

Integration and Auditing of Management Systems and Implementation of
Customer Satisfaction Standards in Serbia

by

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Abstract

This thesis demonstrates the results of an empirical study done in Serbia on the implementation of management systems and customer satisfaction standards, as well as the integration and auditing of standardized management systems. The study is a follow up of the surveys performed in Spain in 2006 and 2010 (e.g. Karapetrovic & Casadesus, 2009 and Simon et al., 2013) and in Canada in 2012 (e.g. Durdevic et al., 2013).

The survey contained nine sections focused on the integration of standardized management systems, auditing and customer satisfaction standards. It was sent to 320 organizations that had been registered to ISO 9001 and ISO 14001. Fifty valid surveys were received during 71 days in 2013, with the response rate of 15.6%.

The study found that the standard that was implemented as the first in 70% of the cases was ISO 9001 and that the average lead time for implementation of management system standards was between six months and one year. The Serbian ISO 9001 and ISO 14001 registered organizations presented a high level of integration, with 76% having completely integrated their management systems. The most significant difficulties in the integration process were “lack of human resources” and “lack of employee motivation”.

With respect to auditing, the most frequently used guidance for both internal and external audits was ISO 19011. A high level of integration was found for auditing subsystems in both internal and external audits. For example, internal audits showed simultaneous audits in 58% of organizations and the integration of human resources, audit inputs and audit outputs in 46%, 56% and 52%, respectively. Furthermore, a comparison between different sizes of organizations and industry

sectors was performed, showing, for example, that a high percentage of large organizations conducted internal audits as an integrated system.

The results regarding customer satisfaction standards show less familiarity with augmentative standards (e.g. ISO 10004 at 60%, ISO 10002 at 48% and ISO 10001 at 44%) compared to other augmentative standards (e.g. ISO 19011 at 72% and ISO 14031 at 60%). Fifty percent of the organizations that had implemented customer satisfaction standards implemented them at the “same time as ISO 9001”. Audits against those standards were performed as “a part of the internal audit of the integrated management system” in 36% of the organizations. The major reasons for not implementing customer satisfaction standards were “lack of financial resources” and “lack of human resources”.

The main limitation of this study was a small sample size, thereby not giving the possibility for performing advanced statistical testing. Furthermore, the survey was done in only one country.

Future research could extend the study in other countries (as was done, for example, in Canada by Durdevic et al., 2013) and then repeat it in Serbia with the same fifty organizations that participated originally. As e.g. Simon et al. (2012a), those results could illustrate the Serbian organizations’ progress in integration, auditing and particularly in the implementation of customer satisfaction standards

This thesis illustrates one of the first studies conducted in Serbia related to customer satisfaction standards and the first empirical study related to auditing standards and auditing systems in organizations.

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Glossary of terms, definitions and acronyms

IMS- Integrated Management System
ISO- International Organization of Standardization
MS- Management System
MSs- Management Systems
MSS- Management System Standard
MSSs- Management System Standards
CS- Customer satisfaction
CSS- Customer Satisfaction Standard
CSSs- Customer Satisfaction Standards
QMS- Quality Management System
EMS- Environmental Management System
OHS- Occupational Health and Safety
OH&S MS - Occupational Health and Safety Management Systems
OHSAS- Occupation Health and Safety Assessment Series
CSR- Corporate Social Responsibility
CSRMS- Corporate Social Responsibility Management System
PDCA- Plan, Do, Check, Act

AIMSL- Auditing and Integration of Management Systems Lab

An **audit** is “[...] a systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled” ISO 19011 (ISO, 2011a).

Internal audits “[...] sometimes called first party audits, are conducted by the organization itself, or on its behalf, for management review and other internal purposes (e.g. to confirm the effectiveness of the management system or to obtain information for the improvement of the management system)” 19011 (ISO, 2011a).

External audits “[...] include second and third party audits [...] Second party audits are conducted by parties having an interest in the organization, such as customers, or by other persons on their behalf [...] Third party audits are conducted by independent auditing organizations, such as regulators or those providing certification” 19011 (ISO, 2011a).

An **audit team** is “[...] one or more auditors conducting an audit, supported if needed by technical experts ISO 9000 (ISO, 2005).

An **audit plan** is “[...] description of the activities and arrangements for an audit ” 19011 (ISO, 2011a).

A **nonconformity** is “non-fulfilment of a requirement” ISO 9000 (ISO, 2005).

An **audit report** “[...] should provide a complete, accurate, concise and clear record of the audit” 19011 (ISO, 2011a).

Customer satisfaction is “[...] the customer’s perception of the degree to which the customer’s requirements have been fulfilled” ISO 9000 (ISO, 2005).

Augmentative standards “[...] focus on single management system components that then can be used to supplement and improve the management system itself” (Karapetrovic, 2007).

ISO 10001 “Customer Satisfaction-Guidelines for codes and conduct for organizations” “[...] is intended to establish internationally accepted and consensus based guidance for developing and implementing a set of commitments to customers about an organization's products, services and activities” (Dee et al., 2004).

ISO 10002 “Customer Satisfaction- Guidelines for complaints handling in organizations” is “[...] meant to help organizations address cases in which complaints do occur. [...] The focus of ISO 10002 is on devising effective approaches for addressing complaints using resources and expertise within the organization (Dee, et al., 2004).

ISO 10003 “Customer Satisfaction- Guidelines for dispute resolution external to organizations”, “[...] is used to provide guidance for organizations to plan, design, operate, maintain and improve effective and efficient external dispute resolution for product related complaints [...] Dispute resolution gives an avenue of redress when organizations do not remedy a complaint internally” ISO 10003 (ISO, 2007).

ISO 10004 “Customer satisfaction - Guidelines for monitoring and measuring” is “[...] one of the key elements of organizational success is the customer’s satisfaction with the organization and its products. Therefore, it is necessary to monitor and measure customer satisfaction” ISO 10004 (ISO, 2012).

ISO 10008 “Customer satisfaction -Guidelines for business-to-consumer electronic commerce transactions” “[...] provides guidance to organizations for planning, designing, developing, implementing, maintaining and improving an effective and efficient system concerning business-to consumer electronic commerce transactions” ISO 10008 (ISO, 2013).

ISO 10005 “Guidelines for Quality Plans”. “[...] address the need for guidance on quality plans, either in the context of an established quality management system or as an independent management activity [...] In either case, quality plans provide a means of relating specific requirements of the process, product, project or contract to work methods and practices that support product realization” ISO 10005 (ISO, 2005b).

ISO 10012 “Requirements for Measurement Processes and Measuring Equipment” illustrates “[...] the concept of metrological management, and enlarges the scope of Measurement Management Systems and improves their integration with other standardized management systems” (Beltran et al., 2010).

ISO 19011 “Guidelines for Auditing Management Systems” “[...] provides guidance on auditing management systems, including the principles of auditing, managing an audit programme and conducting management system audits, as well as guidance on the evaluation of competence of

individuals involved in the audit process, including the person managing the audit programme, auditors and audit teams” 19011 (ISO, 2011a).

ISO 14031 “*Environmental Performance Evaluation – Guidelines*”, “[...] gives guidance on the design and use of environmental performance evaluation within an organization” ISO 14031 (ISO, 2013).

