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Co-Creation and Connectivity: The Role of Consumers in Digital Ecosystem Evolution

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Abstract

In this paper, we examine a pivotal phenomenon in contemporary consumer behavior: the evolution of digital ecosystems in which a multitude of consumers co-create value and innovatively interact with each other and firms. We analyze this phenomenon through the empirical investigation of national consumer co-creation networks in 11 European countries as part of a transition to a digital ecosystem in shareable citizenship. The paper contributes to the literature on platform ecosystems and their evolution by explicitly addressing how ecosystems evolve among consuming agents and highlighting the role of a novel form of connectivity (the notion of shareable citizenship) as a resource of consumer co-creation. Integrating insights from the literature on systems competition, ecosystem evolution, and consumer role theory, we develop a theoretical framework to interpret the empirical findings. The paper concludes by discussing practical implications and presenting ideas for future research.

With the expansion of digital platforms throughout the economy, consumers are increasingly viewed as actively co-creating value and innovating within ecosystems of interacting agents. As highly networked actors, consumers not only enrich or co-create platforms with their contributions but also collectively co-create the rules and designs that shape the platform ecosystem. This growing role of consumers in the emergence and evolution of digital ecosystems has direct implications for the effective management of such ecosystems, not only by firms but also by consumers and institutions.

Consumers interact with firms and other consumers and play a co-creation role, i.e. are involved in one or multiple aspects of value creation involving digital platforms. This research was motivated by the observation of how networks of European consumers emerged in recent years to collectively combat platformization and the excessive power of a few technology firms. Exploring the co-creation roles of consumers in the context of a nascent digital ecosystem led to the discovery of a new type of connectivity: network-level co-creation across a multitude of actors. Insights from this research may not only be of relevance to understand the co-creation of value among consumers but also more generally to understand how digital ecosystems emerge in the broader realm of interactions among government, business, and society.

Keywords: Co-creation, Consumer engagement, Digital ecosystems, Connectivity, User participation, Innovation, Value co-creation, Network effects, Digital transformation, Platform economy, Consumer empowerment, Collaborative innovation, Online communities, Social media interaction, Customer-centric design, Digital collaboration, Participatory culture, Technology adoption, Data-driven innovation, Open innovation

1. Introduction

The emergence of new marketing channels that facilitate individual-level communications and transactions has transformed the nature of the interactions, relationships, and exchanges between consumers and firms. On the one hand, consumers gain unprecedented control over many aspects of the value creation process. On the other hand, cheap and ubiquitous publicity gives rise to a communication overload, and transaction opportunities explode. Together, these technological and social changes threaten to overwhelm firms and destabilize their marketing strategies. Despite the wide-spread enthusiasm with which the new marketing opportunities are embraced, the question remains whether and how firms can cope with such profound upheaval. Certainly, consumer side developments can create a living hell from a firm perspective, characterized by an incessant stream of consumer deviance that is broadcasted worldwide.

Recent technical advances in computer technology and the Internet have opened up a new domain of communication, information, and transaction possibilities. In reality, an immense variance in marketing channels exists along a continuum of considerations. Some channels facilitate only unilateral firm-to-consumer communications, while others allow bilateral consumer-to-firm interactions. At the extreme, some channels support faceless mass communications and interactions among many individuals, while others restrict interactions to a small set of recognizable individuals

social interaction strategies providing businesses with users' feedback and behaviour data. Nevertheless, the complex interplay of users and professionals as it relates to business dynamics highlights the issues of motivation and responsibility and consequently of different perceptions of ethicality and legality. When consumers act in public forums on behalf of an existing company, their views are either regarded as brand perceptions or as the brand's initiative to gain corporate legitimacy. When individuals are treated as both consumers and prosumers searching, swapping, migrating, modulating, and reviewing mass, niche and long-tail media, once frozen, but now digitised, augmented and performative their thoughts will progressively take over public online spaces.

In such spaces everything is "out in the open" and subject to ethnographic and analytical scrutiny and the underlying frame of reference is as equally manipulated as the drawn and the projection. A behavioural genre has emerged of overseeing otherwise private and casual everyday conversations. Published outrages and demonstrations of indignation or of public praise or devotion seem to have become core elements of social rituals. Should these rituals be altered or terminated, simulated or neglected it is certainly globally open to discussions and interpretations. However, it remains to be observed whether and how this meta-mediation stage influences co-creating consumption and mainstream consumption and production networks, and their interplay connecting thus locally emergent actions and tasks, and prefiguring, but not necessarily digital drift or scatter of narrativity sector-specific semiotic encasements of established commercial TV channels, news media, user interface design of web platforms, and more generally marketable curated and aggregated information and experience flows. In this semi-open systems approach societal structure is conceived as a dynamic between shaped action and acting subject, in which the first concepts attention mechanisms, centre of gravity, emerging structure and enacting action are prior in analysis and description. This approach directly relates to modelling and simulation and the exploration of socially emergent structures in naturalistic and behavioural research.

Eqn.1: Co-Creation Contribution Index (CCI)

$$CCI = \frac{C_u + F_u + I_u}{N}$$

- C_u = Consumer-generated content contributions (e.g., reviews, posts, designs)
- F_u = Feedback provided (e.g., ratings, surveys)
- I_u = Ideas or innovations submitted (e.g., feature suggestions, community voting)
- N = Total number of users

2.2. Types of Digital Ecosystems

Digital Ecosystem is defined as an open, loosely coupled, domain clustered, demand-driven, self-organising agents' environment, where each specie is proactive and responsive for its own benefit or profit [2]. The species are the entities with common interests that participate in the digital ecosystems. These contain biological species such as people, economic species such as organizations and digital species such as software, hardware and applications. The environment refers to the underlying technologies and services that support the digital ecosystems. Additionally, the species are the providers and consumers of the technologies and services.

The digital ecosystems constitute a widespread computing environment comprised of heterogeneous, geographically dispersed and ubiquitous species, technologies and services. From the perspective of services, the species can simultaneously act in the role of service provider and service consumer. One direct consequence of the features of the services is that it is difficult for a service consumer to precisely and quickly retrieve a service provider who can provide a requested service [3]. One reason for this problem is that the service information in the web is ambiguous and interspersed with other information such as product information. Another reason is that the service information in the web is heterogeneous without a mechanism for the classification of the service information. In order to solve the problem, the digital ecosystems propose a service factory by means of which service providers can publish and classify their services when entering the environment. The digital health ecosystems, as a domain within the digital ecosystems, also inherit the similar defects. Health service information in the digital health ecosystems is ambiguous and heterogeneous without sufficient supports for service discovery and classification. Therefore, in this research, we are concerned with health service discovery and classification by means of service information disambiguation.

3. The Concept of Co-Creation

The emergence of web-based technologies has radically influenced communication and interaction. Individuals can now communicate directly across large distances and share their experiences with others, making customers and stakeholders increasingly involved in product and service design. The majority of web-based technologies are changing both the underlying processes and marketing practices of some organizations and the relations between organizations and customers. During innovation co-creation, customers take an active role in adopting and applying new ideas, processes,

products, or procedures. This study carries out case studies of innovation co-creation in a highly active and participatory environment, virtual worlds. The study describes new evolving technologies that allow customers to voice their experiences and needs in meaningful ways and to create specific product content. It explores collaborative processes involved in innovation co-creation and presents an analysis of behaviors that facilitate innovation co-creation in virtual world projects. Practical recommendations for users and designers to support innovation co-creation in virtual worlds are given [4]. Industries have become significantly more volatile and competitive, and the fast pace of change in consumer markets poses continuous challenges for firms. In many industries, products are becoming more customizable, and even mass market consumer products are influenced and directed by the specific attitudes and behaviors of a small number of so-called opinion leaders. As a result, organizations cannot thrive independently and ignore other actors' viewpoints, preferences, and expectations anymore. Actors within organizations' environments, also referred to as stakeholders, are interdependent and a co-evolving environment needs to be created. An organization's stakeholders are co-creators of the organization's environment. The main actors in this environment are organizations and consumers. Organizations are confronted with uncertain demand, an increasing number of reproduction and distribution issues, a growing number of rivals, and escalating efforts to obtain consumers. These environmental changes are forcing organizations closer to consumers; co-creation is seen as a necessary activity. Here, co-creation refers to the collaborative and iterative process that focuses on the value-in-use for certain actors. In the marketing literature, co-creation is commonly studied regarding the central question whether and how to involve consumers in value creation processes.

