

# The Quality Management Principles and Their Incidence Within ISO 9001:2015

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**Abstract.** The study that is the base of the present paper intends to underline the prevalence of the new set of quality management principles within the new form of the ISO 9001. For this scope, the ISO 9001:2015 standard was exhaustively analyzed and, for each chapter the corresponding quality management system principles were extracted. Therefore, the methods used are analytical; of most importance being the absolute mastering of the new and of the old approach of quality standard analyzed and of the application of quality management principles with their correct meaning. The results are presented in a graphical mode, depicting the incidence of the quality principles within each chapter. This is important for implementation and certification scopes. Because one of the reasons of the changes within the ISO 9001 standard was for balancing its structure, the main objective of this study must underline the validity of this target.

**Keywords:** ISO 9001:2015 · Quality management principles · Leadership · Evidence based decision-making · ISO/TS 16949

## 1 Introduction

A multitude of factors promoted the change of the standard ISO 9001. First of all, it needed to adapt to an economically, politically and societal changing world, in order to reflect the increasingly complex business environments in which organizations currently operate. Also, it needed to provide a consistent foundation for the future of the business environment and to ensure the needs of all relevant interested parties of the organization. Finally, it needed to ensure an optimal alignment with other management system standards (environment, HACCP - Hazard Analysis and Critical Control Point, OHSAS - Occupational Health and Safety, social accountability, information security, sectorial quality management systems, etc.).

According to [1] the main considered changes of the new version of ISO 9001 are:

- 10-clause structure and core text for all management system standards according with the annex SL [2];
- Increased compatibility with services and non-manufacturing sector users;
- Clearer understanding of the organization's context;
- The "process approach" is strengthened and more explicit;

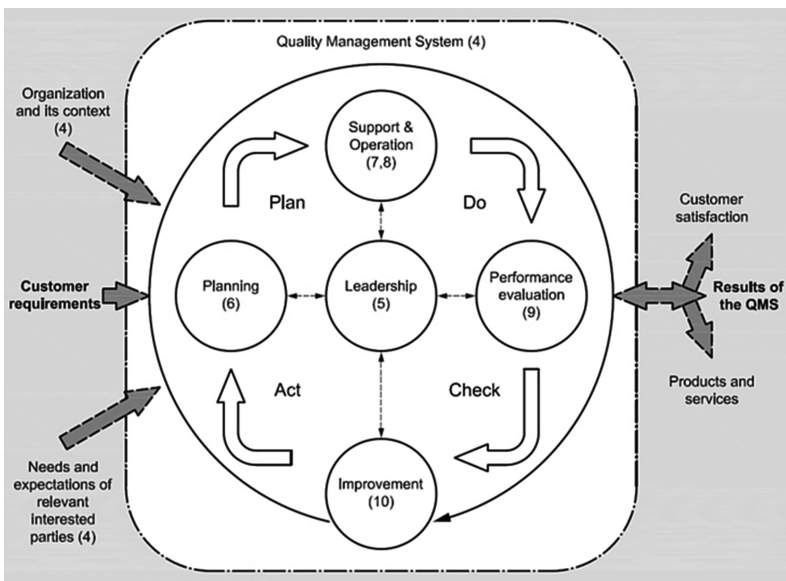
- Addressing the concept of preventive action by introducing the risk identification and mitigation plan [3];
- The term “documented information” replaced by the terms “document” and “record” [4];
- Control of externally provided products and services replaces purchasing/outsourcing;
- Increased emphasis on seeking opportunities for improvement.

## 2 The Quality Management Principles Within the ISO 9001

### 2.1 The Structure of the New ISO 9001:2015

The structure of the standard ISO 9001 has been changed, especially for its alignment it with the structure of the famous “Annex SL” [2]. Therefore, the ISO 9001 standard is composed of 10 chapters, with the chapters 4 to 10 containing the certification requirements.

Those chapters are aligned with the same Deming’s P.D.C.A. (Plan - Do - Check - Act) cycle (Fig. 1), as ISO 9001:2008. As new aspects, it appears the “Organization and its context” and “Needs and expectations of relevant interested parties”, as inputs beyond the “Customer requirements”. Within the quality management system model PDCA cycle, the central role is occupied by the “Leadership”, required with a supplemental accent by the ISO 9001:2015.



