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# Strategic Foresight in Technology-Driven Industries: Anticipating Market Change Through Digital Data Signals and Predictive Insights

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## Abstract

In technology-driven industries characterized by rapid disruption and hyper-connectivity, conventional strategic planning rooted in historical patterns proves insufficient for sustaining competitive advantage. Organizations must shift from reactive postures to anticipatory strategies that harness digital data signals and convert them into predictive insights. This article presents a novel conceptual framework—the Digital Anticipatory Foresight Architecture (DAFA)—designed to embed strategic foresight as a core organizational capability. By integrating weak-signal detection, advanced analytics, scenario synthesis, and adaptive decision loops, the framework enables early market sensing and proactive responses. The DAFA comprises five interdependent layers that transform fragmented digital inputs into foresight-informed actions while maintaining continuous feedback for organizational learning. By bridging environmental scanning, predictive modeling, and strategic alignment, the architecture addresses critical gaps in existing literature on corporate foresight and digital sensing. Practical implications include enhanced resilience, greater innovation capacity, and faster decision-making in volatile digital markets. Theoretical contributions refine the conceptual foundations of anticipatory strategy, offering a blueprint for future research on technology-enabled foresight systems. The proposed model equips leaders to navigate uncertainty by treating digital signals as strategic assets rather than operational noise.

**Keywords** Anticipatory strategy, Strategic foresight, Digital data signals, Predictive insights, Weak signals, Technology-driven industries

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## Introduction

Technology-driven industries operate in environments defined by exponential change, where competitive advantage increasingly hinges on the capacity to detect and interpret subtle market shifts before they crystallize into threats or opportunities. Strategic foresight, once viewed as a peripheral planning tool, has emerged as an essential organizational capability that enables firms to move beyond reactive adaptation toward proactive market shaping. In sectors such as information technology, telecommunications, and digital platforms, the velocity of

innovation and the proliferation of data streams render traditional forecasting methods obsolete. Organizations that rely solely on historical performance metrics or periodic market reports risk being blindsided by disruptive entrants, shifting consumer behaviors, or technological breakthroughs that originate as faint digital signals [1–4].

The transition from reactive to anticipatory strategy represents a fundamental reorientation of strategic management. Reactive approaches respond to visible market changes after they have materialized, often resulting in costly catch-up investments and diminished

market position. Anticipatory strategy, by contrast, cultivates an organizational mindset that treats the future as malleable and actively influences outcomes through early insight. This shift is particularly critical in technology-driven contexts where digital data—generated continuously through social platforms, sensor networks, e-commerce transactions, and search behaviors—provides unprecedented granularity for environmental scanning [5–7]. Yet the mere availability of data does not guarantee foresight; organizations must develop systematic processes to filter noise, amplify weak signals, and synthesize predictive insights to inform high-stakes decisions [3].

Recent scholarship underscores the growing recognition of foresight as a dynamic capability. Longitudinal analyses demonstrate that firms practicing corporate foresight outperform peers in innovation output and long-term financial performance, especially when foresight activities are embedded within digital ecosystems [8–11]. However, many organizations still treat foresight as an episodic exercise rather than a continuous, digitally augmented process. The integration of predictive analytics with traditional scenario thinking offers a pathway to overcome this limitation, yet conceptual models that explicitly link digital signal capture to strategic action remain underdeveloped [12–17].

Environmental scanning in digital markets further amplifies the need for advanced foresight architectures. Weak signals—early, ambiguous indicators of potential change—often appear first in unstructured digital data sources such as online discussions, patent filings, or usage patterns. Detecting and interpreting these signals requires sophisticated analytical layers that combine machine learning, natural language processing, and human judgment [12, 15]. Without such integration, firms risk either information overload or strategic myopia.

The present article addresses these challenges by proposing the digital anticipatory foresight architecture (DAFA), a multi-layer conceptual framework that operationalizes strategic foresight through digital data signals and predictive insights. The architecture explicitly incorporates feedback loops that link anticipation, action, and adaptation, ensuring that foresight remains a living organizational process rather than a static deliverable. By synthesizing foundational concepts from the strategic management, information systems, and technology forecasting literatures, the framework fills a critical gap: the absence of an integrated model that translates digital

signals into foresight-informed decision-making systems suitable for high-velocity industries [4, 5, 18–21].