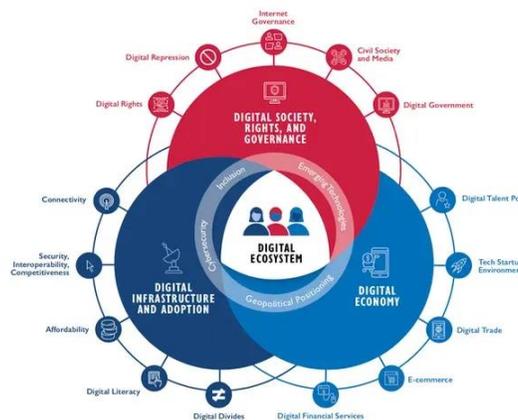


Fig 2: Digital Ecosystem

3.1. Defining Co-Creation

Topic of co-creation has gained significant attention from practitioners and researchers over the last decade. Co-creation occurs when value is generated through the interaction between a provider and the user. Value co-creation is based on engaging value-creating users directly through the provision of concrete skills and tools for the analysis and reuse of resources. This actively engages the user as a co-creator of value, both directly in tangible processes and indirectly as a partner in ideation processes, equal to and in conjunction with the provider. In recent years, the emergence of the digital economy as a new collaborator in behaviour and business has radically altered how firms and consumers interact with each other. The digital economy includes digital consumers and new digital tools such as search-engines, social-mapping, or service recommendation systems. These new technologies facilitate new value creation in the firm-consumer/competitors/partners triangular interaction web that implies new analysis, new logic, new actions, and responses from consumers and firms alike, thus posing new challenges and opportunities for all actors involved in the interaction web.

It is clear that along with the provision of new tools and technologies, also new behaviours from consumers, designers and firms in the overall interaction web are employed to create new value. Within this transformation, the nature of firms, services, service systems, and their relationships with one another and consumers is in a process of co-evolution. The concept of value co-creation provides an excellent analytic tool for studying this co-evolution and connectivity in a wider and richer perspective. Value co-creation has two dimensions: definition and connectivity. Co-creation is a polymorphic concept with numerous dimensions and definitions. A search for the definition of co-creation in academic databases yielded hundreds of academic papers. Value co-creation is based on engaging value-creating consumers directly with producers in the creation of value. This refers to the process during which consumers take an active role and co-create value together with companies [4].

3.2. Historical Context

The interaction of organizations and consumers mediates the constant restructuring of exchanges, leading to new forms and networks of value creation. Standardized, homogeneous resource and labor markets have evolved over time into a pluralistic, fragmented economic ecosystem populated by diverse forms and types of interactions and exchanges. Economic and technological evolution has yielded new opportunities for actors

to connect with specific resources, value-generating forms, and content through a diversified range of venues and modalities with minimal restrictions. A conceptual framework for the study of the recontextualization and constant evolution of these consumer-centric, decentralized, nonlinear, heterogeneous initiatives is proposed; a model that captures the co-evolution of actors and the structure of the ecosystem in which they connect and interact. The emergence of digital ecosystems or platforms has facilitated connectivity between organizations and consumers, enabling their interaction whereby they co-create new resources that are exploited by the corresponding ecosystem. These digital ecosystems are typically large, complex social systems composed of heterogeneous elements and structures with complex connections. The development of digital ecosystems is governed by self-organization, emergence, and resilience. Co-creation initiatives vary in their connectivity and consumer involvement across the dimensions of density and richness of interactions [1]. Efforts to pilot an initiative with a spectrum of connectivity and involvement are suggested.

Digital ecosystems comprise a large number of loosely connected components, customizable venues of connectivity, and interactions among a variety of heterogeneous actors. By constituting a connectivity venue devoted to consumers' interaction, organizations enable consumer-centric content creation and access new engagement opportunities with consumers for resource utilization. New internet connectivity approaches also provide an opportunity to test co-creation at the level of a mass gathering (or a mega event). This chapter addresses the unevenness in intensity and types of connectivity and engagement across a diversity of venues and resources. Like networks, ecosystems evolve through the emergence of new nodes or venues and new links or interactions, which react on interactions recursively and, ultimately, shape the emergence of the whole structure. Though perhaps inaccurate to describe the emergence of connections as growth in an organic sense, the emergence of a diversity of new connections due to how actors/interactions recombine existing elements is akin to growth processes in social systems [5].

3.3. Benefits of Co-Creation

The question of why co-creation in digital ecosystems is necessary can be answered from several perspectives. First, on a cultural level, in many ways, sharing is the new purchasing. This results in an abundance of information concisely enabling better decisions, more flexibility and choice, new social relationships, and greater stimulation. Brands can create utilitarian value via the creation of relevant content, experiences, tools, and expertise for consumers [4]. This can be achieved through either entertaining or helpful stories, liking, and via great experiences, companionships, relationships or a sense of community.

Altered social expectations create pressure on organizations not just to keep pace but to connect and co-create with the consumer. The emergence of new types of brands demonstrates the prevalence of this trend. All these brands have shifted from a firm-centric perspective to platforms and scripts where orchestrators offer infrastructure and where users are invited to together shape markets or services. In digital ecosystems, economies become more connected, involving sensors and public data, platforms, organizations, and consumers, calling for management of the interplay between data ownership, security, and open access.

Second, on a practical level, an increased number of brands promote multiple forms of consumer participation and co-creation. This includes content and idea sharing, virtual teamwork, co-funding of new innovations, collaborative experiments across organizations, and competition and voting between decentralized proposals. All these forms consist of a variety of encounters and interactions on four levels: the brand, the service, the artifact, and the experience. Organizations have a growing interest in understanding how these new value co-creation opportunities can be harnessed via new strategies and new forms of dialogue with stakeholders.

4. Consumer Roles in Digital Ecosystems

To understand the role of consumers in digital ecosystem evolution, an ecosystem perspective on consumer involvement is required. From this perspective, consumers are considered relevant ecosystem actors and their participation depends on their attributes, ecosystem attributes, and involvement mappings. First, the concepts of consumer and ecosystem actors, and the classic actor-resource-activity framework as well as its augmentation into an ecosystem perspective are formalized.

Second, based on this framework, consumer roles in the co-evolution and connectivity of ecosystems are established based on four consumer roles: supportive consumer, content consumer, resident consumer, and champion consumer. Next, the mapping between consumer and digital ecosystem characteristics clarifies co-evolution expectations and outcomes. Finally, several avenues for future research are proposed.

Definition of consumer and ecosystem actors: An actor is defined as a self-contained entity of distinct boundaries that can utilize resources and perform activities independently. A resource is a fundamental input for an actor-performance activity or a potential for an actor to utilize. An activity is a set of actions and interactions to transform resources into services. Here, in sum, an ecosystem actor refers to either firm or consumer actors, while a digital ecosystem actor refers to a firm or consumer actor in a digital ecosystem context. The literature has noted that digital technology and the related modern-day firms have empowered consumers to connect through digital platforms [1]. Role mapping between consumer characteristics and digital ecosystem characteristics is described.

4.1. Active Participants

Digital ecosystems only exist when participants agree to share some information or other resources [4]. Although the need for agreement implies governing mechanisms, current research presumes their existence. While rules-in-use or coding are indeed crucial, they are not, however, sufficient. The eventual success of digital ecosystems will depend, at least in part, on their bound and glue aspects of connectivity. Effective governance should ensure that these aspects support open access while deterring exploitative strategies by developers that undermine connectivity and create digital deserts. There are two facets to this challenge. On one hand, ecosystem developers face the double challenge of being competitive and collaborative. Most are hardly equipped with the prior and tend to favour monopolistic strategies that undermine the latter. On the other, governance relies on actors that have little incentive to create digital ecosystems and who lack the competencies to do so.

