

ISO 9001 - Certificates by industrial sector in the world as a key decision variable

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Abstract: The aim of this article is to present and analyse trends in the scope of the implementation of quality certificates compliant with the ISO 9001 standard. The analysis will concern the trend in the sectoral approach all over the world. The preparation of data, their analysis and drawing conclusions have been made on the basis of the desk research method. The data was gathered by means of an analysis of source materials such as, among others: announcements, press releases, reports for industries, publicly available reports of companies and research institutions, information from the Internet. The main conclusion is the fact that the number of certificates compliant with the ISO 9001 standard is constantly growing in the world. The kind of business activity determines the engagement in the certificate implementation. The subject of research provided conclusions and at the same time, became an inspiration for defining research issues such as the ex-post analysis of the information available, drawing conclusions and drawing up directions of development. The retrospective analysis in the scope of the sectoral analysis of ISO 9001 trends, drawing conclusions and drawing up evolution directions is the author's original contribution.

Key words: ISO 9001, certificates by industrial sector, decision managers

JEL Classification: E2, F6, L1

Introduction

The total quality management (TQM) all over the world is implemented by means of many concepts, for which a lot of supporting methods and tools of strategic and operational character were developed [Haffer, 2003; Hamrol, 2005; Kolman, 2009; Borys, 2012; Hawrysz and Hys, 2012; Karaszewski and Skrzypczyńska, 2013; Lisiecka, 2013; Hys and Hawrysz, 2014; Hys and Lorenc, 2015]. Generally speaking, the TQM concept is considered to be a key quality management idea at the international level. The TQM concept has a positive influence on the creation of operational solutions, generally known as Kaizen and the formation of a systemic approach to quality by means of the implementation of the ISO 9001 standard principles [Skrzypek, 2000; Lisiecka, 2003; Urbaniak, 2012; Lisiecka, 2013; Wolniak, 2013; Wolniak, 2014]. By Kaizen we mean among others: customer orientation, Total Quality Control - TQC, robotics, Quality Circles - QC suggestion systems, automation, discipline in the workplace, Total Productive Maintenance - TPM, kanban, improving quality, just-in-time - JIT, zero defects, working in small teams, cooperation between the different levels of the organization, increase productivity and development of new products [Imai, 1986]. Whereas the implementation of the ISO 9001 standard to the structures of a given organisation is a documented confirmation of the fact that the implemented activities meet requirements of the systemic approach to the quality management process [Łańcucki, 1999; Lisiecka, 2001; Łunarski, 2008; Karaszewski, 2009; Urbaniak, 2011; Hys and Hawrysz, 2014b; Hys, 2014a; Wolniak, 2013].

The research in the paper is focused on the issue of the company certification level

compliant with the ISO 9001 standard all over the world. It has been assumed that by the quality we mean the level of meeting the client's defined requirements, whereas the level of the client's requirements which are being met is now a key factor of the economic reality assessment by the managers. It has an influence on the market possibilities of a given company. In the context of the contribution made by the management, the quality management system in the ISO 9001 standard is treated as a system of organisation management, in particular its supervision in relation to the quality. It has been agreed at last that the aim of this elaboration is an analysis of the dynamics of the formation of the number of the implementations of certificates compliant with the ISO 9001 standard in the sectoral system. Particular attention has been paid to the dynamics and trend of the formation of the number of the implementations of certificates compliant with the ISO 9001 standard in the sectoral system on the world market. This paper is a continuation of a series of papers in this scope [Rogoziński, 2005; Hawrysz, 2014a; Skrzypek, 2013; Hawrysz and Hys, 2013].

1. Background

Principles of the ISO 9001 standard form the way of perceiving the organisation in the framework of its employees, including decision-makers. The ISO 9001:2008 standard includes eight fundamental principles, which influenced the way of seeing the organisation activities both by its employees and stakeholders (including customers, competitors, partners, market). The enforcement of ISO 9001 principles by employees of a given organisation is a kind of a promise to meet

client's expectations. The fact of satisfying the client's needs has an influence on the level of purchase made by them and at the same time, on the level of profit and satisfaction of the management. The following principles of the ISO 9001 have been included in the standard [Borys, 2011;

Casadesús et al., 2011; Chiarini, 2015]:

- Customer focus Organizations depend on their customers and therefore should understand current and future customer needs, should meet customer requirements and strive to exceed customer expectations.