1. Introduction

Organizations use Management System Standards (MSSs) to improve products, processes and systems and to give stakeholders the confidence and security that they will meet their needs. Many of those standards are international. “*International Standards make things work [...] They give world-class specifications for products, services and systems, to ensure quality, safety and efficiency*” (ISO, 2016). Moreover, there are “[...] *more than 19,500 International Standards covering almost all aspects of technology and business*” (ISO, 2016). MSSs are a subset of these standards. As defined by ISO (2008): “*a management system standard is set of structured requirements that provides an organization with the capability to meet the specific purpose of the standard, such as the establishment of quality, environmental, or health and safety management systems. [...] These standards have different objectives and they affect multiple stakeholders*”. An MSS describes a management system (MS). “*The management system of an organization consists of various processes that employ resources to deliver the organizations’ products, achieve the organization’s goals and objectives, and meet stakeholder requirements*” (ISO, 2008).

Organizations can register to multiple MSSs. There are a number of organizations that do not hold just one, but multiple MSS certificates. In the last two decades, ISO 9001 and ISO 14001 became the main and minimum standards for the majority of organizations. According to the most recent ISO survey (ISO, 2016) in 2014, there were 1,138,155 MSS certificates to ISO 9001 and 324,148 MSS certificates to ISO 14001 issued in the world. Additionally, just ten months ago, a new edition of ISO 9001 and ISO 14001 was published, giving more requirements for organizations to improve their quality and environmental MSSs.

According to Singels et al. (2001) the reason for organizations to have ISO certification “[...] *could be out of an internal or an external motivation*”. Singels et al. (2001) also distinguished the difference between these two, saying that “*with internal motivation we mean that organizations want to become registered, because they themselves feel the need to do so*”. Some organizations had internal reasons for implementation (e.g. Zaramdini, 2007; Magd & Nabuls, 2012; Singels et al., 2001; Douglas et al., 1999; Najmi & Kehoe, 2001; Gotzamani & Tsiotras, 2002, Bhuiyan & Alam, 2005 and Bernardo et al., 2015b). Examples of internal motivations are: “*improvement of*

throughput time” (Singels et al., 2001), *“improve efficiency”* (Singels et al., 2001; Alolayan et al., 2013; Almeida et al., 2009; Boulter & Bendell, 2002; Escanciano et al., 2001 and Martinez-Lorente & Martinez-Costa, 2004) and *“business performance”* (Singels et al., 2001 and Al-Refaie et al., 2012). Some organizations prefer to have suppliers that are ISO 9001 registered (e.g. Bhuiyan & Alam, 2005; Withers & Ebrahimpour, 2000; Terlaak & King, 2006 and Terziovski et al., 2003). According to Singels et al. (2001) *“external motivation means that organizations gain ISO certification out of external pressures”*. Examples are *“meeting demands from government regulations”* (Singels et al., 2001), *“pressure from clients or suppliers”* (Singels et al., 2001; Bhuiyan & Alam, 2005; Poksinska et al., 2006; Georgiev & Georgiev, 2015 and Costa & Lorente, 2004), *“customer pressures or market-related reasons”* (Bhuiyan & Alam, 2005) and *“corporate image”* (Sampaio et al., 2010; Santos et al., 2014 and Cagnazzo et al., 2010). Moreover, after analyzing 111 papers Boiral (2012) concluded that *“[...] the main impact of ISO 9000 [...] concern internal as well as external aspects”*. Recent studies show that internal motivation was considered when organizations wanted to implement ISO standards (Santos et al., 2015; Allur et al., 2014; Castka et al., 2015 and Willar et al., 2015). However, a study by Georgiev & Georgiev (2015) showed that external reasons are still important for some organizations.

“ISO 9000 standards for quality system management standards are involving a higher and higher number of enterprises and organizations” (Franceschini et al., 2004). Both ISO 9001 and ISO 14001 *“[...] followed the similar pattern of diffusion”*, even though ISO 9001 was published first, but ISO 14001 *“[...] is spreading in much greater speed”* (Marimon et al., 2006). Looking at Table 1.1, it could be seen that the number of organizations implementing standards in Serbia is increasing rapidly, especially for ISO 14001, ISO 13485, ISO 16949, ISO 22000, ISO 27001 and ISO 50001. For example, the number of ISO 14001 certificates almost tripled in four years. The peak of implementation of ISO 9001 in Serbia was 2011, while for ISO 14001, it was in 2014 (ISO, 2016). Fluctuations in ISO 9001 can be because registration of the implementation of industry sector-specific versions of ISO 9001 (e.g. ISO 13485 and ISO 16949) is increasing. The number of other certificates is also rising especially for ISO 27001, ISO 14001 and ISO 50001 and integration is needed. Since this thesis is about Serbian organizations, it was interesting to see what was the extent of MS integration.

	2010	2011	2012	2013	2014
ISO 9001	1790	3228	2750	2366	2637
ISO 14001	318	573	736	762	901
ISO 13485	30	32	47	53	55
ISO 16949	11	15	18	26	44
ISO 22000	116	145	172	193	217
ISO 27001	8	9	25	43	101
ISO 50001	0	0	2	3	9

Table 1-1: Number of organizations registered to various MSSs in Serbia (Source: ISO,2016)

This research contains an analysis of the results obtained in Serbia on the topics of the integration of MSs, auditing of MSSs and customer satisfaction standards. It included organizations that had already implemented the ISO 9001 and ISO 14001 standards.

The study is interesting because there are no similar empirical studies that examine auditing and customer satisfaction standards in Serbia. Although a similar survey was previously done in Spain in 2006 and 2010 and in Canada in 2012 by the Auditing and Integration of Management Systems Lab (AIMSL), Serbia was used as the next country for continuing this research. Particularly because the number of ISO 14001 certificates has been increasing there over the years (see Table 1.1). Furthermore, when the number of organizations having ISO 14001 is divided by the number of organizations having ISO 9001, the percentage has increased from 2010 (17.76%) to 2014 (34.16%). A similar pattern is seen in Spain in 2010 (30.65%) and in 2014 (38.51%) (Table 1.2).

	2010	2011	2012	2013	2014
ISO 9001	59854	53057	59418	42644	36005
ISO 14001	18347	16341	19470	16051	13869
ISO 13485	98	124	161	222	331
ISO 16949	869	891	900	902	934
ISO 22000	364	375	468	525	537
ISO 27001	711	642	805	799	701
ISO 50001		95	127	196	310

Table 1-2: Number of organizations registered to various MSSs in Spain (Source: ISO,2016)

Marimon et al. (2008) said that the implementation of ISO 9001 and ISO 14001 in Spain and Serbia “[...] has sharply increased in the last ten years”. Moreover, an increased percentage of implementations of ISO 14001 could mean that organizations already had ISO 9001. Thus, there may already be two standards in the MS, implicating that there may also be integrated systems in place. Observing ISO 14001, Table 1.1 shows that the implementation of multiple standards in MSs is increasing over the years, allowing us to conclude that those organizations are most likely going to integrate their systems, as previous studies show (e.g. Bernardo et al., 2009; Simon et al., 2012a; Simon et al. 2013; Sampaio, 2012; Douglas & Glen, 2000; Karapetrovic et al., 2006; Simon et al., 2012 and Karapetrovic & Casadesus, 2009). Nowadays organizations have multiple MSSs in their MSs, thus it is essential to have the integration of standardized MSs and the knowledge of integration, which validates the importance of this research.

