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VALUE CO-CREATION IN VIDEO GAME MODDING

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ABSTRACT

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Video game modifications, mods, are becoming increasingly common and widespread in gaming communities. Mods have existed since the late 20th century, the early ones being results of the community editing the games' source code without the publishers' permissions. Their popularity and the firms' interaction with the modding communities has increased drastically resulting in environments in which the firms facilitate modding which makes the community-driven creation of additional content more widely accessible. As a result, the more players engage in modding activities. Even though this additional content is generally not paid, and in such sense does not directly increase the revenue per player generated by the game, it does improve the user experience of the community, resulting in more players returning to play the same game while also prolonging the lifespan of the modded game.

This literature review examines views on value, from philosophical experiential viewpoint to classical economics, to form a diverse foundation for the value co-creation examination. The theoretical outline of service-dominant logic, prosumption, and modding is explained, which is then expanded with recent illustrative examples from modding. In the examination of value creation processes between modders, community, and firm, each of the three stakeholders is studied one by one, identifying the nature of perceived value for each, after which the dynamics of the interactions are investigated in greater detail.

Different types of perceived value are discovered on the stakeholders, in which the experiential framework fits well with customers, and economic with firm, but both approaches can be seen in the value perceived by modders. Three positive feedback loops are discovered in the co-creation system of the three stakeholders. Each stakeholder is primarily involved in at least one of the loops, but the importance of the modders gets particularly emphasized.

Keywords: value, value co-creation, prosumption, modding, video games, community

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TIIVISTELMÄ

Ari Hietanen: Arvon Yhteisluonti Videopelien Modauksessa
Kandidaatintutkielma
Tampereen yliopisto
Tietojohdaminen
Elokuu 2022

Videopelien modifikaatioiden, modien, suosio on jatkuvassa kasvussa peliyhteisöjen keskuudessa. Modeja on ollut 1900-luvun lopulta asti, jolloin ensimmäisiä modeja luotiin ilman firmojen lupia muokkaamalla pelien lähdekoodia. Modien suosio on kasvanut huomattavasti, ja samalla firmojen sekä modausyhteisöjen välinen vuorovaikutus lisääntynyt, minkä seurauksena on syntynyt ympäristöjä, joissa firmat fasilitoivat peliensä modausta. Tämä on laajentanut yhteisölähtöisen lisäsisällön saavutettavuutta, minkä seurauksena yhä suurempi osa pelaajista käyttävät modeja ja kokeilevat modausta. Vaikka tämä pelaajien luoma lisäsisältö ei lähtökohtaisesti ole maksullista, eikä sikäli suoraa kasvata pelin yksittäisestä pelaajasta saamia tuloja, se parantaa pelaajien käyttäjäkokemusta. Tämän seurauksena useammat pelaajat palaavat saman pelin pariin, mikä johtaa pelin suosion kasvuun ja elinkaaren pitenemiseen.

Tämä kirjallisuuskatsaus tutkii näkökulmia arvoon aina filosofisesta kokemuspainotteisesta näkökulmasta klassiseen taloustieteeseen muodostaakseen monipuolisen perustan arvon yhteisluonnin tutkimiselle. Palvelukeskeisen logiikan, prosumption ja modauksen teoreettinen tausta esitellään, minkä jälkeen taustaa laajennetaan viimeaikaisilla havainnollistavilla esimerkeillä modauksesta. Arvonluontia tutkitaan modaajien, yhteisön ja yrityksen välillä yksitellen, ja identifioidaan jokaisen sidosryhmän kokemat arvotyypit, minkä jälkeen vuorovaikutusten välisiä muutoksia tarkastellaan yksityiskohtaisemmin.

Erilaisia sidosryhmien kokemia arvotyyppäjä löydetään, joista kokemuspainotteinen näkökulma sopii parhaiten yhteisön kokemaan arvoon yritysten saadessa etenkin taloudellista arvoa. Sen sijaan molempia näkökulmia pystytään havaitsemaan modaajissa. Kolmen sidosryhmän yhteisluontisysteemistä löydetään kolme positiivista palautesilmukkaa. Jokainen sidosryhmä on ensisijaisena osallisena ainakin yhdessä silmukassa, mutta etenkin modaajien tärkeys korostuu.

Avainsanat: arvo, arvon yhteisluonti, prosumptio, modaaminen, videopelit, yhteisö

Tämän julkaisun alkuperäisyys on tarkastettu Turnitin OriginalityCheck –ohjelmalla.

FOREWORD

This bachelor's thesis was done in the degree programme of information and knowledge management at Tampere University. The literature review and illustrative cases investigate the value creation between modders, a firm, and the rest of a community in the world of video game modding. Over the years, I have put quite a few hours into modded games myself, such as Arma 3, The Elder Scrolls V: Skyrim, and Witcher 3, and I had my first touch with programming via Arma 3 modding. Hence, the topic itself is close to my heart. It would have never become as dear to me without the people I met over the years online through modded games, and I'm grateful for all these encounters which ultimately led me to write this thesis. I am thankful to my supervisor, Ilona Ilvonen, for helping me through this process and providing constructive feedback! Lastly, I want also to thank my friends with whom I discussed my topic, resulting in the reinforcement of the good ideas and the abandonment of the worse ones.

In Tampere, 25 August 2022

Ari Hietanen

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ABBREVIATIONS

cDLC	creator Downloadable Content
G-D logic	Goods-Dominant Logic
IP	Intellectual Property
PC	Personal Computer
S-D logic	Service-Dominant Logic

1. INTRODUCTION

The introductory chapter explains the lay of the thesis. It begins with a general dive into the topic's background and explains the research's purpose. In the second sub-chapter, the research questions are introduced, followed by an explanation of the delimitation of the study. The introduction concludes with an overview of the structure of the research, which explains the function of each chapter.

1.1 Background, Purpose, and Prior Research

It is stated that the gaming industry has thrived during the COVID-19 pandemic (Şener et al., 2021; Smith, 2020). According to Şener et al., the use of the online gaming platform Steam has increased by more than 20% since the beginning of the pandemic. Thus, the research concentrates on a relevant industry with a lot of recent growth in popularity.

This study concentrates on the long-term value creation between multiple stakeholders in the gaming industry. The primary medium connecting the stakeholders are video game modifications, known as mods. They are user-created additional content for games (Poor, 2014). Further delimitation is explained in chapter 1.2.

Modding hasn't been studied extensively as the main focus in the past, especially with a business approach. Most existing studies are qualitative or quantitative case studies, such as Poor (2014), and mainly investigate the modders' sense of community and potential clashes between the firm and modders on the social level. Dewalska-Opitek & Hofman-Kohlmeyer (2021) approach the topic from the Service-Dominant logic's (S-D logic) point of view, which is also used as the interconnecting framework in this thesis. They concentrate mainly on the modders and the community through prosumption, leaving the firm's share for less focus, let alone the platforms.

Value and value co-creation are not as situational concepts as modding, and they've been researched extensively. The more challenging part is finding papers with applicable takes and focuses. Dewalska-Opitek & Hofman-Kohlmeyer (2021) bring the topics of value co-creation and modding together in their case study. Agrawal & Rahman (2015) investigate different roles taken by customers in value co-creation in broader terms, prosumption being one of them.

Service-Dominant Logic by Vargo et al. (2004, 2008, 2017) creates the framework to bring together the service business and the borderline philosophical views regarding value. It is used as the core theory of the research. Looking at the customers' point of view, Holbrook (2006) takes a more philosophical stance on different forms of customer value that can be applied particularly to the community of the stakeholders. His research can be mirrored by the study by Vargo et al. (2008) on value-in-use.

From the companies' side, Guido & Peluso (2008) investigate the preconditions a firm needs to fill to engage in prosumption. These conditions can be illustratively used to explore some companies involved in video game modding. Hong (2013) criticizes modding based on interviews with modders.

Thorhauge & Nielsen (2021) concentrate on the platforms such as Steam Workshop. Their primary focus is not on prosumption, but it is addressed in their paper from the otherwise less studied platforms' point of view. Another article involving the platforms is by Andreassen et al. (2018). They introduce the triadic model to investigate service platform situations in which a service provider functions externally on a platform provided by a third party. While their case doesn't entirely match modding, the environment they investigate has significant resemblances with modding, such as a customer and firm co-creating value on an external service platform.

To form a more holistic view of value as a general concept, a philosophical and economic viewpoint was taken. These are respectively represented by the books by Shepherd (2018) and Mazzucato (2018).

1.2 Research Questions and Delimitation

Firstly, the delimitation for the industry is the gaming industry. Modding is mainly prominent in computer gaming (Poor, 2014), known as PC gaming, and hence PC gaming is concentrated on leaving mobile devices and gaming consoles outside the study. No specific firm is investigated through the thesis, but a few are mentioned as illustrative cases to reflect on the studies, including publishers. These illustrative cases have been collected in Chapter 4.2.

Secondly, the operational environment affected by mods is investigated as a whole. It includes multiple stakeholders, such as the mod creators – modders, the rest of the community, the gaming firm, and lastly, the platforms on which mods are shared. The platforms were left out of this study to limit the extent of the thesis.

The primary point of view for the research will be modding. The modders' and community's involvement will be slightly emphasized over the gaming firm and the platforms, but all stakeholders are introduced briefly.

The main research problem is

- “How is value co-created in computer game modding?”

The sub-problems are as follows:

Firstly, the core concepts must be defined thoroughly to investigate the roles of different stakeholders in the environment.

- What is value?

