

White Paper

How to Enter Technology- driven Markets Fast

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The attraction of technology-driven markets

In today's global landscape, we are witnessing a strong movement towards a circular economy and sustainable growth. This shift indicates a fundamental reassessment of how industries operate, with a greater emphasis on promoting environmentally sustainable practices. The request for inventive technological solutions has never been more urgent as societies around the world face the need to deal with environmental issues and to mitigate the effects of climate change [1].

This is why it is important to recognize the challenges associated with the transition to sustainable growth. The rapid pace of technological change, combined with the dynamic nature of markets, exposes companies to a high level of uncertainty and risk [2], [3]. In navigating this complex landscape, agility becomes a crucial factor for companies that not only want to survive but to prosper [4].

Technology-driven markets

Technology-driven markets are characterized by frequent and rapid advances in various technological areas which act as catalysts for change and drive innovation. As a result, established industries are often disrupted and transformed.

In technology-driven markets, new technologies and innovative start-ups can quickly challenge and displace traditional players, creating paradigm shifts, changing the competitive landscape and opening up new opportunities [5]. The complex nature of technology-driven markets often requires collaboration across disciplines such as engineering, materials science, chemistry, and computer science [6]. Partnerships between companies, research institutions and governments are common to pool resources and expertise.

Need to enter new markets

Germany's manufacturing industry is known for its robust ecosystem of mid-sized companies, often referred to as hidden champions. They thrive by owning and leading distinct market segments, often outperforming larger competitors due to their focus and expertise.

While this strategy has been successful for many years for the German Mittelstand, these once-profitable niches are now shrinking due to rapid technological advances and changing market needs [7], [8]. Meanwhile, new niches are emerging, and companies must now compete with a variety of new competitors for market dominance.

The automotive industry functions as a good example of this phenomenon, as it is losing a significant portion of its previous value creation due to the shift to electromobility. This affects not only the major OEMs, but also their suppliers, many of which are multi-billion-dollar companies that have generated a significant portion of their revenue from combustion engines and transmissions and now face the prospect of losing their core business altogether [9]. In this situation, it is essential for the company to enter new growth markets and develop new technological competence in time to survive on the global scale [10].

Speed as a success factor

As markets around the world reconfigure to align with green initiatives, new ecosystems are emerging. Key markets are now emphasizing the need for new technologies to meet sustainability goals. Speed to market is crucial for companies to capitalize on emerging opportunities and establish themselves as key players in the evolving green landscape [11], [12]. The pace of change demands rapid responses, and companies that act quickly can gain a competitive advantage and position themselves for the future.

By providing a blueprint for a fast entry into technology-driven markets, this paper enables companies to make informed decisions about such markets, minimize the risk of collaborative entry, and seize the opportunities presented by dynamic technology landscapes.

Choose the door, not the wall – entering technology-driven markets

The methodology for the successful entry of manufacturing companies into technology-driven markets consists of five guiding steps, separated into an analysis and implementation phase.

Internal and external analysis

The analysis phase starts with the identification of the company's core competences and capabilities (step 1). Aware of their strengths and weaknesses, companies can conduct a thorough market scan to identify potential entry options (step 2). These options are prioritized based on factors such as market potential, competition, and alignment with the company's competences. For the prioritized options, a more detailed analysis is required to gather all the information necessary for a well-founded market entry decision. Therefore, the analysis should be divided into two parts: The analysis of the target market and innovation system (step 3a) and a technology-focused analysis of the application area (step 3b).

The target market and innovation system analysis involve understanding the dynamics of the market, customer needs and the existing technology and innovation ecosystem. The technology-focused application area analysis involves a deep dive into the specific application areas, with a particular emphasis on the technical aspects, including the potential adaptation of the company's current technologies.

