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# **P R E F A C E**

*If we start from the well-known dictum "things are changing so fast, we do not have time to change," then this is the time where dictum has the right stronghold. The question arises why? Because we are in a chaos of permanent happenings.*

*A large number of migrants that nobody anticipated, the Ukrainian crisis, unrest in Syria and terrorist attacks create additional troubles, and there is increased tensions between the countries and creates additional uncertainty and economic problems.*

*In the field of standardization we have a lot of changes, primarily the acceptance of the new version ISO 9001: 2015 and ISO 14001: 2015, where committee members that wrote the new requirements of standard believe that will contribute to a visible improvement of the business, but there are those who think differently.*

*In the future there will be a lot of work for the organization, especially for those who participate in changes in order to go to meet the new challenges. It is one of the real ways survival organization in the market.*

*Scientific conference QUALITY SYSTEM CONDITIONS FOR SUCCESSFUL BUSINESS AND COMPETITIVENESS organized by the Association for Quality and Standardization of Serbia, Faculty of Business Economics and Entrepreneurship, High Business School of professional studies "Prof. Dr. Radomir Bojković", Center for Quality of Faculty of Engineering sciences in Kragujevac, Center for quality of Faculty of Mechanical Engineering in Podgorica and Middle and Southeast Europe Quality Initiative with the support of the Ministry of Defence of the Republic of Serbia gives full contribution to the promotion of improving the quality infrastructure in Serbia and the region.*

*Papers published in this Proceedings provides an opportunity for entrepreneurs and managers in the public sector to find the right strategy, policy, defining goals, especially in the field of quality management system, environmental management system, health and safety at work management system, thereby strengthening its competitive position and increase customer-citizens satisfaction.*

*Round table discussion WHAT DO WE GET WITH THE NEW STANDARDS gives an opportunity in the public discussion about new standard requirements, and we can see what advantages and disadvantages (future problems) are, bearing in mind that the discussion involved experts consultants, auditors and representatives from neighboring countries.*

*Round table discussion MODERN SUCCESS FORMULA shows that people – human resources are key for success. For the Republic of Serbia is important to put human and other resources at the service of business improvement, because these resources are currently unexploited.*

*On behalf of the Organizing Committee of the XVII National and III International scientific conference to thank to all authors and co-authors of articles, co-organizers, sponsors, and all those who have support, participants from Serbia and abroad who have helped to make this event successfully..*

*President of the Organizing Committee*

*Professor Zoran Punoševac PhD*

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## QUALITY SYSTEM CONDITIONS FOR SUCCESSFUL BUSINESS AND COMPETITIVENESS

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*Rad po pozivu*

# OVERVIEW OF THE DEVELOPMENT OF REVISION OF THE STANDARD ISO 9000 AND ITS INFLUENCE ON THE REVISIONS OF ISO 9001 STANDARD

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**Abstract:** Through out history, it is evident that the need for standards appeared very early, that the standards throughout that time were constantly improving the development of the following overall market, and although their use in organizations is not mandatory, in the business world without them is not possible to survive on the market. Standard ISO 9001 and its quality management systems is one of the most applied standard for certification in the business world. With the development of society, organizations and business concepts there is a constant need for the development of standards, not only for certification but also other standards of the same grade. These changes do not occur at the same time, so it can be argued that revisions of certain norms affect significantly the development of ISO 9001 according to which the quality management systems are certified. On the development of the ISO 9001 standards is affected by the standard of the same grade, ISO 9000. ISO 9000 defines the terminology and basic. Through the years, these standard has been developed to support the standard ISO 9001. In the revisions of this standard there are visible changes in her contents, which was a reflection of the newly emerging market demands and the needs of the business world. These changes influenced the development of the ISO 9001 standard that it became a basic standard for quality management systems for any organization that wants to improve their business operations and become more competitive in the market.

