

Balancing Agility and Resilience in Pharmaceutical Supply Chains: The Impact of Disruptive Changes and Innovations

St. Gallen Research Report, 2024

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Introduction

The pharmaceutical industry is undergoing profound transformations driven by rapid technological advancements, global challenges, disruptive changes, and innovations. Traditionally characterized by stringent regulations and lengthy development cycles, the sector is increasingly facing unexpected disruptive changes and innovations affecting both management and the entire supply chain. These disruptions encompass external influences, such as interruptions in raw material supply, as well as internal factors, including advancements in production technologies, digital tools, and IT applications like artificial intelligence.

Given these profound changes, pharmaceutical companies must swiftly develop new operational capabilities or adapt to emerging developments to remain competitive. Given the constantly evolving global economic and social landscape, the pharmaceutical industry faces unique challenges. Considering the scale of global phenomena over the past decade and disruptions in management and pharmaceuticals, along with societal changes, it is anticipated that the landscape for pharmaceutical companies will dramatically change over the next two decades. These changes will significantly impact the supply chain and its management, from the supply of components to manufacturing technology, shifts in the structure of therapeutic areas, and the distribution of medicines. To stay competitive, it is important for pharmaceutical companies to develop new operational capabilities based on holistic overall management concept for continuous adaptation, a process unprecedented in the past century.

Several studies and sources indicate that between 70% and 95% of strategies fail due to poor execution (Müller-Stewens, 2019; Gomez, Meynhardt, & Lambertz, 2020). These failures are frequently driven by inadequate management systems leading to insufficient operational execution within organizations. A central premise of this report is the assumption that all types of functional strategies, including supply chain strategies, cannot be developed as standalone approaches: Upper Management often overlooks the need for interconnection and alignment with all other elements of a management system.

For several years, research has focused on these topics and aims to identify the evolving strategic capabilities in the pharmaceutical sector (Dukart et al., 2022). Many articles examine how the management of pharmaceutical supply chains emphasizes operational capabilities, defined as *"the ability of an organization to perform a coordinated set of tasks, utilizing organizational resources, for the purpose of achieving a particular end result"* (Teece, Pisano, & Shuen, 1997).

The primary focus of this research is to determine how to balance agility and resilience within supply chain strategies, organizational structure, and culture to respond to disruptive innovations in supply chains. Additionally, based on expert opinions from the industry, the study analyzes the solutions considered to be most effective and identifies future directions that could further enhance the resilience and agility of supply chains in the pharmaceutical sector.

The paper is structured as follows: Initially, approaches of agility and resilience in the supply chain, with a specific focus on the pharmaceutical industry, are defined and explained. The methodology section describes the research design, the survey conducted, the sample, and the data collection

and analysis methods. Following this, the survey results are presented and analyzed in detail. Finally, managerial implications, including recommendations for management, are provided.

Agility and Resilience in Supply Chain Management

Agility and resilience are two distinct but complementary concepts in supply chain management. Understanding the difference between these terms is crucial for developing robust supply chain strategies. Regardless of which strategic directions are chosen, successful implementation requires the development of new operational capabilities and potential adaption of the operational capabilities based on a holistic and integrated perspective.

Agility in Supply Chain Management

Agility in supply chain management refers to the ability of a supply chain to rapidly respond to changes in the internal and external environment. This includes adapting to fluctuations in demand, huge changes in supply, and other unforeseen disruptions. Agility emphasizes speed, flexibility, and responsiveness, allowing organizations to quickly reconfigure their operations and processes to meet new requirements. Speed refers to the ability to quickly adjust production schedules and inventory levels. Flexibility is the capability to alter supply chain routes and methods in response to changes. Responsiveness denotes the capacity to promptly react to customer and other stakeholder demands as well as market and technological shifts. In addition, agility is also required to quickly break new ground, adapt, and take advantage of opportunities to renovate as an organization.

For example:

- A pharmaceutical company that swiftly adjusts its supply chain to increase the production of a new vaccine in response to an emerging health crisis demonstrates agility. This involves rapidly reallocating resources, securing additional raw materials, and optimizing manufacturing processes to manage increased production volumes. Additionally, the company streamlines its distribution network to ensure the vaccine reaches healthcare providers and patients promptly. Such rapid and flexible adjustments allow the company to effectively respond to urgent demands and mitigate the impact of the crisis.
- The relevance of agility in the pharmaceutical industry is also evident in the operations of a company that had to rapidly adapt to regulatory changes. When the European Union introduced new stringent regulations for pharmaceutical packaging to ensure better traceability and patient safety, the company quickly overhauled its packaging processes and supply chain logistics.

Resilience in Supply Chain Management

Resilience in supply chain management refers to the ability of a supply chain to withstand and recover from disruptions. This involves preparing for potential risks, maintaining operations during disruptions, and quickly restoring normal functionality after a crisis. Resilience focuses in general on robustness and recovery, ensuring long-term sustainability and stability.

Key characteristics of a resilient supply chain include – as mentioned – robustness and recovery, as well as redundancy and a necessary and suitably large buffer for potential impacts. Robustness is the strength to endure shocks without significant operational breakdowns. Recovery is the efficiency of bouncing back to normal operations post-disruption. Redundancy refers to the presence of backup systems and alternative supply sources as well as the creation of so-called breaking points to be able to leave a country market immediately in an emergency, for example. A buffer is to absorb variations in demand and supply, ensuring stability and continuity even when facing unforeseen disruptions.

