

Tight coupling and temporal compression: How speed-driven cultures accelerate systemic breakdown

Delight Deborah Ajayi *

Department of Finance, Faculty of Management Sciences, Ekiti State University, Ekiti, Nigeria.

Global Journal of Engineering and Technology Advances, 2023, 15(01), 162–169

Publication history: Received on 06 March 2023; revised on 26 April 2023; accepted on 29 April 2023

Article DOI: <https://doi.org/10.30574/gjeta.2023.15.1.0079>

Abstract

The relationship between organizational speed and systemic failure has received insufficient theoretical attention relative to its practical significance. This paper argues that speed-driven cultures, defined as institutional environments in which velocity of execution is treated as a primary performance value, create a distinctive configuration of escalation risk through two interacting mechanisms: tight coupling, the structural condition in which subsystem failures propagate rapidly and without natural containment, and temporal compression, the progressive reduction of response intervals available to actors confronting developing failures. Drawing on normal accident theory, high-reliability organization research, organizational culture theory, and complexity science, we develop a framework for understanding how the pursuit of operational speed systematically degrades the conditions necessary for effective failure detection and interruption. We propose the Speed-Failure Interaction Model (SFIM) as an analytical framework and advance six theoretical propositions connecting cultural velocity orientation, structural coupling, temporal response capacity, and escalation outcomes. Cross-sector case analyses from aviation, financial trading, digital platform operations, and emergency services provide empirical grounding. We conclude with prescriptive guidance for organizations seeking to maintain competitive velocity while preserving the structural and cultural conditions necessary for systemic resilience.

Keywords: Tight Coupling; Temporal Compression; Speed-Driven Culture; Systemic Breakdown; Escalation Dynamics; High-Reliability Organizations; Organizational Resilience; Normal Accident Theory

1. Introduction

Speed is among the most consistently celebrated organizational virtues in contemporary institutional life. Across industries and sectors, the capacity to execute rapidly, to reduce cycle times, to compress decision intervals, and to outpace competitors has been positioned as a primary determinant of competitive advantage and institutional survival. The management literature has reinforced this orientation through a sustained emphasis on agility, lean operations, rapid iteration, and first-mover advantage. The result is a pervasive institutional culture in which velocity of execution functions not merely as an operational objective but as a governing value shaping resource allocation, personnel selection, performance evaluation, and strategic decision-making at every level of organizational life.

This paper argues that this cultural orientation toward speed carries systemic consequences that the management literature has substantially undertheorized. The pursuit of operational velocity does not merely accelerate execution; it structurally reconfigures the conditions under which organizations detect and respond to developing failures. Specifically, speed-driven cultures generate two interacting mechanisms that amplify escalation risk. The first is tight coupling, the structural condition in which operational subsystems are so interdependent and sequentially constrained that failures in one domain propagate rapidly and without natural containment across system boundaries. The second

* Corresponding author: Delight Deborah Ajayi.

is temporal compression, the progressive reduction of the time intervals available to organizational actors for recognizing, diagnosing, and responding to developing failures before those failures cross irreversible thresholds.

These two mechanisms are not independent. Speed-driven organizational cultures actively promote tight coupling as an efficiency measure, eliminating the redundancies, buffers, and slack resources that would otherwise provide the containment boundaries through which cascading failures are interrupted (Reason, 1997). Simultaneously, by compressing decision intervals and elevating velocity as a performance criterion, they reduce the temporal space in which warning signals can be recognized and acted upon before escalation reaches critical thresholds. The result is a distinctive configuration of systemic vulnerability in which organizational environments optimized for competitive speed are simultaneously optimized for catastrophic failure.

We advance three primary contributions. First, we develop the Speed-Failure Interaction Model (SFIM) as a theoretical framework connecting cultural velocity orientation to systemic escalation risk through the mediating mechanisms of tight coupling and temporal compression. Second, we propose six theoretical propositions that specify the relationships between speed-driven cultural conditions and escalation outcomes across varied organizational contexts. Third, we present prescriptive guidance for organizations seeking to maintain operational velocity while preserving the structural and cultural conditions necessary for effective failure detection and systemic resilience. The paper proceeds through a review of relevant theoretical foundations, development of the SFIM framework, cross-sector case analysis, discussion of implications, and conclusion.

