

Exploring the Core Values of Entrepreneurs: A Comparison to the United Nations 17 Sustainable Development Goals

Dimitris Polychronopoulos

Faculty of Marketing Management
University of South-Eastern Norway
Drammen, Norway
244602@usn.no

Yngve Dahle

Faculty of Health and Social Science
University of South-Eastern Norway
Porsgrunn, Norway
ydahl@usn.no

Kevin Reuther

Faculty of Economics and
Management Science,
University of Leipzig
Leipzig, Germany
kevin.reuther@uni-leipzig.de

This paper is an exploratory research that builds on existing theoretical and empirical studies in the areas of entrepreneurship and sustainability. Its aim is to gain insights into the extent to which entrepreneurs are engaging in the United Nations 17 Sustainable Development Goals (UN 17). It therefore analyzes the core values of 1,467 entrepreneurs to understand the present state of their core values for subsequently comparing them to the UN 17, which we consider as normative. The methods employed include Latent Dirichlet and text data mining. The outcome of the research identifies entrepreneurs as having some degree of engagement with sustainability and that only two of the UN 17, namely education and health, are particularly conspicuous.

Keywords—United Nations Sustainable Development Goals, UN 17, UN 17 SDGs, sustainability, entrepreneurship, entrepreneurial opportunity, core values, motivation, intention, text data mining, thematic analysis, Latent Dirichlet Allocation

I. INTRODUCTION

Since 2015, the United Nations has been promoting its 17 Sustainable Development Goals (hereafter referred to as the UN 17) worldwide as a way of creating measurable achievable goals for a prosperous future on the planet [1]. Various stakeholders have begun to adopt the UN 17 as a way of aligning themselves to work toward improving life on our planet and the UN 17 has gradually been used as the yardstick of sustainability also within entrepreneurship [2-4]. By considering the UN 17 as a normative framework for sustainability, we conduct exploratory research to investigate the extent to which entrepreneurs are engaging with the UN 17. In order to evaluate such engagement, we pose the question whether (and to what extent) the self-defined core values of entrepreneurs relate to these goals. Fayolle, et al. [5] claim that values are at the heart of entrepreneurs' motivations relating to the nature of their businesses. Moreover, in his PhD thesis, Dahle [6] proposes that core values of entrepreneurs are among the first elements to consider when building the foundations of an entrepreneurship project. Based on this, our aim is to understand more about entrepreneurs via their core values

and to tie this into the UN 17's ambition to provide a framework for helping entrepreneurs focus on ways to improve life on Earth.

Filser, et al. [3] conducted a literature review and found that there is a dearth of research discussing the extent to which entrepreneurs support reaching the goals laid out by the UN 17, yet the United Nations has explicitly mentioned entrepreneurship as one of the paths to reach the goals. Thus, the purpose of this paper is to identify to what extent entrepreneurs' core values suggest their engagement in solving pressing problems outlined in the UN 17 and to discuss the relation between entrepreneurial activities and the UN 17 on this basis. From this emerges the following research question: *What overarching characteristics of entrepreneurs' self-defined core values can we identify and how do they relate to the aims of the UN 17?*

To investigate the phenomenon via exploratory research from a broader empirical basis, we use text mining techniques [7] to analyze the core values of 1,467 entrepreneurs. These entrepreneurs are recruited from different entrepreneurship support programs from all over the world using the Systemic Entrepreneurship Activity Method (S-E-A-M) as introduced by Dahle et al. [8]. As part of the training received, these entrepreneurs identified and reported the core values on which they base their projects. We analyzed these and compared them with the UN 17 in the course of this paper. In this context, we do not claim that there is causality between entrepreneurs self-declared core values and the UN 17. There is a chance that some of the entrepreneurs, when writing their core values, had still not heard of the UN 17.

Our aim is for policymakers, entrepreneurs, entrepreneurial training hubs and other stakeholders to have an overview of where emphasis is needed when supporting entrepreneurial initiatives. In addition, we contribute to the nascent academic field which aims to better understand the nexus where entrepreneurship, motivation, and the UN 17 coalesce.

II. LITERATURE

A. The United Nations Sustainable Development Goals

The frame of reference for this paper is a timeline of milestones that steered the way for the UN 17. The term sustainable development first appeared in 1972, at the United Nations Conference on the Human Environment [9]. The following decade, two interconnected milestones took place. In 1983, the UN General Assembly agreed to establish the World Commission on Environment and Development (WCED) to report on environmental and related issues leading up to the year 2000 and considering the future beyond [10]. Four years later, in 1987, the WCED published a report, titled, “Our Common Future”, which became known as the “Brundtland Report”, after the Commission’s chairwoman Gro Harlem Brundtland. In the report, sustainable development is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” [11].

The following decade, in 1992, the United Nations developed reports at the national level for those participating in the United Nations Conference on Environment and Development in Rio de Janeiro in June 1992 [12]. These reports also helped create areas for discussion on regional cooperation [12]. Through the 1990’s sustainable development entered agendas at regional levels, with initiatives such as the Barcelona Convention, concerning sustainability for the Mediterranean Sea coast [13]. Specific development goals did not emerge on a worldwide level until the year 2000, at the United Nations Millennium Summit, where the UN established eight international development goals which they aimed to achieve over the next 15 years [9].

