

# **Quality Management System Certification in the Russian Software Development Industry**

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*ISO 9001, an esteemed quality assurance system in use globally, establishes quality management system requirements, bringing benefits for organizations' competitiveness and success. Consistent increases in Russian exported software sales occurred during the last 15 years, but the share of software exports lags other developed countries. Russian software companies planning to increase exports do not associate this with improvement of management. ISO 9001 certification contributes to export growth, reductions in international trade barriers, improvements in product quality, differentiation, and a better image of the enterprise. This study analyzes these issues related to the Russian software development industry.*

## **ISO 9001'S EFFECT ON ORGANIZATION PERFORMANCE**

The globally interconnected and vibrant market economy of the 21<sup>st</sup> century has become a challenge and the norm for organizations striving for value creation and profit maximization. Global political, economic, social, technological, legal, and environmental challenges cannot be easily foreseen in the strategy of each organization and are considered primary factors contributing to the sustainable development of organization (Grant, 2010). Over 1,100,000 enterprises have adopted ISO 9001 systems globally, across all industry sectors. (see Table 1).

**TABLE 1**  
**QUANTITY OF ISSUED ISO 9001 CERTIFICATES**

	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>
<i>The world, thousand</i>	162,7	223,3	271,8	343,6	407,6	510,3	561,7
<i>Annual growth, thousand</i>	35,3	60,6	48,5	71,8	64,0	102,7	51,4
<i>Number of countries</i>	125	125	140	148	153	161	159
	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>
<i>The world, thousand</i>	497,9	660,1	773,8	896,9	951,5	980,3	1063,7
<i>Annual growth, thousand</i>	-63,8	162,2	113,7	123,1	54,6	28,8	83,4
<i>Number of countries</i>	149	154	161	170	174	176	178
	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>
<i>The world, thousand</i>	1076,5	1009,8	1017,3	1022,8	1036,3	1034,2	1105,9
<i>Annual growth, thousand</i>	12,8	-66,7	7,5	5,5	13,5	-2,1	71,7
<i>Number of countries</i>	178	179	184	187	188	201	201

Source: <sup>121</sup>.

The popularity of QMS stems from an idea that it helps companies operate more efficiently and respond to customer and key stakeholder requirements. Pressure from stakeholders to introduce QMS is associated with the evidence that it can be useful in international trade and investment facilitation (Neumayer and Perkins, 2005), and in decreasing transaction costs and information asymmetry. Terlaak and King, (2006) have pointed out that even if there is little external pressure to introduce certification, the voluntary act of doing it can help the company to communicate its quality and help it to garner an advantage among competitors.

Since the advent of easily accessible online word of mouth reviews via the internet, the ability to support quality claims for a product have risen in importance. Cheung, et.al, found that “comprehensiveness and relevance to be the most effective components of the argument quality construct ..., making them key influencers of information adoption” (Christy, et.al., 2008). Given this degree of importance, external validation through ISO 9001 represents a key component for gaining competitive advantage.

Internal improvements following the implementation of ISO 9000 include internal organization and operations, internal and external efficiency of process and performance, reduction of costs, efficiency in quality control, waste reduction, better traceability of products, improvements in documentation management (Terlaak and King, 2006) (Briscoe, Fawcett, and Todd, 2005). These improvements were observed in various types of organizations, including small and medium-sized enterprises (Douglas and Glen, 2000).

Better commitment from managers, as a key requirement of ISO 9000, leads to efficient integration of quality practices in the organizations strategic planning and increases efficiency of long-term decisions (Sun, 2000). External impacts of implementation of ISO 9000 and QMS certification deal with improving relationships with customers and suppliers. Improvement of customer satisfaction can be considered as one of the main benefits of the standard (Gotzamani and Tsiotras. 2001). The impacts of

certification are also associated with improvements in communication, sales and exports, image, competitiveness (Douglas, Coleman and Oddy, 2003).

According to Aba et al, financial performance improvements occur over time given successful QMS implementation and certification. (Aba, Badar and Hayden, 2016). Experts in quality management would argue that introduction and QMS certification, while formal, aren't used by management for the solution of real problems, and at times don't bring to the enterprise a desirable effect.

