AIR TRANSPORT VALUE PROPOSITION.

COVID-19 AFFECT.

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Abstract: Improving variety of business aspects such as operations and innovation are often accomplished via systematization that taxonomies provide. Taxonomies have been proven effective in many industries e. g. medicine, material science etc.; recently also becoming adopted in aviation – IATA airline taxonomy was created in 2019. Availability of multiple taxonomies is beneficial since each provides a different view. We aim at developing taxonomy with the following important differentiations: customer-centric bottom up development via customer questionnaires and interviews (vs top down approach of IATA where taxonomy was created by a governing body), focusing on innovation and new value creation (vs operational focus of IATA of standardizing the descriptions and contexts of products and services of multiple providers). We show that our taxonomy is conductive to identifying novel innovation opportunities, which could then be integrated into existing operations by being partially aligned with the IATA's taxonomy.

The authors of this paper conducted research in the time of a dramatic change in the circumstances (COVID-19) that has a great impact on the norms and practices in aviation. The research reflects both pre-COVID and COVID-time value proposition assessment.

Keywords: COVID-19, Value Proposition, Taxonomy, Air Transportation

JEL classifications: F5

1 INTRODUCTION

Taxonomies are important as a foundation in any scientific endeavour. The reason for this is that it is necessary to agree on a common and unambiguous frame of reference to advance the understanding of the nature, origins and causes of a specific phenomenon of interest. Only by agreeing on a particular

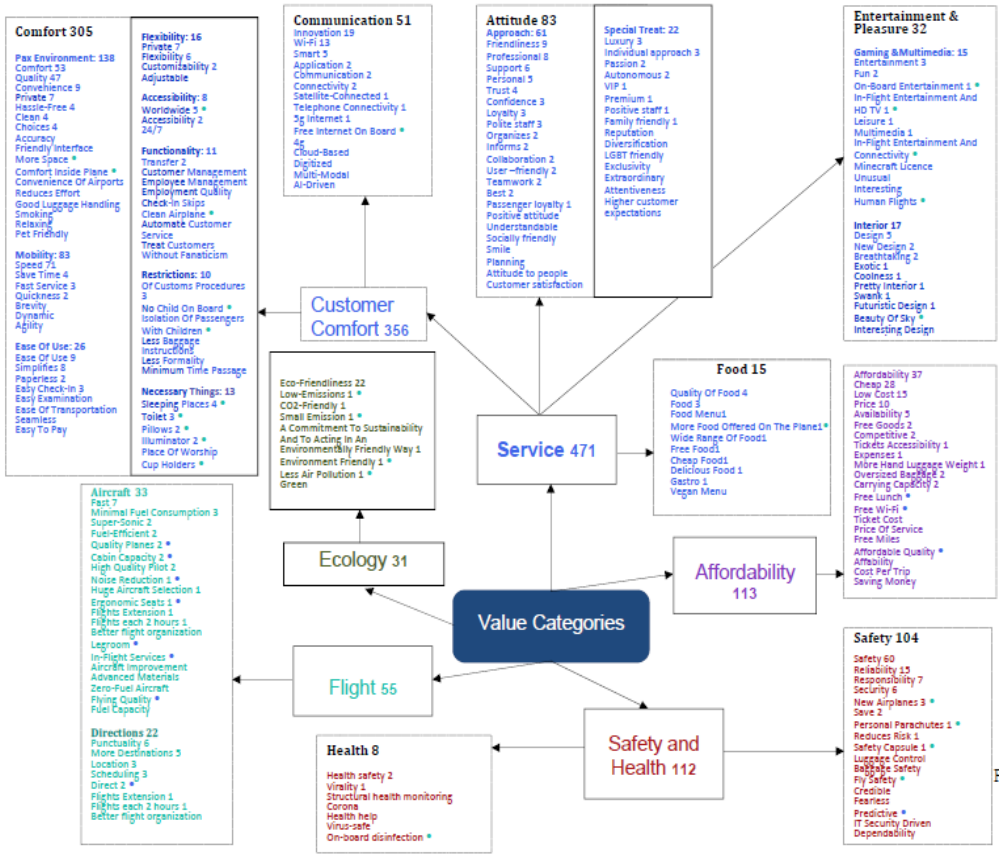
set of classifications can research results be compared and knowledge be accumulated (Bove, 2002). There are different types of taxonomies used in the aviation industry focusing on safety and security, products and services.