The remainder of the paper proceeds as follows. First, a comprehensive literature synthesis establishes the conceptual foundations of strategic foresight, digital sensing, and predictive analytics. The subsequent section introduces the DAFA in detail, delineating its layers, processes, and cyclical nature. Throughout, the discussion maintains a conceptual focus, emphasizing theoretical integration and practical architecture rather than empirical validation. Ultimately, the DAFA offers technology-driven organizations a structured yet flexible pathway to convert digital abundance into strategic foresight, enabling sustained anticipation of market change.

**Literature synthesis and conceptual foundations:** Strategic foresight has evolved from a niche planning technique into a recognized organizational capability essential for navigating technological turbulence. Early conceptualizations positioned foresight as the systematic exploration of possible futures to inform present decisions. Contemporary research, however, emphasizes its role as a dynamic process embedded within digital ecosystems [4, 5, 14]. Systematic literature reviews reveal that corporate foresight enhances innovation capacity, organizational resilience, and long-term performance when it moves beyond scenario exercises to encompass continuous environmental sensing [11, 22–28]. Longitudinal studies spanning more than two decades confirm that firms with mature foresight practices exhibit superior adaptability, particularly in technology-intensive sectors [14, 15].

A central theme in the literature is the transition from reactive to anticipatory strategy. Traditional strategic management often relies on retrospective analysis and incremental adjustment, yet digital markets demand proactive orientation. Anticipatory strategy treats the future as a space for deliberate influence rather than an inevitable outcome [1, 17]. This perspective aligns with dynamic capabilities theory, where sensing, seizing, and transforming become digitally augmented processes [16]. In high-tech environments, anticipatory strategy manifests through the deliberate cultivation of foresight routines that detect weak signals and convert them into actionable intelligence [12, 18].

Digital data signals constitute the raw material of modern foresight. The exponential growth of unstructured data from social media, IoT devices, online marketplaces, and search

engines creates both opportunity and complexity. Research on big data analytics demonstrates that firms can achieve superior market sensing by integrating advanced analytics with traditional environmental scanning [21, 23]. Digital signals serve as early indicators of emerging trends, shifts in consumer sentiment, and technological convergences. However, signal detection alone is insufficient; interpretation requires layered analytical capabilities that distinguish meaningful weak signals from ambient noise [26, 27]. Studies of high-tech firms highlight that relational and practice-based approaches to signal interpretation enhance foresight effectiveness by combining human intuition with algorithmic pattern recognition [12, 15].

Predictive insights extend beyond descriptive analytics to enable scenario synthesis and probabilistic forecasting. Predictive modeling, when combined with scenario thinking, enables organizations to explore multiple plausible futures and assess strategic implications under uncertainty [3, 9, 19]. Recent work on technology foresight emphasizes the value of integrated scenario-roadmapping approaches that link digital signals to strategic decision pathways [3, 22]. In technology-driven industries, predictive insights facilitate the early identification of disruptive trajectories, enabling firms to reallocate resources or shape industry standards before competitors react [28, 29].

The literature further underscores the importance of decision systems for future-oriented strategy. Corporate foresight achieves maximum impact when embedded within organizational decision architectures that align insights with resource allocation and risk management [11, 20]. Feedback loops between anticipation and adaptation emerge as critical mechanisms for organizational learning. Outcomes from strategic actions refine future sensing routines, creating a virtuous cycle of continuous improvement [14, 23]. Empirical observations from the ICT and automotive sectors illustrate how open innovation contexts amplify the value of foresight when digital tools facilitate cross-boundary signal exchange [21, 22].

Despite these advances, several conceptual gaps persist. Existing models often treat digital technologies as supportive tools rather than core components of foresight architecture [21]. Few frameworks explicitly integrate weak-signal detection, predictive analytics, scenario synthesis, and adaptive loops within a unified, multi-layer system tailored to technology-driven markets [4, 5]. Moreover, the literature calls for architectures that operationalize foresight as an ongoing capability rather than a periodic project [1,

14]. The DAFA addresses these gaps by providing a cohesive conceptual model that positions digital data signals as the foundational input for predictive insights and anticipatory action.

## Foresight Capabilities in Digital Industries

Technology-driven industries require foresight capabilities that go far beyond conventional planning horizons. The DAFA treats foresight as an embedded organizational competence that continuously scans and processes digital signals to sustain strategic vigilance. Rather than relying on periodic, one-off exercises, the architecture operates as a perpetual cycle, keeping anticipation constantly aligned with the market's speed [11, 14, 17].

