

Entrepreneurship: The Value-Added of Co-Creation Through Web 3.0

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ABSTRACT

This paper explores the concept of entrepreneurship and the added value that co-creation, facilitated by Web 3.0 technologies, can bring to businesses. It delves into the potential advantages of integrating co-creation strategies, such as increased innovation, customer engagement, and market adaptability, while highlighting the role of emerging web technologies in enabling more effective collaboration and interaction between businesses and consumers. The various formations of customer integration in terms of ideational and inventive service and new product development represent an essential factor of economic success in the current work reality for companies. In this emerging epoch, which is constitutively characterized by increasing disruption processes and is referred to by politics and economics etymologically and polysemically as Industry 4.0 and Economy 4.0, a more precise discourse analysis is required in a problem-explorative manner. As a result of an increasingly individualized, informatized, and internationalized society, in which the Java API Web 3.0 not only leads to the transformation of the communication matrix through web-semantic algorithms per se, there is potential added value through co-creation. The customer, in the sense of appropriation research, is not only a profane website visitor but can be determined as an ideational and inventive prosumer with regard to conversion who, within the framework of integrative, interactive, and readaptive value creation, offers companies a decisive benefit reciprocally with the help of Web 3.0. Companies are looking for ways to cope with the phenomenon of ever-shortening product life cycles.

Keywords: Innovation Management, Knowledge Management, Prosumerism, Disruption, Co-Creation, Web 3.0, Communities of Practice, Not-invented-here Syndrome, Transformation, Emergence, Innovation Cooperation, Customer Integration, Innovation Resistance, Customer Integration.

INTRODUCTION

The emergence of an increasingly rapid societal technological development formation in recent decades has not only led to numerous technological disruptions but also to significant transformation processes concerning corporate management in almost all economic sectors. The Internet, and in particular the Java API-based Web 3.0 specified and modified since 2012, has connected market participants as Communities of Practice (CoP) in a simplified and web-semantic way, mass-compatible, heuristically collaborative, and iteratively acting regularly on a global level [1]. Meanwhile, an emergent culture as a living and working space could arise from a media sociological perspective that goes beyond an appositive, i.e., a media-enhancing

information space and use. Individualization, informatization, and internationalization not only represent the current living and working reality in the realm of Web 3.0 in a simplified and profane way but also constitute an immersively sociological hybrid living and working space with various motives and influencing factors per se [2; 3]. At the same time, and sometimes even synchronously, recipients reciprocally shape their individual life perceptions in the realms of Web 3.0 across various media carriers and platforms [4]. The accompanying global competition for the respective target groups on the Internet leads to accelerating R&D processes through convergent subject positioning, which can be inductively specified with the help of two formations and record interdependencies concerning the H-O-T-fit approach (human-organization-technology) [5; 6; 7; 8].

For companies, this means having to address problem-exploratively those emergent and now increasingly immersive Web 4.0 challenges, such as VR and AR measures, concerning the web-semantic architecture [9]:

- a) Consumers are no longer reached in a simplified and heuristic manner due to the increasing redundant sensory overload caused by the often intrinsically company-led communication policy measures. The scatter loss, as can be demonstrated and substantiated by numerous investigator and theory triangulative studies through the increase of bounce rate KPIs, explicates very negative, sustainable, quantitative, and qualitative entrepreneurial aspects.
- b) Companies need to transfer strategic and programmatic adjustment modifications to respond to the declining attention of recipients and those negative bounce rate effects, by adapting and integrating these emergent formations with regard to customer loyalty and customer integration models using the tools of Web 3.0. The not-invented-here syndrome, which is often observed in companies, requires overcoming this barrier and a paradigm shift that goes beyond the polysemic discourse on Industry 4.0 and Economy 4.0 led by politics.

In summary, it can be scientifically substantiated that ever-shortening product life cycles, in the context of the above-mentioned problem-explorative interdependencies, on the one hand, require increased innovation demand that companies often cannot provide from their own ideational and inventive development work per se, and on the other hand, the entrepreneurial not-invented-here syndrome with regard to the Web 3.0 formation means overcoming this barrier [10; 11]. However, both challenges can be addressed, possibly with the same tool, namely the specified, and indeed corporate cultural realignment, through the integration of the customer within the product development process, such as through co-creation.

EXPLICATION REGARDING A DIAGNOSIS OF CO-CREATION FORMATION AND OBJECTIVES

To what extent co-creation records the core dimension capable of significantly increasing a company's innovation power, and to what extent integrating the customer through their commitment to the entrepreneurial brand can even lead to the sustainable reinforcement of this, deserves a scientific examination, which is carried out here using theory and research triangulation analyses.

In a first step, it will be determined how product development and prosumer can be explained in the context of co-creation formation in terms of technical terminology and determination.

Furthermore, a deductive discourse is required to classify co-creation within entrepreneurial product development in terms of entrepreneurship. In the subsequent discourse, the reasons and motives from which co-creation can be integrated as a positive opportunity strategically and operationally from a business perspective will be determined. In reference to the problem of the mentioned not-invented-here syndrome, the communication policy motivations will first be specified. Building on this, the current framework conditions for the product development of companies from a product policy perspective will be substantiated. Through problem exploration using selected co-creation methods, it will be explained how and to what extent the customer can be meaningfully integrated into the entrepreneurial product development process. At the same time, examples of current practice will illustrate not only the economic value added that corporate customer integration offers today but also the potential risks and limitations regarding co-creation methods.