The typical representatives of the safety and security taxonomies are The International Civil Aviation Organization (ICAO) ADREP (ADREP, 2013) and HEIDI (HEIDI, 2014). These are complex and detailed taxonomies used by industry experts in the process of event description and categorization. Standardization Workgroup of the Safety Management International Group (SMICG) introduced another one, called SMICG hazard taxonomy, which was further developed by Civil Aviation Safety Team/ICAO Common taxonomy Team (SMICG, 2013). Another group of taxonomies could be the one consisting of those primary oriented on the human factor and its relations to specified events and errors. Such taxonomies are HFACS, CHIRP, or TEM taxonomy (Stojić, Vittek, Plos, and Lališ, 2015).

Taxonomy type standardizing the descriptions and contexts of products and services was introduced only recently by the International Air Transport Association (IATA) in late 2019 (IATA Airline Taxonomy, 2019). IATA gives the following description of the taxonomy: The Taxonomy is a hierarchy of related items which is used to convey the context of the product or service and serves as shared language for describing products and services (IATA Airline Taxonomy, 2019).

This paper creates a new type of taxonomy with the focus on Value Proposition (VP) in Air Transportation (Figure 1); a taxonomy that reflects hierarchical classification and relations between conventional kinds of the categories and entities that exist in the society, aim at air transportation industry and could be proved by empirical investigation. (Goodman, 1978) states that a taxonomy shows the hierarchy and relationship between the different elements and capabilities that exist. All objects, properties, relations and propositions make sense and justification only within the framework of a specific conceptual scheme.

Figure 1: Value Proposition Taxonomy in the Air Transportation



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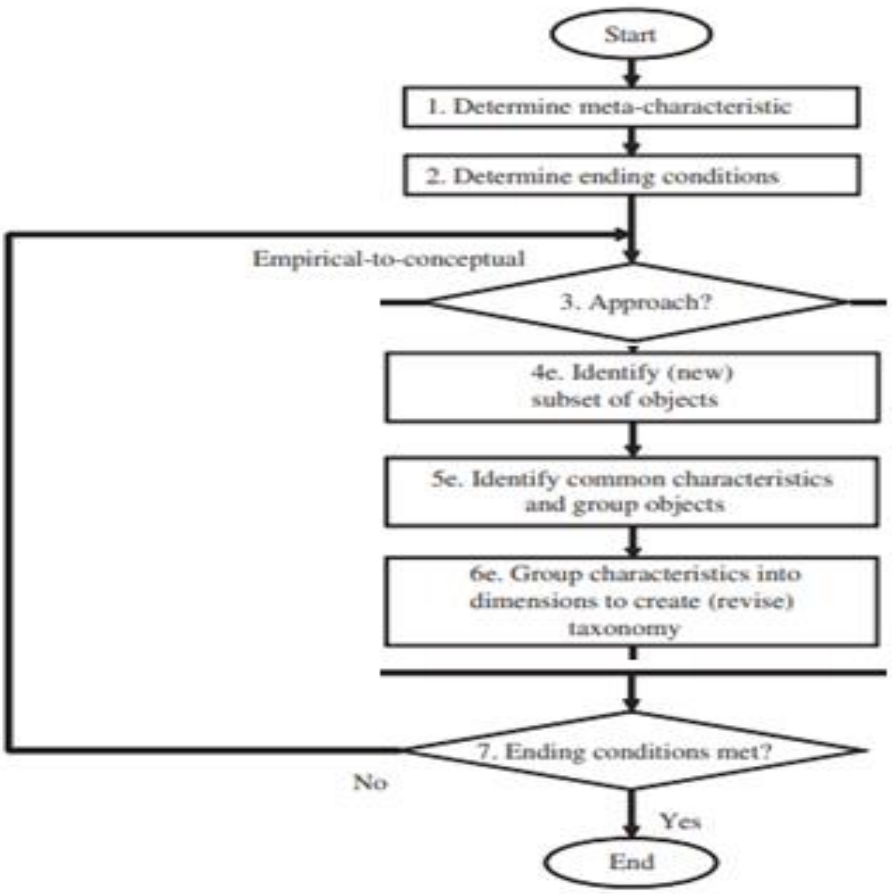
The authors of this paper conducted research in the time of a dramatic change in the circumstances (COVID-19) that has a great impact on the norms and practices in aviation. The research reflects both pre-COVID and COVID-time value proposition assessment. The proposed taxonomy is limited by opinions of millennials related to transportation area (students of a transportation university). Categories of comfort, safety, health, affordability are general for human wellbeing and are a natural claim of air transport consumers. Of practical value there are the weights of those general characteristics and their relative importance, evaluated by the potential consumers.