At the end of that period, in 2015 the United Nations expanded the goals to a total of 17, with the aim for all people to enjoy peace and prosperity by 2030 [1]. Table I displays each UN 17 goal by number, topic and full sentence, as taken from the UN website [1].

TABLE I. UNITED NATIONS 17 SUSTAINABLE DEVELOPMENT GOALS

No.	Main Topic	Full Sentence
1	Poverty alleviation	End poverty in all its forms everywhere.
2	Food security	End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
3	Health	Ensure healthy lives and promote well-being for all at all ages.
4	Education	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
5	Gender equality	Achieve gender equality and empower all women and girls.
6	Clean water	Ensure availability and sustainable management of water and sanitation for all.
7	Access to energy	Ensure access to affordable, reliable, sustainable and modern energy for all.

No.	Main Topic	Full Sentence
8	Decent work	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
9	Infrastructure	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.
10	Equality	Reduce inequality within and among countries.
11	Safety	Make cities and human settlements inclusive, safe, resilient and sustainable.
12	Sustainable consumption	Ensure sustainable consumption and production patterns.
13	Combating climate change	Take urgent action to combat climate change and its impacts.
14	Ocean conservation	Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
15	Land conservation	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
16	Peace and justice	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
17	Partnership	Strengthen the means of implementation and revitalize the global partnership for sustainable development.

As we can see from Table I, the UN 17 are interdisciplinary and multifaceted. One can argue that this makes their implementation complex because it requires collaboration across sectors, as well as skill sets from different disciplines [14]. When concerning implementation targets, Stafford-Smith, et al. [15] express that the UN 17 are largely silent about interlinkages and interdependencies that exist among the goals. Even before the publication of the UN 17, discussions evolved stating the danger of focusing on the achievement of a particular aspect of sustainable development to the detriment of the environment in other regions or at the expense of other sectors [16]. In this regard, Stafford-Smith, et al. [15] suggest three particular interlinkages where stakeholders in the UN 17 should place greater attention:

- 1) Across sectors (examples: finance, agriculture, energy, technology and transport)
- 2) Across societal actors (local authorities, government agencies, private sector and civil society)
- 3) Between and among low, medium and high- income countries.

B. Core Values, Entrepreneurial Opportunity and - Sustainability

Within the context of the UN 17, we next explore three areas of the entrepreneurship field that support answering our

research question. Those are core values, entrepreneurial opportunity and sustainability. Collins and Porras [17] define core values as “a small set of timeless guiding principles” that have “intrinsic value and importance” to an organization. Urde [18] postulates that core values affect the entire organization, from strategy, leadership, product development and beyond. One could thus argue that core values are a cornerstone of all entrepreneurial endeavors. We empirically explore core values in this paper in order to understand the extent to which entrepreneurs engage in the UN 17, as they may provide insights into what inspires entrepreneurs. Cohen and Winn [19] investigated core values as being related to individual entrepreneurs and categorized them as either economic, environmental or social [19]. Since that time, Gagnon [20] explored core values that drive entrepreneurs to engage in sustainability, Schaefer, et al. [21] have defined what they call sustainable entrepreneurship, which focuses on economic opportunities that do not undermine the social and ecological domains of their operation, Kirkley [22] investigated entrepreneurial values as forms of intrinsic motivation, Dahle [6] proposed that the foundations of entrepreneurship projects begin with core values, and Peng, et al. [23] have noted that entrepreneurs have begun to recognize rising environmental problems as opportunities. In this manner, such entrepreneurs are able to integrate solutions to these problems into their business models. We argue on this basis that entrepreneurs’ core values can constitute a suitable starting point for an empirical investigation of the extent to which the UN 17 may impact their activities.

Another area to assist our understanding of entrepreneurs’ involvement with the UN 17 is the concept of entrepreneurial opportunity, where Shane and Venkataraman [24] argue that entrepreneurship involves the nexus of opportunities and individuals. In this domain, Ardichvili [25] formulated eight propositions regarding how entrepreneurs identify opportunities. Proposition five on prior knowledge of customer problems is of particular relevance to the discussions in this paper, as we propose that certain entrepreneurial opportunities can exist through the interpretation of the UN 17 as a set of problems to be solved. In this context, when entrepreneurs scrutinize the UN 17 while wearing the lenses of entrepreneurial opportunity, they can delve into what appears to be an endless stream of problems to solve. When considering this as a source of inspiration and combining it in particular with propositions 2 (network) and 3 (special interest/industry knowledge) from Ardichvili [25], an entrepreneur can be more likely to succeed, while simultaneously helping to achieve one or more of the UN 17 goals.

