

# ANTHROPOCENE? YES, BUT STRATIFIED – MEASURING EXISTING SOCIETIES WITH CIVILIZATION LEVEL INDEX

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## ABSTRACT

This paper extends the authors previous work discussed at 2014 ISSS Conference, “Civilization Level Index (CLI): A Systemic Instrument for Measuring the Level of Development, or How Human Are We Actually Becoming.” Since the theme of this year’s conference is Anthropocene, it is relevant that we recognize as clear as possible what humanity exactly is and how human we are at current time. The biological definition of humanity has been clear even it starts being challenged by frontier researches in artificial intelligence and genome engineering. But the consensus of sociological and anthropological definition of humanity in this planet has yet to be formed at the global level. Civilization Level Index is a candidate tool for clarifying this issue. However, a full scale implementation of CLI measurement is a huge project requiring institutional support that is yet to be found, the author as an independent researcher can only initialize the first step, i.e. to use limited data available from the internet to present a small subset of CLI here for discussion and for attracting interests of cooperation for further work.

*Keywords: Civilization Level Index, Measurement, Multi-Layer Self-Organization, Stratified Anthropocene, country development.*

## BACKGROUND

It is a consensus now that GNP or GDP is not a good indicator for a country’s development. GNH, Gross National Happiness, defined and promoted by the King of Bhutan in 1972, expands our attention from economic production to include sustainability, cultural values, environment, and good governance. It is an improvement over GNP/GDP for sure, but is still not satisfying from point of view of a system scientist. GPI, Genuine Progress Indicator, is another candidate replacing GNP/GDP, emphasizing resource depletion, carbon footprints etc. Med Jones proposed a 7-dimension index function to define the “second-generation GNH,” including wellness of economic, environmental, physical, mental, workplace, social and political.

Nevertheless, the author suggested that the usefulness and helpfulness of all of the above are limited to only the elite group of a society, i.e., the kings, the presidents, ministers and the official experts. Instead, in order for such an index to serve as a true change agent, i.e. a self-organization process agent, it needs to be available to grass root activists, younger generation, college students, or even teenagers, who have some basic education in system thinking. It will be at the very root of a society that such knowledge of such index would become effectively influencing people’s daily behaviors.

Therefore, the author outlines a systemic index that is understandable, useable for the common public, younger generation, college and high school students, as a tool to measure not only the immediate society they live in, but also to compare different societies, cultures, and yes, civilizations that were divided by geography, race, language, or nationalities in past times. This work is compatible with the work of ISSS community, in terms of facilitating us to understand how well we're doing as human or how are we actually becoming more human.

Instead of previous efforts in finding better alternatives of GNP/GDP, of trying to come up a "laundry list" as holistic as possible, the author uses a theory of multi-layer self-organization as guidance, while incorporating elements from previous efforts, to design this systemic index. The idea is that it needs to be down-to-earthly simple, so that a teenager can use it to view his immediate society, but in the same time as comprehensive as possible in terms of the alignment to the mainstream civilization of this planet.

### **CIVILIZATION LEVEL INDEX**

The initial proposal of CLI consists of four dimensions with a number of measurements in each dimension. (*Quoting from the previous working paper*):

#### *I. Dimensions of Achievements*

1. *Music*
2. *Art*
3. *Literature*
4. *Drama*
5. *Architecture*
6. *Mathematics*
7. *Philosophy*
8. *Religion*
9. *Science*
10. *Technology & Engineering*
11. *Moral standard level in average member*
12. *Philanthropic establishment & humane concerns (level of violence observable)*

#### *II. Dimensions of Individual Living Condition*

1. *Average life span of average individual*
2. *How clean is an average individual*
3. *Healthcare indicators*
4. *Human rights indicators*
5. *Freedom indicators*

#### *III. Dimensions of Individual Life Capacity*

1. *Experiential Opportunities: Travel*
2. *Language: Cognitive Resolution*
3. *Language: Available Knowledge*
4. *Education indicators: Types & Levels*

5. *Thinking/logic/cognition capacity*

IV. *Dimensions of Group Capacity/Organizational Efficiency*

1. *History (Group Memory): Time, Area, Quality*

2. *How People Make Decisions*

3. *Communication Efficiency*

4. *Organizational Efficiency*

5. *Behavioral pattern/Self-organizing Code in groups*

The initial idea is to design a questionnaire, aiming to establish a ratio scale if possible, or an interval scale, or at least an ordinal scale, for each of the above categories. Similar to Myers-Briggs Personality Type Indicator, which has improved the public understanding of human individuals and their interactions, the author hopes that CLI would improve the public understanding of human civilizations, and would lead to more rational approaches to deal with the differences among civilizations, more fruitful interactions in building a better planet.

