



# RESEARCH REGARDING THE USE OF STANDARDS AND THEIR IMPACT ON THE

OF THE COMPANIES
IN THE REPUBLIC
OF SERBIA

**BUSINESS ACTIVITIES** 



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#### **Foreward**

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Research on the economic impact of standards is not new among national standards bodies, but such research has not yet been conducted in our country. The immediate motive for the research was the publication of a study by the National Standards Body of Belgium (NBN) because, among other things, it included two levels of research: macro and microeconomic. This second level, the level of individual organizations, seemed suitable for our conditions and could provide data that would indicate to the Institute possible directions for further development based on the needs of existing and potential users of the standards.

In cooperation with the Serbian Chamber of Commerce and Industry and the Sector for Quality and Product Safety of the Ministry of Economy, within the Czech program for the development of cooperation "Support for the improvement and development of the Quality Infrastructure Sector of Serbia", the Institute for Standardization of Serbia conducted, during the period April–May 2022, an extensive online research, which was designed to obtain data on the reasons why an organization uses standards, the costs associated with it, the level of knowledge of standards, especially standards from the field of different management systems, as well as the possible participation of organizations in the standardization process and procedure of standards adoption. The results obtained on the basis of the survey have been processed and are published them in this publication.

We are grateful for the help and support of the Ministry of Economy, the Sector for Quality and Product Safety, the Chamber of Commerce of Serbia, the Bureau for Standardization of Belgium (NBN), all the collaborators of the Institute who, with their participation and comments, contributed to the implementation and publication of this research, and especially the Czech program for the development of cooperation "Support for the improvement and development of the Quality Infrastructure Sector of Serbia", without whose help this research would not have been carried out.

**Authors** 

# REPORT ON THE RESULTS OF THE SURVEY ON THE USE OF STANDARDS AND THEIR IMPACT ON THE BUSINESS OPERATIONS OF ORGANIZATIONS IN THE REPUBLIC OF SERBIA

# The impact of standards on the economy – international and national experiences

One of the crucial aspects of the mission of the National Standardization Bodies is establishing and maintaining relations with interested parties to achieve mutual benefits: using the potential of interested parties for the standardization development and using standards for the companies and other organizations development. Companies that do not even consider participating in the standards development and that are not aware of their role and potential contribution to the standardization development, while at the same time improving their business, which they can achieve by applying standards, are compelled to look for solutions, even though they already exist. The answers have been discovered and tested in practice because the standards represent experiences of the world's best practices in various fields. Therefore, presenting the practical benefits that standards contribute to organizations, citizens, and society is essential.

Most organizations are aware of the fact that standards are beneficial for their organization, although the level of awareness and recognition of such benefits varies significantly. However, organizations that clearly realize a direct connection between standards and their strategic development are in the minority. Consequently, they generally do not approach standardization in a systematic and organized manner, with a clear insight into the impact of standards on their activities and work performance. Some business entities apply standards only for specific processes or activities, and some organizations use standards only to a lesser extent or do not apply them at all. These organisations consider standards a burden - an activity that should avoid or an activity that represents an additional expense or obligation with a negative impact on the company.

Figure 1 below graphically shows the impact of standards on the economy and the mutual effect of various relevant factors. 1

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<sup>&</sup>lt;sup>1</sup> The figure is downloaded from the publication of the International Organization for Standardization ISO: "Economic impact of standards – Methodological guidance", which can be found at the following link:

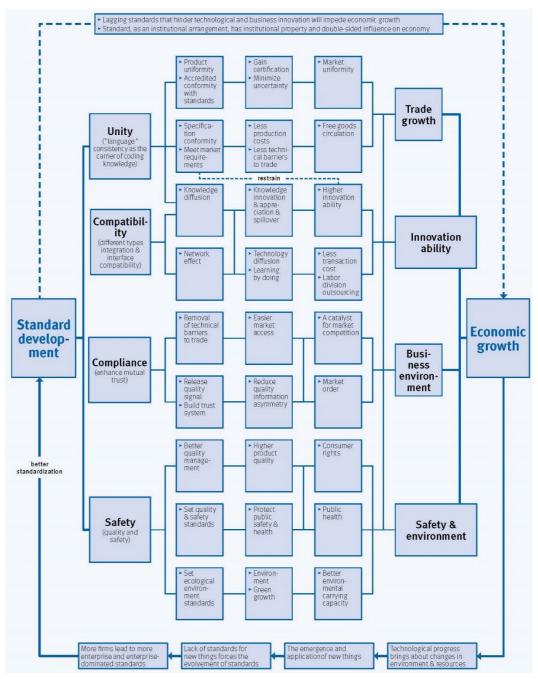


Figure 1 – The effect of standards on an economy

It is also a fact that the number of organizations that use standards is growing and that they are aware that more than 50,000 experts work on standards in the International Organization for Standardization ISO. These experts have tested the effectiveness of the offered solutions in practice, in their companies, at universities and other organizations, and the most successful solutions are described in standards. At the same time, those who use standards can direct their energy to business development in areas where innovation and creativity are expected and taken for granted if they want to stand out with a product or service in today's hyperproduction. The organizations that invested the most in innovation and research, at the same time, alerted the international and European organizations for standardization, recognizing the opportunity and developing cooperation. Some even established awards for young researchers and innovators. It is crucial to discover and start applying standards in education as early as possible and cooperate with standards organizations to achieve continuity and recognize modern trends in business. In addition to the above, it is most suitable to develop a standard simultaneously when creating an innovative product, which has been confirmed in practice.

In July 2020, the International Electrotechnical Commission (IEC) surveyed 300 respondents and presented the survey results. The survey was sent to standardization experts in North America and some in South America and Europe. The results are following: 87% of respondents identified safer processes and facilities as the primary benefit of the standards; 8 out of 10 respondents said the standards helped companies demonstrate compliance with regulations; more than 65% believe standards make it easier to train and cross-train people for technical jobs, while 63% of respondents said standards make processes and facilities safer for cyber business. The survey was conducted among managers who were expected to identify work values in their companies, with the majority identifying the importance of giving employees time to travel to meetings and participate in standardization work. Most managers expressed that participation in the development of standards enabled their organizations to access the world's best practices and knowledge exchange. The survey also touched on the future of standards. As many as 96% of respondents believed that standards would be "extremely important" or "important" in the future. Accordingly, the COVID-19 crisis has shown that this is more evident than ever because, in the months of the most intense fight against the epidemic, standards were the primary tool in the risk assessment process, the management process, and then the return to work and recovery process. The IEC has identified several advantages provided by international standards and conformity assessment. This includes ensuring the safety,

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performance and reliability of electronic and electrical systems and devices and facilitating trade and access to new markets. In addition, standards provide technical frameworks, metrics and specifications that regulators can refer to in legislation. Standards also provide governments with technical references in public procurement, giving confidence that products meet commonly agreed rules developed and accepted by industry and regulatory bodies. Furthermore, standards and the IEC conformity assessment system help developing countries ensure that products entering their market fulfil the required safety and performance criteria. It makes citizens safer, promotes economic development and facilitates access to investments.<sup>2</sup>

The direct impact of the standards on the economy, GDP and labour productivity began to be monitored relatively recently. Still, most countries do not deal with the organized data processing required for this analysis and do not have all the necessary indicators for making relevant conclusions. However, several examples of carrying out case studies in developed countries have been covered and analyzed by the International Organization for Standardization (ISO) in the publication: *Standards and Economic Growth – Survey of ISO Members on the Impact of Standards on Their National Economies*<sup>3</sup>, 2021.

<sup>2</sup> The results of the survey are available at the following link: https://www.arcweb.com/blog/what-value-industry-standards-todays-world.

- Association française de normalisation (AFNOR) "The Economic Impact of Standardization", 2009.
- Business and Economic Research Limited "The Economic Benefits of Standards to New Zealand", 2011.
- Centre for International Economics "Standards and the Economy", 2006.
- Conference Board of Canada "Economic Value of Standardization", 2007.
- Department of Trade and Industry "The Empirical Economics of Standards", 2005.
- Deutsches Institut für Normung (DIN) "Economic Benefits of Standardization", 2000.
- Deutsches Institut für Normung (DIN) "The Economic Benefits of Standardization", 2011.
- Liao, D (Standards Council of Canada) "Every Standard Counts How Standardization Boosts the Canadian Economy", 2021.

<sup>&</sup>lt;sup>3</sup> All of the studies listed below are publicly available at the following websites:

Each study used a similar methodology based on a principle developed by the German Institute for Standardization (DIN) in 2000. The studies are based on the Cobb-Douglas function, allowing researchers to determine the contribution of each listed component (labour, capital and total factor productivity) to economic growth.

Each study found an increase in the number of standards correlated with a measure of economic growth. Using economic modelling, the researchers could suggest the share of economic growth that could be explained by an increase in the standard's stock.

The National Body for Standardization of Belgium (NBN) conducted a case study in 12 Belgian companies in 2020 and found that the benefits of using standards in an organization are numerous and include:

- enhancing the exchange of information with clients and suppliers, reducing costs and improving the company's financial performance;
- creation of equal conditions for placement in the competitive markets;
- improvement of quality and safety products;
- support for research and development, innovation and commercialization of innovative products and services.

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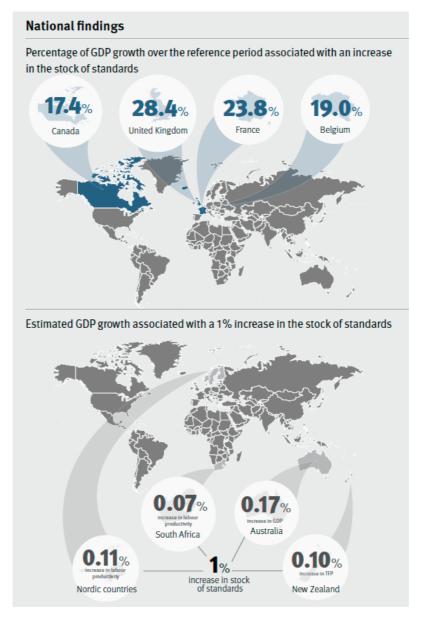


Figure 2 – Results of research on the impact of standards on the economy<sup>4</sup>

<sup>&</sup>lt;sup>4</sup> Figure is downloaded from the publication "Standards & economic growth: ISO members' research on the impact of standards on their national economies", which can be downloaded from the following link: https://www.iso.org/files/live/sites/isoorg/files/store/en/PUB100456.pdf

Based on the survey results in British and Australian companies, it was found that standards can reduce operating costs by establishing procedures for repetitive activities, while management system standards reduce the costs of "diffusion of ideas" within the organization.