To evaluate comprehensiveness and contextual factors we adopted empirical-to-conceptual approach (Nickerson, R. C., Varshney, U., and Muntermann, J., 2013): if the researcher has little understanding of the domain but significant

data about the objects is available, then starting with the empirical-to-conceptual approach is appropriate, that is shown in Figure 2:

Figure 2: The taxonomy development method



Source: Nickerson, R. C., Varshney, U., and Muntermann, J., 2013

Following the empirical-to-conceptual approach, we identified a subset of objects (terms) that we wished to classify low priced, friendly, multiple destinations, Wi-Fi on board, etc. These objects were value propositions from the surveys. Next, we identified common characteristics of these objects. The characteristics were logical consequences of the meta-characteristic. Thus, the authors started with the meta-characteristic and identified characteristics of the objects that follow from the meta-characteristic. Once a set of characteristics had been identified, were grouped formally using statistical

techniques. The resulting groups formed the initial dimensions of the taxonomy.

The research interest of this paper is limited by the possibility of adding new value proposition through education not considering Added Value or Value for Money; for incremental operational improvement IATA's taxonomy and regular surveys would probably be more efficient.

2 MAIN BODY OF TEXT

2.1 Background and related work

The suggested in this paper value proposition taxonomy is a combination of Services/Products with Innovation reflected by values from surveys. As the aim of this paper was to develop a taxonomy focusing on innovation and value proposition in air transportation, two existing taxonomies seem related; and their different focus could be interesting to examine. Also, a recent development in Value Proposition theory is worth of mentioning.

2.2 IATA Airline taxonomy (AT)

The IATA Airline Taxonomy (IATA Airline Taxonomy, 2019) is a code set managed by Airlines through the Standards Settings Governance. The Airline Taxonomy is a shared language for Airlines to describe their products and services to Sellers and a way for Sellers to optionally request specific features in an Offer. It was adopted in October 2019 and according to the experts' it is yet not of common usage by airlines.

Airline Taxonomy (AT) offers 4 major categories: Ground, Airport, Journey, and Flight and 108 basic level terms. Here is a top down approach of IATA where taxonomy was created by a governing body and an operational focus of IATA for standardizing the descriptions and contexts of products and services. AT does not provide any weight for its categories, as it offers a universal approach to enlisting all existing product and services experts accounted, as it stated in AT Code set (IATA Airline Taxonomy code set, 2019):

Table 1: Sample of IATA Airline Taxonomy code set

Taxonomy ID	Parent ID	Name	Description
0000		Airline Taxonomy	
0064	0000	Flight	Any Product or Service related to a Flight
00C8	0064	Servicing	Any Product or Service related to Servicing of that Flight
012C	00C8	Change	Any Product or Service relating to Change Conditions
0190	00C8	Refund	Any Product or Service relating to Refund Conditions
01F4	0064	Entertainment	Any Product or Service related to Entertainment on board a Flight
0258	01F4	WI-FI	Any Product or Service which is transmitted through
02BC	01F4	Television	Any Product or Service which plays Video related Content

