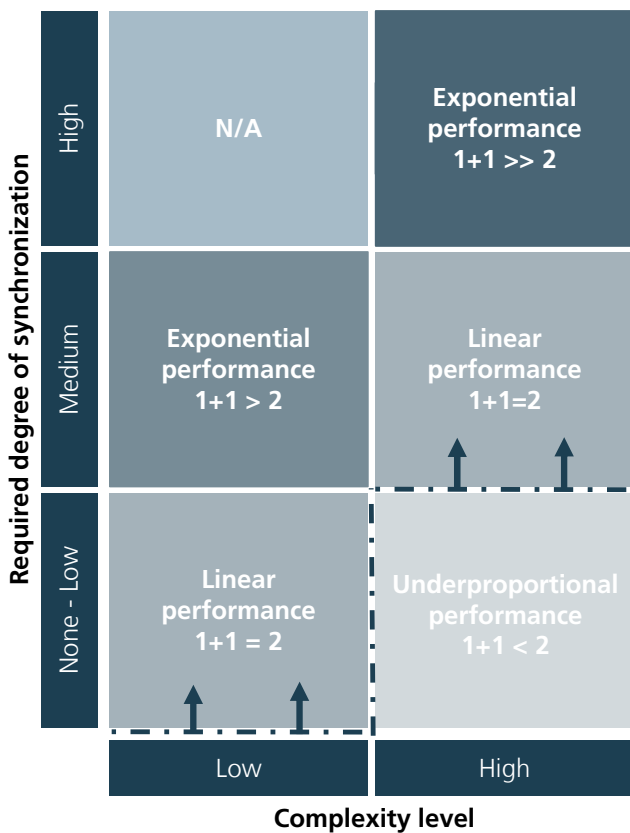


Figure 2: Performance in relation to complexity and synchronization

### To avoid: $1+1 < 2$

An under proportional performance has a degressive relationship between input and output. This is characterized by a lack of synchronization, where additional resources do not correspond proportionally to the achieved results. Failure to synchronize complex activities will lead to under proportional performance results. For example, an additional team member who is not aligned with others may create confusion instead of adding value.

### Could be better: $1+1 = 2$

The minimum level of performance that corporations should aim for is the linear performance output. This is represented by the dashed line. A linear performance has a constant input-output relationship. It suggests that the organization is capable of delivering consistent results without significant variations in resource allocation. Linear performance can be reached in simple tasks without the need for synchronization. In Olympic swimming, for example, the individual performances of the participating athletes are added together to determine the overall performance of their team. A synchronization of these would no longer lead to an increase in performance. In contrast, it becomes obvious that synchronization will always be necessary for complex activities in order to be able to generate at least linear output. Consider the context of developing innovations within globally distributed teams. In this scenario, basic synchronization plays a crucial role. It means that the team members must coordinate their efforts even when faced with uncertainty, geographical dispersion, and the potential for different team members to be working on similar tasks without being aware of each other's work.

### Performance-boosting: $1+1 > 2$

An exponential performance is characterized by a progressive relationship between performance input and output of the activity. The more resources or effort are invested in an activity, the more significantly the results or yields increase. This signifies a highly efficient and well-synchronized organization where resources are effectively utilized. In order to realize exponential performance in simple activities, fundamental synchronization is required. In a soccer team, for example, different players have different roles and can only perform at their best when they work together. With the use of basic synchronization in simple activities, the performance maximum reaches its limits. To achieve exponential performance in complex tasks, a stronger form of synchronization proves to be indispensable. A more detailed explanation of the degree of synchronization is given in the chapter "The phases of synchronization".

# From idea to concept

## Dimensions, phases and principles as fundamental concepts for synchronization

### The dimensions of synchronization

A synchronization of corporate activities can be approached in four dimensions: Influenced by the underlying strategy and according business model, temporal, spatial, structural and personal are distinguished as dimensions for implementation (see Figure 3). Each of these dimensions plays a role in the characteristic manifestation of measures for synchronization, hence contributing to the goal of performance improvement. The characteristics of each dimension are briefly outlined below.