In June 2021, the British Standards Institution engaged the Center for Economic and Business Research (CEBR), one of the UK's leading economic prediction and analysis houses, to re-examine the economic impact of standards in the UK. Most surveyed organizations believed that standards contribute to crucial business areas such as profit-making, increased labour productivity, trade, innovation and sustainability.<sup>5</sup>

The measures of each of the listed components are presented in each of the mentioned studies:

- Labour is measured by employment parameters, such as the number of employed people or working hours.
- Capital is measured by national estimates of GDP, as well as by gross investments in fixed capital.
- Economic growth is measured either by GDP or by a measure of labour productivity, such as output per hour.
- Standards were measured using the stock of standards, which is the number of standards (national or international, adopted at the national level) that are "active" in a certain period. This number is generated by subtracting the number withdrawn from published standards.

During the research, it was recognised that participation in standards development is crucial for larger companies because it allows them to predict the potential market and develop and maintain solid industrial networks. In the case of small and medium-sized companies and entrepreneurs, they seemed to take a reactive attitude towards standards, move their processes where necessary, and participate in developing standards through cooperation with larger companies.

Also, each of the studies found that the implementation of standards correlated with the measure of economic growth. Using economic modelling, the researchers could suggest the percentage of economic growth that could be explained by the increase in the number of standards. Although these studies indicate a positive impact of standards on the economy, they do not identify how standards achieve such an effect. A consensus has been observed that standards contribute to the exchange of information in the economy by making the latest knowledge equally available to everyone by codifying information about technologies, products and processes. Accordingly, all manufacturers and service providers have access to the same information and facilitate the exchange and application of technological and other knowledge through the standards development process.

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<sup>&</sup>lt;sup>5</sup> https://www.bsigroup.com/en-GB/standards/benefits-of-using-standards/research-reports/

# Summary of study findings by country

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Country	Publication year	Period of analysis	Estimated economic function		ution of ds to growth	Projected impact of a 1%	Contribution of standards to GDP
				GDP	Labour productivity	increase in standards	growth
				(expressed	d as a percentage)		
Australia	2006	1962-2003	TFP	-	-	0.17% increase in TFP	-
Australia	2012	1982-2010	LP	-	-	0.17% increase in GDP	-
Belgium	2020	1994-2018	LP and GDP	19%	19%	-	0.2%
Canada	2007	1981-2004	LP	9.0%	17.0%	0.356% increase in LP	0.24%
Canada	2021	1981-2019	LP and GDP	17.4%	38.4%	0.056% increase in LP	-
France	2009	1950-2007	GDP	23.8%	27.1 %	0.12% increase in TFP	0.8%
Germany	2000	1961-1990	GDP	-	-	-	1%
Germany	2011	1960-2006	GDP	-	-	-	0.72%
New Zealand	2011	1978-2009	LP and TFP	-	-	0.10 % increase in TFP	-
Nordic Countries	2018	1976-2016	LP	28%	39.5 %	0.105 % increase in LP	-
South Africa	2016	1972-2011	LP	-	-	0.07% increase in LP	-
UK	2005	1948-2002	LP	-	13.0%	0.05 % increase in LP	-
UK	2015	1921-2013	LP	28.4%	37.4%	_	0.7%

TFP: Total Factor Productivity | LP: Labour Productivity | GDP: Gross Domestic Product

Note: This table offers a general overview of research findings for indicative purposes only. Countries cannot be directly compared because of variations in reference period, data sources and methodology.

Figure 3 – Results of research on the impact of standards on the economy<sup>6</sup>

<sup>&</sup>lt;sup>6</sup> Figure is downloaded from the publication "Standards & economic growth: ISO members' research on the impact of standards on their national economies".

For the research methods described, we considered that, at this time, they are not yet suitable for use in the Republic of Serbia, and we opted for a narrower approach and observation of the application of standards at the level of organizations, especially bearing in mind the relatively recent full membership of the Institute in the European organizations for standardization (from 2017) and the obligation to adopt all European standards into the national standardization system, as well as the adoption of a large number of international standards at the request of interested parties.

Year	Number of published Serbian standards and related documents			Number of published Serbian standards and related documents that are identical with European standards (SRPS EN)				Number of withdrawn conflicting
	In Serbian	In English	Total	CEN	CENELEC	ETSI	Total	Serbian standards
2007.	65	393	458	274	11	0	285	128
2008.	512	2314	2826	1990	613	0	2603	344
2009.	252	3257	3509	2312	1136	4	3452	386
2010.	284	3496	3780	2161	1513	0	3674	609
2011.	226	4127	4353	2797	1310	7	4114	1.308
2012.	206	5020	5226	3714	1010	275	4999	6.371
2013.	158	3089	3247	2147	564	87	2798	2.071
2014.	323	2128	2451	1314	447	97	1858	1.456
2015.	183	1806	1989	1011	624	52	1687	1.210
2016.	200	1608	1808	1184	333	124	1641	1.445
2017.	234	2818	3052	1966	762	109	2837	1.842
2018.	158	1705	1863	1013	383	79	1472	1.467
2019.	212	1937	2149	1345	418	77	1840	1.637
2020.	171	1862	2033	1116	553	81	1750	1.257
2021.	136	1654	1790	1075	418	151	1644	1.081
2022. 30. јун	49	651	700	514	113	0	627	460
Укупно:	3.369	37.865	41.234	25.933	10.208	1.143	37.281*	23.072

Figure 4 – The number of published and withdrawn Serbian standards in the period 2007–2022. year

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For example, the Institute currently has around 32.432 valid standards in its portfolio, publishes 2,000–3.000 standards annually, and withdraws between 1.000 and 4.000 standards yearly, depending on the need. However, the number of published standards still does not mean the adequate application of these standards in organizations. Also, it is impossible to assess the impact of the standards on business based on the above data, following the example of developed countries that have done so by applying the described method.

However, the results we reached by surveying companies in cooperation with the Ministry of Economy and the Chamber of Commerce of Serbia are sufficiently informative and indicative that, at this moment, we can create a picture of the impact of standards on business, as well as influence interested parties to recognize their interest in using standards and notice that standards have a positive effect on business, primarily based on the experiences of other companies. The Republic of Serbia has established quality infrastructure, which to the greatest extent enables all interested parties to obtain information on time, to participate in standardization work directly and, in general, in quality infrastructure, following the example of the most developed countries in Europe.

# The Republic of Serbia and the Western Balkans and Turkey

In this context, it is important to mention the results of the implementation of the 6th cycle of the Small Business Act, which was recently published and where Serbia is observed concerning the countries of the Western Balkans and Turkey (SME Policy Index 2022 for the Western Balkans and Turkey<sup>7</sup>). Compared to the report from 2019, for the Republic of Serbia significant progress in the following areas is noticed, and it is above the average for the countries of the Western Balkans and Turkey::

- The environment in which the activities of small and medium enterprises take place;
- Services that support the activities of small and medium-sized enterprises;
- Public procurement;
- Access to financial resources;
- Innovations;
- Standards and technical regulations.

The report assesses the quality infrastructure (QI) in Serbia as very developed, which is very important in reducing trade barriers. Compliance of national legislation with the legislation of the European Union is a fundamental prerequisite for recognising economic procedures and institutions at the level of quality infrastructure institutions in the European Union.

Since 2007, the Institute for Standardization of Serbia has adopted a high percentage of European standards into the National Standardization System (according to the latest data from European organizations for standardization, the compliance rate is 99%). All activities aimed at promoting standardization and developing tools that facilitate the access to standards and participation in standardization established by the Institute certainly contributed to Serbia ranking highest in comparison with other countries of the Western Balkans and Turkey. For example, compared to the average in these countries, which is 3,77, when it comes to compliance with European standards, Serbia is rated 5,00; 4,47 compared to the average of 3,88 for the so-called raising awareness and providing information about standards, and it received a score of 3,50 for the evaluation of the participation of small and medium-sized enterprises in the process of standards development (average score of 3,21).

# Some indicators of using standards in the Republic of Serbia

The International Organization for Standardization ISO ("ISO survey") conducts an annual survey worldwide by collecting data on the number of valid certificates<sup>8</sup> for international management system standards. Collected data are from certification bodies accredited by IAF MLA<sup>9</sup>, members who participate in this research voluntarily. Figure 5 below presents the total number of valid certificates in the Republic of Serbia for each management system standard for 2018-2020, which is included in the research.

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<sup>&</sup>lt;sup>8</sup> A certificate, in terms of this research, is a document issued by a certification body accredited by a recognized organization when the client demonstrates compliance with a certain standard. The data were downloaded from the link <a href="https://www.iso.org/the-iso-survey.html">https://www.iso.org/the-iso-survey.html</a>.

<sup>&</sup>lt;sup>9</sup> The International Accreditation Forum (IAF) is a worldwide association of accreditation bodies and others bodies interested in conformity assessment in the areas of management systems, products, processes, services, personnel, validation and verification and other similar conformity assessment programs.

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Year	2018.	2019.	2020.
ISO 9001	2.427	2.707	3.092
ISO 14001	1.169	1.275	1.629
ISO/IEC 27001	223	258	351
ISO 22000	216	195	187
ISO 45001	216	209	844
ISO 13485	35	54	64
ISO 50001	73	87	77
ISO 22301	6	10	20
ISO/IEC 20000-1	22	10	25
ISO 28000	1	0	0
ISO 37001	0	3	7
ISO 39001	0	4	11
Total	4.388	4.812	6.307

Figure 5 – Number of certificates for management systems issued by accredited certification bodies in the Republic of Serbia

Also, the period from 1993 to 2017 for certificates issued for the ISO 9001 standard is also shown. Based on this data, it is evident that the first certificate in the Republic of Serbia was issued by an accredited standardization body only in 2003, for 103 organizations, after which a large number of certificates were issued in the period from 2006 to 2020. The reason for this is primarily the establishment of the Accreditation Body of Serbia, which made it available for domestic certification bodies to perform certification by international and European rules. As a reminder, it has to be mentioned that in 1993, of that time Federal Institute for Standardization issued the first certificate for the Quality System according to the requirements of the JUS ISO 9000 series of standards in the former SR Yugoslavia. The reason for this is primarily the establishment of the Accreditation Body of Serbia, which made it possible for domestic Certification Bodies to perform certification by international and European rules. In this context, as a follower of the Federal Institute for Standardization, then the Institute for Standardization, the Institute is considered the originator of certification in our country. From 1994 to the end of 2006, the Institute issued 450 certificates, and in 2008, when there was no more legal basis for engaging in this activity, it had 198 valid certificates in the register.

