Universal Library of Business and Economics Research Article

ISSN: 3064-9951 | Volume 3, Issue 1

Open Access | PP: 90-96

DOI: https://doi.org/10.70315/uloap.ulbec.2026.0301011

The Role of Direct Communication with the Consumer in Identifying Hidden Vulnerabilities in Business Processes

Nikolay Grebentsov

President at Nikovit Inc, Statesville, USA.

Abstract

The article is dedicated to the analysis of direct communication with consumers as a mechanism for identifying hidden vulnerabilities in business processes. The relevance of the study is determined by the growing digitalization of customer contact channels and the increasing reliance on automated process monitoring systems that often fail to capture experiential distortions. The scientific novelty lies in conceptualizing direct communication not as feedback, but as a multi-level diagnostic infrastructure capable of revealing structural misalignment between formal process design and lived consumer experience. The work describes communicative micro-failures, complaint-based meso-level instability, and macro-level governance tensions associated with process transparency. Special attention is paid to the divergence between interface corrections and systemic adaptation. The goal of the research is to conceptualize direct consumer communication as a structural diagnostic mechanism for identifying latent vulnerabilities in business processes. Comparative analysis, structural synthesis, and interdisciplinary source analysis were used. The conclusion demonstrates that communication data enables earlier detection of vulnerabilities than aggregated performance metrics. The article will be useful for researchers in business process management and practitioners responsible for digital service design.

Keywords: *Direct Communication, Business Processes, Hidden Vulnerabilities, Process Mining, Complaint Analytics, Chatbot Interaction, Customer Journey Modeling, Governance Configuration, Service Failure, Process Resilience.*

INTRODUCTION

Digital transformation has significantly expanded the volume of data available for business process monitoring. Organizations increasingly rely on automated analytics, process mining systems, and performance dashboards to assess operational efficiency. Despite this technological sophistication, hidden vulnerabilities persist. These vulnerabilities rarely manifest in aggregated indicators; instead, they emerge in the space where organizational procedures encounter consumer interpretation.

The relevance of this study is connected with the growing discrepancy between internally measured efficiency and externally perceived coherence. Consumers evaluate not only the functional completion of service operations but also fairness, clarity, responsiveness, and moral alignment. As a result, process distortions often become visible through direct communication before they appear in formal performance metrics.

The purpose of this article is to conceptualize direct communication with consumers as a structural diagnostic infrastructure capable of revealing latent vulnerabilities in business processes across micro-, meso-, and macro-level organizational configurations. To achieve this purpose, three research tasks were formulated: (1) to analyze how communicative micro-interactions reveal structural process misalignment; (2) to examine how complaint analytics and customer journey modeling expose meso-level vulnerabilities; and (3) to assess how transparency technologies and governance configurations influence the interpretation and management of identified vulnerabilities.

The scientific novelty of the research lies in integrating conversational analytics, complaint modeling, journey co-creation approaches, and process mining into a unified diagnostic framework that treats consumer communication as structural evidence rather than subjective opinion.

METHODS AND MATERIALS

The theoretical and empirical foundation of the article is

Citation: Nikolay Grebentsov, "The Role of Direct Communication with the Consumer in Identifying Hidden Vulnerabilities in Business Processes", Universal Library of Business and Economics, 2026; 3(1): 90-96. DOI: https://doi.org/10.70315/uloap.ulbec.2026.0301011.

formed by contemporary research in customer interaction analytics, service failure modeling, process mining, and governance studies.

Følstad and Taylor investigated qualitative analysis of chatbot dialogues and demonstrated the significance of response relevance, false positives, and dialogue outcomes for understanding user experience. Their work provides the empirical basis for examining communicative micro-failures as early indicators of process misalignment (Følstad and Taylor, 2021). Kim and Kwak proposed review-based control charts combined with dynamic importance–performance analysis to detect instability in service attributes through complaint volume dynamics (Kim and Kwak, 2023). Wei and Shi developed a perception-driven model of service failure in smart product consumption, showing that experiential dissonance extends beyond technical malfunction (Wei and Shi, 2024). Huang and Liu examined moral transgressions in e-commerce complaints and demonstrated how normative interpretations intensify reputational exposure (Huang and Liu, 2024). Foroudi et al. analyzed e-service failure and recovery strategies during crisis conditions, emphasizing the impact of communicative framing on future behavioral intention (Foroudi et al., 2025). Halvorsrud et al. explored participatory modeling approaches in customer journey development and demonstrated how co-created representations reveal transition gaps between sub-processes (Halvorsrud et al., 2023). Kobialka et al. introduced automated user journey games that simulate interaction pathways to detect deviations in experiential flow (Kobialka et al., 2024). Eggers et al. investigated sociotechnical mechanisms of process mining-induced transparency and showed how governance configuration influences the development of process awareness (Eggers et al., 2021). Leemans et al. reviewed partial-order-based process mining approaches and outlined advanced methods for discovering process structures in complex event logs (Leemans et al., 2023). Meyer et al. studied user attributions in service failure contexts and demonstrated how perceived responsibility affects retention and behavioral responses (Meyer et al., 2022).

