

## A NEW APPROACH TO EVALUATE THE INDEX OF ISO 9001 STANDARD

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**Abstract:** *The purpose of this study was to offer a new approach to evaluate the index of ISO 9001 standard, as so far countries are listed for the ISO 9001 standard based only on the number of ISO 9001 certificates issued for each country, and this perception does not correspond to reality, because some countries that are listed per alphabetic order on top, doesn't enjoy the property of having a better ranking when it comes to rank countries per number of ISO 9001 certificates issues, or when it comes to rank countries about their weight on the issue. On the other side, listing countries simply by the number of ISO 9001 certificates issued, doesn't reflect the real weight of countries on the issue, because this rank should be adjusted with the number of businesses of countries taken into consideration, better understanding of ranking models used. A new approach to ranking countries about this issue is needed, reflecting the issue of taking into consideration the number of ISO 9001 certificates issued in a country per number of businesses in that country, as a better way of evaluating the index of ISO 9001 standard. The methodology/method used to conduct this study were (1) the data collection on the number of ISO 9001 certificates issued per country, (2) the data collection on the number of businesses in each country, (3) the division of the number of ISO 9001 certificates issued with the number of businesses, (4) construction of a new ranking list of countries based on the ISO 9001 standard index, (5) inversing the list to give the right value/rank of countries, and graphics draw of the new approach for better visualization and understanding the issue. The main conclusion of this study is that a new approach is needed to evaluate the index of ISO 9001 standard as a more appropriate indicator for listing/ranking countries and this serves all those interested in the academic field, public administration, and the reports and studies of the national and international level of organizations, to create a better perception of doing business in general and on the aspects of quality management in particular, especially when it comes to making the most appropriate comparisons between countries on these issues, weighting them numerically and graphically, as well as helps on understanding, and for a better approaching of socio and economic issues related to ISO standards and continuous improvement of people and organizations.*

**Keywords:** ISO 9001 index, International Standards Organization, ISO standards, ISO 9001 standard, quality, quality management, quality culture, competitive advantage, socio-economic development, the weighting of the index.

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### Introduction

There is an increasing interest in quality, quality culture, and ISO standards currently, especially for ISO 9001.

Quality is related to the characteristics of products and services.

Quality culture serves as a guide for continuous improvement, belonging to all members of the organization(s), forming a connection of internal clients and suppliers too.

The core value of quality culture is embodied in ISO standards, for which there is an increasing interest worldwide, aiming to achieve competitive advantage.

Quality, quality culture, quality culture management, and ISO standards, are (Ceko, 2021) becoming an essential part of business models achieving competitive advantage, under the new reality and new normality.

## **1. Literature review**

### **1.1 Quality and culture of quality**

The core definition of quality, as a group of values that helps (Ceko, 2021) on how improvement is done on the daily practice of works and outputs related, a group of applications taken for granted that forms the philosophy of organizations or working groups, has been identified by several authors, which (Ceko, 2021) in paraphrasing that has defined quality culture as a social requirement intend and push people to stay all together.

Products and services features and improvements of them thrive (Ceko. 2021, Vlăsceanu, Grünberg, Pârlea. 2007). This culture has been shown in some areas: (1) individual improvement, (2) tolerating and respecting others, (3) entrepreneurship, (4) having capacities in a proven way, etc.

A culture of quality is a group of common, respected, and integrally formed approaches to features of products and services, identified in the culture of organizations and systems of management (Ceko, 2021).

Quality culture (QC), and quality management culture (QMC) help achieve competitive advantage as important patterns of doing business. They are related to the social responsibility of corporate (SCR), sustainable sophisticated business, ethics of business, organizational human diversity, international cross-cultural management, national organizational culture, international organizational culture, sectors of the economy in a country and their links and relations with culture, etc. (Ceko, 2021).

ISO standards, their importance, use of them in practice, etc. have been described in several publications (Ceko, 2021, Harrington & Mathers, 1997).

Main ISO's required then most currently are:

- 9000 Family – Quality management system
- 10244: 2010 – Management of documents
- 14000 – Environment protection
- 20000 – Information technology
- 22301 : 2019 - BCMS
- 27000 – ISM
- 45000 – HSW
- 50000 – Efficiency of energy
- 56002: 2019 - IMS
- Etc.

### **1.2 Benefits of using ISO standards**

According to the Organization of Standards, there are three main types of gains of using standards (ISO, 2014, ANSI 2014):

#### 1: Internal operations improvement

ISO standards can be used to improve procedures and processes internally in a company, for example by waste management and reducing, time reduction to handle unique procedures and processes, procurement procedures and costs reduction, as well as increasing efficiency and effectivity (ANSI. 2014), contributing between 0.15 % to 5 % on revenues of sales annually.

#### 2: Operational innovation and scaleup

ISO standards have been used as the basis for innovative processes in business operations, helping business units to improve supplier selection procedures and expand their network, introducing new manufacturing lines (Musa. 2014), etc, which at the end of the day helps on risk management on introducing innovative products/services nationally and/or internationally (ANSI. 2014).

### 3: New markets creation or entering there (ANSI. 2014)

Creating markets is a new pattern of ISO standards too, contributing to some organizations about 33% of their annual gross revenue, which makes leaders in their sector over a certain period (ISO. 2014).

## **2. ISO standards listing literature**

Currently, literature on ISO standards listing is not developed, and there is only a worldwide report published by the International Standards Organization, ISO, called: The ISO survey of management system standard certifications (ISO. 2022).

Certification with ISO standards is a system under which, at the end of the day, if a subject deserves it, the certificate, the document which has been delivered by a certification firm/body, has been recognized upon the company demonstrates their procedures and processes are conform to standards.

