

*A socio-technical approach to study consumer-centric information systems*

# **A Socio-Technical Approach to Study Consumer-Centric Information Systems**

*Research-in-Progress*

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## **Abstract**

*Given the unprecedented role of digital service platforms in private life, this research sets out to identify the mechanisms that are designed into information systems with the purpose to increase consumer centricity. We evaluate the consumer centricity of an information system against three reflective indicators, that is the degree of need orientation, value co-creation and relationship orientation and conceptualize consumer centricity as the ability to align social and technical information system components.*

*We employ a positivist, explanatory case study approach to test three hypotheses on system component alignment in cases from three domains (gaming, social networking, and video sharing). We found preliminary evidence for three alignment mechanisms that increase consumer centricity.*

*With this research, we plan to contribute to the literature on consumer-centric information systems by elaborating and empirically grounding a socio-technical approach to study mechanisms and their joint application to increase consumer centricity in information systems.*

**Keywords:** *Human behavior in IS, Human-computer interaction, Information systems, IS models, IS research, Socio-technical approach, Case Study Research*

## Introduction

Enjoying Internet-based services is an integral part of our everyday life. We socialize on Facebook, play games via Steam, and watch videos on YouTube. Today, these digital service platforms (cf. Lusch and Nambisan 2015) attract a large number of private users, or *consumers*, who engage voluntarily and develop an emotional bond with these platforms (cf. Sas et al. 2009). The mentioned examples are well-crafted digital artifacts embedded in a compatible social context: they cater to utilitarian and social needs of individual consumers; they create a forum for collaborative dialogue; and they become more beneficial and appealing through continued engagement. These qualities make socio-technical systems consumer-centric (Spottke et al. 2015).

Information systems (IS) research is rooted in the workplace. Thus, systems have traditionally been examined for their utilitarian value (Sarker et al. 2013). The overarching question has usually been how to extract most business value from investments in digital technologies (Agarwal and Lucas 2005). This inclination has made IS scholars predominantly root with organizations and the people they employ, whereas the consumer who simply wants to have a good time often has been either ignored or marginalized (Yoo 2010). In this regard, *Consumer-centric information systems* differ from organizational information systems and represent a new type of IS (Liang and Tanniru 2006).

In this paper we propose a novel vista on the systems and companies that control these consumer-centric information systems. Specifically, the *objective of this research* is to identify mechanisms that are designed into information systems with the purpose to increase consumer centricity. We regard consumer-centric mechanisms as interacting processes that align socio-technical components of an information system with the individual consumer and that cause the information system to be consumer-centric, or organized around the consumer. The notion of socio-technical component alignment has its roots in organizational settings (Bostrom and Heinen 1977; Hester 2014; Leavitt 1965; Lyytinen and Newman 2008; Sarker et al. 2013) but to the best of our knowledge, it has not been applied to consumer-centric IS.

Focusing on mechanisms that foster system component alignment with the consumer enhances existing research and has two advantages: *First*, it directs our attention towards those outcomes that consumers care about, as opposed to economically relevant outcomes for service providers. Hence, our work complements research on digital platforms and digital infrastructures which, for example, focuses on the nature of such digital artifacts (Kallinikos et al. 2013; Yoo 2013), on explaining how digital platforms evolve (Hanseth and Lyytinen 2010; Henfridsson and Bygstad 2013), or on how tensions between providers and developers are resolved (Eaton et al. 2015). *Second*, focusing on mechanisms offers an analytical lens that integrates the social and technological components. So far, research on consumer-centric IS has largely neglected the interplay of socio-technical components. However, several publications on consumer-centric IS have identified design activities, that we regard as mechanisms, e.g., the alignment of service offerings toward consumer needs through personalization (Albert et al. 2004), the modularization of technology and service architectures to align a provider's technology base to the consumer and her technology (Liang and Tanniru 2006; Tuunanen et al. 2011), and the adaptation to emerging social structures within an IS to comply with the values and norms of consumers (Wagner and Majchrzak 2006). While these authors discuss individual mechanisms, the socio-technical model offers a lens to examine the joint application of such mechanisms, which is at the root of consumer centricity. To frame our research, we pose the following question: *What mechanisms align the socio-technical components of an IS towards consumer centricity?*

