Research Article

From Zero Sum to Positive Sum: Case Studies in Positive Sum Design

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Abstract
Positive Sum Design is a critique of zero-sum bias, and an approach to the design process that seeks greater aggregate value for all stakeholders by reframing constraints and creatively aligning users' incentives and needs away from zero-sum games. This paper examines several principles of Positive Sum Design against two case studies. The first case study examines affordances for trust and communication in the ride-sharing industry. The second examines affordances for producing and consuming knowledge in the design of Wikipedia. We set these examples against a critical framework of fundamental principles of Positive Sum Design, including the Mutability of Constraints, the Multivalence of Utility, and the development of Affordances for Trust and Communication.

Introduction

Zero-sum bias pervades much of today's social and political discourse, often limiting our ability to work towards outcomes where all stakeholders benefit. Positive Sum Design (PSD) challenges this narrow thinking by asking: Are we ethically bound to seek creative solutions that avoid zero-sum outcomes? PSD encourages the design of affordances that maximize value for all stakeholders, enhancing creative and cooperative problem-solving rather than settling for win-lose scenarios. This paper presents several Positive Sum Design principles and applies them to two case studies, illustrating how framing the design process in this way can lead to win-win outcomes.

The Multivalence of Utility

Utility is a measure of preferences. Economists use this term as a metric to determine the desirability of goods; how much we want what we want. However, Positive Sum Design poses a deeper question: Why do we want what we want? Too often, our preferences are shaped by normative assumptions about value, leading to unnecessary competition, and defaulting to zero-sum bias. But by embracing creative ways to satisfy the needs of all stakeholders, beyond initial assumptions, we often discover more value than we initially expected. Not everyone wants the same thing. The Multivalence of Utility expands the

conditions of possibility and provides a framework that allows designers to consider how the available resources in any given situation might differently address users' preferences rather than defaulting to the same incentive.

The Mutability of Constraints

Constraints are limitations that define the boundaries within which the design process plays out. However, any given constellation of constraints, which are necessary features of any creative process, can be misaligned or mismatched to the given context in which they operate. By creatively reframing the constraints, in part by critiquing assumptions about utility, and in part through a broader analysis of the given context, the range of possibilities can be expanded, and new value can be recognized, moving from a perception of scarcity to a perception of abundance.

Affordances for Trust and Communication

Stakeholders can coordinate their behaviors both directly and indirectly. In some cases, behaviors can emerge through affordances for behaviors inherent in a system. But stakeholders can directly act on each other as well. Whether it is through direct communication with each other or in the emergent behaviors that are built into the system in which these stakeholders operate,

designing for communication and trust allows for greater coordination and cooperation. Careful design consideration can be given to the ways communication and trust play out within these collaborative interactions.

Positive Sum Design Analysis of Wikipedia

Positive Sum Design serves as the foundation for creating practical design methods [1]. This paper aims to explore these principles through case studies that demonstrate positive sum features, highlighting both the potential benefits and risks involved.

Wikipedia offers an illuminating case study, showcasing how the intentional design of open access and decentralized governance can foster collaboration and coordination through Affordances for Trust and Communication. By examining how Wikipedia puts PSD principles into practice, we can gain insight into the potential benefits and limitations of applying these principles at scale.

Wikipedia: Affordances for Communication and Trust

Wikipedia is a particularly interesting case study, both in terms of the scale and longevity as a nonprofit, open-access platform. With over 6 million articles in English, Wikipedia is a hub for intellectual exchange with contributors gaining recognition and users enjoying an evolving repository of knowledge [2] Wikipedia's strength lies in its dual model of production and consumption. Users enjoy a vast knowledge base without incurring any cost. Alternatively, contributors—over 121,000 active editors as of 2023—are empowered to correct inaccuracies and share their expertise.

This expansion of value for all stakeholders, both producers and consumers, is due, at least in part, to Affordances for Trust and Communication. Contributors can coordinate their offerings, even and especially if these contributions present contradictory or opposing perspectives. This diversity of perspectives is a key factor in the value of the discourse. The exclusion of perspectives ultimately impoverishes the discourse.

The information being offered is taken, at least partially, to be trustworthy because users are invited to observe and partake in these discussions. Mesgari et al. argue that Wikipedia's accuracy is comparable to traditional encyclopedias precisely because of these open communication affordances [3]. Contributors debate and refine content transparently, strengthening both the quality and reliability of the information. The process is as transparent as the product. The triumph of Wikipedia lies in the affordances woven into its anti-rival design. From these bids of participation, a stable consensus emerges, while preserving divergent perspectives, coalescing into a fuller and deeper understanding.