- Leadership - Leaders establish unity of purpose and direction of the organization. They should create and maintain the internal environment in which people can become fully involved in achieving the organization's objectives.

- Involvement of people - People at all levels are the essence of an organization and their full involvement enables their abilities to be used for the organization's benefit.

- Process approach A desired result is achieved more efficiently when activities and related resources are managed as a process.

- System approach to management - Identifying, understanding and managing interrelated processes as a system contributes to the organization's effectiveness and efficiency in achieving its objectives.

- Continual improvement Continual improvement of the organization's overall performance should be a permanent objective of the organization.

- Factual approach to decision - Effective decisions are based on the analysis of data and information.

- Mutually beneficial supplier relationships - An organization and its suppliers are interdependent and a mutually beneficial

relationship enhances the ability of both to create value.

The applied principles and operational solutions suggested in the ISO 9001 standard have a lot of supporters both among scientists and practitioners [Hys and Hawrysz, 2011]. Results of an analysis concerning global tendencies in the scope of the implementation dynamics of the certificate compliant with the ISO 9001 standard all over the world, presented in this paper, are the objective evidence.

2.Data and Methods

The quality management concept is one of potential answers to questions, one of solutions looked for by managers, solutions supporting their decision-making process [Hawrysz, 2014b; Hawrysz and Hys, 2014]. The formalised quality management compliant with the ISO 9001 standard has been used by organisations since the 1990s [Hys, 2014b, Borys, 2013; Barata and Cunha, 2014]. This article is a continuation of the author's papers in the scope of forming global trends in the scope of dynamics of changes in the implemented quality certificates compliant with the international ISO 9001 standard [Hys and Hawrysz, 2012].

The preparation of data, their analysis and drawing conclusions have been made on the basis of the desk research method. The data was gathered by means of an analysis of source materials such as, among others: announcements, press releases, reports for industries, publicly available reports of companies and research institutions, information from the Internet.

An analysis of the implementation dynamics to organisations all over the world

has been made in the scope of 39 defined sectors. Among these sectors are:

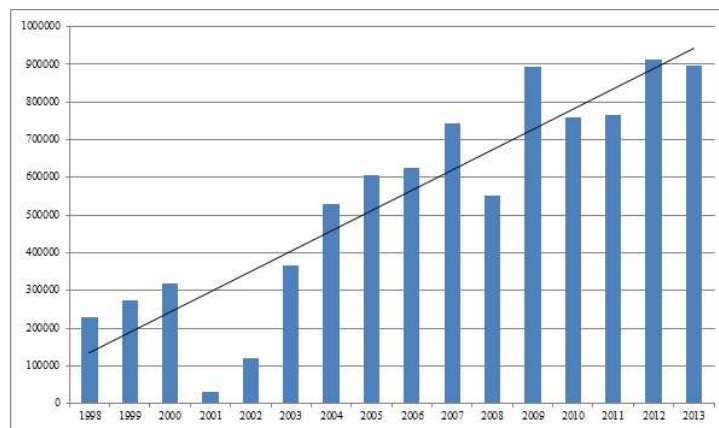
1. Agriculture, fishing.
2. Mining and quarrying.
3. Food products, beverages and tobacco.
4. Textiles and textile products.
5. Leather and leather products.
6. Wood and wood products.
7. Pulp, paper and paper products.
8. Publishing companies.
9. Printing companies.
10. Manufacture of coke & refined petroleum products.
11. Nuclear fuel.
12. Chemicals, chemical products & fibres.
13. Pharmaceuticals.
14. Rubber and plastic products.
15. Non-metallic mineral products.
16. Concrete, cement, lime, plaster, etc.
17. Basic metal & fabricated metal products.
18. Machinery and equipment.
19. Electrical and optical equipment.
20. Shipbuilding.
21. Aerospace.
22. Other transport equipment.