Detailed results for each standard and each country that are monitored are available on the International Organization for Standardization (ISO) website at the following link:

https://isotc.iso.org/livelink/livelink?func=ll&objId=18808772&objAction=browse&viewType=1

Year	Number of certificates issued in RS for ISO 9001
2003.	103
2004.	0
2005.	0
2006.	1.551
2007.	1.987
2008.	2.091
2009.	2.733
2010.	1.790
2011.	3.228
2012.	2.750
2013.	2.366
2014.	2.637
2015.	2.512
2016.	3.017
2017.	2.213

Figure 6 - Number of certificates issued for ISO 9001 in the Republic of Serbia

According to the official records of the Institute for Standardization of Serbia, approximately 1.500 representatives from 697 organizations directly participate in the work of 163 national standards committees. When their structure is considered more carefully, 55% are representatives of business companies, 12% of public companies and 1% of entrepreneurs, which makes 68% of economy representatives. Representatives of educational institutions (12%), as well as state administration (5%), public institutions (8%), public agencies (1%), as well as various associations (6%) participate in the adoption of standards in a significant percentage, while representatives of local self-government, non-governmental, tourist and other organizations together about 1%.

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Such a diverse structure of the members of the standards technical committees indicates the equal representation of all interested parties. However, compared to the fact that in July 2022, 133.329<sup>10</sup> companies, 298.693 entrepreneurs and 36.288 associations were registered and actively operating in the Republic of Serbia, it is clear that the number of organizations represented in the national techical committees could and should be significantly higher.

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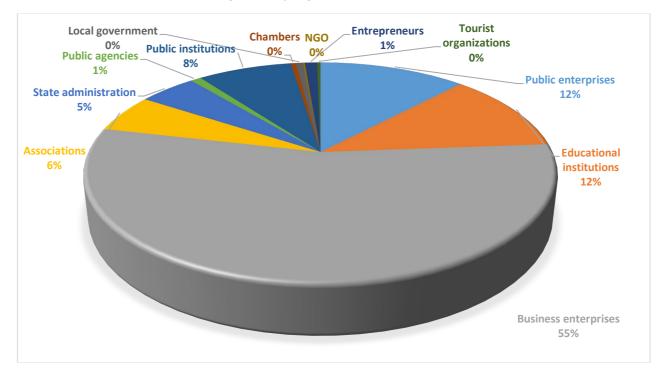
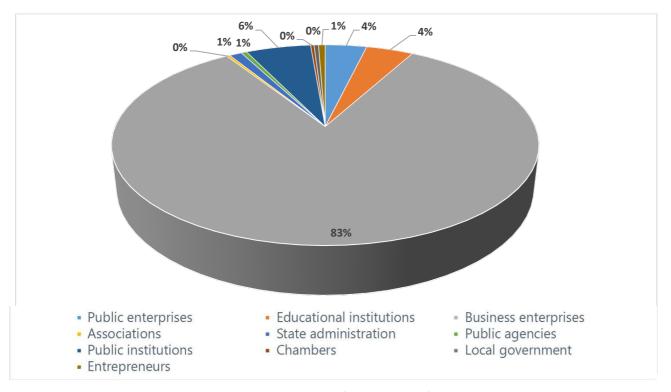


Figure 7 – The structure of the members of the National Technical Committees in the Institute for Standardization of Serbia

Looking at the structure of customers for standards, which was made on the basis of the Institute's data, it is clear that there are similarities in relation to the structure of committee members, but the data still differ significantly. Namely, it is clear that companies with 83% share dominate the structure of customers, and all other forms of organizing participate between 1% and 6%. At the same time, among the members of the national technical committees, there is a much greater diversity and representation of different organizational forms.

<sup>&</sup>lt;sup>10</sup> Data from the Serbian Business Registers Agency (accessed on July 19, 2022); https://www.apr.gov.rs/%D0%BF%D0%BE%D1%87%D0%B5%D1%82%D0%BD%D0%B0.3.html



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Figure 8 – The structure of customers of standards in the Institute for Standardization of Serbia

The Institute conducted a series of activities to increase the organization's visibility so that all interested parties could more easily get involved in the standardization process and facilitate access to the standards for all those interested in their application. One of the models that has a lot of potentials is opening Information centres in six cities in the Regional Chambers of Commerce in the Republic of Serbia. This project was implemented in cooperation with the Ministry of Economy, the Chamber of Commerce of Serbia, and the German Society for International Cooperation (GIZ). However, despite the publicity given to this event, the impression is that there is not enough interest in using these Information centers by people in business. Therefore, intensive activities to promote them are planned in the coming period.

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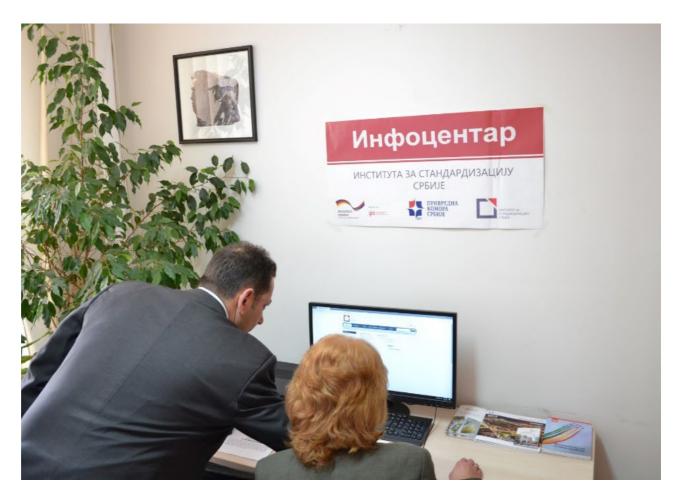


Figure 9 – Infocentre of the Institute in the Regional Chamber of Commerce in Zaječar

Serbia has gone through a period of dramatic change, navigating through a rapidly evolving political and economic environment. Today, Serbia is a candidate country for membership in the European Union, reflecting the significant progress achieved in structural and institutional reforms. The Serbian economy has recovered well from the mild recession of 2020, which is linked to the impact of COVID-19. The fact is that during the epidemic, interest in using standards increased for a simple reason, and that is those organizations which used standards more successfully weathered the crisis. The economy in Serbia grew by 7,4% in 2021, mainly thanks to private consumption and an increase in wages and consumer loans. The economic recovery in 2021 was comprehensive, except in the agriculture sector, where production fell by 5.4%. Growth is expected to slow in 2022. It is predicted

that the economy in the Republic of Serbia will grow by around 4-4,5% per year. However, the war in Ukraine and the sanctions imposed on the Russian Federation will impact Serbian exports, foreign direct investments, remittances and tourism revenues. As such, economic growth for 2022 was revised to 3,2%, and in the medium term, the economy is expected to grow steadily at around 3% per year. The historical moment that we are all experiencing together is adequate to examine the effectiveness of the tools that can eventually help us overcome the challenges ahead.

# Methodology used for analysis

In cooperation with the Serbian Chamber of Commerce and the Sector for Quality and Product Safety of the Ministry of Economy, the Institute for Standardization of Serbia conducted an online survey in the period April–May 2022 to determine whether business entities in the Republic of Serbia use standards and how, according to the opinion of the companies, the benefits of their application can be evaluated. This market research was prepared within the framework of the implementation of the Czech program for the development of cooperation "Support for Improvement and Development of Serbian Quality Infrastructure Sector" in cooperation between the Institute for Standardization of Serbia and Czech Office for Standards, Metrology and Testing (ÚNMZ).

The Chamber of Commerce of Serbia sent the link with the survey to the addresses of the members of its associations and the e-mail addresses of the contacts of the Institute for Standardization of Serbia. The survey was announced on the portal of the Ministry of Economy, "Tehnis", and forwarded to the Association of Business Women of Serbia, the business association "Bussines on heels", and the "Competition for the Best technological innovation of Serbia". In addition, news of this research was published on the Institute's website and shared on social media. The survey was anonymous unless the respondents themselves desired to be contacted by the Institute. During the research period, a total of 197 respondents filled out the survey in about a month, and the survey results are given below.

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<sup>&</sup>lt;sup>11</sup> Data from the World Bank, April 18, 2022; https://www.worldbank.org/en/country/serbia/overview

### Survey results

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The survey contained a total of 27 questions, which were thematically arranged in six sections. The questions related to various aspects of the implementation of the standards, as well as the respondents' assessment of the impact of the implementation of the standards on the business of domestic enterprises and organizations.

# SECTION 1: BASIC INFORMATION ON THE STRUCTURE AND BUSINESS OF THE PARTICIPANTS

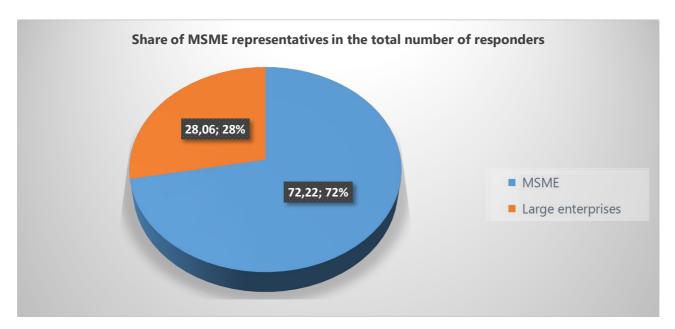
The first four questions from the survey made up the first section and included basic information about the respondents' organizations and workplace, in order to gain insight into the structure of the participants in the research, i.e. the characteristics of the surveyed sample.

1. Based on the responses of the survey participants, we came to the conclusion that enterprises of all sizes are relatively evenly represented in the survey, as indicated by the results given below.

