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Personalization and Customization in E-Commerce: An Exploratory Study of Collaborative Innovation

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Salwa ZEGZOUTI
Cadi Ayyad University, UCA, ENCG,
LAREGO
salwa.zegzouti@gmail.com

Chakib HAMADI
Cadi Ayyad University, UCA, ENCG,
LAREGO
hamadichakib14@gmail.com

Abstract— In the context of digital commerce, the role of consumers has progressively evolved from that of passive recipients to actors whose interactions may inform and shape innovation processes. This study examines how personalization, understood as automated system-driven adjustments, and customization, defined as user-initiated modifications, contribute to collaborative innovation in e-commerce environments. Relying on an exploratory qualitative approach, the research is grounded in two complementary theoretical perspectives: the interactive model of innovation (Von Hippel, 1986), which emphasizes the role of users in innovation processes, and the theory of value co-creation (Vargo & Lusch, 2004), which conceptualizes value as emerging through interaction and collaboration.

Empirical data were collected through nine semi-structured interviews with digital professionals (including developers, digital project managers, and innovation consultants) and fifteen interviews with consumers with diverse profiles who regularly interact with personalized and customizable e-commerce platforms. The findings reveal a functional complementarity between personalization and customization. Personalization primarily generates implicit contributions through routine interactions and behavioral signals, which can be integrated into iterative innovation processes. Customization, by contrast, involves more explicit and deliberate forms of contribution, allowing users to influence the configuration and evolution of offerings.

Overall, the results highlight a form of collaborative innovation that emerges through the aggregation and interpretation of user-generated signals, rather than through formal participatory mechanisms. By shedding light on these implicit modes of contribution, this study contributes to a better understanding of how personalization and customization can operate as strategic levers for collaborative innovation in digital commerce.

XIX. INTRODUCTION

Over the past years, the growing diffusion of intelligent technologies has progressively reshaped how organizations approach innovation. Innovation is no longer viewed solely as an internal activity, confined to research and development departments, but increasingly as a process that takes shape through interactions with actors outside organizational boundaries. In this context, the concept of augmented management, as discussed by Brynjolfsson and McAfee (2017), points to a move away from purely automated decision-making toward organizational arrangements that allow different forms of contribution and collaboration. Users are therefore no longer seen simply as recipients of products or services, but as stakeholders whose interactions can contribute to value creation within digital environments (Von Hippel, 2005; Prahalad & Ramaswamy, 2004). This shift echoes a broader view of collective intelligence, where innovation emerges from coordination rather than from isolated efforts.

The e-commerce sector offers a particularly appropriate setting to observe these developments. In 2024, global online sales exceeded USD 6.9 trillion, accounting for 23% of total worldwide retail sales (Statista, 2024). Beyond this quantitative expansion, e-commerce has also undergone a more qualitative transformation. Personalization and

customization have gradually become central practices, allowing firms to adjust their offerings, content, or services to heterogeneous preferences. At the same time, these practices help structure ongoing interactions between firms and their markets. Industry reports show that the absence of personalized recommendations continues to generate dissatisfaction among consumers, which underlines the strategic importance of personalization and customization in the design of contemporary value propositions (McKinsey, 2023).

Importantly, personalization and customization should not be reduced to technical or algorithmic adjustments. They are embedded in broader organizational and strategic processes that facilitate information flows, learning mechanisms, and the integration of external contributions into innovative activities. Several studies suggest that such practices may support forms of co-design and collaboration between firms and users, thereby contributing to collaborative innovation dynamics (Magne & Lemoine, 2015; Abidi-Barthe, 2020). From this perspective, personalization and customization appear less as isolated tools and more as organizational mechanisms that connect data, modular offerings, and coordination among the actors involved in innovation.

Despite the increasing attention devoted to these practices, existing research still provides only partial insights into how personalization and customization contribute to collaborative innovation. Much of the literature has focused on commercial outcomes or technological performance, while the organizational mechanisms through which these practices structure collaborative innovation processes, remain relatively underexplored (Kaiss, 2023). In addition, qualitative and inductive studies capable of capturing these mechanisms in practice are still limited.

Against this background, the present study seeks to contribute to the ongoing discussion by addressing the following research question from a managerial perspective: **How do personalization and customization practices influence collaborative innovation dynamics in the context of e-commerce?**

XX. RESEARCH OBJECTIVES AND QUESTIONS

The main objective of this research is to better understand how personalization and customization practices influence collaborative innovation dynamics in e-commerce. More specifically, the study examines how these practices contribute to shifting users from a position of simple recipients of offerings toward a role in which their choices and interactions may inform or support innovation processes. By approaching personalization and customization as organizational and strategic mechanisms, this research seeks to clarify their contribution to collaboration and value co-creation within e-commerce platforms.