2. Theoretical foundations

2.1. Normal Accident Theory and Structural Coupling

Perrow's Normal Accident Theory (1984) provides the foundational structural account of systemic failure relevant to the present analysis. NAT identifies two properties of sociotechnical systems as primary determinants of failure risk: interactive complexity and tight coupling. Interactive complexity refers to the presence of unplanned and unexpected interactions between system components that may not be immediately visible to operators. Tight coupling refers to the condition in which system processes are so interdependent and time-constrained that there is little slack, substitutability, or alternative sequencing available when a component fails. In tightly coupled systems, failures that would be containable in loosely coupled environments propagate rapidly across system boundaries before corrective intervention can be mounted.

The theoretical contribution of NAT to the present framework is its demonstration that failure risk is a structural property of systems rather than merely a function of actor-level competence or attentiveness. Systems with high interactive complexity and tight coupling are predisposed to catastrophic failure regardless of the quality of individual decision-making within them. Critically for our purposes, Perrow notes that tight coupling is not a fixed structural property but one that can be intensified or relaxed through deliberate organizational choices. The choices that speed-driven cultures characteristically make, including eliminating redundancy, reducing buffers, compressing process sequences, and increasing interdependency between operational domains, are precisely the choices that move systems toward higher coupling and greater failure vulnerability. This systems-level perspective on safety and failure causation is further elaborated in Leveson's (2011) systems-theoretic approach, which extends NAT by examining how organizational and social factors shape the conditions under which technical failures escalate into systemic breakdowns.

2.2. High-Reliability Organizations and Temporal Mindfulness

High-reliability organization (HRO) theory, developed by Weick, Sutcliffe, and colleagues (Weick and Sutcliffe, 2007; Weick, Sutcliffe and Obstfeld, 1999), identifies the organizational practices that attenuate structural vulnerability to failure. Of the five HRO capacities identified in this literature, two are particularly relevant to the temporal dimension of escalation risk. Sensitivity to operations refers to the maintenance of real-time situational awareness across system levels, which requires the temporal space to attend to operational conditions and the cultural permission to redirect resources from primary tasks when anomalies are detected. Preoccupation with failure refers to the active, anticipatory attention to weak signals that precede failure, which requires both the interpretive framework to recognize such signals as meaningful and the time available to investigate them before they escalate.

Speed-driven cultures systematically undermine both capacities. By filling all available temporal space with execution activity and treating attention to anomalies as distraction from primary performance objectives, they eliminate the slack necessary for sensitivity to operations. By rewarding rapid action over careful deliberation, they discourage the

preoccupation with failure that HRO theory identifies as a primary protection against escalation. The HRO literature therefore provides a behavioral and cultural complement to NAT's structural account, establishing the specific ways in which speed-driven organizational environments degrade the human and cultural conditions on which effective failure detection depends.

2.3. Organizational Culture and Velocity Orientation

Schein's (1985) model of organizational culture as a system of shared basic assumptions, values, and artifacts provides the conceptual foundation for understanding how velocity becomes institutionalized as a governing organizational value. When speed is consistently rewarded, when slow deliberation is consistently penalized, and when the organizational narratives that define success are consistently stories of rapid execution, velocity orientation becomes embedded at the level of basic assumptions rather than merely stated policy. At this level, it operates below conscious awareness as a background condition shaping perception, judgment, and action without requiring deliberate activation.

Velocity-oriented basic assumptions have two consequences particularly relevant to failure dynamics. First, they shape what counts as a problem worth attending to. In organizational environments where speed is the governing value, conditions that slow execution are recognized as problems worthy of immediate response while conditions that might produce future failures are deprioritized as speculative concerns. Warning signals that require time to investigate and respond to are particularly at risk of being filtered out by this attentional bias. Second, velocity orientation shapes the criteria by which decisions are evaluated. In speed-driven cultures, the cost of delay is experienced as immediate and concrete while the risk of insufficient deliberation is experienced as distant and probabilistic. This asymmetry systematically biases decision-making toward rapid action even in conditions where careful analysis would be more appropriate.

2.4. Complexity Science and Cascade Dynamics

Complexity science provides additional analytical resources for understanding how tight coupling and temporal compression interact to produce cascade dynamics. In complex adaptive systems, the capacity for self-organization and adaptive response depends on the availability of time and information adequate to the complexity of the challenge being addressed (Stacey, 1996; Holland, 1995). When the pace of environmental change exceeds the system's capacity for adaptive response, a condition Ashby (1956) terms a violation of requisite variety, the system loses its ability to maintain coherent functioning and becomes vulnerable to cascading dysfunction.