### Digital signal detection and interpretation

The foundation of the DAFA is the digital signal detection layer. This layer systematically captures heterogeneous digital data streams—including real-time social listening, transaction logs, sensor outputs, patent databases, and web analytics—via automated ingestion pipelines.

Interpretation is handled through multi-modal analytics that combine natural language processing and anomaly detection to identify weak signals early. Human oversight works alongside the algorithmic filters to ensure contextual relevance and minimize false positives [12, 23, 26].

### Predictive insight for strategic anticipation

Building upon the signals identified and interpreted in the preceding layers, the predictive modeling and scenario synthesis layer converts dispersed data into forward-looking, decision-relevant intelligence. At this stage, machine-learning models are used not merely to identify correlations, but also to estimate the likely trajectories, speeds, and possible inflection points of emerging trends across markets, technologies, and consumer behavior. Time-series forecasting, anomaly detection, clustering, and pattern-recognition techniques enable organizations to distinguish between short-lived fluctuations and signals that may indicate structural change. These computational forecasts are then complemented by scenario-planning methods, which broaden analytical horizons by constructing

multiple plausible futures rather than assuming a single linear path. Through this combination, organizations can examine how different combinations of technological, regulatory, competitive, and societal variables may interact over time.

The strength of this layer lies in its capacity to synthesize predictive outputs into forms that are both analytically rigorous and strategically interpretable. Quantitative projections provide estimates of market direction, probability ranges, and risk exposure, while narrative scenarios translate these projections into coherent future contexts that decision-makers can understand and debate. In practice, this enables organizations to move beyond reactive planning and instead anticipate discontinuities, prepare contingent responses, and identify windows for strategic intervention before competitors do. By linking statistical prediction with scenario imagination, the layer produces actionable foresight that clarifies strategic implications, supports resource prioritization, and enhances the precision with which firms anticipate market shifts in volatile digital environments [3, 9, 29].

## Anticipatory decision systems

The strategic integration and decision alignment layer serves as the bridge between foresight generation and organizational action. Its primary function is to ensure that predictive insights do not remain isolated within analytical units or strategy reports, but are instead translated into concrete strategic choices. In this layer, cross-functional decision forums bring together leaders from strategy, innovation, operations, finance, marketing, and technology to assess alternative scenarios against the organization's broader objectives, available resources, and acceptable levels of risk. Such forums create an institutional mechanism through which foresight becomes operationally meaningful, allowing competing priorities to be weighed and strategic trade-offs to be openly evaluated.

More importantly, this layer embeds anticipation into governance routines. Rather than treating foresight as an occasional exercise, organizations use structured alignment mechanisms to connect future-oriented insights directly to investment decisions, partnership development, capability building, and product or service innovation. Predictive scenarios, therefore, serve as inputs for budget allocation, portfolio management, and long-term positioning decisions. This increases organizational coherence because units across the firm act on a shared interpretation

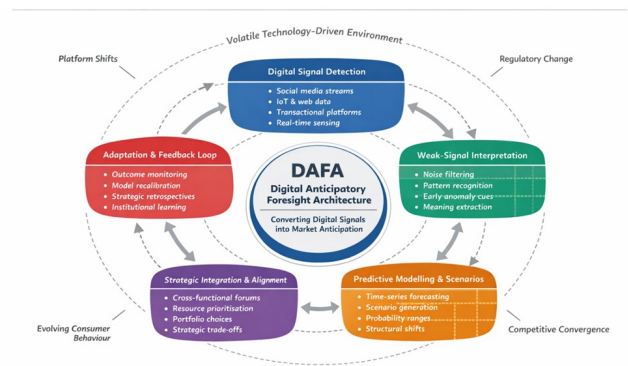
of possible futures rather than on fragmented assumptions. In fast-changing, technology-driven industries, such alignment is critical: a firm's ability to respond early often depends not on whether signals are detected, but on whether they are translated into timely, coordinated choices. The Strategic Integration and Decision Alignment Layer thus institutionalizes anticipatory decision systems by ensuring that foresight outputs actively shape strategic intent, organizational commitment, and execution priorities [18, 20, 22].