Afterward, to delve deeper into the interactions

- What stakeholders are involved in the value creation processes in modding?
- What kind of value does each stakeholder gain?
- How do the different co-creation processes vary?
- What risks are there in the processes?

The following research objectives will give a holistic view of the topic. After the types of value gained by different stakeholders are investigated, the impacts between the processes in a greater picture can be determined in a comparative manner.

1.3 Structure of the Research

The second chapter first explains how the research was conducted, after which the obtainment of the material is described. Examples of the essential papers for the study are given alongside an explanation of how the papers were selected.

The third chapter lays the theoretical groundwork for the study by first concentrating on different viewpoints on value, which are then used to investigate the environment with unique approaches. Later, it introduces S-D logic and prosumption as concepts to the reader, which are utilized. Modding, the context to which the theory is applied, is introduced in the fourth chapter. Its introduction is extended with illustrative cases which give examples of modern video game modding.

The fifth chapter examines the types of value gained one stakeholder at a time. This chapter covers the remaining research questions, although the conclusions are left for the final chapter. The thesis ends in the sixth chapter, in which the findings are presented in a more condensed manner, and potential future research topics are suggested.

2. CONDUCTING THE RESEARCH

The thesis is carried out as a literature review enlivened with illustrative cases to practicalize & exemplify different situations in the environment. The following chapter will start by explaining the research methodology. After the methodology, the research process, selection of the material, and delimitations are explained.

2.1 Research Methodology

Fink's (2014) model for a literature review was used as the basis for the methodology. Its seven steps read as follows:

1. Determining the research questions
2. Selection of databases
3. Selecting search queries
4. Defining additional practical search limitations
5. Delimitation of academically valuable articles
6. Writing the review
7. Synthesizing the results

As the research question wasn't delimited adequately at first, the early queries concentrated on less specific topics and weren't particularly useful for the final study. Additionally, sub-questions for the research were added after the initial search. After the specific delimitation was decided, the process was iterated, and the queries were updated to more sufficient ones.

Additionally, the pearl growing strategy was used in finding further material. After utilizing Fink's process, the found material was used to discover other suitable articles that studied the same topic. This process is further explained in subchapter 2.2.

2.2 Research Material

Research material has mainly been found via ANDOR by Tampere Universities. ANDOR is a discovery service maintained by Tampere University library. As of November 2021, it combines 421 databases (ANDOR, 2021A & 2021B). ANDOR was used as the primary source for academic articles because it firstly combines multiple databases amounting

to vast coverage, and secondly, students of Tampere university have access to the majority of research listed in it, which rules out the inaccessible resources.

The focus of my thesis shifted quite a lot during the early steps of the writing process. Hence not all of the searches are applicable for the final thesis. The search parameters used are displayed in Table 1.

Table 1. Initially used search queries

	Search query	Service	Results
1	value	ANDOR	25 273 470
2	"online community"	ANDOR	422 484
3	"community of interest"	ANDOR	147 401
4	("video gam*" OR "computer gam*") AND (modificati*)	ANDOR	153
5	modding AND "value creation"	ANDOR	109
6	"prosumption" AND "modding"	ANDOR	37
7	"service dominant logic"	ANDOR	8 998
8	"service dominant logic" AND prosumption	ANDOR	165
9	"service dominant logic" AND prosumption AND (modd*)	ANDOR	4
10	modding AND (ip OR "intellectual property")	ANDOR	817

Ultimately, the searches with less accurate terms were barely usable, except for the query for value, which, as intended, gave a multitude of views on the topic. Out of the queries with thousands of different matches, the topics were oftentimes too specific on different fields, which made them practically useless. In the end, three articles were found that touch upon the topic:

First, Dewalska-Opitek & Hofman-Kohlmeyer (2021) concentrate on prosumption in the context of modding following S-D logic. Their main research objective is to identify the factors that motivate community members to mod while trying to understand the community. Second, Hong (2013) describes the history of modding till 2013 while criticizing the concept of "free labor" prosumption can be seen as. His approach concentrates more on the concerns and the potential ethical issues of prosumption from the viewpoint of, and while the main emphasis of the thesis is to identify the value gained, the negatives should also be considered. Last, Kretzschmar & Stanfill (2015) investigate the different impacts of modding on communities and firms.

As for value, Shepherd (2018) delves deep into the view on value and how we perceive it. His perspectives are philosophical above all and well fit to investigate the value perceived by the community. Mazzucato (2018) provides a very different view on value in her book, looking into the history of value in economics. The core material is listed in Table 2.

Table 2. Core material

Authors	Title	Content	Method of discovery
Shepherd, 2018	Consciousness and moral status. (Chapters 1 - 15)	Value from a philosophical viewpoint, concentrating on the fundamental nature of value, and experiences as its bearers	ANDOR
Mazzucato, 2018	The value of everything: making and taking in the global economy (Chapter 1)	(especially) the history of value in economics, from mercantilism to classical economists	ANDOR
Vargo et al., a) 2004, b) 2008, c) 2017	Evolving to a New Dominant Logic for Marketing On value and value co-creation: A service systems and service logic perspective, Service-dominant logIC II025	Service-Dominant Logic & modern value frameworks in marketing sciences	ANDOR (bc) & Pearl-growing (a)
Holbrook, 2006	Consumption experience, customer value, and subjective personal introspection: An illustrative photographic essay	Value from the customer's point of view & value in consumer experience; categorizing customer value	Pearl-growing
Dewalska-Opitek & Hofman-Kohlmeyer, 2021	Players as Prosumers - How Customer Engagement in Game Modding May Benefit Computer Game Market	Modding and prosumption from the modders' and community's perspective through the lens of value co-creation	ANDOR
Agrawal & Rahman, 2015	Roles and Resource Contributions of Customers in Value Co-creation	Roles customers take in value co-creation , including prosumption	Pearl-growing
Guido & Peluso, 2008	Preconditions for the diffusion of prosumption among firms: a case study approach	Prosumption from the firm's perspective	Pearl-growing
Hong, 2013	Game Modding, Prosumerism, and Neoliberal Labor Practices	Potential harms and motivations to mod from the modders' point of view	ANDOR
Kretzschmar & Stanfill, 2015	Mods as Lightning Rods: A Typology of Video Game Mods, Intellectual Property, and Social Benefit/Harm	Mods' potential as value creators but also creators of harm	ANDOR

No additional "quality requirements" for the source material were put, as ANDOR was used as the main source for the material. ANDOR was chosen due to the generally high quality of articles, e.g., the majority being peer-reviewed. For the studies found from other sources, e.g., using the pearl growing strategy from cited papers (Ramer, 2005), the paper was required to be peer-reviewed. During the research, no emphasis was put on the journal. More prestigious ones were favored when choosing the articles on theories, but as prosumption and modding are relatively scarcely researched topics, this limitation didn't apply to the more practical papers.

3. VALUE

Value is a complex term that has been defined and approached differently depending on a discipline. In this chapter, a more philosophical, subjective viewpoint is represented by Joshua Shepherd's (2018) *Consciousness and Moral Status*. Mariana Mazzucato's *The Value of Everything: Making and Taking in the Global Economy* (2018) gives us a general view of the major economists' opinions on value. Lastly, in the third subchapter, Holbrook's (2006) essay on consumption experience and customer value is used as a bridge between philosophical and marketing-oriented takes and the works by Vargo and his colleagues (Vargo et al., 2004; 2008; 2017) introduce yet another point of view on value alongside Service-Dominant logic.

The following takes are not entirely comparable with each other, yet each of them provides a different approach to the topic of value while slowly moving closer to its co-creation. The fourth subchapter is the synthesis of the different sources, in which the similarities and differences of the views are examined. After the views on value have been covered, S-D logic by Vargo et al. (2004; 2008; 2017) is investigated to give a theoretical framework to evaluate modding. The final subchapter will investigate value co-creation, and prosumption in particular, which entails customers taking part in different parts of the product development.

3.1 Phenomenal Value – Experiences as the Bearers of Value

Items may bear *derivative* or *non-derivative value*, out of which items with non-derivative value bear value in themselves, whereas derivative value is something an item has due to its connection to things with non-derivative value (Shepherd, 2018; pp. 9–13). Hence, out of these, non-derivative value is the fundamental source of value, and *phenomenal value*, which Shepherd concentrates on, is non-derivative in its nature. Here, the word *phenomenal* is derived from *phenomenal consciousness*, which is a state in which “there is something it is like” to undergo mental states, events, and processes (Shepherd, 2018; p. 7), and therefore also a capability to perceive value. In other words, while Shepherd didn't use these exact words, a phenomenally conscious entity is capable of undergoing *experiences* that affect its mental states, (mental) events, and (mental) processes.