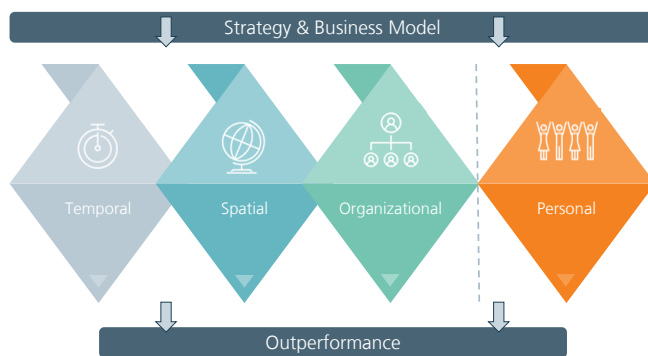


Figure 3: Dimensions of synchronization

The temporal dimension of synchronization describes the timing of activities in relation to one another. An example for this is the generation of an efficient exchange of information in real time via a data exchange platform. Sharing data without delay minimizes the occurrence of delays in action. The interaction partners are enabled to react quickly to changing requirements and challenges and to continuously optimize their workflows. This continuous adaptation of work processes helps to ensure that the required information is available at the right time and in the appropriate place, thus guaranteeing optimal resource allocation. Accordingly, temporal synchronization promotes the performance and effectiveness of activities by enabling improved, temporal coordination of relevant measures.

The spatial dimension refers to the coordination and alignment of activities across different geographical locations. In a globalized world, where companies often have multiple sites, offices or branches, spatial synchronization is essential to ensure efficient operations and smooth collaboration. The establishment of a common central knowledge base and targeted access to specific local competencies, for example, represents a synchronization measure and is characterized primarily by a spatial dimension. This measure serves as a basis for strengthening the collaboration of cross-regional teams. By sharing best practices and transferring knowledge between teams in different regions, companies can benefit from synergies, learn from best practices in other locations, and thus overcome the disadvantages of spatially segmented process silos.

The organizational dimension includes the design and relation of activities as well as the definition of interfaces within the corporate structure. An example of a synchronization measure that affects the structural dimension is the consolidation of two similar production steps for one production line into one production step. By optimizing the design of an activity involving several areas of the organizational structure, synergies can be exploited, and a holistic instead of local optimum achieved. The synchronization of cross-departmental activities also makes it possible to increasingly avoid redundancies and inconsistencies.

The personal dimension of synchronization focuses exclusively on interpersonal interactions. It includes various aspects that help employees work together effectively and use their personal skills and talents for the benefit of the company. These aspects include, for example, the way they communicate, trust and motivate each other or show empathy. Increased synchronization thus can create a work environment that enables employees to improve performance by sharing knowledge and experience at different levels. In this way, the individual's own spectrum of knowledge can be continuously expanded, and the collective potential maximized.