Such a research is necessary, because the existing body of knowledge is conspicuously silent on the specifics of consumers – and not organizational users – as actors of socio-technical systems (Yoo 2010). To this end, we propose a research model and a case study approach in this research-in-progress article which is suitable for identifying the sought-for mechanisms and assessing them. With the research presented here, we contribute to the literature on consumer centricity in socio-technical systems by elaborating an empirical approach to identify mechanisms that increase consumer centricity through socio-technical component alignment. To this end, (1) we apply socio-technical systems theory to put forth the concept of a *consumer-centric information system*; (2) we propose an empirical research design that aims to reveal alignment mechanisms and their effects on consumer centricity; and (3) on a case vignette we illustrate how the proposed model and methodological approach will help us answering the formulated research question.

The remainder of this manuscript is structured along these lines. It concludes with a brief reflection of main limitations and an outlook on future research.

## **Theoretical foundation**

### ***Consumer centrality and customer centrality***

Customer centrality has come to be known as a synonym to “*literally organize around the customer*” (Galbraith 2005 p.14). With such a vague definition in place, the term is amenable to a broad range of interpretations and variations (Alter 2008; Shah et al. 2006). To increase clarity of the concept, we briefly introduce three main dimensions of customer centrality commonly discussed in the marketing and IS literature, based on a recent review of the knowledge base (Spottke et al. 2015). Turning to the marketing discipline makes sense, because scholars of strategy and marketing have been debating this concept for over five decades (Kumar 2015; Levitt 1960).

Moreover, we will employ the term of *consumer centrality* throughout this paper to narrow the discussion towards a certain type of customer, namely an individual human being in her private surroundings. The discussion laid out below leads us to evaluate the consumer centrality of an IS against three reflective indicators, that is the degree of need orientation, value co-creation and relationship orientation of an IS.

Recognizing and satisfying consumer needs is a key dimension within the consumer-centric paradigm (Shah et al. 2006; Sheth et al. 2000). *Need orientation* is typically based on information and knowledge about the preferences of individual consumers (Peppers et al. 1999). Consumer needs are multi-dimensional and heterogeneous, that is they encompass individual utilitarian, hedonic and social needs (Albert et al. 2004; Schmitt 1999). In addition, they are not only experienced in cognitive, rationale terms, but also through thoughts, emotions and activities, which are harder to detect (Hirschman and Holbrook 1986). The degree of need orientation depends on a socio-technical system’s ability to recognize and satisfy the multidimensional needs that are experienced by individual consumers as part of the system.

The concept of *value co-creation* emphasizes the active role of consumers in value-generating service processes (Vargo and Lusch 2004, 2008). Value is not passively delivered to the consumer. It rather results from collaborative interactions in which consumers and providers integrate their resources, such as skills and technologies (Payne et al. 2008; Payne and Frow 2005). Hence, consumers are co-creators of their experience (Prahalad and Ramaswamy 2004), their beneficiaries, and the ultimate causal factor for any created value (Etgar 2008; Vargo and Lusch 2008). The degree of value co-creation is reflected in how consumers are involved in the service process, e.g., the level of resource integration and the amount of influence consumers have on service activities (Sarker et al. 2012).

A third crucial element of consumer centrality is establishing, developing and maintaining *relationships* among consumers and providers (Berry 1995; Morgan and Hunt 1994). In order for sustainable relationships to develop, they need to be beneficial for both parties in the long run (Lamberti 2013). Trust is regarded as the foundation of long-term relationships, and it is built upon successful interactions, shared values and norms, and compatible behavioral practices (Hennig-Thurau et al. 2002; Morgan and Hunt 1994). Thus, the degree of *relationship orientation* depends on a system’s ability to foster trust among participating consumers and providers, and in the continued creation of mutual benefits through repeated interactions.