23. Manufacturing not elsewhere classified.

24. Recycling.
25. Electricity supply.
26. Gas supply.
27. Water supply.
28. Construction.
29. Wholesale & retail trade; repairs of motor vehicles, motorcycles & personal & household goods.
30. Hotels and restaurants.
31. Transport, storage and communication.
32. Financial intermediation, real estate, rental.
33. Information technology.
34. Engineering Services.
35. Other Services.
36. Public administration.
37. Education.
38. Health and social work.
39. Other social services.

The data analysis has been made for the years 1998-2013. The number of implemented certificates in particular years has been presented in Figure 1. Moreover, Table 1 presents detailed figures which reflect the structure of given sectors.

Fig. 1. The number of certificates implemented in different years



An analysis of the number of implemented certificates ISO 9001 makes it possible to notice the following phenomenon. Generally speaking, the number of implementations shows a growing trend. The level of implementations in the year 2001 deserves attention. A dramatic fall of the number of implementations reflects the situation which took place at this time. In the year 2000 a new version of the standard was implemented and important changes were made in it. Among these changes it is possible to

enumerate the focus on the approach to the quality which illustrates the concept of continuous improvement. Ensuring the quality regulating operation has become an element of the quality management system apart from planning, controlling and improving quality. In the ISO 9001 standard, it is recommended for the quality management system to focus on the process-oriented approach and take into consideration the concept of continuous improvement.

Table 1. The number of ISO 9001 - sectoral data

SECTOR	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1.	610	678	1745	112	813	2584	4359	5797	5540	4896	3190	5234	4595	4683	4883	4953
2.	1052	1791	2028	131	607	1758	1801	2436	2508	2673	2164	3204	2955	2766	4039	3479
3.	7347	8746	11440	1317	5113	14682	22036	25737	26879	31060	21608	38817	33193	28434	33705	32519
4.	2835	3673	5178	593	3045	7151	10131	11024	11892	12935	6404	14105	12223	13319	15176	14461
5.	2313	2093	926	115	492	1394	2118	2252	2350	2726	1136	2369	2338	2562	2712	2728
6.	2218	1967	2225	197	868	2483	3971	4824	5196	6130	3691	6759	6498	6284	6823	6535
7.	1316	3279	4785	420	1227	4375	5674	5929	6218	7171	4328	8192	8970	8521	8556	9405
8.	363	354	445	68	190	617	844	697	608	539	513	670	707	657	775	724
9.	1998	2939	3299	378	1097	3234	4965	5808	6168	7518	5084	8732	7624	8341	9161	9223
10.	1009	1669	1929	127	407	1052	1614	2072	2199	2324	1096	2002	1792	1626	1669	1955
11.	279	220	115	4	108	68	69	131	167	125	94	257	330	465	321	433
12.	11803	12615	14790	1232	5481	15806	22911	23685	25306	29924	15925	31880	29557	30278	33583	33610
13.	1160	1105	1451	137	496	1160	1943	2757	3061	3062	2722	3588	3222	3766	3840	6710

14.	4690	11738	865	16451	19768	505	390	860	1001	2106	3040	1052	398	36653	20275	28885	4998	6277
15.	3218	11366	1794	13803	25273	799	558	932	1765	4844	7656	4131	4670	40035	19827	28972	7107	13575
16.	4367	13181	1187	18530	32389	1242	531	979	932	5534	9072	924	589	38148	23027	40713	6467	18036
17.	773	1221	204	2275	3507	106	41	171	97	807	599	58	50	3558	2146	2912	544	1315
18.	2322	4592	670	8723	15752	331	171	569	357	1879	2465	184	188	14001	9246	13248	2312	5210
19.	6149	14955	2245	23751	51188	138	559	1190	580	4535	9311	606	984	38782	27705	41455	6217	16683
20.	9559	21265	2924	35380	71652	1136	658	1887	989	7500	12998	1025	972	51623	39023	59045	8812	24720
21.	10452	23520	3557	43971	82669	1404	863	2163	1445	7293	12733	967	1030	57161	44787	69198	8956	26943
22.	10604	23372	3875	44620	80432	1525	975	2251	1199	8188	12137	1161	1192	59138	46296	72100	9142	28987
23.	13008	27202	4186	51185	95076	1551	911	2323	1639	10072	14518	1113	1917	73139	54432	92230	11808	36024
24.	8571	24899	3437	46180	76043	1526	1011	2006	1918	6647	8228	1399	1526	42601	30334	64518	6790	25106
25.	13900	32286	4731	63015	116672	1991	1210	2854	2342	12386	15086	2105	3056	85357	63523	107253	12709	42682
26.	11057	22804	3499	53051	82262	2602	871	2404	2104	12768	13415	1758	2783	81893	58685	95375	10656	39425
27.	11423	24846	3664	55961	83864	1535	612	1948	2648	10533	12141	1464	2396	79237	58427	101848	11567	40854
28.	16445	31679	5496	70082	108396	2658	1003	2681	2869	11642	12544	2359	2952	85969	63723	115731	13065	44769
29.	16198	31490	5021	73167	80920	2318	1254	3069	3371	11823	11899	1776	2131	87797	63497	116602	12250	45204