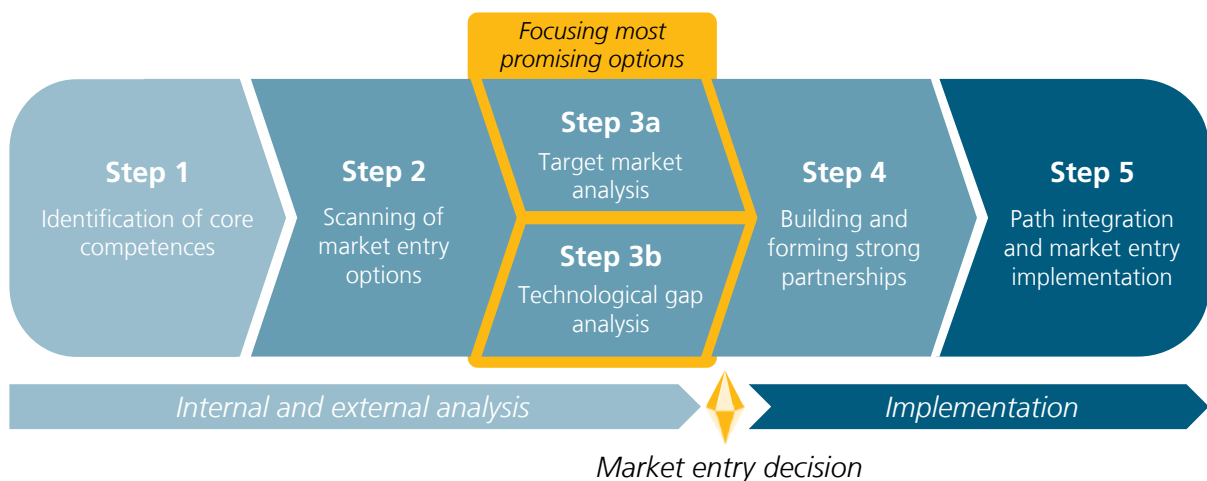
Based on the results of the analysis, a preliminary market entry decision is made.

Implementation

If the company decides to pursue the application further, feedback should be gathered from potential partners and strong collaborations need to be established with relevant stakeholders such as industry partners, start-ups or research institutions (step 4).

The final step is to detail the integration and implementation pathways (step 5). Companies need to develop a clear roadmap for entering the market, implementing the necessary changes, and integrating their competences into the technology-driven market.

All in all, this methodology provides a structured approach to enter and navigate technology-driven markets successfully. Companies can increase their chances of success by leveraging their competence, analyzing the market, building strong partnerships, and carefully planning their integration and implementation paths. The following pages will provide a more detailed description of the five steps.



Step 1: Identification of core competences

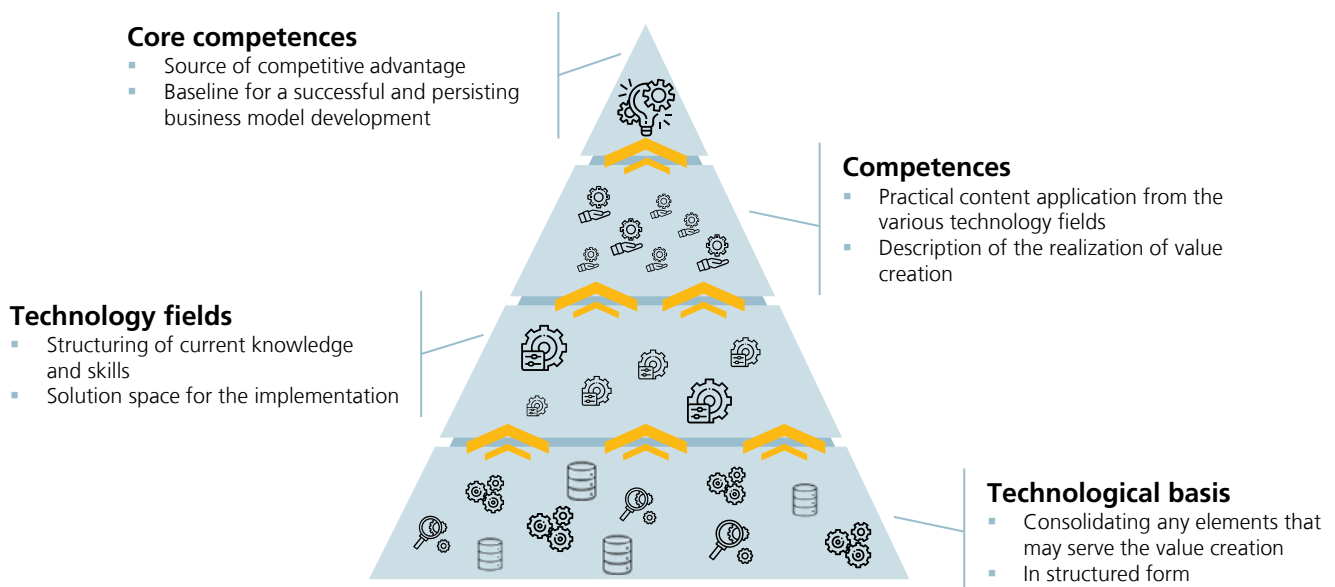
Entering a technology-driven market requires a manufacturing company to align the firm's objectives and approach with internal competences to capitalize on existing expertise and innovation capabilities.