To avoid falling into the ‘tragedy of the digital commons’ that threatens the success of digital ecosystems, an understanding of how to co-create governance, particularly boundedness, and glue is necessary. The experience of the data ecosystem illustrates how this outcome can be achieved. What started out in 2010 as an exploratory attempt to use compatibility and middleware to foster the emergence of a data ecosystem led to a continuously evolving governance structure that is currently forming the glue for a complex, diverse, competitive, and creative landscape of over 100 software service providers, utilizing open-source, proprietary, and mixed software products, and a variety of collaborative practices. Its emergence relied heavily on the engagement of stakeholders who recognized the need for an ensuing competitive collaborative landscape and who collectively elaborated working rules and supporting peer-to-peer practices that have since evolved and adapted to changing circumstances, successes, and failures.

The emerging governance structure is, however, heavily dependent on its champion. To understand the current challenges of governance, it must be recognized that this role is at odds with investment in a competitive offering. All services must be on par with others to avoid creating a digital desert that drives away potential participants, questioning the motivations and incentives to create a digital ecosystem in the first place. The implications of this predicament for the future of the data ecosystem and, generally, for the governance of digital ecosystems is reviewed.

4.2. Feedback Providers

Although co-creation is often spoken of at an abstract level as a firm-integrated value co-creation process, it must be concretized in its scope to be properly understood. In particular, co-creation can differ in the manner in which the consumer participates in the process (i.e., consumer input) and the extent to which the consumer is involved in the production of the product (i.e., consumer integration) [1]. The former results in differing levels of consumer interaction with the systemic entity and, depending on the level of input, differing consumer evaluations of the co-created product. The latter, which must be distinguished from consumer input to the co-design process, has to do with the process (as opposed to the product) outcomes of co-creation. This more implicit understanding of consumer participation in the co-creation of value is not yet sufficiently articulated in the scholarly literature on co-creation in digital ecosystems.

Digital technology has made it possible to have more flexible interactions between a consumer and a firm than was previously possible. In the past, there was already consumer participation in a firm’s production process, but there were typically only one or two possible consumer-specified attributes, preventing truly individual products from coming into existence. Second, co-creation has enabled not only a firm-integrated co-creation process in which a consumer participates actively in determining the final product, but one in which consumers design their own product or service online according to their preferences, through a more or less firm-integrated co-design process.

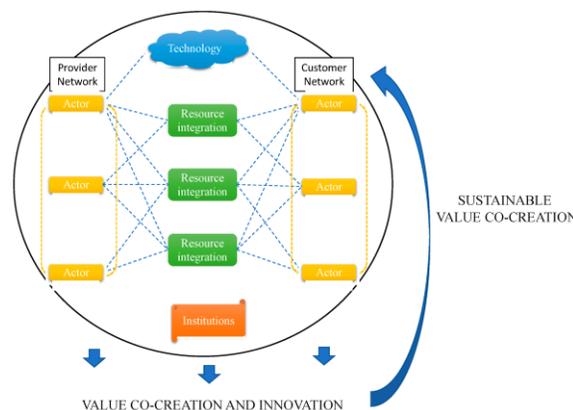


Fig 3:Sustainable Value Co-Creation

For a firm's success in generating value co-creation, it is not only necessary to facilitate the consumer's co-design efforts by providing a user platform, it is also crucial to create a wider and richer digital ecosystem in which consumers can experiment with and test their (and others') designs or applications. One important outcome of a co-creation process is the input of a consumer regarding a firm's production of a product. The form and extent of this input can differ across contexts, varying from mentioning a few purposes or goals regarding a product, to specifying some product attributes, to providing an exhaustive description of the complete complex product or service desired.

4.3. Content Creators

Consumers take different roles in co-creation process in digital ecosystem. They can be classified into four categories: co-creating users, data creators, service evaluators, and content creators. Co-Creating users are the users actively engaged in developing digital services as developers, testers or improvement providers. Typically, they are technical-savvy users or programmers. In the evolution process of the digital ecosystem, some users act as co-creating users of the digital service developers. They may take several roles in co-creation process. Some users develop services on the existing platform, some conduct tests before the service is formally released, and some provide suggestions to help improve the service.

In addition to co-creating users, all the users of a digital service generate various types of data concerning service usage, which become the digital footprints or by-products of the service usage. These data are typically called usage data or user-generated data. User-generated data are produced automatically and unplanned. A group of experts involving service usage analysis, data mining, machine learning or statistics analyze user-generated data and then use information extracted from this analysis to help improve the existing service or launch a new service that better fits service types and user needs. This completely passive process is also very common in the evolution of digital ecosystem. For instance, the recommendation algorithm of e-commerce platform is improved continuously over time, based on the huge amount of usage data collected from users.

Service evaluators are consumers who only perform evaluation on the service to provide ratings or reviews. They do not create any new contents. Content creators are users who play an active role in co-creation of contents, which is elaborated below. In the digital ecosystem, content creation is indispensable, and users are the fundamental sources of multimedia contents. With the emergence of social media platforms, contents generated by normal users have soared. On these platforms, content creators upload their own creative contents and seek viewership, subscribing audiences, and building connection with the viewers. The content development is participative and interactive. As a response to the online contents, viewers may express opinions through comments, like, dislike, or share it to generate secondary contents such as parody, remixes, or responses.

5. Connectivity in Digital Ecosystems

Digital ecosystems consist of a set of interconnected organizations and individuals that share complementary assets, resources, and capabilities. Connectivity refers to the specific ways in which different participants within a digital ecosystem communicate, interact, and share information with one another. Connectivity can encompass a wide range of activities, including the exchange of messages, the sharing of data and knowledge, and the collaborative development of new products and services. In particular, connectivity can take several forms, including one-to-one interfaces that allow direct communication between individual participants, one-to-many interfaces that enable the dissemination of information to a broader audience, many-to-many interfaces that facilitate collaborative interactions among multiple participants, and feedback loops that allow for the continuous exchange of information and ideas [6].

The rapid evolution of the internet and digital economy over the last three decades has ushered in profound changes in the global economic landscape. Industries in every corner of the world are turning digital, undertaking large-scale transformation initiatives towards smart products, services, interactions, and decision-making processes. Traditional industry value chains are converging into digital ecosystems that generate new competitive dynamics characterized by winner-take-most effects. Industry incumbents are striving to leverage information and communication technology and data to remain relevant, and new entrants are rapidly establishing themselves as formidable competitors. Accordingly, innovation management – traditionally viewed as a process that firms undertake to create differentiation – is increasingly viewed through a collaborative lens. Firms in the digital economy are now seen as part of broader innovation ecosystems, beyond the dyadic producer–consumer relationships at the basis of the firm-centric view of innovation management [4].

The premise is that co-creation holds the key to understanding innovation management in digital ecosystems. Drawing on insights from literature on co-creation at the consumer-firm interface, the existing literature illustrates that this collaborative lens also applies to understanding knowledge creation at the firm-ecosystem interface. Co-creation refers to the active involvement of consumers in innovation activities traditionally undertaken solely by firms. While firms in traditional industries could protect their innovation processes from consumer influence, firms in digital ecosystems must embrace collaboration as their innovation management processes evolve.

5.1. The Importance of Connectivity

Interconnected consumers create social connectivity; as a result, brands can develop thousands of social connections consisting of various communities. Different communities develop among consumers, some of which can be subcultures that drive the evolution of a brand. Consumers become an emergent element of a brand's ecosystem by joining different groups. These emergent connections can start new interactions that create innovation signals for the co-creation ecosystem [4]. Brands can also embrace these new consumer interactions and connect new elements from different ecosystems, causing radical change.

Eqn.2: Connectivity Factor (CF)

$$CF = \frac{E}{U(U - 1)}$$

- E = Number of active connections or interactions among users (e.g., messages, collaborations, follows)
- U = Total number of users

Disconnected consumers weaken social connectivity. The brand ecosystem loses members, and therefore, communities become smaller. Over time, cases when co-creation had been observed tend to drift and cannot be sustained anymore. If the feedback remains disconnected, the brand cannot exploit the co-creating connections, and their role for a brand fades from a sensory point of view. Brands become isolated and disconnected from their ecosystems. As a result, the brand develops a narrow focus, leading to simple and easily applicable strategies. Should feedback remain disconnected, the connection with the coastal ecosystem may stay closed, leading to insularity and old-age decay. Without new signals from the outer social layer, brands develop symbiotic perceptions of a shared world view with the co-creation network. Brands become the keystone and by the gradual extinction of several consumer communities [5].