34.	8064	9201	11451	1590	4699	13738	19657	21277	20969	26683	20761	35909	32726	31086	38160	38659
35.	13088	12150	13160	1886	5169	18379	26954	34825	37507	39657	41404	53116	41615	40303	54572	55602
36.	689	2086	1404	331	780	2229	3457	4213	4371	6208	4911	7938	5399	6468	7428	8039
37.	1833	3996	4282	580	1529	5915	9625	12607	13200	14832	16242	19689	14511	14141	19379	19713
38.	1250	2871	3820	411	1723	5561	10295	13389	14180	16516	19712	21909	16278	19351	25036	26992
39.	2513	2005	1529	332	629	4413	5657	6817	7073	7750	8518	12748	7620	6987	10601	10240
TOTAL	229846	274040	317126	31816	121467	367385	528638	607147	625742	743147	550076	894133	760243	766778	911564	895363

Source: Iso-survey, 2013

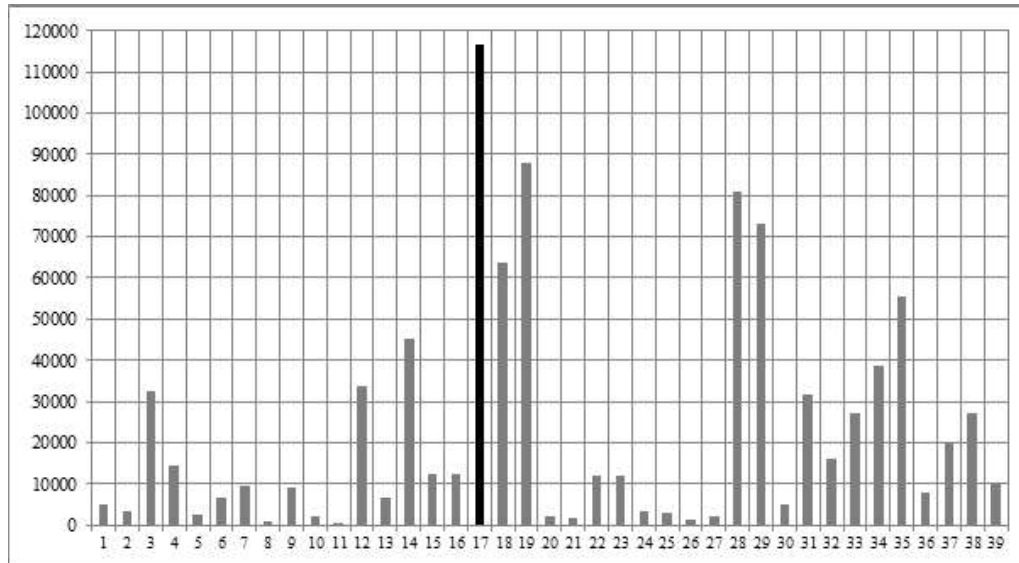
At the same time, there was a redefinition of the quality context in the companies. The process of re-education took place and then, the process-oriented approach became the basis of operation for the companies all over the world. As a consequence, it is possible to notice that the ISO 9001 standard was accepted by the business environment. It became a synonym of the quality standard, the principles and applied operational solutions

of which formed a kind of an international language code. The code is clearly understood by all parties involved.