No.	The organization in which I am employed is of the following size:	%
1.	Micro (up to 10 employees)	14,21
2.	Small (10–49 employees)	25,89
3.	Medium (50–249 employees)	31,98
4.	Large (250+ employees)	27,92
	Total:	100,00

Figure 10 – Graphic representation of the structure of respondents according to the size of the organization

The results show that the MSME sector belongs to slightly less than three quarters of the total number of respondents (72,08%). The participation of representatives of the MSME sector in the survey on knowledge of Serbian standards and their more detailed structure within the sector are shown in the following graphs:



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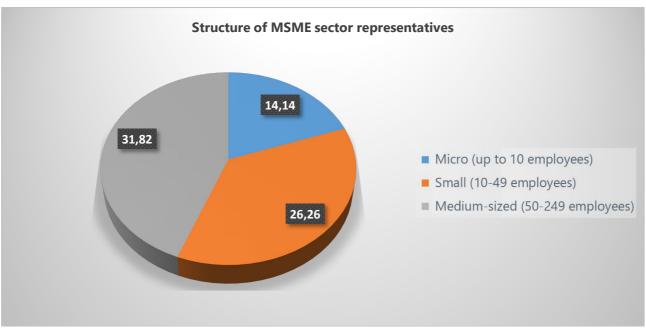


Figure 11 – Graphic representation of the structure of MSME representatives

**2.** To the question on which market the organization operates, the research participants gave the answers shown in Figure 12. Answering this question was mandatory. Four different options were offered and the following results were obtained:

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No.	The organization in which I am employed operates in the following markets:	%
1.	Domestic market	48,73
2.	Domestic market and activities (export) to the European market	22,34
3.	Domestic market, activities (export) to the European and international market	23,35
4.	International market	5,58
	Total:	100,00

Figure 12 – Graphic representation of the structure of respondents according to the markets in which their organizations operate

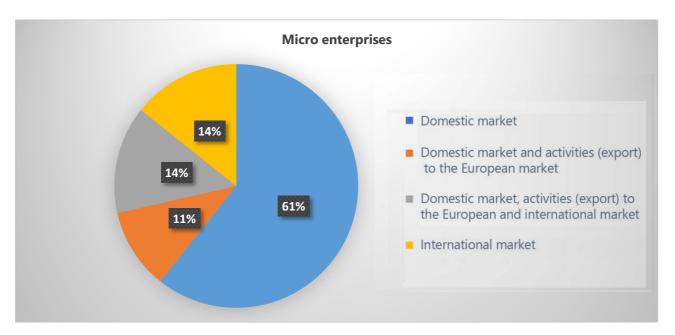
The results show that almost half of all organizations are present exclusively on the domestic market, while slightly more than half are also engaged in export activities to other markets, which probably influenced them to a greater extent to know and apply standards that enable them to be more competitive on foreign markets.

A total of 186 surveyed organizations operate on the domestic market, which represents 94,42% of all respondents, and only a little more than 5% of the enterprises that participated in the research operate exclusively on the international market.

In addition to the Serbian one, a total of 90 surveyed organizations operate on the European market, which represents 45,69% of all respondents, and a total of 57 surveyed organizations are present on the international market, which represents 28,93% of all respondents.

Slightly less than a quarter of organizations (23,35%) operate on the domestic, European and international markets at the same time.

According to the size of the company, the structure of the presence in certain types of markets is shown in the graphs that follow:



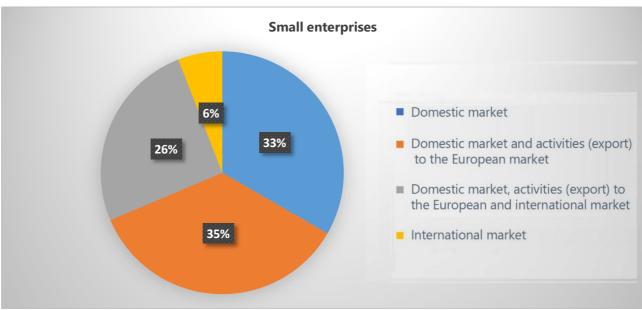
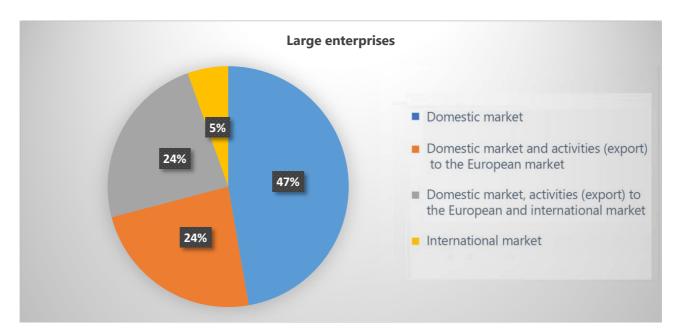


Figure 13 – Graphic representation of the business structure for micro and small businesses according to markets



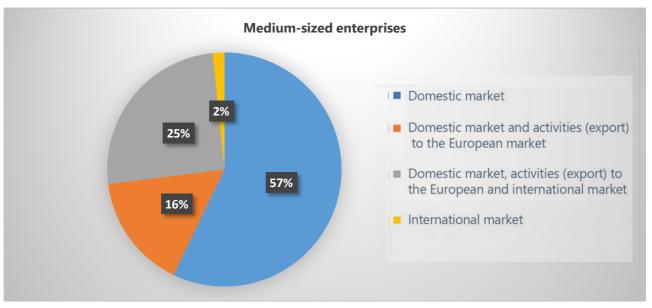


Figure 14 – Graphic representation of the business structure for large and medium-sized enterprises by market

**3.** The participants were invited to declare themselves in relation to the dominant field of business, that is, the activity in which the respondent's organization mainly deals in (multiple answers were offered at the same time), and the answer was not mandatory. To this question, 175 respondents (88,83% of all who participated in the research) gave an answer. A total of 345 responses were recorded, and their structure is given in Figure 15 below:

	The main activity of your	No. of		SI	ME	Large enterprises	
No.	organization is within the following area:	responses	%	Number	%	Number	%
1.	Chemistry and chemical technologies	4	2,03	4	100,00	0	0,00
2.	Construction	17	8,63	17	100,00	0	0,00
3.	Food industry and agriculture	20	10,15	17	85,00	3	0,15
4.	Safety and health at work	6	3,05	6	100,00	0	0,00
5.	Information technology	4	2,03	4	100,00	0	0,00
6.	Wholesale and retail	7	3,55	4	57,14	3	0,43
7.	Electronics	5	2,54	5	100,00	0	0,00
8.	Energy and communal infrastructure systems	12	6,09	7	58,33	5	0,42
9.	Health protection	11	5,58	7	63,64	4	0,36
10.	Mechanical engineering	14	7,11	9	64,29	5	0,36
11.	Mining and metallurgy	4	2,03	2	50,00	2	0,50
12.	Services	30	15,23	27	90,00	3	0,10
13.	Transport and logistics	2	1,02	1	50,00	1	0,50
14.	Public sector	21	10,66	11	52,38	10	0,48
15.	Textile industry and clothes	5	2,54	4	80,00	1	0,20
16.	Telecommunications	13	6,60	3	23,08	10	0,77
17.	No answer selected (other)	22	11,17	14	63,64	8	0,36
	Total:	197	100,00	142	72,08	55	27,92

Figure 15 – Graphic representation of the structure of the respondent's activity

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More than 40% of the respondents indicated that their organizations are engaged in an activity that was not on the list offered. 50 of them additionally gave a description of their activities, and among them the most were service activities (18). The most common description referred to consulting services. A total of 9 organizations mentioned production as an activity (pumps, oil and gas, water, pharmaceutical products and plant protection products), and there were also answers that implicitly pointed to the production activity, such as: automotive industry, metal industry and metal processing industry. In addition, there were more answers related to educational activity (6).

**4.** In the part of the research related to the organizational unit within the organization in which the respondent is employed, the answer was given by all the respondents, of which a total of **161** respondents (or 82% of the respondents) chose one or more of the offered answers, while the rest gave descriptive answers (36 respondents or 18% of respondents). A total of 267 answers were given, of which 210 answers were offered and 57 additional answers, and their general structure is shown in the following table:

No.	Your workplace is located within the following organizational unit:	No. of responses	%
1.	Procurement	14	5,24
2.	Senior management of the organization	102	38,20
3.	Sales and marketing	16	5,99
4.	Research & Development	29	10,86
5.	Production	27	10,11
6.	Supply chain	1	0,37
7.	IT	7	2,62
8.	Human resources	14	5,24
	Responses in TOTAL:	210	78,65
9.	Other	57	21,35
	TOTAL:	267	100,00

Figure 16 – Graphic representation of the organizational units in which the respondents are employed

The largest number of respondents (half of all who participated in the survey) belongs to the top management. The smallest number of respondents (only 1) belongs to the supply chain (in combination with two other organizational units).

There were 16 respondents whose jobs and tasks belong to sales and marketing (about 6% of all participants in the research) and they can be further divided into 8 different groups. In this group, about 19% deal only with sales and marketing, while the rest are also in charge of other organizational units.

Of the respondents whose workplace includes research and development, of which there were a total of 29 (14,72% of all participants in the survey), the majority (more than 65%) are engaged exclusively in research and development, while around 35% of the respondents are also engaged in other areas. There were 27 respondents engaged in production (10,11% of all participants in the research). Only one respondent (0,37% of all survey participants) is employed in the supply chain, but his workplace includes two more areas, namely research and development and production. There were 7 respondents dealing with IT jobs (2,62% of all research participants), and 14 respondents dealing with human resources (7,11% of all research participants).



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#### **SECTION 2: APPLICATION OF STANDARDS**

The second section of the survey was supposed to provide answers as to whether the surveyed organizations use standards as an integral part of their daily business and, if so, which standards they are. Five optional questions were asked from No. 5 to No. 9.

5. The fifth question of the survey was general and related to the **use of standards** of any kind in the business of an organization. Three answers are offered: positive, negative and neutral (in case the respondent is not familiar). All the respondents answered this question, and the largest percentage of them, i.e. 89,85%, answered positively, while about 10% of the respondents answered "No" or "I don't know". From the MSME sector, the highest percentage of organizations that use standards belongs to large enterprises (94,55%), while among organizations that do not use standards, the highest percentage belongs to micro-enterprises (14,29%). In medium-sized organizations, the percentage of those using standards is 92,06%.

No.	Company size	YES		NO		I DON'T KNOW		TOTAL
		Number	%	Number	%	Number	%	TOTAL:
1.	Micro	23	82,14	4	14,29	1	3,57	28
2.	Small	44	86,27	6	11,76	1	1,96	61
3.	Medium	58	92,06	5	7,94	0	0,00	63
4.	Large	52	94,55	2	3,64	1	1,82	55
	Total:	177	89,85	17	8,63	3	1,52	197

Figure 17 – Graphic representation of the application of standards in organizations

**6.** When it comes to the type of standards that are most often in use, i.e. the standard-setting organizations (national organization – Institute, international, European or national organizations of other countries), the largest number of respondents' organizations use international and national standards (about one third). European standards are used by about one fifth of all respondents' organizations. Comparing the obtained data with the data on the markets where the surveyed organizations operate, the results on the type of standards applied are not entirely comparable.

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Namely, if almost half of all organizations are present exclusively on the domestic market, and 94,42% of all organizations on domestic and other markets, the high percentage of use of national, i.e. Serbian standards can be explained considering the existence of technical regulations from certain areas that are referred to on the so-called pure national standards, which, also is not a rare case in other countries of the European Union.