The third research area which helps us answer our research question is sustainability in the entrepreneurship context. Seelos and Mair [26] contribute to the literature of sustainable development and entrepreneurship with their focus on the international development goals from the United Nations Millennium Summit where they provide examples of social entrepreneurship from different countries as a path

toward achieving the goals. Prior to the rollout of the UN 17, research in the field of entrepreneurship and sustainability focused much on terms such as ‘ecopreneurs’, ‘social entrepreneurs’ and ‘sustainable entrepreneurs’ [3, 27].

Even though six years have passed since the introduction of the UN 17, we still see that limited research exists to provide an overview of the present state of entrepreneurial engagement with relation to the goals [3]. One investigation of the topic is presented by Horne, et al. [4] who focus on the German context of the UN 17 for entrepreneurial levels and national performance. One can argue that Horne, et al. [4] make an important contribution to the inception of a new area of research that aims to have sweeping implications to improve the quality of life on the planet. Beyond their work, we could find no other major academic publication attempting to link the global phenomena of implementation of the UN 17 and entrepreneurial endeavors. The implication of this lack of information is that there is still much to learn about entrepreneurs’ engagement with the aims and how entrepreneurs contribute to improving life on Earth.

With further regards to the significance of the UN 17, Apostolopoulos, et al. [2] suggest that entrepreneurship can be in the vanguard of achieving the goals in two primary ways: 1) by delivering desired results as outlined in the goals and 2) by fueling economic growth based on the principles of the goals. Along these lines, there is evidence to show that sustainability has surpassed profit and that we have reached the point where economic growth is not necessarily the prime concern of entrepreneurs [28]. To this extent, the nature, image and meaning of entrepreneurship have also changed shape.

With this background in mind, we carry forward with exploratory qualitative research by explicitly examining the core values of entrepreneurs in relation to the UN 17. This is also a framework suggested by Horne, et al. [4] who employ the term *sustainability entrepreneurship* and who recommend the use of the UN 17 as a guideline for its very definition [4]. Below, we will discuss the methodology that we use to compare the present state of entrepreneurs’ core values with the normative state of the UN 17.

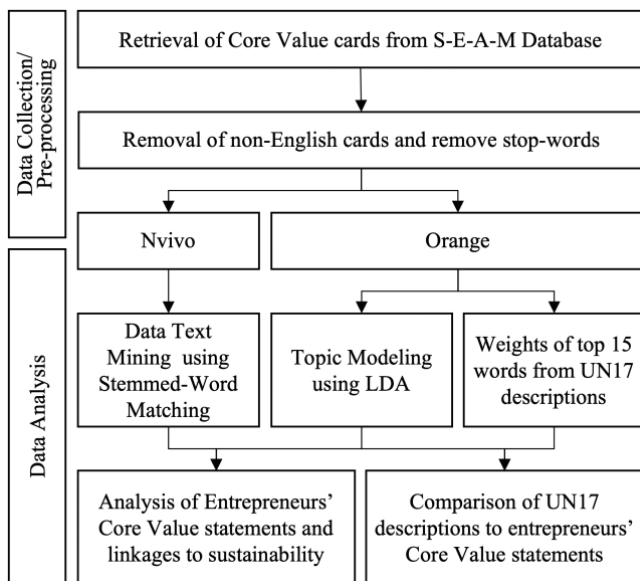
III. METHODOLOGY

To identify potential relationships of entrepreneurs’ core values to the aims of the UN 17, this exploratory research uses a qualitative approach based on text data mining. We initially selected 2,740 entrepreneurial projects from the S-E-A-M database where entrepreneurs defined and wrote down their core values. We then narrowed this down to 1,467 statements that matched the criteria of having coherent words in the English language. We chose the S-E-A-M database as it is the largest set of entrepreneurial activity data based on non-participant observation. The data are gathered via a project management tool used by entrepreneurs throughout the globe, whereby each input to the system is anonymized and subsequently stored in the database [8]. The S-E-A-M database is populated by entrepreneurs’ interaction with an

Entrepreneurship Management System (EMS) called Entrepreneurerdy, which entrepreneurs in various parts of the globe have been using since 2012. So far, more than 25,000 entrepreneurs have projects on the EMS and numerous incubators, educators, and business advisors have introduced the tool to entrepreneurs to organize business ideas, tasks, resources, forecasting and business modeling.

We used two different approaches to analyze the derived data. Firstly, we applied a Latent Dirichlet Allocation (LDA) model of Blei [29]. LDA is a thematic modeling technique [7] which we carried out using the opensource software Orange. Secondly, we used Text Data Mining with stemmed-word matching. As this helps researchers find meaning in large quantities of data [7], we conducted this part of the research with the qualitative data analysis software NVivo. Figure I below summarizes this approach:

FIGURE I. CORE VALUE CARDS COMPARED TO UN 17 WEIGHT



We chose LDA analysis as the core analytical technique because it helps to discover temporal trends if analyzing emerging fields [30], and researchers can visualize the data easier to help discover such trends [31]; LDA has the reputation as the leading model of probabilistic topic modelling on account of the range of extensions for modeling text corpora [30] and distributes words so they can be viewed under what Blei [29] calls the topic simplex. That is to say, the model creates structure based on the number of topics the researcher aims to create [29]. However, we do recognize that LDA has some limitations such as strings of connected words or titles emerging into separate topics upon output rather than remaining within their original context [29]. We emphasize that use of LDA is appropriate to explore data as a qualitative method and not as a statistical, quantitative method [32].