DETERMINATIVE DISCOURSE AND THEORY TRIANGULATION EXPLANATORY APPROACH

A propaedeutic discourse is first necessary to determinatively contextualize the aspects of product development, prosumer, and co-creation in relation to entrepreneurship. The use of co-creation-relevant options, i.e., in terms of product and service development and their entrepreneurial implementation, is receiving increasing attention in the current work reality [12]. Terms such as "Industry 4.0" or "Economy 4.0" express this, i.e., despite polysemic-semiotic aspects in the technical literature and on the part of politics [13]. The following discourse will show how ideations and inventions constitute innovations, to what extent it is necessary to differentiate determinatively between invention and innovation in essence, and furthermore, which similarities and formative differences are increasingly given as market-economic dependence with regard to innovations and variations, which manifest themselves sociologically in a globalized e-commerce market through imitations or their manifestations. In terms of their own innovation achievements, the innovation variant is also substantiated as a purchase variant compared to the copy variant. The open innovation approach will then be focused separately as an essentialist category of entrepreneurial perception, i.e., because of the context concerning co-creation.

Product Development

Between inventions and innovations of all kinds, the significant difference is that innovations show sustainable market dependence [14; 15; 16; 8]. According to Weis [14], innovations arise by developing ideas into inventions that are then successfully penetrated into the market through diffusion. However, it is questionable when a market launch is successful at all. In current innovation research, there is controversial discussion to what extent an innovation only characterizes market success per se as a formation and core dimension [14; 17; 8]. In contrast, the definition regarding the term "product innovation," as Wöhe [18] specifies, would only arise "when technical progress and/or shifts in demand lead to the development of entirely new products". Abductively, however, this would mean that an innovation in dependent formation does not need market success per se but merely has to penetrate diffusively into the market in order to be perceived only cognitively and neuroeconomically by recipients. If a product innovation is understood as an invention newly introduced into the market through diffusion, the possibility of product variation must also be considered in the development and introduction of new products, in addition to the precise product innovation (cf. Chesbrough,

2006:4). Wöhe [18] states that product variations are only substantiated if "already existing products are technically improved". However, this statement must be abductively falsified. Because Wöhe [18] himself defines the term elsewhere in the form that, among other things, transformations of aesthetic or symbolic properties, i.e., thus conative formations, can cause variations. A product variation always involves inventions or innovations that are integrated into an existing product, i.e., essentialistically and convergently, and disruptively substitute it. This can sometimes lead to a need for knowledge in non-company areas of competence or to entrepreneurial barriers, as is often determined in the context of knowledge management. need for knowledge usually also entails conflicting aspects, characterized in the form of the not-invented-here syndrome, which is why various extrinsic transfers using a promoter model are usually necessary [19]. Another contradiction can be found in Wöhe's [18] description, according to which, in the context of product variation, product differentiation and diversification should be considered interdependent. In both cases, according to Wöhe [18], it is not about the variation of an already constituted product category but about the introduction of a new product as a problem-explorative product innovation. However, this presentation does not deterministically and plausibly determine when a product innovation or variation can be spoken of at all. Research and theory triangulation can precisely substantiate that, with regard to variations, in contrast to innovations, the sum of the products offered by the provider always remains immanent and constant [20; 21; 22; 23; 24]. Consequently, both product differentiations, i.e., modified extensions of a product line, and product diversifications, i.e., the diffusive penetration of a completely new product line into the market per se, must be eclectically assigned to product innovations [25].

In general, three strategies for introducing new products have become established in market economics:

1. **Product innovation:** This refers to the market launch of entirely new goods or services based on new concepts, technological advancements, or changes in demand. These innovations are frequently meant to give the company a competitive advantage by addressing unmet customer needs or providing improved functionality.
2. **Product variation:** This strategy focuses on modifying existing products or services, such as improving their technical performance, aesthetic properties, or symbolic characteristics. The goal of product variation is to maintain or increase the attractiveness of the product for the target market, often in response to changing customer preferences or technological advancements.
3. **Product differentiation and diversification:** These strategies involve expanding a company's product portfolio by adding new products that are related to the existing product line or by introducing completely new products that are not related to what the company currently offers. Both methods aim to increase market share and reduce the company's dependence on a single product or market segment.

Depending on their specific goals, resources, and market conditions, companies may choose one or a combination of these strategies. In order to successfully implement these strategies, it is frequently necessary to have a thorough understanding of customer needs, market trends, and the competitive landscape, as well as the ability to adapt and innovate when things change. In today's dynamic business environment, co-creation, a method of involving customers and

other stakeholders in the product development process, can be an essential tool for helping companies achieve these goals and stay competitive.

With regard to the three strategies for introducing new products, it should be stated in terms of market economics:

1. In the innovation variant, companies carry out their own deductive basic research and development work in an ideative manner in order to develop new products within the framework of the inductive invention process, i.e., within applied research, and subsequently penetrate the market in a diffusive manner [17; 18; 8].
2. In the copy variant, the introduction of new products is reacted to with respect to the competition and subsequently penetrated into the market in an adapted form [18; 26].
3. Furthermore, there is the option of proceeding with the purchase variant, in which, in the case of successful product innovations, entire companies or individual brands are acquired. The focus here is on the innovation variant, as the company's own innovation performance seems to have little or no relevance to the other strategies. Therefore, they can be neglected in the future [7; 18]. The focus here is on the innovation variant, as the company's own innovation performance, as with the other strategies, has little or no relevance in terms of usability and sociability. In summary, it can be plausibly argued that product development, with regard to the exploration of discourse, can be understood as a process structure in which companies diffusively place product innovations or variations on the market, but in which propaedeutic innovation achievements must be constituted that go beyond the mere eclectic adaptation or acquisition of competitive products. At its core, this records a corresponding value creation height and quality.