Therefore, a core competence analysis helps to identify a company's unique strengths and capabilities, which form the basis for a competitive advantage and successful business development. Core competences are specific strengths and capabilities that set a company apart from others, giving them a competitive advantage [13]. This enables strategic positioning by leveraging core competences and aligning them with market opportunities. The analysis emphasizes viewing the company as a collection of competences rather than individual business units.

A core competence analysis starts with structured interviews and visits to production facilities to assess the company's internal resources, skills and knowledge with the goal to define the technological basis. The company's competences are derived

as the practical applications of know-how (cognitive) and skills (practical, applied) within this scope and describe how value is created.

In workshops with experts and management, the identified competences are reviewed and evaluated to determine which ones can be considered as core competences. This evaluation includes an assessment of the relative strength of each competence, which shows the contribution to the company's value creation and how it differentiates the company from its competitors. Additionally, the economic attractiveness of the competence is assessed, considering its contribution to customer added value and to the competitive position in the market. Only valuable competences that are difficult to imitate and cannot be substituted are considered true core competences of the company. All in all, these insights ensure, that the following analysis in step 2 is structured precisely.



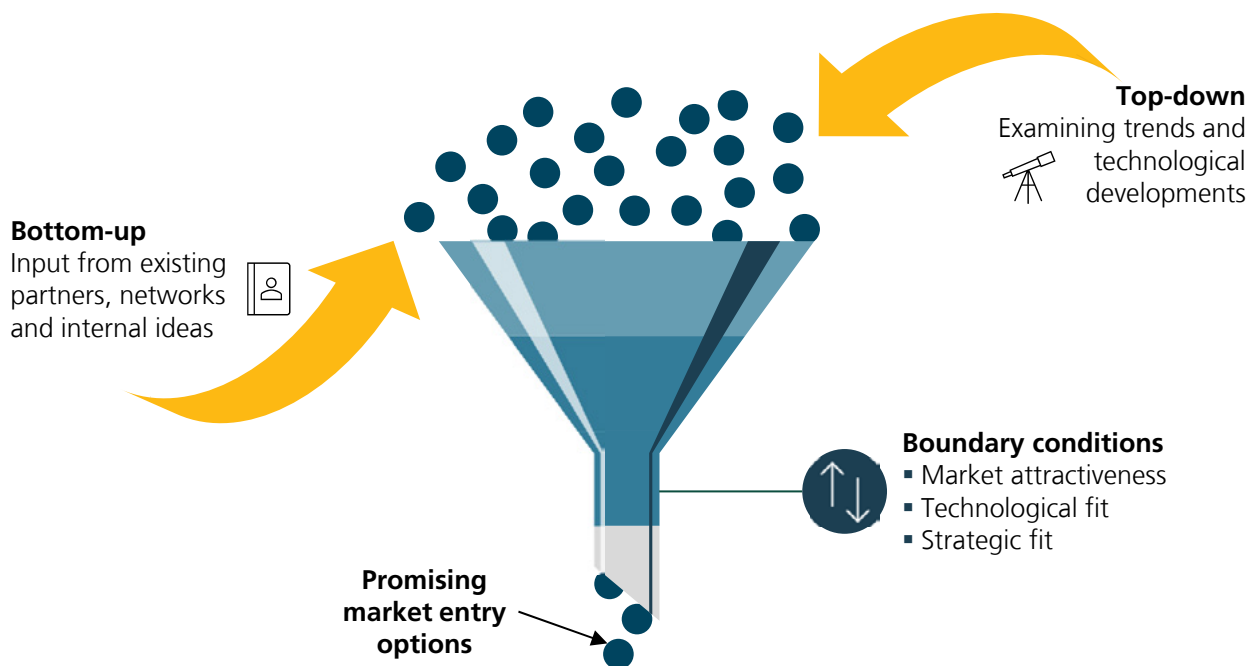
Step 2: Scanning and prioritizing market entry options

A systematic approach is essential in order to make sustainable decisions about promising technology-driven markets. This is necessary despite the presence of technology hypes that may seem to be the most relevant option at the time. The starting point for identifying entry options in technology-driven markets is the definition of search fields. These search fields must be determined by the company's strategy and objectives, the relevant constraints and limitations along with the competences that form the basis for the market. A clear definition of the timeline, overlap with the existing business, and willingness to invest are essential criteria that need to be taken into account.