There is a lack of studies connected to integration, but there are even fewer studies on auditing and customer satisfaction. Most of the studies are theoretical (e.g. Karapetrovic, 2002; Backmerhagen et al., 2003 and Jorgensen et al., 2008), so there is a lack of empirical studies (e.g. Bernardo et al., 2009; Bernardo et al., 2012a; Bernardo et al., 2012b; Casadesus et al., 2008 and Karapetrovic et al., 2012).

A further reason to do empirical studies on integration is to show how it evolves over time. Therefore, the results from previous studies were compared to the results obtained in this study in Serbia. Empirical studies of internal audits help organizations understand how to integrate the process of auditing (e.g. knowing what they are doing in auditing and how to do that audit), because it is more difficult to conduct audits of integrated systems (e.g. Simon et al., 2011 and Bernardo et al., 2010). There is also a lack of studies on that topic. Empirical studies of external audits investigate how registrars do their audits and what their degree of integration is (e.g. are they integrated to the same extent as internal audits?).

Finally, an empirical study of customer satisfaction standards may show the benefits of having those standards and their usage in organizations. This will educate organizations as to which new standards to implement and reinforce the importance of benefits to organizations that already have them. At the end of the day, it is the customers that make a business thrive. Therefore, everything depends on their satisfaction.

1.1.Motivation

There are many studies regarding the integration of MSs (e.g. Asif et al., 2010a; Bernardo et al., 2009; Bernardo et al., 2012a; Bernardo et al., 2012b; Casadesus et al., 2008; Castillo-Rojas et al., 2012; Douglas & Glen, 2000; Durdevic et al., 2013; Khanna et al., 2010; Karapetrovic & Casadesus, 2009; Karapetrovic et al., 2012; Rajkovic, 2010; Salomone, 2008; Sampaio et al., 2012; Simon et al., 2013; Simon et al., 2012b; Bernardo et al., 2015a; Zeng, et al., 2007; Zeng et al., 2005 and Zutshi & Sohal, 2005). However, there has been a lack of studies related to the integration of MS components. Most of the studies that exist were done in Spain (e.g. Bernardo et al., 2009; Bernardo et al., 2012a; Bernardo et al., 2012b; Casadesus et al., 2008; Karapetrovic & Casadesus, 2009; Karapetrovic et al., 2012; Simon et al., 2013; Simon & Douglas, 2013 and Simon et al., 2012a). Only one study was found in Serbia (Rajkovic, 2010). However it only displayed the extent and difficulties of the integration of the surveyed small and medium-sized Serbian organizations. Furthermore, there is no study regarding the examination of integration processes and human resources considering the size of the organizations or the industry sector.

There is also a limited number of studies regarding the integration of audits in MS (e.g. Bernardo et al., 2009; Bernardo et al., 2010; Bernardo et al., 2011; Douglas & Glen, 2000; Durdevic et al., 2013; Karapetrovic et al., 2006; Simon et al., 2014 and Simon et al., 2011). There are no studies performed in Serbia. Moreover, studies regarding the integration of audit systems in different sizes of organizations and different industry sector were not found. Furthermore, there is room to continue developing investigations on the integration of both internal and external audits.

There is a lack of research concerning augmentative standards. Furthermore, there is a lack of studies on customer satisfaction standards (CSSs), which provides room for more theoretical and empirical studies. Although there are some studies regarding augmentative standards (Karapetrovic & Doucette, 2009; Karapetrovic et al., 2010; Ang & Buttle, 2006; Ang & Buttle, 2012; Khan et al., 2010; Nowicki et al., 2014; Karapetrovic & Spasojevic-Brkic, 2014; Beltran et al., 2010 and Morhardt et al., 2002), there is still a need for deeper analysis of the organizations who implement CSSs. There are no studies regarding comparisons between organizations which have implemented CSSs and the ones who have not.

Since the AIMSL started empirical studies in Spain in 2006 and 2010, and in Canada in 2012, there is a need to follow up on this kind of empirical research by the same lab in different countries. The study illustrated in this thesis examines CSSs, augmentative standards and the auditing of both, which was not done in previous AIMSL studies.

1.2.Objectives

The main objectives of the study presented in this thesis are to analyze how organizations in Serbia integrated their MSs and their audits, as well as how they implemented augmentative standards.

The specific objectives are to perform an analysis on the:

- Difficulties and time needed to integrate MSs
- Extent of integration of MSs in organizations overall
- Extent of integrated MS processes, resources and goals
- Extent of integration of the elements of audit systems
- Benefits of having integrated audits in organizations
- Knowledge of augmentative standards
- Reasons for not implementing augmentative standards, and
- Differences between organizations that have implemented CSS and the ones that have not regarding internal audits and customer benefits.

1.3.Organization of the thesis

Chapter 2 covers a literature review for this research focusing on theoretical studies, case studies and survey investigations done on the topics of integration, auditing and customer satisfaction. Section 2.1 categories the empirical studies done so far by year of publication, year of conduct them and the country where the study took place. Section 2.2 gives a review of the studies regarding audits. Finally, Section 2.3 describes theoretical and empirical studies, that were done regarding augmentative standards. Moreover, Section 2.3 depicts examples of studies on CSSs, which show the organization's benefits of having those standards.

Chapter 3 presents results of an empirical study that was done in Serbia regarding the integration of MSs and the implementation of MSSs. It clarifies the difficulties of integration that organizations had during the integration and covers the levels of integration of documents, processes, human resources and goals. This chapter describes the order of integration and lead time for implementation of MSSs.

Chapter 4 shows the results of having audit systems integrated into organizations, focusing on both internal and external auditing. The extent of audit integration is described through the level of integration of teams, time, plans and reports. This chapter gives an analysis of guidelines used for doing auditing and the frequency of conducting audits. Finally, it gives the description of outcomes that organizations got while having integrated audits in place.

Chapter 5 exposes the analysis of data related to CSSs. Furthermore, it provides data regarding the familiarity of Serbian organizations with CSSs, the order of implementing those standards and performing audits of those standards. This chapter also compares organizations which implemented CSSs and the ones that did not regarding customer benefits and internal audits.

Chapter 6 summarizes the study, illustrates the limitations of research, contributions to research and provides plans for future research.

2. Literature review

The main objective of this research was to investigate the usage of Management System Standards (MSSs) and the integration of MSs in organizations with multiple MSSs. The survey that was used had three major components: integration, auditing and augmentative standards. For that reason, this chapter will illustrate studies done regarding the implementation of MSSs, the integration of MSs, the auditing of MSs and customer satisfaction standards (CSSs).

2.1.Integration

Organizations can integrate different MSs in order to eliminate redundancy regarding performed work, processes, documents, human resources and for attaining more efficient approaches and increasing benefits.

In order to study the integration of MS differences between “implementation” and “integration”, as well as “management systems” and “management system standards” need to be distinguished.

