Conceptual Models of Customer Interaction to Ensure Sustainable Growth in Sales and Service Indicators

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Abstract

The article is dedicated to the conceptual analysis of customer interaction models in digitally mediated service ecosystems and their relationship with sustainable growth in sales and service indicators. The relevance of the study is determined by the growing mismatch between linear management models and the non-linear dynamics of contemporary customer interactions shaped by digital platforms, algorithms, and omnichannel environments. The novelty of the work lies in treating customer interaction as a systemic configuration of resource integration rather than as a sequence of isolated transactions. The article describes how value emerges through the interaction of human, digital, and organizational resources and how this process affects long-term performance indicators. Special attention is paid to algorithmic mediation, omnichannel coherence, and the conditions under which value co-creation transforms into value co-destruction. The article sets itself the goal of developing a multi-layered conceptual framework linking interaction configurations to sustainable economic outcomes. To achieve this goal, analytical synthesis, comparative analysis, and conceptual modeling are employed. The study draws on contemporary research in service management, consumer behavior, and AI-enabled organizations. The conclusions demonstrate that sustainable growth depends on managing interaction density, employee agency, and technological governance. The article will be useful for researchers, managers, and practitioners working in service design, customer experience management, and digital strategy.

Keywords: *Customer Interaction, Service-Dominant Logic, Resource Integration, Sustainable Growth, Sales Indicators.*

INTRODUCTION

At a certain stage of analytical work, it becomes apparent that the available explanatory frames no longer align cleanly with the material under observation. The neat causal loops connecting service quality to satisfaction, and satisfaction to loyalty, begin to fray when placed under the pressure of high-velocity, fragmented digital markets. It is not that these concepts are wrong, but rather that they are insufficient; they describe a stable state that rarely exists in practice. Instead of smooth linear progressions, one observes jagged interruptions, recursive feedback loops, and emergent behaviors that defy simple categorization. The data ceases to be a roadmap and becomes a territory of its own, full of noise and signal that must be disentangled not by reducing complexity, but by inhabiting it. Understanding emerges through sustained engagement with what resists simplification.

Complexity in this domain is not merely a byproduct of technological proliferation but a fundamental characteristic of the modern economic exchange. The separation between "sales" as a revenue-generating event and "service" as a cost-incurring obligation has dissolved into a continuous stream of resource integration [7]. Organizations attempting to manage these functions through independent silos find themselves grappling with a "precision-fragility paradox," where the optimization of individual touchpoints leads to systemic vulnerability. A conceptual model capable of ensuring sustainable growth must necessarily abandon the safety of linear causality. It must account for the entropy introduced by external actors, the agency of non-human intermediaries, and the recursive nature of value co-creation.

Relevance for such a model arises from the operational crisis facing contemporary firms. The stabilization of sales and service indicators—retention rates, lifetime value, net promoter scores—has become decoupled from traditional management levers. Increasing marketing spend no longer guarantees customer acquisition; improving service speed no longer guarantees satisfaction. The intervening variable

is the interaction configuration: the specific arrangement of human, digital, and organizational resources that facilitates or inhibits value creation [1,6]. This report seeks to map these configurations. The goal is to construct a multi-layered conceptual framework that links interaction dynamics directly to sustainable economic outcomes. Three specific objectives guide this inquiry:

1) to identify the constitutive elements of interaction in a digitally mediated ecosystem;

2) to trace the non-linear pathways between resource integration and firm performance;

3) to isolate the mechanisms of value co-destruction that undermine sustainable growth.

Current theoretical perspectives often fail to capture the "dark side" of these interactions or the nuanced trade-offs between efficiency and human connection. The analysis that follows moves beyond the celebration of "engagement" to examine the structural tensions that define it. It explores how sustainability in growth is not a function of infinite expansion but of resilience—the ability of the interaction model to absorb shock, adapt to shifting customer contexts, and maintain the integrity of the value proposition over time [3].