## Scenario formation and adaptive strategy

The Adaptation and Feedback Loop Layer closes the foresight cycle by connecting strategic action back to organizational learning. Once strategies informed by foresight are implemented, this layer captures performance outcomes, behavioral responses, and environmental changes to evaluate whether prior assumptions and predictions were accurate. In doing so, it transforms foresight from a one-way planning exercise into a recursive, self-improving system. Learning algorithms update detection thresholds, recalibrate model parameters, and refine scenario assumptions based on real-world feedback, thereby improving the sensitivity and relevance of future analyses. At the same time, organizational routines such as post-implementation reviews, strategic retrospectives, and cross-unit learning processes help codify lessons and feed them back into the architecture.

This adaptive function is essential in contexts characterized by continuous volatility, where technological shifts, platform dynamics, and market expectations evolve faster than traditional planning cycles can accommodate. The value of the layer, therefore, lies not only in correction but also in resilience: it enables organizations to adjust strategies as conditions change while also improving the quality of future anticipation. Over time, this recursive learning strengthens institutional memory, sharpens the interpretation of weak signals, and enhances the organization's capacity to respond to novelty with greater speed and confidence. By embedding continuous adaptation within the architecture, the final layer ensures that foresight remains dynamic, iterative, and practically relevant amid ongoing market flux [14, 15, 23].

**Figure 1** presents the DAFA as a recursive five-layer architecture through which digital signals are converted into anticipatory strategic action and continuously refined through feedback-driven organizational learning.



**Figure 1.** Strategic foresight architecture for technology-driven industries. The figure depicts the DAFA as a recursive five-layer architecture linking digital signal detection, weak-signal interpretation, predictive modeling and scenario synthesis, strategic integration and decision alignment, and adaptation through feedback-driven learning.

Table 1 clarifies the distinct strategic functions of each DAFA layer by showing how different forms of uncertainty are translated into specific organizational outputs and, if underdeveloped, into distinct forms of strategic failure.

**Table 1.** Distinct strategic functions of the five DAFA layers

| DAFA layer                       | Primary strategic function                                                                     | Type of uncertainty addressed                        | Dominant analytical logic                                             |
|----------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------|
| Digital signal detection layer   | Captures distributed, high-velocity environmental data before they become obvious market facts | Environmental ambiguity and informational dispersion | Broad sensing and data acquisition                                    |
| Weak-signal interpretation layer | Distinguishes meaningful early indicators from background noise                                | Interpretive uncertainty and signal ambiguity        | Pattern recognition, anomaly identification, and contextual filtering |
| Predictive modeling and scenario | Converts interpreted signals into                                                              | Temporal uncertainty                                 | Forecasting plus multi-                                               |

|                                                    |                                                                                        |                                                         |                                                         |
|----------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|
| synthesis layer                                    | forward-looking estimates and plausible future configurations                          | and path uncertainty                                    | scenario reasoning                                      |
| Strategic integration and decision alignment layer | Translates foresight into coordinated strategic choice across organizational functions | Decision uncertainty and resource-allocation trade-offs | Cross-functional deliberation and governance alignment  |
| Adaptation and feedback loop layer                 | Evaluates outcomes, updates assumptions, and improves future anticipation              | Learning uncertainty and model decay                    | Recursive learning, recalibration, and strategic review |

Anticipatory strategy systems

The DAFA advances anticipatory strategy by embedding foresight into the ongoing rhythm of organizational decision-making rather than limiting it to periodic planning cycles. In technology-driven industries, where competitive conditions can shift rapidly through platform updates, data-policy changes, ecosystem reconfigurations, or sudden technological breakthroughs, the ability to maintain a continuously active foresight capability is increasingly central to strategic relevance. The architecture addresses this need by integrating live digital sensing, interpretation, prediction, and strategic coordination into a single recursive system. As a result, anticipation becomes a practical managerial capability rather than a conceptual aspiration. The model enables organizations to move from passive environmental scanning to active strategic shaping by ensuring that weak signals and predictive insights are continuously channeled into decision structures that inform present action.

Table 2 demonstrates that the DAFA is not merely an analytical enhancement to traditional planning, but a shift toward a distinct governance logic in which strategy is organized around continuous anticipation, alignment, and feedback.