Source: IATA Airline Taxonomy code set, 2019

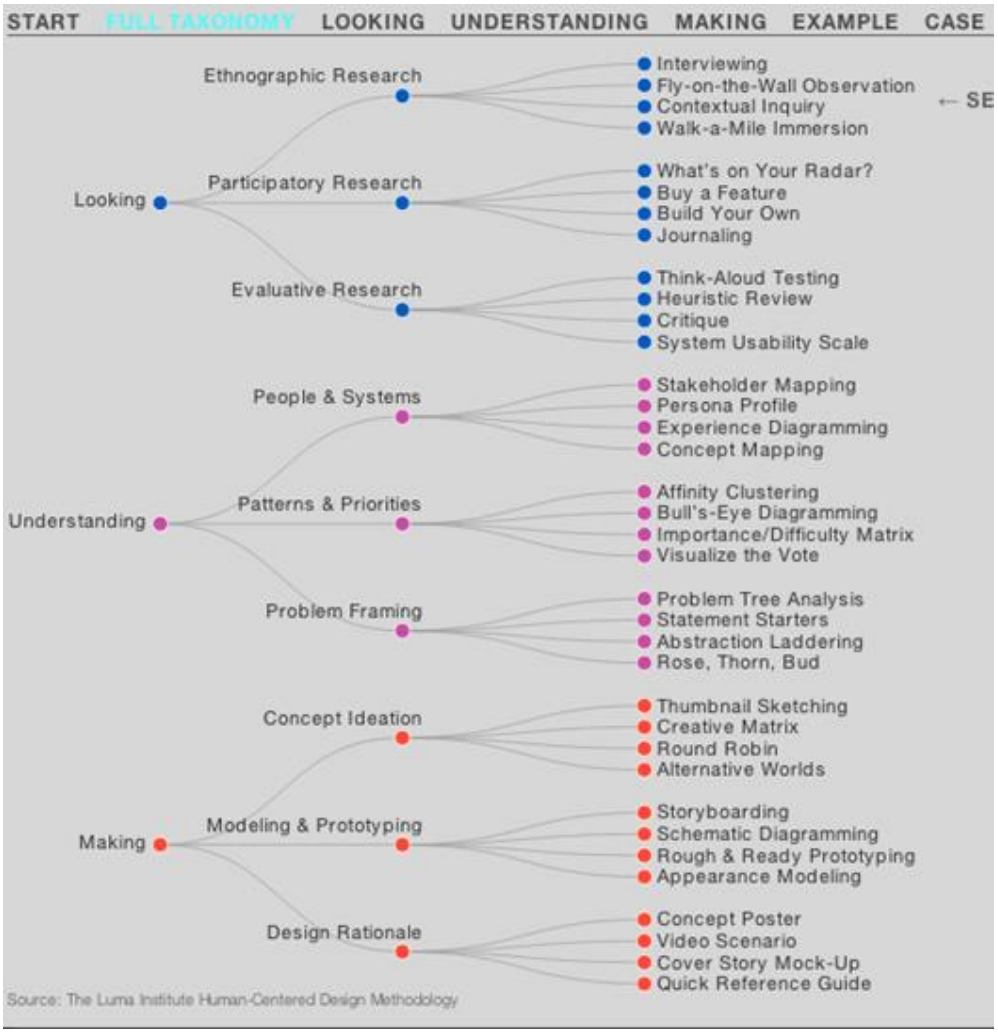
2.3 A Taxonomy of Innovation

A comprehensive Taxonomy of Innovation (Figure 3) was created by Luma Institute (Luma Institute, 2014). A version of this article appeared in the January–February 2014 issue of Harvard Business Review Thousands of tools and methods are available to help innovators discover what users want and how to deliver on their expectations. The challenge is to figure out which ones to use when. Luma Institute has created a framework to help you choose the best tool for each step of the innovation process, based on the people you're designing for and the complexity of the systems in which you operate.