The study employs comparative analysis, structural synthesis, qualitative source analysis, and conceptual modeling. These methods were used to integrate diverse analytical approaches into a coherent diagnostic framework that interprets direct consumer communication as a structural element of business process evaluation.

RESULTS

Direct communication with the consumer exposes irregularities in business processes at the level where operational scripts encounter lived experience. Hidden vulnerabilities rarely manifest in aggregated indicators; they surface when a request is misunderstood, when a complaint escalates beyond its immediate trigger, or when a user abandons interaction despite nominal service completion. Across the analyzed corpus, three analytically distinct trajectories become visible: micro-level distortions in communicative exchanges, meso-level structural blind spots revealed through complaint analytics and journey modeling, and macro-level governance tensions emerging from transparency technologies. The systematization of analytical trajectories is presented below (Table 1).

Table 1. Multi-level diagnostic trajectories of hidden process vulnerabilities (compiled by the author based on Følstad and Taylor, 2021; Kim and Kwak, 2023; Wei and Shi, 2024; Huang and Liu, 2024; Halvorsrud et al., 2023; Kobialka et al., 2024; Eggers et al., 2021)

Analytical Level	Primary Communication Form	Type of Revealed Vulnerability	Organizational Effect	Managerial Interpretation of Risk
Micro-level	Chatbot dialogue and direct interaction	Intent misclassification, escalation loops, and ambiguity in user input	Interface-layer friction	Treating errors as purely technical
Meso-level	Complaints, reviews, journey narratives	Expectation misalignment, moral escalation, transition gaps	Reputational and structural strain	Overreliance on KPI-based evaluation
Macro-level	Process mining transparency, governance discourse	Resistance to visibility, defensive routines, and silo reinforcement	Organizational awareness distortion	Confusing transparency with adaptation

Message sequences between firms and consumers reveal structural fragilities long before they appear in performance dashboards. Qualitative coding of chatbot interactions shows that response relevance is the primary friction point in digitalized customer contact. In one documented financial service setting, only 66% of initial chatbot responses were coded as relevant, while 23% constituted false positives and 6% false negatives; 5% were categorized as out of scope (Følstad and Taylor, 2021). The distribution of response relevance categories is presented below (Figure 1).

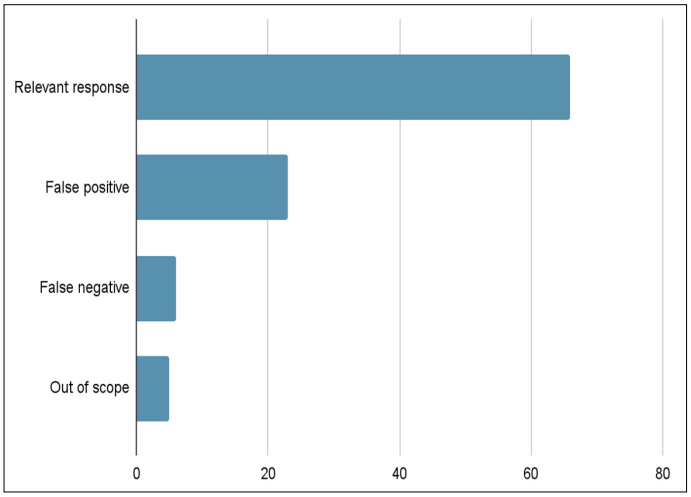

Figure 1. Distribution of chatbot response categories in customer service interaction (compiled by the author based on Følstad and Taylor, 2021)

The distribution is not trivial: nearly one in four interactions began with an erroneous intent prediction, meaning that a process deviation originated at the interface layer rather than in downstream execution. The internal pattern becomes sharper when dialogue outcomes are considered. In the same dataset, 36% of dialogues resulted in help likely used, whereas 46% led to escalation to human personnel; 16% provided no relevant help, and 2% offered help not used (Følstad and Taylor, 2021). Escalation rates approaching half of all dialogues signal not only technological limitations but organizational design gaps: process resolution capacity is fragmented between automated and human subsystems.