**Table 2.** Governance shifts from conventional planning to DAFA-based anticipatory strategy

| Analytical dimension      | Conventional strategic planning                            | DAFA-based anticipatory strategy                                   | Theoretical implications                                                                         |
|---------------------------|------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Temporal orientation      | Periodic and review-cycle driven                           | Continuous and recursively updated                                 | Strategy shifts from episodic planning to ongoing anticipatory governance                        |
| Environmental treatment   | Environment treated as analyzable but relatively stable    | Environment treated as fluid, data-rich, and non-linear            | Competitive relevance depends on dynamic interpretation rather than static analysis              |
| Role of data              | Data support retrospective review and periodic forecasting | Data continuously feed sensing, interpretation, and recalibration  | Data become constitutive of strategic anticipation rather than supplementary evidence            |
| Treatment of weak signals | Often ignored until patterns become visible and measurable | Elevated as early indicators of structural change                  | Advantage depends on acting before signals become widely legitimate                              |
| Predictive logic          | Projection from historical trends                          | A combination of forecasting and scenario synthesis                | Strategic foresight becomes plural, probabilistic, and contingency sensitive                     |
| Decision structure        | Strategy formulated centrally and cascaded downward        | Cross-functional alignment forums evaluate trade-offs in real time | Anticipation requires distributed strategic coordination rather than isolated executive judgment |

|                               |                                                        |                                                                                     |                                                                             |
|-------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Resource allocation logic     | Budgeting is linked to annual or periodic cycles       | Resources adjusted in light of emerging scenarios and anticipated inflection points | Capital deployment becomes adaptive and future-contingent                   |
| Learning mechanism            | Post hoc performance review                            | Continuous feedback, recalibration, and institutional learning                      | Learning becomes embedded within the architectural strategy itself          |
| Source of strategic advantage | Better planning, discipline, and execution consistency | Superior sensing, interpretation, alignment, and adaptation speed                   | Advantage stems from anticipatory capacity rather than planning stability   |
| Main organizational risk      | Rigidity and late response                             | Over-complexity or weak cross-layer integration                                     | Effective anticipation depends on architectural coherence across all layers |

A key contribution of the DAFA is that it reduces the long-standing gap between foresight production and strategic execution. In many organizations, foresight remains trapped in reports, presentations, or isolated innovation units, disconnected from the decisions that shape competitive positioning. By contrast, the five-layer architecture routes detected signals through interpretation and predictive synthesis before placing them directly into cross-functional decision forums where choices about investments, partnerships, capabilities, and innovation trajectories are made [17, 20, 22]. This direct integration strengthens strategic agility by enabling earlier, more coordinated responses to emerging developments. For example, when weak signals indicate accelerating convergence between AI and edge computing, the architecture enables predictive scenarios to inform alignment sessions across business, technical, and financial functions. These sessions can then trigger pre-

emptive reallocation of resources, revised partnership strategies, or accelerated product development initiatives, potentially weeks or months ahead of slower-moving competitors [3, 9, 29]. In this sense, anticipatory strategy systems do more than improve forecasting accuracy; they create organizational conditions in which future-oriented intelligence can be translated into timely action and sustained competitive influence.

The architecture's strength lies in its explicit treatment of uncertainty as a strategic variable. Rather than seeking perfect prediction, DAFA employs probabilistic scenario synthesis to map ranges of plausible futures, allowing leaders to prepare branching response pathways. This approach aligns with dynamic capabilities theory by strengthening the sensing and seizing mechanisms through digital augmentation [11, 16]. Organizations adopting such systems report conceptual gains in decision velocity: foresight-informed choices reduce reaction lag from quarters to weeks, preserving first-mover advantage in hyper-competitive digital markets [14, 18].

**Weak-signal amplification in digital ecosystems:** A recurring challenge in technology-driven environments is the dilution of weak signals amid the data deluge. The DAFA's Digital Signal Detection and Interpretation layers address this through layered amplification protocols. Automated ingestion pipelines continuously harvest multi-source digital traces. At the same time, interpretation algorithms apply anomaly detection and semantic clustering to elevate faint patterns—such as nascent consumer sentiment shifts on niche forums or early patent clusters—above the noise threshold [12, 23, 26]. Human-machine collaboration is institutionalized: analysts receive curated signal dashboards that highlight interpretive confidence scores, enabling rapid validation and contextual enrichment.

This amplification process is not linear but relational. Practice-based scholarship demonstrates that weak-signal efficacy increases when interpretation routines combine algorithmic precision with organizational memory and cross-industry analogies [12, 15, 27]. Within DAFA, amplified signals cascade immediately into predictive modeling, ensuring that early indicators do not dissipate before strategic consideration. The result is a heightened organizational sensitivity that converts peripheral digital noise into central strategic intelligence, directly supporting the transition from reactive to anticipatory postures [1, 7, 21].