The actual scanning process based on the defined criteria is divided into a top-down and a bottom-up approach: In the top-down approach, trends and technological developments are examined through scientific literature, studies, and expert interviews to identify promising application areas. The bottom-up approach focuses on gathering input from existing customers, partners, networks, and other contacts, as well as internal ideas and local associations. The combination of both approaches enables a comprehensive scan of entry options in technology-driven markets.

The identified options are consolidated, clustered, and evaluated along three dimensions: market attractiveness, technological fit and strategic fit. Market attractiveness, which includes market size, growth rate, competitive landscape, barriers to entry, and regulatory environment, focuses on assessing the market potential, profitability and overall viability of the application area from a business perspective. Technology fit, which covers competence fit, resource compatibility, investment needs and innovation potential, assesses how well the company's existing technology, expertise, and resources align with the needs of the application area. Strategic fit indicates how well the options align with the initial search criteria and potential synergies.

Finally, the options are evaluated and prioritized based on these criteria to select the most promising and strategically aligned go-to-market options. For a small set of prioritized options, a more detailed analysis will be conducted in subsequent steps to further assess their feasibility and potential for successful entry.



Step 3a: Analyzing the target market

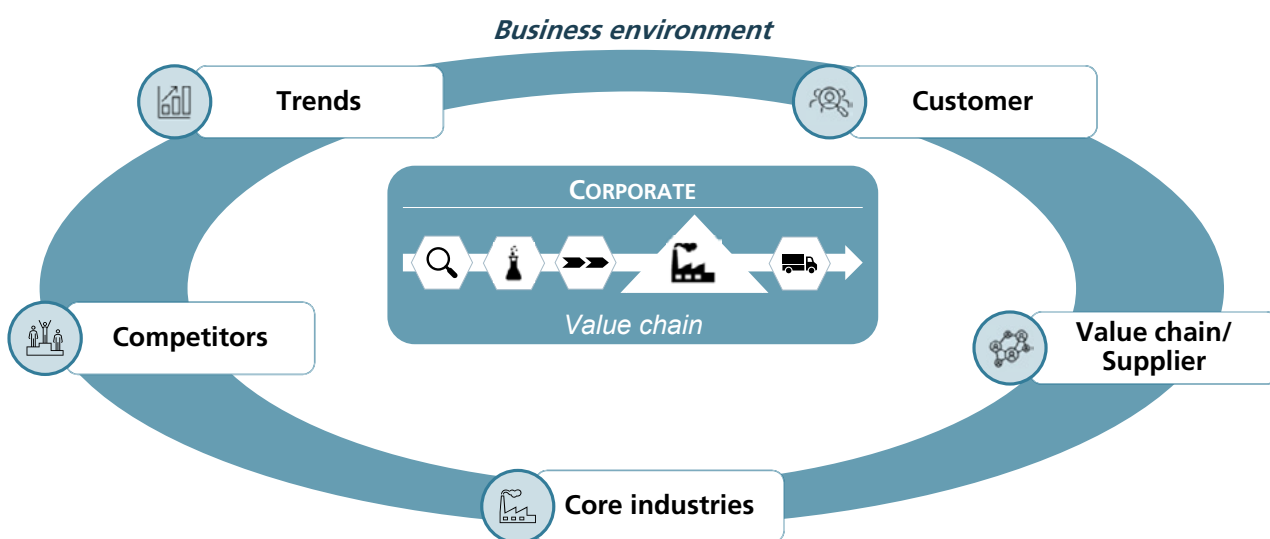
Once possible market entry options have been selected, the attractiveness of each option needs to be assessed in more detail through a target market analysis.

To conduct a thorough target market analysis, the first step is to initially define the scope and to analyze customer groups, competitors, suppliers, and partners within the value chain. The analysis may also extend to studying industry trends and characteristics. Understanding the interconnected network of actors, industries, trends, and regulatory issues is essential for a company's innovation and success in the target market.

It is important to anticipate or identify possible actions of competitors. This includes analyzing their strategies, market developments and technological advances. A thorough understanding of the competitive landscape allows to predict risks and opportunities early and to develop appropriate countermeasures. When entering new industries, it is also necessary to assess risks and chances, e.g., climate regulations or partnerships within the competition. The focus should lay on industry-specific and regulatory frameworks which can have a considerable impact on a company's success and strategy. A detailed examination of these factors is necessary to effectively navigate the complexities of new markets.

It is beneficial to identify innovation potential along the external value chain, including vertical integration and the potential for new higher value-added products. Working closely with suppliers can lead to efficiencies and innovation benefits that improve the entire value chain. Analyzing future customer needs and their impact on product and service offerings is another important aspect, e.g., determining the demand for subscription offers instead of one-time purchases.