**Keywords:** ISO standards, revision of the standards, quality management systems, certification

**JEL Classification:** M 21, Business Economics

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## 1. INTRODUCTION

Because of the development of industry and trade on the market were found many products intended for satisfying different needs and requirements of customers. Due to the increasing number of products and services on the market, the expectations of customers in terms of quality become higher. In order to survive on the market and maintain strong economic performance, organizations should implement more efficient and effective systems that will lead to continuous improvement of quality and continuous increase in customer satisfaction. As a response to market demand appeared standards that determined the requirements for the control of products and global expansion of the market has shown a need for international merger and integration of experiences and knowledge by creating an organization that would contribute to the coordination among the states.

The need for more effective and efficient systems has led to the emergence of a series of standards ISO 9000 which specified the requirements for the application, implementation and improvement of these systems.

In 1986 was published standard ISO 8402, which defined the basic and main terms relating to quality. In 1987 was published ISO 9000 standard which has provided organizations guidelines for the selection and use of standards ISO 9001, ISO 9002 and ISO 9003. In order to allow the users easier understanding of the concepts and definitions of quality and the actual implementation of series of standards ISO 9000, the standards over the years supplemented and changed in accordance with the requirements of the market

## 2. OVERVIEW OF THE DEVELOPMENT OF REVISION OF THE STANDARD ISO 9000

In the time from 1986 to 2000, applied the ISO 8402<sup>3</sup> standard that explained the basic concepts related to quality. In 1987 was used the standard ISO 9000<sup>4</sup>, which provided guidelines for the selection and use of ISO 9001, ISO 9002 and ISO 9003. In 1993, was used the standard ISO 9000 which through its four component parts ( ISO 9000-1, ISO 9000-2, ISO 9000-3 and ISO 9000-4 ) provided guidance for elements of management and quality assurance as well as guidelines for the selection and application of the standards ISO 9001, ISO 9002 and ISO 9003<sup>5</sup>.

The standard ISO 9000, in the next revision which took place in 1994, was still consisted of four parts. In this edition the purpose of the standard was to provide guidance to organizations for management and quality assurance as well as providing guidelines for the selection and implementation of ISO 9001, ISO 9002 and ISO 9003. The first part of ISO 9000 (ISO 9000-1<sup>6</sup>) is significantly expanded and includes terms for the implementation of standards that are not listed in the previous edition of ISO 9000 in 1987. Added concepts are essential for the understanding and use of standards from series ISO 9000.

The standard ISO 9000, in the next revision which took place in 1997, was still consisted of four parts. In this edition the purpose of the standard was to provide guidance to organizations for management and quality assurance as well as providing guidelines for the selection and implementation of ISO 9001, ISO 9002 and ISO 9003. The third part of ISO 9003 (ISO 9000-3<sup>7</sup>) standard sets the guidelines for the application of ISO 9001 for development, supply, installation and maintenance of computer software.

In the next revision of ISO 9000<sup>8</sup> which was in the year 2000, the ISO 9000 which was consisted of four parts ( ISO 9000-1, ISO 9000-2, ISO 9000-3 and ISO 9000-4 ) has been replaced by ISO 9000 entitled *Quality Management Systems - Fundamentals and vocabulary*. This edition of the standard explains the eight basic principles that can be used to improve the performance capabilities of the organization.

In addition to the basic principles, new to this edition of the standard is to encourage organizations to use the process approach for management of the organization.

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<sup>3</sup> ISO 8402:1986 Quality – Vocabulary

<sup>4</sup> ISO 9000:1987 Quality management and quality assurance standards - Guidelines for selection and use.