For example:

- A pharmaceutical company that has multiple suppliers for critical components and a well-established crisis management plan, enabling it to maintain production during a natural disaster, demonstrates resilience. This approach ensures that if one supplier is affected by the disaster, alternative suppliers can fill the gap, minimizing disruption to the supply chain and maintaining continuous production.
- A pharmaceutical company that implements advanced data analytics to predict and manage supply chain risks is using predictive modeling and real-time monitoring, the company can anticipate disruptions, such as delays in raw material shipments or sudden changes in regulatory requirements. This proactive approach allows the company to adjust its operations, secure alternative resources, and ensure a continuous supply of essential medications, thereby maintaining stability even in the face of potential disruptions.

Comparing Agility and Resilience

While balancing both agility and resilience are essential for effective supply chain management, they serve different purposes. Agility focuses on the ability to swiftly adapt to short-term changes and opportunities, ensuring that the supply chain remains competitive and responsive. In contrast, resilience is about long-term sustainability, emphasizing the capacity to endure and recover from significant disruptions.

In summary, an agile supply chain excels in flexibility and rapid response, while a resilient supply chain is characterized by its robustness and recovery capabilities. Both qualities can seem to be vital for a supply chain's success, especially in dynamic and unpredictable environments. Each requires a separate set of operational capabilities, what makes it necessary to optimize and renew not only structures and activities but also attitudes as a part of culture. All these elements must be integrated into a cohesive management concept.

Methodology

The methodology of this paper is based on a comprehensive survey conducted online, targeting all participants of the Pharmap 2024 conference in Amsterdam¹. Out of approximately 270 delegates, 78 participants responded to the survey, yielding a response rate of around 29%. The

¹ Pharmaceutical manufacturing and packaging congress 2024, Amsterdam. Organized by BGSgroup, Amsterdam, Netherlands.

accuracy rate of the completed surveys was 93%, affirming the high quality of the collected data. The survey participants held managerial positions within the supply chains of pharmaceutical companies operating in Europe:

Table 1	Distribution of respondents					
<i>Respondents</i>	<i>CEO</i>	<i>Senior directors</i>	<i>Directors</i>	<i>Manager</i>	<i>Specialists</i>	<i>All</i>
Distribution	13%	17%	25%	26%	19%	100%
	(n: 10)	(n: 13)	(n: 20)	(n: 21)	(n: 15)	(n: 81)

Table 1: Distribution of respondents

The research group, consisting of representatives from various management levels of pharmaceutical companies and associated firms (including Johnson & Johnson, Merck, Bayer, and Pfizer), provides a valuable perspective on industry opinions. Due to the extensive range of positions and functions held by the respondents, the study offers significant insights into both the breadth and depth of supply chain-related issues in the pharmaceutical sector. These findings are crucial for comprehending the current and future challenges faced by the industry.

Survey Methodology

The survey employed a mixed-method approach, incorporating both quantitative and qualitative responses. This approach allowed participants to provide their own assessments in addition to responding to structured questions. The survey included reverse-worded control questions to ensure respondents were attentive and accurate in their answers. The analysis revealed that 93% of the responses were consistent, confirming the high authenticity and engagement of the participants.

Profile of Survey Participants

Given the profile of the survey participants, substantial conclusions can be drawn regarding their professional experience and tenure within their current companies. This is critical for evaluating the reliability and depth of the collected data. It is particularly noteworthy that many questions were organization-specific, making the length of tenure within the organization significant for the quality of the responses.

Table 2	Company Affiliation of the Respondents				
<i>Respondents</i>	<i>Less than 5 years</i>	<i>5-10 years</i>	<i>10-20 years</i>	<i>More than 20 years</i>	<i>All</i>
Distribution	32%	40%	16%	12%	100%
	(n: 24)	(n: 30)	(n: 12)	(n: 9)	(n: 75)

Table 2: Company Affiliation of the Respondents

Industry Affiliation

Similarly significant is the respondents' affiliation with the pharmaceutical industry, as the questions were specifically tailored to this sector. The data indicates that most of the respondents have been working in the industry for more than 10 years:

Table 3	Industry Affiliation of the Respondents				
<i>Respondents</i>	<i>Less than 5 years</i>	<i>5-10 years</i>	<i>10-20 years</i>	<i>More than 20 years</i>	<i>All</i>
Distribution	12%	36%	32%	20%	100%
	(n: 6)	(n: 27)	(n: 24)	(n: 15)	(n: 75)

Table 3: Industry Affiliation of the Respondents

This research is conducted under the academic patronage of the StGallen Integrated imt Business School AG, which follows a legacy of over 50 years established by Professors Hans Ulrich Knut Bleicher, the initiators of the holistic St. Gallen Approach and many other co-creators of the University of St. Gallen, for example Christian Abegglen, who transferred the St. Gallen concept to the demands of today (see Abegglen and Bleicher, 2021). The StGallen Integrated imt Business School AG focuses therefore on delivering holistic Integrated Management concepts and systems that address a comprehensive holistic practical management approach, combining cultural, structural, and strategic layers as of an organization. These concepts are materialized through the organization's structures, activities, and attitudes, offering a robust framework for improving supply chain directions in the pharmaceutical sector.

At the end, the results will be transferred into the well-known Integrated St. Gallen Management Concept, originally developed by Knut Bleicher and further advanced by Christian Abegglen. By embedding the survey findings into this concept, pharmaceutical companies can gain a holistic view of how to align their strategies with operational capabilities and cultural readiness to foster agility and resilience. (Bleicher, 1991; Abegglen and Bleicher, 2021)

Challenges and Innovations in the Pharmaceutical Supply Chain

Over the past decade, the pharmaceutical supply chain has faced significant challenges requiring innovative solutions and strategic adaptations. Moving forward, similar challenges in the form of disruptions and innovations will continue to impact supply chains. Both internal and external influences, along with changing conditions, share a common requirement: companies must respond effectively to navigate these disruptions successfully. The solution space outlined in this paper is divided into two key areas: agility and resilience.