However, “If phenomenal consciousness is solely valuable in virtue of what-it-is-likeness, we have no way to explain the difference between valuable and disvaluable experiences”

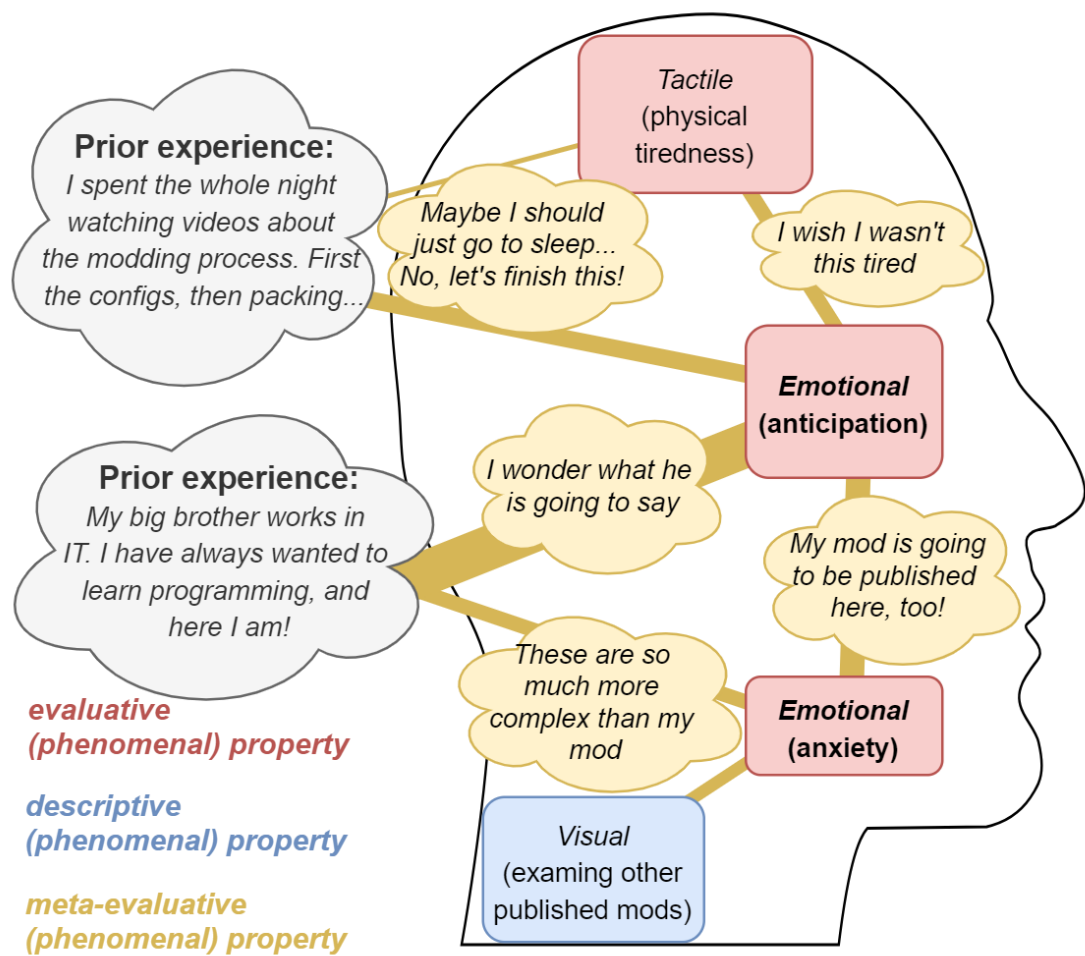
(Shepherd, 2018; p. 24). The fundamental issue with what-it-is-likeness is its determinability – it depends nearly solely on one’s own explanation and does not have defined limits. Hence, to examine the value more objectively, determinate phenomenal properties which grant non-derivative value to an experience are required. The phenomenal character of an experience consists of various phenomenal properties. Shepherd (2018; p. 72) mentions three classes: evaluative, meta-evaluative, and descriptive phenomenal properties.

Evaluative phenomenal properties, each as an individual property, constitute the character and, therefore, the value of an experience. Some evaluative properties are affective in nature. For an experience to bear non-derivative value, it must have affective evaluative properties. Shepherd himself words the claim in the following manner: “It is necessary and sufficient for the presence of some (non-derivative) value in a conscious experience that the experience has evaluative phenomenal properties that essentially contain affective phenomenal properties” (Shepherd, 2018; p. 31).

Using Shepherd’s (2018; p.32) example on affective evaluative properties, a wine-taster may be able to analyze the taste of wine in great detail, but if the tasting experience doesn’t *affect* the taster by, for instance, awaking emotions, the experience doesn’t bear non-derivative value to the taster. To rephrase Shepherd (2018; p.32), intellectual, knowledge-based evaluations, such as in the connoisseur’s case, are not mutually exclusive with the emotional, feeling evaluations, but the emotionally evaluable significance is what makes an evaluative property *affective*. It is worth noting that even with the evaluative properties, the presence of non-derivative value appears to depend on the subject, as different evaluative properties affect subjects differently.

Shepherd (2018; pp. 47–55) continues delving into the evaluative phenomenal properties and declares that the valence of a phenomenal character of an experience constitutes the value of an experience. He continues by stating that “it is worth asking whether a change in an experience’s valence is the only factor relevant to explaining changes in the value an experience bears (2018, p. 54).” Next, the so-called thick experiences are introduced, which combine evaluative properties with “non-evaluative descriptive content” is introduced. “The value that a thick experience bears depends upon the experience being what it is (2018, p. 63).” In other words, while the affective evaluative properties are integral for value, the context brought by descriptive phenomenal properties alters the value of an experience up to a point where a negatively valenced evaluative experience, e.g., sorrow after losing a loved one, may transform to an important, valuable experience, with the given description – the reason behind the sorrow.

Meta-evaluative phenomenal properties, unlike evaluative or descriptive phenomenal properties, are not “directed at features of the world” but instead the “features of one’s experience.” An example of the meta-evaluative properties is given in the form of finishing a novel that is *rich in complexity* and *harmonious in diversity*, with the reader engaging in these details while reading and, at the end connecting the pieces (Shepherd, 2018; pp. 67–68). Below, in Figure 1, a simplified interpretation of a phenomenal character of a thick experience in modding is displayed. The magnitude of meta-evaluative properties is unlikely as grand as Shepherd intended, as this example is still relatively simple, but it visualizes the connections between different types of evaluative properties and helps understand how all of them work towards the creation of non-derivative value.



Simplified phenomenal character of a thick experience

Figure 1. Example: A simplification of a thick experience right before a band starts playing in a concert. The width of a yellow line expresses the implied significance of a meta-evaluative phenomenal property

The fundamental bearers of non-derivative value are experiences (Shepherd, 2018; p. 58). Nearly all experiences are complex in their nature, meaning they are accumulations

of multiple phenomenal properties of varying intensities and durations, including descriptive and meta-evaluative ones, which do not have as straightforward valence as evaluative properties. The importance of experience's shape is also underlined (Shepherd, 2018; p. 72). What Shepherd calls shape can, in other words, be called context. The descriptive non-evaluative and meta-evaluative properties give an experience its shape (Shepherd, 2018; pp. 69–70).

To enable “conceptualizing differences of value between the experiences” both intra- and inter-personally, *evaluative spaces* are introduced (Shepherd, 2018; pp. 73–83). Two determining factors of evaluative spaces are their *size* and *coherence*. Out of these, size refers to the physical and mental capacities of evaluating an experience, for instance, different senses, but also emotional skills and their sensitivity. Coherence describes the subject's capacities to form connections between different areas of evaluative spaces, affecting, e.g., memory, reasoning, and learning (Shepherd, 2018; pp. 80–81).

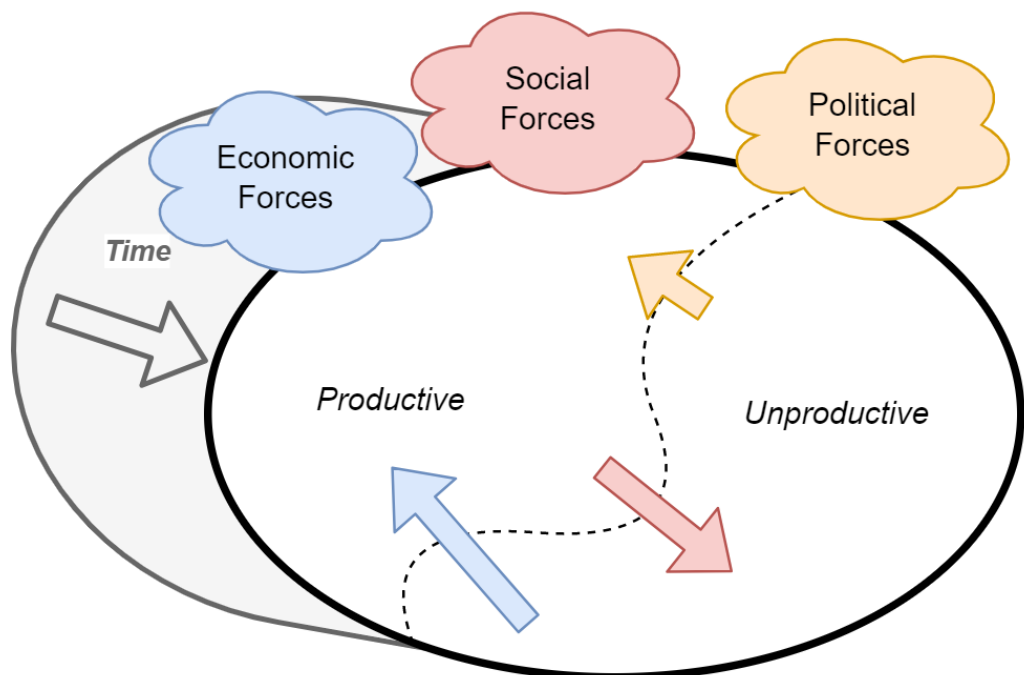
In conclusion, an experience requires some affective evaluative phenomenal properties firstly for it to bear value. For a modder, such might be, for instance, a chance to feel joy for positive feedback and appreciation of their mod, but simply being proud of self. However, as the example already suggests, the more valuable experiences are valuable in virtue of their shape, which is given to them by the descriptive and meta-evaluative properties. For instance, if a mentor figure of a modder was involved in the project, the relationship between the two would give additional value, as the feedback from the mentor would have a special meaning to the modder. If the topic of such a mod was also personally meaningful to the modder, such as adding content inspired by their favorite franchise to the game, these two descriptive properties and their meta-evaluative connection would enable a more valuable modding experience than a bland upvote from a stranger in the internet.