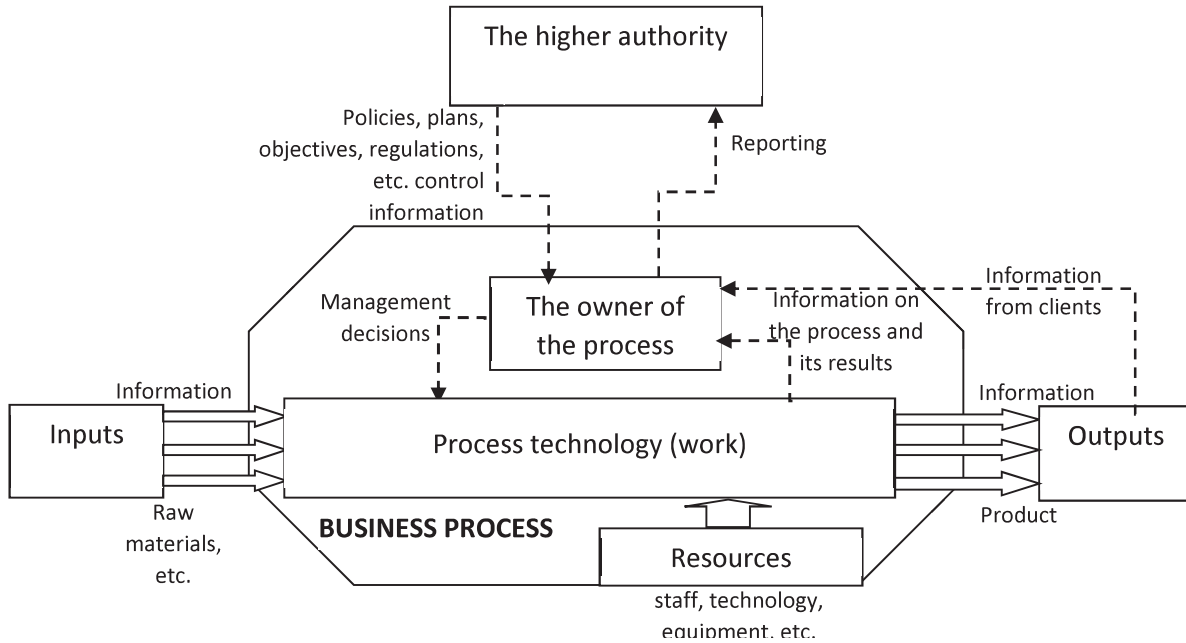
Regarding negative aspects of QMS implementation, the following problems should be taken into account: bureaucracy (not necessarily incompatible with certain improvements in the management of documentation), the lack of mobilization with regard to ISO 9000 (associated with resistance to change and a lack of cooperation), excess of certification costs over the real benefits (Martinez-costa and Martinez-Lorente. 2007), and a lack of trust among managers (Walgenbach 2001).

Moreover, as emphasized by some studies, the positive or negative impacts of QMS depend on contextual and institutional factors that differ significantly from one organization to another (Boiral and Roy, 2007). The main unit of administration in quality management systems is a business process. The ideology of reorganization of business for orientation to processes, instead of «success» of functional divisions, and the term «reengineering» are associated with two American researchers in the field of management: Michael Hammer and James Champy (1993). In the late 80s and early 90s, they stopped asking managers and experts questions like: how much efficiently (quickly, cheaply) are problems addressed? They began to ask another question: why do you make this or that work?

Hammer and Champy have offered a view into the organization based not on a set of services and departments, but rather on «factory of business processes». «Business process» they defined as follows: a set of operations which, taken together, create the result having value for the consumer (Hammer and Champy, 1993).. Business processes are not only in overall organizational management, but in any production process therein.

The authors proffer a definition of business processes: a system of interdependent, repeated, cyclic actions at which, pending inputs, the information and result of activity of the previous process (external - the supplier, or internal - other work), on an output - a product which is directed on satisfaction of requirements of internal (the subsequent work) or the external consumer (the firm's clients). Production activity is carried out with certain technology with use of certain resources. There proprietor of associated processes (specialist), who is responsible for its correct realisation, supervises inputs and outputs (see fig. 1).