Prosumer

The various approaches regarding the self-concept of the prosumer determinatively require a more precise demarcation in the context of the present discourse. To better illustrate this, the programmatic application possibilities of prosumers in the product development environment will be demonstrated using selected examples. Although the German-adapted term "prosumment" is now also used, the English term should be retained for the sake of a comprehensive subject position [27]. The acronym "prosumer," which is also common in German-speaking specialist discourse, is formed from the English words "producer," i.e., "producer," and "consumer," i.e., "consumer" or "customer" (cf. *ibid.*). However, semiotically formative and diverse fundamental discourse analyses are hidden behind this term. The original approach goes back to Alvin Toffler, i.e., the early 1980s, and refers to the constitution of products and services by the customer, but always heuristically motivated by a teleological systematization of one's own consumption [29]. This concretizes that producer and consumer are convergent and self-conceptually perceptive, united in one person. Consequently, a value chain is generated in which companies only appear as suppliers of raw, auxiliary, and operating materials or take over services in partial processes of product creation [29]. This approach therefore describes a development or production process that is based on the initiative of consumers and whose goal, i.e., in the sense of the Uses and Gratifications approach, is their own use or consumption and always has problem-explorative existential coping in focus [30; 31]. Therefore, this does not establish a dependency on the market *per se* and thus does not constitute a business model in itself (cf. *ibid.*). In the sense of exploration within this discourse, which refers to B2C-based product developments, the prosumer in this determinative

formation is therefore not relevant [32]. In newer approaches, however, it can be observed that the term "prosumer" is now increasingly defined as a producer and consumer of media content through social media platforms due to the transformed usage behavior mediated by Web 3.0 [33; 34; 35]. As already explained in the previous discourse, there is no sufficient contextualization to the present research question here, as no connections are made between the prosumer and product development processes in companies.

However, it is of interest that further definitions can be derived from the theoretical triangulation, according to which prosumers, in relation to market-oriented product development, are end consumers who, beyond mere use or consumption, influence the development and ultimately the production of goods and services [36; 37]. In this context, prosumers can actively or passively contribute to value creation for product innovation through their usage behavior, often in combination with customer review systems or with the support of AI-based recommender systems, by sharing their knowledge, personal affinities, and preferences, or by taking on tasks within the innovation process itself [8; 38].

In conclusion, the prosumer concept has evolved over time and has been applied in various contexts, from individual production and consumption to involvement in market-oriented product development. In the context of product development, the focus should be on those approaches that consider the prosumer's active or passive role in shaping and influencing the development and production of goods and services. Therefore, in the following, the prosumer is understood as an integrated participant in the product development process of companies who is involved on the initiative of companies with the programmatic strategy to place, vary, or individualize a product in the B2C market diffusively and sustainably disruptively.

When consumers are actively involved in one or more production processes in an entrepreneurial cybernetic way, they directly influence the constitution of the final product. An example of this can be found in the offerings of the muesli manufacturer mymuesli GmbH [39], where individualized muesli creations can be compiled from various ingredients and then delivered to the end customer in the desired mixture. By individualizing the product "muesli mix" and producing it, the consumer becomes both ideative and inventive as a prosumer [39]. End consumers are also referred to as prosumers when they take on tasks within the innovation process that do not concern their own problem-explorative product individualization but the development of products in the market [8; 25; 17; 36; 37; 38]. Customer participation is made possible, for example, through competitions such as the design competition by the lighter manufacturer Bic Group [40]. Customers had the option to submit self-designed motifs. The winning motif was printed on one million lighters, and the winner also received a cash prize [40]. Another possibility for the integrative participation of consumers in the creation of products is the provision of personal preferences, which are then incorporated into product innovation. In this case, consumers voluntarily and knowingly share their knowledge, as through idea platforms such as "My Starbucks Idea," where prosumers have already submitted over 45,000 improvement suggestions in the "Coffee & Espresso Drinks" area alone [41]. Those who submit a proposal to Starbucks [41] are well aware of their potential participation in product innovations at the socio-conceptual level.

However, this is not always the case. Companies can receive external knowledge from blogs, forums, or communities at the beginning of a product innovation that is web-semantically tagged and algorithmically verified. In this method, called "netnography," the customer remains uninformed despite the EU-DSGVO [42; 43]. They find out more subliminally that their information is being used by companies to create new products. In this passive form of customer participation model concerning product innovations, the consumer indirectly, therefore subliminally, influences the product innovations by unconsciously providing essential information about usability and social aspects through the disclosure of their knowledge and usage behavior [8; 36; 37; 44]. In conclusion, it can be substantiated that both the active and passive participation of prosumers in fact supports companies in certain phases of product development. In both cases, problems, i.e., solution suggestions in the sense of a life-determining existence mastering, are expressed by the customers, thus identifying, validating, and substantiating necessary goods and services [33]. Through their participation, customers help companies explore the decisive problem-solving skills of their target group, such as in the area of new product development, and can thus generate new markets.