Our decision to use LDA as a method to structure the data using topic modeling is based on the notion that we could employ topic modeling to provide us with a set of meaningful categories known as ‘topics’ [33]. In addition to LDA, we used NVivo qualitative analysis software to visualize the data

on several levels. The process began by drawing data from Entrepreneurerdy and storing it in an Excel file containing the words from the value cards of 1,467 entrepreneurs in the English language. We then explored the data and exported the file into NVivo and created a query and reflected upon it. Then we visualized the data and produced a memo from the data, after which we worked our way through the process again to conduct our analysis.

Using NVivo’s Query feature, we chose stemmed-word matching, meaning we would include “talk” and “talking” as a match, following the Porter stemming algorithm [34]. We used a minimum length of three letters and opted to display the 50 most frequent words. Moreover, we imported the entire text of the United Nations 17 Sustainable Development Goals into Orange and ran a word cloud and a list to include the top 15 words, along with their weights.

IV. FINDINGS

After conducting a LDA in the Orange software, five topics of ten words each emerged. Since it is up to the researchers using LDA to decide the number of topics and there is no standard procedure to guide this process [32], we compared the LDA output of six topics to the output of five topics and decided that the output of the five topics provided the most appropriate data for further interpretation.

TABLE II. LDA TOPIC LISTS

Topic Number	The ten words appearing in each topic
1	people, business, believe, honest, treat, creation, get, serve, accessibility, others
2	good, customers, create, value, creativity, community, communities, health, loyalty, money
3	education, first, build, creating, creative, global, family, open, systems, performance
4	development, values, better, core, personal, improve, needs, easy, grow, helping
5	quality, integrity, innovation, service, honesty, customer, clients, respect, high, reliability

When looking at the 50 words above, as they emerged into five topics of ten words each, we began by looking for any overlaps and noting the following:

TABLE III. SIMILAR WORDS IN LDA THAT OVERLAP

Topic Numbers	Overlapping root words in respective order
1 & 5	Honest & honesty
1, 2, & 3	Creation, create/creativity & creating/creative
2 & 5	Customers & customer
2 & 4	Value & values

Although there is some overlap with a few words appearing in more than one topic, Jacobs and Tschötschel [35] postulate that it is not a concern because a meaning can vary between topics and it is the role of the analyst to interpret the meaning of a topic from how it relates to the other topics. After

reflecting upon the five topics, we chose the one word from each topic that we felt best represented the overall topic. When necessary, we changed the form of the word to a noun and assigned it as the title for its respective topic. Thusly we have the following titles for each topic number:

TABLE IV. TOPIC TITLES FOR LDA OUTPUT

Topic Number	Title
1	Service
2	Community
3	Creativity
4	Development
5	Quality

In this context, any overlapping, or stemmed words adopt a particular meaning as they relate to the topic title. Hence, it is a matter of providing the context with similar words that appear in more than one topic, which is outlined in Table V below.

TABLE V. STEMMED WORDS ACROSS DIFFERENT LDA TOPICS

<i>Similar words appearing in more than one topic</i>	<i>Topic Title</i>	<i>Topic Number</i>
Honest	Service	1
Honesty	Quality	5
Creation	Service	1
Create / creativity	Community	2
Creating / creative	Creativity	3
Customers	Community	2
Customer	Quality	5
Value	Community	2
Values	Development	4

On this basis, we can further differentiate the overlapping words by combining them with the derived topic titles. This is laid out in Table VI. It underlines that similar words can take on different meanings and contexts and provides a better overview of the core values of the 1,467 entrepreneurs who participated in the study. The topics community, creativity, development, quality and service represent five overarching themes. All remaining 45 core values from the LDA output fall into one of these themes, with nine core values per theme.

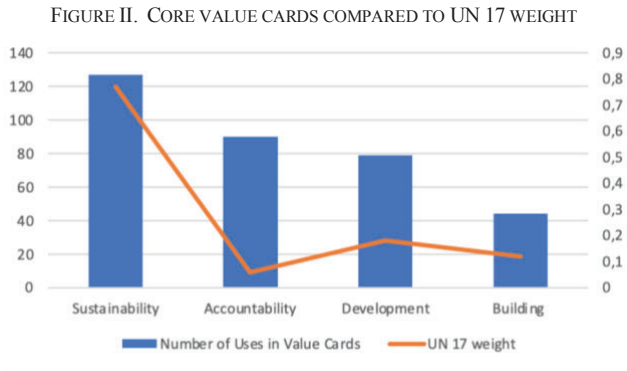
TABLE VI. OVERLAPPING WORDS IN THEIR LDA-ASSIGNED TOPIC

<i>Similar words appearing in more than one topic, along with their contexts in each topic</i>	<i>Topic Number</i>
Honest service	1
Honesty as a component of quality	5
Service creation	1

<i>Similar words appearing in more than one topic, along with their contexts in each topic</i>	<i>Topic Number</i>
Creativity for the community	2
Creativity as an overarching topic	3
Customers as part of the community	2
Quality for customers	5
Adding value to the community	2
Values that contribute development	4

Beyond the words ‘development’ ‘education’ and ‘health’ we have not seen a lot of direct connection between the LDA core values output and the UN 17. ‘Development’ takes the role as the title for topic number 4. ‘Education’ appears under topic number 3: Creativity. ‘Health’ appears under topic number 2: Community. The other two topics appear to be more generic business-related topics relating to service and quality, but without an explicit connection to the UN 17.