The following sections will identify and discuss current potentially disruptive challenges:

Regulatory Changes and Stricter Regulations:

The introduction of stringent regulations, such as those imposed by the Southeast Asian Sanitary Agency (ASAN) concerning heavy metals in pharmaceutical products, has posed significant challenges. Additionally, varied regulations regarding serialization and aggregation in countries like Brazil and India have led to increased administrative costs by 15-20% and extended lead times by 5-10 days². These regulatory differences require substantial adjustments and efforts from pharmaceutical companies to ensure compliance. (Yue et al., 2024)

² Results based on data evaluation from Bayer AG, conducted through Dr. Christopher Pawlak, External Manufacturing Lead, Bayer AG.

Technological Innovations:

Technological advancements have played a critical role in transforming pharmaceutical supply chains. For instance, Pfizer's implementation of a blockchain system for oncology drugs resulted in a 30% reduction in delivery time and a 25% (Priyan, 2024) decrease in documentation errors (Wolfson, 2019). Similarly, Novartis utilized AI and automation in production planning, reducing the time to market for new products by 20% based on annual report 2023. Additionally, new therapeutic technologies, such as immunotherapies and biotechnologies, are revolutionizing drug distribution and cold chain logistics, especially for personalized therapies.

Changing Competitive Landscape:

The competitive landscape in the pharmaceutical sector has also dramatically shifted. During the COVID-19 pandemic, Pfizer demonstrated remarkable agility by developing a supply chain for the mRNA vaccine, outpacing over 80 other candidates. The rapid development of a cold chain system in collaboration with CryoExpert was a key element in ensuring the safe transport of the vaccine under the required temperature conditions.³

Margin Pressure:

Pharmaceutical companies are under constant pressure to maintain margins amidst rising costs and competitive challenges. Quality regulations in the European Union, which mandate the use of more expensive testing methods, have increased production costs by 5-10%. Additionally, competition from generic drug manufacturers in Asia, where production costs are lower, has led to a 30% reduction in margins for original products within the first two years of market entry. (Shaffer, 2007)

Innovations in Digitalization within Pharmaceutical Supply Chains:

Innovations in digitalization are becoming increasingly critical for addressing challenges in pharmaceutical supply chains. The use of artificial intelligence (AI) and, in the future, quantum computing, promises significant improvements in demand forecasting, production planning, and the prediction of supply chain disruptions, also known as "weak signal detection." AI technologies are currently being used to analyze vast amounts of data from various sources to make more accurate predictions about demand and supply chain needs. By integrating AI into their supply chain management systems, pharmaceutical companies can better predict demand fluctuations, optimize inventory levels, and enhance production schedules, leading to more efficient resource use and reduced risks of stockouts or overproduction.

Disruptive Innovations as Opportunities:

The examples of disruptions illustrate that strategic and operational implementation can turn challenges into opportunities. Companies that can effectively adopt, process, and manage disruptive innovations can leverage these changes successfully. For instance, Novartis' use of AI in their production planning processes demonstrates a successful implementation. By leveraging AI, Novartis was able to reduce the time to market for new products by 20%. This not only enhances their competitive edge but also ensures that essential medications reach patients faster. (Bender & Cortés-Ciriano, 2021)

³ Information and data based on interviews, conducted by Dr. Christopher Pawlak, External Manufacturing Lead, Bayer AG.

In the following section of the paper, the results will analyze how companies are positioned and how they organizationally respond to and manage disruptions.

Results

The findings indicate that organizations and their leaders exhibit varying degrees of familiarity with disruptive changes and innovations, leading to divergent responses. While there is general awareness of potential internal and external influences, the strategic handling of these influences varies, as does the management of the necessary operational capacities within the company.

In the next section, the relevant research results will be identified and contextualized. This will be followed by lessons learned and actionable recommendations for companies in the pharmaceutical industry.

Balancing Agility and Resilience as the most important Aspect for an Organization in turbulent times

Agility and resilience are two well-known methodologies in management practice that not only have independent benefits but also create a synergistic effect when combined. The data reveals that only a minority of 4% believes resilience alone is sufficient to respond to disruptive changes and innovations. In contrast, 23% — more than six times that minority — consider agility as the key to organizational adaptation. The majority, 58%, assert that a combination of agility in strategic management and resilience within the organization is the most crucial aspect and characteristic for navigating a turbulent and volatile world.

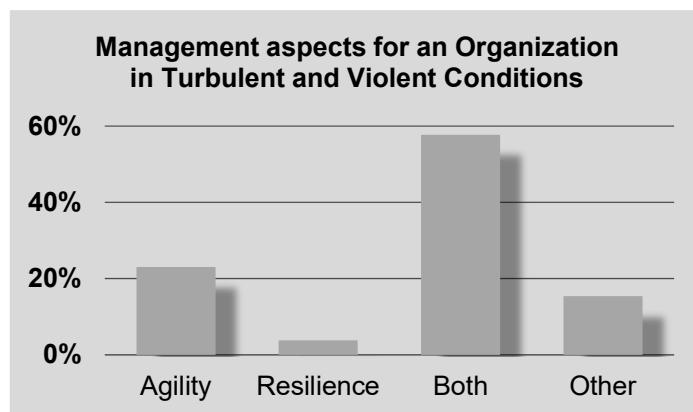


Table 4: Management Aspects for an Organization in Turbulent and Violent Conditions

These findings underscore the importance of integrating both agility and resilience to create a robust management concept. Agility allows companies to quickly adapt their strategic directions and operations in response to rapid changes and emerging opportunities. This flexibility is essential for maintaining competitiveness and capitalizing on new market trends. On the other hand, resilience ensures that organizations can withstand shocks and recover from

disruptions, providing stability and long-term sustainability.