Luma distilled the portfolio down to 36 of the most effective tools for innovation - the majority of them in common use - organized in three categories: looking, understanding, and making. Each category contains three subcategories, and each subcategory contains four innovation tools. This

hierarchical model makes it much easier to identify the tools you need and then put them to use.

Figure 3: Taxonomy of Innovation by Luma



Source: Luma Institute, 2014

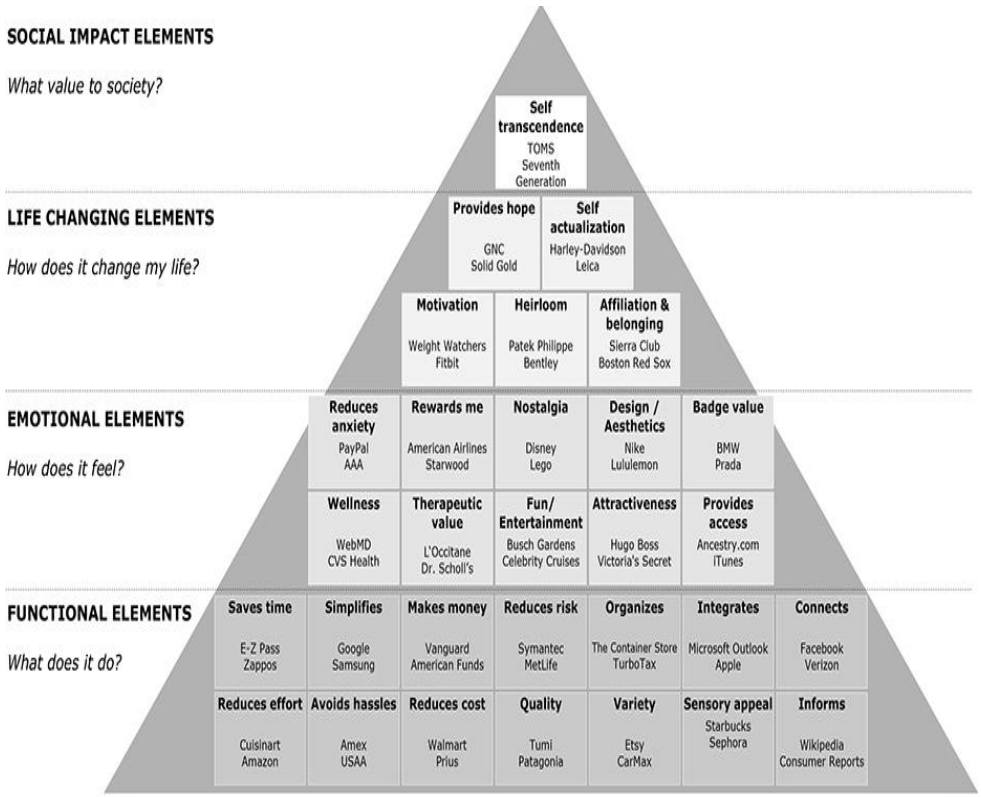
2.4 Value Proposition

A rich theoretical and empirical literature can be applied to the question on how to identify Value Proposition in start-ups texts. As the current research focuses on linguistic patterns of start-ups landing pages, the authors reviewed theoretical and empirical literature on specific online text features, textual value proposition methods, value proposition comprehension by consumers of different level of expertise.

(Lanning and Michaels, 1988) first used the expression "value proposition" (VP) in a 1988 work document for the consulting company "McKinsey and Co". In the article, which was entitled "Delivering value to customers", the authors define value proposition as "a clear, simple statement of the benefits, both tangible and intangible, that the company will provide, along with the approximate price it will charge each customer segment for those benefits".

(Almquist, 2016) suggested a strategy based on a differentiated customer value proposition. A suggested set of value was called Elements of Value. Elements of Value (Figure 4) where categories are based on the classic Maslow's Hierarchy of Needs.