This conceptualization of consumer centrality emerged from a systematic literature review and coding process (Spottke et al. 2015). The identified *indicators* are interrelated, i.e. they can re-inforce each other, and they can occur simultaneously. For example, personalization mechanisms aim at increasing the degree of need orientation by adjusting a service to specific consumer preferences, thereby making interactions more successful and, as a consequence, it deepens relationships (Huang and Rust 2013).

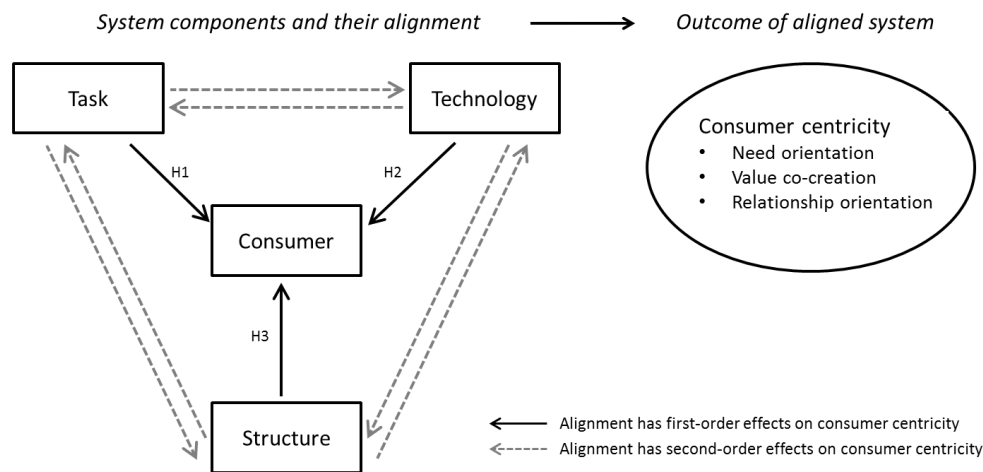
### ***Consumer-centric information systems***

Recent publications in the IS field have suggested to expand the scope of inquiry to computing in everyday life and to the supporting artifacts and infrastructures (Yoo 2010), to account for the *individuation of IT* (Baskerville 2011), and to conceptualize users as actors in their social context to better understand their technology adoption and use (Lamb and Kling 2003; Venkatesh et al. 2012). Private users, or *consumers*, differ from organizational users in important ways. Not only is system adoption voluntary and system use guided by individual will (Tuunanen et al. 2008). Compared with organizational users, consumers are free

to choose their activities, roles and relationships which depend on their private, individual and social contexts, i.e. they are not primarily driven by economic considerations (Wagner and Majchrzak 2006).

An emerging body of IS literature specifies characteristics of consumer-centric information systems and provides methodological support about how to design this type of IS (Huang and Rust 2013; Pan and Pan 2006; Tuunanen et al. 2010; Tuunanen et al. 2011). Several studies emphasize the importance to modularize IT and service architectures to enable flexible adaptation and reconfiguration of services (Liang and Tanniru 2006; Tuunanen et al. 2011). For example, Albert et al. (2004) propose a personalization process to dynamically adapt and configure a website based on identified visitor segments. Research on consumer-centric Wikis clearly indicates the importance of being aware of and respond to (emergent) social structures that are shaped and enacted through practices of technology-enabled consumer collaboration (Wagner and Majchrzak 2006). Consumer-centric IS can easily fail without mechanisms that define, e.g., the standards and norms for collaboration, or the roles that consumers can take, or the mechanisms for moderating social interactions (Pan and Pan 2006; Wagner and Majchrzak 2006).