The majority, 76% of respondents, are aware that agility and resilience are essential in the current business environment. Conversely, only 24% exhibit low to moderate awareness of this necessity. These results indicate a widespread recognition of the importance of agility and resilience at the general management level, which can be viewed positively. However, the extent to which this awareness translates into action and implementation remains to be determined.

This prominent level of awareness among managers suggests a solid foundation for fostering organizational change and development. The recognition of the need for agility and resilience is a crucial first step towards building robust and adaptive business practices. Nevertheless, understanding the theoretical importance of these concepts must be followed by well-defined tasks, processes, and actions to embed them into the overall management concept.

The surveyed experts present a significant diversity of opinions regarding the optimal balance between agility and resilience within organizations. Half of the respondents (48%) believe that there is an optimal balance between agility and resilience. This suggests that these respondents recognize the importance of both attributes and understand that creating a harmonious balance can enhance a company's ability to adapt to changes while maintaining stability. These respondents may have experienced or observed effective strategies where both agility and resilience are well integrated.

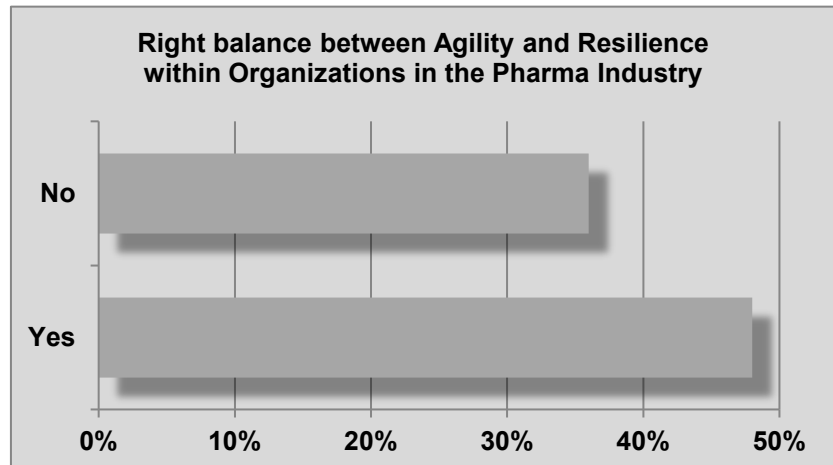


Table 5: Right balance between Agility and Resilience within Organizations in the Pharma Industry

A substantial portion of respondents (36%) do not believe that there is a proper balance between agility and resilience. This could reflect skepticism about the feasibility of effectively balancing these two attributes. It may also indicate that these respondents perceive agility and resilience as mutually exclusive or challenging to integrate. The remaining 16% of respondents are unsure or do not know if a balance exists.

The equal split between affirmative and negative responses underscores the need for further investigation and discussion within the industry about what the right balance looks like and how it can be achieved. The varied responses also suggest that there may not be a universal solution, and the appropriate balance may be company-specific within the pharmaceutical industry. Pharmaceutical companies may need to tailor their strategies to specific operational contexts, to external dynamics, and internal capabilities.

Gaps and Overlooked Hidden Aspects in Supply Management Strategies

In the context of implementing and bringing supply chain management strategies to action within a company, it has been observed that linking the operational level with strategy many necessary tasks, processes, and actions are often overlooked or disregarded. Whether management opts for a disruptive strategic shift to change the company or merely a marginal adaptation or optimization of the strategy, both internal operational capabilities and external factors contribute to the divergence between strategy and understanding and its actions at the operational level. Accordingly, a solid management concept is needed that includes these processes, tasks, and actions to close the gap between what is strategically desirable and what is achievable.

The survey results reveal significant insights into what is often overlooked in the development of functional, especially supply chain management strategies. Most respondents (62%) believe that internal operational aspects are frequently neglected. This oversight poses a significant risk to the alignment of strategic objectives with operational execution. The lack of integration of the operational level with the strategic level can undermine the overall effectiveness of the intended strategy and lead to potential failures in achieving the strategic objectives.

Moreover, 27% of respondents identified external factors as often being overlooked. While there is broad recognition of the impact of external factors on supply chains, this acknowledgment does not always translate into strategic alignment and action at the operational level. The identified strategic divergence, a high-risk tendency in the pharmaceutical sector, highlights the disconnect between the strategic decisions of upper management and the actual operational capabilities of the organization. This divergence can have various causes, including, as already mentioned, too many management levels, a hierarchical organizational structure, and a lack of communication between the lower and upper levels. Larger companies, with their greater complexity and number of management levels, are particularly susceptible to this risk.

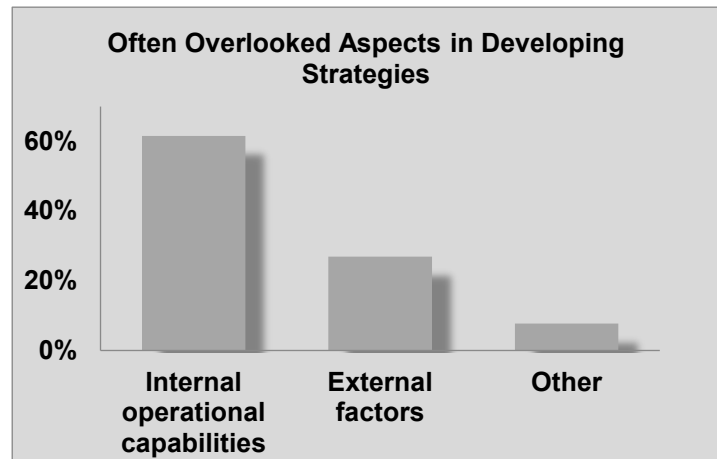


Table 6: Often Overlooked Aspects in Developing Strategies

This divergence can have various causes, including, as already mentioned, too many management levels, a hierarchical organizational structure, and a lack of communication between the lower and upper levels. Larger companies, with their greater complexity and number of management levels, are particularly susceptible to this risk.