“A Management System exists in every organization or enterprise” (ISO, 2008). “Management system standards (MSS) and the related requirements will impact an organization’s Management System” (ISO, 2008). “The impact of such requirements may be large or minimal depending on the level of implementation and compliance by the organization” (ISO, 2008). Therefore, there are organizations that implement MSSs one by one and keep MSs separate, but there are also organizations that use “[...] a more effective and efficient approach”, which is to “[...] integrate the implementation of multiple MSS requirements” (ISO, 2008).

According to ISO (2008), *“integration is the process of unifying multiple management system standards requirements into an organization’s overall management system”*.

Subchapter 2.1 illustrates the implementation of multiple MSSs and integration processes. The implementation part of the subchapter (sections 2.1.1 and 2.2.1) focuses on the order of the MSS implementation and the time needed to implement them. The integration part (section 2.1.3) defines the overall system integration and describes studies that examine difficulties (section 2.1.4) stated by organizations that had integrated their MSs and the levels of integration they had.

Likewise, studies that define the reasons organizations did not integrate their MSs are analyzed. In order to achieve a certain level of integration, organizations use specific tools, which is another topic that is covered in this subchapter. The last topic observed (section 2.1.5) is the level of integration in processes, organizational goals, and the human and documentation resources achieved during the standardization of MSs.

2.1.1. Order of implementation of MSSs

The order of implementation frequently depends on the needs of organizations. Moreover, sometimes it is governed by the timeline of standard publishing (e.g. Karapetrovic, 2002 and Bernardo et al., 2013). The majority of the organizations implement the Quality Management System (QMS) followed by the Environmental Management System (EMS) and the Occupational Health and Safety MS (OH&S MS), but it would depend on the industrial sector or the need of the organizations itself (e.g. Beckmerhagen et al., 2003, Karapetrovic, 2003 and Karapetrovic & Jonker, 2003). Beckmerhagen et al. (2003) stated that an *“[...] oil company, utility or nuclear power plants is more likely to implement ISO 14001 MS, before deregulation and increased competition would force it to register to quality systems”*. Additionally, Karapetrovic (2003) and Karapetrovic & Jonker (2003) also mention that an energy utility should implement safety and environmental standards first and then consider quality. A case study in ISO (2008) implemented ISO 14001 prior to ISO 9001 *“[...] due to the opinion that an EMS was less demanding and more familiar to the engineering business culture and therefore it would have been easier to involve the whole organization in this system”* (ISO, 2008).

This section presents theoretical and empirical studies that were done with respect to the order of implementation of MSSs in organizations.

According to Zeng et al. (2011) if organizations want to *“[...] create complete advantage and [...] to achieve sustainable development”*, they have to implement QMS, EMS and OH&S MSs. An analogous statement was noted by Karapetrovic (2003): *“[...] the sequence of implementing largely mimics the development of MSS: ISO 9000- based QMS, followed by ISO 14000- compliant EMS, and then OH&S MS according to e.g. OHSAS 18001”*. McDonald et al. (2003) said: *“many organizations implementing ISO 14001 likely have an existing QMS in place that meets the*

requirement of ISO 9001". Furthermore, Karapetrovic & Willborn (1998) introduced three strategies:

- 1) *"Establishing QMS first and subsequently EMS"*.
- 2) *"Establishing EMS first and subsequently QMS"*..
- 3) *"Establishing EMS and QMS simultaneously"*.

Studies that were examined regarding the order of implementation of MSSs are present in Table 2.1.1.1. This table contains the authors of a study, year of study, year of publication and the country where the research was done.

Description	Authors	Year of study	Year of publication	Country
<ul style="list-style-type: none"> • “All of the respondent organizations had implemented their QMS prior to introducing the EMS.” 	<ul style="list-style-type: none"> • Alex Douglas and David Glen 	<ul style="list-style-type: none"> • Not specified 	<ul style="list-style-type: none"> • 2000 	<ul style="list-style-type: none"> • UK
<ul style="list-style-type: none"> • All three companies implemented QMS first, followed by EMS and OHSAS. 	<ul style="list-style-type: none"> • Ambika Zuitshi, Amrik and S. Sohal 	<ul style="list-style-type: none"> • 2002 	<ul style="list-style-type: none"> • 2005 	<ul style="list-style-type: none"> • Australia
<ul style="list-style-type: none"> • “All responders attained ISO 9001 certification before ISO 14001”. 	<ul style="list-style-type: none"> • S.X. Zeng, Jonatan J. Shi and G.X. Lou 	<ul style="list-style-type: none"> • 2004-2005 	<ul style="list-style-type: none"> • 2007 	<ul style="list-style-type: none"> • China
<ul style="list-style-type: none"> • “86% QMS first, second EMS. • 3% EMS first then QMS”. • “11% EMS and QMS simultaneously”. 	<ul style="list-style-type: none"> • Stanislav Karapetrovic, Marti Casadesus and Inaki Heras 	<ul style="list-style-type: none"> • 2006 	<ul style="list-style-type: none"> • 2006 • 2007 • 2008 	<ul style="list-style-type: none"> • Spain
<ul style="list-style-type: none"> • “Most [...] had started with single MS mostly ISO 9000”. 	<ul style="list-style-type: none"> • Hardee K. Khanna, S.C. Laroia and D.D. Sharma 	<ul style="list-style-type: none"> • 2008 	<ul style="list-style-type: none"> • 2010 	<ul style="list-style-type: none"> • India
<ul style="list-style-type: none"> • “First, QMS was implemented, then EMS and OHSAS 18001”. 	<ul style="list-style-type: none"> • Alexandra Simon and Alex Douglas 	<ul style="list-style-type: none"> • 2010 - 2011 	<ul style="list-style-type: none"> • 2013 	<ul style="list-style-type: none"> • Spain and UK
<ul style="list-style-type: none"> • “ISO 9001 was the standard most frequently implemented first, followed by ISO 14001, and OHSAS 18001”. 	<ul style="list-style-type: none"> • Tijana Durdevic 	<ul style="list-style-type: none"> • 2013 	<ul style="list-style-type: none"> • 2014 	<ul style="list-style-type: none"> • Canada

Table 2.1.1-1: Order of implementation of MSSs

Table 2.1.1.1 shows that the majority of organizations started the implementation with the QMS, followed by the EMS and OH&S MS.

Bernardo et al. (2012b) did the most detailed study on the implementation order of MSs. The study describes six groups and their order of implementation MSs in Spain. For example, group one implemented a QMS and then an EMS, group two implemented an EMS first and then a QMS, group three a QMS and an EMS simultaneously, group four QMS, EMS and OHSMS, respectively, group five with the order of a QMS first, an EMS second and a CSRMS third and group six a QMS as first, a CSR as second and EMS as the third MSs. The study by Bernardo et al. (2012b) gives a conclusion that the “[...] order of implementation does not condition the level of integration for groups one and two”. However, Bernardo et al. (2012b) also found that organizations that had OH&S as a third implemented MSSs recorded a high level of MS integration.

2.1.2. Time for implementation of MSSs

According to Karapetrovic et al. (2006), the lead time for implementation of standards is motivating to observe because “[...] it relates to both the efficiency in the use of resources and the effectiveness of application of standards”.