We conceptualize consumer centrality as a latent trait of an information system, the roots of which we find in socio-technical system design. Socio-technical theory attributes a system’s performance to the mutual alignment of four logically separated components (Bostrom and Heinen 1977; Leavitt 1965). The research model in Figure 1 and the hypotheses presented below are based on a previous literature review (Spottke et al. 2015) and show the system components, their alignment relationships, and the desired outcomes of alignment. It is worth noticing that this model emphasizes the *consumer* as single most relevant actor. Here, we deviate from the canonical socio-technical model that considers all actors involved in system design and usage, such as providers, developers, and consumers (Leavitt 1965). We regard consumer-centric mechanisms as interacting processes that align socio-technical components of an information system with the individual consumer and that cause the information system to be consumer-centric, or organized around the consumer. Although extant research on consumer-centric IS does not explicitly conceptualize socio-technical alignment mechanisms, it suggests that personalization, modularization of architectures, and adaptation of social structures towards consumers’ preferences, technology base and value system represent important mechanisms to enhancing consumer centrality. In this context, the socio-technical model offers a lens to examine the joint application of such mechanisms, which is at the root of consumer centrality. We assume that consumer centrality is primarily determined by those relationships in which the consumer is directly involved (*first-order effects*, black arrows in Figure 1). These direct relationships are the most pertinent ones to examine, because *second-order effects* affect the consumer, and thus consumer centrality, via indirect causal changes. We therefore exclude such second-order effects from this study.



**Figure 1. Research Model of a Consumer-Centric Information System**

*Consumers* are private individuals who perform activities (or *tasks*) to fulfill their hedonic and utilitarian needs. Consumers use systems voluntarily and select their activities freely (Wagner and Majchrzak 2006). The *task-consumer* relationship reflects the capacity of system tasks to fulfill consumer needs, to enable value co-creation, and to facilitate relationships. We argue that the task component can be aligned towards the consumer, e.g. by implementing mechanisms that enable consumers to execute tasks or that enable

consumers to influence the task itself. Such a mechanism would for example, enhance a system's ability to recognize and satisfy consumer needs, or offer new opportunities for value co-creation. We therefore hypothesize: (H1) Implementing mechanisms that capacitate consumers to influence task design and performance increases consumer centrality of an IS.

*Technology* consists of the hardware and software artifacts used within the socio-technical system (Lyytinen and Newman 2008). In a consumer-centric IS, these elements include consumer-controlled technology such as their private computers, smartphones, and wearables (Liang and Tanniru 2006; Pan and Pan 2006; Tuunanen et al. 2010). Thus, the *technology-consumer* relationship reflects the capacity of a system to fulfill the technological prerequisites to integrate consumers' technology resources, thereby enabling them to actively co-create value, to fulfill their needs, or to build technology-mediated relationships, e.g., by implementing mechanisms that ensure compatibility with or adapt to consumers' technology base. In this sense technological adaptability refers the capability to adjust an installed technological base to new or emerging technologies, and compatibility ensures that different technological combinations work together (Hanseth and Lyytinen 2010). We therefore propose: (H2) Ensuring adaptability to and compatibility with the technological environment of the consumer increases consumer centrality of an IS.

Social *structure* refers to shared values and norms, as well as to behavioral practices that govern the interactions within systems (Lyytinen and Newman 2008). For example, existing privacy settings such as the permission to use pseudonyms, enacts certain values and enforces specific norms within a system (Pan and Pan 2006). The *consumer-structure* relationship refers to the capacity of a system to foster consumers' identification, that is the "perception of similarity of values, membership and loyalty" (Kankanhalli et al. 2005), with the social structure embedded in a system. We argue that implementing mechanisms that enhance consumers' identification fosters trust within the relationship, and thus nurtures consumers' willingness to collaborate in co-creation activities. Therefore, we hypothesize: (H3) Embedding values and norms in a system that consumers identify with increases consumer centrality of an IS.