As per the ISO, the information of the 2022 survey was:

- The number of valid certificates per country as of the end of 2020. (A valid certificate has been issued by a certification body accredited by IAF MLA members during the year of the survey or in the two years preceding it that is still valid on 31 December of the year of the study).
- Sectors' number/country is covered by the certificates according to the 39 EA sectors classification.
- The number of sites per country is covered by their certificates (A site is a permanent location where an organization carries out work or service).

This report contains:

- An overview table showing the total number of valid certificates and the total number of sites for each standard (the site can be considered a stable location where products/services of the business entities can be delivered).
- Detailed results for each standard covered by the survey with the data by country for the number of certificates and the number of sites and the total number of sectors. The number of sectors per country is in a separate file called "Sectors by country". A survey of ISO is an annual report published for the valid certificates issued globally (ISO. 2021).

As it was declared in the ISO publication, the ISO Survey is not a database. The providers of the data are the certification bodies accredited by IAF members and they participate voluntarily.

Saying that there is no listing of countries based on any logic, parameters, or index.

## **3. Methodology**

Specifically, while acknowledging the importance of ISO certificates issued worldwide and per each region and country, including ISO 9001 certificates, the prior and current publications on this issue just list countries in alphabetic order and do not explain how to list countries for ISO 9001 standards certificates based on a logical perspective, for example, based on a parameter, or based on an index, while if the parameter or index exists, then it will be easier to list countries for this issue based on logic, and in a parameter, or an index, to gain more insights about the quality, quality management and quality culture in the world, regions, and countries, making easy comparisons and making easier understanding business climate, and helping for a more qualitative and quantitative academic research and reports on the issue, offering an exploratory approach, appropriate for building an in-depth understanding of a phenomenon and allowing closer investigation of theoretical and practical constructs (Ceko. 2021).

The methodology/method used to conduct this study were (1) the data collection on the number of ISO 9001 certificates issued per country, (2) the data collection on the number of businesses in each country, (3) the division of the number of ISO 9001 certificates issued with the number of businesses, (4) construction of a new ranking list of countries based on the ISO 9001 standard index, (5) inverting the list to give the right value/rank of countries, and graphics draw of the new approach for better visualization and understanding the issue.

#### 4. Case selection

The case was selected based on three main criteria: a theoretical approach, suitability of relations, and practical positive impacts on relations between (Ceko. 2021) ISO 9001 standards certificates issued in a country and the number of businesses in a country.

##### 4.1 Collection of data

- Data for ISO 9001 standard certificate issued collected from ISO Report 2022.
- Data for the number of businesses per country gathered from HitHorizons (visited during June 2022).

##### 4.2 Data analysis

- Data about ISO 9001 standard certificates issued, collected from ISO Report 2022, was divided by the number of businesses per country, gathered from HitHorizons (visited during June 2022). The numbers which resulted from this procedure formed the list of countries based on the ISO 9001 index.

In the table below, at ISO 9001 row, (1) a list of countries for ISO 9001 certificates issues until 2020 based on alphabetic order is given, taken from ISO, (2) at the number of active companies row in alphabetic order, the number of businesses per country is given, taken from HitHorizon, and (3) at ISO 9001 index, countries are listed under an alphabetic order for the index generated by dividing the number of ISO 9001 certificates issued with the number of active businesses per country (which is the new index this paper presents).

Table 1. List of countries for ISO 9001 certificates issued in alphabetic order (taken from ISO), number of businesses per country (taken from HitHorizon), and ISO 9001 index per country (136 countries worldwide, prepared by the author of this paper)

No	Country	ISO 9001	No of companies	ISO 9001 Index
1.	Albania	378	166.614	0.0023
2.	Algeria	477	2.200.000	0.0002
3.	Angola	100	55.000	0.0018
4.	Argentina	6128	856.000	0.0072
5.	Armenia	37	74.709	0.0005
6.	Australia	7971	2.402.254	0.0033
7.	Austria	3562	358.400	0.0099
8.	Azerbaijan	259	2.963	0.0874
9.	Bahrain	463	92.000	0.0050
10.	Bangladesh	495	650.000	0.00076
11.	Barbados	10	18.000	0.00055
12.	Belarus	6890	162.788	0.042
13.	Belgium	2887	1.032.984	0.0028
14.	Belize	2	7.975	0.00025
15.	Benin	40	4.500	0.0089
16.	Bhutan	18	28.000	0.00064
17.	B&H	1145	82.500	0.0139
18.	Botswana	9	26.256	0.00034
19.	Brazil	17503	6.400.000	0.0027
20.	Brunei	77	6.047	0.0127
21.	Bulgaria	6069	803.290	0.0075
22.	Burkina Faso	29	80.000	0.00036
23.	Cambodia	78	513.759	0.00015
24.	Cameroon	70	209.872	0.00033

Table 1 (cont.). List of countries for ISO 9001 certificates issued in alphabetic order (taken from ISO), number of businesses per country (taken from HitHorizon), and ISO 9001 index per country (136 countries worldwide, prepared by the author of this paper)