However, if slightly less than half of all respondents are also present on the European market (45.69% of all respondents), the percentage of 19,53% of those who apply European standards is still lower than expected. It is possible that the reason for this is the fact that the largest number of organizations that took part in the survey are from the service sector (whether they chose one of the offered answers for the business sector, or whether they themselves stated in which field they operate), in which , mostly, international standards served as the basis for the adoption of European standards and are therefore more recognizable among the users of the standards. For example, a number of respondents wrote consulting services and educational activity as an answer that they did not recognize among the answers offered for the type of activity their organizations are engaged in, which represents the field of activity of primarily international and then European standardization organizations.

Also, it is possible that the respondents under national SRPS standards also considered those that were adopted on the basis of international and European standards, and that this influenced a greater number of answers in favour of national and international standards.

No.	Which standards are most often used in your organization?	No. of responses	%
1.	National (SRPS)	126	30,00
2.	European (EN or HD)	82	19,53
3.	International (ISO or IEC)	152	36,19
4.	National standards of other countries (DIN, BS, ASTM, ΓΟCT)	36	8,57
5.	Specific standards of the organization	21	5,00
6.	I don't know	3	0,71
	Total:	420	100,00

Figure 18 – A graphic representation of the types of standards used in organizations

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Analyzed according to the size of the organization, national standards are used by about one half of all micro and small enterprises of the respondents, as well as almost two thirds of medium and large enterprises.

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European standards are mostly used by micro and large enterprises (about one half), as well as one third of small and medium-sized enterprises.

International standards are used by the largest percentage of enterprises of all sizes (more than 70% of all surveyed enterprises).

The standards of other countries are mostly used by micro, medium and large enterprises (about one fifth).

A total of 17 respondents (8,63% of all who participated in the survey) did not answer this question. The majority of respondents who did not answer this question belong to the SME sector (5 micro, 4 small and 5 medium enterprises), while two respondents are employed in large enterprises. The answer "I don't know" can be attributed to the fact that those who answered the survey are not familiar with all the elements of the organization's business in the position they occupy.

**7.** Given that the application of standards in the field of management systems is possible in all types of organizations, regardless of their size, way of organization and the activity they are engaged in, among the questions offered was the question about the application of these standards. Five answers were offered, the first three of which related to specific management systems. Due to the possibility of simultaneous application of several management systems, respondents were able to provide a greater number of answers at the same time. Also, the option of a negative answer was offered, i.e. case that standards for management systems are not used in a certain organization.

The results showed that the largest number of respondents' organizations have implemented management systems that were offered in the answers.

This question was answered by 180 respondents (91,37% of survey participants), most of whom use quality management standards in their organizations (80,71%), while 5,44% do not use management standards. Standards for occupational health and safety management (50,76%) and standards for environmental protection management (46,19%) are also ranked quite high, while standards for the information security management system (29,44%) are significantly lower.

All the results of their answers are shown in the following table:

No.	Which management standards are used in your organization?	No. of responses	%
1.	Standards for quality management	159	80,71
2.	Standards for occupational health and safety management	100	50,76
3.	Standards for environmental protection management	91	46,19
4.	Standards for information security management	58	29,44
5.	Other management standards	32	16,24
6.	We do not use management standards	11	5,58
7.	No answer	16	8,12

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Figure 19 – Graphic representation of standards for management systems used in organizations

When specifying other standards for management systems, respondents showed special interest in the following standards:

- Energy management system
- Food safety management system
- Service management system
- Business continuity management system
- Management of information privacy (personal data protection)
- Quality management system for car and spare parts manufacturers
- Facilities and equipment maintenance management (facility management)

Observed according to the size of the organization, the most common use of standards for management systems, regardless of the field, is from large, through medium, small to micro organizations.

**8.** The application of other types of standards, according to the questions offered in the survey, is given in the following table:

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No.	Type of standard	Micro	Small	Medium	Large	Total
1.	Standards for products	11	28	26	26	91
2.	Standards for testing	8	18	35	26	87
3.	Standards for services	9	15	16	20	60
4.	Standards for processes	5	13	17	28	63
5.	Other types of standards	4	1	4	6	15
6.	None	5	4	5	4	18
7.	No answer	5	5	7	3	20

Figure 20 – Graphic representation of other standards used by organizations

Regardless of the size of the organization, the order of the answers also reflects the prevalence of the application of other types of standards: the most frequently used are standards for products (52,9%) and tests (50,6%), and one third of all respondents' organizations use standards for services and processes (about 34%).

By comparing these answers with the answers related to the activities of the organizations, we can conclude that there is consistency. Namely, if you look at the areas in which organizations perform the main part of their activities and when the percentage of organizations dealing with services and those from the public sector are excluded (about one fifth of all organizations), the majority of other organizations explicitly or implicitly belong to the production sector. This picture is not changed even by organizations that did not express their activity through the answers provided, but rather stated it separately.

We should not ignore the fact that of the organizations that answered the previous two questions, 5,58% of them do not use standards for management systems at all, and even 9,14% of organizations declared that they do not use any of the types of standards shown in Figure 20. Looking at the percentage of organizations participating in the survey, the largest number of such organizations belongs to micro enterprises.

**9.** In the part of the survey that considered the use of standards, a question was asked about the importance of applying standards in the organization. The grades were widely ranked - from 1 to 10, and 91.88% of all participants in the research answered this question. A score greater than 5 was given by 88.32% of respondents, and 56.85% of organizations rated the importance of the implementation of the standard with the highest score of 10.

A part of the respondents (75 of them) took the opportunity to describe why they consider the implementation of standards important. We will highlight only some of the answers:

As we mainly produce goods for the foreign market, we are fully committed to product manufacturing, testing, documentation and other things in accordance with standards. Buyers of our products require a product in accordance with the required standard, tested according to the appropriate prescribed or required standards. They are guaranteed a test report according to EN XXX (ed. change). In addition, most buyers require that the company they buy goods from has an ISO 9001 certificate issued by a certification house. All of this influenced our awareness of the application and compliance with standards to be at the highest level.

The basic and most important principle of developing a competitive product is the application of standards.

The largest part of the business is related to testing and control tasks in accordance with the appropriate standards, recommendations, regulations.

Standards are a work tool for us.

The organization is engaged in research and development activities, and compliance with standards and recommendations are the basis for achieving the required performance and sustainability of the process.

Our organization deals with providing services to end users. We take customer satisfaction very seriously. Applying the above standards helped us to raise user satisfaction to the highest level.

The use and application of standards is important for complying with legal regulations and achieving defined goals that bring value to the organization.

The standard enables us to market products on the foreign market.

They are vitally important, but awareness is at the very low level.

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### SECTION 3: MARKET IMPACT OF STANDARDS APPLICATION

10. The third section of the survey referred to the market impact of the implementation of the standard. Organizations were asked to rate from 1 to 6 the given statements related to the impact of the standard on sales, technical barriers to trade and market access.

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Statement	Ознака	Lowest grade (%)	Highest grade (%)
Standards help our organization overcome technical barriers to trade	А	5,08	36,04
Standards create trust among our customers	В	1,52	56,35
Standards simplify communication between suppliers and customers	V	2,03	43,65
Standards improve the quality of our products and services	G	1,52	54,82
Standards increase the compatibility of our products and services with our target market	D	2,03	55,84
Standards simplify the export of our products and services	E	8,12	50,25

Figure 21 – Graphic representation of the responses of organizations regarding the impact of standards on the market

The highest grade, whether only a grade of 6 or a grade higher than 3 is considered, refers to the statements that describe the relationship of the organization with its users (B), their ability to deliver a product or service aligned with the requirements of the target market with the help of standards (D), that is, using standards to improve the quality of their products and services (G).

11. Furthermore, the organizations declared about the impact of the standard on the increase of sales or production and the acquisition of new customers/users, and the ranking was done with marks from 1 to 6, as in the previous question. The answer was given by all organizations, of which about 20% declared that this question was not applicable to them. Of the organizations that gave ratings, 62.44% gave a rating greater than three for the answer under A and 64.47% for the answer

under B. When it comes to the impact that the standards have on the realization of the aforementioned statements, more than 53% of the organizations estimated that the standards had an impact on the increase in production and sales, that is, the acquisition of new customers/users. 5.8% of respondents estimated that the standards did not affect the organization at all.

	Have the standards helped your organization to increase sales (or production in general)?	А		В		V		
No.		No. of responses	In %	No. of responses	In %	No. of responses	In %	
1.	Grade 1	8	4,06	5	2,54	106	53,81	
2.	Grade 2	4	2,03	5	2,54	10	5,08	
3.	Grade 3	13	6,60	15	7,61	9	4,57	
4.	Grade 4	26	13,20	23	11,68	12	6,09	
5.	Grade 5	35	17,77	40	20,30	4	2,03	
6.	Grade 6	62	31,47	64	32,49	10	5,08	
	Not applicable	43	21,83	39	19,80	40	20,30	
	No answer	6	3,05	6	3,05	6	3,05	
7.	Total:	197	100,00	197	100,00	197	100,0 0	

Figure 22 – Graphical representation of responses from organizations regarding the impact of standards on increasing sales/production

**12.** 52 organizations answered the optional question about the importance and role of standards when it comes to the impact on sales/production, access to markets and acquisition of new customers/users. We highlight some answers:

The standard requires a certain business organization from the company that deals with every process from start to finish in order for our end product to be the best possible. Care for the user is a priority, sales are conditional on user satisfaction.

Based on the applied standards and established management systems, customers have greater confidence when purchasing and using our products.

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Applying the standard when ordering a product clearly defines that product with all essential features, which reduces the risk of complaints that could arise due to an error when ordering. Application of standards facilitates communication with regular and new customers. When a new customer receives an offer defined in accordance with the appropriate standard, he can see at the start that he is dealing with a company that knows the standards, operates in accordance with them, which means easier business communication and a quality product in accordance with the required features accompanied by appropriate documentation, which means easier business. Knowledge of the standards and their implementation by the manufacturer create a sense of trust and security in the customer.

Standards are mandatory for cooperation with large trade chains, thus showing seriousness in business.

The application of standards enables us to focus on customer requirements, meet their needs and expectations, by having a certificate we prove that we are competent to carry out tests, standardization affects the maintenance of our reputation, contributes to better communication with clients and an efficient response to resolving complaints and complaints.

Some organizations also gave critical comments on the impact of standards and the state of the domestic market:

Some procedures within the standard have had a negative impact on communication with customers and subsequent sales, because customers more often do business in a non-procedural way and follow the line of least resistance, especially when it comes to products that do not require special legal regulations.

In terms of quality, we sometimes encounter outdated/obsolete standards that limit us because they do not allow new and modern solutions. Also, the standards are often not aligned, so there are problems with entering the market of certain products. The system of adopting standards is quite slow and inert, and due to almost no corrective factor of the state, there are problems in the relationship between the subject of standards and the general social interest. Compatibility with international standards is also important because the domestic market is small and the development of products exclusively applicable in our country is unprofitable and therefore rejecting for the company.