With LDA patterns in mind, we investigated further into the connections between entrepreneurs’ core values and the UN 17 by exploring the 50 most frequent words from the core values of entrepreneurs and comparing them with the top 15 words of the UN 17. Of the top 10 words in the value cards, only the word ‘sustainability’ and its variations matched the UN 17. It placed 8th and had a total usage of 127 times, with a weighted percentage of 0.98% Whereas for the UN 17, sustainable was the top word, with a weight of 0.65 and sustainability was 13th with a weight of 0.12. That makes for a combined weight of 0.77. The second word that matched between the value cards and the UN 17 was the word ‘accountability’ and all its variations. This word placed 20th in NVivo with a total count of 90 and a weighted percentage of 0.69%. For the UN 17, it placed 15th with a weight of 0.06. The third word with a match was the word ‘development’ and its variations, placing 25th in NVivo with 79 counts and a weighted percentage of 0.61%. For the UN 17, it placed fifth and had a weight of 0.18. The fourth and final word with a match was the word ‘building’ and its variations, placing 50th in NVivo with 44 counts and a weighted percentage of 0.34%. For the UN 17, it placed 8th and had a weight of 0.12.



In Figure II above, we see the relationships between each of these four core values and their UN 17 weights. The

strongest fit between the value cards and the UN 17 is with the core value of ‘sustainability’.

As a next step, we embark on two ways to evaluate the output further. Firstly, we take a look through the top 15 weighted words of the UN 17 from the Word Cloud output of Orange opensource software to point out the gaps. Secondly, we focus on the UN 17 and indicate key concepts missing from entrepreneurs’ core values. Starting with the top 15 weighted words of the UN 17, which we see the table below, only three of the words appear in LDA from the entrepreneurs’ value cards: access, build and development. These also appear in Table II for reference.

TABLE VII. TOP 15 WORDS IN THE UN 17 BY WEIGHT

Word	Weight
Sustainable	0.65
Promote	0.41
Inclusive	0.35
Ensure	0.29
Development	0.18
Access	0.12
Achieve	0.12
Build	0.12
Combat	0.12
End	0.12
Halt	0.12
Resilient	0.12
Sustainability	0.12
Use	0.12
Accountable	0.06

Comparing the UN 17 to entrepreneurs’ core values, we can identify gaps in several areas, at least when considering the absence of most of the words from Table VII from the entrepreneurs’ core value LDA output in Orange, which are compiled in Table II. To analyze this, we list the core concept of each UN 17 goal along with any LDA word from the core values that relates to it. This provides us Table VIII, where in the column to the right, there are three possible relationships: 1) explicit, 2) tangential and 3) absent, depending on how directly LDA words match each goal. If the words are the same, we state that the relationship is explicit. If there is a tenuous or partial connection, we state the relationship is tangential. If we found no matching connection, we state the relationship is absent.

Our findings indicate that education and health are explicitly incorporated into the core values of a significant number of entrepreneurs. It also appears there is a greater need to build awareness of the UN 17 amongst entrepreneurs, especially for specific goals that did not have even tangential mention. The aim is to help various stakeholders recognize the

gaps and seek improvement of the alignment of entrepreneurial activities and the UN 17.

TABLE VIII. EACH UN 17 SDG AS CONNECTED TO LDA CORE VALUES

Sustainable Development Goal	Latent Dirichlet Allocation	Relationship
1: Poverty alleviation	Money	Tangential
2: Food security	-	Absent
3: Health	Health	Explicit
4: Education	Education	Explicit
5: Gender equality	-	Absent
6: Clean water	Health	Tangential
7: Access to energy	-	Absent
8: Decent work	Money	Tangential
9: Infrastructure	Sustainable, Building	Tangential
10. Equality	-	Absent
11. Safety	Sustainability, Development, Build	Tangential
12. Sustainable consumption	Sustainability	Tangential
13. Combatting climate change	-	Absent
14. Ocean conservation	Sustainability	Tangential
15. Land conservation	Sustainability	Tangential
16. Peace and justice	Community, Sustainability, Accessibility	Tangential
17. Partnership	Sustainability	Tangential

When comparing the usage of LDA to the direct count of the value cards themselves, it is odd that the no form of the word ‘sustainability’ appears in the topic list of 50 words, despite a higher frequency in the NVivo output than ‘development,’ which does appear in the LDA collection.