No	Country	ISO 9001	No of companies	ISO 9001 Index
25.	Canada	4707	1.230.000	0.0038
26.	Chad	6	1.200	0.005
27.	Chile	2897	158.583	0.0182
28.	China	324621	150.000.000	0.0021
29.	Colombia	10147	2.700.000	0.00375
30.	Costa Rica	345	130.000	0.00265
31.	Croatia	2531	307.413	0.0082
32.	Cuba	208	9.477	0.022
33.	Cyprus	736	248.416	0.00296
34.	Czech Rep.	10085	807.981	0.0125
35.	Denmark	2181	513.934	0.0042
36.	Djibouti	4	548	0.0072
37.	Dominic. Rep	190	80.000	0.0024
38.	Egypt	1839	3.900.000	0.00047
39.	El Salvador	185	161.934	0.00114
40.	Estonia	947	240.147	0.0039
41.	Ethiopia	43	55.000	0.00078
42.	Finland	2861	644.433	0.00444
43.	France	21880	6.084.269	0.0036
44.	Gambia	1	115.000	0.000087
45.	Georgia	197	23.162	0.0085
46.	Germany	49349	3.470.000	0.0142
47.	Ghana	110	92.000	0.0012
48.	Greece	6822	356.082	0.0192
49.	Guatemala	211	18.000	0.0117
50.	Guinea	10	3192	0.0031
51.	Haiti	2	60.000	0.00033
52.	Honduras	161	160.000	0.001
53.	Hungary	7030	1.300.000	0.0054
54.	Iceland	105	114.636	0.00091
55.	India	32236	63.000.000	0.0051
56.	Indonesia	6861	64.000.000	0.00011
57.	Iran	1523	90.000	0.017
58.	Iraq	98	27.747	0.0035
59.	Ireland	2338	291.365	0.0080
60.	Israel	8250	593.000	0.0139
61.	Italy	91493	6.000.000	0.0152
62.	Jamaica	36	12.809	0.0028
63.	Japan	32287	5.300.000	0.0061
64.	Jordan	575	363.000	0.0016
65.	Kazakhstan	447	470.559	0.00095
66.	Kenya	456	3.400.000	0.000134
67.	Korea Rep	11982	6.013.000	0.00199
68.	Kuwait	584	30.000	0.01947
69.	Kyrgyzstan	8	2.640	0.0030
70.	Laos	47	133.997	0.00035
71.	Latvia	868	141.812	0.0061
72.	Lebanon	529	225.000	0.00235
73.	Lesotho	2	109.268	0.00002
74.	Liberia	8	1.700	0.0047
75.	Lithuania	1254	267.000	0.0047
76.	Luxembourg	157	135.245	0.00116
77.	N R Macedonia	629	72.922	0.0086
78.	Malawi	33	20.000	0.00165

Table 1 (cont.). List of countries for ISO 9001 certificates issued in alphabetic order (taken from ISO), number of businesses per country (taken from HitHorizon), and ISO 9001 index per country (136 countries worldwide, prepared by the author of this paper)

No	Country	ISO 9001	No of companies	ISO 9001 Index
79.	Malaysia	9533	1.226.494	0.00777
80.	Maldives	11	8.000	0.00138
81.	Malta	216	53.348	0.0040
82.	Mauritius	178	124.000	0.00144
83.	Mexico	7002	5.000.000	0.0014
84.	Moldova	88	123.246	0.00071
85.	Montenegro	220	35.281	0.0062
86.	Morocco	1099	84.000	0.0131
87.	Mozambique	38	4.699	0.0081
88.	Myanmar	215	59.297	0.00363
89.	Namibia	29	40.000	0.00073
90.	Nepal	90	922.445	0.000098
91.	Netherlands	8358	1.900.000	0.0044
92.	New Zealand	1034	557.680	0.0019
93.	Niger	8	2.150	0.00372
94.	Nigeria	368	46.000.000	0.000008
95.	Norway	2578	672.140	0.00384
96.	Oman	587	62.335	0.0093
97.	Pakistan	2016	147.842	0.0136
98.	Panama	226	50.000	0.0045
99.	Peru	1631	2.330.000	0.0007
100.	Philippines	3572	957.620	0.00373
101.	Poland	10219	2.400.100	0.00426
102.	Portugal	4734	556.688	0.0085
103.	Qatar	887	25.000	0.0355
104.	Romania	9935	1.314.098	0.00756
105.	Russia	4159	3.400.000	0.0012
106.	Rwanda	11	72.000	0.00015
107.	Saudi Arabia	1988	1.000.000	0.00199
108.	Senegal	74	320.000	0.00023
109.	Serbia	3092	332.000	0.0093
110.	Sierra Leone	1	12.476	0.00008
111.	Singapore	3234	400.000	0.0081
112.	Slovakia	3897	430.048	0.0091
113.	Slovenia	1817	209.213	0.0087
114.	South Africa	3399	2.650.000	0.00128
115.	Spain	29814	3.363.197	0.0886
116.	Sri Lanka	1237	1.200.000	0.001
117.	Sudan	69	2.500	0.0276
118.	Sweden	3190	1.200.260	0.00266
119.	Switzerland	7551	541.559	0.0139
120.	Tajikistan	3	1.000	0.003
121.	Tanzania	86	3.000.000	0.00003
122.	Thailand	9240	3.000.000	0.0031
123.	Togo	25	115.880	0.00022
124.	Trind&Tobg	71	25.000	0.00284
125.	Tunisia	1077	801.000	0.00134
126.	Turkiye	8150	10.914.000	0.000747
127.	Uganda	125	1.500.000	0.00083
128.	Ukraine	1465	1.970.000	0.00074
129.	UAE	3625	650.400	0.00562
130.	UK	25995	5.600.000	0.00464
131.	USA	20919	32.000.000	0.000654
132.	Uruguay	1203	192.800	0.00624
133.	Uzbekistan	218	395.900	0.00055
134.	Viet Nam	4207	629.700	0.0067
135.	Yemen	20	2.000	0.01
136.	Zambia	24	1.200.000	0.00002

Source: ISO, HitHorizon, prepared by the author of this paper.

In the table below, a list of countries based on the number of ISO 9001 certificates issued is given, where China is the first because has the highest number of ISO 9001 certificates issued, followed by Italy, Spain in 6<sup>th</sup> position, and the USA in 9<sup>th</sup> position and so on, a ranking which doesn't describe the reality on ISO 9001 certificates issued ranking.