A. Specific Objectives

- To explore how personalization and customization are understood and interpreted by digital experts and end consumers, with attention to the practical uses associated with each concept.
- To examine how consumers' micro-actions (such as selections, refusals of recommendations, or individual configurations) are perceived by professionals as informal inputs within innovation processes.
- To identify the organizational and technological mechanisms through which information generated by personalization and customization practices can be integrated into collaborative innovation dynamics.
- To analyze the conditions under which personalization and customization support coordination, learning, and knowledge sharing between firms and external actors involved in innovation.

B. Research Questions

- How do professionals and consumers distinguish between personalization and customization in digital environments?
- How are consumers' micro-actions interpreted and mobilized within collaborative innovation processes?
- To what extent do practitioners consider the data and signals generated through personalization and customization practices as meaningful resources for continuous improvement or innovation?

XXI. LITERATURE REVIEW

This study builds on a combined examination of two complementary theoretical frameworks: the interactive innovation model (Von Hippel, 1986) and the value co-creation theory (Vargo & Lusch, 2004). Together, these perspectives make it possible to understand how personalization and customization mechanisms reshape the relationship between firms and users within digital collaborative innovation processes.

A. User Contributions and Interactive Innovation

The innovation model introduced by Von Hippel (1986) emphasizes the active role of users -particularly lead users- in the creation and modification of innovations. This approach departs from traditional linear innovation models by highlighting the importance of reciprocal interactions between firms and users, where innovation emerges through continuous feedback, experimentation, and adjustment. In data-driven e-commerce environments, such interactions are intensified through the use of digital usage data, behavioral tracking systems, and adaptive technologies, which allow firms to continuously adjust their offerings based on observed user actions (Wirtz et al., 2019).

Within the e-commerce context, these dynamics are particularly pronounced, as users have gradually moved from being simple recipients of standardized offerings to becoming active contributors to distributed innovation processes. The integration of real-time data, recommendation algorithms, and rapid feedback mechanisms illustrates how Von Hippel's model has evolved within contemporary technological settings (Chatterjee et al., 2022). These developments reinforce the idea that innovation increasingly results from interaction and collaboration rather than from unilateral organizational decisions. This interpretation is in line with previous research suggesting that routine digital interactions generate meaningful behavioral signals that organizations can mobilize for innovation purposes. Without necessarily formalizing participation, these signals may be interpreted as informational inputs supporting ongoing adaptation and collaborative innovation processes (Hamadi, 2010).

B. *Value Co-Creation in the Service Economy*

The concept of value co-creation, introduced by Vargo and Lusch (2004, 2008) within the service-dominant logic (SDL), challenges the traditional view of value as a process produced solely by firms. This framework argues that value is created collaboratively through interaction and use. While firms provide resources and structure enabling conditions, value emerges through the integration of these resources by users in interaction with organizational systems (Vargo & Lusch, 2016). In this perspective, customers are viewed as co-creators of value and as active participants in innovation processes, rather than passive beneficiaries (Grönroos, 2017).

Applied to personalization and customization technologies, this theoretical lens allows these practices to be understood not merely as automated marketing tools, but as mechanisms that facilitate dialogue, coordination, and collaboration between firms and external actors. Through these mechanisms, personalization and customization support the integration of user-generated inputs into organizational learning and innovation processes (Wang et al., 2020).

C. *Personalization, Customization, and Value Creation*

Building on this reasoning, Arora et al. (2008) propose a relevant distinction between personalization and customization. Personalization relies on automated processes that use algorithms to analyze user-related data, whereas customization involves more explicit user participation through the deliberate selection or configuration of product or service attributes. Although conceptually distinct, both forms of individualization carry collaborative potential, as they enable users to influence the design, adaptation, or evolution of offerings (Pine & Gilmore, 2019).

In digital contexts, these practices extend beyond functional value creation. They contribute to the generation of relational and contextual value, by acknowledging user inputs and integrating them into the ongoing development of products and services (Tynan et al., 2014). This form of value creation plays an important role in collaborative innovation, as it encourages voluntary participation and supports sustained collaboration between firms and users over time.

XXII.   METHODOLOGY

This research adopts a qualitative exploratory methodology, which is particularly suited to the analysis of complex phenomena that remain insufficiently theorized, such as the role of personalization and customization practices in collaborative innovation contexts. As emphasized by Miles, Huberman, and Saldaña (2014), qualitative approaches make it possible to identify interpretative categories emerging from actors' discourses, practices, and representations. The study follows an inductive research strategy, favoring analytical depth over statistical generalization (Denzin & Lincoln, 2018).