Presenting discussions in this way, side by side as it were, gives insight into how a provisional consensus is achieved, as it invites further commentary and development. This decentralized approach does not rely on an oligarchy of experts but rather builds trust directly into the discourse between all stakeholders. Open communication fosters trust, and in this way, communication and trust are two sides of the same coin.

"Talk Pages" play a central role in facilitating communication, allowing contributors to discuss edits, justify their contributions, and seek consensus [4]. These pages convert passive users into active contributors, enhancing the sustainability of Wikipedia by promoting greater participation. This transparency ensures that disputes are resolved with evidence-based reasoning rather than majority rule. This model of communication reinforces Wikipedia's commitment to accuracy.

Wikipedia: Mutability of Constraints

Wikipedia exemplifies the Mutability of Constraints by fundamentally reimagining the limitations inherent in traditional encyclopedias. Conventional encyclopedias operate within rigid constraints, including limited editorial capacity, high production costs, and restricted access. These factors dictate who can contribute, how much information can be included, and who has access

Distinctively, Wikipedia bypasses traditional constraints by leveraging a flexible, communitydriven model where anyone can contribute, regardless of credentials. These contributions are reviewed and discussed by the community, balancing open participation with consensus building. This decentralized, collaborative approach removes barriers and turns the scarcity of authoritative information into an abundant, evolving resource [5]. By allowing broad participation, Wikipedia has transformed knowledge creation and distribution, turning restricted expert knowledge into a richer, more comprehensive understanding that benefits all stakeholders.

Wikipedia: Multivalence of Utility

Moreover, Wikipedia demonstrates the Multivalence of Utility by functioning not only as an information repository but also as a platform for both consuming and producing content. This shift from passive consumption to active participation adds multiple layers of utility [6]. Contributors gain recognition, share expertise, and experience community involvement, while users benefit from up-to-date, free information. This participatory model encourages individuals to recognize their role in shaping collective knowledge, offering value beyond a simple exchange of information. Wikipedia's design maximizes utility by transforming individual contributions into a collective reservoir, making knowledge-sharing an inclusive and evolving process.

Wikipedia as a Positive Sum Knowledge Commons

Wikipedia exemplifies PSD by fostering a mutually beneficial ecosystem where knowledge is produced and consumed without resource depletion. In this way, it offers a solution to the so-called tragedy of the commons because of its non-rival or anti-rival design. Yochai Benkler's book, The Wealth of Networks, addresses how digital networks, information sharing, and collaborative production can transform traditional economic models along these lines [5]. Information is a non-rival good. One person's use of information does not diminish its availability to others. Instead, it can increase in value through more widespread access, which is what Benkler refers to as "anti-rival" goods. For example, the limitations of socio-economic barriers are minimal as the site offers multilingual content globally. Intellectual exchange at this scale would otherwise be hard to sustain under a zero-sum model. The more people who participate, the greater the aggregate value for all stakeholders.

Though Wikipedia is not without challenges, the platform strategically addresses issues such as vandalism, misinformation, and the free rider problem. Community monitoring, automated bots, and a culture of voluntary contributions mitigate some of these concerns [7]. Though the platform is vulnerable as a digital common, its transparent processes and active contributor base help generate reliable content and promote iterations [6].

Positive Sum Design Analysis of the Sharing Economy

The sharing economy, which facilitates resource and service sharing through digital platforms, has transformed many industries by focusing on access over direct ownership. Uber, founded in 2009, is a prominent example of this shift. Uber and similar ride-sharing companies connect passengers with drivers via mobile apps. Despite significant labor issues and zero-sum dynamics during Uber's rise, their design of Affordances for Trust and Communication is noteworthy. Historically, getting into a car with a stranger was considered risky for both drivers and passengers. Ride-sharing companies addressed this by verifying identities and setting behavioral standards, ensuring safety for all involved [1]. These features can be effectively analyzed through Positive Sum Design (PSD) principles.