**Fig. 1.** The new model of the PDCA approach of the quality management system according with the ISO 9001:2015 (Source ISO 9001:2015, p. 7)

## 2.2 The New Set of Quality Management Principles

Causing controversies in the beginning of the new version of the ISO 9001 proposal [5, 6], the new set of the quality management system principles has only 7 principles [7] (Table 1). This is one less than the old set [8]. The actual “process approach” principle is more emphasized, underlining, the old principle of “system approach to management”. Therefore, the ISO 9001:2015 strengthens the process approach of the quality management system, as a better way to manage the organization.

**Table 1.** The old and new quality management principles

The quality management system principles according with ISO 9000:2005	The new quality management system principles according with ISO 9000:2015
Customer Focus (P1)	Customer focus (NP1)
Leadership (P2)	Leadership (NP2)
Involvement of people (P3)	Engagement of people (NP3)
Process approach (P4)	Process approach (NP4)
System approach to management (P5)	
Continual improvement (P6)	Improvement (NP5)
Factual approach to decision making (P7)	Evidence-based decision making (NP6)
Mutually beneficial supplier relationships (P8)	Relationship management (NP7)

The relative importance of each principle will vary from organization to organization and can be expected to change over time, this being the approach for implementing it within the quality organizational quality management systems [7].

By comparing the new edition of the standard to the previous model, the main target of the present study is to underline the spread of the quality management principles within the body of the new edition.

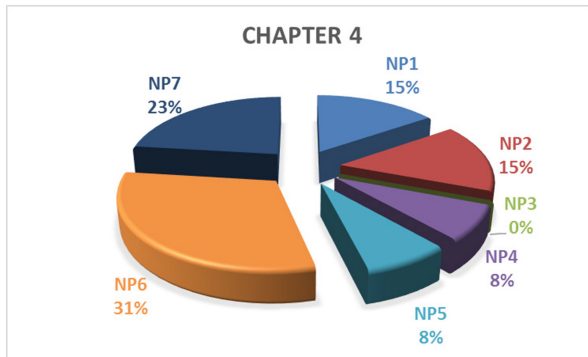
## 3 Data Analysis for the Researched Study

By analytical investigation of ISO 9001:2015 [9], taking into account of the quality management principles definitions (Fig. 2), and the own practical and theoretical body of knowledge, the incidence of the quality management principles within each chapter was underlined.

Within the chapter 4 of the ISO 9001:2015 the more spread principle is NP 6 (evidence based decision making), followed by NP 7 (relationship management). Also, NP1 and NP2 (customer focus and leadership) are present (Fig. 3). By this evidence, it can be considered that when analyzing the context of the organization there must be kept documented information for making the decisions. Additionally, it is important to note the way in which the relationship between the relevant interested parties is taken into consideration. This relationship must be managed with leadership and customer focus as its primary target.

<p><b>1. Customer focus.</b> The primary focus of quality management is to meet customer requirements and to strive to exceed customer expectations.</p>	<p><b>2. Leadership.</b> Leaders at all levels establish unity of purpose and direction and create conditions in which people are engaged in achieving the organization’s quality objectives.</p>
<p><b>3. Engagement of people.</b> Competent, empowered and engaged people at all levels throughout the organization are essential to enhance its capability to create and deliver value.</p>	<p><b>4. Process approach.</b> Consistent and predictable results are achieved more effectively and efficiently when activities are understood and managed as interrelated processes that function as a coherent system.</p>
<p><b>5. Improvement.</b> Successful organizations have an ongoing focus on improvement.</p>	<p><b>6. Evidence-based decision making.</b> Decisions based on the analysis and evaluation of data and information are more likely to produce desired results.</p>
<p><b>7. Relationship management.</b> For sustained success, an organization manages its relationships with interested parties, such as suppliers.</p>	

**Fig. 2.** The new set of quality management principles and their new approaches & meanings



**Fig. 3.** The incidence of the quality management principles in the chapter 4

Chapter 5 of the ISO 9001:2015 specifically takes into consideration the evidence based decision making and leadership for the “Leadership” chapter (Fig. 4). Also, importance is placed on customer focus, and on the relationship between management and the interested parties.

Chapter 6 (“Planning”) of the ISO 9001:2015 also takes into consideration the evidence based decision making and leadership principles (Fig. 5). Additionally, the chapter focuses on customer orientation, the process approach, and improvement.