The average lead time for MS implementation in Karapetrovic et al. (2006) and Karapetrovic & Casadesus (2009) was 19 months for the first standard. For the second it was 15 months, whereas for the third and fourth, it equaled 11 months. However, Karapetrovic et al. (2006) and Karapetrovic & Casadesus (2009) reported that the lead time for implementing ISO 9001 and ISO 14001 simultaneously was 13.8 months. Zeng et al. (2007) found that for Chinese organizations that already had ISO 9001 in place, the lead time for implementing ISO 14001 was over three years in 36% of those organizations, whereas 51% organizations recorded between one and three years. The same study noted that the lead time for implementation of OHSAS 18001 in the majority of the surveyed organizations was one year.

It is evident is that there is a low number of studies regarding this topic, which provides the subject that is interesting to examine.

2.1.3. Integration of standardized MSs

Beckmerhagen et al. (2003) clarify that “[...] integration of management systems can be defined as a process of putting together different function-specific management systems in to a single and more effective integrated management system (IMS)”.

Integration of MSs had been covered by many articles in literature such as: Savino & Batbaatar (2015), Bernardo, et al. (2015a), Gianni & Gotzamani (2015), Lopez-Fresno (2009), Leopoulos, et al. (2010), Tari & Molina-Azorm (2010), Asif et al. (2010b), Santos et al. (2011), Rebelo et al. (2015), Poltronieri et al. (2015), Bernardo & Farrero (2015) and Domingues et al. (2015). There are articles now that are focused on sustainability in the integration of MSs: Siva, et al. (2016), Mezinska, et al. (2015), Roessler & Schlieter (2015), Ruzevicius & Serafinas (2007), Ho (2009)

and Rocha, et al. (2007). Since this research is empirical, Table 2.1.3.1 summarizes the studies regarding the levels of MS integration.

Description	Author	Year	Year of publication	Country
<ul style="list-style-type: none"> • “28% no integration” • “71% partial integration” 	<ul style="list-style-type: none"> • Alex Douglas and David Glen 	<ul style="list-style-type: none"> • Not provided 	<ul style="list-style-type: none"> • 2000 	<ul style="list-style-type: none"> • UK
<ul style="list-style-type: none"> • “59% have integrated ISO 9001 and ISO 14001” 	<ul style="list-style-type: none"> • S.X. Zeng, P. Tian and Jonathan J. Shi 	<ul style="list-style-type: none"> • Not provided 	<ul style="list-style-type: none"> • 2005 	<ul style="list-style-type: none"> • China
<ul style="list-style-type: none"> • “79% of responders claim cross-functional integration to some degree, while only the remaining 21% have not integrated their standardized MSs” 	<ul style="list-style-type: none"> • Stanislav Karapetrovic, Marti Casadesus and Inaki Heras 	<ul style="list-style-type: none"> • 2006 	<ul style="list-style-type: none"> • 2006 	<ul style="list-style-type: none"> • Spain
<ul style="list-style-type: none"> • “11% no integration” • “47% partial integration” • “42% full integration” 	<ul style="list-style-type: none"> • Alexandra Simon, Stanislav Karapetrovic and Marti Casadesus 	<ul style="list-style-type: none"> • 2006 	<ul style="list-style-type: none"> • 2012 • 2009 	<ul style="list-style-type: none"> • Spain
<ul style="list-style-type: none"> • “85% integrated their systems” • “15% no integration” 	<ul style="list-style-type: none"> • Marti Casadesus, Inaki Heras and Stanislav Karapetrovic • Stanislav Karapetrovic and Marti Casadesus 	<ul style="list-style-type: none"> • 2006 	<ul style="list-style-type: none"> • 2008 	<ul style="list-style-type: none"> • Spain
<ul style="list-style-type: none"> • 17% no integration • “83% implemented IMS” 	<ul style="list-style-type: none"> • Harjeev K. Khanna, S.C. Laroija and D.D. Sharma 	<ul style="list-style-type: none"> • 2008 	<ul style="list-style-type: none"> • 2010 	<ul style="list-style-type: none"> • India
<ul style="list-style-type: none"> • “14% no integration” • “7% partial integration” • “79% full integration” 	<ul style="list-style-type: none"> • Merce Bernardo, Marti Casadesus, Stanislav Karapetrovic and Inaki Heras 	<ul style="list-style-type: none"> • 2006-2007 	<ul style="list-style-type: none"> • 2009 	<ul style="list-style-type: none"> • Spain
<ul style="list-style-type: none"> • “16% no integration” • “22% partial integration” • “62% full integration” 	<ul style="list-style-type: none"> • Alexandra Simon, Merce Bernardo, Stanislav Karapetrovic, and Marti Casadesus • Alexandra Simon, Stanislav Karapetrovic and Casadesus 	<ul style="list-style-type: none"> • 2010 	<ul style="list-style-type: none"> • 2013 • 2012 	<ul style="list-style-type: none"> • Spain
<ul style="list-style-type: none"> • Two out of three had full integration 	<ul style="list-style-type: none"> • Paulo Sampaio, Pedro Saraiva and Pedro Dominues 	<ul style="list-style-type: none"> • Not specified 	<ul style="list-style-type: none"> • 2012 	<ul style="list-style-type: none"> • Portuguese

Table 2.1.3-1: Empirical studies regarding integration of MSs

Table 2.1.3.1 shows that the last study regarding the level of MS integration was conducted in 2010. Therefore, one of the reasons to conduct this study was to determine what is happening currently in organizations regarding the extent of integration of MSs.

Of note on the table is that most of the found studies were done in Spain. The majority of the studied organizations (more than 50%) reported “full integration”, according to the studies

conducted in 2006, 2008, 2009 and 2010. The high percentage of “full integration” was present in studies of Bernardo et al. (2009), Khanna et al. (2010), Simon et al. (2012a), Simon et al. (2013) and Sampaio (2012). Furthermore, these findings introduced another motivation for the study presented in this thesis.

Table 2.1.3.1 shows a high percentage of “partial integration” in studies conducted ten years ago or more (Douglas & Glen, 2000 and Simon et al., 2012a).

A low percentage of separate MSs was reported in studies by Douglas & Glen (2000), Karapetrovic et al. (2006), Simon et al. (2012a), Karapetrovic & Casadesus (2009), Casadesus et al. (2008), Khanna et al. (2010), Bernardo et al. (2009) and Simon et al. (2013).

The reasons for not having integrated MSs was studied by Karapetrovic et al. (2006). They noted that the major reasons were “*lack of human resources*” and “*lack of government support*”. On the other hand, Durdevic et al. (2013) reported that the reason for keeping MSs separate in Canadian organizations was “*lack of interest*”. As this topic was not examined in depth in the literature, it would be interesting to study organizations that did not integrate MSs.

2.1.4. Integration tools and difficulties

According to Karapetrovic & Willborn (1998), difficulties that could occur during the integration process are “[...] *insufficiently harmonized standards from the ISO 9000 and ISO 14000 series, [...] different perceived customers and stakeholders, [...] interfunctional conflict and [...] interests concerning the environment are more homogeneous internally and externally than interests concerning assistance in product quality improvement*”.