Ride Sharing: Affordances for Trust

Uber built trust through several design features that addressed the inherent lack of trust in getting into a stranger's car. These include real-time GPS tracking, driver profiles with rating systems, and transparent payment processes. These elements significantly reduce uncertainty and anxiety for users, fostering confidence in the platform. These trust-building affordances are fundamental to the UX/UI design that ride-sharing companies rely on to ensure user safety and confidence.

Ride Sharing: Multivalence of Utility

Uber transformed how both drivers and riders perceive their options. For drivers, it turns personal vehicles into a source of income, offering flexible work hours. For riders, Uber provides on-demand transportation that is often cheaper and more transparent than traditional taxis. Ultimately, Uber enhances urban mobility for both parties. In this way, ride-sharing apps deliver distinct forms of utility for both customers and drivers.

However, the ride-sharing industry must contend with the negative externalities it fosters. Two are the disruption of traditional public transportation models and problematic labor practices [8]. Uber and similar companies illustrate that while expanding utility for some, it can lead to restrictions for others, cautioning us to weigh both benefits and consequences.

Ride Sharing: Mutability of Constraints

Uber's model expanded public transportation by decentralizing it using private vehicles connected through a mobile app. By leveraging personal cars, Uber bypassed the high costs and rent-seeking behaviors inherent in fleet ownership, creating an adaptable service that filled gaps in traditional transportation models [9]. This flexibility enabled Uber to provide on-demand rides even in underserved areas and off-peak hours.

But once again, these examples caution us to consider how the appearance of greater aggregate value may be temporary or illusory and might mask zero sum incentives.

The Shift from Positive to Zero Sum

As Uber grew its markets, the benefits that initially benefited both riders and drivers by expanding constrained resources and offering new utility to customers, began to shift. Initially, to capture market share, Uber adopted an aggressive pricing strategy that lowered fares to attract riders. This, however, led to disruptions in the taxi industry, causing significant revenue losses for traditional taxi drivers and medallion owners [10].

Internally, Uber's model became increasingly exploitative of its drivers. Despite offering flexible work hours, many drivers faced low pay and lacked benefits such as healthcare or job security [11]. By 2013, thousands of Uber drivers filed a lawsuit, demanding full employment status instead of independent contractor status [12]. As Uber continued to gain market dominance, it began raising prices, which led to dissatisfaction among riders. For example, in Innisfil, Ontario, where Uber initially provided affordable transportation as a substitute for public buses, fare increases, and capped availability left users with fewer options at higher prices [13]. Thus, Uber's shift towards a zero-sum model was marked by growing dissatisfaction among both drivers and riders, as the company prioritized profitability and shareholder value over stakeholder welfare.

Contributing Factors to Uber's transition

Several factors contributed to Uber's divergence from a positive sum model to a zero-sum model as gains for certain stakeholder groups came at the expense of others.

In terms of the short-term factors, Uber's business model and growth strategy played a pivotal role in accelerating its shift. Uber's aggressive growth strategy, focused on rapid market expansion through penetration pricing, initially offered affordable rides and attracted millions of users. However, this shortterm approach, fueled by investor funding, led to rising prices once Uber reduced competition [9]. As the company gained market dominance, riders who had benefited from low fares found themselves facing higher costs and fewer options. Additionally, Uber exploited regulatory loopholes by classifying drivers as independent contractors to avoid labor costs, which sparked legal challenges and dissatisfaction among drivers. These factors contributed to Uber's shift from a positive sum model to a zero-sum model, where benefits for some stakeholders came at the expense of others.

Uber's shift to a zero-sum model was driven by longterm factors such as the exploitation of the gig economy and disruption of traditional industries. Initially, Uber's model offered flexibility for drivers, but as the company grew, concerns about low pay, job insecurity, and lack of benefits sparked protests and legal challenges [14]. At the same time, Uber's expansion undermined the traditional taxi industry, reducing incomes and destabilizing transportation ecosystems. While Uber's rapid growth brought short-term benefits, its focus on market dominance and cost-cutting came at the expense of workers' rights and long-term industry stability. Ultimately, the broader implications of zero-sum models extend beyond Uber, with platforms like Airbnb and Doordash showing similar patterns of rapid growth, aggressive pricing, and reliance on contract labor. The challenge moving forward is to find a balance between sustainable practices, fair labor conditions, and continued business growth.