Table 2. List of countries for ISO 9001 certificates issued based on the higher value of ISO 9001 certificates issued (136 countries worldwide, drawn from the author of this paper from the ISO table of the list of countries per alphabetic order, using Excel)

No	Country	ISO 9001
1.	China	324621
2.	Italy	91493
3.	Germany	49349
4.	Japan	32287
5.	India	32236
6.	Spain	29814
7.	UK	25995
8.	France	21880
9.	USA	20919
10.	Brazil	17503
11.	Korea Rep	11982
12.	Poland	10219
13.	Colombia	10147
14.	Czech Rep.	10085
15.	Romania	9935
16.	Malaysia	9533
17.	Thailand	9240
18.	Netherlands	8358
19.	Israel	8250
20.	Turkiye	8150
21.	Australia	7971
22.	Switzerland	7551
23.	Hungary	7030
24.	Mexico	7002
25.	Belarus	6890
26.	Indonesia	6861
27.	Greece	6822
28.	Argentina	6128
29.	Bulgaria	6069
30.	Portugal	4734
31.	Canada	4707
32.	Viet Nam	4207
33.	Russia	4159
34.	Slovakia	3897
35.	UAE	3625
36.	Philippines	3572
37.	Austria	3562
38.	South Africa	3399
39.	Singapore	3234
40.	Sweden	3190
41.	Serbia	3092
42.	Chile	2897
43.	Belgium	2887
44.	Finland	2861
45.	Norway	2578
46.	Croatia	2531
47.	Ireland	2338
48.	Denmark	2181
49.	Pakistan	2016
50.	Saudi Arabia	1988
51.	Egypt	1839
52.	Slovenia	1817
53.	Peru	1631
54.	Iran	1523

Table 2 (cont.). List of countries for ISO 9001 certificates issued based on the higher value of ISO 9001 certificates issued (136 countries worldwide, drawn from the author of this paper from the ISO table of the list of countries per alphabetic order, using Excel)

No	Country	ISO 9001
55.	Ukraine	1465
56.	Lithuania	1254
57.	Sri Lanka	1237
58.	Uruguay	1203
59.	B&H	1145
60.	Morocco	1099
61.	Tunisia	1077
62.	New Zealand	1034
63.	Estonia	947
64.	Qatar	887
65.	Latvia	868
66.	Cyprus	736
67.	N.R. Macedonia	629
68.	Oman	587
69.	Kuwait	584
70.	Jordan	575
71.	Lebanon	529
72.	Bangladesh	495
73.	Algeria	477
74.	Bahrain	463
75.	Kenya	456
76.	Kazakhstan	447
77.	Albania	378
78.	Nigeria	368
79.	Costa Rica	345
80.	Azerbaijan	259
81.	Panama	226
82.	Montenegro	220
83.	Uzbekistan	218
84.	Malta	216
85.	Myanmar	215
86.	Guatemala	211
87.	Cuba	208
88.	Georgia	197
89.	Dominic. Rep	190
90.	El Salvador	185
91.	Mauritius	178
92.	Honduras	161
93.	Luxembourg	157
94.	Uganda	125
95.	Ghana	110
96.	Iceland	105
97.	Angola	100
98.	Iraq	98
99.	Nepal	90
100.	Moldova	88
101.	Tanzania	86
102.	Cambodia	78
103.	Brunei	77
104.	Senegal	74
105.	Trind&Tobg	71
106.	Cameroon	70
107.	Sudan	69
108.	Laos	47
109.	Ethiopia	43
110.	Benin	40
111.	Mozambique	38
112.	Armenia	37
113.	Jamaica	36
114.	Malawi	33
115.	Burkina Faso	29



Table 2 (cont.). List of countries for ISO 9001 certificates issued based on the higher value of ISO 9001 certificates issued (136 countries worldwide, drawn from the author of this paper from the ISO table of the list of countries per alphabetic order, using Excel)

No	Country	ISO 9001
116.	Namibia	29
117.	Togo	25
118.	Zambia	24
119.	Yemen	20
120.	Bhutan	18
121.	Maldives	11
122.	Rwanda	11
123.	Barbados	10
124.	Guinea	10
125.	Botswana	9
126.	Kyrgyzstan	8
127.	Liberia	8
128.	Niger	8
129.	Chad	6
130.	Djibouti	4
131.	Tajikistan	3
132.	Belize	2
133.	Haiti	2
134.	Lesotho	2
135.	Gambia	1
136.	Sierra Leone	1

Source: drawn from the author of this paper from the ISO table of the list of countries per alphabetic order, using Excel.

In the table below a list of countries based on the ISO 9001 index is given, where on top is Spain, while China, Italy, and the USA which was on top first and second and in the ninth position in the previous list are in 83<sup>rd</sup> and 11<sup>th</sup> and 111<sup>th</sup> position, a ranking which reflects better than two previous tables the current situation of ISO 9001 certificates issued in these countries, bringing in front countries where the business community is more motivated to be certified.

Table 3. List of countries for ISO 9001 index based on the number of ISO 9001 certificates issued divided by the number of businesses per each country (136 countries worldwide, drawn from the author of this paper)

No	Country	ISO 9001 index
1.	Spain	0.0886
2.	Azerbaijan	0.0874
3.	Belarus	0.042
4.	Qatar	0.0355
5.	Sudan	0.0276
6.	Cuba	0.022
7.	Kuwait	0.01947
8.	Greece	0.0192
9.	Chile	0.0182
10.	Iran	0.017
11.	Italy	0.0152
12.	Germany	0.0142
13.	B&H	0.0139
14.	Israel	0.0139
15.	Switzerland	0.0139
16.	Pakistan	0.0136
17.	Morocco	0.0131
18.	Brunei	0.0127
19.	Czech Rep.	0.0125
20.	Guatemala	0.0117
21.	Yemen	0.01
22.	Austria	0.0099
23.	Oman	0.0093