V. CONCLUSIONS AND IMPLICATIONS

When revisiting our research question, *what overarching characteristics of entrepreneurs’ self-defined core values can be identified and how do they relate to the aims of the UN 17?* we find the following answers based on the findings of our research:

Where the overarching characteristics of entrepreneurs’ self-defined core values are concerned, from the LDA output, we found that five specific themes emerged: community, creativity, development, quality and service. Via these themes, we were able to provide context for the remaining words from the LDA output. This delivered an overview of the characteristics of the entrepreneurial core values, where we could also see some connections to the UN 17, in particular within the topic of development.

With further regards to how the entrepreneurs' core values relate to the goals of the UN 17, the most important finding from this study is that entrepreneurs to a large extent are not explicitly engaging in the UN 17. The second most important finding is that education and health appear to be the UN 17 goals that are the most represented amongst entrepreneurs' core values. Thirdly, it appears that the following UN 17 goals are not prioritized by entrepreneurs' core values: food security, gender equality, access to energy, equality, and combatting climate change.

Our aim has been to contribute to the emerging research field in the nexus of entrepreneurship and the UN 17. We begin by tying our current findings with those of Horne, et al. [4], who shows that in Germany, there is also a lack of entrepreneurs focusing on: 1) goal 5: gender equality and 2) goal 13: combatting climate change. These are two of the five goals that appear to be most neglected based on the results of this study as well.

In addition, to the extent that we consider the contribution of Rahdari, et al. [9], who conclude that in order to realize the UN 17, there are three groups of hierarchical, interrelated social agents that need to work together: 1) non-administrative social intrapreneurs, 2) managerial-level social entrepreneurs, and 3) social enterprises that consciously aim to achieve the goals, we can argue that there is a need to find ways for these groups to collaborate to fill the gap between the core values of entrepreneurs and the normative UN 17 vision. Moreover, we need to move beyond the term 'social entrepreneurship' to the point that all forms of entrepreneurship seek to align with the goals, rather than doing good being a niche form of entrepreneurship. Therefore, another implication from this research is the need to find ways to encourage all entrepreneurs to incorporate the UN 17, as well as to seek areas of collaboration with the aim of interlinking the goals, as suggested by Stafford-Smith, et al. [15]. This has implications for entrepreneurial training programs, universities, entrepreneurial funding schemes, investors, accelerators, incubators, as well as for the entrepreneurs themselves.

In terms of our contribution to the body of academic literature in the entrepreneurship field, we add to Apostolopoulos, et al. [2], Filser, et al. [3] and Horne, et al. [4]'s research by providing further examples how entrepreneurs engage in the UN 17, and to what extent. We have provided five topics into which entrepreneurs' core values fall. Of these, the topic of *development* is the overarching connection between entrepreneurs' core values and the UN 17. Through the remainder of the 2020's we believe that scholars will continue to investigate entrepreneurship and the UN 17 as we strive to achieve the goals by 2030, as outlined by the United Nations.

VI. LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

This research is limited by the level of interaction with the entrepreneurs themselves, and the lack of demographic information about the entrepreneurs. In addition, the data are anonymous and aggregated, so we cannot reach out to specific entrepreneurs to delve further into the research questions at hand. Regarding the methodology, we opted for the qualitative method of data text mining because we had access to the database from Entrepreneurdy's 1,467 value cards in English. Limitations include the restriction of using data only in the English language at the exclusion of other languages.

In addition, there are particular limitations of LDA. We would like to point out two weaknesses mentioned by Lee [36]: firstly, LDA is not based upon a robust probability theory; secondly, it is a question of human judgment to decide how many topics to include – not a question of statistics.

More research is needed to understand why several UN 17 goals appear to be missing from entrepreneurs' core values, how entrepreneurs perceive the UN 17, how they initially became aware of the UN 17, how entrepreneurs engage with other stakeholders to implement the UN 17, as well as how entrepreneurs attempt to keep balance among the various goals. The point of entrepreneurs' perception of the UN 17 is a salient issue of concern as Günzel-Jensen, et al. [37] show through their interviews with social entrepreneurs in Berlin, that some find the UN 17 difficult to implement and some view the United Nations as a political organization rather than a source of inspiration for sustainability guidelines. Of further note, this article does not include a review of the dozens of scholarly articles written in the past decade on the subject of entrepreneurial processes, which in 2012 Shane [38] urged scholars to investigate in order to gain insights into how entrepreneurs identify opportunities, formulate business ideas and evaluate them.

Regarding recommendations for future research, on a qualitative level, we believe that one approach would be to conduct interviews with entrepreneurs regarding their awareness of the UN 17 and their intentions of implementing them via their entrepreneurial endeavors. This would help to understand more about which specific UN 17 goals that entrepreneurs are addressing. Stakeholders such as policymakers and entrepreneurial training programs can then begin to fill in gaps in an effort to steer entrepreneurs to work toward solving goals where the need is greatest. Additionally, further research could explore the extent of entrepreneurial orientation of each UN 17 goal to learn how likely entrepreneurs will be to succeed by focusing on a particular UN 17 goal.

As for recommendations for research on a quantitative level, we suggest that one approach would be to consider the UN 17 as an intervention. In this way, further research could seek to quantify with statistical analysis on the extent to which entrepreneurs' values evolve before and after the intervention.