All consumers are thought to be either connected or disconnected. If they are to become connected, there must be at least one interaction reaching each consumer; if they are to become disconnected, there must be at least one interaction starting from each consumer. Steps towards connectivity and disconnectivity can occur in both ecosystem types. If these steps persist long enough, consumers will lose their connections to a brand ecosystem altogether and can no longer connect to it. Co-creation and commentary have been observed before, but never in so many brand ecosystems at once. During the evolutionary step, there were extensive discussions within the communities about the nature of co-created outputs (brands and implementations) which tested consumer interest, and several alternative scenarios were articulated about the future of brands.

5.2. Technology's Role in Enhancing Connectivity

Consumer technology plays a pivotal role in enhancing connectivity by creating virtual spaces and facilitating relationships both between firms and consumers and within consumer consumers. The concept of connectivity refers to the resources and capabilities that enable interconnections directly or indirectly among firms and consumers [7] and, some scholars argue, it could also be viewed as relationship quality [1]. Knowledge will become more and more dynamic with an increasing number of possible sources and mechanisms of creativity, interaction, and exchange. Opting for a connectivity-enhancing strategy will be more about continuously designing and operating the information system than designing firm-specific platforms. With respect to modeling purpose, thus creating consumer-connection varieties will become pivotal.

A first group is the so-called co-production enhancement technology, which creates a connection directly between firms, as well as consumers-consumers and firm-ecosystem. It encompasses several social media, technologies, and market screening/knowledge arena techniques by which direct connections and low-entry barriers are provided for content creation, aggregation, co-creation, and sharing. Currently, the remarkable outcome is enemy consumer conglomerates and super-aggregators whose arguments against firms are hard to catch and counteract outside a costly litigation route. On the public-good character of outcomes and knowledge assets, the challenger holds unproportional abundance and positive disutility (like targeting contestants in the rumor industry). On the other hand, with the exponentiation of co-creation, more and more services will suffer consumer saturation. In that direction, overturning the public character of co-created knowledge is another aggregation/appropriation route worth exploration.

A second group is the so-called value-creating enhancement technology, broadening the aptitudes of firm-ecosystem technology to collectively create value (like consumer profiling/screening techniques), market screens, and aggregate-firm branding pathways. Spelling out potential varieties of these value-creating technologies, it should be noted that even with non-adaptive knowledge, ongoing tensions will remain, especially within a multi-firm/eco-systems environment. Here again accuracy, credibility, and rivalry will be needed to cope with and counteract the strongest consumer, or significant competitors. A potential outcome will be so-called legal consumer mingling capabilities, which only attach slightly so as to distort profiling.

6. Case Studies of Co-Creation

Transformation in means, contents, motivation, forms, organisation, and processes of co-creation has been brought about by digitization trends in service innovation. For citizens in the consumer ecosystem, daily routines of commuting, securing educational paths, and shopping, as well as interactions with services, speeds up co-creation. Integrative consumer co-creation capabilities enhance resource integration and improve innovation performance by the demand side of the ecosystem. It is found that challenges and enablers exist both on the firm side and the consumer side concerning the development of integrative consumer co-creation capabilities in ecosystems. New strategies and platforms for consumer participation in service co-creation are hinted for scholars and practitioners. It is contended that it is now time for consumer-oriented co-creation research, focusing on technological empowerment and opportunities for enhancing consumer participation in co-creation, as well as values, risks, and harms caused by the top-down orchestrating and manipulation of consumer co-creation processes.

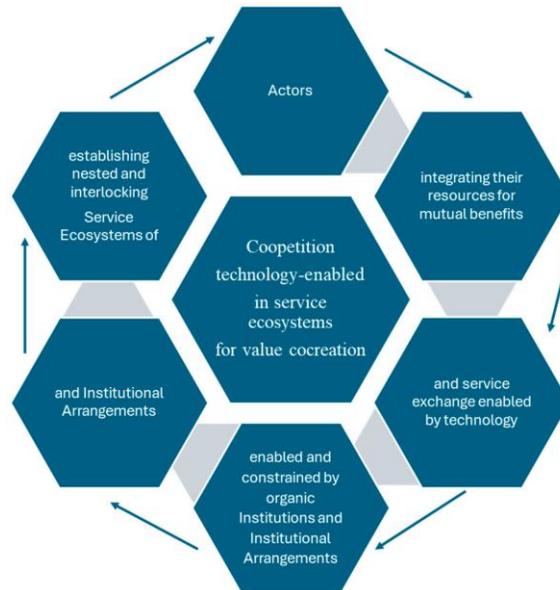


Fig 4: Value Creation in Technology-Driven Ecosystems

There is a wide spectrum of possible consumer co-creation pursuits found on the literature. Beyond study projects integrating co-design, an important factor influencing co-creation parameters is the form of consumer engagement employed in the use context. Before determined by firms, modes of engagement are becoming more fluid and less deterministically organised by firms in a fast-evolving digital service arena. Concepts in the consumer co-creation mode, ranging from participation and mass collaboration to crowd-based engagement, are characterised, and meta-dimensions explicated. Six co-creation forms are distilled for more nuanced future research. On-going transformation in consumer co-creation forms is documented and graphically represented in an adaptive taxonomy. Possible research strategies for studying these evolving forms are suggested. It is claimed that consumer co-creation, as a closely knit fabric of certain co-design behaviour modes and affordances embedded in the artefact, context, and ecosystem, is an essential driver of the new consumer-centric platform economy [4].

6.1. Successful Examples

The rising role of consumers in Internet-based markets was advanced and corroborated via several successful examples of consumer innovation in social media, open source software design, consumer flight cost prediction, and gaming. When a firm attempts to introduce innovation via internal expertise or hired innovations the failure rate is typically in excess of 90%. Introduced well, consumer co-created innovations for games via game mods or social media were building blocks that greatly impacted firm success. The effectiveness of consumer-driven innovation and collaborative innovation was affirmed in specific cases, while vetting interaction producers were identified. New technologies globally uplift consumer activism and the likelihood of such innovation. The source of identified consumer innovation in both specific cases, broad outcomes, gating, and issues were defined. Many cases of consumer-led innovation are prominent in literature and as socio-technical systems demand further elaboration. In newly evolving complex systems such as digital platforms a finer temporal granularity of concepts was suggested to account for emergent behavior. The absence of canonical underlying models for interaction and composition rules for independent innovation was noted.

Such systems of creation and connectivity at a previously unattainable level elevate the role and position of consumers in digital ecosystems. In a short period of time engaged by an order of magnitude, more motivated co-creation than in the firm-consumer interaction observed in earlier times was experienced. Evolving complex codebases engender resulting difficulty for censorship in web 2.0. Controlling autonomy limiters for consumer content was considered in the very early creation of web 2.0. Tactics were discussed and suggested at multiple temporal resolutions from gating prior

to publication to vetting the publication and having flagged programs. Interactive-competitive infrastructures for distributed interaction and massive user created content were considered. Threats such as self-censorship, the public perception of loss, and the unanticipated consequences of global abundance for firm over-dependence on consumer creativity requiring their direct interaction were also described.

6.2. Lessons Learned

The digital age has significantly shifted the positioning of consumers, whereby they are more than just passive observers, receiving marketing messages [5]. Digital services allow brands to be integrated into consumers' everyday lives, focusing on establishing interactions and attachments with consumers to enmesh themselves into their lives. They allow an increasing amount of data to be provided by consumers in the lifestyle context. These data can be processed to gain insight into consumers' lives, establish interactions with them, and provide a service that connects to their reality. Consequently, the interconnectedness and high levels of transparent consumer-generated content online create rich opportunities for value co-creation through ongoing adaptations to the consumer behavior of brand-entity interactions, ownerships, and practices [1]. Consumers become co-producers with firms and are actively involved in the construction and reconstruction of products, services, and brands.