Ensuring greater customer focus in deriving areas for innovation helps to continuously align the offering with evolving customer needs, expectations and requirements. Identifying and assessing market changes and trends that will shape society in the future brings further vital advantages. Understanding the business implications of these trends enables proactive responses to emerging developments and informed strategic decisions. In total, transparency and insights within the market and its environment helps identifying and preparing successful partnerships in step 4.



Step 3b: Analyzing technological gaps

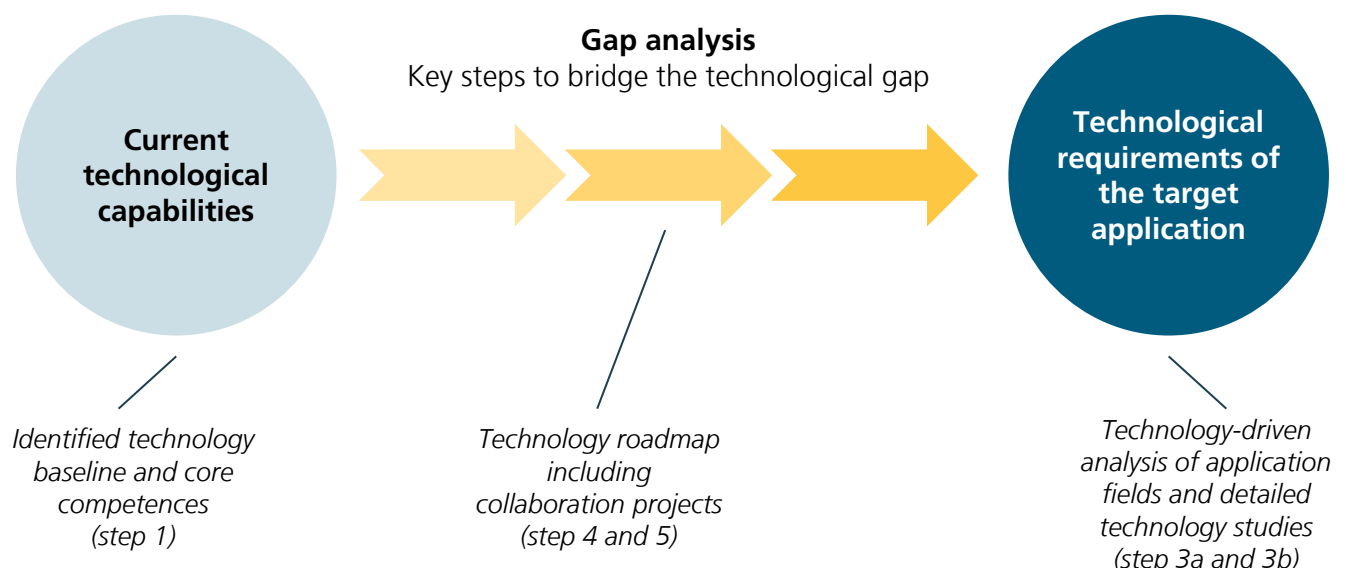
The second part of step 3 is a comprehensive technological gap analysis. This analysis is crucial for understanding the differences between a company's current technological capabilities and the technological requirements of the targeted application field of the new market. The analysis determines whether additional competences are required for successful market entry, identifies which can be developed internally, and reveals which require collaboration.

First, the company should conduct a technology-driven application field study to gain an understanding of the complex technology landscape within the application area. This research should focus on the technologies used in the target market applied by leading competitors that have been identified in step 3a. The goal is to develop a comprehensive understanding of all relevant technological requirements for an offering. This can be achieved by reviewing technical documents and case studies to uncover the underlying mechanics of these technologies. Understanding the production process, which includes mapping each stage of the production lifecycle and identifying essential resources, as well as understanding the flow of materials and information can also help achieve the goal. To remain competitive, it is necessary to analyze current trends and to evaluate the innovation potential of each technology. This includes assessing the technology's adaptability, its compatibility with other systems, and its potential for improvement. It is important to determine the maturity of the technology, as indicated by its Technology Readiness Level (TRL), to determine

its readiness for market deployment. If necessary, an Intellectual Property (IP) analysis can be performed to identify current innovation activities and potential legal challenges.

Comparing the results of the technology study with those of the core competence analysis is a strong indicator of how well the technology is aligned with the application area. To conduct a more comprehensive gap assessment, it is important to examine the technology baseline (see step 1), which provides a comprehensive overview of the technical capabilities. It allows for a detailed comparison of technical parameters to determine whether the requirements of the application area match the company's technological strengths. If gaps exist, it should be checked whether they can be overcome by in-house research and development or whether collaboration with external partners is required. Since the goal is rapid market entry, the time required to fill these gaps should also be considered.