Co-Creation

It can be observed that the term "co-creation" is used in a very polysemous way in the technical literature. There are other terms, such as "co-production," that imply a similar semiotic structure [44; 45; 46]. This observation is also confirmed by others [47]. Apparently, the transdisciplinary discourse of the fields of marketing, innovation, and knowledge management is not yet clear about who has etymologically coined the term [48]. In order to categorically typologize co-creation in a substantiating way, the open innovation paradigm must necessarily be contextualized for a better understanding. Furthermore, it should be noted that in the interpretation of co-creation, customers and consumers are often mentioned in a deterministic and theoretically triangulative manner. However, the correct term, following the previous section, would be prosumer in these cases. While there are approaches that subsume co-creation in the B2B area, in most cases, co-creation is located in the B2C area [31; 49]. It can thus be established that a dependency on the B2C area is always recorded under co-creation and can be understood as a methodology based on the open innovation paradigm. Chesbrough [50] coined the term "open innovation" and specified it as a strategic-teleological entrepreneurial transfer of intrinsic and extrinsic knowledge in order to accelerate internal innovation processes on the one hand and to complete the market from a company perspective through external use for own entrepreneurial innovations programmatically on the other hand.

Chesbrough [50] substantiates open innovation as an entrepreneurial option to advance technologies. As a structuring principle of the commercial sector's entrepreneurial program, open innovation can be used in three different ways:

- a) Internal innovation processes can be accelerated through the targeted diffusion of external knowledge [50]. These entrepreneurial outside-in processes, within the framework of entrepreneurial knowledge management, function through knowledge transfer, such as the use of external technologies, for which license fees are usually paid [50].
- b) In contrast, inside-out processes can be recorded in which unused patents are marketed, for example, i.e., already intrinsically constituted ideative knowledge or even existing inventions are to be commercialized outside the [50; 51].

- c) The third variant, the so-called coupled processes, are a complementarity of the first two variants and condition the innovation process as a collaborative CoP process between different companies, i.e., in the form of strategic alliances or innovation networks, in which companies, suppliers, and prosumers are equally located [50]. Co-creation processes should also be classified here.

Theory Triangulative Conclusion

In conclusion, the formation of co-creation can be substantiated within the collaborative and readaptive interaction between companies and prosumers [52]. Co-creation should therefore be understood as a systematic approach that integrates the prosumer within different phases of product development, i.e., in individual ideative and inventive subprocesses, complementarily in the sense of the stage-gate model. However, the initiative comes from the company itself, such as through communication policy measures within the operationalized copy strategy towards prosumers, so that they share their knowledge, ideas, opinions, and evaluations in the constituting entrepreneurial innovation process (cf. Jacob, 2014:22–23). In this context, prosumers are included in the entrepreneurial innovation process in various ways through the web-semantic and collaborative Web 3.0 architecture, particularly social media platforms, with the primary value creation coming from the company [47]. Web 3.0 represents a transformed, i.e., technologically collaborative, emergent, iterative, and readaptively heuristic communication matrix that usually records a sophisticated hodological and ludological GUI interface [53]. Offers and user behavior on the internet, where websites have instrumentally evolved from a purely appositionive communication matrix with information and multimodal content to a living space, i.e., towards social media platforms, increasingly represent an emergent immersive perception space that will enable both private and commercial users to generate their own media content, communicate with each other across various media, and connect even more deeply as interpretation communities with identical genre preferences than is currently the case [4].

Co-creation should also be understood as an option in which the innovation constitution is generated by the prosumer's usage process itself, with the company essentially assuming a moderating or promoter-driven function, such as through community management [47]. This understanding is also based on personalization processes, which are particularly contextualized within the framework of entrepreneurial knowledge management as driving forces of the current knowledge economy, alongside informatization and internationalization. Furthermore, using Chesbrough's [50] discourse, it can be determined that open innovation methods can occasionally represent eclecticism, i.e., convergences with open-source methods, and thus represent closed systems. However, it makes more sense to demarcate open innovation determinatively, as there is usually an underlying business model that creates value and carries out teleological value capture [50]. Although the open-source term, due to its polysemous semiotics, apparently finds practical use in some entrepreneurial projects that are also based on a business model, differentiation is recommended [54]. Tesla's example confirms Chesbrough's [50] interpretation that there may be, among other things, charitable interests behind it: in 2014, the company released its patents to fulfill its vision of "accelerating the advent of sustainable transport" [55]. However, Google [54] uses the term "open-source" in a modified way, e.g., with regard to its "Android Open-Source Project" [54]. Through this project, developers can create compatible apps that can be downloaded through their own "Google

Play" platform [54]. A monetization model is inherent in this case, as Google receives a 30% commission on the sale of paid apps and, according to DPA figures and expert estimates, was able to generate revenue of 3.4 billion US dollars in the first half of 2015 alone [56]. For this reason, clear classification and categorization are fundamentally necessary. In this aspect, open-source systems are excluded from further discourse.

Theory triangulatively, it can be plausibilized that co-creation, in the sense of the present discourse, should be understood as a company-initiated collaborative and web-semantically readaptive interaction between companies and prosumers, in which new product development is generated through targeted knowledge-economic transfer via Web 3.0, in subprocesses according to the stage-gate principle, using extrinsic ideations and inventions.

In summary, co-creation is a powerful approach for businesses to harness the ideas, knowledge, and creativity of prosumers, making use of advanced technological communication matrices such as Web 3.0 and social media platforms. By incorporating these external resources in a systematic way, companies can accelerate their innovation processes and develop new products more effectively. As the world continues to evolve towards greater interconnectivity and as technology becomes increasingly collaborative and adaptive, the importance of co-creation in the business landscape will continue to grow. Companies that embrace this approach and leverage the power of their prosumer base will be better positioned to succeed in the competitive and ever-changing marketplace.