Less influenced by brands' agendas, they may profess contrasting meanings and produce and share consumer-generated content, shaping other consumers' perceptions of consumer journey constructions and firm-consumer engagements in performing the consumer experience. Dissatisfaction may even lead to negative consumer experiences. As the social boundary defining the consumer experience becomes permeable, the boundaries of digital ecosystems extend. Different digital entities, usually operating in different stages of the consumer experience or across consumer and product boundaries, can now interact with the same consumer. To be able to continue the consumer experience and share interactions or data across entities, a level of alignment needs to be reached. As this shift in power dynamics between firms and consumers is unforeseen and ever-evolving, few established perspectives on addressing the complications brought about by the extended boundaries of connected ecosystems are provided.

7. Challenges in Co-Creation

The emergence of web-based technologies has radically influenced the ways in which individuals communicate, represent themselves, share ideas, and otherwise interact with one another. This has allowed for new means of communication and information transmission that do not require media that are part of the physical world [4]. In recent years, attention has shifted from organizing information to organizing interactions. More precisely, emphasis is moving towards the efficiency, effectiveness, and equity of communication. With this in mind, web-based applications are enabling people to communicate directly and shape their own experiences. Customers and stakeholders are increasingly involved in the design of products and services. During innovation co-creation, customers take an active and creative role in adopting and applying ideas, processes, products, or procedures that are new to the adopting organization. The emergence of web-based technologies is radically influencing the ways in which individuals communicate, represent themselves, share ideas, and otherwise interact with one another. Virtual worlds are computer-generated spaces in which individuals, represented by avatars, can communicate, interact, and engage in social activities. They allow for highly active and participatory forms of communication, interaction, and creativity.

7.1. Consumer Resistance

The significance of understanding consumers' involvement and power within the Internet of Things (IoT) era can be seen through the opposing forces of co-creation and consumer resistance. The convergence of information and communication technologies has reshaped how firms engage with their markets, extending their brand ecosystems, fostering collaboration with consumer communities, and enhancing value generation. However, the rapid emergence of linked products is causing resistance and brand switching, as consumers regard firms as having breached trust and a subjected to unsolicited surveillance of their behavior [1]. Lock-in derails co-creation by driving consumers to abandon brand ecosystems or produce inappropriate anticipated experiences for other users. While prior literature focusing on co-creation describes the mechanisms used by suppliers to integrate consumers into the innovation process, there is a gap regarding the consequences of consumer resistance and potential countermeasures to what they perceive as breaches of the supplier-consumer relationship.

Industry partners have expressed great interest in understanding how involvement in the co-creation process is translated into positive determinants for the brand, thus evoking consumer resistance on a subjective, implicit, and individual level. Collaborative model of co-creation, connectivity, and co-evolution of co-creating events, representations, and connective intelligences should be regarded as a new form of digital consumption, in which consumers are no longer regarded as passive audiences, and offer novel opportunities for brand research [5]. Brand managers should seek to understand how these changes impact their brands' searchability, listenability, and appreciability. By gaining an understanding of consumer resistance as a search, cognizing, and sense-making process, brand managers can take proactive measures to constructively disrupt evolving

constituencies by proposing consumer-proposed responses that complement existing practices. Best-practice solutions from the co-creation side should be adapted for the resistance side.

The community of consumers transforming into brand advocates is intriguing. Different meanings of a brand can emerge through disparate co-creating acts, raising the question of the persistence and credibility of brand-human co-creations. Understanding the origins of brand consumer resistance as qualitatively different from former brand mis-management and ultimate brand switch should accumulate insights into its temporal persistence and lead to constructively resolving it into situations of co-evolving brands. As the entities of brand-consumer co-creation intertwine, expansion into the co-evolutionary realm of brand consumer resistance opens up a large, previously barren research area of how and why economies of brandness generate new signals in the form of brand consumer resistance, with interactive social media introducing new actor-facilitated counter-narratives tracing coalition signals.

7.2. Managing Expectations

The power dynamics between consumers and brands are changing and evolving due to emergent social and learning networks. In turn, the role of brands and their influence, stronghold, and meaning are in flux. The rapid development of ICTs provides consumers with tools for interconnectedness and co-creation, allowing them to create unique experiences and shared brand meanings. Today, more than ever, consumers want to be connected with other users. They are actively engaging in co-creation and collaborative platforms and find it unacceptable for brands to behave inadaptably, share uncontextualized messages, take too long to respond, or be unchallengeable [5]. These expectations are rooted in the core beliefs of being interconnected, knowledgeable, and co-creational.

A digitally literate consumer is much less easily persuaded to form a brand bond. Instead, they expect the brands they are connected to, and thus expect them to adapt their functional and symbolic brand offer in real-time. Out of a desire for integration and meaning, interactivity, and active participation in networks, consumers have come to expect convenient and tangible brand experiences across interaction touchpoints that resonate with their culture. They feel empowered by their ability to lead brand values, help control meaning, and challenge brand interpretation by other consumers, and by the brand. This constructs accountability as the tacit perception of joint active responsibility for brand governance among brand communities and in between the community and brand [8]. These expectations reflect a volatile mix of conflicting beliefs about what a brand should be and the experience it should enable. They stem from a paradox of desires for stability and change that brands need to balance.

To appeal to consumers and create sustained value, brands need to become con-culturative: to include consumers in everything they do. Creating a sense of ownership, making them feel special and unique, and thus important for the brand organization are the key principles of connecting with consumers over the long term. Planning positive surprises and facilitating unexpected valuable encounters, involvement in co-creation of shared values, ideas, and experiences, and controlling what, when, why, how, and where to co-create and accommodate are fundamental in achieving a state of connection in the long run. To achieve overall connectivity while respecting the sensitivities and desires of the brand community, interpretation of messages, meanings, and values needs to be guarded and hegemonic moves anticipated. In addition to the overall brand experience, the experience of sub-narratives needs to be guaranteed; starting networks must be protected to prevent dilution of the brand meaning. In order to plan effectively, brand managers need to update how, with whom, when, why, and in which context a brand is co-creating values, based on quantitative and qualitative data gains from stage 0.5 access.

8. Strategies for Enhancing Consumer Engagement

Ecosystem theory implies that a brand does not function alone but as part of a larger system comprising various complementary or competitive brand elements. Such networks make it possible for consumers to co-create their experience in an arena that comprises both brand-provided and consumer-generated content. Ecosystems embrace open sourcing, crowd sourcing, expert sourcing, and peer sourcing approaches among others [5]. Marketers can facilitate co-innovation by encouraging participation of creative consumers with a perspective of discovering their unmet needs [8]. The challenge lies first in identifying the appropriate target communities to engage in co-innovation and second in motivating them to become active, rather than passive participants. Target communities can be proactive or reactive. Proactive communities conceive unmet needs that they themselves wish to see fulfilled. Reactive communities respond to a request from an organization for consumer ideas. Aspiring creatives would be better catered to by being invited to submit vignettes of unmet need. The T-shirt company hired creative consumers to submit designs for T-shirts. The best received user-generated designs were then produced and distributed by management.

Eqn.3:Ecosystem Evolution Velocity (EEV)

$$EEV = \frac{\Delta V}{\Delta T}$$

- ΔV = Change in ecosystem value (e.g., platform features, services, content diversity)
- ΔT = Time over which the evolution occurs

Another form of co-innovation is the encouragement of the current consumer base to propose modifications to current offerings. Some consumers may feel affronted by any suggestion that their choices are flawed. A clever demoscene invites current consumers to contribute product enhancement ideas. The product enhancement pledge encourages retailers to support developments mandated by current consumers. Marketplace minority rule leverages the fact that mainly a few products are used by most consumers. Retailers are then encouraged to support these items. Such vague demoscene questions allow consumers' creativity to flourish without their feeling their competency being challenged. However restrictive, consumers largely own the brand. Brands thus are obliged to accept the co-creative process with all its contingent behavior, though many lack the financial means to do so. Truly co-creative markets generate vast amounts of market data concerning the preference structures of consumers. On various qualitative measures the returning consumer decides what stays and what goes. As brands cannot exist without consumers, they have limited clout in this domain.