Speed-driven organizational cultures create precisely this condition. By continuously accelerating the pace of operations while simultaneously reducing the resources available for adaptive monitoring and response, they systematically push organizational systems toward the boundary of their adaptive capacity. Individual failures that would otherwise be absorbed and corrected propagate across system boundaries before adaptive responses can be mounted, and the temporal compression that prevents correction of individual failures also prevents the pattern recognition necessary to identify systemic vulnerabilities before they produce threshold-crossing events.

3. The speed-failure interaction model

3.1. Framework Architecture

The Speed-Failure Interaction Model (SFIM) provides an integrated theoretical account of how speed-driven cultural conditions translate into elevated systemic failure risk through the mediating mechanisms of tight coupling and temporal compression. The model identifies four interacting elements: velocity orientation, which is the degree to which speed of execution functions as a governing organizational value; structural coupling, which is the degree of interdependency and time-constraint between operational subsystems; temporal response capacity, which is the available time and attentional bandwidth for recognizing and responding to developing failures; and escalation vulnerability, which is the probability that localized failures will propagate to systemic breakdown before effective intervention can be mounted.

The SFIM proposes that velocity orientation shapes structural coupling and temporal response capacity through distinct but interacting pathways. Through the structural pathway, velocity orientation drives the elimination of slack resources, redundancies, and buffers that would otherwise limit coupling and provide containment boundaries for localized failures. Through the cultural and attentional pathway, velocity orientation compresses temporal response capacity by filling available time with execution activity, rewarding rapid action over careful deliberation, and creating attentional biases that deprioritize warning signal investigation. The interaction of these pathways produces an escalation vulnerability that exceeds what either tight coupling or temporal compression would generate independently.

3.2. The Temporal Compression Mechanism in Detail

Temporal compression warrants detailed analysis as the less theoretically developed of the two core mechanisms. The concept refers to the progressive reduction of the time available to organizational actors for the recognition, diagnosis, and response activities necessary for effective failure interruption. Three distinct forms of temporal compression are relevant to escalation dynamics.

Decision interval compression refers to the reduction in the time available between the recognition of an anomaly and the requirement to act on it. In high-velocity operational environments, the pace of operations may render careful diagnosis practically impossible: by the time an anomaly has been adequately investigated, the operational window for corrective action has closed. This form of compression is particularly acute in domains characterized by rapid market dynamics, real-time operational requirements, or competitive pressures that penalize hesitation.

Attention interval compression refers to the reduction in the time available for monitoring and detection activities as distinct from execution activities. In organizations that have eliminated slack and filled all available temporal capacity with primary execution tasks, the attention available for the peripheral monitoring through which weak signals are typically detected is systematically reduced. Warning signals that would be noticed in environments with adequate attentional slack go undetected not because they are inherently undetectable but because no organizational actor has the temporal space to attend to them.

Learning interval compression refers to the reduction in the time available for reflection on operational experience, including the near-miss events and anomalies from which organizations characteristically develop their most valuable knowledge about systemic vulnerabilities. Organizations operating under sustained temporal pressure consistently deprioritize after-action review, debriefing, and organizational learning activities in favor of continued execution. The result is a progressive degradation of the knowledge base from which warning signals are recognized and interpreted.

3.3. Theoretical Propositions

Six theoretical propositions follow from the SFIM framework:

- **P1:** Organizations in which velocity of execution functions as a primary governing value exhibit systematically higher structural coupling than organizations with more balanced performance value configurations, independent of industry or technology characteristics.
- **P2:** Structural coupling and temporal compression interact multiplicatively rather than additively in their effects on escalation vulnerability: the combination of high coupling and high compression produces escalation risk exceeding the sum of their independent contributions.
- **P3:** Velocity orientation degrades all three forms of temporal response capacity, specifically decision interval capacity, attention interval capacity, and learning interval capacity, through distinct mechanisms that each independently amplify escalation risk.
- **P4:** The attentional bias toward execution over monitoring in speed-driven cultures produces a distinctive warning signal filtering effect: signals requiring extended investigation are systematically deprioritized relative to signals amenable to rapid response, regardless of their relative importance to systemic health.
- **P5:** Organizations that have experienced sustained competitive pressure to increase velocity exhibit characteristic patterns of coupling intensification over time, including progressive elimination of redundancy, reduction of buffer resources, and compression of process sequences, that are not reversed by isolated safety interventions.
- **P6:** The temporal compression produced by speed-driven cultures is self-reinforcing: as learning interval compression degrades the knowledge base from which warning signals are recognized, the threshold for signal recognition rises, further reducing the effective response window available before escalation reaches critical thresholds.