## **Methodology**

### ***Research design***

With this research we aim to identify alignment mechanisms that increase consumer centrality within information systems. Therefore, this study involves the analysis of socio-technical alignment activities. More specifically, we test how well the formulated hypotheses explain mechanisms of system component alignment observed in empirical settings.

Theory testing is often performed through quantitative research methods such as survey instruments. However, a quantitative approach would be impractical for our purposes because there is no unified understanding of key terms. For example, the terms "structure", "task" or "alignment" are not generally recognized in the context of consumer centrality in information systems. Also, the theoretical basis to operationalize and measure the influence of alignment mechanisms on consumer centrality is not yet established sufficiently, and hence a qualitative research approach is favored (Benbasat et al. 1987).

We adopt a positivist, explanatory *case study* approach, and do so for three fundamental reasons. First, case studies are suitable to study context-rich socio-technical systems, such as consumer-centric IS (Yin 2013). Second, the approach is appropriate to understand which mechanisms are implemented and how they impact consumer centrality (Yin 2013). Third, due to their strengths in taking context and temporal sequence into account, case studies are useful to identify causal relationships and thereby to test hypotheses (Dubé and Paré 2003). We study three consumer-centric information systems in a multiple holistic case design (Yin 2013) to provide sufficient empirical grounding and to strengthen generalizability (Benbasat et al. 1987). We employ the proposed research model to specify the unit of analysis, namely a consumer-centric information system, and the boundaries of our inquiry. The model also provides a single theory approach to hypothesize on the alignment of system components (Benbasat et al. 1987). For this study we select the leading digital video game distribution platform (Steam), the leading social network service (Facebook) and the leading digital video sharing platform (YouTube). Despite differing case contexts, we expect that findings can be reproduced from case to case, that is we implement a literal replication strategy (Yin 2013).

The case selection process is based on the principles of *similarity & variation*, and *information richness*. The cases are similar in their exceptional success across a range of consumer-related performance indicators. We suppose that high adoption, an abundance of consumer-generated content, and high frequency of use, are sensible proxies for detecting consumer centrality of an IS. For example, Steam has 125 million active accounts, and typically 8-12 million consumers are playing video games simultaneously every day (Valve 2016b, 2016c). Analogously, Facebook registers over 1 billion consumers per day who generate 4.3 billion “likes” (Facebook 2016). YouTube also counts over 1 billion active consumers per day, who upload over 300 hours of video content every minute (YouTube 2016). Consumers spend huge amounts of their time as part of these systems in order to fulfill social and hedonic needs, such as play, social exchange, and entertainment. They integrate their skills and technology to use the offered services, and to engage in interactions with other consumers and with the provider – exemplified by activities such as generating content, chatting, and rating. According to these data, we infer the selected systems possess a high degree of consumer centrality.

We explicitly seek for *variation* between cases to increase generalizability of findings. First, the selected systems differ in their domains, namely gaming, social networking, and video sharing. Furthermore, the socio-technical components of each system vary with their primary purposes. For example, consumers engage with Steam to play games, while Facebook centers around social exchange. Similarly, technology differs: in the case of steam, consumers tend to use their gaming PCs, while Facebook and YouTube depend much more on smartphones. As a result, we expect to empirically investigate a broad variety of alignment mechanisms against which the hypotheses of our research model can be tested.

Lastly, the selected cases are *information rich*, which allows thorough data collection and analysis (Paré 2004). We apply four a priori criteria to assess information richness. First, much information is published about each case and it can be obtained from multiple sources. Second, the available data is appropriate to triangulate the perspectives of the consumer, the provider and potentially of third parties who are involved in the system. Third, sufficient historical data is available to study the development of the system over time. Finally, the dimensions of consumer centrality can be described and captured. For instance, Steam, Facebook, and YouTube enjoy extensive media coverage, and the digital leaders controlling these systems (Valve Corp., Facebook Inc., Alphabet Inc.) frequently release information on crucial changes they implemented or plan to implement. Therefore, plenty of data is available for describing key events in the history of each system and to operationalize the dimensions of consumer centrality for each case context.