The results indicate a critical need for better integration of internal operational and supply chain management strategies based on the corporate strategies and for addressing the factors that contribute to strategic divergence and highlight the importance of recognizing both internal and external factors when developing strategies. Internal operational capabilities must be integrated into strategic capabilities to ensure alignment and effective execution.

Navigating Disruptive Challenges: Key factors in Identification and Implementation

A key component of the expert survey was to assess how the respondents and their respective companies manage disruptive changes and innovations – specifically, how they identify, analyze, and implement effective tasks in response to these changes. The analysis of the survey results reveals several intriguing themes. While there appears to be a general awareness of disruptive changes and innovations that could impact the company both currently and, in the future, the approach to managing these innovations within the organization is questionable, as are the associated competencies.

The survey revealed that 58% of companies have identified disruptive changes and innovations that could impact their supply chains in the next 5-10 years. A deeper analysis of data correlations showed that this identification is typical for individuals with either short tenure or those with over 20 years of experience. This trend suggests that both newcomers, who may bring fresh perspectives, and seasoned professionals, who have

extensive industry knowledge, are more attuned to identifying disruptive changes. Additionally, the highest response rate was observed among middle management, which often bridges the gap between strategic and operational levels. This finding aligns with the research and expectations regarding the survey results.

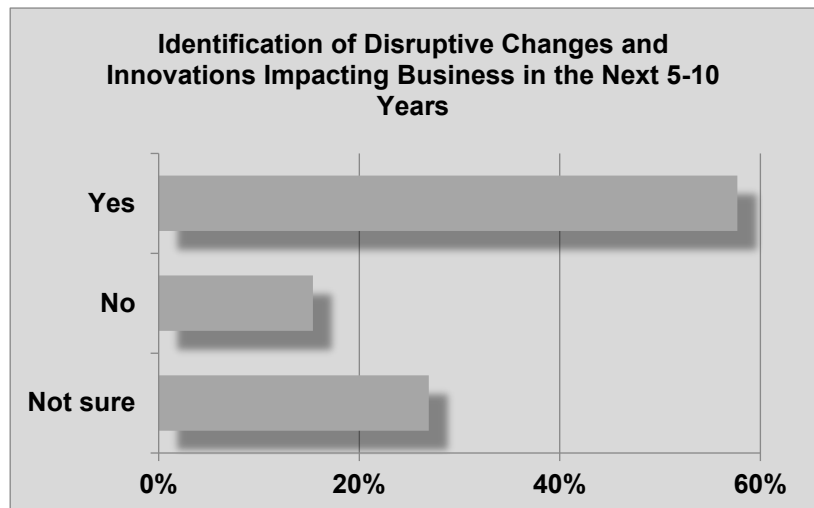


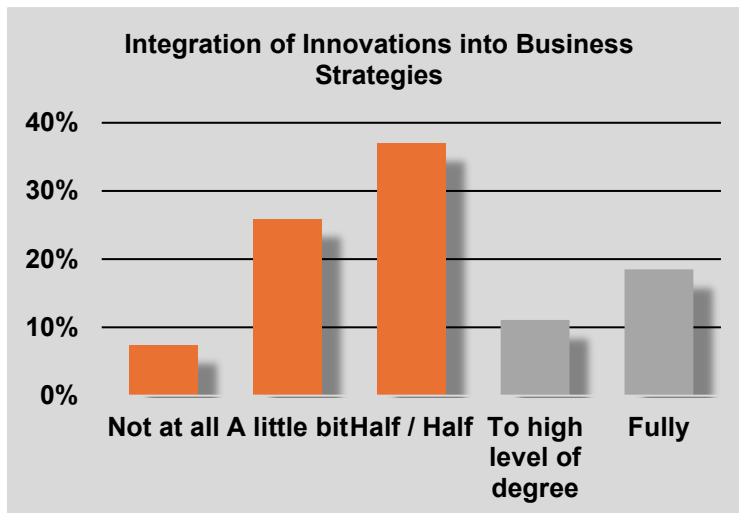
Table 7: Identification of Disruptive Changes and Innovations Impacting Business in the Next 5-10 Years

Despite this high rate of identification, there is significant room for improvement in both awareness and implementation of these disruptive changes and innovations. This divergence highlights the need for better integration of innovative strategies across all organizational levels.

The respondents identified several key technological trends:

- **Digital Decision-Making Tools:** These tools are recognized for their potential to streamline decision-making processes and increase efficiency.
- **Artificial Intelligence (AI):** AI is seen as a transformative technology that can enhance various aspects of supply chain management, such as demand forecasting, inventory management, and production planning.
- **Blockchain Technology:** Blockchain is noted for its ability to improve transparency, security, and traceability in supply chains, which is crucial for regulatory compliance and quality assurance.
- **Sector-Specific Technologies:** Technologies such as mRNA and CGx are particularly relevant to the pharmaceutical industry. These innovations are expected to revolutionize drug development and personalized medicine, but their integration into supply chains requires significant adjustments and new capabilities.

Despite the recognition of these technologies, they are often underutilized due to a lack of familiarity and operational integration. This underutilization points to a significant gap in the operational capabilities of companies, suggesting that more effort is needed to train and equip employees to leverage these technologies effectively. When asked whether companies include these innovations in their business or supply chain management strategies, the results were as follows.



This indicates that 70% of the companies that identify these trends do not fully incorporate them into their business strategy. Therefore, only 30% of those identifying these trends implement them in their strategies effectively. This lack of strategic integration suggests that many companies are missing the potential benefits of these innovations, which could enhance their competitive advantage and operational efficiency.