4. Cross-sector case evidence

4.1. Research Approach

To provide empirical grounding for the SFIM framework and its theoretical propositions, we conducted retrospective analyses of documented systemic failures across four sectors selected for their relevance to speed-driven operational

cultures: commercial aviation, financial trading operations, digital platform systems, and emergency services. Cases were selected purposively to achieve variation across industry context, failure type, and organizational scale, while maintaining the criterion that speed-driven cultural conditions were documented as contextual factors in pre-failure analysis. Primary sources included official investigative reports, regulatory analyses, internal communications obtained through legal discovery or freedom of information processes, and peer-reviewed organizational studies. Analysis proceeded through structured comparison (Ragin, 1987), identifying common patterns in the relationship between speed-driven cultural conditions, coupling intensification, temporal compression, and escalation outcomes.

4.2. Commercial Aviation

Commercial aviation provides the most extensively documented evidence base for the relationship between tight coupling and systemic failure, making it an invaluable reference case for the SFIM framework. The foundational contribution of aviation to NAT and HRO research reflects the fact that aviation systems exhibit high interactive complexity and tight coupling as near-permanent structural conditions, producing a continuous imperative to develop organizational practices adequate to managing the resulting failure risk. The aviation cases most relevant to the present analysis are those in which schedule pressure and turn-around-time optimization produced coupling intensification and temporal compression in maintenance, crew coordination, and air traffic management contexts.

Analysis of runway incursion patterns and controlled-flight-into-terrain incidents consistently documents the role of time pressure in degrading crew attentiveness to warning signals. In multiple documented cases, crews operating under schedule pressure or fatigue suppressed or deprioritized warning signals, including terrain alerts, traffic collision avoidance system advisories, and air traffic control communications, that under less temporally compressed conditions would have produced immediate corrective response. The learning interval compression predicted by Proposition 3 is particularly well-documented in aviation: post-incident analyses consistently reveal that the conditions producing specific accidents had been identified and reported in prior near-miss events whose lessons were not systematically incorporated into operational practice due to insufficient time and organizational attention for after-action learning.

4.3. Financial Trading Operations

Financial trading operations, particularly high-frequency and algorithmic trading environments, provide a contemporary context in which temporal compression has been elevated to a structural design principle. The competitive dynamics of electronic trading markets have driven a progressive compression of transaction intervals from seconds to milliseconds to microseconds, creating operational environments in which the time available for human recognition and response to developing anomalies has been effectively eliminated from the primary execution cycle. The Flash Crash of May 6, 2010, provides the most extensively analyzed illustration of cascade dynamics in this environment.

Analysis of the Flash Crash documents a cascade dynamic consistent with Proposition 2: the interaction of high structural coupling among trading algorithms and extreme temporal compression of response intervals produced systemic effects exceeding what either condition would have generated independently. The elimination of human decision intervals from the primary trading cycle meant that the attentional and deliberative resources that might have recognized and interrupted the developing cascade were structurally unavailable. The warning signal filtering effect predicted by Proposition 4 is visible in the pre-crash period: automated circuit breaker mechanisms that would have interrupted the cascade had been disabled or set at thresholds calibrated to normal velocity conditions rather than to the extreme velocity of developing cascade dynamics.

4.4. Digital Platform Operations and Emergency Services

Large-scale digital platform outages provide a contemporary organizational context in which speed-driven development cultures interact with highly coupled technical architectures to produce failure cascades with significant operational and social consequences. Analysis of major platform outages across leading technology organizations documents a consistent pattern: development velocity pressures drive the progressive tightening of dependencies between platform components, the reduction of deployment review intervals, and the compression of testing and validation cycles. These conditions produce technical architectures of increasing coupling, in which changes to individual components propagate effects across system boundaries in ways that even experienced engineers cannot fully anticipate.