INTEGRATION OF PROSUMERS AS A STRATEGIC BUSINESS ALIGNMENT MODEL

In summary, two central business strategies emerge to include the prosumer in the respective co-creation processes. In addition to the motivation-driven reasons for collaboration, such as product policy perspectives, it should now be determined why the innovation power within the company might not be sufficient and why even basic satisfaction with the already developed products does not lead to brand loyalty and customer retention, i.e., manifesting itself in a brand belief.

Furthermore, the consequences of perception transformation regarding customers should be explicated discursively: How can communication alignment models modified by companies be used from a communication policy perspective due to significant prosumer interactions? How can customer loyalty be made more efficient in times of considerable redundancies, such as sensory overload from advertising measures and their scattering losses?

Product Policy Challenges in The Age of Web 3.0

Today's companies are increasingly under higher competitive pressure due to the driving forces of a knowledge-based society. The reasons for the intensification of the competitive situation are manifold: A significant role is undoubtedly played by the continuously advancing internationalization (globalization), informatization, and increasing individualization of society, leading to increased competition from internationally operating players in previously nationally played markets [57]. In addition, technological progress increasingly leads to faster product developments, shorter product life cycles, and shorter disruption processes. While R&D budgets remain the same, the costs in that area continue to rise, putting companies in a fragile situation [57; 58; 8].

Furthermore, companies sometimes suffer from the problem of a lack of brand loyalty. In 2014, a study surveyed the German population aged 14 and older to determine whether they would remain loyal to a brand if they were satisfied with it [59]. This study plausibly showed that approximately 7% of respondents answered "hardly to not at all true" [59]. This result allows conclusions to be drawn about certain consumer behaviors, which are described in the specialized sciences with the phenomenon of "variety-seeking behavior" [60]). According to this approach, based on the concept of "optimum stimulation level," consumers switch brands in habitualized purchasing decisions to gain additional benefits through the change in the sense of the Uses & Gratifications approach [60]. While the variety-seeking behavior approach also describes consumer behavior patterns exposed to sensory overload or exhibiting escapist tendencies, in the opposite case, with heuristic purchasing decision processes, consumers experience a lack of incentives due to a "suboptimal arousal level" [60]. Popp (2011) states that by introducing new products, companies can generate new emotional-value-added triggers for consumers, minimizing this effect [10]. The above reasons consequently lead to an ever-increasing need for innovation, as companies that want to assert themselves in the market are forced to penetrate new products diffusively into markets at relatively short intervals. However, to consistently create product innovations, companies need up-to-date information in the form of content to know the needs of their homogeneous target group or the latest technical problem-exploratory solution options [1].

This circumstance led to an opening of the innovation process as early as the 1990s. Various companies formed strategic alliances with the aim of accelerating their own product development. This led to a conversion in the sense that, from 1995, innovations that already consisted of up to two-thirds of external company knowledge led, ten years later, to immanent networking between companies and consumers through the Java API (Web 3.0) infrastructure and instrumental social media platforms, with the latter becoming prosumers [58]. The advantage that companies derive from the existence of such online platforms is that they can easily enter into a corporate dialogue with a large number of prosumers to gain access to both the need for information and knowledge regarding existential coping aspects that are needed for the development of new products. From this formation, it is possible to find and bind the respective target group with identical genre preferences [4]. More than a third of the companies, namely 37.6%, stated in the aforementioned survey about their goals in social media activities that they expected a reduction in product development costs, and 44% even hoped to achieve a shortening of the time-to-market period in this way [59]. According to this survey, companies have not only taken away the advantages they can derive from an active dialogue with prosumers, but also seem to have recorded that communication and the use of co-creation strategies beyond their own ideas or social media platforms not only lead to better customer loyalty to the company but also have many positive effects in terms of product development. These include reducing development costs, shortening product development phases, and increasing innovation power [58]. From a product policy perspective, co-creation can be a promising instrument in terms of the challenge of increased innovation demand within a knowledge-based society.

Communication Policy Consequences in The Age of Web 3.0

Already in 2004, the Institute for Marketing and Communication made plausible through a study that consumers living in Germany, depending on their place of residence, perceive up to

6,400 advertising contacts per day [61]. From this, it was inductively specified that an average consumer living in Hamburg with eight hours of sleep per day, in 2004 would be exposed to an advertisement of any formation on average every ten seconds. These values have more than doubled over a decade later due to new possibilities such as social media marketing [62]. At the time of the study in 2004, respondents stated that they could only consciously remember three advertising contacts in the last 24 hours [61]. This fact inevitably implies the assumption that, in the future, customers will pay less and less attention to advertising contacts, as an increased redundancy effect will lead to a cognitive-psychological limitation of these. In another study on the "approval rate for various characteristics of advertising in different media 2014," about 25% of respondents stated that they no longer paid attention to advertising, regardless of the media carriers or the medium [63]. Particularly in-app advertising on mobile Internet, according to that survey, is not noticed by more than a third of respondents (36.5%) [64]. In addition, it should be added that advertising on the Internet is completely blocked by 25% of users in Germany using ad blockers on their devices [64]. Even with TV advertising, the leader in that study, almost one in six respondents (17.1%), is no longer reached. Also, the opinion that advertising represents a purchase incentive per se fluctuates in that survey, depending on the medium, between 4% (apps and mobile Internet) and 32.2% (advertising newspapers). Identical results emerged from another randomized Gallup study in 2018 [62]. If we follow these studies, advertising, at best, does not even lead to a purchase incentive for a third of the respondents. It can be concluded that generating sales or increasing sales figures through advertising contacts is becoming increasingly difficult.