Table 8: Integration of Innovations into Business Strategies

Furthermore, the survey assessed how familiar companies are with innovations such as AI, quantum computing, and GMOs. The responses indicated that approximately 77% of companies are either not familiar or only familiar with these innovations:

This lack of familiarity implies that most companies are not well-prepared to manage rapid technological changes and are not resilient in terms of future adoption to these changes. The survey results underscore the critical need for companies to enhance their knowledge and understanding of these technologies to effectively integrate them into their business strategies.

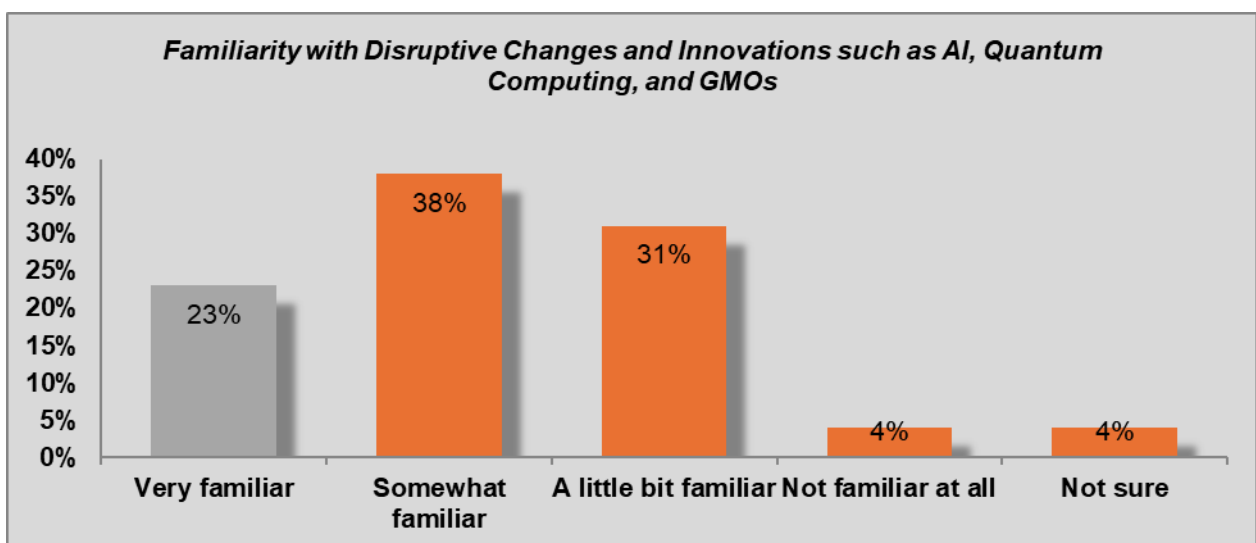


Table 9: Familiarity with Disruptive Changes and Innovations such as AI, Quantum Computing, and GMOs

The data also reveal significant gaps in the strategical capabilities of companies. Only about 50% of respondents indicated that these operational capabilities are partially integrated into their supply chain strategies. This partial integration reflects insufficient awareness and understanding of the importance of building resilient supply chains. While there seems to be significant awareness within the supply chain function itself, this awareness does not extend adequately beyond supply chain leadership. This indicates a critical gap in the broader organizational understanding and support for developing agile and resilient supply chains.

In summary, the survey results indicate considerable obstacles in identifying and implementing major disruptive changes and innovations in organizations. While many companies recognize the potential impact of these innovations, there is a clear gap in integrating this knowledge into strategic and operational frameworks. Companies need to bridge this gap by fostering a culture of continuous learning and innovation, improving communication across organizational levels, and investing in training and resources to effectively implement innovative technologies. Addressing these areas will enable companies to better navigate the complexities of a rapidly evolving business environment and maintain a competitive edge.

Building Capabilities to improve Operational Performance

The survey further reveals that all respondent companies are engaged in developing operational capabilities through training, IT systems, or organizational structures to foster innovations.

However, the results indicate that only about 38% of companies make significant efforts to close the gaps in operational capabilities required to support innovations. While it is positive that all companies invest at least some resources in this area, the low percentage of those fully committed to building these capabilities suggests a potential deficit in preparedness for changes.

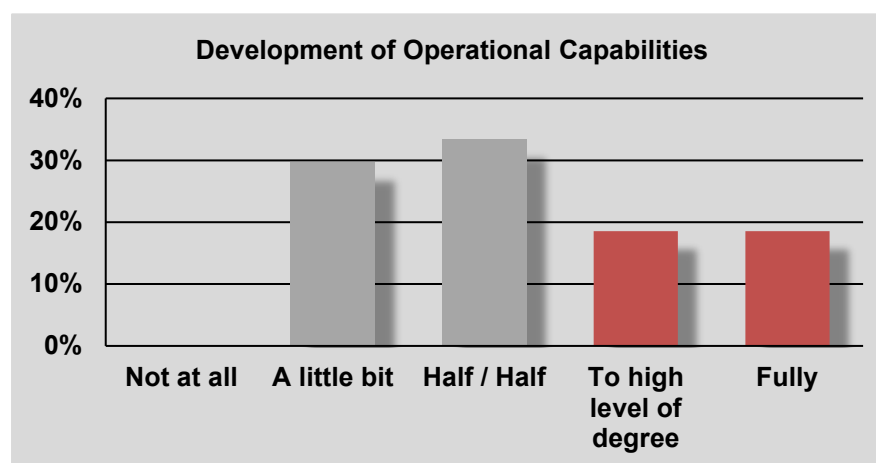


Table 10: Development of Operational Capabilities

This lack of comprehensive investment could impair their ability to effectively leverage modern technologies and maintain their competitive edge. The data underscores the necessity for companies to prioritize and intensify their efforts in building operational capabilities to create a more innovation-friendly environment.