Emergency services contexts provide a contrasting case in which the consequences of temporal compression are most directly visible in human safety outcomes. Analysis of emergency dispatch and response operations under surge conditions, when call volumes exceed normal capacity and response time pressure intensifies, documents the

attentional bias predicted by Proposition 4: under temporal compression, dispatchers and responders systematically deprioritize signals that require extended investigation in favor of more immediately actionable information, with consequences for the accuracy of situation assessment and the appropriateness of resource allocation. The self-reinforcing compression dynamic predicted by Proposition 6 is particularly visible in surge contexts: as temporal compression degrades the quality of individual decisions, system performance deteriorates in ways that generate further demand, further compressing response intervals in a self-amplifying cycle.

5. Discussion

5.1. Theoretical Contributions

The SFIM advances organizational theory in three principal respects. First, by integrating NAT's structural account of coupling with HRO theory's behavioral account, complexity science's account of adaptive capacity, and organizational culture theory's account of velocity orientation, it provides a more comprehensive framework for understanding the relationship between speed-driven cultures and systemic failure than any single theoretical tradition offers. The central integrative insight is that tight coupling and temporal compression are not independent structural conditions but culturally produced and mutually reinforcing mechanisms through which velocity orientation translates into escalation vulnerability.

Second, the concept of temporal compression as a tripartite mechanism, encompassing decision interval compression, attention interval compression, and learning interval compression, advances the theoretical precision with which time-related escalation dynamics can be analyzed. Prior work has addressed aspects of temporal pressure in organizational decision-making (Eisenhardt, 1989; Staw, Sandelands and Dutton, 1981) but has not systematically connected these to escalation dynamics or to the structural conditions of coupling that determine their systemic consequences.

Third, Proposition 6, positing that temporal compression is self-reinforcing through its degradation of the learning capacity from which warning signals are recognized, identifies a mechanism of escalating vulnerability that has not been previously articulated in the organizational failure literature. This self-reinforcing dynamic explains why speed-driven cultures do not merely expose organizations to higher baseline failure risk but actively erode the protective capacities that might otherwise mitigate that risk over time.

5.2. Practical Implications

For senior leaders in speed-competitive environments, the primary practical implication of the SFIM is the need for a principled distinction between competitive velocity and coupling intensity. These are not synonymous: organizations can maintain high execution speed while preserving the structural redundancies, buffer resources, and review intervals that limit coupling and preserve temporal response capacity. The design challenge is to identify which process compressions and redundancy eliminations generate genuine competitive value and which merely intensify coupling without corresponding performance benefit. This requires an analytical framework that assesses coupling effects alongside efficiency effects, a perspective that conventional process optimization approaches do not typically incorporate.

For risk management and operational resilience functions, the framework implies specific interventions targeting each of the three temporal compression mechanisms. Decision interval capacity can be preserved through the pre-authorization of response protocols for anticipated anomaly patterns, reducing the deliberation required in time-compressed conditions without eliminating adaptive response capacity. Attention interval capacity can be preserved through the structural protection of monitoring functions from execution pressure, ensuring that the organizational actors responsible for warning signal detection have temporal space that is not competed away by primary task demands. Learning interval capacity can be preserved through the institutionalization of after-action review as a non-negotiable operational requirement rather than a discretionary improvement activity.

5.3. Limitations and Future Research

The theoretical framework presented here, while grounded in established organizational theory and illustrated through retrospective case evidence, requires prospective empirical validation. The propositions advanced represent theoretically motivated hypotheses rather than established empirical generalizations, and their validity across varied cultural, industry, and technological contexts requires systematic testing through longitudinal research designs. Retrospective case analysis is inherently subject to hindsight bias, and the degree to which speed-failure interaction patterns would have been recognizable in real time cannot be fully established through post-hoc reconstruction.

Future research priorities include the development of validated measurement instruments for velocity orientation as an organizational cultural construct, the empirical testing of the multiplicative coupling-compression interaction predicted by Proposition 2, and longitudinal studies tracking coupling intensification patterns in organizations subject to sustained competitive velocity pressure. The boundary conditions of the framework also warrant investigation: the degree to which the SFIM applies with equal force across industries with varying baseline coupling levels, and the conditions under which high-velocity organizations successfully maintain resilience through practices not yet fully captured in the model, represent particularly important questions for future theoretical and empirical development.