3.Results and Discussion

The data overview makes it possible to state leading sectors in the scope of implementing certificates compliant with the ISO 9001 standard (Fig. nr. 2).

Fig. 2. Sector presentation implemented ISO 9001 in 2013



Source: own study based on Iso-survey, 2013

For the defined 39 sectors, 13 exceeded the level 20 000 of the certificates implementation all over the world. Out of which only in the companies representing seven sectors exceeded the level 40 000 of the certificates implementation. Among them were companies, the names of sectors of which have been included in Table 2.

Table 2. Top seven industrial sectors for ISO 9001 certificates 2013

Top seven industrial sectors for ISO 9001 certificates 2013		
1	Basic metal & fabricated metal products (17)	116602
2	Electrical and optical equipment (19)	87797
3	Construction (28)	80920
4	Wholesale & retail trade; repairs of motor vehicles, motorcycles & personal & household goods (29)	73167
5	Machinery and equipment (18)	63497
6	Other services (35)	55602
7	Rubber and plastic products (14)	45204

Source: Iso-survey, 2013

The ISO 9001 certificate is most often implemented to the basic metal & fabricated metal products sector organisations all over the world. This trend has been unchanged since 2010. In case of 26 sectors the implementation number is below 20 000, out of which in nine sectors the level 10 000 of implementation was exceeded. These companies operate in the following sectors: other social services (39), manufacturing not elsewhere classified (23), other transport equipment (22), concrete, cement, lime, plaster, etc. (16), non-metallic mineral products (15), textiles and textile products (4), financial intermediation, real estate, rental (32) and education (37).

In case of companies representing the remaining 18 sectors there is a well-visible delay in the ISO 9001 standard implementation. This situation is surprising in the context of promoted benefits of the quality management systems implementation compliant with the ISO 9001 quality standard [Kafetzopoulos and Psomas, 2014;

Lewis et al., 2006; Pantouvakis et al., 2013; Poli et al., 2014; Sampaio et al., 2011; Tzelepis et al., 2006; White et al., 2009]. Implementations on a limited scale (below 10 000) are made in case of organisations operating in the following sectors: nuclear fuel – the lowest level among all studied (11), publishing companies (8), gas supply (26), aerospace (21), manufacture of coke & refined petroleum products (10), shipbuilding (20), water supply (27), leather and leather products (5), electricity supply (25), recycling (24), mining and quarrying (2), agriculture, fishing (1), hotels and restaurants (30), wood and wood products (6), pharmaceuticals (13), public administration (36), printing companies (9) and pulp, paper and paper products (7).

4. Conclusion

The presentation and analysis of trends in the scope of the implementation of quality certificates compliant with the ISO 9001 standard has been the aim of this paper. All companies which implement the ISO 9001 standard were assigned to 39 defined sectors. An analysis of the dynamics of changes in the scope of the number of implemented certificates compliant with the ISO 9001 standard made it possible to draw the following conclusions. The number of certificates all over the world compliant with the ISO 9001 standard has been continuously growing. It is interesting how the level of implemented certificates changes depending on the business activity sector. As it has been observed, the kind of business activity determines the engagement in the certificate implementation. Companies operating in the basic metal & fabricated metal products sector have had the leading role here for five years. The other places belong to companies representing the manufacturing sector, industry, construction and trade. The smallest number of implementations is in case of the companies of the nuclear fuel – the lowest level among all studied, publishing companies, gas supply, aerospace, manufacture of coke & refined petroleum products and water supply sector.

However, it does not mean that these companies do not meet quality standards. It is necessary to remember that there are many kinds of standards compliant with the ISO 9001 standard. It has been estimated that the number exceeds 19 500 [www.iso.org/iso/catalogue_ics]. Apart from that, as it has been mentioned at the beginning of the article, the ISO 9001 standard is one of many pro-quality solutions adopted in companies all over the world. Making a decision to use pro-quality

solutions in an organisation, in particular the ISO 9001 standard implementation is up to the decision making body. The analyses also show that the ISO 9001 standard meets the decision making body's requirements. The

trend is positive and continues to grow. It is thus possible to forecast that the implementation dynamics will still be growing in the future.

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