Most companies recognize the necessity but have not yet sufficiently delved into the depth required to support truly transformative changes. Without a stronger focus on comprehensive competency development, these companies risk falling behind their competitors, who may be better prepared for the integration and utilization of disruptive technologies.

Discussion

Over the past decade, the pharmaceutical supply chain has faced significant challenges that have necessitated innovative solution, overall strategic adaptations, and new supply chain management strategies. These challenges are expected to continue, driven by both internal and external influences. Companies must respond effectively to these disruptions, with a focus of balancing agility and resilience.

Organizations and their leaders exhibit varying degrees of familiarity with disruptive changes and innovations, leading to different responses. While there is a general awareness of potential influences, the strategic handling and management of the necessary operational capacities vary. This highlights the need for better integration of strategies at all organizational levels, making changes less surprising and surviving in a competitive environment.

Agility and resilience create a synergistic effect when combined. The survey indicates that only 4% believe resilience alone is sufficient, while 23% consider agility as key. The majority, 58%, believe that a combination of agility and resilience is crucial for navigating a turbulent and volatile world. This underscores the importance of integrating both concepts to create a robust organizational framework that enables companies to adapt quickly and maintain stability.

Contextualizing Survey Results within the St. Gallen Management Approach

The St. Gallen Concept as a Framework

The St. Gallen Management Concept, based on the holistic St. Gallen Management Approaches, developed by esteemed professors Hans Ulrich and Knut Bleicher and many other scientists of the University of St. Gallen as well as by management trainers and consultants based in the so-called St. Gallen Valley, serves as a comprehensive framework providing practical guidance to businesses. It emphasizes system oriented corporate business management over unidimensional thinking, highlighting that e.g., high employee motivation is futile if the company's strategic direction is misaligned, or if disruptive digital technologies replace the existing business model. This concept aids leaders in developing a management framework that enables an organization to constantly run, optimize and reinvent itself. In other words, it is also considered as a mental model, which helps to continually review and adapt the central elements of a management system and its businesses.

The concept is horizontally structured into three levels:

- Normative Management: Defines the purpose and values of the organization, establishing the foundation for strategic and operational decisions.
- Strategic Management: Focuses on future-oriented positioning, aligning the organization's long-term goals with external opportunities and threats.
- Operational Management: Implements and optimizes day-to-day activities to achieve the strategic objectives, ensuring efficiency and effectiveness in operations.

In this integrated approach, normative and strategic management "design" the future, while operational management "guides" the day-to-day execution.

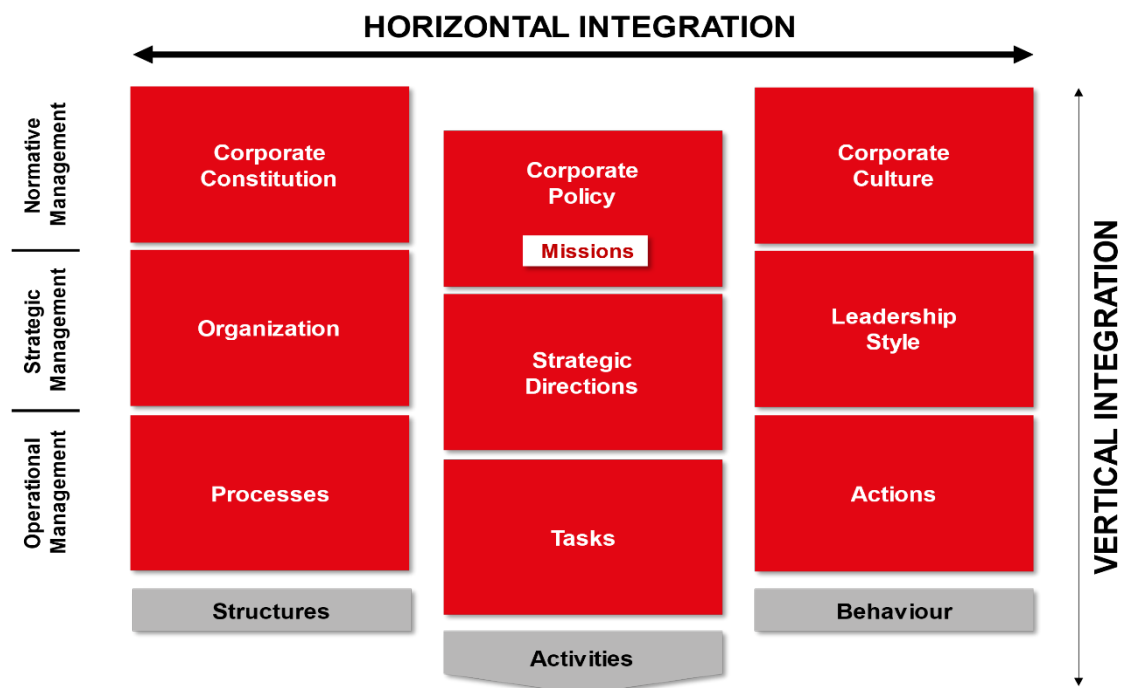


Figure 1: Integrated St. Gallen Management Concept

The concept is vertically structured into three stairs/pillars:

- **Structures:** Defines who has the authority in the company and how the company is organized structurally and procedurally.
- **Activities:** The purpose and main objectives are defined and based on these activities; strategic initiatives are developed into concrete master plans.
- **Behavior/attitude:** The daily actions of managers and employees that shape the company is based on management style and culture.

The survey results indicate significant discrepancies between strategic and operational management (see Figure 2). Although the upper and middle management levels may recognize and understand the importance of innovations, such as AI, there is often a gap in operational capabilities. This gap manifests as a lack of resources, skills, or time within operational teams to implement these strategic insights into practice.