8.1. Building Trust

The Internet and interactive media present quite some promising opportunities for brands to actively engage and co-create with consumers in a way that has not been possible before. Historically, brand equity was created by working on the brand, its associations and experiences crafted through advertising and product attributes [5]. To many brands' dismay, the rise of new communication media enabled consumers to become active participants in brand building. Not only is on-going real-time communication taking place in forums or blogs, but also socially shared brand experiences and co-created brand extensions are praised, criticized, rewarded and punished by consumers [9]. Although the co-creation literature has elaborated on consumer participation at both individual and collective levels, its conceptualization of the second phase in the brand's evolutionary journey is largely underdeveloped. It is not enough to recognize the consumer voice inside this journey or acknowledge the right of transforming brand meaning; brand overcoming means a fundamental change for branding. Recognizing that brands evolve in the consciousness of the consumers challenges marketers' ability to control brand image and reputation. Digitalization not only opens up new communication and co-creative opportunities but also makes consumers more powerful.

The understanding of branding needs to be redefined, moving from a unidirectional transfer of meanings orchestrated by marketers to continuous co-creation of brand identity, image and experience shared by multiple actors. This poses a big threat for brands, as brand equity, brand choice and branding strategies will be under consumer control. However, brand co-evolution offers great possibilities for brands to affect behavioral and attitudinal consumer responses. A new brand co-evolution strategy needs to be established that recognizes consumers as brand custodians and involves them in brand journey planning. Drawing upon the emerging literature in dynamic branding, the two-phase framework is extended and the co-creative brand evolution strategy is proposed as an organizational philosophy that seeks to co-create sustained brand value and holistic experiences with consumers. The framework and co-creative principles revealed in this research can aid organizations in doing so.

8.2. Facilitating Communication

As co-creation naturally grows out of the synergetic relationship of connectivity between consumers and brands [4], embedding co-creation facilitation processes in a digital ecosystem strategy can help ensure its successful implementation. Ever more powerfully connected to one another and to brands, consumers with their collective intelligence can co-create knowledge, meaning, and affiliations, and construct pathways that facilitate fulfillment of their own intentions. Consequently, connectivity frees consumers from organizational dictation to co-create knowledge, meaning and affiliations without brand involvement. As connectivity expands, the potential for knowledge and meaning co-creation outside an organizational frame widens and increasingly thwarts brands' chances to connect and coop, while also deteriorating their positioning scalability and reducing credence to their brands without involvement in that co-creation process.

Digital ecosystems help organizations to support and harness co-creation growth through an overarching strategic think beyond product; think beyond brand; and think beyond touch-point strategy. Such digital ecosystems embed a holistic framework of consumer branding experiences in a coherent strategy for digital interaction. Embedded experiences constitute the experiential connectivity to consumers and the related co-creation facilitation processes. Enriching the branding experience landscape, the strategic facilitation of experience configuration and experience deepening afforders can buffer against co-creation consumers atrophying into co-creation facilitators outside the brand. By embedding processes in the

experience facilitation ecology, organizations can guide the facilitative co-creation process through interconnected, self-fulfilling facilitation experiences on a grander scale.

9. The Future of Digital Ecosystems

Existing research has investigated the reasons, quality dimensions of value co-creation from consumers' and companies' perspectives, the co-creation in brand communities, sports, and sharing economy platforms, and digital marketing activities enhancing the co-creation. Yet, the existing literature mainly focuses on the theoretical discussions of how consumers participate in the creation of digital marketing actions rather than on the non-intended consequences of these perceived consumer digital marketing co-creations.

Failure to understand how consumers' proactive behaviors toward companies' digital marketing in the new context of DL43 may backfire on companies without careful management may constrain the literature's applicability in the practitioners' context. Therefore, to fill the identified void, it is important to comprehend the non-intended consequences of consumer digital marketing co-creation, which focus on potential new defiance behaviors of consumers once their previously desired co-creation efforts fail to meet their expectations. As the idea of co-creation is gaining momentum within the marketing domain, it has also become a compelling context for researchers and practitioners.

Current businesses are undergoing radical shifts due to the emergence of novel consumer-oriented business models, which are powered by the growing consumer ownership of social media and digital platforms in the sharing economy [1]. Co-creation, construction of new complex parallel value systems, and co-destruction of value refer to the consumer proactivity in devising the meanings of companies' value propositions and expressive reactions in the refusal of such value propositions. Ignoring these complexities may make marketing strategies counterproductive.

9.1. Emerging Trend

Smartphone penetration has altered the way consumers engage with organizations and brands. Co-creation is defined as a process and a concept that facilitates direct engagement and interaction between an organization and its consumers through individual or joint activities, which through a production process leads to value creation in the form of offer or perceived value and experience value for one or more parties [1]. It has been positioned as one of the key mechanisms through which organizations can access resources for and develop their brand value and evolution in the digital ecosystem [5]. Co-creating organizations face the challenge of carefully crafting their co-creation processes and the system in which they will unfold in order to be able to benefit from their advantages. In this perspective, sustainability and the quality of experience surrounding the co-creation processes are at stake. The outcome of the processes should maintain in the minds of the consumers regardless of the organization's ongoing efforts. Furthermore, the experience should have an altered consumer state that continuously leads to a more positive sensory interpretation, which may cast a glow on brands and products alike.

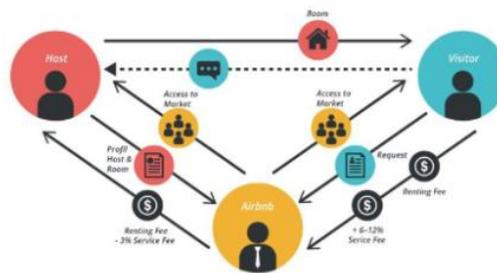


Fig 5: Digital Ecosystem

Some organizations do co-create experiences and brand evolution with consumers that are embraced by them and consequently are shared in the wider market. It appears that consumers attempt to make sense of the experience and the meanings associated with it within their domain of experience and reference. In an elaborate manner consumers modify the terms and conditions set out by the brands and organizations, altering the original intended meanings. As a consequence the consumer-organization relationship may alter causing a shift in consumer states that impact the brand, product, organization, and the experience itself in turn. Some consumers develop a sense of ownership of the experience, resulting in altered cognitive processing and exploration behavior. The brand and its evolution are considered a valuable part of consumer lives and serve a function in emotional enjoyment. A sense of kinship emerges with other consumers that embrace the experience, either co-living or clashing. This leads to interaction creation and consideration, collectively or individually focused, may reassess and adapt relational parameters. As a result multi-layered brand facilitates for navigating the phenomenon underlying the experience, including the macrosystem level. Aspect of appreciation for the consumer and societal position of the experience and reference brand and their ecosystem emerges.

9.2. Impact of AI and Automat

Artificial Intelligence (AI) is a revolutionary technology that the world is now witnessing. Much interest has been generated recently around AI presence in everyday applications like ChatGPT or Copilot in their software. AI has had a profound influence on civilization, as well as positive and negative consequences, on societies [10]. AI is anticipated to reshape a wide array of sectors. The Influence of AI is foreseen in global innovation, productivity, diversity and inclusion, sustainability outcomes, social challenges, education, creativity and culture, and economic factors. AI has enormous power to enhance tourism middleware like the recommendation of destinations, hotels, and booking services, as well as marketing of tourism-related services and products. Both Offline and Online AI-embedded tourism services proliferate to have a profound influence not only on service offerings, accessibility, and consumption but also on tourist behaviors [7]. Additionally, to a good extent, AI predictions are already a reality. AI is creeping into everyday lives both at home and at work. AI-embedded technology tools have a lot of potential benefits, as well as risks and concerns. AI-embedded technology tools in daily lives are expected to replace people in traditional mundane tasks and consume unnecessary time and resources for tougher tasks. AI is already paving the way for new innovations in the field of enterprise, business strategy, and public policy. Industries, governance, and civilization have already seen profoundly disruptive and empowering impacts of robotics and automated systems with sophisticated learning capabilities.

10. Measuring Co-Creation Success

To introduce a new co-creation practice often means introducing a new kind of co-creation capability that is not easily spotted by the current measurement models. For mature value co-creation contexts, such as pre-existing ecosystems, it is easier to spot a variety of current capabilities and actions, however, even in this case the difficulty is spelling out measurement models that match up with the spatial and behavioral diversity of consumers. A prospective measure deriving from a behavioral-cluster lens stresses that decisions about quality criteria and performance development must take the consumer's preferences into consideration. The choice of such a measure emphasizes the need for qualitative and exploratory measures as starting points for co-creation contexts that are newly introduced or that are revisited. Here, managers can rely on measurement models stemming from the psychological literature. A second type of measure conceptualizes environments and instruments for co-creation actions that affect the co-creation capability of consumer segments based on the clustering of both spatial and behavioral dimensions. Coping with changing consumer preferences in terms of a diversity performance measure requires the simultaneous functioning of bundles of capabilities across various co-creation instruments.