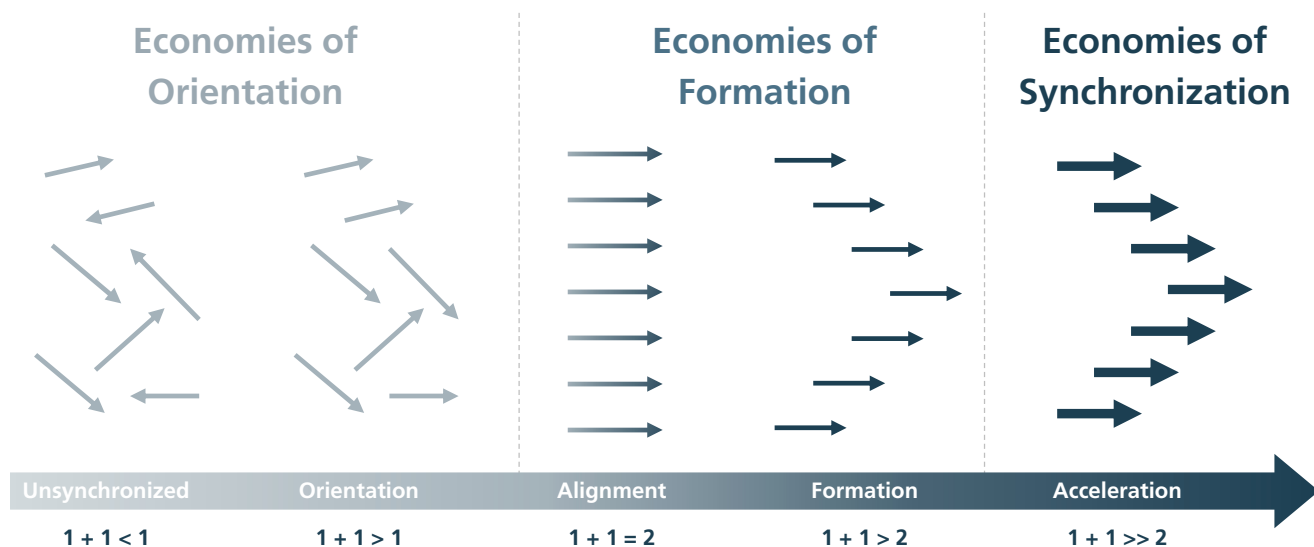


Figure 4: Phases of synchronization

## The phases of synchronization

Synchronization can be seen as a continuous process with the goal of increasing performance and competitiveness. To classify the state of synchronization in companies, this process can be divided into five phases: the unsynchronized, orientation, alignment, formation and acceleration phase as shown in Figure 4. The development towards more advanced phases of synchronization is accompanied by increasing integration and effectiveness of synchronized corporate activities. In the orientation phase, there is no specific synchronization, but the company begins to realize that the lack of synchronization is causing efficiency problems. The divisions act independently from each other, without conscious coordination or cooperation. There is a lack of coordination and integration between the individual activities. This leads to the fact that e.g., in the temporal dimension impairments can occur in the form of delays and bottlenecks. A readiness for change and for the solution of these problems grows. The first steps are taken to identify and understand the causes of desynchronization. The orientation phase lays the foundation for the next steps towards coordinated activities.

The third phase, the alignment phase, is a critical step in the synchronization process within an organization, where all stakeholders are aligned to a common synchronization target picture. The main goal of this phase is to ensure that all team members and activities are aligned on the same goals and approaches to enable effective and efficient collaboration.

Entering the fourth phase, the formation phase, synchronization is introduced structurally. Using simple communication and coordination mechanisms, the activities involved are linked and related to each other. A basic framework for cooperation

and exchange of information is established. Conscious coordination and alignment enable a better overall performance of activities. In the temporal dimension this leads e.g., to the elimination of time delays and a faster reactivity, in order to be able to adapt to changing boundary conditions. In the spatial dimension, the creation of central knowledge bases and targeted access to local competencies is promoted. Information and best practices are collected and made available in a structured manner to facilitate knowledge transfer. In the structural dimension, process interfaces are clearly defined and coordinated.

In the subsequent acceleration phase, activities are synchronized at an advanced stage. It is characterized by digitization and the use of data-driven methods and tools that enable seamless collaboration and maximum exploitation of synergy effects. Data-driven synchronization results in high performance, agility and innovation power. In the context of the temporal dimension, this enables, for example, the transition from a step-by-step process of adaptation and optimization to a continuous, dynamic, and observable improvement of processes.

## Synchronization principles

Synchronization principles comprise a set of practices that follow a common principle and can be fleshed out in any dimension of synchronization. In particular, various examples of synchronization from nature and sport can be used to grasp these principles. These exemplary cases serve as a starting point to elaborate the fundamental nature of synchronization phenomena and to develop a deeper understanding of the underlying mechanisms (see Figure 5). The first principle



guidance describes the definition and common understanding of a goal or vision. Examples from sport show that the guidance principle is used by coaches for communicating their expectations and transferring them to the players for common ambition. In the corporate world, an example for this principle is establishing a common target picture. This involves aligning all team members around a shared vision or goal. Guidance ensures that everyone is on the same page, working toward a unified objective, which is crucial for achieving organizational success. The interaction principle can be derived from the analogy of the duet singing of birds. Birds time-align their song patterns and rhythms to produce a harmonious duet. This synchronizes their brain activities, which in turn leads to more effective communication and interaction. In companies, interaction describes collaboration and cooperation and can be accomplished for example through team building events and professional development.

The participation principle includes the reliable attendance and awareness of individuals in a specific task. For example, in team sports, it is crucial that every individual regularly attends the training sessions. For companies, flexible task management and shared responsibility in a project team foster team

members to actively participate in the project tasks and at the same time adapt to the evolving needs of the team and the project. The training principle describes any measures that promote the practice or learning of an activity. In the corporate context, this can include training employees in a specific area. The access principle describes measures that enable independent access as well as the exchange of information or resources via a common basis. A very common example in companies is the establishment of a SharePoint to which a team has access and defined editing rights. A natural example for the derivation of the principle of coordination is the hunting behavior of orcas. To get a seal off an ice floe, orcas form a group in which each individual has a specific role. Some orcas propel the seal into the water, while others hold the seal near the water surface and eventually strike it with their fins or tail flaps to capture it. In a corporate context, it can include determining a chronological sequence of interrelated processes. The principle of team composition emphasizes the importance of harmony and mutual complementarity in diverse teams. Among other things, this can be achieved e.g., through a diverse combination of cross-functional, international, and -cultural expertise in project teams.