Figure 4: Heuristic model of value with examples of companies exhibiting elements of value



Source: Almquist, 2016

There are comparatively a few researches on analyzing value propositions in online startups. (Su-C Li, 2007) argues that a properly constructed value proposition is essential to the value creation process in e-business, and value

co-production is the building blocks for value protection mechanism in network economy.

3 RESEARCH DESIGN

For internal value study, authors showed the possibility to improve value adoption via training via the following steps: (1) baseline values, (2) wide variety of values identification, (3) values adoption. Baseline was established via a pre-survey where participants were asked to list as many values as possible (in the context of air transportation). For value identification, authors designed an exercise where participants were tasked with identifying wide variety of values (100+) by looking at 1,000+ startups' landing pages (startups are frequently the first to identify novel values). Finally, to evaluate how well participants were able to adopt the values that they were exposed to (the previous step) as well as improve their creative thinking (values that they haven't been exposed to), authors conducted a post-survey.

The last step was interviews with 20 participants. They discussed the learning outcomes and the impact of COVID-19 pandemic on their answers.

3.1 Participants

In order to collect generalizable observations on air transportation value proposition, we recruited 100 students from transport university with a connected, but still diverse range of majors and/or professional roles in a transportation field: Aviation Management, IT, Logistics.

All participants were between 20-42 years of age. Many participants had multiple years of experience in different types of professional roles, including 13 aviation mechanics (1-15 years), 14 middle level managers (1-5 years), 21 programmers (1-5 years), 16 administrators (1-7 years), and others. Most participants were not aviation management experts - 65 reported that they had never heard of Value Proposition before, but never built a model, 35 reported that they had taken some classes about marketing and management with value proposition as a study material. No one reported being an expert in the field of air transportation marketing or management.

Three industry experts from the top air transportation organizations' management were introduced with the research results and interviewed: two commercial directors of international airports and one IT director of an international airline.

3.2 Procedure

There were four stages of the procedure:

1. Pre-Survey
2. Trainings
3. Post-Survey + interviews
4. Taxonomy construction

A total of 800 different start-ups in the field of air transportation were chosen, their landing pages consist the research base for analysis on Value Proposition. 100 participants - IT, Aviation, and Management undergraduate and graduate students – were involved in a preliminary survey, post-survey, training and post-training annotation of start-ups' landing pages. A separate webpage was created for conducting surveys, two-level training and annotation process. The quality of annotation was re-assessed by industry experts.

The aim of a preliminary survey is to understand the level of expertise for non-trained participants and to determine value proposition volume and structure before the education process. The students were told about the basic concept of value proposition. Also, they were given some examples of Value Proposition such as typical ones: affordability, quality, speed; less typical: eco-friendliness. After that they were asked to list as many values as they can, that are provided by the Air Transportation start-ups and companies.

After the participants are told the start-up concept, they learned existing Value proposition major theories. After that they were offered two trainings. Training 1 shows five relatively simple examples of how to determine VP on start-ups landing pages. Training 2 presents five landing pages where the VL cannot be easily identified due to its vague expression or the creators of the webpage use non-standard ways to promote their start-up, e.g. video or non-trivial words.

Categories are not collapsed by excluding partial synonyms as to preserve semantic difference might be important for marketers and customer service.

15 interviews were conducted online on a Moodle chat platform, 5 respondents were interviewed face-to-face.