<sup>5</sup> ISO 9000-2:1993 Quality management and quality assurance standards: Part 2: Generic guidelines for the application of ISO 9001, ISO 9002 and IS 9003

<sup>6</sup> ISO 9000-1:1994 Quality management and quality assurance standards: Part 1: Guidelines for selection and use

<sup>7</sup> ISO 9000-3:1997 Quality management and quality assurance standards:Part 3: Guidelines for the application of ISO 9001:1994 to the development, supply, installation and maintenance of computer software

<sup>8</sup> ISO 9000:2000 Quality management systems – Fundamentals and vocabulary



In the following revision of ISO 9000<sup>9</sup> in 2005 were added the definitions of terms necessary for the application of the other standards from series ISO 9000. In this edition of the standard are specified eight fundamental quality management principles which form the basis of a series of quality management system ISO 9000. In this standard is also stated the importance of the process approach for the management of the organization. The table lists the revisions of ISO 9000 standards from 1986 to 2005.

**Table 1. The revisions of ISO 9000 standard**

YEAR	ISO STANDARD	NAME OF THE STANDARD	QUALITY CONCEPTS
1986.	ISO 8402	<i>Quality - Vocabulary</i>	<i>Basic terms relating to quality</i>
1987.	ISO 9000	<i>Quality management and quality assurance standards - Guidelines for selection and use.</i>	<i>Quality management, internal quality assurance and quality control</i>
1993.	ISO 9000	<i>Quality management and quality assurance standards: Part 1: Guidelines for selection and use Part 2: Generic guidelines for the application of ISO 9001, ISO 9002 and IS 9003 Part 3: Guidelines for the application of ISO 9001 to the development, supply and maintenance of software Part 4: Guide to dependability programme management</i>	<i>Quality management, internal quality assurance and quality control</i>
1993.	ISO 9000-4	<i>Quality management and quality assurance standards – Part 4: Guide to dependability programme management</i>	<i>Dependability programme through planning, organizing , directing and controlling resources for the production of a reliable and sustainable product</i>
1994.	ISO 8402	<i>Quality management and quality assurance - Vocabulary</i>	<i>Total quality management</i>
1994.	ISO 9000	<i>Quality management and quality assurance standards: Part 1: Guidelines for selection and use Part 2: Generic guidelines for the application of ISO 9001, ISO 9002 and IS 9003 Part 3: Guidelines for the application of ISO 9001 to the development, supply and maintenance of software Part 4: Guide to dependability programme management</i>	<i>Quality management, internal quality assurance and quality control</i>
1997.	ISO 9000	<i>Quality management and quality assurance standards: Part 1: Guidelines for selection and use Part 2: Generic guidelines for the application of ISO 9001, ISO 9002 and IS 9003 Part 3: Guidelines for the application of ISO 9001:1994 to the development, supply, installation and maintenance of computer software Part 4: Guide to dependability programme management</i>	<i>Quality management, internal quality assurance and quality control</i>
2000.	ISO 9000	<i>Quality management systems – Fundamentals and vocabulary</i>	<i>Quality management systems</i>
2005.	ISO 9000	<i>Quality management systems – Fundamentals and vocabulary</i>	<i>Quality management systems</i>

**Source: Made by the author**

<sup>9</sup> ISO 9000:2005 Quality management systems – Fundamentals and vocabulary

### 3. OVERVIEW OF THE DEVELOPMENT OF REVISION OF THE STANDARD ISO 9001

In 1987 were published three international standards which were describing the meaning of quality assurance. Standard ISO 9001 *Quality systems. Model for quality assurance in design/development, production, installation and servicing*<sup>10</sup>, the standard ISO 9002 *Quality systems. Model for quality assurance in production and installation*<sup>11</sup> and the standard ISO 9003 *Quality systems. Model for quality assurance in final inspection and test*<sup>12</sup>.

Each standard determined the specific requirements for ensuring the quality in the stages of the product life cycle. ISO 9001 determined the requirements for quality assurance in the stages of design / development, production, installation and servicing, ISO 9002 determined the requirements for quality assurance in production and installation stages and ISO 9003 determined the requirements for quality assurance in the stages of final inspection and testing.