Several methodological and practical steps of this study yielded promising results. The attempt to provide a greater understanding of how the measurement of co-creation performance can be grounded emerged through the effort to account for the multiplicity of scales and variables. This grounding in the comprehension of co-creation enables co-creation performance measures to be built, tested, and refined for specific contexts and actions. A limited collection of variables, process stages, and co-creation capabilities was assembled, addressing the greatest breadth of co-creation types. Capturing this breadth was necessary in order to draw general conclusions on this new form of performance measurement for managers and researchers alike. Nevertheless, the findings of the study should be treated with caution. Not all the measures for all the types of value co-creation action were collected and only prototypes were created. There is a need to improve the measurement, availability, and transferability of measures in order to aid practitioners in the assessment of co-creation performance. Such efforts are already actively ongoing.

10.1. Key Performance Indicator

Before consumers start co-producing, it is important for both firms and consumers to review the specific goals and expectations of engagement in co-production. This clarifies whether or not co-production can be expected to occur or is desirable, and as a benchmark to evaluate the operating characteristics of co-production. This is analogous to setting key performance indicators (KPIs) to evaluate the success or otherwise of a system. We identify five specific aspects of performance: consumer contribution, consumer engagement, consumer experience, consumer-led emergence, and consumer retention. Consumer contributions can be measured in general or in relationship to a specific firm, and KPIs can be either aggregate or disaggregate across the consumer base. This is quite broad and more detailed variables can be created to elaborate each aspect, but at least these five dimensions will need to be addressed in co-production and will need to be specified as KPIs when consumers are invited to actively co-produce. Consumer contributions focus on the added value that active consumers generate through co-production processes. It can be measured by the number of contributions (typically some content such as ideas, images, text, and designs), their usefulness (the extent to which they are relevant and good quality), consistency (whether they generated in a way that conform collective standards, such as style of writing), and proportion of contributions that get a formal response from the firm. Consumers will usually be willing to contribute to a firm's community only if they feel that their engagement adds some value to themselves. Therefore, the benefit of the engagement needs to be specified beforehand [1]. For a firm, measuring the value of consumer contributions is difficult, since they cannot directly control the quality or debate the level of relevance of all contributions. Nevertheless, they can measure to what extent their consumers are engaged, which then can be used to calculate both the consumer-side benefits of co-production as well as the firm-side cost of under or over-engagement. Decomposing overall contribution into its mechanisms has proven to be useful in other domains to illuminate this process more clearly. Here proposals are made to do the same in co-production.

10.2. Feedback Mechanisms

In their explorations of consumer feedback mechanisms, the authors distinguish three categories of feedback actions that consumers can take: traditional behavior-focused feedback, which works well in established digital ecosystems; experience-focused comments, which require active engagement; and behavioral feedback with embedded affective reactions. These three types represent explicit feedback action types. Other feedback actions, specific to behavioral data, that do not involve any explicit consumer action can be captured through digital footprints or meta-data.

While many actors can play a role in establishing, maintaining, and evolving a digital ecosystem, the authors focus specifically on the role of consumers. Consumers are defined broadly as all individuals who interact with firms in a voluntary marketplace, ranging from current users of products and services to those who have only searched for them. In ecosystems that involve ubiquitous consumer tracking, the consumer role may extend to passive stakeholders, who do not use the product/service at all but whose behavioral data may still be valuable. With appropriate adaptations, the authors' reasoning can probably be extended to include all relevant actors.

Among the possible roles consumers can play in the evolution of a digital ecosystem, the authors investigate co-creators who provide explicit feedback either to enrich or evaluate a firm's offer(s) and assess the evolution of this role. They focus on co-creation of feedback, as firms initially may be unaware what type of comments or marks would be valuable, due to their novelty and the imaginative aspects of introducing something new to a market [1]. Assessed from the perspective of consumer feedback action types, the authors elaborate on a particular feedback action type that fits the digital ecosystem under study and shifts its co-creation role. In elaborating on feedback action types, they adopt a structure that allows for a thorough exploration of feedback mechanisms within and across co-creation roles.

11. The Role of Social Media in Co-Creation

Digital tools play an important part in delivering value and connecting end-users and providers [4]. The digitalisation of many services has enhanced widespread consumer adoption of basic self-service technologies (SSTs), the transition of many organisations to internet-only strategies, and the rapid increase in the use of social media platforms to co-create or co-destroy value. The present research contributes to the co-creation literature by illustrating three ways social media may affect consumer engagement behaviours in the innovation co-creation. This theory development explains why co-creation happened in some cases, but not others. It contrasts processes that enable value co-creation with those that inhibit it and describes important facets of the transition from co-creation to connectedness. Social media often provide an unbounded environment in which consumers can voice opinions about products or providers, share experiences, and express feelings. Consumers may proactively use social media, catalysed by service failures or innovation. Co-creation innovation, as collaborative generation of new ideas and development of consumer-generated content (CGC), descriptive content on the growth of markets and services in ways that influence how products fit in with consumption, reduce information overload, and amplify changes in perception of existing products. The implications for theory involve illustrating the role of complexity, value co-destruction, and connectedness for co-creation. To the best of their knowledge, there is no framing in the literature for how social media may affect the innovation co-creation process.

There are important challenges associated with the collaborative generation of value to be solved before co-creation can occur at scale. The literature acknowledges the importance of co-destruction, but has adopted only a structural perspective and thus neglected the associated dynamics. To broaden opportunities for future research, possible ways to adapt the literature to embedding a consumer-centric decision-making context in which feedback is eco-logic count or equivalently balance the involvement of varied stakeholders with distinct knowledge structures. There are challenges for companies in who to involve, how to motivate participations, which tasks to assign, and how to incentivize engagement. While social media connect businesses with consumers, there are profound implications for how service organisations manage the co-creation environment in an unstructured context and how the value co-creation journey can be shaped.

11.1. Platforms for Engagement

Local businesses such as bakeries and cheese stores offer platforms for engagement in the sharing economy, allowing consumers to suggest recipes. If these submissions reach a threshold level, the businesses can respond by organizing an in-store baking occasion with the suggested items. As items made using the consumer-generated recipes are sold in stores, firms can offer a small reward to the consumer(s) behind the recipe. This platform for engagement creates a shifting boundary between the firm and the consumer. The firm's material inventory, typically baked goods, becomes an essential resource in the production of the consumer's material inventory, the baked good(s) suggested or created by a consumer. The platform for engagement allows consumption and production activities in a hybrid mode. Consumers engage in non-commercial production, but their co-created and co-consumed item(s) can become commercialized and serve as a source of revenue for firms. One implication of this is that a firm may contribute and/or benefit from a marketplace for consumers creating products for one another [1].

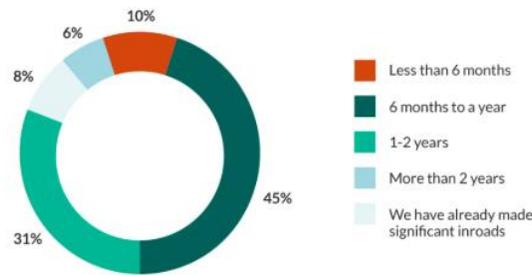


Fig : Digital Transformation is Driving The Customer Experience

Firm-supported platforms for consumer engagement in creation can involve different levels of consumer participation. Advertising agency platforms for engagement may consist of a drawing competition in which consumers need to send in their drawings of objects to be used by a firm in its television advertisement. Here, the firm only co-produces consumer-created expressions when they draw their pictures in a firm-specified format, using a consumer-decided idea. In a less restrictive platform for engagement, consumers need to produce their own creations in a firm-specified manner, such as a specific holding capacity of a composition or a color, such as an advertisement that embodies the repeated use of a specific color. Finally, in the most open version, a firm may offer an online gallery on which consumers can present their products, ideas, or services directed at the firm in any way they desire. This allows consumers to take part in the creation process organically and without restrictions.