Bad experience on the domestic market in non-compliance with standards.

The experience is such that the customer or partner is only interested in the price (as low as possible) and delivery times!

### SECTION 4: IMPACT OF STANDARDS ON THE EFFICIENCY OF PRODUCTION AND SUPPLY CHAIN AND INNOVATION

Section 4 included questions that contained specific positive statements about the benefits of implementing the standards and how they can affect the production efficiency of the organization and its supply chain.

Statement	Designation
They simplify the procurement and public procurement process	Α
They contribute to cost reduction in the organization's production processes	В
They contribute to cost reduction throughout the supply chain	V
They facilitate the outsourcing of products and services	G
They improve the delivery of products and services	D
Not relevant to my organization	Đ

Figure 23 – Graphic representation of the responses of organizations regarding the impact of standards on production and supply chain efficiency

- 13. 7,11% of respondents said that they believe that the standards do not contribute to reducing costs in the production process, as well as in the entire supply chain. On the other hand, 34,01% of organizations fully agreed with the statement that standards improve the delivery of products and services, and 28,43% of organizations with statements that standards simplify the procurement process, as well as facilitate the procurement of products and services from "outsourcers".
- **14.** The next question was related to the way in which the application of standards affects innovation. Of the six answers offered, the first five related to statements about different aspects on which standards positively affect innovation, while the last answer offered stated the irrelevance of standards in terms of innovation. Respondents answered this question with "*Yes*" and "*No*", depending on whether they positively or negatively evaluated the statements offered. The answers obtained are presented in the following table:

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	How do standards affect ability	Yes		No	•	No	%
No.	or your organization's readiness for innovation?	No. of responses	%	No. of responses	%	answer	70
1.	Application of standards is a good way to follow technical developments	177	89,85	12	6,09	8	4,06
2.	Because of the standards, our organization is prevented from developing innovative technology	12	6,09	175	88,83	10	5,076
3.	Due to the application of standards, our organization can invest more resources in the development of innovative activities	134	68,02	55	27,92	8	4,06
4.	Standards speed up the introduction of new products and services to the market	150	76,14	38	19,29	9	4,57
5.	Standards improve market acceptance of innovations	156	79,19	32	16,24	9	4,57
6.	Innovation is not relevant to my organization	40	20,30	148	75,13	9	4,57

Figure 24 – Graphical representation of organizations' responses regarding the impact of standards on innovation

The largest number of respondents (89,85%) confirmed the statement that standards are a good way to monitor technical development and that they enable the acceptance of innovations on the market (79.19%). A slightly smaller number of respondents (68,02%) agreed with the statement that thanks to the use of standards, the organization can invest more in the development of innovations.

15. The opportunity to express his opinion on whether there is a link between standards and efficiency of production and supply chain, as well as innovation was used by 18,78% of respondents. A negligible number of respondents stated that the question was not applicable to them, while the rest of them pointed out that the standards shorten the production time and reduce the possibility of non-conforming products, then that the testing standards are a guide for the development and application of new technologies, that with the help of the standards the efficiency of the supply is increased, as well as the implementation of new knowledge and technologies.

### SECTION 5: PARTICIPATION OF ORGANIZATIONS IN THE DEVELOPMENT OF STANDARDS

The questions in the fifth section were supposed to provide an answer about the participation of the surveyed organizations or their representatives in the standardization process at the national, European and international level.

Statement	Designation
Standards help organizations comply with regulations	Α
Standards help to reduce my organization's environmental impact	В
Standards reduce occupational safety and health risk in my organization	V
Standards help reduce product quality risks	G
The standards help my organization better manage subcontractor quality	D

Figure 25 – General statements about the standards that the respondents declared

**16.** At the beginning of the section, organizations were given the opportunity to comment on the proposed general statements on standardization. The respondents expressed the degree of agreement numerically, with grades from 1 to 6, whereby the grades were ranked in ascending order. The lowest score of 1 indicated the statement "disagree", while the highest score of 6 indicated the statement "strongly agree". The largest number of organizations responded positively to the statements offered, which can be seen from the presentation in Figure 26.

		Α		В		V		G		D	
No.	Ranking	No. of response s	%	No. of response s	%	No. of response s	%	No. of responses	%	No. of responses	%
1.	Grade 1	1	0,51	7	3,55	5	2,54	2	1,02	4	2,03
2.	Grade 2	2	1,02	5	2,54	2	1,02	3	1,52	6	3,05
3.	Grade 3	10	5,08	17	8,63	11	5,58	9	4,57	16	8,12
4.	Grade 4	14	7,11	19	9,64	20	10,15	13	6,60	21	10,66
5.	Grade 5	43	21,83	49	24,87	51	25,89	49	24,87	46	23,35
6.	Grade 6	121	61,42	94	47,72	102	51,78	115	58,38	98	49,75
Respo	onses in total:	191	96,95	191	96,95	191	96,95	191	96,95	191	96,95
7.	No answer:	6	3,05	6	3,05	6	3,05	6	3,05	6	3,05
	TOTAL:	197	100,00	197	100,00	197	100,00	197	100,00	197	100,00

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### Figure 26 – Graphic representation of the ranking of general statements about standards

17. According to the answers to the question whether their organization participates in the work of NTCs/TCs received from 190 organizations, less than half of them (42,13%) participate in national standardization, i.e. in the work of the Institute for Standardization of Serbia, 9,14% of organizations participate in European standardization and 9,64% in international standardization. A small number of respondents declared that they do not know whether their organizations participate in the standardization process, but even if there are those among them who are involved in the standardization process, it would not significantly affect the obtained result, which shows a relatively low level of involvement in standardization.

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**18.** If they gave a positive answer to the previous question, the respondents were asked about the main reasons for their organization's participation in the work of standards commissions. Considering that there may be several important reasons for involvement in the work on the adoption of standards, it was allowed to give several answers at the same time. An addition to this question was an "Other" option.

No.	Statement	SME %	Large enterprise %
1.		23,94	54,55
2.	Ability to influence standards in the area in which the organization operates	10,56	21,82
3.	Ability to influence standards at the organizational level	24,65	34,55
4.	Early access to strategic information – the ability to predict changes	12,68	16,36
5.	Gaining access to business information that would not otherwise be available	26,76	32,73
6.	Networking with other experts (at national/European/global level)	38,73	43,64

Figure 27 – Graphic representation of responses regarding the reasons for participation in the Institute's NTCs

When observed according to the size of the organizations, the main reason for participation in standardization is different. For large companies, it is the possibility to influence the development of standards in the areas in which the organization operates (54,55%), and for organizations belonging to the sector of small and medium-sized enterprises, it is the exchange of experience and knowledge with others (38,73%). The other three most important reasons for the participation of small and medium-sized enterprises in standardization are connecting with other experts, the possibility of predicting changes thanks to early information, as well as influencing the development of standards in areas of interest to the organization. In large companies, sharing experience and knowledge and connecting with other experts is also second in importance, and then the ability to predict changes due to having information from developing standards.

19. The largest number of respondents, 46,09% of them, stated that they are representatives of their organization who participate in the work of national technical committees for standards, and then also in the work of European and international technical committees. A smaller number of them answered that they participate in the work of the national technical committees out of personal interest – 16,52%. 13,04% of respondents expressed interest in working in national technical committees, but almost twice as many of them explicitly stated that they were not interested in participating in the work of committees.

The largest number of respondents who are also representatives of their organizations national technical committees are from large companies (56,25%), followed by medium, small and micro companies. When it comes to engagement on a voluntary basis and out of personal interest, the largest number of respondents belongs to the category of micro enterprises (25%), followed by large, medium and small enterprises.

- **20.** Both categories of respondents participate to the greatest extent in the development of standards at the national level. Also, of the respondents who showed an interest in engaging in standardization, the majority were representatives of medium-sized companies (18,42%), but there were many more representatives of organizations of all sizes who stated that they were not interested in participating as experts in the development of standards at the moment.
- **21.** The opportunity to describe their experience in the development of standards was used by 15 respondents.

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### **SECTION 6: APPLICATION OF STANDARDS IN PRACTICE**

In the last, sixth section, the respondents declared and evaluated the practical application of the standards.

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22. When it comes to determining the main motives for using standards in the respondents' organizations, eight reasons were offered that relate to various aspects of business improvement. 191 answers were received (96,95% of respondents who participated in the research).

The largest number of respondents (40,61%) recognized the improved quality of products or services as the main reason for implementing standards in their organization. Reasons such as risk reduction (18,27%) and easier access to the market (13,20%) are present in a much smaller percentage. The size of the organization did not affect the choice of answers, as representatives of organizations of all sizes answered this question in a similar way.

No.	What would you say are the most important reasons why your organization uses standards?	%
1.	Easier access to the market (export)	13,20
2.	Risk reduction (accidents, production errors, social responsibility)	18,27
3.	Improved quality of the product/service	40,61
4.	Increased efficiency (saving time, reduced number of errors, common standards with subcontractors)	7,11
5.	Improved environmental performance	1,02
6.	Improved ability to keep up with the technical developments	4,06
7.	Improved internal communication	3,55
8.	Improved competencies of employees	9,14
9.	No answer	3,05

Figure 28 – Graphic representation of reasons for using standards in organizations

**23.** The application of standards certainly causes certain costs, therefore the respondents had the opportunity to state which costs they associate as dominant with the application of standards in their organizations.

No.	There are costs associated with purchasing, implementing and complying with the standards.  Which of these costs is dominant in your organization?	Designation	%
1.	Purchasing standards	A	14,72
2.	System and process change	В	11,68
3.	Customization of products and services	V	15,23
4.	Employee training	G	8,63
5.	Certification and compliance	D	46,70
6.	No answer	-	3,04
	Total:		100,00

Figure 29 – Graphic representation of the responses related to the costs of implementing the standard

Almost half of all survey participants (46,70%) identified the certification process as an important activity related to the implementation of standards that requires the highest costs. Then there are the costs associated with adapting products and services, purchasing the necessary standards, and changing systems and processes. According to respondents, employee training related to the application of standards is not associated with higher costs for organizations.

For micro-enterprises, it is worth mentioning that the costs associated with the certification process are almost identical to the costs of acquiring standards. In the case of small companies, the relationship is slightly different, but the costs of purchasing standards are still high. However, if we look at medium and large enterprises, the costs of certification greatly prevail in relation to the costs of purchasing standards.