METHODS AND MATERIALS

This section outlines the theoretical materials and methodological approaches used to construct the conceptual framework of the article.
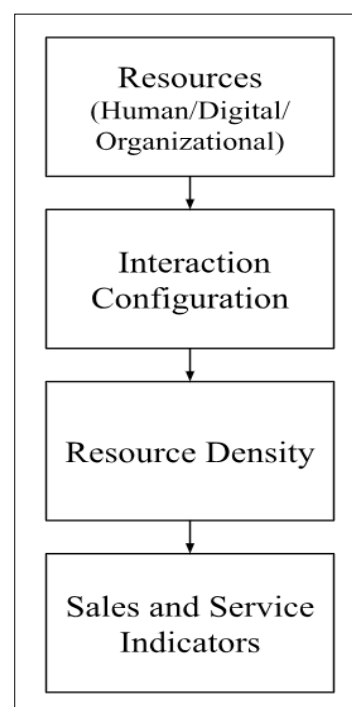
The study is based on a structured analysis of contemporary academic literature addressing customer interaction, service systems, algorithmic management, and sustainable performance. Eric Aguirre et al. [1] examined the personalization paradox and demonstrated how information use and trust-building strategies shape customer responses in digital environments. Benjamin Dietvorst et al. [2] analyzed algorithm aversion, highlighting behavioral resistance to automated decision systems after observable errors. Anna Hay et al. [3] explored relational adaptation in service design, emphasizing resilience and contextual flexibility in interaction models. Ewald Hermann and Stefano Puntoni [4] investigated the impact of artificial intelligence on consumer behavior, focusing on the transition from predictive to generative AI. Katherine Kellogg et al. [5] analyzed algorithmic control in organizations, introducing the concept of competing authorities in digitally mediated work. Khalid Khattak et al. [6] proposed a conceptual model of customer relationship management in global software development, emphasizing interaction configurations. Bart Larivière et al. [7] examined technology-enabled service encounters and the integration of employees, customers, and digital systems. Chris Prentice et al. [8] studied AI as a boundary-crossing object affecting employee engagement and performance. Hui Wei and

Chris Prentice [9] analyzed the service profit chain under conditions of artificial and emotional intelligence.

To write the article, methods of comparative analysis, conceptual synthesis, source analysis, and system modeling were applied. These methods made it possible to integrate heterogeneous theoretical perspectives into a coherent conceptual framework describing customer interaction and sustainable growth.

RESULTS

Analytical attention must first be directed toward the fundamental unit of exchange. Traditional economic models posit the transaction as the locus of value. In a service-dominant environment, the transaction is merely a punctuation mark in a continuous process of resource integration. Value is not delivered; it is co-created through the interaction of actors who bring distinct resources to a shared platform. Sustainable growth depends on the firm's ability to maximize "resource density"—the mobilization of the optimal combination of resources at a specific time and place to solve a customer's problem (Figure 1).

Figure 1. Configuration of Resource Integration in Customer Interaction

This density is achieved through liquefaction. Information, once tightly coupled with physical carriers (books, CDs, physical storefronts), has been decoupled, allowing it to flow freely across the service ecosystem. This separation enables the reconfiguration of resources in real-time. A customer interacting with a digital interface is not merely retrieving information; they are integrating their own operant resources (skills, knowledge, context) with the firm's operand resources (data, algorithms, infrastructure). The interaction is a site of innovation (Table 1).

Table 1. Resource Types and Their Functions in Service Interaction and Sustainable Growth

Resource Type	Description	Role in Interaction	Impact on Sustainable Growth
Operand Resources	Tangible assets (goods, tech infrastructure, raw data).	The vehicle or platform for service delivery.	Provides the necessary scale and stability for operations.
Operant Resources	Intangible assets (skills, knowledge, culture, motivation).	The active agent that acts upon operand resources to create value.	Drives differentiation, adaptation, and long-term competitive advantage.
Liquefaction	The decoupling of information from physical matter.	Allows resources to be unbundled and rebundled dynamically.	Increases the velocity of value creation and market responsiveness.
Density	The concentration of resources at the point of need.	Maximizes the effectiveness of the solution provided.	Reduces customer effort and increases value-in-use, securing loyalty.