	Synchronization principles	Implementation mechanism	Examples from nature	Sport examples	Corporate examples	
Leadership	Guidance	<ul style="list-style-type: none"> <li>• Vision</li> <li>• Strategy</li> <li>• Targets</li> </ul>	<ul style="list-style-type: none"> <li>• Business Model</li> <li>• Values</li> <li>• Trust</li> </ul>	<ul style="list-style-type: none"> <li>• Birds orientating by the earth's magnetic field</li> </ul>	<ul style="list-style-type: none"> <li>• Coach gives a speech on expectations</li> <li>• Analyzing &amp; evaluating of a game</li> </ul>	<ul style="list-style-type: none"> <li>• Establishing a common target picture</li> <li>• Use of KPI monitoring</li> </ul>
	Interaction	<ul style="list-style-type: none"> <li>• Clarity</li> <li>• Communication</li> <li>• Motivation</li> </ul>	<ul style="list-style-type: none"> <li>• Direct reassurance</li> </ul>	<ul style="list-style-type: none"> <li>• Birds synchronizing their duets</li> <li>• Dogs eating and resting together</li> </ul>	<ul style="list-style-type: none"> <li>• Warming up with group exercises</li> <li>• Correcting each other during an exercise</li> </ul>	<ul style="list-style-type: none"> <li>• Realization of team building events</li> <li>• Conducting feedback talks</li> </ul>
	Coordination	<ul style="list-style-type: none"> <li>• Commitment</li> <li>• Agreement</li> </ul>	<ul style="list-style-type: none"> <li>• Focus</li> <li>• Empathy</li> </ul>	<ul style="list-style-type: none"> <li>• Hunting behavior of orcas, lions</li> <li>• Birds flying in V-formation</li> </ul>	<ul style="list-style-type: none"> <li>• Fixed roles of team members in rowing sport</li> <li>• Slipstreaming in cycling</li> </ul>	<ul style="list-style-type: none"> <li>• Definition of process flows</li> <li>• Assignment of tasks in a project</li> </ul>
People	Participation	<ul style="list-style-type: none"> <li>• Agility</li> <li>• Ownership</li> </ul>	<ul style="list-style-type: none"> <li>• Empowerment</li> </ul>	<ul style="list-style-type: none"> <li>• Birds keeping their nests clean and feeding their young appropriately</li> </ul>	<ul style="list-style-type: none"> <li>• Reliable participation in team sports training</li> </ul>	<ul style="list-style-type: none"> <li>• Flexible task handling in a project team</li> </ul>
	Team composition	<ul style="list-style-type: none"> <li>• Cohesion</li> <li>• Diversity</li> </ul>	<ul style="list-style-type: none"> <li>• Complementarity</li> </ul>	<ul style="list-style-type: none"> <li>• Clear team composition in wolf packs e.g., alpha and beta wolves</li> </ul>	<ul style="list-style-type: none"> <li>• Setting up the strongest starting six in volleyball matches</li> </ul>	<ul style="list-style-type: none"> <li>• Functional and cross-functional composition for project teams</li> </ul>
Systems	Training	<ul style="list-style-type: none"> <li>• Theoretical learning</li> <li>• Mentoring</li> </ul>	<ul style="list-style-type: none"> <li>• Practical application</li> </ul>	<ul style="list-style-type: none"> <li>• Cheetah mothers teaching their cubs hunting techniques</li> </ul>	<ul style="list-style-type: none"> <li>• Carrying out individual goalkeeper training</li> </ul>	<ul style="list-style-type: none"> <li>• Training of employees in a specialized field</li> </ul>
	Access	<ul style="list-style-type: none"> <li>• Pooling</li> <li>• Deployment</li> </ul>	<ul style="list-style-type: none"> <li>• Transparency</li> </ul>	<ul style="list-style-type: none"> <li>• Coral reefs as a place of exchange for food resources</li> </ul>	<ul style="list-style-type: none"> <li>• Using apps for match and training organization</li> </ul>	<ul style="list-style-type: none"> <li>• Setting up a sharepoint</li> <li>• Use of a joint infrastructure</li> </ul>

Figure 5: Synchronization principles [6]-[10]

# From theory to practice and back

## Synchronization-based outperformance at Henkel as pilot for method modelling

### The launch of Economies of Synchronization at Henkel

By combining scientific methodology and practical experience, a grounded method was developed to enable the guided implementation of Economies of Synchronization. The methodology and the beneficial impact of Economies of Synchronization were validated through a pilot application at Henkel. As a large, global company with complex structures and cutting-edge solutions in adhesives, sealants and functional coatings, Henkel must constantly innovate and adjust its strategy to maintain its leadership position. Motivated by this, Henkel initiated a strategic transformation program several years ago under the umbrella of "Loctite Reloaded". One focus of this transformation was to investigate new performance-enhancing effects, such as Economies of Synchronization, in the increasingly VUCA environment.

As a data-driven pioneer, Henkel compiled a comprehensive database over several years, which is still constantly being extended. This has been the starting point to investigate the effect of the first two synchronization phases (see Figure 6) on the market outperformance at Henkel in cooperation with the Leuphana University in Lüneburg.