### ***Data collection and analysis***

The research model guides our *data collection* protocol (Yin 2013). The hypotheses lead us to focus on alignment mechanisms, the impacted socio-technical components, and resulting changes in consumer centrality. In order to ensure quality and consistency of obtained data and to limit the risk of bias, three researchers are engaged in data collection. Furthermore, a case study database is established where all evidences and their sources are filed. We collect descriptions of the system components of Steam, Facebook and YouTube and changes of each system. These changes often affect how consumers perceive and engage with the system, and hence are regarded to influence component alignment. The subsequent efforts concentrate on gathering data about these changes by drawing on multiple sources. We obtain evidence from system providers, from public media, e.g., journals and blogs, and from engaging with the systems directly.

First, we collect data from *providers* which publish system and service descriptions, help sections that explain functionality, and usage statistics. We also identified subscriber and developer policies and system change histories as useful sources. For example, the “Facebook Newsroom” (Facebook 2016) provides detailed descriptions of system changes as well as (claimed) outcomes for consumers. Second, we obtain data from *publications* of knowledgeable industry experts and analysts who are familiar with one or more of the cases. This allows not only a critical assessment of provider information, but also to understand how specific changes have been reported to impact consumers. Exemplary sources are Harvard Business Review, Forbes.com, The Economist, but also smaller news journals, blog entries and social media sites. These sources help to generate and enrich the understanding of system changes, and often include statements from consumers and provider representatives. Third, once we have sufficient overview of each case context, we review and document how consumers *engage* with the respective system, by making screenshots of relevant aspects, for example the Steam client application and the various workflows embedded in it. We

continue with the data collection process until we are able to comprehensively describe system changes based on multiple sources. Another criterion for ending data collection is when information about a case consistently repeats, that is when saturation has been reached. The collected materials are used to interpret the events during the data analysis phase.

The purpose of *data analysis* is to test if the research hypotheses can explain the empirically identified mechanisms and their outcome on consumer centrality. The analysis follows a systematic process, separated in a within-case analysis and a cross-case analysis phase (Yin 2013). The individual within-case analysis consists of five steps which are summarized in Table 1 and illustrated in the following section.

<b>Steps</b>	<b>Tasks</b>	<b>Output</b>
1. Define system components and explicate indicators of consumer centrality	(a) Specify relevant system components; (b) Specify indicators of consumer centrality	IS overview, description of system components and specified indicators of consumer centrality
2. Identification of changes to the information system and their underlying forces	(a) Identify changes to the IS (b) Develop overview of changes (c) Assess underlying forces / drivers changes	Overview of changes and the underlying reasons why changes were performed
3. Identify impacted system components, alignment dimension and specify alignment mechanism	(a) Code data based on research model; (b) Describe change, affected system components, mechanism and outcome for consumers	Detailed understanding of changes, mechanisms and impact on consumers' system usage / experience
4. Identify and describe the impact of alignment mechanisms on consumer centrality	Analyze data on how alignment mechanisms impacts consumer centrality	Assessment of the causal relation between alignment mechanisms and consumer centrality
5. Test hypotheses on alignment mechanisms against results from empirical investigation	(a) Match results from empirical analysis with hypotheses derived from theory	Tested hypotheses

**Table 1: Steps in Within-Case Analysis**

First, we describe the system components for each case based on a review of the collected data and also define how the reflective indicators of consumer centrality can be assessed in the specific case context. In the second step, we draw on multiple data sources to develop an overview system changes. We regard system changes as the adaptation of one or several system components (c.f. Lyytinen and Newman 2008). To gain richer insights, we also analyze the data about the circumstances and underlying forces for each change. In the third step the elements of the research model are used to code data, that is affected system components, alignment relations, implemented mechanisms, and outcomes for consumers. As a result, we obtain rich descriptions of implemented changes. In the fourth step, data are revisited to infer to which extent the identified alignment mechanisms affects any of the three consumer centrality dimensions before and after the implementation.