Since the implementation of the UN 17 dates to 2015, one possibility would be to examine the five years before and the five years after the implementation. Another study could examine areas where entrepreneurial training programs are implementing the UN 17 and study the impact thereof, including how entrepreneurial projects are implementing the UN 17. Yet another couple of approaches could be to research the relationships amongst stakeholders as they attempt to implement UN 17 as well as to conduct comparative analyses between two separate countries regarding their levels of success with the UN 17 implementation.

REFERENCES

- [1] United Nations. "THE 17 GOALS | Sustainable Development." <https://sdgs.un.org/goals> (accessed March 2021).
- [2] N. Apostolopoulos, H. Al-Dajani, D. Holt, P. Jones, and R. Newbery, "Entrepreneurship and the Sustainable Development Goals," 2018, pp. 1-7.
- [3] M. Filser, S. Kraus, N. Roig-Tierno, N. Kailer, and U. Fischer, "Entrepreneurship as Catalyst for Sustainable Development: Opening the Black Box," *Sustainability*, vol. 11, no. 16, 2019, doi: 10.3390/su11164503.
- [4] J. Horne, M. Recker, I. Michelfelder, J. Jay, and J. Kratzer, "Exploring entrepreneurship related to the sustainable development goals - mapping new venture activities with semi-automated content analysis," *Journal of Cleaner Production*, vol. 242, 2020, doi: 10.1016/j.jclepro.2019.118052.
- [5] A. Fayolle, F. Liñán, and J. A. Moriano, "Beyond entrepreneurial intentions: values and motivations in entrepreneurship," *International Entrepreneurship and Management Journal*, vol. 10, no. 4, pp. 679-689, 2014, doi: 10.1007/s11365-014-0306-7.
- [6] Y. Dahle, "The Design and Implementation of an Entrepreneurship Management System," PhD Dissertation - NTNU 2020.
- [7] J. R. Saura, P. Palos-Sanchez, and A. Grilo, "Detecting Indicators for Startup Business Success: Sentiment Analysis Using Text Data Mining," *Sustainability*, vol. 11, no. 3, 2019, doi: 10.3390/su11030917.
- [8] Y. Dahle, M. Supphellen, M. Steinert, and K. Reuther, "Extending the business model concept: A holistic and dynamic entrepreneurship activity system," Norwegian University of Science and Technology (NTNU), Unpublished article, 2021.
- [9] A. Rahdari, S. Sepasi, and M. Moradi, "Achieving sustainability through Schumpeterian social entrepreneurship: The role of social enterprises," *Journal of Cleaner Production*, vol. 137, pp. 347-360, 2016, doi: 10.1016/j.jclepro.2016.06.159.
- [10] United Nations. "WCED ... Sustainable Development Knowledge Platform." <https://sustainabledevelopment.un.org/milestones/wced> (accessed March, 2021).
- [11] F. O. f. S. D. ARE, "1987: Brundtland Report," 2021. [Online]. Available: <https://www.are.admin.ch/are/en/home/nachhaltige-entwicklung/internationale-zusammenarbeit/agenda-2030-fuer-nachhaltige-entwicklung/uno--meilensteine-zur-nachhaltigen-entwicklung/1987--brundtland-bericht.html>.
- [12] J. M. Lindsay, "Overlaps and Tradeoffs: Coordinating Policies for Sustainable Development in Asia and the Pacific," *The Journal of Developing Areas*, vol. 28, no. 1, pp. 21-30, 1993.
- [13] A. Vallega, "Regional level implementation of Chapter 17: the UNEP approach to the Mediterranean," *Ocean & Coastal Management*, vol. 29, no. 1-3, pp. 251-278, 1995.
- [14] F. Annan-Diab and C. Molinari, "Interdisciplinarity: Practical approach to advancing education for sustainability and for the Sustainable Development Goals," *The International Journal of Management Education*, vol. 15, no. 2, pp. 73-83, 2017, doi: 10.1016/j.ijme.2017.03.006.
- [15] M. Stafford-Smith *et al.*, "Integration: the key to implementing the Sustainable Development Goals," *Sustain Sci*, vol. 12, no. 6, pp. 911-919, 2017, doi: 10.1007/s11625-016-0383-3.
- [16] U. Brand, "Green Economy - the Next Oxymoron?," *GALA - Ecological Perspectives for Science and Society*, vol. 21, no. Number 1, pp. 28-32, 2012.
- [17] J. Collins and J. Porras, "Built to last: Successful habits of visionary companies. Random House Business, London," 1998.
- [18] M. Urde, "Core value-based corporate brand building," *European Journal of Marketing*, vol. 37, no. 7/8, pp. 1017-1040, 2003, doi: 10.1108/03090560310477645.
- [19] B. Cohen and M. I. Winn, "Market imperfections, opportunity and sustainable entrepreneurship," *Journal of Business Venturing*, vol. 22, no. 1, pp. 29-49, 2007, doi: 10.1016/j.jbusvent.2004.12.001.
- [20] M. A. Gagnon, *Sustainable Minded Entrepreneurs: Developing and Testing a Values-Based Framework*. Journal of Strategic Innovation and Sustainability, 2012. Journal of Strategic Innovation & Sustainability
- [21] K. Schaefer, P. D. Corner, and K. Kearins, "Social, Environmental and Sustainable Entrepreneurship Research," *Organization & Environment*, vol. 28, no. 4, pp. 394-413, 2015, doi: 10.1177/1086026615621111.
- [22] W. W. Kirkley, "Entrepreneurial behaviour: the role of values," *International Journal of Entrepreneurial Behavior & Research*, vol. 22, no. 3, pp. 290-328, 2016, doi: 10.1108/ijeb-02-2015-0042.
- [23] H. Peng, B. Li, C. Zhou, and B. M. Sadowski, "How Does the Appeal of Environmental Values Influence