Table 3 (cont.). List of countries for ISO 9001 index based on the number of ISO 9001 certificates issued divided by the number of businesses per each country (136 countries worldwide, drawn from the author of this paper)

No	Country	ISO 9001 index
24.	Serbia	0.0093
25.	Slovakia	0.0091
26.	Benin	0.0089
27.	Slovenia	0.0087
28.	N.R. Macedonia	0.0086
29.	Georgia	0.0085
30.	Portugal	0.0085
31.	Croatia	0.0082
32.	Mozambique	0.0081
33.	Singapore	0.0081
34.	Ireland	0.008
35.	Malaysia	0.00777
36.	Romania	0.00756
37.	Bulgaria	0.0075
38.	Argentina	0.0072
39.	Djibouti	0.0072
40.	Viet Nam	0.0067
41.	Uruguay	0.00624
42.	Montenegro	0.0062
43.	Japan	0.0061
44.	Latvia	0.0061
45.	UAE	0.00562
46.	Hungary	0.0054
47.	India	0.0051
48.	Bahrain	0.005
49.	Chad	0.005
50.	Liberia	0.0047
51.	Lithuania	0.0047
52.	UK	0.00464
53.	Panama	0.0045
54.	Finland	0.00444
55.	Netherlands	0.0044
56.	Poland	0.00426
57.	Denmark	0.0042
58.	Malta	0.004
59.	Estonia	0.0039
60.	Norway	0.00384
61.	Canada	0.0038
62.	Colombia	0.00375
63.	Philippines	0.00373
64.	Niger	0.00372
65.	Myanmar	0.00363
66.	France	0.0036
67.	Iraq	0.0035
68.	Australia	0.0033
69.	Guinea	0.0031
70.	Thailand	0.0031
71.	Kyrgyzstan	0.003
72.	Tajikistan	0.003
73.	Cyprus	0.00296
74.	Trind&Tobg	0.00284
75.	Belgium	0.0028
76.	Jamaica	0.0028
77.	Brazil	0.0027

Table 3 (cont.). List of countries for ISO 9001 index based on the number of ISO 9001 certificates issued divided by the number of businesses per each country (136 countries worldwide, drawn from the author of this paper)

No	Country	ISO 9001 index
78.	Sweden	0.00266
79.	Costa Rica	0.00265
80.	Dominic. Rep	0.0024
81.	Lebanon	0.00235
82.	Albania	0.0023
83.	China	0.0021
84.	Korea Rep	0.00199
85.	Saudi Arabia	0.00199
86.	New Zealand	0.0019
87.	Angola	0.0018
88.	Malawi	0.00165
89.	Jordan	0.0016
90.	Mauritius	0.00144
91.	Mexico	0.0014
92.	Maldives	0.00138
93.	Tunisia	0.00134
94.	South Africa	0.00128
95.	Ghana	0.0012
96.	Russia	0.0012
97.	Luxembourg	0.00116
98.	El Salvador	0.00114
99.	Honduras	0.001
100.	Sri Lanka	0.001
101.	Kazakhstan	0.00095
102.	Iceland	0.00091
103.	Uganda	0.00083
104.	Ethiopia	0.00078
105.	Bangladesh	0.00076
106.	Turkiye	0.000747
107.	Ukraine	0.00074
108.	Namibia	0.00073
109.	Moldova	0.00071
110.	Peru	0.0007
111.	USA	0.000654
112.	Bhutan	0.00064
113.	Barbados	0.00055
114.	Uzbekistan	0.00055
115.	Armenia	0.0005
116.	Egypt	0.00047
117.	Burkina Faso	0.00036
118.	Laos	0.00035
119.	Botswana	0.00034
120.	Cameroon	0.00033
121.	Haiti	0.00033
122.	Belize	0.00025
123.	Senegal	0.00023
124.	Togo	0.00022
125.	Algeria	0.0002
126.	Cambodia	0.00015
127.	Rwanda	0.00015
128.	Kenya	0.000134
129.	Indonesia	0.00011
130.	Nepal	0.000098
131.	Sierra Leone	0.00008
132.	Tanzania	0.00003
133.	Lesotho	0.00002
134.	Zambia	0.00002
135.	Gambia	0.0000087
136.	Nigeria	0.000008

Source: drawn from the author of this paper.

In the table below, countries are listed in alphabetic order, and the ranking for ISO certificates issued, ISO 9001 index, and the inverse of ISO 9001 index are given, to weight them numerically.

The inverse of the ISO index is needed because when the rank of countries per ISO index has been prepared, the countries with the highest index are given the lowest numbers, while in fact, these countries have the highest number of ISO certificates issues per number of businesses. For example, Spain is number one (1), but the score should be 136, etc.

Table 4. The rank of countries as per the alphabetic order, number of ISO 9001 certificates, and as per the ISO 9001 index (136 countries worldwide)

Country	Alphabetic order	ISO certificates issued	ISO 9001 index	ISO index inverse
Albania	1	77	82	54
Algeria	2	73	125	11
Angola	3	97	87	49
Argentina	4	28	38	98
Armenia	5	112	115	21
Australia	6	21	68	68
Austria	7	37	22	116
Azerbaijan	8	80	2	134
B&H	9	59	13	123
Bahrain	10	74	48	88
Bangladesh	11	72	105	31
Barbados	12	123	113	23
Belarus	13	25	3	133
Belgium	14	43	75	61
Belize	15	132	122	14
Benin	16	110	26	110
Bhutan	17	120	112	24
Botswana	18	125	119	17
Brazil	19	10	77	59
Brunei	20	103	18	118
Bulgaria	21	29	37	99
Burkina Faso	22	115	117	19
Cambodia	23	102	126	10
Cameroon	24	106	120	16
Canada	25	31	61	75
Chad	26	129	49	87
Chile	27	42	9	127
China	28	1	83	53
Colombia	29	13	62	74
Costa Rica	30	79	79	57
Croatia	31	46	31	105
Cuba	32	87	6	130
Cyprus	33	66	73	63
Czech Rep	34	14	19	117
Denmark	35	48	57	79
Djibouti	36	130	39	97
Dominic Rep	37	89	80	56
Egypt	38	51	116	20
El Salvador	39	90	98	38
Estonia	40	63	59	77
Ethiopia	41	109	104	32
Finland	42	44	54	82
France	43	8	66	70
Gambia	44	135	135	1
Georgia	45	88	29	107
Germany	46	3	12	124