## PRELIMINARY RESULTS

Efforts invested in trying to materialize the above framework of CLI proved to be not easy, especially without institutional support. Therefore only a small sample of these measurements can be presented here for discussion and partnership invitation.

The initial proposal of CLI consists of four dimensions with a number of measurements in each dimension. As each measurement is a subject of design, debate and consensus forming, there is a long way to go to eventually achieve the full measure of the CLI in all four dimension. Here I shall present four preliminary rankings, one in each dimension, using limited data dug out from the internet. The point is to provide a clue, or a direction, of what can be done if a full-scale study were carried out. These four rankings are:

- 1- Civilizational Achievement
- 2- Living Condition/Standard
- 3- Individual Life Capacity
- 4- Group Capacity/Organizational Effectiveness and Efficiency

**Civilizational Achievement:** The initial proposed 12 measurements in this dimension calls for a large scale project of data collection and data process. Here I highly simplified the idea of this dimension to the counting of two representative numbers – Number of Nobel Prizes and Number of Patent Granted. Also, instead of traditionally using country as unit of comparison, I've included a different perspective of using “native language” as unit of measurement – this reminds us an unanswered question in civilization studies – what exactly should be the boundaries of a civilization? I propose to use language because it is a different perspective beyond geography, time, and political governments. People speaking the same language understand and network with each other easier.

<i>Language</i>	<i># of Prize</i>	<i>Population</i>	<i>per million</i>
Swedish	30	9,785,000	306.59%
Norwegian	13	5,176,998	251.11%
Danish	13	5,668,743	229.33%
Lithuanian	4	2,904,391	137.72%
German	123	90,402,112	136.06%
Hungarian	13	9,900,000	131.31%
Dutch	19	16,912,500	112.34%
French	68	66,186,000	102.74%
English	491	631,304,322	77.78%
Finnish	4	5,478,002	73.02%
Croatian	3	4,267,558	70.30%
Czech	5	10,546,000	47.41%
Belarusian	4	9,481,000	42.19%
Polish	16	38,540,000	41.52%
Portuguese	4	10,515,000	38.04%
Italian	20	61,080,000	32.74%
Romanian	4	19,942,642	20.06%
Russian	28	146,532,100	19.11%
Japanese	22	126,865,000	17.34%
Ukrainian	5	42,836,922	11.67%
MIX	114	1,649,549,840	6.91%
Spanish	23	361,083,017	6.37%
Arabic	6	119,826,267	5.01%
Chinese	8	1,394,601,562	0.57%

Table I: Number of Nobel Prizes per million people (Source: edited from Wikipedia.org)

To compare, here is a similar table listed by countries.

<i>Country</i>	<i># of Prize</i>	<i>Population</i>	<i>per million</i>
Switzerland	26	8,256,000	314.92%
Sweden	30	9,785,000	306.59%
Norway	13	5,176,998	251.11%
Austria	21	8,602,112	244.13%
Denmark	13	5,668,743	229.33%
Ireland	10	4,609,600	216.94%
United Kingdom	115	64,800,000	177.47%
Israel	12	8,358,100	143.57%
Lithuania	4	2,904,391	137.72%
Hungary	13	9,900,000	131.31%
Germany	102	81,800,000	124.69%
Netherlands	19	16,912,500	112.34%
United States	353	321,477,000	109.81%
France	67	66,186,000	101.23%

Belgium	11	11,245,629	97.82%
Finland	4	5,478,002	73.02%
Croatia	3	4,267,558	70.30%
New Zealand	3	4,602,710	65.18%
Canada	23	36,670,000	62.72%
Australia	13	23,842,500	54.52%
Czech Republic	5	10,546,000	47.41%
Belarus	4	9,481,000	42.19%
Poland	16	38,540,000	41.52%
Portugal	4	10,515,000	38.04%
Italy	20	61,080,000	32.74%
Romania	4	19,942,642	20.06%
South Africa	11	54,845,000	20.06%
Russia	28	146,532,100	19.11%
Japan	22	126,865,000	17.34%
Spain	7	46,603,000	15.02%
Ukraine	5	42,836,922	11.67%
Argentina	5	43,132,000	11.59%
Egypt	4	89,187,800	4.48%
Mexico	3	122,390,000	2.45%
India	9	1,274,640,000	0.71%
China	7	1,371,140,000	0.51%

Table II: Number of Nobel Prizes by country (Source: edited from Wikipedia.org, due to space limit, countries won 1 or 2 prizes are not included here.)