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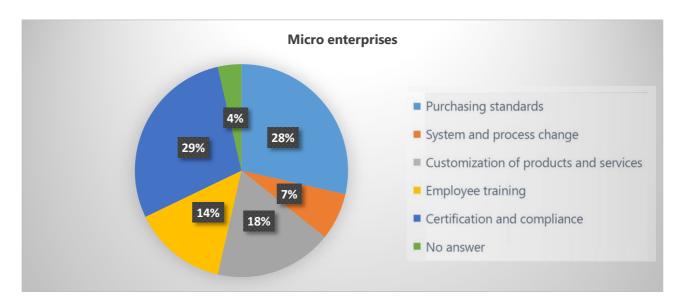


Figure 30 – Costs of standardization in micro enterprises

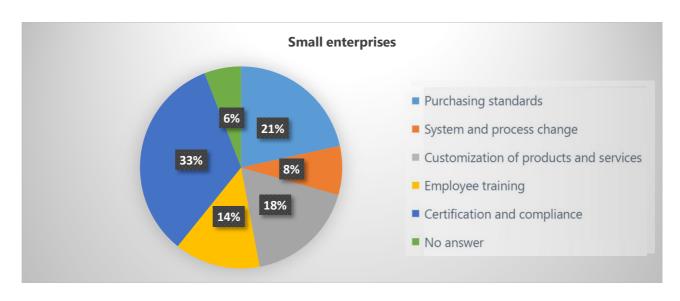
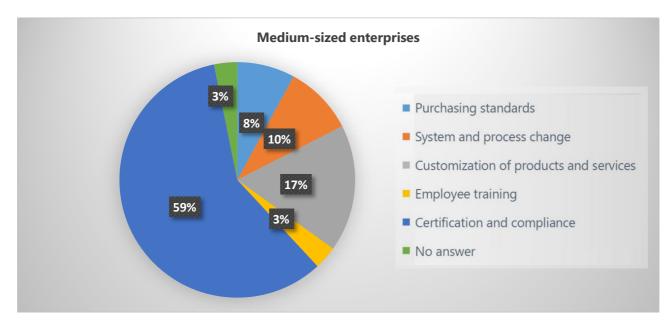


Figure 31 – Costs of standardization in small enterprises



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Figure 32 – Costs of standardization in medium-sized enterprises

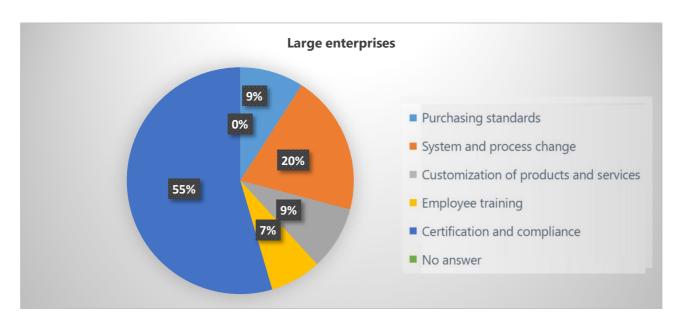


Figure 33 – Costs of standardization in large enterprises

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**24.** Organizations that are potential users of standards, i.e. those whose representatives answered "No" and "I don't know" when asked whether their organization uses standards (10% of all surveyed organizations), were asked about knowledge of standards in general. Namely, the organization's knowledge of standards at different regional levels (international, European, national ...) was checked, as well as standards for management systems that are most widely used and other technical standards.

No	Designation of the statement		I've never heard of that		I've heard of it, but I'm not familiar with it		I have basic knowledge about it		amiliar th it
•	Please indicate whether you are familiar with the following standards	Number	%	Number	%	Number	%	Number	%
1.	National (SRPS)	10	5,08	8	4,06	14	7,11	74	37,56
2.	European (CEN or CENELEC)	16	8,12	19	9,64	18	9,14	41	20,81
3.	International (ISO or IEC)	1	0,51	9	4,57	12	6,09	86	43,65
4.	National standards of other countries (DIN, BS, ASTM, FOCT)	9	4,57	25	12,69	22	11,17	43	21,83
5.	Specific standards of the organization	15	7,61	23	11,68	22	11,17	40	20,30
6.	I'don't know	17	8,63	2	1,02	2	1,02	2	1,02

Figure 34 – Graphic representation of knowledge of standards in organizations that do not use them in their business

The largest number of organizations answered that they were familiar with the standards, and the largest percentage of them (43.65%) with the standards of international organizations for standardization (ISO or IEC), followed by Serbian standards (37.56%), and an almost equal percentage of them knows European and national standards of other countries, as well as standards specific to individual organizations. When it comes to complete ignorance of the mentioned types of standards, the highest percentage of respondents showed that in relation to European standards, standards specific to the organization, as well as in relation to national standards and standards of other countries.

**25.** In the next question, potential users of the standards were checked regarding their knowledge of specific types of standards. Five answers were offered, of which the first four related to specific types of management system standards, while the last offered answer included various general groups of standards.

	Designation of the statement	I've never heard of that		I've heard of it, but I'm not familiar with it		I have basic knowledge about it		l am familiar with it	
No.	Please indicate whether you are familiar with the following standards	Numbe r	%	Number	%	Number	%	Number	%
1.	Standards for quality management	2	1,02	11	5,58	13	6,60	92	46,70
2.	Standards for occupational health and safety management	1	0,51	21	10,66	18	9,14	74	37,56
3.	Standards for environmental protection management	1	0,51	21	10,66	22	11,17	70	35,53
4.	Standards for information security management	6	3,05	32	16,24	23	11,68	53	26,90
5.	Standards for processes, products, services, testing	6	3,05	20	10,15	21	10,66	65	32,99

Figure 35 – Graphic representation of knowledge of standards for management systems and technical standards in organizations that do not use them in their business

In this case too, the respondents showed that they are mostly familiar with management system standards, but also with other types of standards related to processes, products, services and tests. Among the management system standards, the most recognizable are the standards for the quality management system, and the least known are the standards for the information security management system.

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**26.** The next question related to the reasons for which, according to respondents, their organizations do not use standards. Five possible reasons have been offered.

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No.	What, in your opinion, is the main reason why your organization is not currently using the standards?	Designation	No. of answers	%
1.	Lack of knowledge about the existence of standards	Α	7	3,55
2.	Lack of understanding of the benefits that standards can have for your organization	В	11	5,58
3.	Lack of financial resources for investment in procurement and application of standards	V	16	8,12
4.	Lack of human resources to deal with the implementation of standards	G	11	5,58
5.	The standards are not relevant to your organization or the area in which it operates	D	10	5,08

Figure 36 – Graphic representation of the reasons why standards are not yet used in organizations

The financial reason, i.e. the impossibility of investing in the procurement and implementation of standards, was cited by the largest number of organizations of potential users of the standards (8,12%), and an almost equal percentage of respondents cited a lack of understanding of the benefits of the standards as the reasons why the standards are not applied in their organization, lack of human resources or the relevance of standards for the organization's operations. The smallest percentage of them rated insufficient knowledge of the standards as the reason why they are not applied. The largest number of organizations that cited financial reasons as the key reason for not applying the standards belong to small companies, the same number of medium-sized companies opted for financial reasons and insufficient recognition of the benefits of applying the standards. In large companies, the lack of human resources was highlighted as the reason why the standards are not applied.

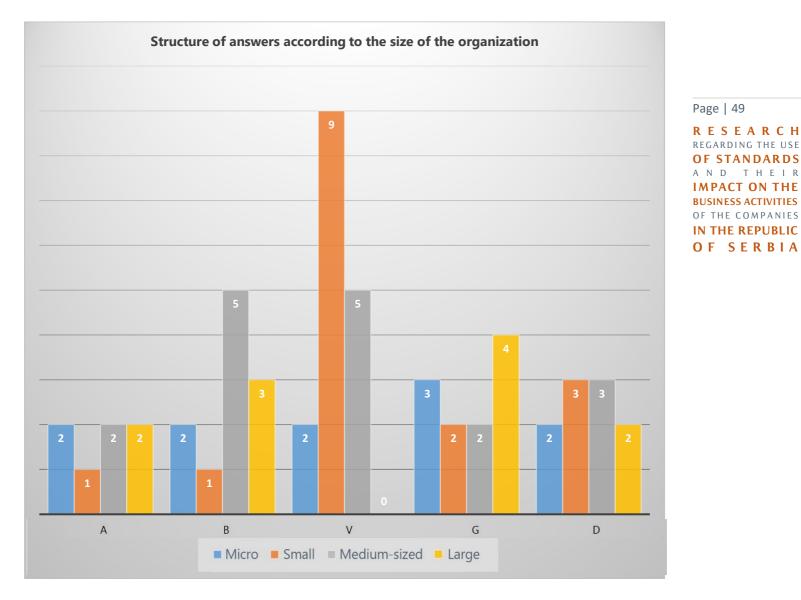


Figure 37 – Graphic representation of answers to question 26 according to the size of the organization

### **Conclusion**

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The analysis we carried out aimed to show how much, in general, and then in relation to the size and the sector in which they operate, business entities in the Republic of Serbia are aware of the strategic impact of the application of standards on business, as well as what their experiences are in the application of standards, the reasons for which they participate or do not participate in the standards adoption process. The analysis also helped to gain insight into the knowledge of standards and standardization among those organizations that declared that they do not apply standards in their operations.

In the sample of 197 organizations that participated in the survey, the largest number of them belong to the sector of micro, small and medium enterprises, among which the most numerous are medium-sized organizations. Almost half of all organizations are present exclusively on the domestic market, while slightly more than half are also engaged in export activities to other markets. When we talk about the business areas of individual organizations, the largest number of them are service providers, followed by organizations from the public sector, food industry and agriculture, construction, telecommunications, energy and communal infrastructure systems, etc.

Close to 90% of surveyed organizations stated that they use standards in their operations. Quite expectedly, the standards for management systems were most often used, namely for the quality management system, and then for other management systems.

As values that the organization obtains through the application of standards, the relationship between the organization and its users, the ability to deliver a product or service that is aligned with the requirements of the target market, as well as the improvement of the quality of products and services are most often highlighted. Also, when looking at the market impact of the application of standards, the largest number of organizations pointed out that standards create trust among their users/customers, as well as that by using standards they improve the quality of their products and services. When it comes to the application of standards in practice, the largest number of respondents recognized the improved quality of products or services as the main reason for the application of standards in their organization, while in a much smaller percentage there are reasons such as risk reduction and easier access to the market.

Looking at the relation between standards and innovations, organizations confirmed the statement that standards are a good way to monitor technical development, that they enable the acceptance of innovations in the market, and that thanks to the use of standards, the organization can invest more resources in the development of innovations.