Companies within the current globalized working reality thus face the significant challenge of having to appeal to their potential customers in other ways to bind them to their businesses. The traditional advertising strategy, which often still relies on the classic AIDA model, which has been refuted neuroeconomically in numerous studies, therefore requires a paradigm shift [8; 65; 66; 67; 68]. Many companies therefore hope for a solution by focusing their communication policy more on activating customer needs and thus binding the customer to the company, its product, or its brand core. Companies are aware that customer loyalty is an essential success factor for remaining successful in the market in the long term and sustainably. On the one hand, interaction via social media platforms can serve this purpose; on the other hand, with the help of these networks, this goal can also be achieved in another way, namely through co-creation.

In another representative empirical study, it was precisely derived that "the expression of trust and commitment would be positively influenced by the degree of customer participation" [47]. Thus, co-creation measures could significantly increase customer loyalty, among other things, due to their conative-affective connotations and, with this, the willingness to consciously perceive messages from the company among the flood of advertising contacts and, in the best case, to internalize them as well.

THE PROSUMER WITHIN THE IDEATIVE AND INVENTIVE PROCESS DEVELOPMENT

There are a variety of methods to include prosumers in entrepreneurial product development processes. Through netnography, ludological-hodological gamification options, or crowdsourcing, these collaborative integration formations offer diverse options with a focus on

different entrepreneurial customer integration models [68]. However, possible risks during the measures concerning the co-creation process should not be ignored here.

At this point, practical examples can help provide support for those interested in using co-creation. The procedural integration of the prosumer: In the early stages of product development, companies tried to explore the needs of potential customers through market research to develop relevant product ideas from the insights gained [18; 70]. However, there has always been a business risk in alerting competitors to potential product ideas through publicly effective communication measures. Moreover, in sensitive topics, insufficient answers may arise, among other things, due to the deficitary survey situation regarding the ideative quality and quantity [71]. To minimize these risks, companies are increasingly using netnographic methods. Netnography can be understood as the adaptation of ethnological research methods in Web 3.0, i.e., the elenctic as the exploration of the knowledge structure of cultures and communities that interact with each other and collaborate via social media platforms, thus constituting themselves based on identical genre preferences [4; 8; 36; 37].

Netnography Research Example: Beiersdorf AG, NIVEA

During the product development of "NIVEA Deodorant Invisible Black & White" by Beiersdorf AG [92], netnography was used during the ideative phase [71]. By passively observing online communities, such as blogs and forums, the needs, connotations, emotions, attitudes, and knowledge of prosumers from the interacting contexts of their natural ecosystem could be made plausible, which might not have been possible with classical research methods [72; 73; 74]. In this way, problems and needs could be categorized and classified in an exploratory way for prosumers in terms of their relevance and genre preference, namely whether the discussions were mainly about problem discourses and needs in the sense of relevance feedback or whether the community even constituted its own problem solutions [71].

Discussion

If professional discussions exist in relevant depth and authenticity or if lead users can even be evaluated, i.e., experts identified based on high intrinsic motivation for specific problems or need solutions, the probability of developing a product idea that has a sufficiently large homogeneous group for a promising product development and later, i.e., diffusive market penetration, increases [75]. Furthermore, it helps to explore suitable interaction strategies regarding conative and affective tonalities within the framework of the copy strategy, develop adequate toolkits and motivations concerning the target group, which are used in the active interaction of the co-creation process, and thus prevent a significant bounce rate [71].

However, netnography is subject to some limitations resulting from the specific IT architecture of Web 3.0 itself and its communication matrix within communities [76; 77]. The ductus within communities could even make the analysis more difficult, as outsiders might misinterpret the creation of words or decode them neuroeconomically as polysemic [8]. Moreover, there is a risk that humorous, cynical, or sarcastic representations in the multicode context could be misunderstood, leading to media psychological double-bind problems [71]. Also, individual actors may not be identified due to potential anonymity within social media platforms, thus not being able to be unambiguously typified and categorized, which significantly reduces the informative value of the information gained [85; 86]. Finally, there is a risk that the

communities studied may not have market-related relevance or may be self-sufficient, i.e., not yielding sufficiently reliable and valid information due to the intensity of the investigation [75; 77]. Thus, netnography is primarily a problem and needs an exploratory algorithmic method that enables valid plausibilizations primarily in the early stages of idea generation. However, as in the case of NIVEA mentioned above, it is also possible to abductively verify or falsify the success of a launched product during the introduction and marketing phases [79; 80]. By adequately preselecting both the communities and their actors and considering an ex ante, inter, and ex post evaluation of the information gained, potential risks can be significantly minimized [71]. Additionally, it is possible to integrate identified lead users into further phases of the co-creation process, making their specific expertise and transfer services economically viable for successful product development in the form of contributions [8; 75; 76]. Once enough promising product ideas have been obtained, they are evaluated using a criteria catalog [18]. Prosumers can be actively involved again at this point. However, it is recommended to motivate them with incentives for these activities [57].

Gamification and Co-Creation

To create possible incentives, companies should implement gamification toolkits in the selection and evaluation processes for this reason [81; 82]. Ludologically, gamification stands for the integration of gamified elements within the co-creation process, rewarding and entertaining prosumers in a playful way during their ideative knowledge transfer, with the aim of generating their contributions through intrinsic motivation and increasing their time spent in the process [81; 82]. Gamified elements include badges or leaderboards, limited time and resource constraints, or playful guidance through the problem-solving process using elements from game design [83].