The tension here lies in the capability of the firm to manage this density without overwhelming the actor. Too much information, or resources that are difficult to integrate, leads to cognitive load and interaction failure. The model suggests that sustainable growth is linked to the "absorptive capacity" of the customer—their ability to utilize the resources provided. High-performing firms function as resource integrators, simplifying the complexity of the ecosystem for the beneficiary. This capability is not static. It requires a continuous "sensing" of the customer's context, a dynamic adjustment of the resource mix.

Service innovation, then, is not the production of new goods but the reconfiguration of the resource integration mechanism. It is a collaborative process occurring in an actor-to-actor (A2A) network. The firm does not innovate for the customer but with the customer. This shift redefines the metrics of success. Sales volume becomes a lagging indicator of successful resource integration. At this point, the analytical picture becomes less settled, as the same interaction mechanisms that stabilize performance under one set of conditions begin to produce opposite effects under another. The leading indicators are found in the quality of the collaboration—the depth of the dialogue, the frequency of the interaction, and the degree of mutual adaptation.

Into this fluid dynamic of resource exchange enters the non-human actor. The integration of Internet of Things (IoT) technologies and algorithmic systems creates a "Techno-Service-Profit Chain" (TSPC) that fundamentally alters the topology of interaction. Algorithms are not passive tools; they are agents with the capacity to direct, constrain, and modify human behavior. The TSPC model examines how internal employee management mechanisms spill over into external customer service performance, moderated by the presence of these algorithmic agents

A critical finding is the dual nature of this technological mediation. On one side, algorithms augment human capability. They reduce "script uncertainty" by providing real-time intelligence, suggesting the next best action, and accessing vast repositories of customer history. This augmentation enhances "resource density," allowing a frontline employee to deliver a level of personalization that would be impossible

through memory alone. The immediate effect is a spike in service productivity and consistency.

Yet this efficiency comes with a shadow. The introduction of an algorithmic authority creates a "competing boss" effect [5]. Frontline employees (FLEs) find themselves serving two masters: the human supervisor and the digital directive. When the algorithm dictates the interaction script with rigidity, it de-skills the employee. The autonomy to adapt—a crucial operant resource—is stripped away. The interaction becomes dehumanized. Customers, sensing this robotic adherence to protocol, disengage emotionally [2]. The trust that underpins sustainable loyalty is eroded.

The TSPC framework identifies "role stress" and "perceived control" as pivotal variables [9]. Sustainable growth requires a configuration where the technology remains subservient to the human actor. The algorithm must function as a support system, not a command system. When employees feel empowered by the technology rather than constrained by it, the spillover effect on customer satisfaction is positive [8]. When the technology induces "dehumanization," the chain breaks. The firm may see short-term gains in processing speed (productivity) but a long-term decline in relationship quality (service indicators).

This dynamic is particularly acute in B2B contexts involving "industrial AI." Here, the interaction involves a triad: the supplier, the customer, and the technology provider. Value is co-created through the interplay of these three nodes. The provider supplies the technical capability (system management), the supplier contextualizes it (commercialization), and the customer integrates it. The fragility of this system lies in the "interpersonal skills" required to bridge the technical and the commercial. If the technology provider fails to understand the business context, or if the supplier fails to manage the change within the customer's organization, the AI tool becomes a source of friction rather than value. Sustainable sales in this sector depend on the harmonization of these three distinct capability sets.