While the number of Nobel Prizes may signify how well a measured unit is honored by the world, the number of patents applied may signify how active a measured unit is contributing to technological advancement to benefit the society. Here is top ten countries by their number of patent applications per million population:

<i>Rank</i>	<i>Country</i>	<i>Patent applications per million population</i>
1	South Korea	2,962
2	Japan	2,250
3	Switzerland	1,013
4	Germany	902
5	United States	856
6	Finland	665
7	Denmark	539
8	Austria	489
9	Netherlands	444
10	China	396

Table III: Top ten patent applications per million people by country. (Source: Wikipedia.org)

**Living Condition/Standard:** In this dimension I use the widely available data Life Expectancy per country to simply review the fact that different individual lives can live differently in different civilizations. This is not a simple distinction of rich and poor, but a reminder that lives can be lived differently under different civilizational arrangements. Since this dataset is available easily online, here is a simplified “top-ten-longer-life” (average 84-75 years) country list:

<i>Countries</i>	<i>Overall life expectancy</i>
Japan	84
Andorra, Australia, Switzerland, Italy, Singapore, San Marino	83
Monaco, France, Spain, Iceland, Canada, Cyprus, Israel, Luxembourg, New Zealand, Norway, Sweden	82
Republic of Korea, Finland, Portugal, Ireland, Malta, Netherlands, United Kingdom, Austria, Germany, Greece	81
Belgium, Chile, Slovenia, Denmark, Lebanon	80
Colombia, Nauru, Costa Rica, Cuba, United States, Qatar	79
Barbados, Czech Republic, Croatia, Kuwait	78
Poland, Uruguay, Estonia, Bosnia and Herzegovina, Suriname, Panama, Peru, Bahrain, Brunei, Darussalam, Dominican Republic, Maldives	77
Slovakia, Venezuela, Vietnam, Argentina, Mexico, United Arab Emirates, Oman, Saudi Arabia, Tunisia, Cook Islands, Montenegro, Macedonia,	76
Hungary, Saint Lucia, Thailand, Ecuador, Bahamas, Belize, Paraguay, Turkey, Sri Lanka, China, Taiwan, Antigua and Barbuda, Libya, Dominica, Serbia	75

Table IV: Countries in which people live longer (Source: wikipedia.org, WHO 2013)

**Individual Life Capacity:** The purpose of this dimension is to measure the potentials or available opportunities of individuals living in a specific civilization. One example will be the amount of the available knowledge in a specific language. Before having to learn a foreign language and tap into translations and interpretations from a different culture/civilization, what is the richness of knowledge and experiences that one can get through his/her native language? Thus I use the number of entries in Wikipedia.org in different languages as an indicator of the richness of knowledge available in that language. It is the easiest indicator, not necessarily the best one. Again my purpose is to initialize discussion, not concluding. I use “Knowledge Contribution Index” to name this measurement, meaning the number of entries contributed to Wikipedia.org per every 1000 native speakers of a language.

<i>Rank</i>	<i>Language</i>	<i>Native speakers</i>	<i># of Wiki entries</i>	<i>KCI</i>
1	Swedish	9,200,000	1,971,407	214.28
2	Dutch	22,000,000	1,829,405	83.15
3	Polish	40,000,000	1,124,350	28.11
4	German	95,000,000	1,837,247	19.34
5	Italian	65,000,000	1,212,710	18.66
6	Vietnamese	75,000,000	1,137,511	15.17
7	French	110,000,000	1,645,011	14.95
8	English	400,000,000	4,924,360	12.31
9	Indonesian	43,000,000	362,628	8.43
10	Russian	150,000,000	1,239,719	8.26
11	Japanese	125,000,000	975,276	7.80
12	Persian	60,000,000	461,244	7.69
13	Thai	20,000,000	96,258	4.81
14	Korean	77,000,000	321,780	4.18
15	Portuguese	220,000,000	881,443	4.01
16	Turkish	63,000,000	249,370	3.96
17	Spanish	470,000,000	1,187,988	2.53
18	Tagalog	28,000,000	63,174	2.26
19	Urdu	65,000,000	73,807	1.14
20	Arabic	340,000,000	378,224	1.11
21	Burmese	33,000,000	31,126	0.94
22	Chinese	1,200,000,000	832,258	0.69
23	Hindi	180,000,000	100,711	0.56
24	Amharic	29,000,000	12,955	0.45
25	Bengali	280,000,000	36,620	0.13

Table V: Knowledge Contribution Index by language (Data mining from wikipedia.org)

**Group Capacity/Organizational Effectiveness and Efficiency:** This dimension is the most difficult one to get measurable data. For the starting point I use GDP per Capita as the first step trying to find out hint about how different ways of organization lead to different levels of effectiveness and efficiency. Since no individual can contribute to GDP alone – it has to be a collective process in some organized way, GDP per Capita to some extent illustrates how well people working together, perhaps except the oil-rich countries where money can be generated by simply drilling holes on the ground.