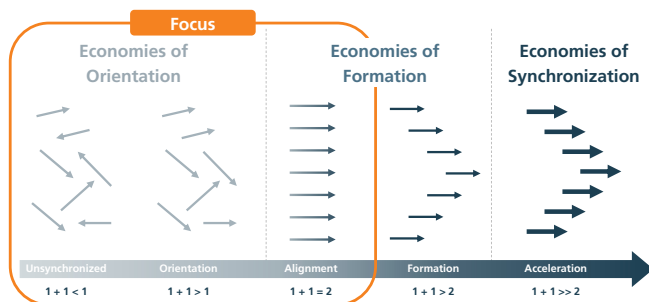


Figure 6: Focus of the Henkel case study

### A new and synchronized strategic program

Based on the synchronization phases illustrated in Figure 4, the process of increasing the synchronization degree typically starts from an unsynchronized state. Therefore, a method for purposefully realizing synchronization synergies in strategic programs was developed based on Henkel's internal and external boundary conditions. The procedure is illustrated in Figure 7 and enables the systematic monitoring and validation of synchronization initiatives. For more practical insights all steps are also outlined using the example of the Henkel case study.

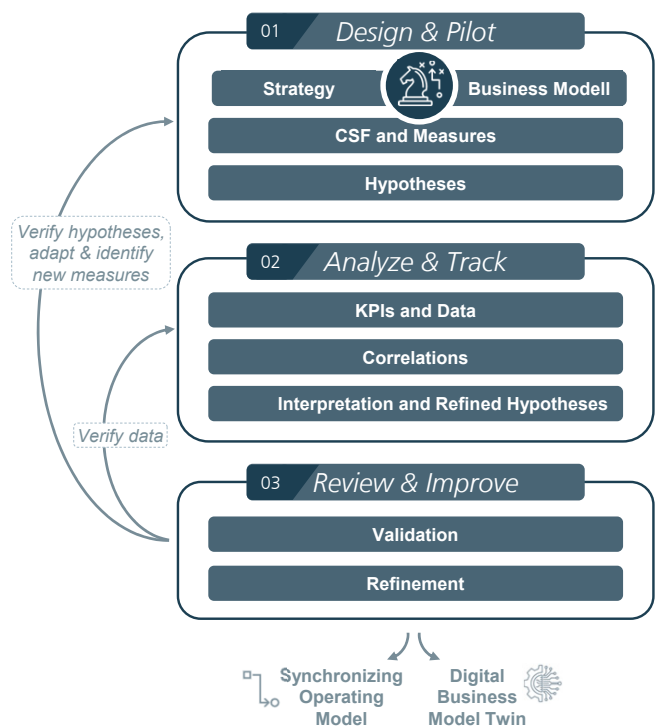


Figure 7: Methodology implementing synchronization synergies

## 1. Design & Pilot Steps

In the first step, the company's strategy and business model serve as a starting point. The core trait of a synchronization-based strategy is the ability of the underlying business model for scalability. From the outset, it is therefore imperative to structure the strategic program. Without the ambition to drive market outperformance and a shared vision to guide the organization, synchronization becomes challenging. For this, the fundamental Critical Success Factors (CSF) need to be developed and internalized by the organization. The CSFs hereby are derived from the strengths of the competitive positioning. Based on the CSFs identified, suitable effective measures are then derived that are expected to implement the strategy and have a positive impact on the company's performance. This ensures alignment between business strategy and the synchronization to be achieved. Possible performance losses within the business model are uncovered by means of a gap analysis. For this, the synchronization principles identified in Figure 5 serve as a toolbox for selecting suitable measures. This approach enables the assessment of performance deficiencies that synchronization measures can address.

*In the Henkel case, initially CSFs were designed for the vision of scalability and derived from Michael Porter's approach to competitive strategy, thus ensuring a link to the strategic alignment. Subsequently, the designed CSFs were piloted in selected regions in order to generate first proof-points and data on the chosen measures of the strategic program for market outperformance. For instance, the synchronization activity "Verticalization of the Sales Force" was derived from the affected CSF of the "Sales Force Ecosystems" as measure in the strategic program.*

Next up, hypotheses to test against are formulated. These are built around selected synchronization measures that could have a positive influence on the company's performance. For this, the performance values can e.g., be specified by sales volume or market share.