As the ecosystem expands, the customer journey fractures across multiple touchpoints—mobile apps, physical stores, call centers, and social media. The challenge of maintaining

a coherent narrative across these fragments is the central problem of omnichannel management. Two distinct dimensions emerge as critical: channel consistency and channel seamlessness. Consistency refers to the uniformity of the content (price, product availability, brand voice). Seamlessness refers to the fluidity of the transition (the absence of barriers when moving from one channel to another).

Standard linear reasoning would suggest that maximizing both leads to the best outcomes. A more nuanced analysis, employing polynomial regression techniques, reveals a complex interaction effect. While high levels of both are desirable, they function as distinct levers. A high degree of seamlessness can, in certain configurations, compensate for a lack of consistency. If the transition is effortless, the customer may tolerate minor discrepancies in information. Conversely, absolute consistency can maintain trust even if the channel switching requires effort (Table 2).

Table 2. Key Dimensions of Omnichannel Interaction and Their Impact on Customer Outcomes

Interaction Dimension	Definition	Outcome Impact
Consistency	Uniformity of price, product, and information across channels.	Builds trust, reduces cognitive dissonance.
Seamlessness	Fluidity of transition between touchpoints.	Reduces effort, enhances perceived convenience.
Combined Effect	The interaction of consistency and seamlessness.	Non-linear impact on "Continuance Intention."
Data Vulnerability	Customer perception of privacy risk.	Moderates the need for consistency/seamlessness.

The regulatory mechanism in this dynamic is "data vulnerability." When customers perceive a high risk to their privacy or data security, the demand for a coherent, error-free environment intensifies. Vulnerability creates a psychological state of hyper-vigilance. Any friction in the seamlessness or discrepancy in the consistency is interpreted as a signal of incompetence or malice. In high-vulnerability contexts, the firm has no margin for error. Sustainable growth in sales indicators is thus directly linked to the "hygiene" of the interaction infrastructure. The backend integration must be flawless to project a frontend simplicity.

Strategies that attempt to "nudge" customers across channels without resolving the underlying data integration issues will fail. The model posits that "continuance intention"—a proxy for sustainable growth—is mediated by the cumulative customer experience. This experience is not a sum of parts but a gestalt. A single failure in seamlessness (e.g., a mobile cart not syncing with a desktop login) can disproportionately damage the perception of the entire ecosystem.

The traditional taxonomy of business functions places "sales" at the end of the value chain, tasked with the commercialization of an already-developed product. This retrospective view is incompatible with the requirements of a dynamic market. The conceptual model necessitates a "front-loading" of the sales function. Salespeople are the organization's primary sensory organs. They operate at the boundary of the firm, in direct contact with the chaotic reality of the market. They are uniquely positioned to detect the "tacit signals" of shifting customer needs—the unarticulated problems that standard market research fails to capture.

In this reconfigured model, sales is an integral component of the innovation process, specifically in the discovery and development phases. The salesperson acts as a "knowledge broker," translating external market intelligence into internal engineering requirements. This "boundary spanning" activity is a driver of sustainable growth because it ensures product-market fit before the costly commercialization phase begins. Innovation becomes a co-creative act between the salesperson and the customer.

The interaction model here is iterative. The salesperson does not present a finished solution but a prototype, a hypothesis. The customer's feedback refines the hypothesis. This "adaptive selling" behavior requires a specific cognitive style: "sensemaking." The salesperson must be able to frame ambiguous information in a way that is actionable for the organization. This capability is distinct from the persuasive skills typically associated with selling. It requires empathy, analytical reasoning, and the ability to navigate internal organizational politics to mobilize resources.

When the sales function is integrated into innovation, the indicators of sales performance shift. "Sales growth" is no longer just a measure of volume; it becomes a measure of "relational capital." A sales team that effectively co-creates with customers builds a reservoir of trust and shared knowledge that insulates the firm from competitive pressure. The customer becomes a stakeholder in the product's success. This "lock-in" effect is far more durable than contractual obligations.