Discussion Based on The Car Brand Smart

The car brand Smart specifically used a gamification tool in the context of netnography to identify the most popular design ideas from a previously conducted design contest [71; 75; 76]. Two anonymized prosumers were randomly selected. They were asked to choose between two submitted design proposals and decide which design, in their opinion, the other participant would choose [84]. In the event of a match, each received a match point [84].

Gamification methods generate socially motivating triggers, as in the example described, through the experience of success itself or through social interactions between individual prosumers or between prosumers within communities of practice and companies, such as likes or comments. This leads to a fundamentally higher willingness of prosumers to participate in the corporate co-creation process [82; 83]. In addition, the likelihood of truthful statements increases significantly [82; 84]. However, it may be difficult for companies to promote such involvement in a target group-appropriate manner. There is also the risk of manipulation or addiction due to escapist tendencies, where appropriate triggers must be found, especially for products that do not have a particularly strong conative or affective communication effect on the part of the prosumers and thus do not have a fundamental interest in, for example, an overly highly competitive design, whereby extrinsic motivation effects can displace these intrinsically [83; 84]). This increased quantitative or manipulative implementation could lead to a loss of quality or even the unusability of the results [83]. An inappropriate level of difficulty can quickly lead to a loss of motivation because tasks that are too easy could bore the prosumer,

while tasks that are too difficult could overwhelm them and prompt them to give up early, i.e., bounce rate [84]. Gamification is therefore a promising method to motivate prosumers within the co-creation process, but a very high degree of sensitivity is required on the part of the company in the context of communication planning and implementation in order to obtain reliable and valid results at all. After the selection and evaluation, the economic analysis of the product ideas is carried out [8; 18; 36; 37; 84]. In theory, it is possible to integrate prosumers into these analyses, but it does not seem sensible since it can be assumed that they are subject to an inherent emotional bias with regard to the ideative process due to their previous involvement, which may jeopardize the objectivity of these analyses. For this reason, co-creation measures should be avoided in this phase.

During product development, in the true sense, prototypes and design patterns are developed from a technological perspective as well as a marketing concept [18]. Prosumers can take on individual subtasks, such as product or packaging design. Crowdsourcing is an appropriate means for this [85; 86].

In summary, gamification can be a valuable tool for involving prosumers in the co-creation process, as long as companies are sensitive to the needs and motivations of their target audience. While there are potential risks, such as manipulation or addiction, careful planning and implementation can help to obtain reliable and valid results that contribute to the overall success of the co-creation process. Furthermore, integrating prosumers into various phases of product development, including design and marketing concepts, can lead to more innovative and user-centric outcomes. However, it is crucial to recognize when prosumer involvement is not appropriate, such as during the economic analysis of product ideas, to ensure the objectivity and validity of the results.

Crowdsourcing and Co-Creation

The acronym "crowdsourcing" consists of the terms "crowd" and "outsourcing" and means the outsourcing of previously internally processed tasks within the product development process via social media platforms to a multitude of external processors [85; 86]. At this point, it should be noted that, in contrast to the comprehensive co-creation approach, crowdsourcing should be understood as a tool to implement individual sub-processes in different ways [87]. However, in practice, projects declared as crowdsourcing in the media have been found to have a holistic character and involve prosumers in the development process from idea to product launch [88]. In the future, clear definitions should be provided by science to better distinguish and determine the terms. Crowdsourcing can be understood as an instrument during the co-creation process. Moreover, it can also be seen as an individual subprocess in an otherwise closed product development process in the sense of the stage-gate model. Discussion based on the examples of Bic Group, Ritter Sport and MAN [91] etc. The design competition for Bic Group [40] took place separately from the rest of the product development, while the brand Ritter Sport holistically involves prosumers in the product development process, from flavor creation to packaging design, to date [86; 89].

Tasks can be quickly and cost-effectively disseminated via social media platforms. Furthermore, companies can use the attention to advertise their products or brands, while prosumers include their contributions on the company's own websites or appearances on social media platforms.

Communication takes place during collaboration, also in the form of interspersed advertising messages, and participation in the process itself can improve the attitude towards the company or even constitute a conative-affective bond with the company and its brands on the part of the prosumer. Crowdsourcing is often carried out in competition form and is therefore also found in the literature under the term "online idea competition" [89]. Competitions increase attention, and the incentive of winning factually promotes the quality of the services to be provided. Crowdsourcing could be used as early as the ideation phase, as the Starbucks idea platform shows [41; 89]. By involving the prosumer and communicating during the processes, a bond can be built that increases the repurchase rate in the long term. In addition, these measures lead to a high relevance of the products concerning the prosumers, as their opinions and ideations flow directly into the development. This also creates increased relevance and authenticity of innovations concerning the target group from a product policy perspective and could thus significantly shorten market entry phases. However, there are also risks concerning the use of these measures, as the entrepreneurial integration of prosumers cannot be fully controlled and, if approached incorrectly, could even lead to undesirable results, such as so-called "shitstorms," i.e., a multitude of negative comments up to insults on social media platforms [90]. Companies must therefore be aware that, for example, due to a lack of conative-affective communication effects concerning the products on the prosumers, results could be delivered that do not correspond to the strategic goals of brand communication. Prosumers can also be annoyed or frustrated by unclear or insufficiently communicated framework conditions. This frustration or anger is then possibly communicated on social media platforms and reaches a broad public through viral distribution, which in turn can lead to shitstorms and harm the company's focused brand belief.