A. *Data Collection Strategy*

The study was conducted in two interrelated phases designed to integrate the perspectives of both professionals and consumers.

1)   *First Phase – Expert Interviews*

The first phase consisted of semi-structured interviews with professionals operating in the digital and e-commerce ecosystem, including digital project managers, front-end developers, innovation consultants, and researchers specializing in data-driven and personalized systems. Participants were selected using purposive sampling (Patton, 2015), based on three main criteria:

- Their documented expertise in the design, implementation, or management of personalization and customization mechanisms
- Their involvement in organizations with varying levels of digital maturity, including start-ups, established e-commerce platforms, and technology-oriented agencies.
- Their experience with collaborative innovation practices and personalization strategies (Gilmore & Pine, 1997).

The objective of this phase was to explore the managerial and organizational logics underlying the integration of personalization and customization technologies, as well as the organizational trade-offs associated with collaborative innovation processes.

2)   *Second Phase – Consumer Interviews*

The second phase focused on experienced e-commerce consumers who regularly interact with personalized and customizable digital environments. Participants were recruited using a snowball sampling technique (Glaser & Strauss, 1967), which facilitated access to diverse profiles while ensuring a sufficient level of familiarity with personalization mechanisms (Hassanein & Head, 2007).

Interviews, lasting between 37 and 76 minutes, were conducted following a flexible thematic guide structured around three main themes:

- Consumers' understanding of personalization and customization tools and their perceived role in digital exchanges.
- The evolution of the consumer's role in relation to brands or platforms within personalized environments.
- Perceptions of participation in innovation processes, whether explicit or implicit.

All interviews were audio-recorded, fully transcribed, and subsequently subjected to in-depth qualitative analysis.

Data were collected through nine semi-structured interviews with digital professionals and fifteen interviews with consumers with diverse profiles. The data collection process was continued until semantic saturation was achieved, as subsequent interviews did not yield additional insights relevant to the research objectives. A detailed overview of the respondents' profiles is provided in Appendix A (experts) and Appendix B (consumers).

B. Data Analysis Method

Thematic analysis was employed to analyze the collected data (Braun & Clarke, 2006; Clarke & Braun, 2017). This method allows for the identification of recurrent meanings while preserving the specificity of individual discourses. Its flexible and systematic structure makes it particularly suitable for identifying semantic patterns relevant to the research question and for capturing how personalization and customization practices are interpreted within collaborative innovation dynamics.

XXIII. DISCUSSION AND IMPLICATIONS

A. Personalization versus Customization

The interviews conducted with experts from diverse professional backgrounds, including digital designers, web developers, and e-commerce project managers, reveal a shared and well-structured understanding of personalization and customization mechanisms. Across profiles, respondents consistently distinguish between two distinct logics: an automated and largely invisible logic on the one hand, and a voluntary, user-driven logic on the other.

Personalization is described by experts as a background mechanism relying on the automated exploitation of behavioral data. It operates without explicit user intervention and is designed to remain largely unnoticed. Its primary function is to adjust content, recommendations, or navigation paths in ways that simplify decision-making and reduce cognitive effort. From this perspective, personalization is not meant to attract attention to itself, but rather to shape interactions discreetly by optimizing relevance and efficiency. One expert explains: "*Users do not necessarily notice the changes taking place, but they perceive that the system works better. Everything feels*

smoother and more coherent, even if they cannot identify exactly why."

In contrast, customization is associated with deliberate action and explicit choice. It allows users to actively configure specific elements of a product or service according to their preferences. Here, technology no longer operates silently in the background, but instead offers adjustable options that can be activated, modified, or disabled. Experts emphasize that this shift transforms the relationship between the user and the platform, moving from passive adaptation to active configuration. Customization is therefore perceived as fostering a more intentional and sometimes even creative interaction with digital systems.

These distinctions are echoed in the accounts provided by the fifteen consumers interviewed, who represent diverse profiles including students, young professionals, self-employed workers, and retirees. Most participants recognize the usefulness of personalization for its capacity to save time, reduce search effort, and improve the relevance of available options. "*The products shown to me usually match what I am looking for. It saves me a lot of time and avoids long and unnecessary searches.*" (Respondent 5)

At the same time, customization is associated with individual choice and autonomy. Several consumers highlight their appreciation for being able to adjust filters, display parameters, or configuration options independently. "*I like being able to make adjustments on my own, without the system deciding everything for me.*" (Respondent 2)

Taken together, these findings suggest that personalization and customization correspond to different, yet complementary, modes of interaction. While personalization operates through automated adjustment, customization relies on explicit user input. This distinction plays a central role in shaping how innovation pathways are structured, as it determines the types of signals generated and the degree of intentionality behind user contributions.