For instance, while management might be aware of trends like AI and possess the necessary competencies, the operational team may lack the operational capabilities, time, or knowledge to conduct the corresponding tasks effectively. Despite the concept's emphasis on vertical (and horizontal) integration, this gap highlights the failure to translate strategic awareness into practical, operational execution.

Implications of the Survey Results

The St. Gallen Management Concept advocates for a seamless integration between strategic and operational levels to ensure cohesive and effective management. The survey results, however, show a significant misalignment, suggesting that while strategic awareness of disruptive changes and innovations exists, operational readiness is lacking. This misalignment can hinder the practical implementation of strategies designed to leverage disruptive technologies, affecting the organization's ability to innovate and remain competitive.



Figure 2: Missing link between Strategic and Operational Level

In conclusion, the St. Gallen Management Concept provides a robust framework for addressing the complexities of modern business management. By understanding and addressing the gaps identified in the survey, pharmaceutical companies can better align their strategic and operational efforts, ensuring that innovative strategies are effectively implemented to achieve desired outcomes.

Managerial implications

The survey results provide critical insights into how pharmaceutical companies can better manage and respond to the challenges posed by disruptive changes and innovations.

Handling the Results

Pharmaceutical managers must acknowledge the varying degrees of familiarity with changes within their organizations. This awareness should inform the development of targeted strategies to bridge the gaps identified in the survey. Understanding that agility and resilience are not mutually exclusive but complementary is essential for creating robust strategic frameworks.

Strategic Initiatives

Comprehensive supply chain strategies must be translated into detailed, coordinated, and well-thought-out strategic initiatives with precise goals, action steps, and responsibilities. This translation process clarifies whether an initiative contributes to strategic goals. An iterative process involving all key employees serves as the final test, ensuring the initiative delivers desired results and convinces all stakeholders of its value.

Education, Training and Culture of Learning

There is a clear necessity for targeted education and training programs to develop the required competencies in emerging technologies. For example, training sessions focused on artificial intelligence (AI), blockchain technology, and digital decision-making tools can enhance employees' technical skills and readiness to implement these innovations effectively. Managers should foster a culture of continuous learning and innovation. This involves encouraging all levels of the organization to stay updated on technological advancements and integrating this knowledge into daily operations. For instance, Pfizer's success with blockchain technology in reducing delivery times and documentation errors highlights the benefits of staying at the forefront of technological advancements (Pfizer, 2022).

Addressing the Gaps and overlooked hidden Aspects

By addressing the gaps in operational capabilities, pharmaceutical companies can better position themselves to navigate the complexities of the evolving supply chain landscape. Companies should conduct regular audits to identify areas where capabilities are lacking and implement strategies to address these gaps.

Ensuring Resilience, Competitive Advantage, and Integration of Operational Capabilities

Building resilience and maintaining a sustainable competitive advantage in the face of rapid technological change are crucial. This involves developing strategies that not only respond to disruptions but also anticipate future challenges. For example, the use of AI in production planning reduced the time to market for new products by 20 - 30%, demonstrating how resilience can translate into a competitive advantage (Starmind, 2023). Developing a comprehensive awareness and integration of operational capabilities into supply chain strategies is essential. This means not only recognizing the importance of these capabilities but also embedding them into the strategic planning process. For instance, a company might integrate AI-driven predictive analytics to enhance its supply chain's agility and resilience, thereby ensuring that the organization can quickly adapt to changes and maintain stability.

Focus on Agility and Resilience

Agility and resilience should be at the core of the pharmaceutical industry's response to innovations. Agility allows for rapid adaptation to market changes and emerging opportunities, while resilience ensures that the organization can withstand and recover from disruptions. A balanced approach that combines both agility and resilience will enable pharmaceutical companies to thrive in a volatile environment.

By implementing these recommendations, pharmaceutical companies can enhance their readiness for changes and innovations, ensuring they are well-equipped to maintain stability and competitiveness in an ever-changing landscape.

Appendix and Information

StGallen Integrated imt Business School AG – Switzerland

StGallen Integrated imt Business School AG in Switzerland is a prestigious educational institution in St. Gallen. Members of the faculty and its founders can look back on more than 50 years of experience in research, consulting and teaching integrated business management. The school is renowned for its innovative and proven management methods that equip business leaders with practical and innovative skills. Over the decades, lecturers, speakers, and consultants of today's StGallen Integrated imt Business School AG has cultivated numerous leaders who now hold key roles in the global business arena.

One of the school's most distinguished assets is its robust connection with the business community, enabling it to conduct targeted research and implement high-impact consulting and advisory projects. This synergy enables managers to participate in real-world business projects while studying in St. Gallen, significantly enhancing their competencies, and preparing them to meet future professional challenges with confidence. Close collaboration with industry and university leaders not only enriches the curriculum but also ensures it is continuously aligned with the evolving needs of the labor market.

StGallen Integrated imt Business School AG is also distinguished by its use of the flipped classroom method, an innovative educational approach that sets it apart from other institutions. In this model, students assimilate theoretical material outside the classroom, while class time is dedicated to deepening understanding and solving practical problems. This approach maximizes interaction with faculty and the practical application of knowledge, fostering a deeper comprehension and retention of the material. The flipped classroom method perfectly complements the school's commitment to practical management and direct business engagement, empowering students to seamlessly integrate theory with practice.

Choosing StGallen Integrated imt Business School AG means joining a legacy of excellence, innovation, and leadership. The rich legacy of St. Gallen's management expertise, combined with its forward-thinking approach, offers both students and executives a unique and transformative educational experience that prepares them to thrive in a rapidly changing global business environment.

More you can find: www.imtschool.ch

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