In 1994, were published new, improved editions of standards. Those standards were determining the requirements for a quality system and were used for external quality assurance. ISO 9001 *Quality systems – Model for quality assurance in design/development, production, installation and servicing* replaced ISO 9001<sup>13</sup>, ISO 9002 *Quality systems – Model for quality assurance in production, installation and servicing*<sup>14</sup> replaced ISO 9002 and ISO 9003 *Quality systems . Model for quality assurance in final inspection and test*<sup>15</sup> replaced ISO 9003 from 1987. Changes in this revision are generally smaller and standards are upgraded.

In the next revision which took place in 2000 standards ISO 9002 i ISO 9003 are withdrawn and ISO 9001<sup>16</sup> becomes a universal model entitled *Quality management systems – Requirements*. Title of the standard no longer includes quality assurance which reflects the fact that the requirements for the quality management system established in this edition of ISO 9001 in addition to quality assurance focused on increasing customer satisfaction. This edition of the standard refers to the orientation on quality management systems and encouraging the adoption of a process approach when developing, implementing and improving the effectiveness of the quality management system and increasing customer satisfaction by meeting their requirements. ISO 9001 is in this edition consistent with ISO 9004 which means that each point of the ISO 9001 corresponds to the point of ISO 9004 where they give instructions and guidance for the establishment of an universal model. The structure of the standard is changed. It consists of eight parts in which are specified requirements for a quality management system.

In 2008 was published the new edition of the standard ISO 9001<sup>17</sup>. A key feature of this release is in request for quality management system through a process approach. In the previous edition of ISO 9001 is still given rise to a process approach, while in this release states promoting the process approach. The advantage of this approach is in providing permanent surveillance of relationships between the individual processes within the process approach and their combination and interaction. This edition of the standard has not changed substantially compared to the previous edition. Still consists of eight points in which are specified requirements for a quality management system.

The new edition of the standard ISO 9001<sup>18</sup> is currently under consideration. In the published draft of the standard are changes that will occur. According the draft the standard ISO 9001 will change its content. It will no longer contain eight parts. The standard will contain ten parts.

Regarding the context of the organization, are superimposed two clauses: 4.1. Understanding the organization and its context and 4.2. Understanding the needs and expectations of stakeholders.

Together these clauses require that the organization determines problems and requests that may affect the planning of the quality management system. The key purpose of the quality management system in this

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<sup>10</sup> ISO 9001:1987 Quality systems. Model for quality assurance in design/development, production, installation and servicing

<sup>11</sup> ISO 9002:1987 Quality systems. Model for quality assurance in production and installation

<sup>12</sup> ISO 9003:1987 Quality systems. Model for quality assurance in final inspection and test.

<sup>13</sup> ISO 9001:1994 Quality systems – Model for quality assurance in design/development, production, installation and servicing

<sup>14</sup> ISO 9002:1994 Quality systems – Model for quality assurance in production, installation and servicing

<sup>15</sup> ISO 9003:1994 Quality systems . Model for quality assurance in final inspection and test

<sup>16</sup> ISO 9001:2000 Quality management systems - Requirements

<sup>17</sup> ISO 9001:2008 Quality management systems - Requirements

<sup>18</sup> Draft ISO 9001:2015

edition of the standard is that it acts as a preventive tool. The fundamental principles are changed. Of the eight fundamental principles, in this edition of the standard are mentioned only seven, namely:

- Focus on the customer;
- Leadership;
- Inclusion of people;
- Process approach;
- Improvement;
- Making decisions based on facts;
- Relationship management.