Analytical honesty demands an examination of the failures inherent in interaction. The assumption that more interaction is always better is a fallacy. Engagement carries the risk of "value co-destruction." This phenomenon occurs when the resources integrated by the actors—firm and customer—are incongruent or misapplied. The "gloomy side" of value co-creation reveals that the very processes designed to enhance value can, under specific conditions, destroy it.

One primary mechanism of destruction is "resource misintegration." This happens when the firm overestimates the customer's operant resources (skills, time, motivation).

A self-service technology that requires a level of technical proficiency the customer does not possess leads to frustration, error, and a net loss of value. The customer feels incompetent, and the firm appears indifferent. This mismatch triggers "avoidance behaviors," directly impacting retention rates.

Another mechanism is "role conflict." In a co-creation model, the customer is a partial employee. If the roles are not clearly defined, or if the customer perceives the workload as unfair, "justice perceptions" are violated. The customer feels exploited. Service recovery in this context is complex. It requires not just an apology but a recalibration of the resource mix. The firm must inject additional operand resources (compensation) or operant resources (staff assistance) to restore the equilibrium.

The "dark side" also manifests in the toll on service employees. High-intensity co-creation requires significant "emotional labor." Employees must constantly adapt to the idiosyncratic needs of the customer. Without adequate "psychological capital" (resilience, optimism), this leads to burnout. A burned-out employee withdraws from the interaction, delivering a "hollow" service that meets the technical requirements but fails on the relational level. Sustainable growth is impossible if the internal engine of interaction—the employee—is depleted. The model links employee well-being directly to the sustainability of the customer relationship

Within the retail sector, particularly for self-employed and smaller entities, the dynamics of interaction crystallize around the concept of Customer Equity (CE). This construct aggregates the lifetime value of the entire customer base, serving as a superior predictor of sustainable growth compared to short-term sales spikes. The conceptual model decomposes CE into three drivers: Value Equity, Brand Equity, and Relationship Equity.

Empirical observations in the retail market—specifically in high-density environments like South Korea—reveal a divergence in how these drivers influence outcomes depending on the retail format. For traditional retailers, often plagued by low data reliability and ambiguous accounting, Value Equity (perception of quality/price ratio) and Brand Equity (subjective assessment of the brand) are statistically significant drivers of satisfaction. Interestingly, Relationship Equity (loyalty programs, affinity) shows weaker significance in these traditional settings compared to modern, data-rich retail formats.

This suggests a hierarchy of interaction needs. Before a customer engages in a deep relationship (Relationship Equity), they must first validate the utilitarian value and the trust signal of the brand. Sustainable growth for these entities is not achieved by jumping straight to loyalty schemes but by stabilizing the core value proposition. The interaction must first be competent before it can be relational.

The model also highlights the role of "data vulnerability" as a boundary condition in this sector. Ambiguous accounting and reluctance to use digital payments in traditional sectors create an opacity that hinders the calculation of CE. Transforming this "blind spot" into visible data is a prerequisite for managing sustainable growth. The adoption of digital point-of-sale systems is not just an operational upgrade; it is a strategic necessity to render the customer base visible and manageable.

The integration of Artificial Intelligence (AI) into management practices offers a bridge between innovation, knowledge creation, and sustainability. The "AI-driven management model" posits that AI does not merely automate tasks but fundamentally alters the knowledge creation process within the firm. By analyzing vast datasets of customer interactions, AI identifies patterns of consumption and waste, enabling the firm to optimize its resource allocation [4].

This capability is central to "sustainable business practices." AI allows for the precise matching of supply and demand, reducing inventory waste (stockouts or overstock). It facilitates "predictive maintenance" in service interactions, solving problems before the customer is even aware of them. This proactive stance transforms the nature of the relationship from reactive problem-solving to continuous value assurance.