B. From Individual Adjustment to Collaborative Innovation

One of the most significant findings of this study concerns how consumers perceive their own contribution to innovation processes. Many participants report having observed changes in their usual e-commerce platforms over time, which they implicitly attribute to their past behaviors, choices, or feedback. Even in the absence of direct communication, this perception of influence contributes to a sense of informal collaboration. "*After leaving a negative review, I noticed that the recommendations seemed to improve. I cannot say for sure that there is a direct link, but the suggestions felt more relevant afterwards.*" (Respondent 9)

This perception reflects a subtle yet important shift: users begin to view their routine actions not only as consumption behaviors, but also as signals that may shape future developments. Experts confirm this interpretation, emphasizing that even the most implicit forms of user behavior represent valuable inputs for continuous improvement. "*Every applied filter, every click, and every rejected recommendation provides information. Even without explicit feedback, these signals help refine the system over time.*" (Web Developper)

Beyond explicit feedback mechanisms, such as reviews or ratings, experts highlight the growing importance of behavioral traces generated through everyday use. These traces are continuously captured, analyzed, and reintegrated into design and development cycles. As a result, innovation emerges less as a discrete event and more as an ongoing, iterative process embedded in routine interactions.

This mechanism sheds light on a form of collaborative innovation that differs from conventional co-creation models based on workshops, crowdsourcing initiatives, or formal participation programs. Instead, it reflects a form of "silent" collective intelligence, in which innovation is gradually shaped through aggregated and often unintentional contributions. From this perspective, personalization and customization function as interfaces between individual actions and organizational learning processes.

Importantly, experts emphasize that strategic challenge does not lie solely in data collection, but in the organizational capacity to interpret and mobilize these signals. Translating dispersed micro-actions into meaningful design decisions requires coordination between technical teams, marketing units, and innovation managers. When such coordination is achieved, personalization and customization become powerful levers for collaborative innovation, allowing firms to integrate user-generated signals into continuous cycles of experimentation and adjustment.

XXIV. CONCLUSION AND PERSPECTIVES

This study highlights a clear and structured differentiation in the ways digital personalization and customization tools are perceived and experienced by both consumers and professionals. Although these two forms of individualization rely on distinct technological principles, they do not appear to be contradictory. On the contrary, they operate in a complementary manner, each contributing differently to value creation within digital environments.

Personalization primarily operates in the background, characterized by its discreteness, fluidity, and seamless integration into digital systems. It relies on automated mechanisms that infer preferences without requiring explicit user input, allowing platforms to adjust content and offerings in a continuous manner. This form of adaptation contributes to efficiency by reducing cognitive effort and facilitating smoother interactions. Customization, by contrast, introduces a dimension of intentional choice and individual expression. It enables users to actively configure certain elements of products or services, thereby positioning them as contributors to the shaping of the offer. This form of involvement is closely associated with a stronger sense of control and appropriation.

Together, these two dynamics shed light on complementary dimensions of digital innovation. While personalization supports efficiency through invisible adaptation, customization fosters explicit contribution through deliberate intervention. The findings suggest that collaborative innovation does not rely exclusively on formal participatory mechanisms. Instead, it can also emerge through incremental adjustments informed by the observation, interpretation, and integration of users' micro-actions within continuous improvement processes.

One of the main contributions of this research lies in its emphasis on the interpretative role of digital interactions within collaborative innovation dynamics. Routine actions, often perceived as trivial or unintentional, may acquire strategic significance when they are systematically captured and translated into design or development decisions. In this sense, users may act as indirect contributors to innovation, even in the absence of explicit collaborative arrangements.

Nevertheless, this study presents several limitations inherent to its exploratory nature. First, the size and composition of the sample limit the generalization of the findings. Although the sample is diverse and theoretically grounded, the results cannot be extended to all digital consumers. Second, the study focuses on B2C visual environments, such as fashion, home décor, and technology, where interaction and configuration play a central role. Different patterns may emerge in B2B contexts or in services characterized by lower levels of visible interaction.

Future research could build on these findings by testing the identified mechanisms on a larger scale in order to assess their robustness and managerial implications. In this respect, the use of mixed or quantitative methodologies would be particularly relevant. More broadly, this study opens avenues for further investigation into emerging forms of participation in innovation within personalized digital ecosystems. It also invites practitioners to reconsider personalization not only as a tool for optimization or conversion, but as a strategic lever for fostering collaborative innovation.

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