Salomone (2008) highlighted that “[...] *although geographical area and company sector have some influence on the perceived benefits and obstacles to adopting the different management systems and their subsequent integration; it is company size that exerts the greatest influence*”.

Simon et al. (2014) and Simon & Petnji Yaya (2012) noted that integration difficulties could “[...] *have an impact on customer satisfaction and innovation, indicating that an organization should give more importance to IMSs, not only for their intrinsic value, but also for their capacity to improve organizational innovation and customer satisfaction*”.

This subchapter presents literature regarding the tools used for MS integration and difficulties that organizations faced during the process of integration of MSs.

The “*process map*” and “*analysis of common elements of standard*” were the most used tools in studied organizations reported by Karapetrovic et al. (2006), Casadesus et al. (2008), Simon et al. (2012a), Simon et al. (2013), Rajkovic (2010) and Karapetrovic et al. (2010). However, Karapetrovic (2003) suggested that an appropriate model for integration could be to “*combine two approaches (process approach and PDCA) under one roof- system approach*”.

Table 2.1.4.1 presents empirical studies that recorded difficulties during the integration of MS.

Description	Authors	Year of research	Year of publication	Country
<ul style="list-style-type: none"> • “People’s attitudes” • “Lack of strategic planning” • “Lack of experience and use of consultant” • “Continually changing regulation and guidelines” • “Reporting results” • “Time delays in integration” 	<ul style="list-style-type: none"> • Ambika Zutshi and Amrik S.Sohal 	<ul style="list-style-type: none"> • 2002 	<ul style="list-style-type: none"> • 2005 	<ul style="list-style-type: none"> • Australia
<ul style="list-style-type: none"> • “Internal factors include: human resources, organizational structure, company culture, and understanding and perception”. • “External factors consist of: technical guidance, certification bodies, stakeholder and customers, and institutional environment”. 	<ul style="list-style-type: none"> • S.X. Zeng, Joonatan J. Shi and G.X.Lou • S.X. Zeng, X.M. Xie, C.M. Tam and L.Y. Shen 	<ul style="list-style-type: none"> • 2005 	<ul style="list-style-type: none"> • 2007 	<ul style="list-style-type: none"> • China
<ul style="list-style-type: none"> • “Management difficulties” • “Lack of competent human resources” • “Lack of information” • “Standards not clear” • “Costs too high” 	<ul style="list-style-type: none"> • Roberta Salomone 	<ul style="list-style-type: none"> • 2007 	<ul style="list-style-type: none"> • 2008 	<ul style="list-style-type: none"> • Italy
<ul style="list-style-type: none"> • “Lack of human resources” • “Lack of employee motivation” 	<ul style="list-style-type: none"> • Merce Bernardo, Marti Casadesus, Stanislav Karapetrovic and Inaki Heras 	<ul style="list-style-type: none"> • 2006-2007 	<ul style="list-style-type: none"> • 2012 • 	<ul style="list-style-type: none"> • Spain
<ul style="list-style-type: none"> • “Lack of employee motivation” • “Lack of human resources” • “Lack of government support” • “Lack of guidelines” 	<ul style="list-style-type: none"> • Sandra M. Castillo-Rojas, Marti Casadesus, Stanislav Karapetrovic, Luis Cromina, Inaki Heras and Irene Mertin 	<ul style="list-style-type: none"> • 2006-2007 	<ul style="list-style-type: none"> • 2012 	<ul style="list-style-type: none"> • Spain
<ul style="list-style-type: none"> • “Lack of human resources” • “Lack of government support” 	<ul style="list-style-type: none"> • Stanislav Karapetrovic, Marti Casadesus and Inaki Heras 	<ul style="list-style-type: none"> • 2006 	<ul style="list-style-type: none"> • 2006 	<ul style="list-style-type: none"> • Spain
<ul style="list-style-type: none"> • “Lack of resources” • “Lack of company interest in integration” • “Difficulties in understanding standards” 	<ul style="list-style-type: none"> • Marti Casadesus, Inaki Heras and Stanislav Karapetrovic 	<ul style="list-style-type: none"> • 2006 	<ul style="list-style-type: none"> • 2008 	<ul style="list-style-type: none"> • Spain
<ul style="list-style-type: none"> • “Employee resistance” • “Lack of resources” • “Lack of strategy for integration” • “Post IMS implementation difficulties” 	<ul style="list-style-type: none"> • Muhammad Asif, Erik J. de Bruijn and Olaf A.M. Fosscher, Cory Searcy and Harm-Jan Steenhuis 	<ul style="list-style-type: none"> • Not provided 	<ul style="list-style-type: none"> • 2009 	<ul style="list-style-type: none"> • theoretical
<ul style="list-style-type: none"> • “Lack of knowledge managers and employees” • “Resistance to change” • “Bureaucratization in the system” • “Lack of employee motivation” 	<ul style="list-style-type: none"> • Dragan Rajkovic 	<ul style="list-style-type: none"> • 2009-2010 	<ul style="list-style-type: none"> • 2010 	<ul style="list-style-type: none"> • Serbia

Table 2.1.4-1: Studies regarding integration difficulties

Description	Authors	Year of research	Year of publication	Country
<ul style="list-style-type: none"> • “Lack of resources for integration” • “Lack of specialized consultants” • “Lack of government support” • “Lack of employee’s motivation” • “Difference in the common elements of the standards” 	<ul style="list-style-type: none"> • Alexandra Simon, Stanislav Karapetrovic and Marti Casadesus 	<ul style="list-style-type: none"> • 2010 	<ul style="list-style-type: none"> • 2012 	<ul style="list-style-type: none"> • Spain
<ul style="list-style-type: none"> • “Lack of human resources” • “Lack of employee’s motivation” • “Lack of department collaboration” • “Lack of specialized consultants” 	<ul style="list-style-type: none"> • Alexandra Simon, Merce Bernardo, Stanislav Karapetrovic and Marti Casadesus 	<ul style="list-style-type: none"> • 2010 	<ul style="list-style-type: none"> • 2013 	<ul style="list-style-type: none"> • Spain
<ul style="list-style-type: none"> • “Lack of human resources” • “Lack of employee’s motivation” • “Differences in standards” 	<ul style="list-style-type: none"> • Alexandra Simon and Alex Douglas 	<ul style="list-style-type: none"> • 2010-2011 	<ul style="list-style-type: none"> • 2013 	<ul style="list-style-type: none"> • Spain • UK
<ul style="list-style-type: none"> • ” Two organizations that did “full integration” did not report difficulties of the integration”. 	<ul style="list-style-type: none"> • Paulo Sampaio, Pedro Saraiva and Pedro Dominues 	<ul style="list-style-type: none"> • Not given 	<ul style="list-style-type: none"> • 2012 	<ul style="list-style-type: none"> • Portuguese
<ul style="list-style-type: none"> • “Difference in common elements of standard” • “Difference in models used in the standards” • “Lack of human resources” 	<ul style="list-style-type: none"> • Tijana Durdevic, Stanislav Karapetrovic and Cory Searcy 	<ul style="list-style-type: none"> • 2012 	<ul style="list-style-type: none"> • 2013 	<ul style="list-style-type: none"> • Canada

Table 2.1.4-1: Studies regarding integration difficulties-continue

Irrespective of the time of the research and the research location, it is evident that all surveyed organizations share the same problems. The majority of the studies revealed two main difficulties “*lack of human resources*” and “*lack of employee motivation*”. Regarding this literature, it is interesting to study what is happening (in recent years) on this topic and if there are difficulties being encountered in Serbian organizations.