**FIGURE 1**  
**THE EXPANDED SCHEME OF THE BUSINESS PROCESS**



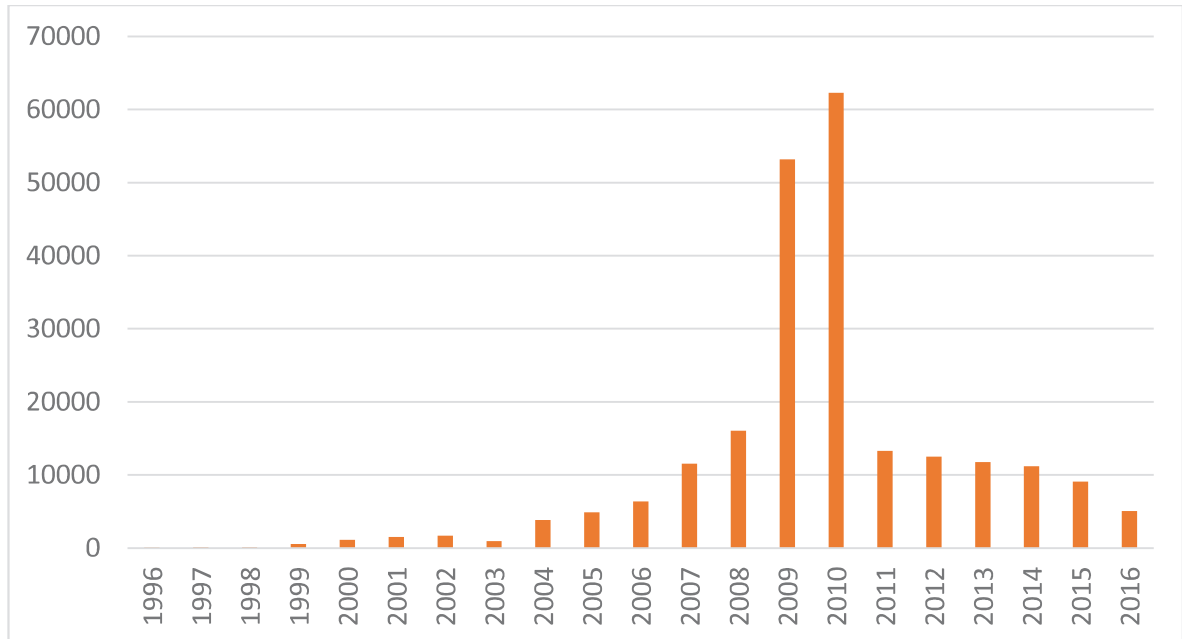
Business processes can be structured in two along 2 orientations: horizontally (on a chain of a value creation) and vertically (on divisions). The typical structure of business managerial processes represents a standard chain of an administrative cycle. The Deming Cycle Model (wheel of continuous improvement) total quality management (TQM) includes four phases: Plan - Do - Check - Act. Actions should be directed on improvement. The continuous improvement process of the company performance is thereby achieved.

**ISO 9001 IN THE RUSSIAN FEDERATION**

The processes of ISO9001 certification development in Russia lag behind global trends. According to an ISO Survey, 5,083 certificates were issued in Russia in 2016 (see fig.2). Certification took off in 2009 and 2010. For the first time in its history, Russia headed the top10 countries for ISO9001 growth in 2009.

This significant growth can be attributed to ISO standards 9001 and ISO 27001 updates in 2008 and 2005 respectively as well as a proactive approach of Russian professionals in promoting these methodologies, especially noticeable in 2008-2009.

**FIGURE 2**  
**NUMBER OF ISSUED ISO 9001 CERTIFICATES IN RUSSIA, THOUSAND**



Source<sup>[3]</sup>

Thus, in 2009 and 2010 Russia joined top 10 countries for ISO 9001 certification (2009 – 5th place, 2010 – 3rd place). China has been leading the top 10 since 2002, and also typically present in the list are the United Kingdom, Germany, Italy, USA, France, and Spain (in 2000s). Several obstacles are a factor for ISO9001 certification development in Russia:

- introduced and certified quality management systems often are formal, aren't used by the management for the solution of real problems, don't bring to the enterprise the desired effect;
- there is no appropriate mechanism to assess QMS economic efficiency which causes difficulties in determining ROI
- mistrust in Russian certification agencies based on the suspicion that they issue certificates regardless whether their clients have actually introduced QMS
- top managers see the benefits from certification, but don't see advantages which are born in the system of quality management per se. Often they want to receive the certificate, but do not support and develop QMS at the enterprise;
- training deficiencies for QMS personnel and responsible for its efficiency, including CEO and all top management;
- resource constraints, since expenses for consulting services on QMS in Russia can be extreme.