As this process includes interpretation, assessments are performed by at least two researchers; furthermore, we require multiple supporting sources to warrant inclusion in the analysis. Finally, in the fifth step, we test the research hypotheses against the results from the empirical case investigation through pattern matching (Paré 2004). Specifically, we test if the empirically studied alignment mechanisms outcomes can be explained with the conceptually derived hypotheses of the research model.

After completion of the individual cases we perform a cross-case analysis to deepen our understanding and to evaluate the explanatory strength of the research model by analyzing similarities and differences between cases (Paré 2004). As we move forward with data collection and gain an understanding of the potential similarities and differences across the case contexts, the exact cross-case analysis procedure will be defined in more detail.

## The case of Steam: illustration of research model and research design

We illustrate the application of the research design with an explicitly non-exhaustive account of Steam. We apply the research model to the case vignette, summarize data collection, and demonstrate the analysis process. We analyze the implementation of *Steam Greenlight*, the *Hardware and Software Survey* and the *Anti-Cheat Client*. For the analysis, we reviewed the Steam client update history and service descriptions to develop the change *overview*, to identify *alignment mechanisms* and to assess their *outcomes for consumers*. We corroborated these insights with media articles and assessed the *impact* of changes on the *dimensions* of consumer centricity. The steps of the analysis are indicated in brackets [1]-[5].

[1a] Steam is a leading platform for digital video game distribution; it is operated by Valve Corporation (Valve). *Consumers* interact with the Steam platform, as well as with other consumers in their private realm, to play various kinds of games. The *task* component describes activities such as purchasing, downloading and organizing video games, starting game sessions, and using community functions. *Technology* comprises the digital infrastructure and the Steam client software (provider technology), as well as consumers' gaming computers and applications (consumer technology). *Structure* refers to values and norms, and behavioral mechanisms that govern the interaction between consumers and the platform. For example, a key value in gaming is 'fair play', and automated anti-cheat detection is a means to enforce this value. [1b] In the case of Steam, an increased degree of *need orientation* is achieved when consumers' demand for new games or social features are recognized and satisfied. An increased degree of *value co-creation* is achieved when consumers integrate their resources (skills and technology) with those of the provider to enable, sustain, or enhance opportunities for value co-creation. An increased degree of *relationship orientation* is achieved when component alignment activities enhance trust among consumers, or when measures are taken to ensure successful consumer interactions when playing games or when using Steam.

[2] In the second step of the analysis key events in the history of Steam are identified. Based on the available data a chronology of key events is developed, as indicated in Figure 2. We discuss the steps [3] to [5] for each mechanism and provide a summary of preliminary findings in Table 2.

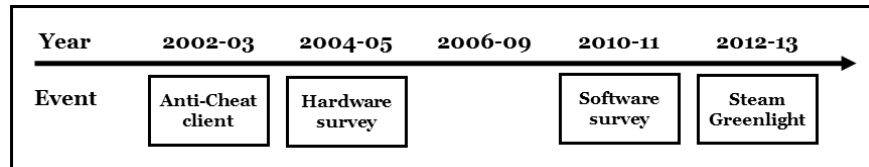


Figure 2: Overview of Selected Mechanisms in the Case of Steam

[3] With the introduction of *Steam Greenlight*, Valve replaced a slow, manual curation process for adding new game titles to the catalog. Greenlight is a collective selection mechanism wherein consumers vote for unpublished games, which are then approved for publication. As Greenlight facilitates how the game catalog is expanded on Steam, it relates to the *consumer-task* dimension. [4] The reviewed data suggests that Greenlight supports *need orientation*, because consumers steer the system towards their preferences. For example, on average only 15-20 games have been released per month to the Steam catalog. After the implementation of Greenlight, the mechanism has been used intensely and 50-100 new games are released for publication every month, leading to a total of ~3,300 released titles between 2012 and 2016. [5] This consumer-driven *collective selection* process is explained by hypothesis H1, as it capacitates consumers to influence the task component to fulfill their needs.