Finally, the value of an experience depends on the subject and their evaluative space – that is, on how good the subject is at performing different kinds of evaluations, by, for example, using their senses, but also on their capabilities to form connections between prior experiences, and the current evaluations. That is, creating a simple modification after gaining some experience doesn't feel as special anymore. For an inexperienced modder, writing just a few lines of code and seeing it come to life may have then awakened strong emotions. Here, the novelty and perhaps a discovery of a new area of one's evaluative space – a new kind of, or a long-lost childish eagerness, could be reached.

3.2 Value According to the Early Economists

In this thesis, economic value is an umbrella term for “what is considered valuable” in economics and the economists’ views on the concept of value. Mazzucato (2018; p. 16) defines value “at its heart” as “the production of new goods and services.” In general, value and wealth are strictly connected to each other, but economists still have varying views on what is actually valuable.

This subchapter will also delve into value creation, as productivity, which is closely linked to value creation in economics, got a lot of attention from economists. Since the early mercantilist theories on value in the 1600s, a distinction between productive and unproductive actions has been recognizable (Mazzucato, 2018; p. 34). To examine this phenomenon, Mazzucato (2018; p. 18) introduces the *production boundary* as a tool that sorts actions as economically productive and unproductive. It is impacted by social, economic, and political forces (Mazzucato, 2018; p.19). Its change over time depending on the three factors is a display of the fact that value isn’t a strictly defined concept in economics, either. This is visualized in Figure 2 below.



All actions whose productivity can be evaluated at a specific time

Figure 2. Change of Production Boundary over time. The current state is shaped by changes in economic, social, and political forces.
(expanded on Mazzucato, 2018; p. 19)

The overall mercantilist claim from the 1600s was that “accumulating precious metals was the route to national power and prosperity,” which led to exchange of these materials

being the central process of value creation (Mazzucato, 2018; p. 32, 36). From here, it can be concluded that national power and prosperity were the objectives towards which the nations strived, yet *value* was seen mainly as monetary wealth.

Adam Smith establishes at the very beginning of *Wealth of Nations* that the wealth of a nation depends on the real income per capita. “It is affected by two factors: the productivity of the labour, and the division of total labour into productive and unproductive employment” (Sinha, 2019; p. 1). Smith’s *labor theory of value* revolved around the industry. Mazzucato (2018; pp. 43–44) states several of Smith’s declarations from the late 1700s, including

1. value was “proportional to the time spent by workers on production.”
2. the border between productive and unproductive labor was the tangibility: material production was seen as productive, while “immaterial production,” such as services, was unproductive, even if they supported the production indirectly.
3. labor was productive as long as it is “ ‘realized’ in a permanent object”
4. if a person’s labor does not reproduce at least as much value as they require to stay alive on a subsistence level, they’re unproductive.

The excess value from the fourth point is surplus. In Smith’s eyes, using achieved surplus is the path to achieving wealth. When an individual produces more value, e.g., via labor, than they consume and invests the surplus in the productive labor, the wealth accumulates. Correspondingly, investing the surplus in unproductive labor is against the (Mazzucato, 2018; p.45). Given the comparison at iv. the point, Smith sees the value of the laborer’s work as the same as their subsistence expenses and, in one way the source of the definer of value.

Smith still lacked a complete distinction between the productivity of immaterial and material production. On the one hand, he perceives service work as unproductive, as it does not necessarily follow the third declaration. Yet, workers, too, can be seen as service providers to their employers when they work on a product (Mazzucato, 2018; p. 46). This demonstrates the importance of perspective. Similar distinctions are still investigated hundreds of years later in Service-Dominant Logic pioneered by S.L. Vargo and R.F. Lusch, which will be covered in the next subchapter.

The early economists saw value as a result of productive actions – something that enables growth and cumulates the wealth when amassed. Currency and other resources can be representations of wealth, the amassed value, but the value at its core is seen as something which is created during labor by workers or exchanges of commodities, depending on the perspective.

3.3 Value in Marketing Sciences

Value and its creation are still vigorously studied in marketing sciences. Vargo and Lusch (2004) introduce the terms *value-in-use* and *value-in-exchange* alongside Service-Dominant Logic, which will be discussed further in the next chapter. The distinction is the same as with *use value* and *exchange value* used by the classical economists, such as Smith and Marx (Mazzucato, 2018), and even before them, Aristotle (Vargo et al., 2008), although Vargo and Lusch expand further, especially on value-in-use.

Based on the value-in-exchange, the value gets figuratively embedded into the product during production via labor. When the finished good gets sold to a customer, the embedded value created in the labour of the good gets traded for the customer's money (Vargo et al., 2008). Citing Vargo et al. (2008; p.148), the purpose of value-in-exchange is to "increase wealth for the firm." The finiteness of value is significant to note. It appears that value-in-exchange as a concept works well in situations where one can easily define the point in time when the value gets transferred. However, one could imagine such a way of thinking to cause problems should the cooperation between the customer and supplier not end in one transaction, that is, a simple change between the good and currency, or have other similar complexities.

Vargo et al. (2008) see the value-in-use as a preferable approach in situations like this. Value-in-use is firstly unique to each user and secondly concentrates on the qualitative elements of the product instead of the quantitative monetary value, for example. These qualitative elements can further be divided into specific and overarching ones. Vargo et al. (2008) use the color or speed of a car as an example of specific quality and transportation for an overarching quality. While overarching qualities may be slightly different to each user, they have a greater potential impact on the user's experience as a whole and may function as enablers for other actions. Vargo et al. (2008; p. 148) state the purpose of value-in-use is to "Increase adaptability, survivability, and system well-being through service (applied knowledge and skills) of others."

To explore value from customers' viewpoint, through an experiential lens, Morris Holbrook (2006) takes yet another approach to value in the form of the consumption experience. He defines the nature of *customer value* as an "interactive relativistic preference experience." The description is broken further down as follows:

1. *interactive* – interaction between the product and customer is an integral part of the experience
2. *relativistic* – Each experience has its own parameters:
3. *comparatively*: different products and will be compared by customers

4. personal: each customer will form their own attitude about the product
5. situational: the situation in which the product will be evaluated affects the customer's attitude
6. *preference* – customers set products in a preferential order

The description regarding the nature of customer value sets some bounds for his view on value. Holbrook also defines four types of customer value depending on the source of the need and the orientation of the created value. They are listed in the two-by-two table in Table 3 number below.

Table 3. *Holbrook's Typology of Customer Value (Holbrook, 2006; p. 715)*

	Extrinsic	Intrinsic
Self-oriented	Economic Value	Hedonic Value
Other-oriented	Social Value	Altruistic Value

Extrinsic customer value is deemed valuable by Holbrook due to the product or consumption experience advancing another valuable objective, whereas *intrinsically* valuable product means the consumption experience itself is deemed valuable enough to consume the product. *Self-oriented value* is valuable due to the response of self or the consumption experience's effect on self. *Other-oriented value*, correspondingly, is a type of value in which "a product or consumption experience [is prized] for the sake of others, because of how they respond to it, or by virtue of the effect it has on them (Holbrook, 2006; p. 715)."

Holbrook (2006) explains the four types in greater detail:

1. *Economic value* entails situations where either a consumption experience or a product is used to further an external goal that is derivatively connected to the experience or product.
2. *Social value* refers to one's consumption experience or product of their possession enhancing their status in their social circle.
3. *Hedonic value* is used when the consumption behavior itself or the item of possession gives the subject value in itself, e.g., a fun consumption experience or a beautiful piece of art whose viewing gives intrinsic value to the owner.
4. *Altruistic value* is attained when the consumption experience has a (positive) impact on others, and the experience "is viewed as a self-justifying end-in-itself" (Holbrook, 2006, p. 716).

There are various perspectives to value in the marketing sciences, although S-D logic's value-in-use (Vargo et al., 2008), which considers the interaction between the customer and firm as a relatively complex act on the experiential level compared to G-D logic and value-in-exchange. Holbrook's views from the customers' viewpoint align with this approach. In that sense, the more qualitative view on value appears to be favored when creating services for customers.

3.4 Synthesis on Value

The covered material approaches value from two distinct points of view. First of them is the non-derivative, intrinsic approach which concentrates on experiences as the fundamental bearers of value and the subjective nature of experiences (Shepherd, 2018; Holbrook, 2006; Vargo et al., 2008). The other sees value rather as a tool to measure productivity and wealth, and sometimes currency is used to quantify it, albeit the labor theory of value, for instance, does have a more qualitative aspect to it, where the value at its core gets created during the labor, by the work of people (Mazzucato, 2018; Vargo et al., 2008). Appendix A entails a further breakdown of the different views.

The approaches to the non-derivative, non-quantifiable views, such as phenomenal value, value-in-use, hedonic value, and altruistic value, share the subjectivity largely.