Of particular importance are the results that show the participation of the surveyed organizations in the process of development and adoption of standards, i.e. in the work of the ISS NTCs and international or European technical committees. At the very beginning of this analysis, when we talked about the number of organizations that through their representatives participate in the work of national technical committees, we pointed out that in relation to the total number of economic entities operating in the RS, the number of those who are members of national technical committees would have to be much bigger. The results of the survey confirmed that less than half of the surveyed organizations are involved in the process of development and adoption of standards, and the largest percentage are representatives of large organizations. This is an important indicator to which the Institute will certainly react by strengthening its activity to promote work on standardization.

What determines an organization to participate in the standardization process differs in relation to the size of the organizations. For large companies, it is the possibility to influence the development of standards in the areas in which the organization operates, and for organizations belonging to the sector of micro, small and medium enterprises, it is primarily the exchange of experience and knowledge with others.

The implementation of the standards implies certain costs for the organization. The question of the justification of selling standards is often raised among users, i.e. advocates the approach that standards should be available at cheaper prices or even for free. However, the survey found that nearly half of organizations identified certification and compliance costs as the dominant costs associated with implementing standards. In the case of micro and small enterprises, the ratio of the costs of certification does not exceed the costs of purchasing standards by much, while the difference is much more pronounced in the case of large and medium-sized enterprises.

Finally, the analysis showed that there are at least 10% of organizations that we can see as potential users of the standard in the future. They declared that they are most familiar with international and national, Serbian standards, primarily with management system standards, especially quality management. As the reason why organizations still do not apply standards, the lack of financial resources for the purchasing and implementation of standards is most often mentioned, followed by lack of understanding of the benefits of standards, lack of human resources or the relevance of standards to the organization's business.

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# SURVEY ON THE USE OF STANDARDS AND THEIR IMPACT ON THE BUSINESS OF THE ORGANIZATION

**SECTION 1: BASIC INFORMATION** 

- 1. The organization in which I am employed is of the following size: (one reply)
  - a) Micro (up to 10 employees)
  - b) Small (10–49 employees)
  - v) Medium (50–249 employees)
  - g) Large (250+ employees)
- 2. The organization in which I am employed operates in the following markets: (one reply)
  - a) Domestic market
  - b) Domestic market and activities (export) to the European market
  - v) Domestic market, activities (export) to the European and international market
  - g) International market
- 3. The main activity of your organization is within the following areas: (one reply)
  - a) Chemistry and chemical technologies
  - b) Construction
  - v) Food industry and agriculture
  - g) Safety and health at work

- d) Information technology
- e) Wholesale and retail
- ž) Electronics
- z) Energy and communal infrastructure systems
- i) Health protection
- j) Mechanical engineering
- k) Mining and metallurgy
- l) Services
- m) Transport and logistics
- n) Public sector
- o) Textile industry and clothes
- p) Telecommunications
- r) Other (please describe):

### 4. Your workplace is located within the following organizational unit:

(multiple replies are allowed)

- a) Procurement
- b) Senior management of the organization
- v) Sales and marketing
- g) Research & Development
- d) Production
- e) Supply chain
- ž) IT
- z) Human resources
- i) Other: (please describe)

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### **SECTION 2: APPLICATION OF STANDARDS**

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5. Does your organization use standards in business operations (for example: SRPS, EN, ISO, IEC...)? (one reply)

- a) Yes  $\rightarrow$  go to No. 6
- b) No  $\rightarrow$  go to No. 24
- v) I don't know → go to No. 24
- **6.** Which standards are most often used in your organization? (multiple replies are allowed)
  - a) National (SRPS)
  - b) European (EN or HD)
  - v) International (ISO or IEC)
  - g) National standards of other countries (DIN, BS, ASTM, ΓΟCT ...)
  - d) Specific standards of the organization
  - e) I don't know
  - ž) Other (please describe):
- 7. Which management standards are used in your organization? (multiple replies are allowed)
  - a) Standards for quality management
  - b) Standards for occupational health and safety management
  - v) Standards for environmental protection management
  - g) Standards for information security management
  - d) We do not use management standards
  - e) Other management standards (please indicate)

8. What types of other standards are used in your organization?

(multiple replies are allowed)

- a) Standards for products
- b) Standards for testing
- v) Standards for services
- g) Standards for processes
- d) None
- e) Other standards (please indicate):
- 9. On a scale of 0 to 10, how important are the use and application of standards in your organization? (evaluate and explain)

### **SECTION 3: SALES, MARKET AND TRUST OF THE CUSTOMERS**

- 10. The following questions include statements about how standards affect sales, technical barriers to trade, and market access. Please indicate whether you agree or disagree. (answer ranking: 1 = 1 do not agree; 6 = strongly agree)
  - a) Standards help our organization overcome technical barriers to trade
  - b) Standards create trust among our customers
  - v) Standards simplify communication between suppliers and customers
  - g) Standards improve the quality of our products and services
  - d) Standards increase the compatibility of our products and services with our target market
  - e) Standards simplify the export of our products and services

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- 11. Have the standards helped your organization to increase sales (or production in general)? (answer ranking: 1 = 1 do not agree; 6 = strongly agree; + = not applicable)
  - a) Standards have helped my organization increase sales/production
  - b) Standards have helped my organization acquire new customers/users
  - v) Standards have not helped my organization at all
- 12. Optional: Describe the importance and role of standards in sales, market access and customer access. What is the experience of your organization? (text field; reply is not obligatory)

### **SECTION 4: PRODUCTION, SUPPLY CHAIN EFFICIENCY AND INNOVATIONS**

13. The following questions provide statements about the benefits of implementing standards and how they can affect production efficiency in your organization and its supply chain. Please indicate whether you agree or disagree.

(answer ranking: 1= I do not agree; 6 = strongly agree)

- a) They simplify the procurement and public procurement process
- b) They contribute to cost reduction in the organization's production processes
- v) They contribute to cost reduction throughout the supply chain
- g) They facilitate outsourcing of products and services
- d) They improve the delivery of products and services
- e) Not relevant to my organization

### 14. How do standards affect ability or your organization's readiness for innovation?

(answer with: Yes/No)

- a) Application of standards is a good way to follow technical developments
- b) Due to the application of standards, our organization is prevented from developing innovative technology
- v) Due to the application of standards, our organization can invest more resources in the development of innovative activitie
- g) Standards speed up the introduction of new products and services to the market
- d) Standards improve market acceptance of innovations
- e) Innovation is not relevant to my organization

## 15. Optional: Please describe your experience and role of standards in production, supply chain efficiency and innovation in your organization?

(text field; answer is optional)

### **SECTION 5: DEVELOPMENT OF STANDARDS**

## 16. The following questions list some of the general statements about standards and standardization. Please indicate whether you agree or disagree.

(answer ranking: 1= I do not agree; 6 = strongly agree)

- a) Standards help organizations comply with regulations
- b) Standards help to reduce my organization's environmental impact
- v) Standards reduce occupational safety and health risk in my organization
- g) Standards help reduce product quality risks
- d) The standards help my organization better manage subcontractor quality

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17. Does your organization participate in standardization (in the work of NTCs/TCs)?

(answer: Yes/No/I don't know)

If the answer is "Yes" in any of the above cases, go to No. 18, otherwise, go to No. 22

- a) At the national level (ISS)
- b) At the European level (CEN or CENELEC)
- v) At the International level (ISO or IEC)
- **18.** What are the main reasons for your organization's participation in the work of NTCs? Multiple responses are allowed.
  - a) Ability to influence standards in the area in which the organization operates
  - b) Ability to influence standards at the organizational level
  - v) Early access to strategic information the ability to predict changes
  - g) Gaining access to business information that would not otherwise be available
  - d) Networking with other experts (at national/European/global level)
  - e) Sharing experiences and knowledge with others
  - ž) Other (please describe):
- 19. Do you participate as an expert in the development of standards? (single answer question)
  - a) Yes, I do it on a voluntary basis and out of personal interest → Go to No.20
  - b) Yes, I am the representative of my organization in the NTCs → Go to No. 20
  - v) No, but I am interested in learning more about this opportunity. Please enter your email address: . . . . . . . . → Go to No.22
  - g) No, and I'm not interested at this time → Go to No.22

[Question 20 is only for respondents who choose an answer under 19a or 19b]

[Question 20 is only for respondents who choose an answer under 19a) or 19b)]

### 20. I participate in the development of standards on:

- a) National level (ISS)
- b) European level (CEN or CENELEC)
- v) International level (ISO or IEC)

### 21. Optional: describe your experience in participating in standards development:

[Text field; the answer is optional]

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### **SECTION 6: APPLICATION OF STANDARDS**

### 22. What would you say are the most important reasons why your organization uses standards? (multiple answers question)

- a) Easier access to the market (export)
- b) Risk reduction (accidents, production errors, social responsibility ...)
- v) Improved environmental performance
- g) Increased efficiency (saving time, reduced number of errors, common standards with subcontractors ...)
- d) Improved environmental performance
- e) Improved ability to keep up with the technical developments
- ž) Improved internal communication
- z) Improved competencies of employees
- i) Other (please describe):

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### 23. There are costs associated with purchasing, implementing and complying with the standards. Which of these costs is dominant in your organization? (single answer)

- a) Purchasing standards
- b) System and process change
- v) Customization of products and services
- g) Employee training
- d) Certification and compliance
- e) Other (please indicate):

### 24. Please indicate whether you are familiar with the following standards:

(possible answers: 1 = 1've never heard of that, 2 = 1've heard of it, but I'm not familiar with it, 3 = 1 have basic knowledge about it, 4 = 1 am familiar with it)

- a) National (SRPS),
- b) European (CEN or CENELEC)
- v) International (ISO or IEC)
- g) National standards of other countries (DIN, BS, ASTM, GOST...)
- d) Specific standards of the organization
- e) I'don't know
- ž) Other, describe:

### 25. Please indicate whether you are familiar with the following standards:

(possible answers: 1 = 1've never heard of that, 2 = 1've heard of it, but I'm not familiar with it, 3 = 1 have basic knowledge about it, 4 = 1 am familiar with it)

- a) Standards for quality management
- b) Standards for occupational health and safety management
- v) Standards for environmental protection management
- g) Standards for information security management
- d) Standards for processes, products, services, testing
- e) Other management standards, please indicate:

### 26. What, in your opinion, is the main reason why your organization is not currently using the standards? (multiple answers question)

- a) Lack of knowledge about the existence of standards
- b) Lack of understanding of the benefits that standards can have for your organization
- v) Lack of financial resources for investment in procurement and application of standards
- g) Lack of human resources to deal with the implementation of standards
- d) The standards are not relevant to your organization or the area in which it operates
- e) Other reasons, please indicate:

### 27. If you would like to find out more about how the standards can help your organisation, please enter your name, email address and telephone number so that we can contact you.

Name and surname	
E-mail	
Phone	

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