**Table 2. The revisions of ISO 9001 standard**

YEAR	ISO STANDARD	NAME OF THE STANDARD	QUALITY CONCEPTS
1987	ISO 9001	<i>Quality systems. Model for quality assurance in design/development, production, installation and servicing.</i>	<i>Quality control and quality assurance</i>
	ISO 9002	<i>Quality systems. Model for quality assurance in production and installation.</i>	<i>Quality control and quality assurance</i>
	ISO 9003	<i>Quality systems. Model for quality assurance in final inspection and test.</i>	<i>Quality control and quality assurance</i>
1994	ISO 9001	<i>Quality systems – Model for quality assurance in design/development, production, installation and servicing</i>	<i>Quality system - External quality assurance</i>
	ISO 9002	<i>Quality systems – Model for quality assurance in production, installation and servicing</i>	<i>Quality system - External quality assurance</i>
	ISO 9003	<i>Quality systems . Model for quality assurance in final inspection and test</i>	<i>Quality system - External quality assurance</i>
2000	ISO 9001	<i>Quality management systems - Requirements</i>	<i>Quality management system</i>
2008	ISO 9001	<i>Quality management systems - Requirements</i>	<i>Quality management system</i>
2015	ISO 9001	<i>Quality management systems - Requirements</i>	<i>Quality management system</i>

*Source: Made by the author*

#### **4. ANALYSIS OF THE DEVELOPMENT OF THE STANDARD ISO 9000 AND ITS INFLUENCE ON THE DEVELOPMENT OF ISO 9001 STANDARD**

In parallel with the technical - technological development have been developed and specific standards that have become a means of communication in the process of work , which means that the development of standards related to quality and quality system did not start in 1987 but much earlier.

First developed standard MIL - Q - 9858 ( 1959 ) and MIL - I- 45208 ( 1961 ) are the result of a need in the production of weapons and other military equipment. In the further development of standards appeared norms that are not related to the production of military equipment and weaponry as standard ASQC / C specification for general quality requirements<sup>19</sup>.

In 1987 were published the series of standards ISO 9000. The series consisted of ISO 9000, ISO 9001, ISO 9002, ISO 9003 and ISO 9004. The standard ISO 9000 provided guidelines for selection and use of ISO 9001, ISO 9002 and ISO 9003. The standard ISO 9004 determined the elements of quality management and elements of quality systems. The standard ISO 9000-2 from 1993 influenced on the development of standards ISO 9001, ISO 9002 and ISO 9003 from 1994 in a way that it indicated on the quality control and process management and it focused attention on preventive actions and lifecycle costs.

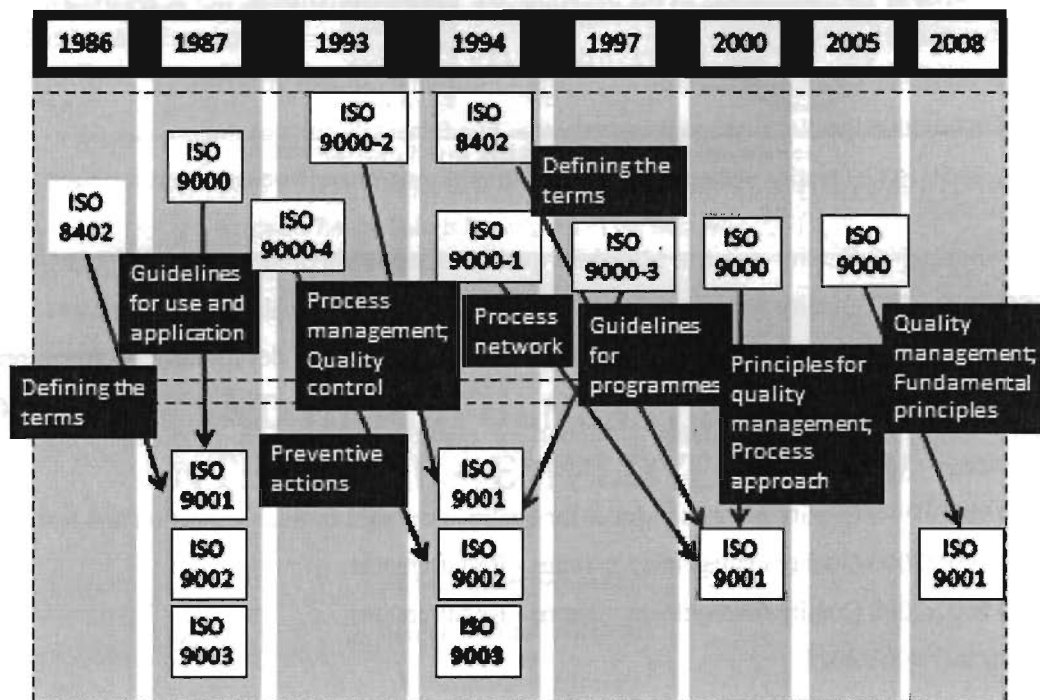
<sup>19</sup> Kondić Ž.: Quality and ISO 9000 – Use, TIVA, Varaždin 2002.