## **RUSSIAN IT INDUSTRY DEVELOPMENT**

Unfortunately, there are no relevant state statistics about the IT market in Russia. According to Rosstat<sup>1</sup>, it is almost as if the IT sector doesn't exist at all. It may be presented in statistical information by high-tech companies' development which appears with a longtime lag and includes a very limited number of indicators. According to International Data Corporation (IDC), the Russian information technology market hovers around \$17 billion. RUSSOFT Association suggests that “the market of products of software developers (including sales of licensed software, sales of development, installation

and support services) in Russia is much higher than the indicator mentioned in IDC reports” approaching \$20 billion (SRSEI). While RUSOFT and IDC don’t necessarily contradict each other, a difference appears due to the dual perspectives – that is, the IT market estimated from the Russian firm/IT user standpoint and alternatively, by international vendors.

**TABLE 2**  
**BASIC INDICATORS OF THE RUSSIAN IT MARKET, 2016**

	Absolute value, USD bln.	Growth	Share, %
IT equipment	10,6	-3,5%	62
IT-services	4,27	-5,3%	25
Software	2,21	-4%	13
Total	17,1	-4%	100
	Absolute value, bln. roubles	Growth	
Cumulative business volume of 100 Russian IT firms	1145	8,4%	
Cumulative income of 20 IT retail suppliers	35,7	15%	
Russian ITC markets	1688	0,8%	
Mobile services	880	0,3%	

Source: IDC Russia IT Services Market 2016

The volume of the Russian IT market has changed recently. The typical higher rates of growth from 2000-2008 were curtailed by the Great Recession. There was a resultant 16% decrease in the Russian IT market. The year 2013 ended with a symbolic reduction of 1%, and the situation in the next two years that the IDC described as a “crash of the Russian IT market” (Russia IT Services Market 2016).

Certain influences contributed to a declining Russian IT industry during 2013-16:

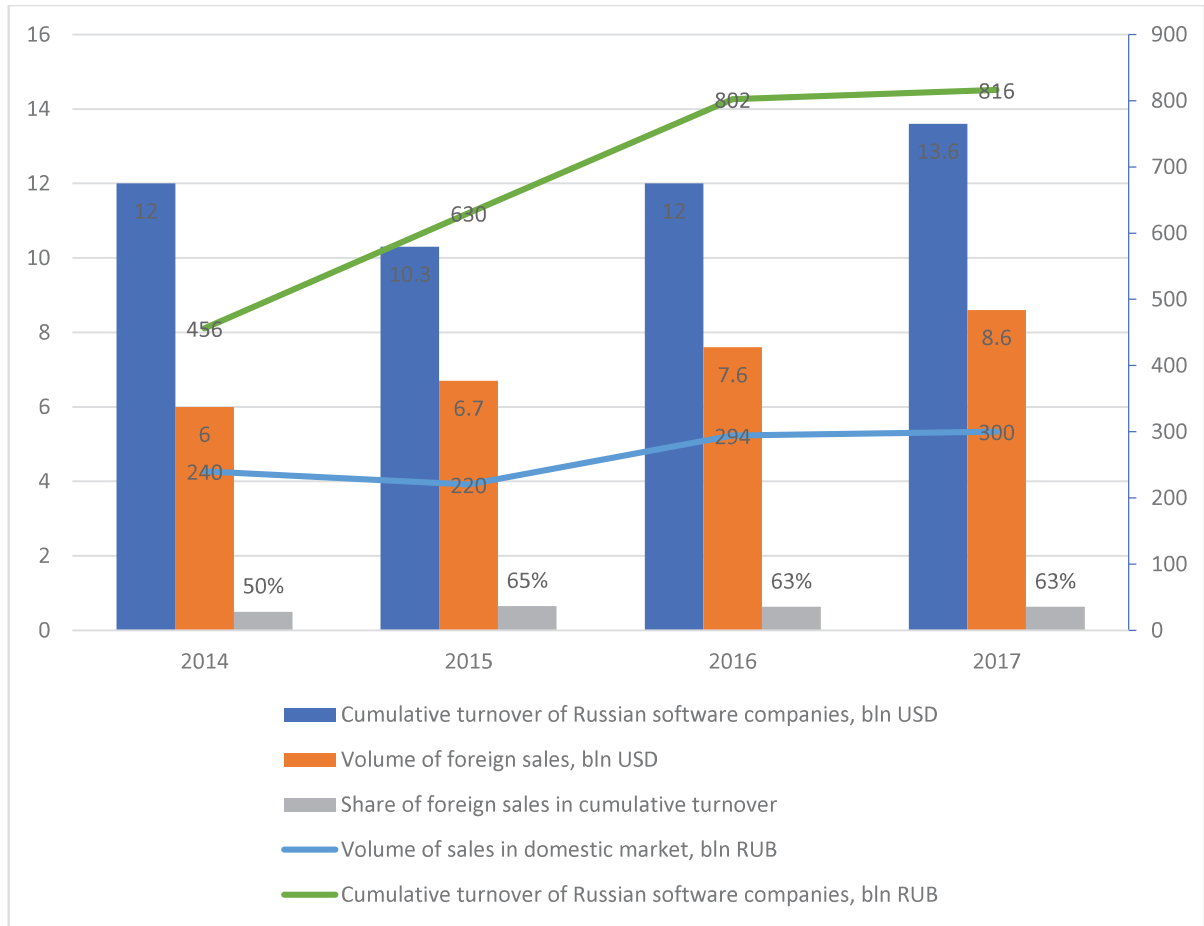
1. Improvement of the effectiveness of investment in IT.
2. Emergence of alternative technologies including public domain software.
3. Saturation in some conventional segments.
4. Lack of sensational novelties (large-scale implementation of a wide range of new technologies will depreciate this factor in the near future).
5. Cost reductions (for computer equipment).
6. Wide-scale change-over to cloud technologies (which require less expenses).
7. The oncoming saturation of a number of conventional segments of the IT market (web-connected computers were almost in every household and ERP and EDMS – almost in every enterprise).
8. Significantly lower cost of computer equipment and the emerging trend of change to free software (SRSEI).

Most of its segments experienced progress. The drop was in segments that were similarly decreasing within global markets.

## **MAIN INDICATORS OF SOFTWARE INDUSTRY IN RUSSIA**

There are about 3200 software companies in Russia. In 2016, six of them garnered a ranking within the world’s 500 best software companies (volume). (Russia IT Services Market. Although a reduction of growth in western markets in 2016 was expected given sanctions and increased difficulties of work, but the reduced activity did not materialize. A decline of the Russian ruble in Russia precipitated a drop in wages in the industry, which dropped by half which increased the competitiveness of Russian companies.

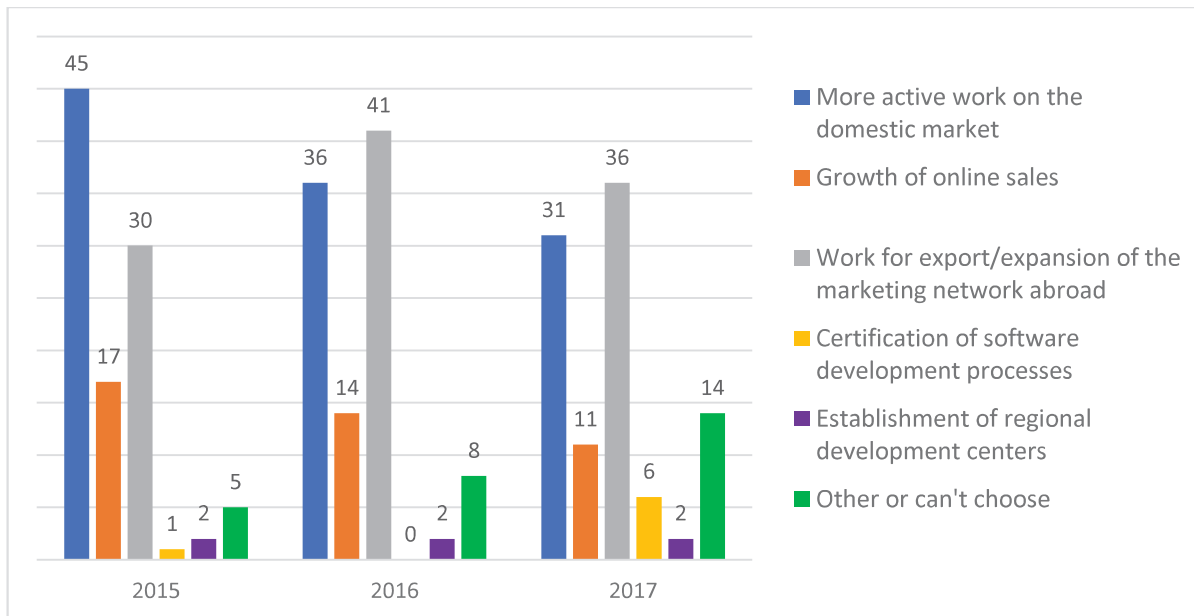
**FIGURE 3**  
**RUSSIAN SOFTWARE INDUSTRY DEVELOPMENT IN 2013-2016**