4 RESULTS

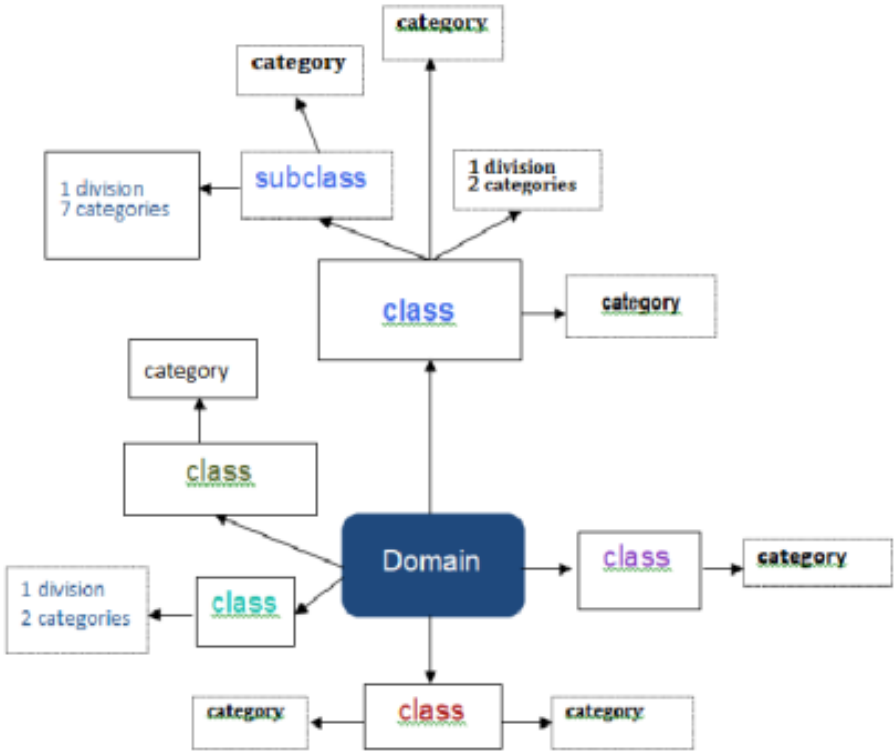
We modelled the taxonomy as a tree diagram. A term in the taxonomy is either an object term (e.g., seat), or an attitude term (e.g., friendly), or an approach term (e.g., no child on board, save time). Taxonomy groups of all levels contain all types of terms and are united by the same concept.

Differentiating object terms from approach or attitude terms is natural in our taxonomy and does not influence on the concepts.

Taxonomic classes, divisions, subdivisions, and categories (Figure 5) were developed from the 241 values describing activities, procedures, objects, emotional experience and considering the context in which they could be possibly associated with in air transportation.

By analysing the terms and the context, five taxonomic classes, one subclass, three divisions, and eighteen categories have been developed. Each of the 241 lowest level terms fits into at least one taxonomic group. However, many of them belong into more than one taxonomic group. Categories are not mutually exclusive.

Figure 5: Taxonomy grouping



Source: own processing

Every group and each term present the number of people that name this value / group of values. The most frequent terms are:

- speed 71
- safety 60
- comfort 53

The weight of each group is a sum of its components. The biggest group is Service with 356 and the smallest one is Ecology with 31.

Terms that could belong to several classes are noted with a bullet of a corresponding class' color.

5 DISCUSSION AND CONCLUSION

Primary purpose of companies is to create value; in aviation traditional dominant values are price, quality, and speed (IATA Passenger Survey, 2019). Taxonomies usage and help and the degree it can be useful for industry and analysts is a subject of a special discussion.

5.1 COVID-19 impact

Comparing results from pre/post survey gave authors a unique opportunity to see how the external factor (COVID-19) influenced the value adoption. Surprisingly, the results show that recent dramatic change in circumstances (COVID-19) has little affected the participants' general idea on value proposition in air transportation; in particular health value was not explicitly mentioned (8 terms were named) and seems to have been simply accepted as a "new reality". The hypothesis is that it is due to overly positive view (such as happened after WWII - baby boomers; art, style, and culture dramatic liberalization). However, the sampling is biased to participants that closely related to transportation area as well as age (millennials); this might not generalize to wider population and e.g. the overly negative reaction might be possible as was the case after WWI (Lost Generation, Dadaism).

5.2 IATA and Value Proposition taxonomies

There is an overlap with IATA taxonomy: categories are partially overlapping, but terms are different. This can facilitate industry implementation, as categories are quite familiar from previous taxonomies. So, requires less department coordination.