*The hypotheses for the Henkel case were set up as shown in Figure 8. It was hypothesized that the synchronization measures "Higher Focus on Golden Range Products", "Increased Focus on Unique Selling Points (USP)", "Verticalization of the Sales Force" and "SME Customer Focus" could have a positive impact on the market outperformance measured in sales figures. These hypotheses were tested in detail in the following steps.*

## 2. Analyze & Track Steps

To be able to steer the designed synchronization initiatives, KPIs are identified for each synchronization measure to enable quantification and thus measurability of the action. This allows the relationship between synchronization measures and performance to be analyzed numerically and ultimately enables the hypotheses to be confirmed or rejected. Focusing on activity KPIs is paramount in this context for assessing the progress towards synchronization. In contrast to result-oriented KPIs, such as sales figures, prioritizing activity KPIs offers the opportunity to record these cleanly in an early phase of the transformation process. This early visibility provides valuable insights into the effectiveness of measures in the strategic program. By consistently tracking activity KPIs, businesses can demonstrate undertaken actions and therefore reasons for scalable, continuous growth over time. For this, the KPIs are set up using existing appropriate data or are derived from proxy data. If there is no data available for analysis or if the quality of the data is insufficient, the creation of the database is necessary for the completion of the process.

*At Henkel, the KPIs were derived from an existing database covering the last six years. Available data from 2016 to 2021 was used, except for 2020 due to the strong external bias caused by the COVID-19 pandemic. The derived KPIs are shown in Figure 8 in the "Proxy and correlation with performance" column. For instance, the KPI "Technologies for 80% of revenue" was set up for the synchronization measure "Increased Focus on Unique Selling Points (USP)". Focusing on the unique selling propositions means that the complexity of the product portfolio should be reduced, so that in Henkel's case the focus should be on the most relevant technologies. To make this focus quantifiable, the representative number of technologies that contribute to 80% of sales was measured over the years using an ABC analysis.*

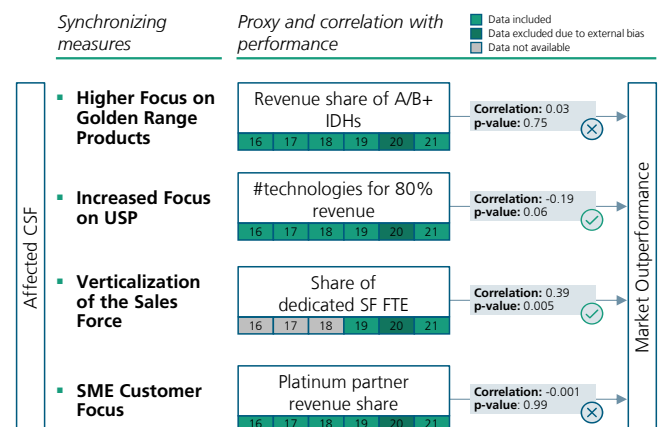


Figure 8: Overview of Henkel's relationships between CSFs, synchronizing measures, KPIs and performance values

The following step includes analyzing the relationship between KPIs and performance output in detail. This is conducted by a correlation analysis. The correlation analysis assesses the linear relationship between two variables by the calculation of the Pearson correlation coefficient. This coefficient is a statistical measure used to quantify the strength and direction of the linear relationship between two continuous variables. It measures how well the two variables are related to each other and whether this relationship is positive i.e., if one variable increases, the other also increases or negative i.e., if one variable increases, the other decreases. The Pearson correlation coefficient can assume values between -1 and 1. To determine the correlation's significance, hypothesis testing is further conducted using a null hypothesis that assumes no correlation. For that, the p-value is calculated with a given alpha level. If the p-value is less than or equal to a given alpha level of  $\alpha$ , usually values of 0,1 or 0,05, the result is considered statistically significant. This means that it is unlikely that the observed result is due to chance. This calculation enables a determination of the statistical significance of the identified association. [11]

In order to draw conclusions from the quantitative analysis, it is necessary to interpret and track the results of the correlation analysis and to generate adjustments from the conclusions. The correlations identified are contextualized in relation to the hypotheses. A non-existing correlation or a not statistically significant correlation suggests that the hypothesis may be rejected, as it indicates its invalidity. Conversely, a confirmed and statistically significant correlation implies that the hypothesis can be accepted and is suitable for further analysis. However, the final validation occurs in the next step, as it is crucial to consider the impact of external factors as well. This comprehensive approach should ensure a more accurate and reliable assessment of the hypotheses in question.