Source: SRSEI

It appeared that the problems of North American and Western European markets did not substantially impact Russian companies' performance in these regions. Some business was albeit in state-controlled areas. New market development can assist in mitigation of such risks. According to a RUSOFT survey, the Russian software companies have following priorities in development (see fig.4).

**FIGURE 4**  
**PRIORITY AREAS OF SOFTWARE COMPANIES' DEVELOPMENT (%)**

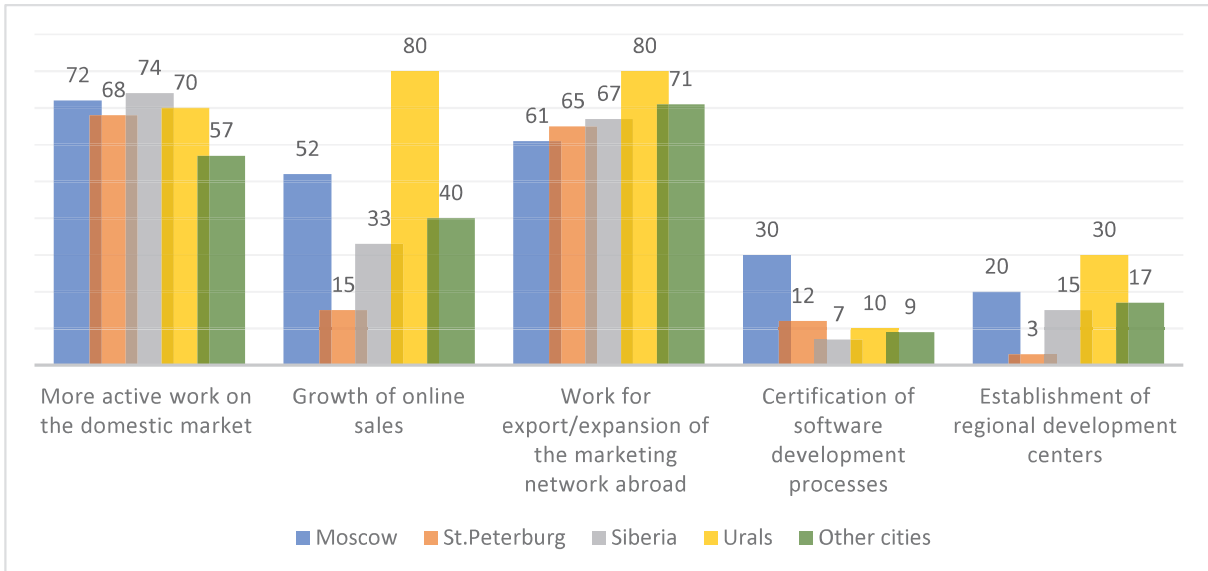


Note: “other tasks” include following: “optimization of internal processes”, “mastering new technological fields”, “equipment certification”. Source: SRSEI

Small businesses with revenues under \$5 million tend to rely on the national markets. In 2016, the emphasis was on export/expansion of the marketing network among companies with a revenue over 5 mln USD. Traditionally, regional software developers have a more focused objective of developing exports compared with companies from Moscow and St.Petersburg. However, the desire to boost foreign sales market share is rather ambitious given the difference in regional sales volumes and those of Moscow and St.Petersburg (see fig.5).