Moreover, studies explained other significant difficulties of integration process such as: “*differences in common elements of standard*” (McDonald, et al., 2003, Slomone, 2008, Simon et al., 2012a, 2012b and 2013, Casadesus et al., 2008, Sampaio et al., 2012 and Durdevic et al., 2013) and a “*lack of specialized consultants*” (Zuitshi & Sohail, 2005, Simon et al., 2012b and 2013).

Integration barriers such as “*lack of knowledge between employees and management, you know what you have not what you get, reinvention of bureaucracy, lack of internal and external demands and certifying bodies*”, were reported in presentation and discussion at the seminar Markedsplads om Miljøledelse (2005), cited by Jorgensen (2008). According to Wilkinson & Dale (2000) “[...] *cultural differences and failure to understand differences in the system*” were the main difficulties.

Sampaio et al. (2012) found no major difficulties during the integration. The reason for that conclusion could be due to the small sample size (three Portuguese organizations). However,

Djordjevic et al. (2010) stated that the problem with the integration of MSs in Serbian small and medium organizations is “[...] *inadequate knowledge about IMS concept and it’s advantages*”. Similarly, another Serbian study by Rajkovic (2010) reported that the major difficulties in Serbian small and medium organizations were “*lack of knowledge of managers and employees*” and “*resistance to change*”.

Bernardo et al. (2012a) used structural equation models and reported the conclusion that “[...] *difficulties of integration can be grouped in three large clusters, which are “internal difficulties”, “external difficulties” and “difficulties with the standard”*”. A similar conclusion was drawn by Zeng et al. (2007), explaining that integration difficulties could be put into two groups: “[...] *internal factors such as: human resources, organizational structure, company culture, and understanding and perception*” and “[...] *external factors such as: technical guidance, certification bodies, stakeholders and customers, and institutional environment*”.

Fresner & Engelhardt (2004) said that QMS, EMS and OHSAS are “*three parallel systems*” and “[...] *separating them does not help the point of view of a company’s employee who must work with these systems*”. Nevertheless, Jorgensen (2008) claims, “[...] *revision of ISO 9001, ISO 14001, EMAS and OHSAS 18001 has increased similarities between the different standards and has made them more compatible*”. Furthermore, less than a year ago new versions of ISO 9001 and ISO 14001 was published, which brings the potential for new integration difficulties. This would be interesting to study in future.

2.1.5. Integration levels

Theories regarding integration levels are studied by many authors (e.g. Beckmerhagen et al., 2003; Jorgensen et al., 2006; Jorgensen; 2008; Asif et al., 2010a; Zeng et al., 2007; Bernardo et al., 2009, Renzi & Cappelli, 2000 and Karapetrovic & Jonker, 2003). However, there is a lack of empirical studies regarding the levels of MS integration (e.g. Simon & Douglas, 2013; Saomone, 2008; Simon et al., 2012a; Bernardo et al., 2009; Bernardo et al., 2012a; Simon et al., 2013; Karapetrovic et al., 2006; and Douglas & Glen, 2000). Most of the studies were done in Spain (e.g. Simon & Douglas, 2013; Simon et al., 2012; Bernardo at al., 2009; Bernardo et al., 2012a; Simon at al.,

2013 and Karapetrovic et al., 2006), so there is a motive for observing the levels of integration in Serbian organizations.

According to Beckmerhagen et al. (2003), *“full integration is required at the top and bottom organizations levels, while function specific elements can be kept separate at intermediate levels”*. Moreover, Beckmerhagen et al. (2003) add that full integration should be mandatory in small organizations, especially in those that have been *“[...] operating with potentially high degrees of risk, for example nuclear and chemical industries”*. Beckmerhagen et al. (2003) presented three different levels of integration: *“harmonization, cooperation and amalgamation”*.

Jorgensen et al. (2006) and Jorgensen (2008) explained three levels of MS integration: *“corresponding - increased compatibility with cross-references between parallel systems; coordinated and coherent- generic processes with focus on tasks in the management cycle; and a strategic and inherent- an organizational culture of learning continual improvements of performance and stakeholder involvement related to the internal and external challenges”*. In addition, Asif et al. (2010a) reported three levels of MS integration: *“strategic level, tactical level and operational level”*.

Bernardo et al. (2009) found four levels of MS integration, presenting that each level indicated some degree of integration, *“no integration (level 0) to complete integration (level 3)”*. Similarly, Sampaio et al. (2012) also reported four levels of MS integration *“Level 1- Documentation integration, Level 2- Management tools integration, Level 3- Common policies and goals and Level 4- Common organization structure”*.

Referring to Associazione Italiana Cultura Qualita (2000), cited by Renzi & Cappelli (2000), the described levels of MS integration in a specific hierarchy of human resources are:

- *“top management: maximum integration, as the strategy is the same”*
- *“middle management: medium integration, because technical specialization comes into account”*
- *“technical and other employees: low integration, for their activities are different”*

Karapetrovic (2002) explained that: *“[...] full integration of MSS requirements may be achieved at strategic and tactical (shop-floor) levels, while the operational level may contain quality, environmental and other function-specific modular guidelines”*.

However, when it comes to MS integration “[...] *there is no ‘one best approach’ for every conceivable situation*”, referred by Karapetrovic & Jonker (2003). The best approach could be defined or chosen by the organization itself, depending on different reasons e.g. the nature of the organization, different expectations of customers, different sizes of organizations and available resources. Moreover, one study by Bernardo et al. (2012a) and (2012b) concluded that higher levels of integration are obtained by the organizations that implemented fewer MSSs.

Two integration approaches were reported in the study of Wilkinson & Dale (2000): “[...] *integration through the standards and implementation of an IMS through a TQ approach*”.

“[...] *Integration requires three strategic organizational levels*” Zeng et al. (2007). Level 1: “[...] *strategic objectives [...] plans and actions*”, Level 2: “[...] *organizational structural, resource and cultural synergy*” and Level 3: “[...] *documentation synergy*”, as introduced by Zeng et al. (2007).

Table 2.1.5.1, presents empirical studies regarding the levels of MS integration.