- Sustainable Entrepreneurial Intention?," *Int J Environ Res Public Health*, vol. 18, no. 3, Jan 26 2021, doi: 10.3390/ijerph18031070.
- [24] S. Shane and S. Venkataraman, "The Promise of Entrepreneurship as a Field of Research," *The Academy of Management Review*, vol. 25, no. 1, pp. 217-226, January 2000. [Online]. Available: <http://www.jstor.org/stable/259271>.
- [25] A. C. Ardichvili, Richard; Ray, Sourav, "A theory of entrepreneurial opportunity identification and development.pdf," *Journal of Business Venturing*, vol. 18, pp. 105-123, 2003.
- [26] C. Seelos and J. Mair, "Social entrepreneurship: Creating new business models to serve the poor," *Business Horizons*, vol. 48, no. 3, pp. 241-246, 2005, doi: 10.1016/j.bushor.2004.11.006.
- [27] D. Fischer, R. Mauer, and M. Brettel, "Regulatory focus theory and sustainable entrepreneurship," *International Journal of Entrepreneurial Behavior & Research*, vol. 24, no. 2, pp. 408-428, 2018, doi: 10.1108/IJEBR-12-2015-0269.
- [28] A. M. Vuorio, K. Puumalainen, and K. Fellnhofer, "Drivers of entrepreneurial intentions in sustainable entrepreneurship," *International Journal of Entrepreneurial Behavior & Research*, vol. 24, no. 2, pp. 359-381, 2018, doi: 10.1108/ijeb-03-2016-0097.
- [29] D. M. N. Blei, Andrew.Y; Jordan, Michael J., "Latent Dirichlet Allocation," *Journal of Machine Learning Research*, vol. 3, pp. 993-1022, 2003.
- [30] A. Daud, J. Li, L. Zhou, and F. Muhammad, "Knowledge discovery through directed probabilistic topic models: a survey," *Frontiers of Computer Science in China*, vol. 4, no. 2, pp. 280-301, 2010, doi: 10.1007/s11704-009-0062-y.
- [31] T. L. Griffiths and M. Steyvers, "Finding scientific topics," *Proc Natl Acad Sci USA*, vol. 101 Suppl 1, pp. 5228-35, Apr 6 2004, doi: 10.1073/pnas.0307752101.
- [32] D. Maier *et al.*, "Applying LDA Topic Modeling in Communication Research: Toward a Valid and Reliable Methodology," *Communication Methods and Measures*, vol. 12, no. 2-3, pp. 93-118, 2018, doi: 10.1080/19312458.2018.1430754.
- [33] J. W. Mohr and P. Bogdanov, "Introduction—Topic models: What they are and why they matter," *Poetics*, vol. 41, no. 6, pp. 545-569, 2013, doi: 10.1016/j.poetic.2013.10.001.
- [34] J. Lang, F. Lin, J. Wang, and (Editors), "Lecture Notes in Artificial Intelligence 4092 - Knowledge Science, Engineering and Management," in *First International Conference, KSEM 2006*, Guilin, China, 2006.
- [35] T. Jacobs and R. Tschötschel, "Topic models meet discourse analysis: a quantitative tool for a qualitative approach," *International Journal of Social Research Methodology*, vol. 22, no. 5, pp. 469-485, 2019, doi: 10.1080/13645579.2019.1576317.
- [36] S. S. Lee, Jaeki; Kim, Yongin, "<An Empirical Comparison of Four Text Mining Methods.pdf>," *Journal of Computer Information Systems*, no. Fall 2010, 2010, doi: 10.1080/08874417.2010.11645444.
- [37] F. Günzel-Jensen, N. Siebold, A. Kroeger, and S. Korsgaard, "Do the United Nations' Sustainable Development Goals matter for social entrepreneurial ventures? A bottom-up perspective," *Journal of Business Venturing Insights*, vol. 13, 2020, doi: 10.1016/j.jbvi.2020.e00162.
- [38] S. Shane, "Reflections on the 2010 AMR Decade Award: Delivering on the Promise of Entrepreneurship As a Field of Research," *Academy of Management Review*, vol. 37, no. 1, pp. 10-20, 2012, doi: 10.5465/amr.2011.0078.