Once the most promising market entry option(s) have been selected, it is time to develop a market entry strategy that addresses the key challenges. These challenges arise from the identified technological deficits and lack of competences, gaps in the innovation system and market-related competences that differ from the company's core business and expertise. In such cases, it is advisable to consider a strategic partnership, as it not only enables a faster market entry compared to organic growth, but also offers an opportunity for risk sharing.



Step 4: Boosting the market entry through strong partnerships

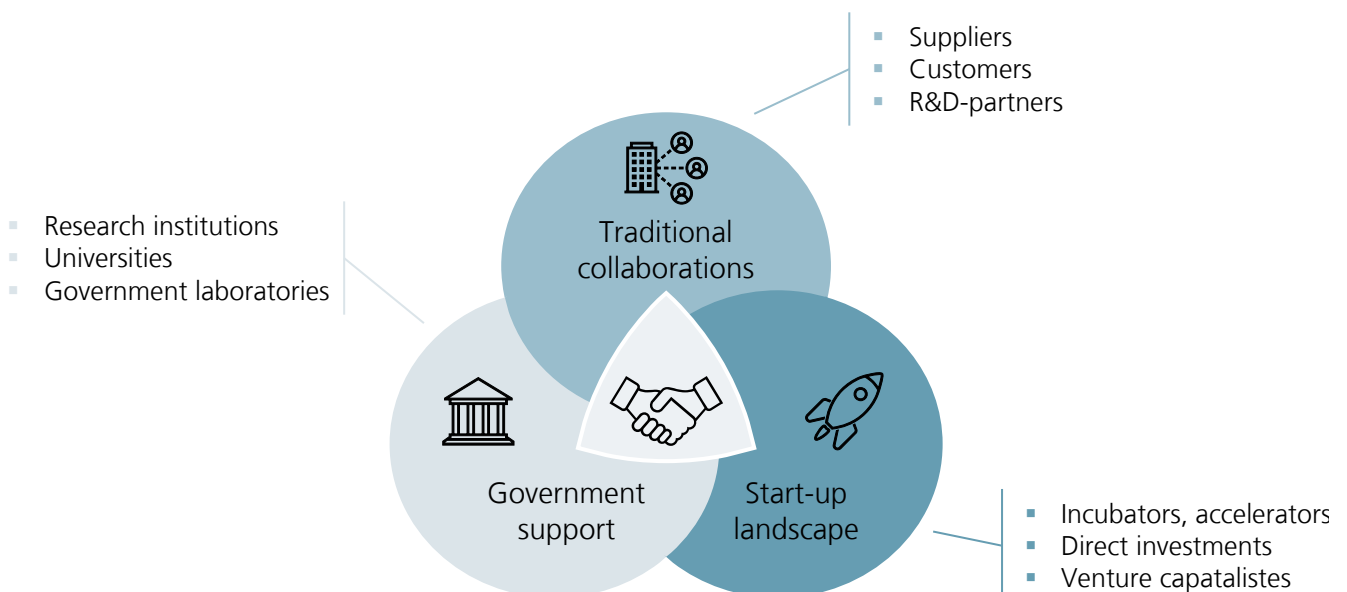
To successfully enter the technology-driven market, it is often beneficial for new entrants to align with partners who bring supplementary or complementary skills and resources. Establishing clear goals for collaboration is vital, as these goals will guide the partnership towards achieving economies of speed and securing desired market or technology access. Even specific skills and resources required for market entry can be secured in this way. The previous analytical steps provide indicators to determine which types of partners are best to complement the company's own existing go-to-market capabilities.

Traditional collaborations

These can arise within the company's existing ecosystem, e.g. with suppliers, customers or R&D partners. Engaging in collaboration agreements or forming joint ventures can bridge market gaps or enhance technological competence. One example of such a collaboration is the joint venture launched in 2016 between GlaxoSmithKline, a British pharmaceutical company, and Verily Life Sciences, part of Google's parent company Alphabet: Galvani Bioelectronics will develop bioelectronic therapeutics [14]. This form of partnership has the advantage that the partners are already known and established, potentially speeding up the early stages of collaboration. However, there is a risk that new formal partnerships could strain existing relationships, particularly if developments prove more challenging than anticipated.