The dishwashing detergent brand Pril of the Henkel Group experienced such a case during a crowdsourcing process it conducted for a packaging design. Some humorous contributions, which temporarily occupied the top positions in the search engine rankings and later dropped significantly in the ranking due to deleted voter votes (according to the company's statements due to manipulations), triggered a shitstorm, which was also picked up by the press (see Spiegel Online, 2011). It is also not advisable to carry out crowdsourcing during times of generally negative public perception of the company. This is because it cannot be ruled out that the results provided by the crowd per se serve only to further discredit the company and publicly insult it, which in Web 3.0 tonality is referred to as "bashing" [33].

The commercial vehicle manufacturer MAN intended to have a new design for the team bus of the Bundesliga soccer club HSV developed via crowdsourcing. Due to the poor sporting performances of previous years, this competition was primarily used to address these issues, which were then picked up and disseminated by the media [91]. This example clearly shows the dangers and consequences of involving the crowd when the public's perception of the company is negative.

If crowdsourcing is to be successfully used as a communication method, the framework conditions must be analyzed beforehand, and, in case of doubt, other communication strategies from the communication mix must be chosen.

Perspectives

In general, it should be noted that products developed collaboratively in co-creation with prosumers are often limited editions that are placed on the market in limited quantities or for a limited period [85; 86]. This implies that interactive collaboration should not be understood as mere communication strategy tools with apposite and affirmative media metrics. Companies apparently primarily pursue the goal of increasing customer loyalty by giving prosumers a sense of participation in the company's processes. In fact, there are hardly any examples, such as that of the Beiersdorf brand regarding the Nivea measure mentioned above, in which prosumers are involved in the entire development process of products intended for permanent market presence, although according to company information it is the most successful deodorant launch in the history of the company to date [71; 92].

From this, it can be concluded that co-creation is mostly used as a communication policy instrument to date, but its use from a product policy perspective is still expandable. Further strategic considerations could be identified, for example, if companies themselves want to be seen as very innovative and therefore, especially in product developments based on their core competencies, do not want to raise doubts about their innovative strength. In addition, it is worth mentioning that the development of products that are part of a company's core competencies per se should be carried out internally, as the impression could arise extrinsically that the company lacks basic knowledge, i.e., with regard to the human resource, to be able to operate and position itself successfully and sustainably in the market. This, in turn, could lead to counterproductive and thus disadvantageous effects in the customer loyalty process, as customers or prosumers may lack or lose confidence in the brand. From this aspect, the use of co-creation should be analyzed in detail from a product policy perspective before each project. In particular, consideration should be given to which development formation offers the greatest benefit in terms of usability and sociability and whether the integration of a co-creation measure is compatible with the company's strategic communication goals.

CONCLUSION AND RECOMMENDATIONS FOR ACTION

The examination of the individual sub-processes of co-creation and the systematic-cybernetic approach, both from a product policy and communication policy perspective, leads to various conclusions.

Co-creation is indeed an instrument that can promote the innovative power of companies. Beiersdorf was able to develop a product that is highly innovative through the comprehensive co-creation process and has so far achieved direct disruptive market success because it is strongly aligned with customer needs. However, the framework conditions must be right, and the process per se should be actively and stringently accompanied. In addition, it should be noted that, from a product policy perspective, few innovations have so far emerged from an interactive collaboration process throughout the entire product development process. From a communication policy perspective, co-creation is indeed a suitable means and has a fixed place in today's brand communication concerning products. Furthermore, it shows that a high degree of preparation and basic considerations are required for these activities, and, especially due to the unpredictability of the crowd, results can be achieved that are contrary to the strategic goals of the company. From a scientific perspective, it can also be inferred that the definitions and

determinations around the thematic subject are polysemous, therefore very imprecise, and numerous semiotic convergences, overlaps, or even contradictory explanations can be found.

In the near future, co-creation could increasingly be included in the strategic communication of companies. This would enable the creation of products that, due to their proximity to the needs and desires of consumers, could shorten development times for numerous products, among other things, because the marketing of products already takes place to a large extent during the development process. As a result, companies could implement co-creation as a holistic strategy in parts of their product development from a product policy perspective. In the case of niche markets, it could also happen that prosumers, in addition to the production and consumption of products, are also involved in the financing of products or even the companies themselves, thus giving them the opportunity to enter the market. In doing so, they would additionally become shareholders in productions for their own needs or consumption, in addition to their function as prosumers. These phenomena have already been observed recently, but only non-commercially for personal use. Ultimately, this could lead to a new evolutionary stage on the demand side: the prosumer would develop into a shareprosumer. To achieve this, companies need to carefully analyze each co-creation project, assess the potential risks and benefits, and ensure that the co-creation process aligns with their overall strategic goals.

In this context, the following application-oriented statement should be made:

1. Enhanced customer loyalty: By involving customers in the product development process through co-creation, companies can establish a stronger emotional connection with their target audience. This sense of involvement and ownership can lead to increased customer loyalty, as customers feel more invested in the company's success and are more likely to recommend the products to others.
2. Improved market responsiveness: Through co-creation, companies can collect customer feedback and insights in real time during the development process. This enables businesses to better understand and respond to market trends, customer preferences, and potential issues, ultimately creating products that are more closely aligned with consumer needs and expectations.
3. Encouragement of innovation and creativity: Companies can tap into a wide range of perspectives, ideas, and experiences by involving a diverse group of people in the co-creation process. Innovation and creativity can be encouraged by this diversity, leading to the development of novel, groundbreaking products that could not have been created through traditional internal development processes alone. Companies should create an open and collaborative environment that encourages idea sharing and experimentation, while also ensuring that the process is structured and well managed to avoid potential pitfalls and negative outcomes in order to fully exploit the potential of co-creation.

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