A subsequent intervention replacing deterministic responses with uncertainty signaling reduced false positives from 28% to 14% ($\chi^2 = 64.2$, $p < 0.001$) (Følstad and Taylor, 2021). Yet dialogue-level outcomes shifted marginally (30% help pre-implementation versus 29% post-implementation; $\chi^2 = 0.1$, $p = 0.73$). The divergence indicates that communication-level corrections do not automatically reconfigure process structures. Users adapt to conversational friction; processes remain unchanged.

A further stratification of interaction styles revealed that 28% of dialogues exhibited socially oriented communication patterns. These users received relevant responses in 52% of cases compared to 67% for non-social users ($p < 0.01$), and successful help in 24% versus 39% ($p < 0.01$) (Følstad and Taylor, 2021). Richer language increased predictive ambiguity. Communication style thus functions as a stress test for process robustness: systems optimized for utilitarian brevity underperform when exposed to socially expressive inputs.

These micro-level findings suggest that direct communication is not merely a feedback channel. It operates as a diagnostic probe revealing a mismatch between system assumptions and consumer cognitive models.

Where conversational analysis isolates episodic breakdowns, complaint analytics aggregate recurrent tensions. Review-based control charts combined with dynamic importance–performance analysis demonstrate how deviations in complaint volume signal instability in specific service attributes (Kim and Kwak, 2023). Variations detected beyond statistical control limits identify process components whose perceived importance outweighs operational reliability.

Perception-driven modeling of smart product service failures further indicates that consumer evaluation integrates functional breakdowns with experiential dissonance (Wei and Shi, 2024). Failure is not confined to technical malfunction; it includes expectation misalignment and trust erosion. The operational implication is structural: vulnerabilities persist where process metrics measure throughput while consumers evaluate coherence.

Empirical modeling of moral transgressions in e-commerce interactions shows that complaint intensity increases when customers interpret failure as normative violation rather than accidental error (Huang and Liu, 2024). The complaint thus reframes a process flaw as an ethical breach, amplifying reputational exposure.

Crisis-period analysis of e-service failure strategies reveals that recovery communication reshapes peer attitudes and future intention trajectories (Foroudi et al., 2025). Process resilience becomes contingent on communicative framing; structural repair without discursive acknowledgment fails to restore trust.

In these strands, direct communication serves as an early-warning infrastructure. Control charts quantify deviation frequency; perception models classify failure semantics; moral analysis decodes normative escalation; recovery research measures downstream attitudinal shifts. The convergence indicates that hidden vulnerabilities persist where process monitoring remains internally oriented and detached from consumer interpretation.

Static process representations obscure experiential discontinuities. Participatory modeling approaches involving consumers in the development of customer journey languages demonstrate that co-created representations surface previously invisible transition gaps (Halvorsrud et al., 2023). Consumers identify friction points not documented in formal process maps.

Automated user journey games further extend this insight by simulating interaction pathways and algorithmically detecting deviations in experiential flow (Kobialka et al., 2024). When journey transitions require repeated clarification or re-entry, latent process fragmentation becomes measurable.

The methodological implication is twofold. First, consumer communication externalizes tacit process knowledge. Second, structural misalignments emerge not as singular failures

but as patterns of detour, repetition, or abandonment. The absence of a break in system execution does not guarantee experiential coherence. These modeling practices reveal that hidden vulnerabilities frequently reside at boundaries between sub-processes. The structural configuration of communicative diagnostics is illustrated below (Figure 2).