In 1994 were published new editions of standards ISO 9001, ISO 9002 and ISO 9003. These standards were determining requirements for quality assurance in the product life cycle. In the same year was published the new edition of the standard ISO 8402. In that standard, the terms related to quality were upgraded.

In addition to these standards, the same year was published a new edition of the standard ISO 9000. ISO 9000-1 from 1994 describes the importance of processes and process management. In this edition occurred five interested parties. This edition of the standard influenced on further development of the standard ISO 9001. In 1997 was published ISO 9000-3 in which were guidelines for application of ISO 9001:1994 to the development, supply, installation and maintenance of computer software. ISO 9000 from the year 2000 describes eight fundamental principles of quality management and process approach. This standard influenced on the development of ISO 9001 from 2000 in a way that it indicated on the need of implementing eight fundamental principles an the application of process approach. In 2000, ISO 9001, ISO 9002 and ISO 9003 were replaced by the ISO 9001 which became consisted with ISO 9004. In 2005 was published a new edition of ISO 9000. In this edition were listed eight fundamental principles for quality management which form the basic of the quality management system. It continue to encourage the acceptance of process approach for quality management. In 2008 was published a new edition of ISO 9001 in which is visible the influence of ISO 9000 because in the ISO 9001 the process approach is determined as a requirement. The advantage of this approach is in providing permanent surveillance of relationships between the individual processes within the process approach and their combination and interaction.

The new edition of the standard ISO 9001 is currently under consideration. The clauses in the standard indicate on the understanding of the organization and its context and understanding the needs and expectations of stakeholders. The clauses require that organizations should determine their problems and requirements which can influence on the planning of quality management system. The fundamental principles are also changed. Of the eight fundamental principles, in this edition of the standard it are mentioned only seven.

The changes contained in the draft of ISO 9001:2015 points to a uniform terminology and enables easier integration of different systems. Integrating management system can be implemented using a variety of specifications. The most popular is the specification issued by the British Standards Institution ( BSI ) - PAS 99. Systematic integration of management systems can be carried out by the specification PAS 99, which is primarily intended for organizations who are establishing the requirements of two or more management system standards. PAS 99 specifies common requirements for management system and presents a framework in which are establish two or more standard management systems in an integrated way, so that in one of his amendment provides correlation with the requirements of the ISO 9001 Quality Management Systems, ISO 14001 Environmental Management Systems, ISO 45001 Occupational health and safety, ISO 22000 Food safety management.



Picture 1. Influence of the development of ISO 9000 on the development of ISO 9001

Source: Made by the author

## 5. CONCLUSION

Analyzing the content of a number of issues of standards ISO 9000, it was noted that the standards were improved in accordance with the needs of the organization and other interested parties

ISO 9000, which in its first edition provided instructions for selection and use ISO 9001, ISO 9002 and ISO 9003 over the years defined as a standard defining the basic principles and vocabulary. Which means that the standard through years changed its content and purpose. These changes had influenced on the development of ISO 9001 in a way that they defined the new changes in the philosophy of quality, quality concepts and explained the terms that have become essential for the understanding the content of the standard.

The use of standards series ISO 9000 in organizations is not mandatory, in the business world without them is not possible to survive on the market.

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