Start-ups

The start-up landscape can provide direct access to innovation, support internal innovation programs and contribute to business development pipelines. These engagements may arise from corporate venture initiatives such as incubators, accelerators or direct investments. Alternatively, collaborations with independent venture capitalists or venture builders are possible. Engagement with larger start-up ecosystems, such as those found in Germany around the Technical University of Munich (TUM) and "UnternehmerTUM" or emerging hubs near technical universities like RWTH Aachen University, can serve as platforms to discover partners and support structures for successful collaborations.



Government support

Leveraging government support mechanisms enables the company to form partnerships that not only meet strategic objectives, but also mobilize additional resources and funding, particularly for the development of technological capabilities. Governments often provide targeted funding for partnerships focused on research and development, technology adoption or market expansion. Research institutions, universities and government laboratories engaged in cutting-edge research relevant to the company's field can provide valuable expertise, facilities and resources that are aligned with the company's needs.

The Fraunhofer Research Institution for Battery Cell Production FFB in Münster, Germany, is an example of government support for the advancement of battery production technologies. The Fraunhofer FFB facility provides an infrastructure for companies and research institutions to test and refine near-series production of innovative batteries.

Go-to-market strategy

A promising go-to-market strategy limits the number of partnerships to a few, ideally just one or two. This is because an excessive number of partnerships can complicate management and increase the risk of misalignment between the partners' different objectives. Although the number of partnerships should be small, the strength of the partnership, the investment required, the sharing of risks and the management of IP and legal issues needs to be determined. In general, the more

inexperienced a partner, like start-ups, is, the more non-binding your collaboration should be in the beginning, e.g., with non-binding pilot projects. Successful ongoing collaboration requires all partners to commit to the necessary resources, including financial, human and physical assets. Partnerships should be viewed as two-way learning opportunities with a culture that values external ideas, especially in new technology markets.

Finally, it is necessary to ensure that the company teams and management are engaged, supported and empowered to collaborate effectively with external partners. Mitigating the "not invented here" syndrome by fostering a culture that values external ideas and continually learning from and using collaborations will refine the company's innovation strategy and partnership approaches.

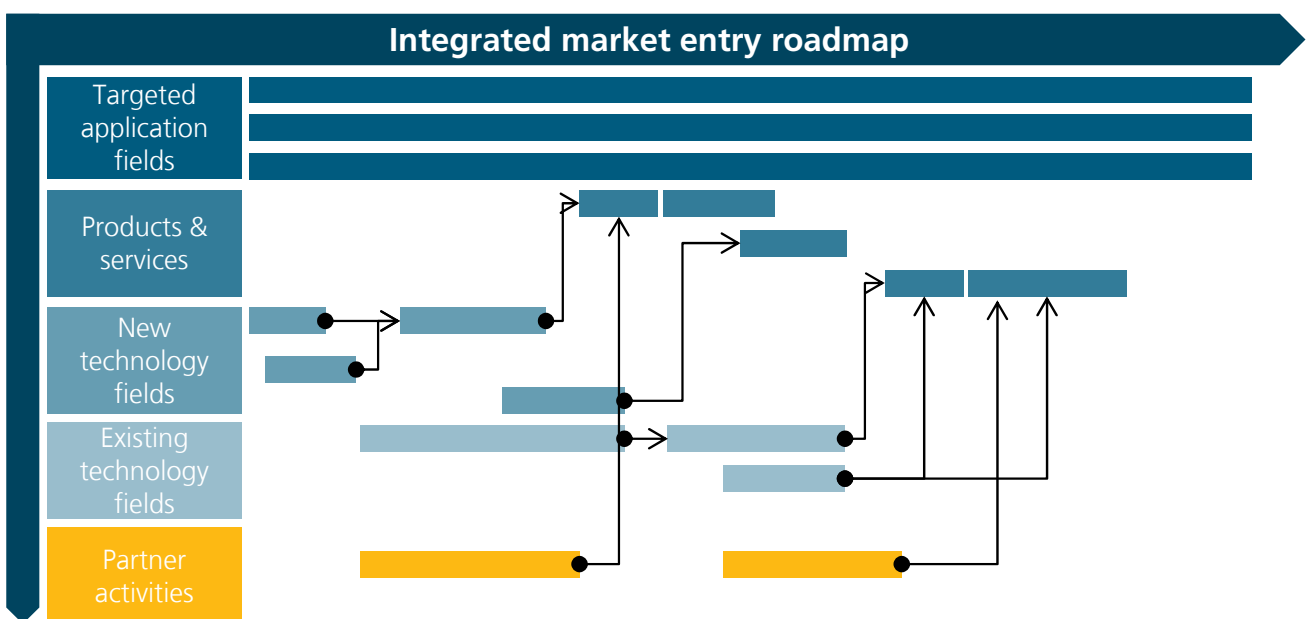
Step 5: Path integration and market entry implementation