**Scenario synthesis for market foresight:** Predictive insight generation within DAFA occurs through the dedicated predictive modeling and scenario synthesis layer. Here, machine-learning ensembles forecast trajectory probabilities while qualitative scenario techniques construct narrative futures grounded in the same digital signals. The synthesis step merges quantitative outputs—trend curves, disruption indices—with qualitative storylines that articulate strategic implications across multiple time horizons [3, 19, 28].

Organizations thus move beyond single-point forecasts to robust, multi-future preparedness. Scenario outputs are stress-tested against organizational capabilities, revealing capability gaps or leverage points for market shaping. This layer explicitly incorporates feedback from prior adaptation cycles, refining model parameters and scenario assumptions with real-world outcomes [14, 15, 23]. The conceptual innovation lies in treating scenario synthesis as both analytical and generative: scenarios do not merely describe futures but serve as boundary objects that catalyze strategic conversation and innovation ideation across the firm [4, 5, 22].

**Organizational transformation for sustained foresight:** Implementing the DAFA requires targeted efforts beyond technology deployment. Leadership must cultivate a culture of foresight that values curiosity, tolerates ambiguity, and rewards signal-sharing behaviors. Governance mechanisms—such as dedicated foresight councils reporting to the C-suite—ensure that DAFA outputs receive executive airtime and budgetary priority [11, 18, 20]. Training programs blend data literacy with scenario-thinking skills, equipping middle managers to participate meaningfully in interpretation and decision-making.

**Resource allocation shifts from static budgets to dynamic foresight portfolios** that fund continuous signal infrastructure and cross-functional experimentation. Cultural barriers, such as short-term performance pressures, are mitigated by incorporating foresight KPIs into balanced scorecards—metrics that track signal-to-decision latency and adaptation success rates [1, 14, 17]. These transformations position DAFA not as an add-on toolset but as an embedded organizational capability that evolves with the firm and its digital ecosystem.

The digital anticipatory foresight architecture (DAFA) offers technology-driven industries a cohesive conceptual blueprint for converting digital data signals into predictive

insights and anticipatory action. By integrating five interdependent layers—digital signal detection, weak-signal interpretation, predictive modeling with scenario synthesis, strategic decision alignment, and adaptive feedback—the framework operationalizes strategic foresight as a continuous, learning-oriented capability. It bridges established literatures on corporate foresight, digital sensing, and dynamic capabilities while addressing persistent gaps: the lack of unified architectures that treat digital signals as strategic raw material and close the loop between anticipation and adaptation [4, 5, 21, 23].

## Conclusion

Theoretically, DAFA refines anticipatory strategy by demonstrating how weak signals, once amplified and synthesized, become the foundation for proactive market shaping rather than passive response. In practice, the architecture equips leaders with a repeatable process for maintaining strategic vigilance amid volatility, thereby enhancing innovation capacity, resilience, and decision velocity. Feedback loops ensure perpetual refinement, turning organizational learning into a competitive multiplier.

As digital markets continue to accelerate, organizations that embed DAFA-like systems will be better positioned to detect emerging trajectories, influence industry evolution, and sustain advantage where others merely react. Future

conceptual extensions may explore DAFA's scalability across industry boundaries or its integration with generative AI for even richer scenario generation. Ultimately, the framework underscores a core proposition: in technology-driven industries, strategic foresight is no longer an optional discipline but the essential infrastructure for thriving in perpetual change.

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## References

Capatina A, Bleoju G, Kalisz D. Falling in love with strategic foresight, not only with technology: European deep-tech startups' roadmap to success. *J Innov Knowl.* 2024;9(3):100515.

Mubarak MF, Jucevicius G, Shabbir M, et al. Strategic foresight, knowledge management, and open innovation: Drivers of new product development success. *J Innov Knowl.* 2025;10(2):100654.

Hussain M, Tapinos E, Knight L. Scenario-driven roadmapping for technology foresight. *Technol Forecast Soc Change.* 2017;124:160-77.

Marinković M, Al-Tabbaa O, Khan Z, Wu J. Corporate foresight: A systematic literature review and future research trajectories. *J Bus Res.* 2022;144:289-311.