Designing for Sustained Positive Sum Outcomes in the Sharing Economy

Despite the transition from positive sum models to zero sum models in the Uber example, positive sum examples exist within the sharing economy industry. One notable example is FairBnb, which adopts a similar model to AirBnb but integrates sustainable tourism and social responsibility into its core business objectives [15]. FairBnb ensures that its operations generate positive social impact by dedicating a portion of its profits to communitydriven projects, focusing on ethical tourism that benefits residents rather than merely capitalizing on transient guests [16]. This approach represents a shift from the more traditional profit-maximizing models seen in platforms like AirBnb and aligns with PSD principles.

From Zero Sum to Positive Sum

One of the central concerns of Positive Sum Design is the development of strategies that shift a zero-sum situation into a positive sum situation. Especially within the sharing economy, the shift requires aligning value creation for all stakeholders - businesses, workers, consumers, and communities. For Positive Sum Design to be sustainable, it must benefit the business while fostering long-term brand loyalty, worker retention, and community trust. This involves expanding stakeholders beyond shareholders, prioritizing ethical leadership, fair compensation, environmental sustainability, and transparent practices. Companies should focus on long-term value creation, rather than short-term profit maximization, creating ecosystems where all parties thrive.

There are two key forms of regulation to drive this shift: internal and external. Internal regulation refers to the company's self-regulation by expanding its view of stakeholders beyond just shareholders to include workers and communities. This approach focuses on ethical leadership, fair wages, transparency, and sustainable growth, as seen in companies like FairBnB [17]. By adopting internal practices that prioritize long-term value over shortterm gains, businesses create a foundation for sustainable success.

On the other hand, external regulation involves public policies and consumer-driven pressures. Governments can enforce ethical business practices through laws that protect workers, such as California's AB5, which sought to reclassify gig workers as employees with benefits [18]. Additionally, consumer activism and market incentives - such as the rise of ethical competitors like Fairbnb - play a critical role in driving companies to improve their practices and adopt more responsible business models. Public scrutiny, amplified by social media, further holds businesses accountable, often influencing them to adapt or risk losing market share.

Transitioning from zero sum models to positive sum models requires a balance of internal strategies and external regulations. Companies that embrace ethical practices and shared value creation, while also responding to external pressures, are better positioned for long-term success in an increasingly ethically conscious marketplace.

Broader Implications of Positive Sum Design

Distinctions between Wikipedia and Uber's Models Wikipedia and Uber offer distinct digital platforms tailored to their specific value propositions and user needs. Wikipedia is a non-profit platform focused on facilitating global knowledge sharing, with users contributing and consuming content to enhance accessibility. Its simple design prioritizes collaboration and the dissemination of information.

In contrast, Uber operates as a for-profit company, leveraging a mobile app to provide real-time transportation services. While its primary goal is profit maximization, this does not inherently exclude the possibility of adopting Positive Sum Design principles. A for-profit model can still create positive outcomes for various stakeholders. The challenge lies in ensuring that profit maximization does not lead to zero-sum dynamics. While Wikipedia's non-profit model naturally lends itself to Positive Sum Design principles, it's not the business model itself but how the platform engages with its users and the goals it sets that determine the ability to implement Positive Sum Design. These structural differences influence how each platform interacts with its users and adapts Positive Sum Design to their respective business models.

PSD Framework for the Non-Profit Sector

Non-profit organizations can adopt Positive Sum Design frameworks by creating systems that generate mutual value for both contributors and beneficiaries while preserving resources. This approach can be achieved through democratized contribution models, where stakeholders offer expertise, resources, or feedback, much like how Wikipedia enables individuals to edit and improve content. By lowering the barriers to participation, non-profits foster a collaborative ecosystem that allows knowledge, skills, or services to flow freely.

The concept of "Sustained Mutual Value" (SMV) encapsulates this, where contributions (financial, intellectual, or volunteer) amplify impact while minimizing resource depletion. The SMV equation, SMV = (Contributions x Impact) / Depletion, helps non-profits track sustainability, ensuring that their efforts create lasting value without exhausting resources. SMV draws on the principles Elinor Ostrom outlines in Governing the Commons [19]. Ostrom implores nonprofit organizations to tailor the extraction, usage, and distribution of resources to the needs and circumstances of the community they affect. However, "congruence between rules and local conditions" cannot ensue without platforming the voices of community members. According to Ostrom, "collective-choice arrangements" foster ownership among contributors, deepening their commitment to the larger community. Sustainability is central to the SMV model. To maintain this value, Ostrom suggests monitoring users' compliance with guidelines they identify; though, sanctioning of any kind would be left to other users to decide. Wikipedia exemplifies these principles, demonstrating that a decentralized model can successfully manage shared resources through effective governance.