Once the framework for the collaboration has been set, the next step is to strategically harmonize the resources, technologies and processes between the partners. This requires a comprehensive action plan tailored to bring the shared vision to life. It is now of vital importance to draw up a comprehensive roadmap that outlines all of the major steps to bring the collaborative effort to life. The roadmap should not only be a schedule of activities, but also a dynamic blueprint that guides the partnership through the various stages of operationalization. The roadmap should clearly name achievable goals, timelines and resources allocated to each milestone as well as the risks and mitigation strategies. It is important to maintain flexibility in the roadmap to allow adjustments as the collaboration evolves and new insights are gained.

As the roadmap progresses, the focus should lie on creating and refining Minimum Viable Products (MVPs), executing pilot projects and cultivating initial customer references. MVPs are vital for tests of fundamental product ideas with a basic feature set, enabling swift collection of user feedback and allowing for quick iterations. This product development approach is useful to validate concepts and to refine the product to better meet customer needs. Simultaneously, sales channels for the new market need to be created and iterated. The established

sales channels are often not suitable for the new activities and offers. Pilot projects serve as trial scenarios for the collaboration, not only to show and to assess the progress of the joint venture, but also to provide concrete evidence for its prospects for success. These projects are valuable because they not only expose the concept to a real-world setting but also serve as a platform for iterative learning, enabling partners to refine and to improve their offer. In recent years, more and more infrastructure has been created to enable “safe spaces” for such pilots. These are good incubators for vulnerable partnerships between corporates and start-ups, especially those start-ups operating in the hardware sector.

Initial customer feedback shows the product's appeal and readiness for the wider market. Early adopters and testimonials bring great benefits for the credibility, trust and proof of concept in the market. Their feedback can provide valuable data for further product refinement and future development direction. A well-designed plan that focuses on minimum viable products, trial projects and initial customer references is essential for a successful and fast market entry. This ensures that the partnership will produce positive outcome and meets its strategic goals.



Key takeaways

In the rapidly evolving landscape of echnology-driven markets, manufacturing companies face the challenge of entering new markets to stay competitive amidst shrinking traditional niches and the rise of sustainable initiatives. A structured approach is required to successfully enter the market and to navigate this dynamic environment. This whitepaper provides a blueprint for rapidly entering such markets. It offers a holistic approach that includes evaluating market potential, developing entry strategies, and establishing proactive measures to minimize risks and capitalize on the opportunities of dynamic technological changes:

1. Entering technology-driven markets starts with identifying the company's core competences and understanding how these align with market demands.
2. Market scanning and prioritization, along with target market and innovation system analysis, are crucial for recognizing viable entry points and understanding market dynamics and customers' needs.
3. A deep analysis of technology-driven application fields is necessary to comprehend current and future trends, potential applications and the competitive landscape.
4. Forming strong partnerships with industry players, research institutions and other stakeholders is vital for leveraging expertise and resources.
5. A detailed plan for integration and implementation is essential for a smooth market entry and to effectively merge the company's competences with market opportunities.

If you, as an expert within an industrial corporate, are looking for expertise or help with setting up your go-to-market strategy, feel free to get in contact. Our overall mission in Strategic Technology Management is to build the path into a (technologically) bright future for each company reaching out to us.

Leading the way in technology management

Our solutions enable companies to master the technological challenges of today and tomorrow. We draw our motivation from new and challenging problems.

We are thought leaders in technology and innovation management and address emerging topics as pioneers. In doing so, we aim to make a lasting impact.

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Authors

Prof. Günther Schuh

Member of the board of directors of Fraunhofer IPT and holder of the chair of Production Engineering at the Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen University

Dr.-Ing. Tim Latz

Head of Department, Technology Management,
Fraunhofer Institute for Production Technology IPT

Frederik Bennemann

Business Development Manager "Battery Production",
Fraunhofer Institute for Production Technology IPT

Leonard Schenk

Group Manager, Technology Management,
Fraunhofer Institute for Production Technology IPT

Contact

Dr.-Ing. Tim Latz
Technology Management
Phone +49 162 1372884
tim.latz@ipt.fraunhofer.de

Fraunhofer Institute for
Production Technology IPT
Steinbachstrasse 17
52074 Aachen
Germany
www.ipt.fraunhofer.de

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