A systematic literature review toward a taxonomy of Open Value Networks

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Abstract. New ways of organizing the economy have arisen over the past few years. Most of them include interactions between agents who join or leave a network at little to no cost. This is defined in the literature as an Open Value Network. However, to the best of our knowledge, there is no research on the different configurations of such businesses networks at a model-level. Hence, we conduct a systematic literature review to find the relevant classes and relations for a taxonomy of Open Value Networks. In this paper, we show the data extracted from 5 peer-reviewed academic papers.

Keywords: Open Value Network, systematic literature review, taxonomy.

1 Introduction

In the past few years, new ways of organizing economic exchanges have appeared. Umbrella terms like *sharing* or *platform economy* are used to describe often different realities. Examples of such organizations include Uber, Deliveroo, local energy sharing projects, fablabs, and repair cafés.

Allee (2008) and Allee & Schwabe (2015) argue that organizations should be considered as constituents of a Value Network with other organizations that creates value for the members of the network. Furthermore, the examples of Uber, etc. cited above have in common that any value collaborator, i.e. any agent cooperating to create value, can join or leave the network at little to no cost, and that the value collaborators act together towards the creation of economic or social value for all the members of the network, including the customer, if applicable. This fits the definition of an Open Value Network (OVN) proposed by Allee (2008), and other definitions (Bauwens & Niaros, 2017 ; Siddiqui & Brastaviceanu, 2013).

Although there is an emerging scientific discussion on the essential physical constituents of an OVN business model (at the meta-model-level), there is, to the best of our knowledge, no research on the different business models (at the model-level) and their desirable and undesirable properties, except for grey literature (i.e. non-academic research outputs). As such, this research project aims at capitalizing on the emerging meta-level research (i.e. Derave, 2020) through a classification of existing OVN business models in a taxonomy.

This systematic literature review will constitute the first chapter of a doctoral thesis that was accepted in early December 2020. Hence, this project is at an early stage of research, so the potential papers for the literature review have been gathered and roughly categorized. This is explained in the methodology section. Then, in the preliminary results section, we show extracted data from a small sample of 5 scientific articles. Finally, we conclude by briefly pointing out some discussion points.

In the future, we aim at finalizing this systematic literature review to present the different classes and relations of our Open Value Networks taxonomy. Then, we plan on identifying their key characteristic in a second chapter by undertaking another literature review and confronting the results to focus groups composed of professionals from the OVN sector. Lastly, in the third and final chapter, we will identify the axioms that will define the universe of discourse of our taxonomy. This will result in a comprehensive and presentable taxonomy that could foster scientific, political, legal discussions, and in the long run the construction of integrated information systems.

2 Methodology

Since grey literature will be used, we need to study our sources in scientific way by using a systematic literature review (Kitchenham, 2004). The main feature of the systematic literature review methodology is that every step of the process is very transparent, and the search method and criteria must be documented thoroughly. This way, other researchers can comment on the process and identify potential pitfalls in the results. Moreover, should biases occur in the review, the methodology ensures that they can be clearly identified and discussed.

Following Kitchenham (2004) and Kitchenham et al. (2009), a systematic literature review should be divided in 5 stages : 1. Selection of sources ; 2. Assessing their quality ; 3. Extracting relevant data ; 4. Synthesis of the data ; 5. Reporting the results. As of writing this paper, the first and second steps are still ongoing. In the next subsection, we explain the start of the sources selection process and the rationales behind it.

2.1 Search process

The aim of this systematic literature review (SLR) is to identify the classes and relations for an Open Value Network taxonomy. As stated in the introduction, OVNs are often associated to umbrella terms like *sharing economy* and *platform economy*, or *fablab* and *repair cafe* so we used these terms in our searches. We also looked up *circular economy*, and found that Kirchher et al. (2017) and Korhonen et al. (2018) had comprehensively defined the concepts embedded in the circular economy, so we decided not to include this particular keyword in our SLR at this stage. Furthermore, we also wanted to include grey literature in the forms of whitepapers. Whitepapers are industry statement pieces on very precise matters that are the results of non-peer reviewed research. However, they may include peer-reviewed sources. So, we used the keyword *whitepaper* in our searches. During our searches, other kind of grey literature such as reports from institutions like the European Commission appeared. Then, since Uber is

probably one of the most talked about actor in the OVN sector, we wanted to capture case studies done by academics by looking up *Uber taxi*. Finally, we looked up *"Open Value Network"*[1]. We used the search engines Google and Google Scholar for all our searches. Note that the searches were made with the Chrome web browser in normal navigation mode (not private). This means that cookies did influence the search results. However, if this review is replicated in the future, we expect that numerous publications (both academic and non-academic) will be shared on the internet by then. So we opted for catered search results rather than reproducibility.