However, this precision introduces a "fragility" to the system. The model identifies a "precision-fragility paradox." As the system becomes more optimized through AI, it loses its slack. A minor disruption in the data flow or a shift in consumer behavior that the algorithm has not been trained on can cause the system to seize. Sustainable growth requires the maintenance of "redundancy"—human oversight and flexible resources that can step in when the algorithmic logic fails.

Governance becomes a critical component of the interaction model. The ethical use of data, transparency in algorithmic decision-making, and the protection of customer privacy are not compliance issues; they are core components of the value proposition. In an AI-driven environment, trust is the currency of interaction. If the customer suspects that the "black box" is manipulating them, the relationship collapses. The sustainable model embeds ethical governance into the very architecture of the interaction.

DISCUSSION

The synthesis of these trajectories reveals a landscape where the "conceptual model" is not a static diagram but a dynamic system of tensions. The first tension is between standardization and adaptation. Sustainable growth requires the efficiency of standardized processes (often delivered by technology), but the resilience of the relationship depends on the ability to adapt to the specific, shifting needs of the customer (often delivered by humans). The firm must navigate the "Techno-Service-Profit Chain" without allowing

the technology to sever the human connection. The proposed conceptual model contributes to the literature by shifting the focus from outcome-based metrics of performance toward interaction-based mechanisms of sustainability. Unlike traditional linear models, it explains growth as an emergent property of balanced interaction tensions rather than as a direct consequence of isolated managerial actions.

The second tension is between openness and control. The "Engagement Ecosystem" demands that the firm open its boundaries, allowing customers and other actors to co-create value. Yet this openness invites entropy and the risk of co-destruction. The firm must relinquish control over the content of the interaction while maintaining control over the context or platform . The third tension is between precision and robustness. AI and data analytics offer the promise of perfect precision in resource allocation and service delivery. Yet this optimization creates a brittle system. Sustainability requires a deliberate inefficiency—a buffer of resources (time, staff, inventory) that allows the system to absorb shocks.

The implications for "sales and service indicators" are clear. These metrics cannot be viewed in isolation. A spike in sales volume accompanied by a decline in employee engagement is a leading indicator of future failure. A high net promoter score (NPS) achieved through unsustainable emotional labor by staff is a fragile victory. The conceptual model advocates for a "balanced scorecard" of interaction metrics that includes:

1) Resource Density: Is the right information/skill available at the point of need?

2) Interaction Fluidity: Is the transition between channels seamless?

3) Employee Agency: Does the human actor feel empowered or constrained by the system?

4) Customer Equity: Is the lifetime value of the customer base increasing or depleting?

5) Co-creation Quality: Are interactions generating new value or destroying it?

Sustainable growth is the emergent property of a system that keeps these tensions in productive balance. It is not a destination but a continuous process of tuning.

CONCLUSION

The architecture of customer interaction has moved irrevocably beyond the transactional. It is now an ecological phenomenon, defined by the circulation of resources, the mediation of algorithms, and the co-creative agency of the customer. The conceptual model presented here does not offer a simplified recipe for growth but a topography of the terrain. It identifies the critical nodes—resource integration, technological mediation, omnichannel coherence, and the

innovation interface—where value is either generated or lost.

Understanding emerges from the recognition that the firm is no longer the sole author of the economic narrative. It is a facilitator, a platform, a partner. Sustainable growth in sales and service indicators is achieved not by conquering the market but by synchronizing with it. It requires the humility to listen to the tacit signals of the customer, the wisdom to govern the algorithmic agents we have created, and the vigilance to detect the early warning signs of value co-destruction. From a practical perspective, the model offers managers a diagnostic lens for identifying hidden fragilities in sales and service systems before they manifest in declining performance indicators.

Ultimately, the stability of the indicators is a reflection of the health of the underlying relationships. By shifting the analytical focus from the output (sales) to the process (interaction), the organization builds a foundation that can endure the volatility of the modern market. The model is a guide for navigating the complexity, not by explaining it away, but by harnessing its power.

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