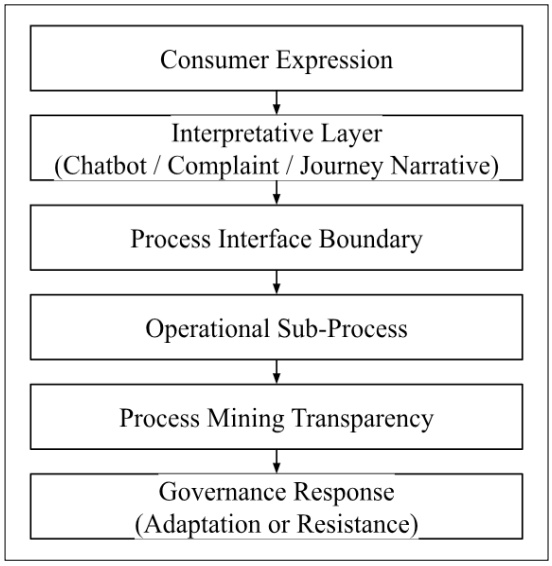

Figure 2. Structural configuration of communicative diagnostics in business processes (compiled by the author based on Halvorsrud et al., 2023; Kobialka et al., 2024; Eggers et al., 2021)

Direct communication traces these boundaries empirically. Process mining introduces large-scale visibility into operational flows. A survey of 360 firms reported that 80% deploy process mining to achieve transparency and awareness, yet many struggle to realize benefits due to resistance to transparency and insufficient process-oriented thinking (Eggers et al., 2021). Technological exposure alone does not yield corrective action.

Market projections indicating a three- to four-fold increase in a $160 million process mining market underscore rapid diffusion (Eggers et al., 2021). Simultaneously, the valuation of a leading process mining provider at $11.1 billion in June 2021 reflects institutional confidence in transparency tools (Eggers et al., 2021). The economic scale contrasts with organizational hesitation.

Seven sociotechnical mechanisms identified across four case organizations show that process awareness depends on governance configuration, and top-down or bottom-up approaches alter how transparency is interpreted and acted upon (Eggers et al., 2021). When transparency is imposed hierarchically, employees experience surveillance pressure; when co-developed, shared language and cross-functional understanding strengthen.

Here, a structural paradox appears. Direct consumer communication highlights experiential deviations; process mining visualizes systemic execution, yet neither guarantees adaptive response. Governance alignment determines whether vulnerabilities are acknowledged or concealed.

Across communicative micro-analysis, complaint analytics, participatory modeling, and process mining, a recurring configuration emerges. Vulnerabilities become visible at the intersection of interpretation and execution. False positives in dialogue reveal misaligned intent classification; complaint spikes signal misweighted service attributes; moralized grievances expose normative rupture; journey mapping uncovers boundary discontinuities; transparency tools surface variation yet require social translation.

Direct communication with consumers operates as a multi-layer diagnostic architecture. It destabilizes process self-perception, introduces external semantic evaluation, and forces organizational actors to confront discrepancies between formal design and lived experience. Where communication data are treated as peripheral sentiment rather than structural evidence, vulnerabilities persist in latent form. Where communication is integrated analytically across micro, meso, and macro layers, hidden weaknesses transform into actionable awareness.

Residual tension remains. Transparency amplifies exposure yet provokes defensive behavior. Communication reveals fragility yet depends on interpretive capacity. The identification of hidden vulnerabilities is therefore not a technological outcome but a socio-analytical accomplishment grounded in continuous engagement with consumer expression.

DISCUSSION

Process vulnerability does not originate exclusively within technical execution layers; it crystallizes at the point where organizational scripts encounter consumer interpretation. The analytical trajectories developed in the Results section-communicative micro-failures, perception-based complaint analytics, participatory journey reconstruction, and transparency-driven governance dynamics-converge toward a single structural insight: direct communication functions not merely as feedback but as a diagnostic infrastructure capable of exposing latent instability in business processes.

At the communicative micro-level, false positives and misaligned responses in chatbot-mediated interactions revealed that automated classification errors frequently precede observable operational breakdowns. The reduction of false positives from 28% to 14% following the introduction of uncertainty signaling demonstrated that interface-layer adjustments can recalibrate prediction precision. Yet the negligible shift in dialogue-level outcomes indicates that communication correction does not automatically reconfigure underlying process logic. The organization may appear more responsive while structural inefficiencies persist. This discrepancy suggests that interface optimization

and process redesign follow different temporal rhythms. The communicative layer reacts rapidly; structural coordination lags.

A tension emerges here. When organizations treat conversational inaccuracies as isolated technological flaws, they confine remediation to algorithmic tuning. When interpreted as indicators of deeper process misalignment between user mental models and system architecture, these same inaccuracies become evidence of structural fragility. The interpretive stance adopted by management determines whether communication data produce superficial smoothing or substantive redesign.