**FIGURE 5  
MAIN AREAS OF COMPANIES' DEVELOPMENT WITH DIFFERENT LOCATION**



Source: SRSEI.

The objective of “development of domestic sales” was no longer as important as there was increasing perceived value in international expansion despite sanctions and geopolitical restrictions. A number of researchers found a significant relationship between growth of sales and ISO 9001 certification, partially due to improvements in product quality and differentiation (Prabhu, et.al., 2000), partially due to better image of the enterprise (Huang, et.al.,1999). ISO 9001 certification also appears to contribute to increasing exports and reducing barriers to international trade. It appears that international customers tend to prefer certified companies over those that are not (Sun 2000) (Capmany, et.al., 2000). Additionally, organizational competitiveness is improved due to increased market share and competitive advantage following the certification (Briscoe, Fawcett and Todd, 2005) (Jang and Lin, 2008).

**CERTIFICATION IN THE RUSSIAN SOFTWARE DEVELOPMENT INDUSTRY**

Certification is a priority for about 6% of Russian software companies. Manufacturers as well as a service firms roll out proprietary QMSs (ISO/CMMI-based) but do not specifically per certification procedures.

**TABLE 3  
SHARE OF RUSSIAN SOFTWARE COMPANIES CERTIFIED TO  
INTERNATIONAL STANDARDS**

	2009	2010	2011	2012	2013	2014	2015	2016
<i>Not certified</i>	65%	61%	69%	64%	74%	71%	61%	61%
<i>ISO 9001</i>	31%	31%	29%	35%	24%	24%	33%	30%
<i>CMMI</i>	4%	7%	2%	6%	6%	5%	4%	4%

Source: SRSEI

The media industry has not registered as many CMMI or ISO certifications in the last two years. Nonetheless, a relevant dynamic relates to Kaspersky Lab (a provided of cybersecurity and antivirus

solutions). Kaspersky went through an audit (BSI certification) to verify ISO 9001:2015 compliance. According to a press release, the “scope of certification covers management of single and multiple safety incidents, client request processing, knowledge management and internal support of Kaspersky Lab customers and certificate validity extends to technical support desks working with corporate and family users of company’s products and services in Russia, Europe, North and South America” (Kaspersky ISO 9001:2015).

Unfortunately, there is minimal tangible state support of certification to international standards in Russia. A possible path to improvement is the consideration of best practices in other nations in which QMS certification is a priority (Nikonov 2017) (Russia-Singapore Business Council). Noteworthy is the 2016 launching of a program to compensate some expenses for production certification in foreign markets (Government decree No 1388, 17, December 2016), budgeting 760 million roubles towards this 2017. While these programs are increasingly in the works in the high-tech industry, the implementation is still pending and preliminary results of its impact on the Russian software industry can be vetted approaching year-end 2018.

## **CONCLUSION**

This study endeavors to analyze the presence and usage of QMS in the Russian software development sector as well as issues surrounding the progress and medium-term future of the management of change in the increasing adoption of ISO quality standards.

The process of ISO 9001 certification development in Russia goes slowly. Unfortunately, certification is not a top priority for Russian software companies as well. Meanwhile, there is a close correlation between growth of sales and exports and ISO 9001 certification. QMS also contributes to reduction of barriers to international trade and to increase of market share and competitive advantages. All these can provide significant expansion of software companies marketing network abroad following priority directions in their development. If Russian software companies plan to increase exports, they should associate this task to improvement of management as well.

Thus, there is an urgent need for increased awareness of QMS certification and its importance in Russian industry that depends on institutional environment, pressure from clients and agents, and on a company’s ability to apply quality management principles and its readiness to perceive market signals sent to it as a reaction to ISO 9001 certification.

## **ENDNOTES**

1. For details see: BS EN ISO 9001:2015. Quality management systems. Requirements.
2. Rosstat – Federal State Statistic Service
3. Nationwide association of the most technically competent software developing companies (100+) from Russia.

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