Table 4 (cont.). The rank of countries as per the alphabetic order, number of ISO 9001 certificates, and as per the ISO 9001 index (136 countries worldwide)

Country	Alphabetic order	ISO certificates issued	ISO 9001 index	ISO index inverse
Ghana	47	95	95	41
Greece	48	27	8	128
Guatemala	49	86	20	116
Guinea	50	124	69	67
Haiti	51	133	121	15
Honduras	52	92	99	37
Hungary	53	23	46	90
Iceland	54	96	102	34
India	55	5	47	89
Indonesia	56	26	129	7
Iran	57	54	10	126
Iraq	58	98	67	69
Ireland	59	47	34	102
Israel	60	19	14	122
Italy	61	2	11	120
Jamaica	62	113	76	60
Japan	63	4	43	93
Jordan	64	70	89	47
Kazakhstan	65	76	101	35
Kenya	66	75	128	8
Korea Rep	67	11	84	52
Kuwait	68	69	7	129
Kyrgyzstan	69	126	71	65
Laos	70	108	118	18
Latvia	71	65	44	92
Lebanon	72	71	81	55
Lesotho	73	134	133	3
Liberia	74	127	50	86
Lithuania	75	56	51	85
Luxembourg	76	93	97	39
Malawi	77	114	88	48
Malaysia	78	16	35	101
Maldives	79	121	92	44
Malta	80	84	58	78
Mauritius	81	91	90	46
Mexico	82	24	91	45
Moldova	83	100	109	27
Montenegro	84	82	42	94
Morocco	85	60	17	119
Mozambique	86	111	32	104
Myanmar	87	85	65	71
Namibia	88	116	108	28
Nepal	89	99	130	6
Netherlands	90	18	55	81
New Zealand	91	62	86	50
Niger	92	128	64	72
Nigeria	93	78	136	0
Norway	94	45	60	76
N.R. Macedonia	95	67	28	108
Oman	96	68	23	113
Pakistan	97	49	16	120
Panama	98	81	53	83
Peru	99	53	110	26
Philippines	100	36	63	73
Poland	101	12	56	80
Portugal	102	30	30	106
Qatar	103	64	4	132
Romania	103	15	36	100
Russia	105	33	96	40
Rwanda	106	122	127	9
Saudi Arabia	107	50	85	51
Senegal	108	104	123	13

Table 4 (cont.). The rank of countries as per the alphabetic order, number of ISO 9001 certificates, and as per the ISO 9001 index (136 countries worldwide)

Country	Alphabetic order	ISO certificates issued	ISO 9001 index	ISO index inverse
Serbia	109	41	24	112
Sierra Leone	110	136	131	5
Singapore	111	39	33	103
Slovakia	112	34	25	111
Slovenia	113	52	27	109
South Africa	114	38	94	42
Spain	115	6	1	135
Sri Lanka	116	57	100	36
Sudan	117	107	5	131
Sweden	118	40	78	58
Switzerland	119	22	15	121
Tajikistan	120	131	72	64
Tanzania	121	101	132	4
Thailand	122	17	70	66
Togo	123	117	124	12
Trind&Tobg	124	105	74	62
Tunisia	135	61	93	43
Turkiye	126	20	106	30
UAE	127	35	45	91
Uganda	128	94	103	33
UK	129	7	52	84
Ukraine	130	55	107	29
Uruguay	131	58	41	95
USA	132	9	111	25
Uzbekistan	133	83	114	22
Viet Nam	134	32	40	96
Yemen	135	119	21	115
Zambia	136	118	134	3

Source: drawn from the author of this paper.

In the graphic below countries are described as per the alphabetic order (dark blue), a number of ISO 9001 certificates (light blue), ISO 9001 index (red), and ISO 9001 inversed index (green), (136 countries worldwide). The graphic shows clearly the difference between indexes used to describe the ranking of countries per ISO standards under several approaches. In that case, depends on the hands of researchers and academics to use the best index which fits with the objective of their studies, as well as allows the International Organization of Standards to prepare reports about ISO certificates around the world and/or based on regions, using several approaches, which helps for a better understanding socio-economic situation worldwide and regionally, as the ISO standards have a great impact on social and economic life worldwide and individually in our life, towards quality life improvement continuously.