Complaint analytics extend this reasoning beyond episodic interaction. Control-chart deviations and importance–performance asymmetries expose recurrent dissatisfaction patterns that conventional KPIs frequently dilute. Consumers do not evaluate processes according to internal performance thresholds; they evaluate coherence, fairness, and responsiveness. Where perceived importance exceeds operational stability, the vulnerability intensifies not because of technical failure alone but because of expectation misalignment.

The distinction between technical malfunction and moral transgression sharpens this observation. Complaints framed as normative violations escalate reputational exposure beyond proportional operational error. A delayed shipment may remain a logistical issue; a perceived breach of trust becomes a legitimacy issue. In such cases, vulnerability migrates from the operational domain into the symbolic domain. Direct communication makes this migration visible.

Recovery strategies during crisis periods further complicate the picture. Structural repair without discursive acknowledgment fails to restore future intention trajectories. Communication, in these instances, performs restorative work that process adjustment alone cannot achieve. The implication is asymmetrical: process improvement enhances efficiency; communicative framing stabilizes legitimacy. Both are required for resilience.

Participatory customer journey modeling introduces a different analytical altitude. When consumers co-construct representations of their interaction pathways, they identify discontinuities at transition points-handoffs between departments, shifts between automated and human channels, and ambiguities in escalation logic. These discontinuities rarely appear in standardized process documentation because they are boundary phenomena. Formal models privilege stable sequences; consumers experience transitions. Vulnerability concentrates in these transitions.

Automated journey simulations reinforce this insight by detecting repeated detours and circular interactions. Repetition signals structural ambiguity. A process that requires re-entry to achieve clarity is not merely inefficient; it reveals incomplete integration between sub-processes. Direct communication provides the empirical traces necessary to detect such fragmentation.

Process mining technologies complicate the discussion further. Large-scale transparency renders event sequences visible, promising data-driven awareness. Yet transparency without interpretive alignment generates resistance. Increased visibility can be perceived as surveillance, especially under top-down governance configurations. When actors interpret transparency as control rather than shared understanding, defensive routines replace adaptive ones. Hidden vulnerabilities then shift from process opacity to social opacity. Information is available; acknowledgment is withheld.

This observation introduces a structural friction. Direct consumer communication destabilizes internal narratives by exposing misalignment. Process mining destabilizes organizational narratives by exposing variation. Both technologies expand visibility. Yet increased visibility does not guarantee corrective movement. It may produce contestation, fear of blame, or strategic minimal compliance.

The governance configuration mediates whether communication-induced transparency transforms into awareness or into resistance. Bottom-up engagement with communicative evidence tends to foster shared language and collective interpretation. Top-down imposition risks reinforcing silos under the guise of integration. The same dataset can generate either collaborative problem-solving or defensive rationalization.

A second tension concerns automation. Automated analytics scale efficiently; qualitative interpretation requires cognitive investment. Organizations may privilege scalable metrics over interpretive depth, thereby overlooking subtle signals embedded in narrative complaints or conversational nuance. The empirical evidence suggests that many hidden vulnerabilities manifest precisely in these nuanced spaces: false positives, ambiguous intent boundaries, normative language shifts. Quantification without contextualization compresses these signals.

Another friction point arises between standardization and personalization. Process orientation historically favors standardized flows to ensure efficiency and predictability. Direct communication reveals heterogeneity in user styles, expectations, and cognitive patterns. Socially oriented users, for instance, generate richer linguistic input that challenges deterministic classification systems. Standardized processes optimized for utilitarian brevity underperform under expressive variability. The more diverse the communicative input, the more rigid process scripts are stressed.

This leads to a conceptual reframing: direct communication acts as a stress-testing mechanism for process elasticity. When processes accommodate linguistic and behavioral

variation without breakdown, resilience is high. When variation induces classification errors or escalation loops, elasticity is low. Hidden vulnerabilities correspond to zones of low elasticity.

An asymmetry persists between micro-corrections and systemic adaptation. Reducing false positives improves local interaction quality but does not necessarily alter escalation rates. Enhancing complaint response language mitigates reputational harm but may leave root-cause inefficiencies untouched. Process mining exposes bottlenecks but may not alter incentive structures that perpetuate them. The diagnostic function of communication exceeds the organization's adaptive capacity in many instances.