Chapter 7 (“Support”) primarily takes into consideration the leadership principles (Fig. 6). Relative importance is also held by the same evidence based decision -

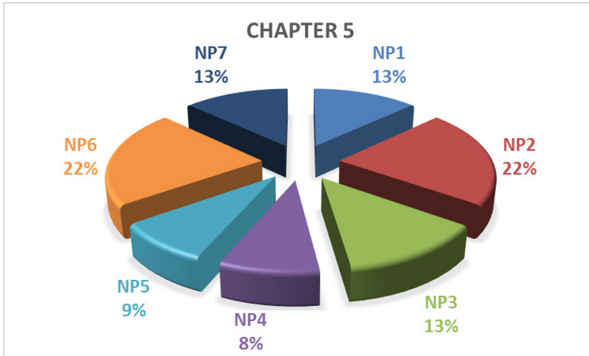


Fig. 4. The incidence of the quality management principles in the chapter 5

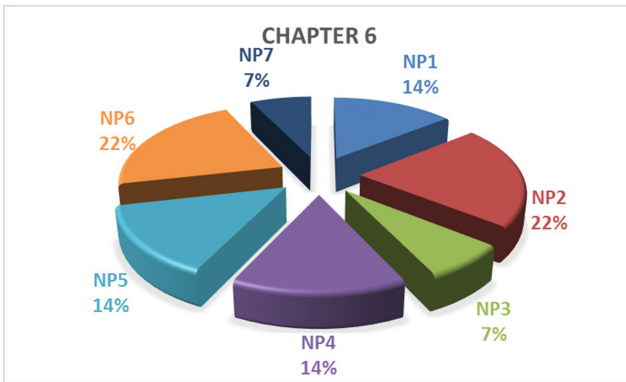


Fig. 5. The incidence of the quality management principles in the chapter 6

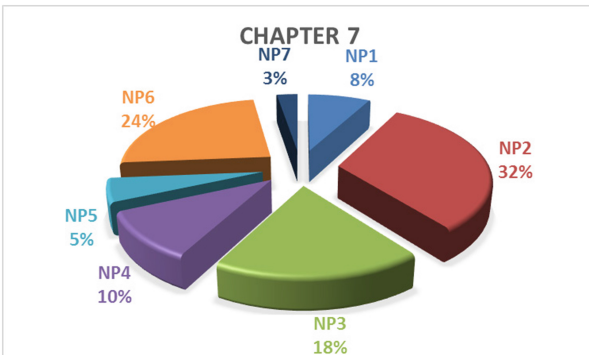


Fig. 6. The incidence of the quality management principles in the chapter 7

making followed by people engagement principle. Chapter 8 (“Operation”) explores the leadership and evidence based decision – making principles. Relative importance is also held by the customer focus and relationship management (Fig. 7). Chapter 9 (“Performance evaluation”) takes in consideration the leadership and evidence based decision making principles. Importance is held also by the same customer focus and improvement principle (Fig. 8). Chapter 10 (“Improvement”) takes in consideration the leadership and customer focus & improvement principles, the engagement of people & evidence based decision making principle (Fig. 9).