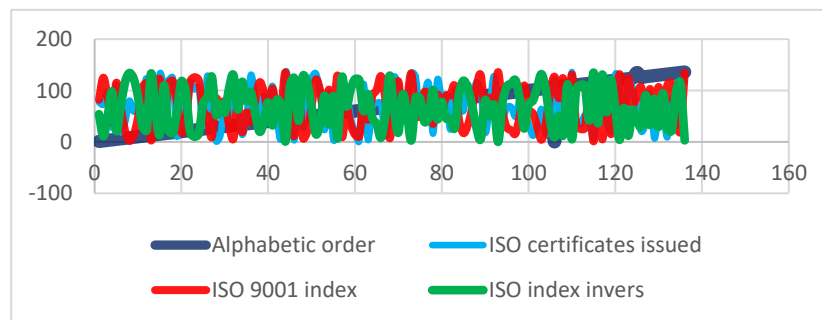
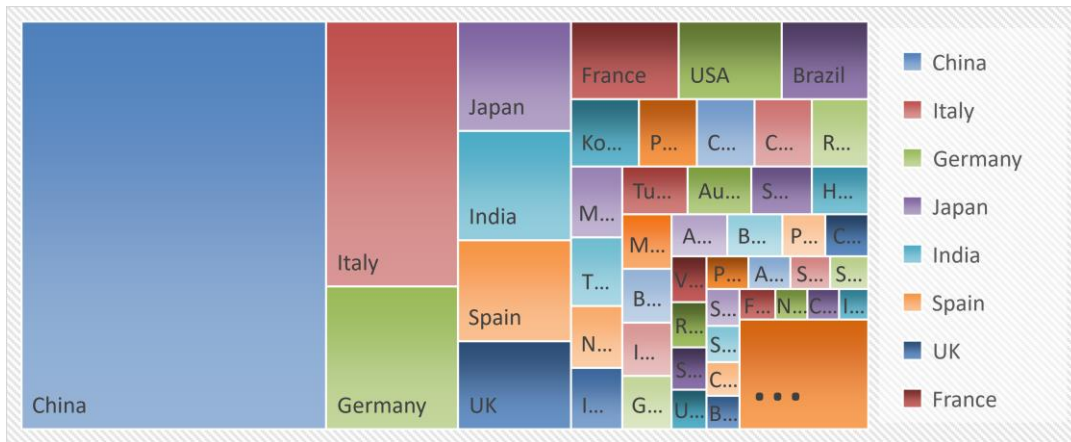


Figure 1. The rank of countries as per the alphabetic order (dark blue), number of ISO 9001 certificates (light blue), ISO 9001 index (red), and ISO 9001 inversed index (green), (136 countries worldwide)

Source: drawn from author of this paper.

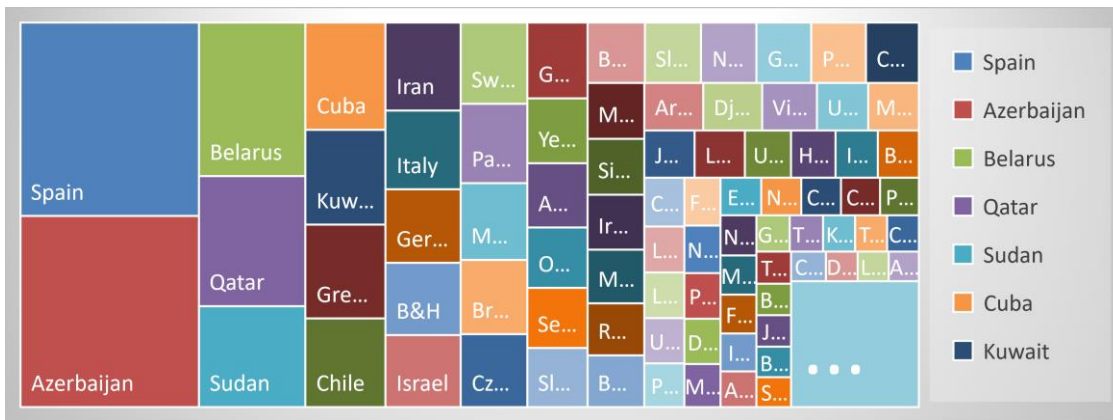
In the graph below a visual view of countries based on the number of ISO certificates issued is given.



**Figure 2. Visualization of countries based on number of ISO 9001 certificates issued.**

Source: drawn from author of this paper.

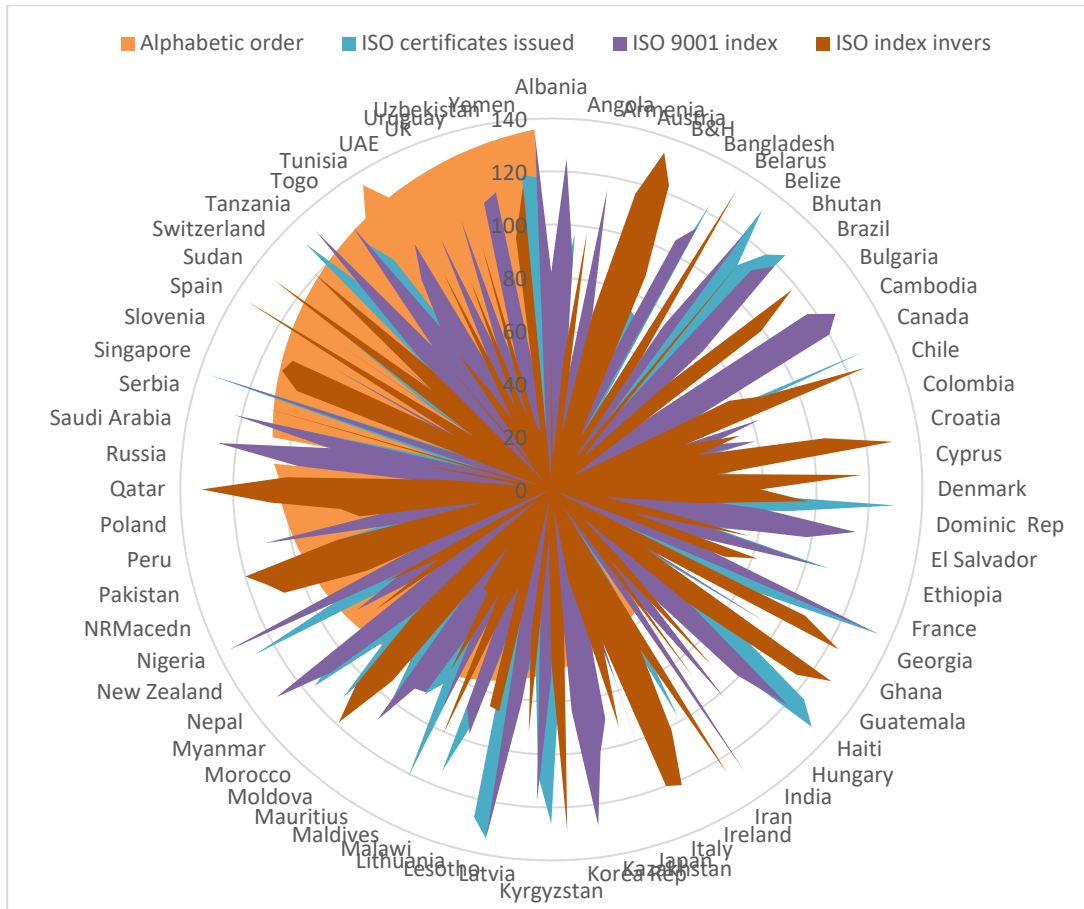
In the graph below a visual view of countries based on the ISO 9001 index is given.