Phenomenal value and hedonic value regard strictly the individual. What is considered valuable by one person in particular, and in their own opinion? Hence, it is very open-ended and means different things to each subject. Naturally, there is some interaction with the environment even in these views, as the environments do shape our views on what is valuable, but ultimately the evaluation is done by the subject in both. The greater difference between the two is perhaps the point of view they take. Phenomenal value attempts to get to the core meaning of value without a specific context, while hedonic value is used in the context of customer behavior. Both examples used by Holbrook (2006, p. 716), "fun" and "aesthetic enjoyment" can be included in the phenomenal value. Altruistic value, too, as Table 3 displays, is intrinsic in nature. While society has arguably shaped the subject to see an "altruistically valuable consumption experience," such as charity work or religious experience (examples Holbrook used), as *valuable*, it is still valuable in virtue of the experience itself and hence may also be seen as a subcategory of phenomenal value. Value-in-use aligns largely with Holbrook's (2006) four types of value. An important perspective for value-in-use can be argued to be that value is created outside the good exchange, as well. That there is more to it than mere value-in-exchange.

The remaining value-in-exchange, labor theory of value, and mercantilistic value views align largely with each other, while there are certain emphases. Value-in-exchange covers the same principles as Smith's labor theory of value. While value-in-exchange is described from the point of view of the transaction of product for currency by Vargo et al. (2008) and Mazzucato (2018) emphasizes the cycle of capitalism and reinvesting the profits, in the end, the process is nearly the same. The mercantilistic view also prioritizes the exchange of materials, but there the drastic difference is the source of value: precious metals and labor are quite different. While these value theories all culminate in the exchange, it is important to note that wealth still has only derivative meaning; in this case, it is viewed arguably as a tool to amass more wealth. In that regard, one could argue that non-derivatively valuable views are more accurate, but it should also be noted that economic representation of value is used as a framework to keep a business running, while the more philosophical takes attempt to understand human behavior.

To conclude, both the experiential, non-derivative view but also the more economical and derivative approach to productivity align in the context of modding. Mods are created to enhance the user experience, but successful mods, alongside the enhanced user experience, also increase the versatility and popularity of the firm's product. This will be uncovered later in greater detail in chapter five after some other theoretical lenses have been assembled.

3.5 Service-Dominant Logic

Service-dominant logic (S-D logic) is a model to view the markets in a more holistic, customer-inclusive way, which doesn't culminate in the transaction of physical goods and money, contrary to the Goods-Dominant logic (G-D logic), but gives emphasis to the interaction between a firm and a customer, an act of service. S-D logic was first introduced in a research paper by Stephen L. Vargo and Robert F. Lusch (2004) as they compiled and refined views on the changing markets of the late 20th century. The concept was refined in another paper led by Vargo (Vargo et al., 2008), defining terminology, especially regarding value. Vargo & Lusch looked back into the topic yet again in a study published in 2017. In their last iteration of the topic, the two summarized some of the research conducted in the field since the emergence of S-D logic and looked into the future of the framework.

Vargo & Lusch (2017; p. 47) bring forth the five axioms of S-D logic, which are as follows:

1. Service is the fundamental basis of exchange
2. Value is co-created by multiple actors, always including the beneficiary
3. All social and economic actors are resource integrators
4. Value is always uniquely and phenomenologically determined by the beneficiary
5. Value co-creation is coordinated through actor-generated institutions and institutional arrangements

Interestingly, Axiom 4 aligns with the phenomenal value introduced in chapter 3.

As for its purpose, S-D logic was developed to examine and study service business (Vargo et al., 2008). It proposes an alternative way of thinking for goods-dominant logic (G-D logic). One perspective to understand the difference between the two is to compare their primary value drivers introduced in the previous chapter: value-in-use in S-D logic and value-in-exchange in G-D logic.

Another method to compare the logic is via the comparison between operand and operant resources. According to Constantin & Lusch (1994), operant resources are resources that are employed to act on an operand resource, and respectively operand resources are the ones on which an operation is performed to produce an effect. As an example, when crafting a piece of furniture, a worker is operating on wood. Here wood and nails are the operand resource, and the fundamental operant resources are the skills and knowledge of the person working on the wood. Technically, the tools used can also be seen as operant resources, as they enable the process, yet *they* wouldn't exist without the idea of creating them, which is fundamentally an operant resource. A similar approach is used in S-D logic, in which goods are seen as "transmitters of operant resources (embedded knowledge)" (Vargo & Lusch, 2004). In the context of modding, the focus is also in utilization of the operand knowledge and skills of the members of the community – modders. Figure 3 illustrates the emphasizes of the different logics and points out how S-D logic views the knowledge work happening in the background as important, while in G-D approach the end product is where the focus often lies.

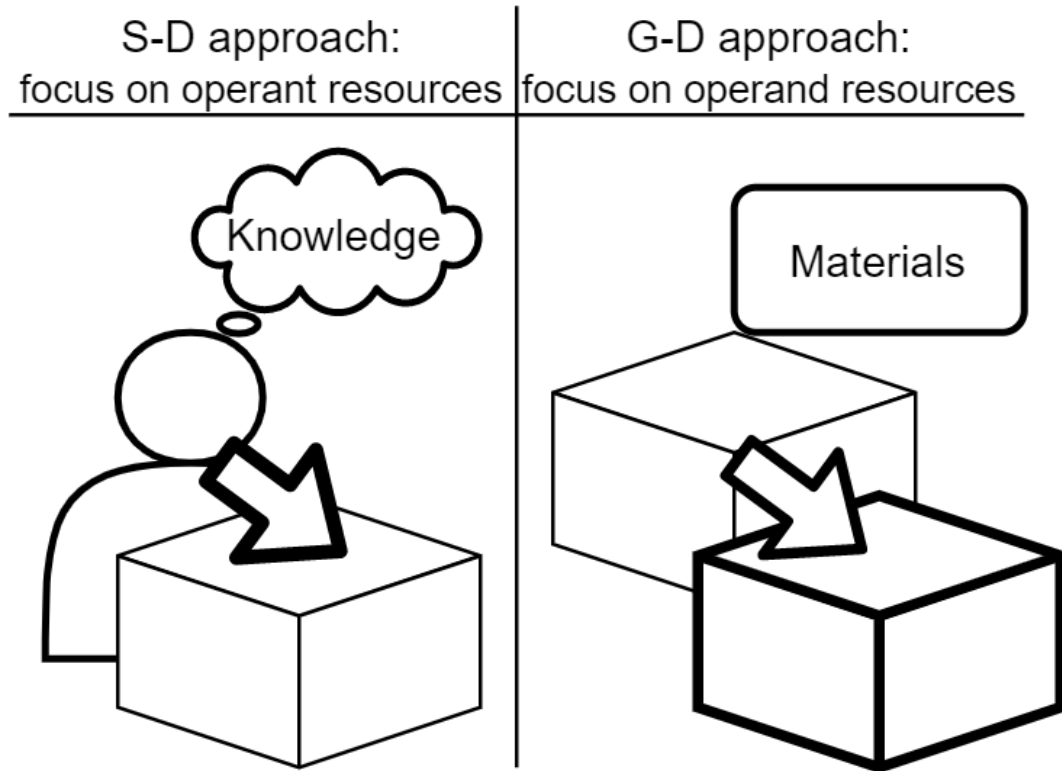


Figure 3. S-D and G-D approaches from the resource perspective

The intangible nature of operant resources is much similar to that of services which are also intangible processes, unlike the operand materials or goods traded in transactions between firms and customers.

Yet, it is important to note that S-D logic, too, requires operand resources to function, such as microprocessors as enablers of all web-based services. Vargo et al. (2008; Table 1) compare relevant features of S-D logic and G-D. The table is partially reconstructed in Table 4.

Table 4. "G-D logic vs. S-D logic on value creation", partially (Vargo et al., 2008; p.148)

	G-D logic	S-D logic
Value driver	Value-in-exchange	Value-in-use
Creator of value	Firm, often with input from firms in a supply chain	Firm, network partners, and customers
Process of value creation	Firms embed value in "goods" or "services", value is 'added' by enhancing or increasing attributes	Firms propose value through market offerings, customers continue value-creation process through use

Purpose of value	Increase wealth for the firm	Increase adaptability, survivability, and system well-being through service (applied knowledge and skills) of others
Measurement of value	The amount of nominal value, price received in exchange	The adaptability and survivability of the beneficiary system

“Purpose of value” and “Measurement of value” deserve special attention here. The purpose of value in S-D logic is to increase adaptability, survivability, and the system’s well-being by providing services to others. This can be interpreted as supporting the longevity of the service. Due to “adaptability,” the service may be allowed to go through changes during its lifespan – even radical ones. Based on the table, value is measured by the adaptability and survivability of the beneficiary system.

3.6 Value Co-Creation in Prosumption

This subchapter examines value co-creation and, in particular, prosumption. Agrawal & Rahman (2015; p. 146) compile multiple definitions for value co-creation in their meta-study. In essence, their message can be summarized as follows:

Value co-creation is an ongoing interaction between multiple stakeholders, often at least a firm and a customer, in which the stakeholders collaborate to cultivate value emerging from one stakeholder to benefit both.

Agrawal & Rahman (2015) summarize the customer’s and firms’ interaction and gained outcomes in a table. The firm often takes the role of a facilitator, while the customers may engage in various tasks, such as production, distribution, promotion, and innovation. In the interaction, both participants exchange operand and operant resources, such as code and knowledge. The outcomes of this interaction on a general level are in Figure 4.