Afterwards, the resulting papers were sorted in three types of publications : 1. Intended for peer-review, which includes working papers and published articles ; 2. Not intended for peer-review, which includes reports, opinion pieces, marketing documents, and semi-working paper ; 3. Whitepapers. We simply labeled whitepapers as such if the word *whitepaper* was included on the title page. Semi-whitepapers are, at first glance, indistinguishable from actual whitepapers, apart form the fact that they do not feature any mention of the word *whitepaper*. Figure 1 below summarizes this preliminary classification. We further discuss this preliminary classification of our search results in the discussion section.

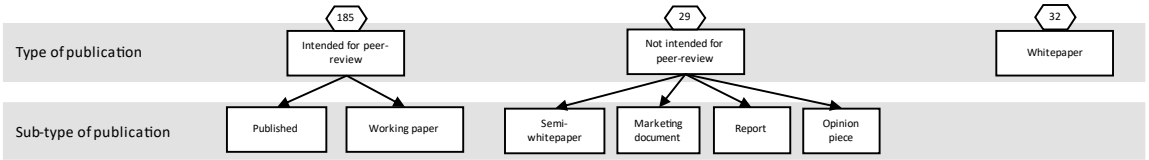

Fig. 1. Premilinary classification

2.2 Exclusion and inclusion criteria

For each keyword and each search engine, we limited ourselves to six wholes pages of results. Thus, at most, 60 links per keyword were considered. Though, some combinations of search engines and keywords yielded redundant or irrelevant results and much fewer than 60 publications were downloaded. One example is that of the keyword *fablab whitepaper* on Google, which mostly yielded websites pointing towards the *Fab City Whitepaper* from Diez (n.d.).

Only websites that gave the opportunity to directly download a computer-readable file (such as .pdf, .epub, .docx) with no privacy or pay wall were considered, i.e. no web pages. Furthermore, some websites required signing in, or yielding personal information in order to obtain the paper. These were discarded as well. However, these latter two criteria did not seem to exclude crucial papers : most sites that did not provide separate file were mostly one person's opinion piece, and the articles behind privacy walls were either opinion pieces or marketing documents. Some published scientific articles where accessible through our institution's subscription package, and few were

[1] Note the quotations marks. Without them, we obtained a results about *open networks*, *value networks*, *open value*, but not about *Open Value Networks* specifically.

not. This criterion was out of our reach to decide, but most major journals from Springer, JSTOR, Elsevier, Sage, and Wiley (which constituted most results) were accessible. The accepted languages were French and English, but in the end, all gathered papers are in English and there were no paper in another language. Figure 2 below summarizes the search results.

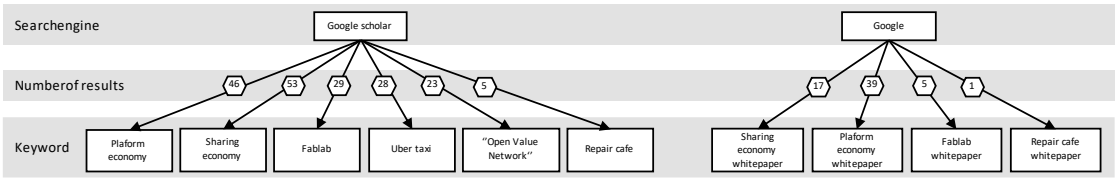

Fig. 2. Search results

2.3 Legal sources

To find definitions of Open Value Networks, we attempted to find how OVNs define themselves. One of our first idea was to look at organizations' legal documents. Often in such documents, organizations are required to provide a short explanation of their corporate purpose, or of their business activities. Such legal documents are freely available in Belgium, Switzerland, the UK, and USA. However, even companies like Uber or Lyft were non-existent in some countries' online repositories. Lesser known OVNs such as Pawshake (an Uber for pet sitters) were non-existent in all countries. However, even when the legal document was available, often the text in the corporate purpose section would be very succinct. For example, Uber London LTD states that their principal activity is to "*support the Uber Group in providing on-demand services through mobile devices and web-based requests*" (Uber London LTD, 2015). More generally, it appears as though the persons completing the documents only aim at satisficing the legal requirements, hence they do not provide much information in general. This explains why we decided to leave aside legal documents at this stage.