Table 2: Number of categories in IATA taxonomy and Value Proposition (VP) taxonomy

IATA Taxonomy	VP Taxonomy	IATA Taxonomy	VP Taxonomy
1st level categories		2nd level categories	2-4th level categories
Ground	Service	Meal	Comfort
Journey	Affordability	Beverage	Pax Environment
Flight	Flight	Medical Equipment	Mobility
Airport	Ecology	Escort	Ease of Use
	Health&Safety	Loyalty	Flexibility
		Upgrades	Functionality
		Charity	Restrictions
		Purchases	Necessary Things
		Cabin Baggage	Communication
		Checked Baggage	Attitude
		Seat Assistance	Approach
		Lounge	
		Terminal	
		Check In	
		Boarding	
Total: 4	55	26	19

Source: own processing

Authors aim at developing VP taxonomy with the following important differentiations:

- customer-centric bottom up development via customer questionnaires and interviews (vs top down approach of IATA where taxonomy was created by a governing body),
- focusing on innovation and value (vs operational focus of IATA of standardizing the descriptions and contexts of products and services of multiple providers).

Authors show that VP taxonomy is conductive to identifying novel innovation opportunities, which could then be integrated into existing operations by being aligned with the IATA's taxonomy.

Some of our classificatory categories and practices though they may appear inevitable are actually contingent and relative to the practice of classification in the context of social institutions and norms (Hacking, 1999). As an example, the category of entertainment during air travel seems to be constructed by marketers, however, according to (Hacking, 1999), some constructed categories reflect real divisions, and so we need not be constructivists in the strong sense. There is still room to distinguish between constructed kinds that reflect real categories and those that do not. Human beings start to present extra worries when evaluating the naturalness of their humankind. That way there is a place for a question if the value, for example, of eco-friendliness is a humankind or a natural kind from the given world. And if it is possible to educate consumers to feel the necessity of proposed values.

5.3 Industry Experts on taxonomies

Three air transportation industry experts of a high level of expertise were asked to compare VP taxonomy with IATA Airline taxonomy. Also, they shared their ideas about the way taxonomies can be useful for industry and COVID-19 surprisingly little significance for respondents in April 2020.

COVID-19 and consumers' expectations. Experts admit that the inertia plays a great role in such conservative industries as air transportation. Consumers may still not realize their expectations for health issues. Also, little attention towards COVID-10 could be due to the well-known fact that in a pandemic, all industry participants (airports, airlines, handling companies, etc.) give priority attention to the safety issues for the health of passengers and employees; therefore, by all passengers / clients (including respondents), this is already taken for granted (the must) and is no longer perceived as a value (added value).

IATA and Value Proposition taxonomies difference. Value Proposition taxonomy focuses on innovative values, reflects consumers' requests for new technologies and attributes like speed, super-sonic, unmanned. IATA taxonomy is more conservative. Also, IATA AT offers top down approach where taxonomy was created by a governing body and reflects the aviation industry ideas on

products and services, while Value Proposition is created using bottom driven approach asking what consumers' wants and needs are.

Benefits for the industry. These taxonomies are extremely useful for the following purposes: to understand the essence and systematization of services / services, to formulate KPIs by directions, to distribute areas of responsibility between all the links in the value chain. Also, the unexpected finds and formulations of values that were not previously in sight are of great interest for marketers. Good perspective can be seen in using VP taxonomy in Project Management.

Ability to operationalize rapid identification and adoption of new values allows corporations not only to improve profitability; but even to become resilient to unexpected external factors that suddenly impose new values. Value Proposition Taxonomy for Air Transportation is characterised by the fact of having been derived in the time of substantial external change of circumstances – COVID-19 pandemic outbreak. The Taxonomy reflects changes in consumers' requests for the industry as for April, 2020.

There already exist different classification systems that could be of relevance in relation to developing a Value Proposition taxonomy. Even though there are some variations in the structure of the main groups and the level of detail in the individual frameworks their overall structure is fairly similar, but the Value Proposition taxonomy is the only one that has been extensively validated and that has been directly aimed at Value Proposition in Air Transportation. Widening values is being considered as one of the main purposes for constructing Value Proposition taxonomy, especially reflecting COVID-19 outbreak.

AFFILIATION

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