The author has defined elsewhere a measuring instrument named Organizational Friction Coefficient (OFC) (Hu, 2007) which can facilitate pushing on this dimension of measurement, but in this paper I shall only use GDP per Capita as initial indicator.

<i>Rank</i>	<i>Country</i>	<i>International \$</i>	<i>Year</i>
1	Qatar	136,727	2013
2	Luxembourg	91,048	2013
3	Kuwait	83,840	2012
4	Singapore	78,763	2013
5	Brunei	71,777	2013
6	Norway	64,406	2013
7	United Arab Emirates	59,845	2012
8	Switzerland	56,950	2013
9	Saudi Arabia	53,644	2013
10	United States	53,042	2013
11	Netherlands	46,162	2013
12	Ireland	45,684	2013
13	Austria	45,079	2013
14	Oman	45,334	2012
15	Sweden	44,658	2013
16	Germany	43,884	2013
17	Bahrain	43,851	2013
18	Denmark	43,782	2013
19	Australia	43,202	2013
20	Canada	42,753	2013
21	Iceland	41,859	2013
22	Belgium	41,575	2013
23	Finland	39,740	2013
24	United Kingdom	38,259	2013
25	France	37,532	2013
26	Japan	36,223	2013
27	Italy	35,281	2013
28	New Zealand	34,732	2013
29	Equatorial Guinea	33,768	2013
30	Spain	33,094	2013

Table VI: GDP per Capita of top 30 countries (Source: Wikipedia.org, World Bank)

How do we weigh and combine different measures mentioned above, and more, to form a final Civilization Level Index is still beyond the scope of this paper given the space and resource limitations at this time. Preliminary explanation about why different countries ended up with different CLI scores can be explained with a theoretical framework of Multi-Layer Self-Organization presented by the author elsewhere. It is author's hope that the above preliminary presentation of the data can stimulate enough interests to push this project further.



## DISCUSSION

There are at least three indications or possible consequences of this line of research. The first is to take a higher resolution picture of the current human civilization, to acknowledge the different degrees of civilization of different groups of human beings in different locations on this planet. This is not the same concept of “development” as traditionally used in talking about “developed versus developing countries”. I would like to emphasize that not all traditional cultures are “created equal” in front of opportunity of development – some are healthier and can civilize themselves earlier, some are less healthier and can be trapped by their own culture, so lag behind on CLI.

The second is to provide distinctions, in terms of human civilizational processes, among mainstream leaders, followers, and refusers – those who perceive mainstream leaders as enemies. Such distinctions highlight the different dynamics of development: (1) trial-and-error pioneering, (2) copycat learning, and (3) irrational denial of the progresses. This provides good explanation for a number of puzzling phenomena in the field of country development and modern history.

The third is a potential to provide a unified framework to reconcile the current debate between the two perspectives about Anthropocene (i.e. Biermann, 2014 versus Malm & Hornborg, 2014). A stratified concept of Anthropocene can be adopted, classifying the mainstream versus the peripheral civilizations, on a staircase of CLI. Similar to an irony quote “all human are created equal, but some are more equal than others,” I would like to propose an observation that not all countries or cultures are created equal, because some are more civilized than others. I am aware that this perspective will set the house on fire for some “political-correctness-lovers”, but will hopefully also ignite a debate to question the dogma of so-called “Political Correctness”, which I’m curious to explore together with the audience. No, I am not trying to restore “Western Centricism” or “Eurocentricism” (e.g. per Zedler, Haushofer, Amin, etc.) nor trying to legitimize colonialism. Those were different concepts in history already. It is my belief that Civilization Level Index could serve as a rational cognitive tool to facilitate the solutions for a number of pending questions today, including improving the healthiness of the relationships between human and the planet as well as of the relationships among different humans.

*(As this paper is submitted to the Curating Emergence for Thrivability SIG of ISSS 2015 in the format of “discussion seed” for the participants attending the session, it is therefore not “final” at this moment. Please do not quote without consulting the author first.)*

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