2.4 Future methodology

The methodology described above permitted us to gather 192 papers intended for peer review, 29 papers not intended for peer review, and 32 whitepapers, for a total of 253 papers.

We will further skim this corpus by looking at each paper's abstract and introduction. Non-academic papers often do not feature an abstract, so excluding papers without abstract would equate to excluding most grey literature. By reading the abstracts and introduction, we will judge whether the papers match the subject of Open Value Networks. In the case they not fit the topic, they will be discarded from the review. Moreover, few papers such as marketing documents and opinion pieces were included. We will identify their bias before using them further in the review. So not all 253 papers will be considered throughout the entirety of the systematic literature review.

Further, we analyze the selected papers to find the classes and relations that are at play in the Open Value Network world to prepare our taxonomy.

3 Preliminary results

We randomly selected 5 peer-reviewed papers from journals ranked 2 or 3 in the JUFO ranking[2], i.e. "leading" or "top" journals. The articles are Arcidiacono et al. (2018), Hoang et al. (2020), Mair & Reischauer (2017), Milara et al. (2017), and Schor et al. (2020). They were found with one of the following keyword : *sharing economy*, *platform economy* or *fablab* on Google Scholar.

Table 1. Selected sources for primary results

Reference	Keyword	Search engine	JUFO ranking
Arcidiacono et al. (2018)	Sharing economy	Google Scholar	2
Hoang et al. (2020)	Platform economy	Google Scholar	2
Mair & Reischauer (2017)	Sharing economy	Google Scholar	3
Milara et al. (2017)	Fablab	Google Scholar	2
Schor et al. (2020)	Platform economy	Google Scholar	2

We checked the abstracts and introductions in order to make sure that Open Value Networks were part of their topics. Then, we scanned the articles in search of a formal definition of *sharing economy*, *platform economy*, or *fablab* and for mentions of any potential classes and relations for an OVN taxonomy. The following summarizes the classes and relations found across the 5 papers considered.

Classes.

1. Organization (e.g. Uber or Amazon)
2. Infrastructure (e.g. an app or website or a physical space in the case of fablabs)
3. Business (e.g. a restaurant)
4. Worker (e.g. a driver)
5. Consumer
6. Resource (e.g. an AirBNB appartement)
7. Tool of trade (e.g. an artisan's hammer)
8. Gig, or job (e.g. a specific one-time order from a consumer that needs business and/or worker for completion)

Relations.

[2] JUFO ranking : https://www.tsv.fi/julkaisufoorumi/haku.php?lang=en

9. An *organization* **provides** an *infrastructure*
10. A *business* and/or *worker* and/or *consumer* **use** the *infrastructure* to get **matched** together for a *job*
    a. Depending on the type of job, either both a business and worker or only a business or only a worker can be matched to one consumer
11. A *business* or *worker* can **own** *resources*
12. *Resources* can be **shared** with a *consumer*
13. A *consumer* **orders** a *job* by **using** the *infrastructure*
14. A *business* and/or *worker* **takes** a *job*
15. A *business* or *worker* **owns** *a tool of trade*

All papers made a distinction between a worker and a business. As one worker often has the status of independent worker in the OVN context, businesses are defined as an organization with employees. Even if only one employee of a business takes care of a job, all papers seemed to consider that the business (employer) was involved. Then, the papers made a distinction between a worker's or business' resources and tool of trade. A resource is embedded with the intention of being shared at some point with a consumer, while the tool of trade is not embedded with such intention. For instance, a Lyft driver (worker) owns a car and uses it to complete a job as a tool, while some other worker can own a car as a resource and put it up for rental. This latter distinction could potentially be argued in the future but note that, for now, no paper contradicted another one on one or more classes or relations. Finally, workers, consumer and business seem to share multiple characteristics and relations. This could lead to a common super-class, as discussed further.

These five papers agreed on all concepts and relations exposed in this paper. However, we suspect that there will be disagreements in the form of synonyms, homonyms, or even on definition of classes, or relations. The OntoClean methodology (Guarino & Welty, 2004) will be used to deal with these issues.

4 Discussion

In this paper, we described our methodology for a systematic literature review on Open Value Networks. We discussed the inclusion and exclusion criterion, as well as the limitations of our search. Then, we randomly pick five academic papers from different fields with a 2 to 3 rating to extract the classes and relations at play in OVNs, as a sample of results.