[3] Valve implemented an automated *Hardware and Software Survey* to better understand the variety of consumer technology configurations, and to share this information with any interested party. On Steam, a wide range of data points and analyses are published every month, including information on which CPUs, graphic cards, and operating systems are popular among consumers. Implementing such survey functionality affects alignment along the *consumer-technology* dimension. [4] The survey supports value co-creation because Valve uses these insights to decide on technology investments and to improve compatibility with consumer technologies. Game developers use the survey to assess compatibility and performance of their games on consumers' PCs. [5] The survey mechanism can be explained with H2: It creates *transparency about technology* and is used to ensure adaptability of the platform and compatibility of games with consumers' technology.



[3] Valve introduced an *Anti-Cheat Client* to prevent players from cheating in multiplayer games. The Anti-Cheat Client encompasses both sophisticated heuristics to automatically detect cheating, and a comfortable way for consumers to report potential cheaters. Online gaming is an inherently social activity in which consumer interactions are mediated by technology and also regulated through social structure. Hence, the Anti-Cheat Client relates to the *consumer-structure* dimension. [4] The examined data indicates that this change was implemented with the intention to foster trust among consumers, to ensure successful gaming interactions and hence, to support *relationship orientation*. The Anti-Cheat Client proved very effective: The average number of banned players (cheaters) has constantly increased from 1.000-5.000 in 2004 to 150.000-175.000 in 2016, which indicates an increasing adoption of the feature. As of early 2016, 2.8 million accounts have been blocked for cheating. [5] The introduction of the Anti-Cheat Client is an evidence for H3: The prevention of cheating embeds the value fair play and *enforces the norm* that cheaters are not allowed to participate in gaming.

Step 5	Step 1 & 2	Step 3	Step 4		Step 5	
Hypothesis	IS change	Consumer outcome	Indication of impact on consumer centricity	Identified mechanism	Exemplary sources	Result
H1	Steam Greenlight	Consumers steer portfolio of games towards their preferences.	Need orientation. (release of games)	Collective selection	(Forbes 2012, 2014; Valve 2012, 2013),	(+)
H2	Hardware/ Software Survey	Enhanced compatibility of consumer technology with the platform and new games.	Value co-creation. (support of technology related decision making)	Technology transparency	(Hoffman 2016; Hughes 2010; Valve 2016a; YouTube 2016)	(+)
H3	Anti-Cheat Client	Cheating in online games is prevented	Relationship orientation (foster trust among consumers)	Norm enforcement	(Newell 2014; SteamDB 2016; Thomsen 2014; Valve 2016d)	(+)

Table 2: Illustrative Results of Within-Case Analysis

## Concluding remarks, limitations and further research

Our interest is to learn how mechanisms can align socio-technical systems towards higher levels of consumer centricity. In this paper we developed a research model and demonstrated its application illustratively. We found preliminary evidence for three mechanisms that increase consumer centricity, namely *consumer-driven collective selection*, increase of *transparency about consumer technology*, and *enforcement of norms*. With the overall research program we aim to devise and empirically test a concept of socio-technical alignment for consumer centricity and thereby offer a lens that has been largely neglected in research on consumer-centric IS. We also aim to provide knowledge for researchers on digital platforms and infrastructures who have rarely focused on consumer outcomes. Our empirical study of consumer-centric IS provides an artifact-oriented approach to examine the mechanisms that influence consumers individual outcomes when using an IS. It further includes consumer technology, that is the technology owned and operated by consumers. The research presented here is clearly limited by its early stage. As for the final results, we expect two major limitations. First, we need to be cautious in generalizing our results to other types of IS. We will do so by critically reflecting potential contingencies. We also acknowledge that we do not have direct access to non-published internal case material. Nonetheless, we are confident to identify sufficiently information rich cases through our case selection approach.

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