**Figure 3. Visualization of countries based on the ISO 9001 certificates index**

Source: drawn from author of this paper.

In the graphic below (1) alphabetic order, (2) number of ISO 9001 certificates issued, (3) ISO 9001 index, and (4) ISO index invers are given to show the differences between different approaches on ranking countries on the issue of ISO 9001 standard certificates issued.



**Figure 4. Radar of (1) alphabetic order (green), (2) number of ISO 9001 certificates issued (light blue), (3) ISO 9001 index (yellow), and (4) ISO index invers (dark green)**

Source: drawn from author of this paper.

Implications for theory and practice

About the theory, based on the final results of this research, a new window has been opened for further research on the field of ISO standards indexes, considering them as a way of comparing countries, economies, and regions based on quality management approaches.

The article contributes not only to the issue of preparing ISO certificate indexes but the way how to compare countries, economies, and regions too.

The article explores approaches that promote ISO certificates indexes preparation and usage.

This is not only a theoretical article, based on an empirical study, employing quantitative methods, but a practice-oriented paper, expressing actual shifts in the global economy, society, and science on the issue of standardizations with ISO standards, and opening a debate for the long-time perspective of the issue of ISO standards indexes.

**Limitations and further research**

This research has been undertaken using reliable data from International Standards Organization about ISO 9001 certificates issued, and data for the number of businesses per country from HitHorizon for the year 2020.

The suggested method of this paper research is an approach that helps further research and calculations needed every year to produce an annual index for ISO 9001.

The suggested method of this paper research is an approach that helps further research and calculations needed every year to produce annual indexes for all main ISO standards like ISO 14001, ISO 20000, ISO 22000, ISO



27000, ISO 45000, and ISO 50000, etc., as well as an overall ISO index for all ISO certificates issued worldwide, and this is the door this research lives open for other contributors on the field.

### Conclusions and recommendations

1. There is an increasing interest in quality, quality culture, and ISO standards currently, especially for ISO 9001.
2. Quality culture serves as a guide for continuous improvement, belonging to all members of the organization(s), forming a connection of internal clients and suppliers too.
3. The core value of quality culture is embodied in ISO standards, for which there is an increasing interest worldwide, aiming to achieve a competitive advantage. Quality, quality culture, quality culture management, and ISO standards, are becoming an essential part of business models achieving competitive advantage, under the new reality and new normality.
4. Currently, literature on ISO standards listing and indexes is not developed, and there is only a worldwide report published by the International Standards Organization, ISO, called: The ISO survey of management system standard certifications (ISO. 2021) doesn't serve as a database, saying that there is a lack of previous listing/ranking of countries based on any logic, parameters, or index prior this research.
5. The ISO 9001 index and its inverse index, developed with this paper, is an indicator for listing countries about the index of ISO 9001 certificates issued and this serves all those interested in the academic field, public administration, and the reports and studies of the national and international level of organizations, to create a better perception of doing business in general and on the aspects of quality management in particular, especially when it comes to making the most appropriate comparisons between countries on these issues, helping on socio-economic studies related to this issue too.
6. The ISO 9001 certificates index presents the motivation that the business community has for being certified with ISO standards and the quality culture that exist in these countries, which reflects socio-economic development in these countries as well too.
7. The suggested method of this paper research is an approach that helps further research and calculations needed every year to produce an annual index for ISO 9001.
8. The suggested method of this paper research is an approach that helps further research and calculations needed every year to produce annual indexes for all main ISO standards like ISO 14001, ISO 20000, ISO 22000, ISO 27000, ISO 45000, and ISO 50000, etc., as well as an overall ISO index for all ISO certificates issued worldwide, and this is the door this research lives open for other contributors on the field.
9. About the theory, based on the final results of this research, a new window has been opened for further research on the field of ISO standards indexes, considering them as a way of comparing countries, economies, and regions based on quality management approaches.
10. The article contributes not only to the issue of preparing ISO certificate indexes but the way how to compare countries, economies, and regions too.
11. The article explores approaches that promote ISO certificates indexes preparation and usage.
12. This is not only a theoretical article, based on an empirical study, employing quantitative methods, but a practice-oriented paper, expressing actual shifts in the global economy, society, and science on the issue of standardizations with ISO standards, and opening a debate for the long-time perspective of the issue of ISO standards indexes.

**Author Contributions:** conceptualization, E.C.; methodology, E.C.; validation, E.C.; formal analysis, E.C.; investigation, E.C.; resources, E.C.; data curation, E.C.; writing-original draft preparation, E.C.; writing-review and editing, E.C.; visualization, E.C.; supervision, E.C.; project administration, E.C.

**Conflicts of Interest:** Authors declare no conflict of interest.

**Data Availability Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

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