In choosing the keywords for our searches, we omitted ones like *gig economy*, or *on-demand economy*, or *Airbnb*. Despite this, we ended up with 253 papers. We invite other researchers to undertake a similar literature review with different keywords to help refine our analysis.

Concerning the classification of papers, we considered the need to change towards a more robust one. Notably, the sole difference between *semi-whitepaper* and *whitepaper* is only whether the word *whitepaper* appears on the document. Further, we might need to distinguish between papers with a least a set number (e.g. 10) of peer-reviewed

sources and classify them as *whitepapers* (or another, more appropriate name). Another, purely semantic change, would be to classify the working papers as a sub-type of not peer-reviewed papers, since they are not *yet* peer-reviewed. Figure 3 in the appendix section illustrates the classification with potential changes.

Further, we consider the preliminary results in terms of classes and relations in an Open Value Network. Until now, none of the paper studied acknowledge the presence of a *catalog* or *menu* that a business or worker can publicly post on the infrastructure, so the consumer can order a job based on what businesses or worker make available. Moreover, no paper explicitly considered the possibility of a worker, or consumer, or business assuming more than one role. However, it was not explicitly excluded either. It is possible that we will have to consider an *actor* super-class that encompasses the three sub-classes.

Finally, the type of scanning we perform on the 5 articles could be too time-consuming if applied to more than 200 papers. Instead, we could potentially use textometric solutions akin to the social-media based system review described in Khan (2013) to automate the search for classes and relations.

5 Appendix

N.B. : some set of words in the images below appear with no spaces between them. This is due to the resizing of vectoral .svg image.

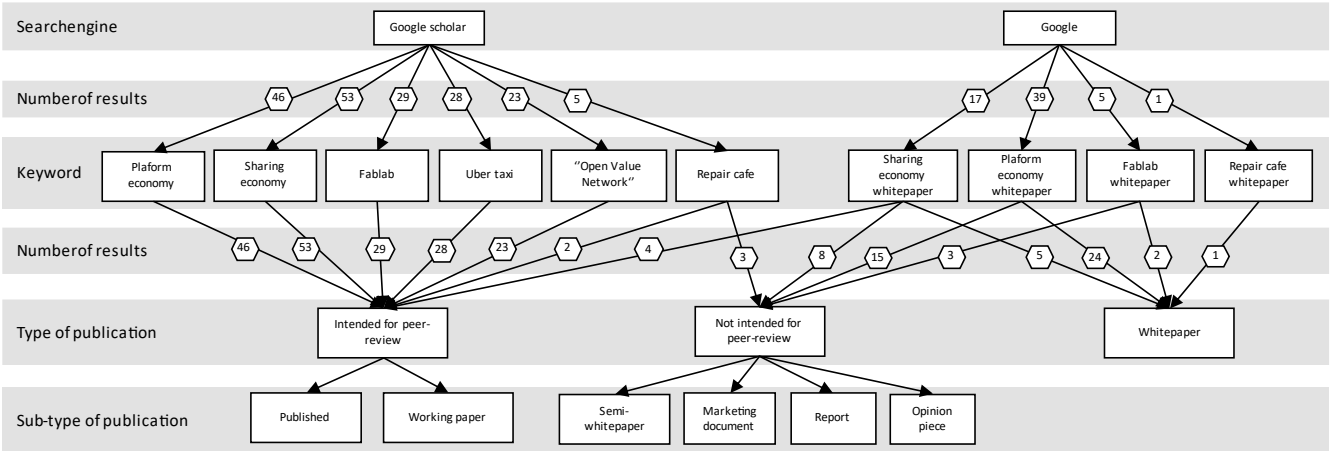

Fig. 3. Search results + preliminary classification of sources

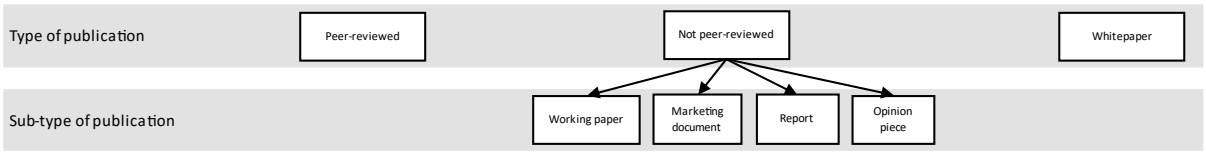

Fig. 4. Potential future classification of sources

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