6. Conclusion

This paper has developed the Speed-Failure Interaction Model as an integrated theoretical framework for understanding how speed-driven organizational cultures generate systemic breakdown risk through the interacting mechanisms of tight coupling and temporal compression. The central argument is that the pursuit of operational velocity is not organizationally neutral with respect to failure risk but structurally reconfigures the conditions under which failures develop and propagate in ways that systematically favor escalation over containment.

The practical implication is not that organizational speed should be abandoned as a competitive objective but that it should be pursued with explicit analytical attention to its structural and cultural consequences. Organizations that treat velocity as an unqualified good, eliminating all friction without distinguishing productive redundancy from wasteful slack, will progressively degrade the conditions on which systemic resilience depends. Organizations that understand the coupling and compression mechanisms through which speed generates failure risk can design competitive velocity into their operations while preserving the structural and cultural conditions necessary for effective failure detection and interruption.

The deeper challenge is cultural. Velocity orientation, once embedded as a basic organizational assumption, shapes perception and judgment in ways that are difficult to alter through policy or procedural intervention alone. Leaders who seek to build genuinely resilient high-velocity organizations must address the cultural conditions that treat all deliberation as delay and all redundancy as waste. This requires not merely the design of better monitoring systems but the cultivation of institutional environments in which speed and care are treated as complementary rather than competing values, and in which the capacity to slow down when conditions warrant is recognized as a competitive asset rather than an organizational failure.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

- [1] Argyris, C., and Schon, D. A. (1978). *Organizational learning: A theory of action perspective*. Addison-Wesley.
- [2] Ashby, W. R. (1956). *An introduction to cybernetics*. Chapman and Hall.
- [3] DiMaggio, P. J., and Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2), 147-160.
- [4] Edmondson, A. C. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly*, 44(2), 350-383.
- [5] Eisenhardt, K. M. (1989). Making fast strategic decisions in high-velocity environments. *Academy of Management Journal*, 32(3), 543-576.
- [6] Holland, J. H. (1995). *Hidden order: How adaptation builds complexity*. Addison-Wesley.
- [7] Leveson, N. (2011). *Engineering a safer world: Systems thinking applied to safety*. MIT Press.
- [8] Perrow, C. (1984). *Normal accidents: Living with high-risk technologies*. Basic Books.
- [9] Ragin, C. C. (1987). *The comparative method: Moving beyond qualitative and quantitative strategies*. University of California Press.

- [10] Reason, J. (1997). *Managing the risks of organizational accidents*. Ashgate.
- [11] Rijkman, J. A. (1997). Complexity, tight-coupling and reliability: Connecting normal accidents theory and high-reliability theory. *Journal of Contingencies and Crisis Management*, 5(1), 15-23.
- [12] Schein, E. H. (1985). *Organizational culture and leadership*. Jossey-Bass.
- [13] Stacey, R. D. (1996). *Complexity and creativity in organizations*. Berrett-Koehler.
- [14] Staw, B. M., Sandelands, L. E., and Dutton, J. E. (1981). Threat-rigidity effects in organizational behavior: A multilevel analysis. *Administrative Science Quarterly*, 26(4), 501-524.
- [15] U.S. Commodity Futures Trading Commission (CFTC) and U.S. Securities and Exchange Commission (SEC). (2010). Findings regarding the market events of May 6, 2010: Report of the staffs of the CFTC and SEC to the joint advisory committee on emerging regulatory issues. Washington, DC: U.S. Government Printing Office. Retrieved from <https://www.sec.gov/news/studies/2010/marketevents-report.pdf>
- [16] Vaughan, D. (1996). *The Challenger launch decision: Risky technology, culture, and deviance at NASA*. University of Chicago Press.
- [17] Weick, K. E. (1995). *Sensemaking in organizations*. Sage.
- [18] Weick, K. E., and Sutcliffe, K. M. (2007). *Managing the unexpected: Resilient performance in an age of uncertainty* (2nd ed.). Jossey-Bass.
- [19] Weick, K. E., Sutcliffe, K. M., and Obstfeld, D. (1999). Organizing for high reliability: Processes of collective mindfulness. *Research in Organizational Behavior*, 21, 81-123.