*In many cases at Henkel, correlations were observed and confirmed, such as those shown in Figure 8 for the synchronization measures of "Increased Focus on USP" and "Verticalization of the Sales Force". For example, in the case of the "Verticalization of the Sales Force". The hypothesis that this synchronization measure has a positive effect on market outperformance is accepted. This result must be validated in the next step in order to rule out distortions and external influences.*

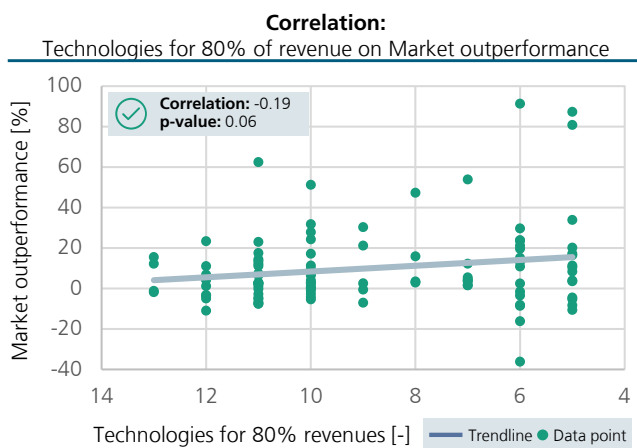


Figure 9: Correlation example at Henkel

Through a correlation analysis, as seen in Figure 9, it has been analyzed what KPIs and corresponding synchronization measures have an impact on the inflation-adjusted market outperformance. In the example, the distribution of "Technologies for 80% of revenue" are plotted on the x-axis with the resulting market outperformance on the y-axis. The Pearson correlation coefficient with a value of -0.19 indicates a weak negative correlation between the KPI "Technologies for 80% of revenue" and the market outperformance. The result of the p-value of 0.06 indicates a slight to good significance at an assumed alpha level of 0.1.

### 3. Review & Improve Steps

The next stage is extended validation of the correlations found in synchronization measures. This is necessary to cross-check and ground the calculations that have been performed. External influences on the correlation analysis are reviewed and the final interpretation of the hypotheses is subjected to critical evaluation. For this validation, t-tests can be used to analyze the influence of other factors on company performance. A two-sample t-test is a statistical method used to compare the means of two independent samples to determine whether there is a significant difference between them. The test is applicable when the data in each group is approximately normally distributed. The t-statistic is calculated by taking the difference between the sample means and dividing it by the standard error of that difference. The resulting t-value is then compared to a critical value from the t-distribution or converted to a p-value to determine whether the observed difference is statistically significant. [12] Statistically significant deviations in the performance values, which are attributable to other factors, indicate that a final validation of the hypotheses is not possible yet. Then, further analysis between the influencing factors and the KPIs are necessary.

*In the Henkel case, t-tests were conducted to verify the results of the correlation analysis, as illustrated in Figure 10. In the example, the market outperformance contribution per FTE of top performing countries in which Henkel is located is compared with follower countries. The analysis demonstrates that*

countries with a high market outperformance contribution show significant differences in CSF relevant KPIs when compared to countries with low market outperformance. A further analysis appears to be particularly useful for the "Platinum Partner revenue share" KPI due to the large difference between top and low performers.

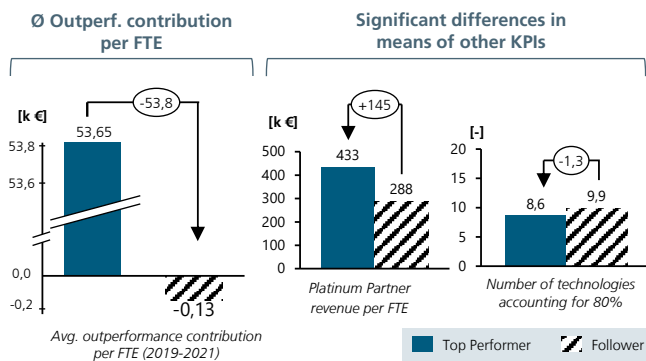


Figure 10: Validation of hypotheses by means of t-tests

Progressing to the next point of the methodology, the focus shifts from validation to refining the strategic program for synchronization. This involves several key tasks: The first task entails updating the data which includes making necessary adjustments for accuracy and comprehensiveness based on the findings from the validation. The consideration of adding new data sources or variables to enrich the dataset is also part of this step. Following the dataset update, a regression analysis is conducted for the synchronization measures and KPIs. The primary objective is to quantify the relation between synchronization measures and specific hypotheses. This enables the identification of measures with the most substantial influence for strategic steering.

Based on the insights gained from the regression analysis, adjustments can be made to the strategy and business model as well as the strategic program implementing the transformation. This includes the removal of synchronization measures that show minimal or no relevant impact on the target hypothesis. New synchronization measures may be derived, or existing ones adapted to align with the findings from the analysis. In some cases, hypotheses may also be revised to better reflect the relationships uncovered during the regression analysis.