Unresolved tension remains around data integration. Conversational data, complaint analytics, journey models, and process mining outputs often reside in separate analytical silos. Hidden vulnerabilities persist where cross-layer synthesis is absent. When organizations fail to integrate micro-level communication signals with macro-level event logs, they interpret isolated anomalies rather than systemic patterns. Integration demands methodological alignment and governance coherence.

The discussion, therefore, converges on a structural proposition: direct communication with consumers reveals hidden vulnerabilities not because it supplies opinions but because it surfaces mismatches between process design, execution transparency, and experiential interpretation. Vulnerability resides at the interface of these domains. Identification depends less on technological sophistication than on the organization's willingness to treat communicative evidence as structural data.

Residual ambiguity should not be dismissed. Transparency may intensify anxiety; participatory modeling may expose conflicts between efficiency and empathy; automated stress-testing may identify more vulnerabilities than an organization can address. Visibility expands faster than adaptation. This imbalance defines the contemporary managerial condition.

Direct communication does not eliminate vulnerability. It renders vulnerability visible. Whether visibility culminates in redesign or defensive stabilization remains contingent on governance alignment, interpretive maturity, and the integration of communicative analytics into strategic process management.

CONCLUSION

The first task, focused on communicative micro-interactions, demonstrated that chatbot misclassification, escalation loops, and variation in user interaction styles reveal structural fragilities before they appear in aggregated operational metrics. Direct communication acts as a stress test for process elasticity.

The second task showed that complaint analytics and participatory journey modeling expose meso-level vulnerabilities linked to expectation misalignment, moral escalation, and boundary discontinuities between sub-processes. Consumer interpretation redefines technical malfunction as symbolic instability.

The third task established that process mining technologies generate visibility but do not automatically produce adaptation. Governance configuration determines whether transparency leads to collaborative awareness or defensive resistance.

The integration of conversational analytics, complaint modeling, participatory journey reconstruction, and process transparency mechanisms constitutes a necessary condition for early vulnerability detection and sustainable process resilience.

REFERENCES

1. Eggers, J., Hein, A., Böhm, M., et al. (2021). No longer out of sight, no longer out of mind? How organizations engage with process mining-induced transparency to achieve increased process awareness. Business & Information Systems Engineering, 63, 491–510. https://doi.org/10.1007/s12599-021-00715-x
2. Følstad, A., & Taylor, C. (2021). Investigating the user experience of customer service chatbot interaction: A framework for qualitative analysis of chatbot dialogues. Qualitative User Experience, 6, Article 6. https://doi.org/10.1007/s41233-021-00046-5
3. Foroudi, P., Tabaghdehi, S. A. H., Cillo, V., et al. (2025). E-service failure and recovery strategy in times of crisis: Effect on peer attitudes, expectation, and future intention. Review of Managerial Science, 19, 537–571. https://doi.org/10.1007/s11846-024-00762-0
4. Halvorsrud, R., Sanchez, O. R., Boletsis, C., et al. (2023). Involving users in the development of a modeling language for customer journeys. Software and Systems Modeling, 22, 1589–1618. https://doi.org/10.1007/s10270-023-01081-w
5. Huang, X., & Liu, X. (2024). Understanding complaints: The role of moral transgressions in e-commerce interactions. Humanities & Social Sciences Communications, 12(1), 1–13. https://doi.org/10.1057/s41599-024-04316-3
6. Kim, S., & Kwak, M. (2023). Customer complaint analysis via review-based control charts and dynamic importance–performance analysis. Applied Sciences, 13(10), Article 5991. https://doi.org/10.3390/app13105991
7. Kobialka, P., Tapia Tarifa, S. L., Bergersen, G. R., et al. (2024). User journey games: Automating user-centric analysis. Software and Systems Modeling, 23, 605–624. https://doi.org/10.1007/s10270-024-01148-2

8. Leemans, S. J. J., van Zelst, S. J., & Lu, X. (2023). Partial-order-based process mining: A survey and outlook. Knowledge and Information Systems, 65, 1–29. https://doi.org/10.1007/s10115-022-01777-3

9. Meyer (née Mozafari), N., Schwede, M., Hammerschmidt, M., et al. (2022). Users taking the blame? How service failure, recovery, and robot design affect user attributions and retention. Electronic Markets, 32, 2491–2505. https://doi.org/10.1007/s12525-022-00613-4

10. Wei, T., & Shi, Y. (2024). A service failure assessment model for smart product consumption experience based on customer perception. Scientific Reports, 14, Article 23097. https://doi.org/10.1038/s41598-024-75283-7