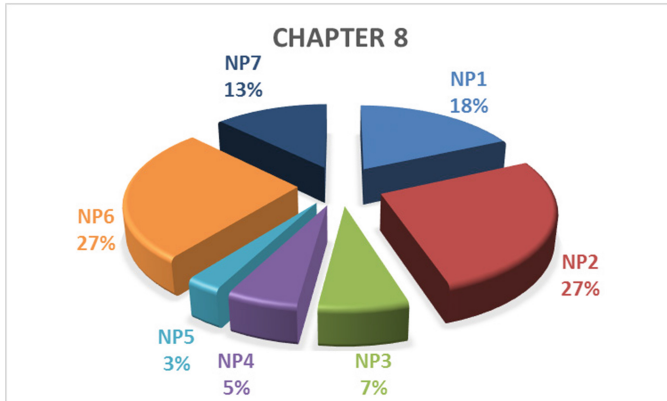


Fig. 7. The incidence of the quality management principles in the chapter 8

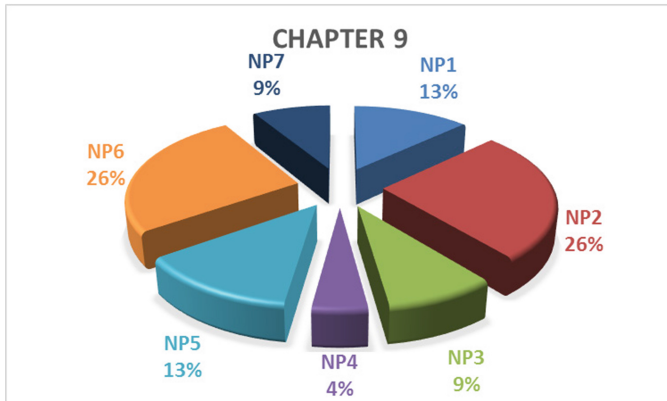


Fig. 8. The incidence of the quality management principles in the chapter 9

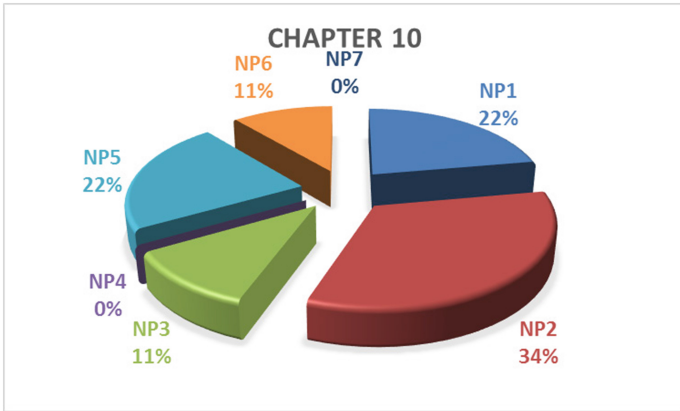


Fig. 9. The incidence of the quality management principles in the chapter 10

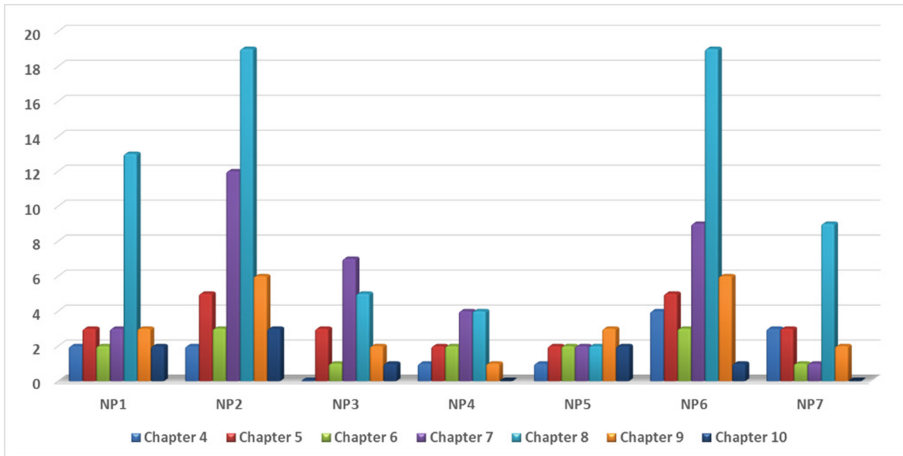


Fig. 10. The absolute value incidence of the quality management principles within the ISO 9001:2015 for underlining the balancing of the quality management principles incidence

## 4 Conclusions

The actual form of the ISO 9001 is quite similar as the old approach and, also, it proposes important modifications (see Fig. 10). These modifications will help organizations (especially the ones with mature and effective quality management systems) to grow and it will provide the auditors a field to mastering their activities in a more appropriate manner. As a result, this new edition of the standard will give the opportunity to improve a company’s weaknesses by means of the organizational quality management systems. Comparing the present study with previous ones [10–12] it can be concluded that between the two versions of ISO 9001, the changes are

important, but not fundamental. The main reason of the formal changes it was reached, for balancing the spread of the quality management principles within the standard.

The presented study is an own and original idea applied previously for studying the previous editions of quality management standards [10, 11]. The results of these past studies are encountered within the present form of the ISO 9001 standard, as major modifications operated by the technical committee ISO TC 176. Because of the magnitude of this last study, and because of the editorial space at disposition, it was presented in a very condensed manner.

## 5 New Developments for ISO/TS 16949 According with the ISO 9001 Family of Standards Changes

Strictly for the quality within automotive supply chain, starting from the ISO 9001:2015 the IATF [13] has approved the first draft of the new automotive quality standard to include additional stakeholder feedback. The revision work team has organized a conference, also, to obtain further stakeholder input, and for presenting a final transition strategy from ISO/TS 16949:2009 to the new automotive industry quality standard [13]. Feedback from gap assessments was used to further refine the new automotive quality standard and the associated rules for achieving and maintaining IATF recognition.

Some of the new enhancements to the ISO TS 16949 include the following [13]:

- Requirements for safety-related parts and processes;
- Enhanced product traceability requirements to support regulatory changes;
- Requirements for products with embedded software;
- Warranty management process including addressing NTF (No Trouble Found) and use of automotive industry guidance;
- Clarification of sub-tier supplier management/development requirements;
- Addition of corporate responsibility requirements.

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