Moreover, the application of Ostrom's principles transcends the community contributors and users curate. Donors, much like contributors, also play a vital role in sustaining mutual value within the nonprofit ecosystem. Gundlach and Murphy emphasize that building trust and ethical relationships is crucial for fostering long-term commitment and loyalty [20]. For

donors, trust is built through transparency regarding how their contributions are used, ethical stewardship of resources, and the tangible impact of their support.

By prioritizing these elements, non-profits create deeper and more meaningful connections with donors, who in turn feel a greater sense of purpose and fulfilment. The Multivalence of Utility is key here, as donors derive not only satisfaction from supporting a cause but also recognition, purpose, and a sense of community. Non-profits that adopt this framework can better navigate challenges, secure long-term impact, and continuously renew resources. All while aligning their mission with broader sustainability objectives.

PSD Framework for the For-Profit Sector

A critical avenue for driving positive change in forprofit companies is through the implementation of frameworks that embody the PSD principles. The failure of Uber's model, at least in terms of its regulatory and labor challenges, is partly due to its strategy to prioritize short-term growth at the expense of broader stakeholders. One might adopt a more balanced approach. Companies like FairBnb show that creating win-win scenarios - where benefits extend beyond shareholders to include communities and the environment - builds loyalty, strengthens brands, and ensures resilience.

A key component in implementing PSD methods is expanding the definition of stakeholders. Traditionally, stakeholders are limited to shareholders, employees, and customers - who have a vested interest in the company's financial success. However, a PSD approach broadens this to include suppliers, communities, the environment, regulators, and future generations. Positive and negative externalities must also be considered. By considering the well-being of all these groups, companies can create greater mutual value. Frameworks like the Triple Bottom Line and Corporate Social Responsibility (CSR) help measure not just financial performance but also social and environmental impact [12,21]. Both frameworks expand the concept of performance measurement to assess the broader impact and ensure that the company's growth does not come at the expense of people or the planet. This wider focus can drive positive change, enhance employee engagement, attract ethical investment, and build stronger, more resilient relationships with customers. Ultimately, this approach positions companies for long-term success and greater aggregate value, while contributing to a more sustainable and equitable society [22].

Conclusion

In reflecting on these case studies, we see two contrasting paths toward implementing Positive Sum Design (PSD). Wikipedia's non-profit model exemplifies how a community-driven approach can generate widespread benefits through collaboration, shared ownership, and mutual trust. By integrating Affordances for Trust and Communication, Wikipedia creates an inclusive environment where both users and contributors engage equitably. Additionally, Wikipedia demonstrates the Mutability of Constraints by redefining traditional barriers, such as editorial gatekeeping, into opportunities for open contribution. This model showcases the Multivalence of Utility, as contributors derive value through recognition and participation, while users benefit from accessible, continually updated information. Wikipedia's

model highlights the potential for longterm, collective value when stakeholders - users and contributors - are equally engaged and empowered.

Conversely, Uber's for-profit model initially incorporated PSD principles. As profit maximization took precedence, the company faced challenges in maintaining mutual value. Affordances for Trust, such as identity verification and transparent pricing, initially helped build confidence among drivers and riders, but the scaling pressures and competitive environment led to tensions and exploitative practices. Uber's example illustrates the difficulties of sustaining PSD in the face of short-term financial incentives, particularly when scaling disrupts the harmony amongst stakeholders.

These case studies underscore that the successful integration of PSD depends on multiple factors: the company's industry, stakeholder interests, leadership vision, and market dynamics. Short-term gains often undermine long-term sustainability, while external pressures can foster zero-sum thinking. Even in nonprofit environments, challenges such as resource competition and the exclusion of diverse voices complicate PSD implementation.

Ultimately, these challenges illuminate a deeper need for a cultural shift within organizations, regardless of sector. By embracing Affordances for Trust and Communication, Mutability of Constraints, and Multivalence of Utility, organizations can create environments where all stakeholders benefit from transparency, trust, and community engagement. This holistic approach can drive sustainable growth and equitable outcomes that endure over time. For Positive Sum Design to thrive, it requires a commitment to long-term vision, inclusivity, and ingenuity– ultimately ensuring shared, sustainable success for all [23-35].

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