Marinković M, Al-Tabbaa OF, Khan Z, Wu J. Corporate foresight: A systematic literature review and a call for future research. *Technol Forecast Soc Change.* 2022;177:121436.

Buehring J, Bishop P. Foresight and design: New support for strategic decision making. *Futures Foresight Sci.* 2020;2(3-4):e32.

Nair AK, Pundir A, Verma P. Blueprinting and wayfinding in corporate foresight enactment. *Technol Forecast Soc Change.* 2025; (in press).  
<https://doi.org/10.1016/j.techfore.2026.100831>.

Halim HA, Hanifah HM, Waqas A, Ahmad NH. Reimagining strategic foresight through the lens of digital technology adoption. *Int J Acad Res Econ Manag Sci.* 2025;15(1):492-501.

Alizadeh R, Lund PD, Solakivi T. An integrated scenario-based robust planning approach for foresight and strategic management with application to energy industry. *Technol Forecast Soc Change.* 2017;104:162-71.

Vecchiato R. Strategic foresight: matching environmental uncertainty. *Technol Anal Strateg Manag.* 2017;24(8):783-96.

Rohrbeck R, Kum ME. Corporate foresight and its impact on firm performance: A longitudinal analysis. *Technol Forecast Soc Change.* 2018;129:105-16.

Sarpong D, Maclean M. Cultivating strategic foresight in practice: A relational perspective. *J Bus Res.* 2017;69(8):2812-20.

Paliokaitė A, Pačėsa N. The relationship between organisational foresight and organisational performance: evidence from high-tech firms in Lithuania. *Int J Foresight Innov Policy.* 2017;10(1-2):3-24.

Gordon AV, Rohrbeck R, Schwarz JO. Exploring the future of corporate foresight: A longitudinal analysis of 25 years of research. *Technol Forecast Soc Change.* 2020;158:120162.

Fernani A, Chermack TJ. The multi-layered nature of strategic foresight: a longitudinal case study of corporate foresight in the high-tech industry. *Futures.* 2021;130:102756.

Schoemaker PJH, Heaton S, Teece DJ. How dynamic capabilities and the digital revolution are shaping the future of strategic management. *Calif Manage Rev.* 2018;60(4):60-82.

Day GS, Schoemaker PJH. Adapting to the digital age: strategic foresight in turbulent environments. *Long Range*

*Plann.* 2019;52(6):101870.

Iden J, Methlie LB, Christensen GE. An exploratory study of corporate foresight in the Norwegian ICT industry. *Long Range Plann.* 2017;50(3):329-47.

van der Duin P, Ligtvoet A. The future of foresight: a case study of corporate foresight in the ICT industry. *Technol Forecast Soc Change.* 2019;147:1-13.

Rohrbeck R, Gemünden HG. Corporate foresight: its three roles in enhancing the innovation capacity of a firm. *Technol Forecast Soc Change.* 2017;78(2):231-43.

Battistella C, De Toni AF, Pessot E. The role of digital technologies in corporate foresight: a systematic literature review. *Technol Forecast Soc Change.* 2023;188:122310.

Schwarz JO, Rohrbeck R, Wach B. Corporate foresight in open innovation: a case study of the automotive industry. *R&D Manage.* 2020;50(3):337-51.

Haarhaus T, Liening A. Big data analytics and corporate foresight: an integrated framework. *Technol Forecast Soc Change.* 2020;155:119923.

Heiko A, Rohrbeck R, Meissner P. Corporate foresight: an emerging field with a rich tradition. *Technol Forecast Soc Change.* 2017;101:1-9.

Savioz P, Blum J. Strategic foresight in high-tech industries: a case study. *Technovation.* 2018;22(6):345-55.

Weber KM, Schaper-Rinkel P. European sectoral innovation foresight: identifying emerging cross-sectoral patterns and policy issues. *Technol Forecast Soc Change.* 2017;115:143-57.

Dufva M, Ahlqvist T. Knowledge creation in strategic foresight: a practice-based view. *Futures.* 2017;75:1-14.

Ho J, O'Sullivan E. Strategic foresight and innovation management: a review and research agenda. *Technovation.* 2018;78:1-15.

Yoon J, Kim K, Kim J. A systematic approach for identifying technology opportunities: keyword-based morphology analysis. *Technol Forecast Soc Change.* 2019;144:1-13.