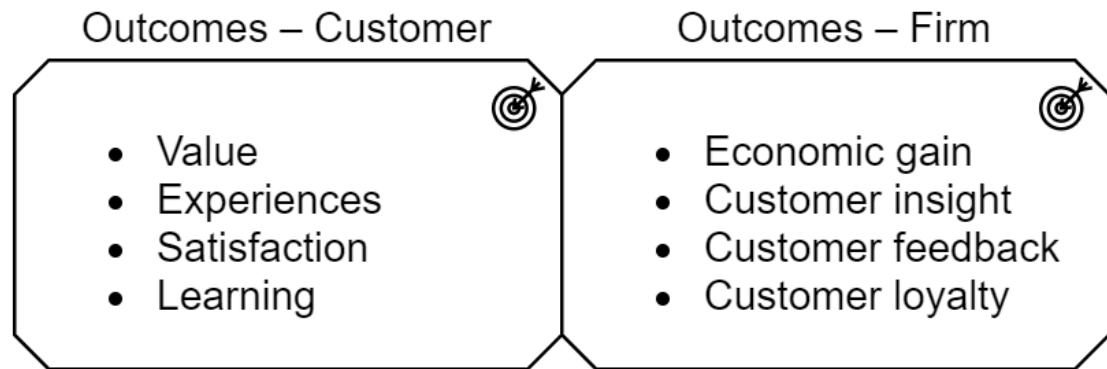


Figure 4. Value co-creation outcomes (Agrawal & Rahman, 2015; p. 147)

A connection between the two views of value can be seen. The customers' outcomes are on the more personal side, and especially "experiences," and "satisfaction" largely align with the view of phenomenal value, while the firm gains wealth as a derivative outcome of the interaction. Though, on the firm's side, the process of wealth is more convoluted. Knowledge about the customers and their loyalty may be commercialized later on.

The term prosumption is rooted in the English words *production* and *consumption*. It is a type of value co-creation in which users of a product – consumers create value by changing the original product somehow. The consumers benefit from this process in the form of a customized experience, for example, but in addition to the prosumers, the rest of the service's customers typically have an opportunity to benefit from this additional content which again creates value for the service provider (Dewalska-Opitek & Hofman-Kohlmeyer, 2021). Additionally, Xie et al. (2008) state that in prosumption, the customer's behavior is often steered by utilizing different values that Xie et al. divide into intrapersonal and interpersonal values as well as fun.

4. MODDING

This chapter introduces the concept of modding. It starts by explaining the term on a basic level and continues to investigate the critique modding has received, as well as its advantages and disadvantages to different stakeholders. Later, six brief illustrative cases (IC) are introduced, which give further depth to the investigation of value creation processes later in the thesis.

4.1 Definition, Opportunities, and Threats

Creation of modifications, known as modding, is a term related to computer gaming which means changing the game by adding entirely new content or modifying existing content. The creators of mods, modders, act privately. That is, do not work for the game's publishers. Oftentimes modding requires programming of a certain level, but there are also exceptions (Poor, 2014).

Renyi Hong (2013) presents a critique regarding modding, which can be aligned with the more economic view on value, such as the labor theory of value of the classical economists (Mazzucato, 2018). As modding is often the first step in the gaming industry (Hong, 2013; Dewalska-Opitek & Hofman-Kohlmeyer, 2021), Hong reminds that potential future employers to value the modding experience highly. From the perspective of productivity, companies encouraging modders to create high-quality mods maximize the surplus value of the modders 'unpaid labor' to the community. Interestingly, most interviewees do not see the indirect commercialization of their labor as a problem. This appears to be something modders have accepted to be part of the system. What they did criticize, however, was the algorithmic evaluation of their mods – that is, ranking mods. Additionally, to create a popular mod, the creator also needs to take care of "customer relations" – that is, market their mods to the rest of the community.

Kretzschmar & Stanfill (2019) also bring forth additional viewpoints in their research, especially their “Video Game Modification Benefits and Harm Typology,” which is reproduced in Table 5 below:

Table 5. *Video Game Modification Benefits and Harm Typology* (Kretzschmar & Stanfill, 2019; p. 522)

	Industry benefits	Industry ‘threatened’
Consumer benefit	Popular mods recognized by both consumers and the industry.	Fan-generated content that can enhance user experience or revive a dormant franchise but done without permission.
Consumers harmed	Industry profits, but players are exploited or harmed.	Mods that threaten company profits or reputation as well as user experience.

The studies of Kretzschmar & Stanfill (2019) and Hong (2013) prove the important point that while cooperation between the firm and modders improves modding as a process by making it more accessible and easier to start, it does not always lead to outcomes that are mutually beneficial to all stakeholders.

Guido & Peluso (2008) define four preconditions for a firm to engage in prosumption, but they fit very well to modding. Illustrative Cases (IC) to which the list refers, found in the following subchapter, 4.2.

1. *Exploiting customer knowledge*. In their view, Guido & Peluso view this as a process of extracting ideas from customers and further implementing such ideas into products. However, in modding, the involvement of the firm itself is not required to a similar extent, as the community itself creates the product the way they see fit. Depending on the licensing, some companies may even own the intellectual property of modders’ creations. IC III gives another view to this.
2. *Creating environments facilitating customer-firm interaction*. It is suggested that internet and networking technologies are used to create virtual environments which enable cooperation between the customers and firm. Exactly this happens in IC I.
3. *Encouraging firm value sharing*. If customers share the firm’s values, they are seen as more eager to participate in co-creation. IC VI explains a situation in which firm organizes a prosumption, that is, modding, competition, and also involves branding and value sharing to the competition.
4. *“Developing customer-centered marketing strategies”* encourages firms to involve customers in value creation. While modding is not on the list of example means, it strongly aligns with the core idea of the method.

In this thesis, four stakeholders of the modding environment are examined, out of which the fourth, platforms will not be covered in as great detail to limit the extent of the thesis.

Modders are the creators of mods (Poor, 2014). They are not employed by the company. The **community** in this context stands for the players of a game. Modders can be seen as a part of the community, as most of the time, they play the game themselves or are strongly involved with the players. The **firm** in this context refers to the creators of the base game. No separate general distinction is made whether it strictly means the developers of publishers unless separately mentioned and clarified, as the distinction between the two is not important in the upcoming chapter.

4.2 Illustrative Cases about Modding

The following cases function as examples from the modding communities and point out different impacts of modding on communities, modders, and firms.

IC I. The community and firm as the support network for modders

While there are differences between games, the modding community is often an important support network for the modders. In the case of Bohemia Interactive (2022b), the creators of the military sandbox simulator franchise, Arma, facilitate a wiki-site largely maintained by the community, which documents the modding processes of their games in great detail, lowering the threshold to start modding. Alongside the wiki, BI also maintains an active server on Discord social platform for intra-community interaction, including modding! This, in turn, incentivizes more community members to try their hand at modding, which leads to the creation of more mods and an overall improved user experience for the game. Here, being part of the community can be considered an extension of social affiliation.

IC II. Previous modders and publishers of the base game teaming up

An illustrative example enabled by all four aspects of modder value is creator Downloadable content (cDLC) from Arma 3 (2022a). In the words of the developers and publishers of the base game, cDLCs are additional content created by "... third-party developers and published by Bohemia Interactive. Our goal with Creator DLC is to provide more original quality content to players and create an opportunity for outside talent to earn a financial reward while also making it possible for Bohemia to invest more into the Arma series' long-term future." Given on the FAQ page, there is a question, "Is Creator DLC paid mods?", the situation is clearly noted at the publishers' end, yet they do not

count cDLCs as mods, and note that "... Creator DLC will never replace something that what was available for free [in the base game.]" While cDLC developers are not always previous modders, the trend is clearly there. For instance, the developers of S.O.G. Prairie Fire, Team Savage, state that "Arma 3 wouldn't be the success it is without the modding community. Most of Team Savage started out as mod makers...."

IC III. "Paid mods"

There are many differences between games and modding communities. Arma 3, for instance, has a strictly set licensing (Bohemia Interactive, 2022a), which states clearly at BI'S TOOLS END USER LICENSE that the tools provided by the firm are exclusively for non-commercial use. However, there are other communities, such as the "Sim Racing" community, where the simulators/games do not have as strict policies about user-created content, and especially its monetization. Race Sim Studio (2022), for instance, is selling functional cars to Assetto Corsa - a driving simulator.

IC IV. Total Conversations & Branding

Mods that change the game, for instance by theme, are called total conversions. Red Hammer Studios (2022) brought the theme of realistic modern warfare to Arma 3 and ended up winning the Make Arma Not War total conversation competition (Bohemia Interactive, 2022d). There are also thematic total conversion mods. For instance, George R.R. Martin's world from A Song of Ice and Fire (or Game of Thrones tv series) has been brought to life in a multitude of ways over the years. In 2012, the mod Crusader Kings 2: A Game of Thrones (CK2:AGOT) was released, which enabled playing as a noble of a house in the Seven Kingdoms, while in 2017, a mod to Game Mount & Blade: Warband was released called "A World of Ice and Fire" in which the player could embark on an adventure in the vast world based on the books and series. Total conversions like these enable a fan to immerse themselves in the world introduced by other media and create experiences not available elsewhere.

IC V. From realism-additive modding to cooperation with the US Army

IDI-Systems (2021) was awarded a "Small Business Innovation & Research" grant by the US Army to bring the features of a non-commercial modification available to the US Army's Ground Vehicle Systems Center for modeling and simulation experiments. IDI-Systems' mod, ACRE (Advanced Combat Radio Environment), is an "open-source radio propagation and communications systems modeling software," which has been used by

“[c]ountless gaming, government and military organizations” to “organize, train, and evaluate operations, military personnel, and combat systems.”