Despite having identified several valid correlations based on the vast dataset provided, these were not comprehensive and complete enough to perform the regression analysis. Therefore, hypotheses and KPIs were updated as well as measures to strategically develop the underlying database were derived instead. However, already at this stage of synchronizing the

strategic program for the "Loctite Reloaded" transformation, Henkel's pilot projects have shown remarkable results in increasing market outperformance. For example, over the observed 3-year period from 2020 to 2022, the win rate of sales teams increased by 41.2% while the overall resource utilization for this decreased by 17% compared to the base year. This real-world track record highlights the tangible benefits for applying the Economies of Synchronization as a management concept.

## The way ahead for Economies of Synchronization at Henkel

Following the development of a synchronized strategic program in the first synchronization phases (see unsynchronized and orientation phases in Figure 4), two tracks are being pursued at Henkel. The first track involves focusing on and developing a synchronized operating model, thereby facilitating the transition of the company into the alignment and formation phase. These phases emphasize aligning the organizational design choices to the synchronized strategic program, thus, ensuring cohesion and efficient implementation within the organization. This includes a thorough review of the operating model through the lens of the synchronization principles to identify performance inhibiting design choices in e.g., processes, structures or systems. Analogous to the procedure in the first phases of synchronization, targeted measures are derived from this to increase the market outperforming effects of the scalability designed business model.

The second track entails the development of a digital business model twin. This involves leveraging the data and the identified, valid correlations to create a digital replica of the business operations. It introduces several transformative elements that extend far beyond the scope of the preceding steps. The established data foundation and methodologies undergo a transformation into a digital twin. This digital twin operates in real-time, leveraging the most current data available, thereby transitioning from static models to dynamic models. This leads to the ability to promptly simulate new hypotheses and empowers the exploration of different scenarios as well as data-driven decision-making in a changing VUCA environment. Continuous monitoring of the synchronized strategic program's performance becomes feasible and enables the identification of deviations from expected outcomes and opportunities. Just as digital twins in other domains (such as products, machines or production), the digital business model twin shows great potential in aligning resources with the most promising synchronization measures to enhance overall performance in pursuit of business objectives.

# From concept to scale

## Mastering organizational complexity and embracing digital transformation

The optimal synchronization of business activities is a key factor for sustainable success. This white paper offers a conceptual approach to implementing the theoretic principles behind Economies of Synchronization in practice.

One notable outcome is the development of a toolbox comprising synchronization dimensions, phases and principles. These principles serve as pivotal control elements and orientational guidelines for synchronization, with the potential to exert significant influence on business performance. In tandem with the theoretical elaboration of the principles and synchronization phases, a methodology for the practical implementation of synchronization synergies has been crafted. This methodology is underpinned by initial empirical validation, which was particularly evident in the case of Henkel. In the case study, the first practical evidence of the effect of Economies of Synchronization was demonstrated by moving from an unsynchronized state to the alignment phase. In particular, the decisive role of a strategy and business model designed with the ambition for scalability was emphasized as a starting point for realizing performance jumps. However, it is important to acknowledge that the explorative research remains incomplete as the practical implementation and detailing so far has only reached the alignment phase. From this, short-, medium- and long-term priorities in further exploring Economies of Synchronization are derived.

### Short- to medium-term priorities

In the short to medium term, the focus needs to shift to the alignment and formation phase. The alignment and formation phase includes analyzing and designing processes, structures, incentives, and other essential organizational factors to support the scalability of the business model and ensuring resource efficiency. For this, recognizing and quantifying performance losses due to unsynchronization will be key in understanding these losses and deriving targeted measures. By understanding these losses, organizations can pinpoint processes of potential synchronization and strategically leverage them for optimization. Navigating through the formation

phase enables companies to transition seamlessly into the acceleration phase, positioning them for future digital growth and advancement.

### Medium- to long-term priorities

As businesses continue to embrace digital transformation, long-term potential arises to explore the digital business model twin for simulating hypothetical synchronization measures. The idea behind this concept is to use state-of-the-art technologies and data analysis methods to create a precise and dynamic simulation of the company. This enables management to better understand and manage activities at all levels. Management can use the digital twin to simulate different scenarios and decisions in advance. If new synchronization measures are to be introduced, they can be tested in virtual space before they are actually implemented.

The field of Economies of Synchronization is still emerging, and further exploration is needed as there is much more to be uncovered, such as embracing the tension between the needs for globally integrated and at the same time differentiated steering of strategic programs. Bridging these tensions and linking strategy, business and operating model through an effective implementation plan, will be fundamental for measurable results and increasing long-term business success.

"Having witnessed business situations with  $1+1<1$  on the one side and inspired by the birds' V-formation benefits on the other side, we did translate these insights into what we call Economies of Synchronization, innovated accordingly our business model and see empirical evidence of  $1+1>3$ . This motivates to develop further this leadership and business approach."

Dr. Kourosh Bahrami  
Business Head LOCTITE

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