11.2. Influencer Impact

The Internet has transformed the ways in which companies operate, and the co-creation of offerings with and by consumers is one of the most radical changes to this end. Consumers are no longer passive receivers of offerings; they now have the opportunity to enhance their consumption experiences by creating their own content. To date, prior research has focused heavily on the positive outcomes of such consumer actions. Specifically, they have been shown to lead to marketing benefits in the form of consumer engagement and costly-to-copy competitive advantages. The downside of consumer-connectedness has been relatively overlooked by pricing, strategy and operations management scholars alike. This oversight is surprising, as consumer co-creation inevitably leads to unanticipated outcomes. Competition is a relevant example; while sharing resources may enhance the provision of social consumer experiences, cost-related resource adoptions offer an opportunity to exploit a competition-inhibiting resource for free.

Given the rise in consumer impact on the validity of firm-initiated efforts, marketers have become increasingly aware of the importance of managing the consumer-based operations of marketing. Despite the growing significance of this shift, to date, prior literature has focused almost exclusively on the radical voluntary consumer actions that result in a firm loss of the status quo. Despite the rapid evolution of consumer behavior towards co-creation and connectedness with firms, research on the evolution and management of such evolutions is scarce. Given consumer co-creation in firms, the flow of actions becomes much more varied and two-sided than simply intention-reaction effects. Most importantly, evolution is not exclusively positive in all cases. Never have firms been more watched and scrutinized by consumers, leading to unprecedented opportunities for undesired consumer actions to quickly spread and snowball effects.

Firms are hence struggling not only to accept co-creation as a way of improving their offerings, but also to handle consumer impact on those firm-initiated co-creations. As a starting point of a multi-disciplinary research agenda, this study aims to lay the groundwork for theorizing the evolution of consumer actions and competitive advantage related to co-creation in marketing [4]. The study first discusses consumer action co-creation with firms, followed by a summary of the co-created firm-influenced consumer actions. Thereafter, the evolution of such actions is detailed, as is the resulting consumer-value creation. Finally, avenues for future research to enhance the understanding of each of the three major building blocks are proposed.

12. Legal and Ethical Considerations

When consumers and firms co-create value through the provision and use of digital contributions, many legal and ethical questions arise. These have to do with data ownership, privacy and the ethics of data gathering and usage practices. First, depending on relevant legal frameworks, consumers may own the data and other contributions they provide. Consumers and firms can negotiate fair terms and conditions. Where consumers own the data, they are free to use it in a way that benefits their interests, possibly maximizing consumer welfare. If firms own the contributions, they could misuse the data unless careful regulation (or self-regulation) is in place. Consumers may choose to limit their contribution for fear that firms would use it in capacities they did not intend or were not fully aware of.

There are important ethical issues regarding what firms may or not do with any data, and to what extent they should inform consumers of the recent developments in this. The fairness and transparency of data-gathering, incentive, and feedback practices is a debatable issue. Additionally, the capabilities of firms (possessing data) should be monitored to ensure maximum consumer welfare. Different stakeholders should track and

scrutinize... Aggregators' use of consumer data leads to questions concerning the permissible extent to which firms may go to optimize their commercial strategies.

Firms may be confronted with consumer collectives that object to the ways in which they propose to use personal data. It is conceivable that the courts may obligate firms to be more transparent with their terms and conditions on how consumer contributions will be used. Whatever the situation, consumers should be made aware of best practice to self-protect against aggressive strategies that may lead to price discrimination or manipulation. The UN Code of Ethics for Artificial Intelligence provides a helpful basis for ensuring that all stakeholders are duly considered [1].

12.1. Intellectual Property

Intellectual property (IP) issues are of increasing concern due to the development of new media. There is uncertainty about legal rights to new products or ideas created by consumers. Intellectual property law traditionally provides firms with legal ownership of these properties; however, the creation process is now open to consumers. Creative, motivated consumers are already active in this area, and managers need frameworks, tools, and advice for capitalizing on consumer-generated intellectual property (CGIP) [11].

CI companies increasingly invite consumers to contribute new product ideas, sites for sharing ideas and evaluations have proliferated, and do-it-yourself promoters and sites encouraging activism are available and growing. There is the emergence of a culture characterized by unsolicited consumer-created, consumer-shared product ideas in a range of industries. As a consequence, CGIP (the byproduct of consumer innovation) is a complex and multiform assemblage: be it images, recommendations, or technical sketches (a product), consequential comments on a product, brand, or company (a reputation), or the way ideas are expressed (a name).

CGIP is plentiful, partially because of the modularity of many products, and also because consumers can now communicate, share, and improve their ideas with relative ease, affording entrepreneurs and firms immediate access to a wealth of good ideas. CGIP has an increasing return to use; it is argued that the idea-generative activity of consumers does indeed feed on itself. The more consumers who contribute, the more active the community becomes, and the more they in turn contribute. As CGIP increases, the ensemble of creative consumer ideas and expressions becomes richer.

12.2. Consumer Privacy

Advance in digital technology opens up new ways for the collection, storage, and use of consumer data, providing opportunities for innovation across industries. Since much of the data exchange in the economy is not between individuals and firms, but rather involves one set of firms aggregating public data to sell insights to other firms, these data ecosystems have attracted considerable attention from scholars and regulators. Therefore, it would be a relevant research question how consumers can have a strategic voice in altering digital ecosystem change beyond their traditional decision roles. Privacy is one topic area where consumers have reacted strongly and unified [12]. Furthermore, how concerns about a rapidly escalating issue become mass market and that raises new questions about the capacity for concerted action against currently entrenched regimes. A relevant line of insight would come from network studies of systemic risks, how these emerge and diffuse, and how this in turn may facilitate or impede the rise of further activism and rebellion. In addition, a longitudinal analysis of ecosystem trade publications, policy reports, and regulatory responses to consumer privacy initiatives may help contribute to understanding how ecosystem actors interact in predictable windows of opportunity to alter change initiatives, despite technology momentum. Industry environments can also be leveraged as an additional context to understand how technology advancement co-evolves with governance regimes and allows for contestation. Only by taking these contexts into account can a complete theory of digital ecosystem ecosystems where the role of customers is considered be developed.

13. Conclusion

The emergence of the digital revolution heralded the start of never-before-imagined partnerships between consumers and firms. New technological capabilities enabled firms to distribute opportunities to consumers, in turn spurring new forms of consumer connectivity and co-creation. Effectively, opportunities and responsibilities spread from firms to consumers, supported by continuous advancements in digital technology. Firms now more than ever leverage deep, rich, and profound interactions with individual consumers and consumer communities, for example, in contributions to service designs, offering reliability of consumer-generated information, social media sentiments, real-life experiences, close inter-firm and end-user community relations. This creates new possibilities for firms and consumers, yet entails risks and challenges for both parties. This creates even more possibilities and challenges for the consumer. The emergent forms of connectivity enable a range of co-creation roles, on a spectrum of decreasing control over the outcome for the firm yet increasing influence on the outcome for the consumer. As such it is suggested that models of role and consumer competence or capability are relevant for a better understanding of these developments in consumer connectivity and co-creation. The evolution of connectivity frameworks illustrates the many issues that arise from these new consumption and marketing practices, framing firm and consumer opportunities and challenges in their ongoing evolution.

Therefore, key developments and trends pertinent to future evolution of connectivity, with regard to both consumer-proposed and digital structures, are first discussed. It is suggested that far-reaching changes are inevitable that will modify both the nature of the established connectivity and co-creation and the implicit contracts and norms that govern them. This discussion addresses re-structuring of co-creation in terms of scopes with regard to content, dynamics, reach, and connectivity. Future tendencies beyond content are to 'listen in' on the co-creation, followed by ever earlier and deeper questions before a product or service leaves a co-creation trial, and timing of monitoring transitions to more 'active after sales'. Far-reaching developments are also likely in terms of co-creation structure and competence. The zero-cost barrier to co-creation out of the co-creation cognizance and financial models, as a consequence of connectivity, is likely to challenge both firm and consumer adaptability, raising the issue of consumer skill levels.

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