IC VI. The firm incentivizes the community by creating a modding competition

In 2014, just after the full release of Arma 3, Bohemia Interactive (2022c) organized the modding competition for the community of Arma 3, Make Arma Not War. In the words of BI, “The Arma series has always been a platform for amazing player-created content.” To develop the modding scene, the firm issued a 500,000€ prize pool to encourage modders to participate in the competition.

As a part of the competition, BI (2022d) teamed up with the International Committee of the Red Cross (ICRC) by including a “Health Care in Danger Special Award” in the competition. Its price was a one-week trip to an ICRC mission. It is worth noting involvement of such a humanitarian NGO as a cooperator has an impact on the brand of the game and the studio.

5. INVESTIGATING THE VALUE GAINED FROM MODDING

What kind of value gets created in modding, and more elaborately, in the different interactions between the stakeholders? This chapter will investigate the processes from different perspectives using the tools established earlier in the thesis. The empirical study by Dewalska-Opitek & Hofman-Kohlmeyer (2021) will serve as a foundation for the perspectives, which are then augmented by Illustrative Cases (IC), which were introduced earlier in chapter 4.2. Each subchapter concentrates on one stakeholder and analyses their interactions with the others from their own viewpoint. Greater general conclusions are drawn in the next chapter.

5.1 Modders

This subchapter investigates the benefits mod creators get from modding. It should be noted modders are a sub-group of the “community,” and hence the community’s gains also affect the modders. Dewalska-Opitek & Hofman-Kohlmeyer (2021) mention four types of advantages modders gain from the mod creation, which are

1. Self-expression & creativity
2. Knowledge about game-creation
3. Pride and social affiliation
4. Career development

Dewalska-Opitek & Hofman-Kohlmeyer do not delve further into the nature of the value in their study, although other studies, such as Hong (2013), concluded creativity and career development are factors motivating modders. The following analysis is enabled by the theoretical approaches introduced earlier.

Creativity can be categorized as non-derivatively valuable, as expressing self is valuable in virtue of itself, and hence, the modding experience can be phenomenally valuable to a modder in the sense Shepherd (2018) described the concept. One could argue for self-expression being used derivatively in an attempt to improve own skills as an artist or other creator, but that does not nullify the phenomenal value of the creative experience to the subject.

Knowledge about game creation appears derivative. From the perspective of phenomenal value, possession of knowledge is not truly valuable in itself. That value belongs to the experience in which the knowledge was obtained. In this case, probably a *creative*

experience. However, the specific knowledge does increase the value of the modder as an operant resource for the firm, granted they continue modding for games of the same firm in the future. The obtained skills also give derivative value when, for instance, attempting to **develop a career in the gaming industry**. Additionally, later this knowledge about creating games may also lead to social value. Sometimes, depending on the licenses, modders may also create paid content, as described in IC III.

Pride and social affiliation are difficult to dissect based on their derivativity. The experience of releasing a mod, and as a creator gaining positive feedback and admiration, or in an opposite case, getting either ignored or even mocked based on their creation, the experience may, either way, have a strong impact on the modder and cause great phenomenal value or disvalue. However, there may also be derivative implications, something along the lines of Holbrook's (2006) *social value* in the sense of the creation of mods leading to "*status-enhancing favorable impression[s]*." The example of Figure 1 aligns mainly with this kind of perceived value. IC I brings a point about the potential in the interaction between the other stakeholders improving the experience for modders drastically.

Dangers and threats for modders come mainly from the environment. As Hong (2013) states, modding can be mentally taxing, especially if it is done less as leisure and instead with a goal, such as landing a job. Difficult community members are also mentioned with whom the modder should be careful if they are willing to keep their own brand, as well as the brand of their mod good.

Modding for content creators may represent a multitude of things. Some modders, as Hong (2013) brought up, see it more as a job and derivatively valuable activity to achieve status and develop a career. Others view it as a way to express self. It is important to note that these factors are not mutually exclusive, and as was stated by Hong (2013), the expectations from the rest of the community and the incentivize modders to try harder, and on some occasions, that will also create affection to the activity, hence creating phenomenally valuable experiences.

5.2 Community

The community outside modders gains a lot from modding Dewalska-Opitek & Hofman-Kohlmeyer (2021) bring forth the following benefits in their study:

1. Game diversification
2. More customization
3. Improved quality

4. More realism

5. Fun and excitement, as mods may prolong the games' lifespans significantly

While Dewalska-Opitek & Hofman-Kohlmeyer (2021) categorize the benefits as follows, all of them can be seen as ways to increase the overall potential of the product by enabling a **larger amount and more diverse experiences** to the gamers than the base game did. In that sense, the value provided to the community can be considered to be largely non-derivative and resembles the phenomenal value. Total conversions introduced in IC IV are a good example of this.

Added realism can also be used to gain knowledge about certain topics. IC V serves as an example of the recognition of mods' quality by professionals in the US military. In this sense, the knowledge gained by a community can also be considered derivatively valuable.

Sometimes there are conflicts between the interests of the community and the firm. For instance, if modders create content for a game that uses IP (Intellectual Property) of another firm or person, the community may enjoy and want to use the content, but popularizing this can damage the brand of the firm, leading to compulsory intervention by the firm to disrupt the distribution of such mods. Especially total conversions such as the ones described in IC IV, are risky, but in the two cases, the IP did not belong to a holder, which resulted in repercussions.

There are few "threats" from modding to the community, as the mods are ultimately created for them, and on many occasions, the player gets to choose which mods they use. Kretzschmar & Stanfill (2019) mentions some examples, such as cheat mods as experience-degrading mods and body modification mods as ones that encourage objectification. Yet, one could combat both of these arguments by questioning if the experience is truly degraded if the mods are willingly used. Using cheats in multiplayer does negatively affect the experience of other players, but in single players, what would be considered a cheat mod may even improve the experience of users. There are also plainly disvaluable mods, such as "rape mods" of GTA Online (Kretzschmar & Stanfill, 2019).

5.3 Firm

Dewalska-Opitek & Hofman-Kohlmeyer (2021) bring the following types of value up when discussing the benefits for firms.

1. Extension of games lifespans,
2. Renewing and updating the game
3. Improved quality of games

4. Reaching a wider audience
5. Unpaid work delivered by modders

All these benefits bring wealth to the firm indirectly but also flexibility. An example of **extending games' lifespans** can be brought from Arma 3 (2022a). The developers of the base game get to “invest more into Arma series' long-term future,” although they refer to cDLCs introduced in IC II. The impact of this phenomenon on the strategy of a firm is noteworthy. A long lifespan for a game means it is logically unwise for the same firm to release a competitive title in the near future, as such a release would likely shorten the lifespan of the older modded game. As it is stated in the case of Arma 3 (2022a), the creator DLCs, among other DLCs, extend the lifespan but also bring revenue to the firm, hence allowing the extension.

One gain not mentioned by them can be derived from Modders' knowledge about game creation introduced earlier in 5.1. When the community, the supergroup of modders, is more technically knowledgeable, they can give **better and more precise feedback** to the firm, much similar to Agrawal's & Rahman's (2015) finding in Figure 4.

From the viewpoint of productivity, while modders are unable to manipulate the official version of the game, which is distributed to all users, as both Hong (2013) and Dewalska-Opitek & Hofman-Kohlmeyer (2021) state, modders essentially provide **free labor to the firm**. Thinking from the perspective of the labor theory of value (Mazzucato, 2018), the modders are workers who do not have subsistence expenses.

Reaching a wider audience may be mainly linked to new gamers, but it is also possible for a firm to improve its brand via modding. IC VI goes over a case in which game developers teamed up with Red Cross in a modding competition. The value firm gains from modding are ultimately derivative in nature, but it is still important to underline modding provides many other opportunities to the firm than just monetary gains.

Firms' concerns revolve mainly around the brand image (Kretzschmar & Stanfill, 2019) but also intellectual property rights. If immoral mods get created and circulated, the brand of the company suffers. When it comes to intellectual property, there may be cases in which the IP rights conflict, but that is not always the case. IC IV covers a total conversion that has not been taken down, for instance, boosting the popularity of the base game instead. Additionally, the long lifespan of a game may become a hurdle. When a company releases a new, competing title, they must take the state of the old moddable game into account.

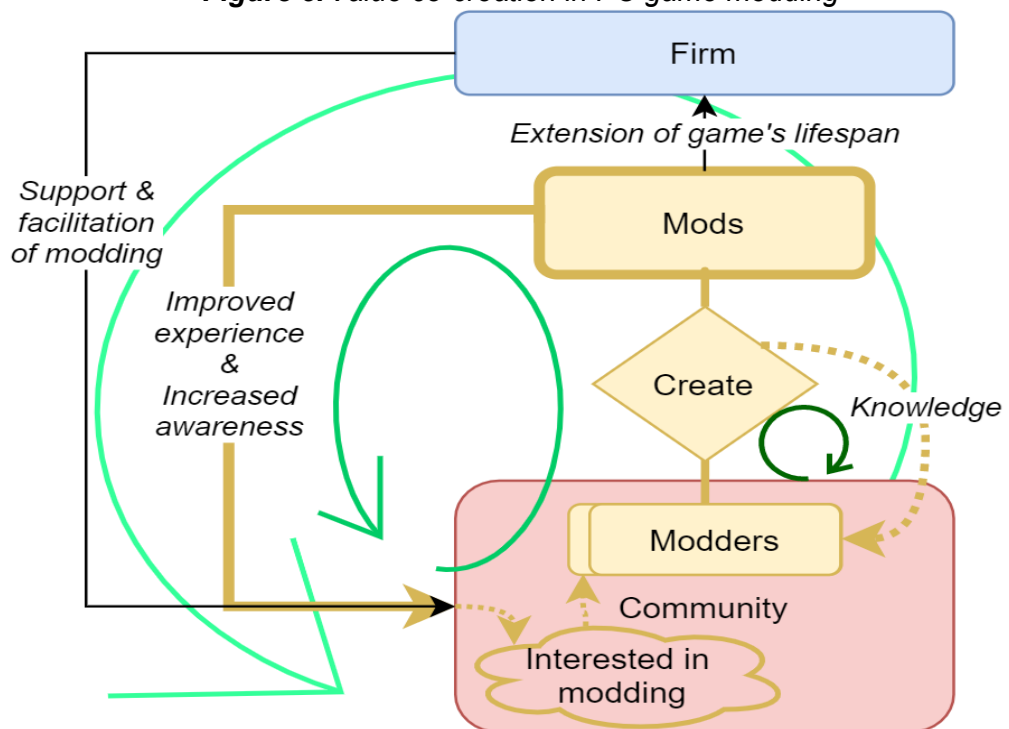
6. CONCLUSIONS

The final chapter goes over the results by summarizing the types of values discovered in chapter five and investigates the applicability of S-D logic and labor theory of value into the context of modding. The second subchapter is a reflection on the chosen research approach, and the thesis ends with suggestions for future research.

6.1 Results and Discussion

In video game modding, value is created by modders in an interaction oftentimes facilitated by the firm and assisted by the community of the respective game. As for the nature of value created, **modders** gain both derivative and non-derivative value, where the distribution depends on the individual's own motivations and the co-creation situation. Derivative in the sense of knowledge, networks, and social affiliation, and non-derivative in the form of self-expression and pride. **Communities** are exposed to more diverse and polished experiences and hence gain non-derivative value-in-use when engaging with a modified product. **Firms** gain economic value via extended lifespan, which is attributed to renewed user experience, improved quality, and wider audience. The firm also obtains information about its target group, which can later be used in the creation of its own products. A generalization of the process is in Figure 5.

Figure 5. Value co-creation in PC game modding



The positive feedback loops of the co-creation process are important to note. **The first** one is on the internal level of a modder. Modding is reinforcing behavior, at least as long as the modding experience itself is considered valuable by the subject, which it is in the forms of expressing creativity and gaining attention – all this while also working as an operant resource for the firm. **The second** one is in the Modder – Community -interaction, in which the positive impact of mods on the experience spreads the awareness of mods firstly but above all feeds the interest in modding within the community, bringing forth new modders. There is **a third loop** at the Firm – Community -a level which begins when the firm decides to start facilitating modding. As Kretzschmar & Stanfill (2019) state, early modding was not supported by the firms, but the firm support has enabled modding on a larger scale and is a feature whose importance should not be disregarded.

The examined cooperation between the three stakeholders follows the five axioms of S-D logic listed at page 17. To assess the value creation processes from the viewpoint of each axiom,

1. Video games in themselves are services. The interaction between the firm and a player starts when the game is purchased and continues in the form of updates, but additionally the mods can be seen as smaller services within a service.
2. As it was discovered in chapter five, the value is created in the interaction of all three stakeholders. The modders are arguably the primary creators of value, functioning as an intermediary without whom the process would not work. Yet, the firm and the rest of the community both play an important role in supporting this behavior.
3. All actors in modding are resource integrators, as each of them adds something to the process, whether it be the modders' knowledge, the firm's facilitation, or the remaining community's feedback which incentivizes the modders to work harder.
4. Each beneficiary gains a different type of value. These types are covered in greater detail in chapter 5.
5. Depending on the game and respective community, value co-creation also takes place in an environment facilitated by the firm. IC III does point out, though, that there are differences between the firms and their general viewpoints.

In this situation, the modders' role appears to be that of an intermediary who is the primary value creator for both the community and firm. The firm's response to this is to cultivate its relations with the community as a whole.

On the contrary, the applicability of the more traditional economic approach introduced in chapter 3.2 to modding can be questioned. Firstly, the involvement of money and wealth as concepts is relatively low when investigating the stakeholders and their views on value. As the modders, the laborers of modding, do not get paid in money by the firm, the whole concept of productivity cannot be used in its traditional sense. Secondly, Smith, in particular, as mentioned in points two and three on page 12, concentrated on

the tangibility of the product. Mods are pieces of software, and while it could be argued they are tangible in a sense, as it was discovered in chapter 5, the experiences provided by the mods are what the customers consider valuable.

6.2 Reflection

The research was successful. The research question and sub-questions were answered, although the variance between the three processes could have been investigated further. However, with the current extent of the thesis, such is not feasible. Instead, the question could have been rephrased as, e.g.,

“How are the value creation processes connected to each other?”

which is briefly inspected at 6.1. The research was structured sufficiently and moved consecutively to the results, building on top of the concepts of value and S-D logic and culminating in the investigation of the co-creation processes.

Finding relevant information on the topic was fairly challenging, and some of the information available was ultimately left out, as applying it would have been difficult. The pearl-growing strategy proved to be fruitful in solidifying the theoretical background of co-creation and prosumption, while the illustrative cases made the investigation of processes more pragmatic.

The coverage of different value perspectives was quite extensive, but it did provide sufficient tools to analyze the value in different situations. Especially the view on value according to the early economists was not as prominent in the examined context, but it did provide a good method of comparison and strengthened the representation of exchange-based views of value, such as G-D logic. Additionally, as the firms ultimately strive for wealth, having such a strong viewpoint made referring to financial goals more concrete. While the thesis could have been less focused on the foundation of value as a concept and instead a more in-depth investigation of prosumption, for instance, the current results and the perspective on value were enabled by diverse examination of value as a concept. It must be noted that while the material on value, in particular, did not lack in quality, the writer’s personal choice on the selection of “views on value” was subjective. While the objective to examine different views and apply them together was completed, that does not remove the initial selection of choosing the views on value.

The introduction to context proceeds orderly from the overarching theoretical framework to the approach to value co-creation and then the actual context of modding. Here, given value was already covered in great detail, the practical side of modding could have been

given more emphasis to familiarize the reader better with the environment, even though the illustrative cases do bring some additional awareness.

The comparison between the co-creation processes was somewhat challenging. The firm, in particular, had quite a different approach from the other two stakeholders, which led to difficulties in comparing the gained value directly. Perhaps recognizing just how different the stakeholders are, is an important realization. The theoretical approaches covered earlier were applied adequately, and the final figure brought the essential insights together. The comparison between S-D logic and labor theory of value pointed out that S-D logic is the better tool to investigate modding, especially when taking the customers into account, but the comparison was not entirely fair, either, as labor theory of value is an old theory and built for a very different environment. However, as these viewpoints were introduced earlier in the theory, a brief comparison of their applicability to modding was deemed adequate.

6.3 Research suggestions

First, this study did not look further into the role of platforms in the co-creation process. What is their role? The platforms on which the mods are shared play an integral role in the facilitated distribution of mods. Both Kretzschmar & Stanfill (2019) and Dewalska-Opitek & Hofman-Kohlmeyer (2021) mention their role, but they are not the focus of either of the studies. For instance, some of them are maintained by the firm who publishes games, and some are owned by a third party that has no other role in the distribution of games. Steam Workshop (Thorhauge & Nielsen, 2021) is a part of a software used to share mods, but Steam in itself is much more, as the games are essentially downloaded and launched via the same service, making its role as a third-party software immense in the interaction.

Second, modding creates value for the firm with little required involvement from the developers. What are the strategic implications of modding to a firm? What kind of development cycles does it enable? What factors determine a firm's suitability to engage in a modding-centric strategy? We know modding increases the lifespan of a game, but firms still require revenue to sustain themselves, and mods as pieces of software provide no direct revenue to the company. How does this big picture work?

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APPENDIX A: DIFFERENT VIEWS ON VALUE

View on value	Source	At which situation is value created?	Who gains value?	Derivative	Quantifiable
Phenomenal value	Shepherd, 2018	Rich – complex experiences	The subject of an experience	No	No
Mercantilistic value	Mazzucato, 2018	Exchange of commodities	The stakeholder who gains more valued commodities	No ^[1]	Yes
Labor theory of value	Mazzucato, 2018	Labor	The capitalist who later sells the product	No ^[1]	Yes ^[2]
Value-in-use	Vargo et al., 2008	Use of a product or service	Both the service provider and the customer	Not necessarily	No
Value-in-exchange	Vargo et al., 2008	Exchange of commodities	The vendor	Yes	Yes
Economic value	Holbrook, 2006	Consumption of a product or later use of purchased product	The consumer	Yes	Not necessarily
Social value	Holbrook, 2006	Consumption of a product or later use of purchased product	The consumer and/or consumer's social circle	Yes	Not necessarily
Hedonic value	Holbrook, 2006	Consumption of a product or later use of purchased product	The consumer	No	No
Altruistic value	Holbrook, 2006	Consumption of a product or later use of purchased product	The consumer and/or consumer's social circle	No	No

^[1] Both mercantilistic view on value and labor theory of value see wealth as the fundamental goal, and while they do not exclude the existence of other valuable items, the theories themselves see wealth in resources, such as money, as an end.

^[2] Wealth is seen as a representation of productive, valuable, labor