Description	Author	Year of study	Year of publication	Country
<ul style="list-style-type: none"> • “A higher levels of integration were exhibited in MS procedures such as management review, record and document control, internal audits or preventive and corrective actions”. • “[...] A lesser extent was resource management, product realization and internal communication”. • “[...] The integration of the human resources, all the companies have achieved a state of partial integration”. • “The level of integration is much higher at the top level than at the shop floor level”. • “English firms show a higher level of integration of the documentation than Spanish firms, especially regarding the company policy, objectives and manual”. 	<ul style="list-style-type: none"> • Alexandra Simon and Alex Douglas 	<ul style="list-style-type: none"> • 2010-2011 	<ul style="list-style-type: none"> • 2013 	<ul style="list-style-type: none"> • Spain • UK
<ul style="list-style-type: none"> • “Regarding the integration level, the elements integrated to the highest extent are human resources (with the exception of the inspectors, which are partially integrated)”. • “The procedures, which are all fully integrated, except for the planning”. • “The documentation resources are also fully integrated (company policy, objectives, manual, work procedures) with the exception of the work instructions and the records which are partially integrated”. 	<ul style="list-style-type: none"> • Alexandra Simon, Merce Bernardo, Stansilav Karapetrovic and Marti Casadesus 	<ul style="list-style-type: none"> • 2010 	<ul style="list-style-type: none"> • 2013 	<ul style="list-style-type: none"> • Spain
<ul style="list-style-type: none"> • “Control of document (100%), policy (93%) management review (93%), continual improvement (93%)”. • Objective and targets (87%), control of records (87%) and internal audits (87%)”. • “Education and training (86%), manual (84%), emergency preparedness and response (83%), strategy and scope (77%), internal and external communication (73%)”. 	<ul style="list-style-type: none"> • Roberta Salomone 	<ul style="list-style-type: none"> • 2007 	<ul style="list-style-type: none"> • 2008 	<ul style="list-style-type: none"> • Italy
<ul style="list-style-type: none"> • “Full integration: policy (78%), objectives (73%) and the manual (82%)”. • “Full integration: management system manager (39%), management system representative (43%) and inspectors (44%)”. • “Full integration: policy (78%), objectives (73%), manual (82%), procedures (63%), instructions (56%) and records (54%)”. • “Full integration of procedures: planning (66%), internal auditing (88%), management review (88%), control of nonconformities (82%), preventive and corrective action (82%), product realization, resource management (75%), determination of requirements (70%), improvements (82%), documentation control (90%), record control (90%), internal communication (89%)”. 	<ul style="list-style-type: none"> • Merce Bernardo, Marti Casadesus, Stanislav Karapetrovic and Inaki Heras 	<ul style="list-style-type: none"> • 2006-2007 	<ul style="list-style-type: none"> • 2009 • 2012 	<ul style="list-style-type: none"> • Spain

Table 2.1.5-1: Level of integration

Description	Author	Year of study	Year of publication	Country
<ul style="list-style-type: none"> • “[...] 5% increase from 2006 to 2010 at the functional level (management system managers), as well as a 20% increase at shop floor level (inspectors)”. • “[...] most firms have both in 2006 and 2010 a single policy, set of objectives and the MS manual”. • “[...] use of integrated records, instructions or procedures significantly increases from 2006, when less than half of the firms had fully integrated these elements, to the year 2010, when between half and three quarters of the respondents had already integrated them fully”. • Internal audit was “full integrated” procedure in 2010 (80%). 	<ul style="list-style-type: none"> • Alexandra Simon, Merce Bernardo, Stanislav Karapetrovic and Marti Casadesus • Stanislav Karapetrovic, Marti Casadesus and Inaki Heras 	<ul style="list-style-type: none"> • 2006 • 2010 	<ul style="list-style-type: none"> • 2012a • 2006 	<ul style="list-style-type: none"> • Spain
<ul style="list-style-type: none"> • “Areas of integration: auditing (85%), training (60%), management review (65%), purchasing (70%), supplier assessment (70%), corrective and preventive action (70%), document control (90%)”. 	<ul style="list-style-type: none"> • Alex Douglas and David Glen 	<ul style="list-style-type: none"> • Not given 	<ul style="list-style-type: none"> • 2000 	<ul style="list-style-type: none"> • UK

Table 2.1.5-1: Level of integration- continue

Looking at Table 2.1.5.1 chronologically, it is evident that levels of MS integration increased over the years. When it comes to the integration of human resources, partial integration was present in studies by Simon & Dauglas (2013) and Simon et al. (2013). However, all studies noted a high level of integration of MS representatives and MS managers (e.g. Simon et al., 2013; Karapetrovic et al., 2006 and Simon et al., 2013a). Simon et al. (2012a) illustrated two studies in Spain, one conducted in 2006 and the second in 2010. The results showed that integration of system managers “[...] increased by 5% whereas integration of inspectors are increased by 20%”. However, Simon & Douglas (2013), compared two countries (Spain and UK), and discovered a higher level of integration in English organizations in organizational policy, objectives and manuals. Furthermore, research by Simon et al. (2012a) and Karapetrovic et al. (2006) recorded a high level of integration of internal audits, which represented the highest integrated process in both studies. Bernardo et al. (2012b) described a high level of integration in the following processes: internal audit, management review, nonconformities, document controls, record controls, internal communications and corrective and preventive actions. Conversely, a lower percentage of the integrated processes was recorded in product realization. In the study by Bernardo et al. (2012b), a level of integration of goals and documentation was described as average. Using structural equation model Simon et al. (2012b) discovered that “[...] a high level of integration of the documents does not lead to strategic or image improvements of the company”. A high level of integration of processes, goals and documentation was present in studies by Simon & Douglas (2013), Simon et al. (2012a), Bernardo et al. (2009), Salomone (2008), Bernardo et al. (2012a),

Simon et al. (2013), Karapetrovic et al. (2006) and Douglas & Glen (2000). In these studies, the least integrated processes were resource management and record control (Simon & Douglas, 2013 and Bernardo et al., 2009). Furthermore, it could be concluded that a low number of studies exist regarding the levels of integration of processes.

2.2. Auditing

This part of the literature review demonstrates the implementation of audits and their integration. In the implementation sections of the literature reviews (sections 2.2.1 to 2.2.4), the focus is on guidance on doing audits, frequency of performing audits and the outcomes that they provide for the organizations. Furthermore, topics that were covered for the integration of audits are the structure of audits, the extent of integration of audit teams, time for performing audits, audits objectives and audits plans and reports.

2.2.1. Guidelines used in auditing

Guidelines are sets of procedures used to audit systems. ISO 19011 is the only ISO guideline for auditing quality, environmental and other management systems.

According to Kraus & Grosskopf (2008) *“the standard explains the principles of management system auditing [...] It also offers advice on evaluating auditors and assessing their competence, guidance on managing audit programs, and guidance on conducting internal and external auditors”*.

According to Simon et al. (2011), organizations used ISO 19011 in addition to their model for doing internal audits. Similar results regarding ISO 19011 as guidance for internal audits were found by Simon et al. (2014), showing that 28.9% of internal auditors used that practical guideline. However, Simon et al. (2014) said *“[...] 27.6% do not follow any guideline”*, when it comes to internal auditing. Furthermore, *“[...] 40.8% of external auditors use ISO 19011 and mere a 9.2% follow no guideline”* (Simon et al., 2014). Casadesus et al. (2008) concluded that *“[...] the ISO 19011 standard seems to be most commonly used for external audits, in the case of internal audits, companies themselves created their own procedures”*.

With respect to internal auditing, Karapetrovic et al. (2006) and Casadesus et al. (2008) reported that the majority of organizations in Spain used ISO 19011 as a guideline for both internal and external auditing. However, Casadesus et al. (2008) reported that *“[...] a significant number of responders are not aware of particular guidelines used for external audits (27%)”*.

2.2.2. Frequency of the audit

Performing audits regularly are very important for continual improvement of an organization.

“Since auditing is a costly process, the allocation of resources between the frequency and the accuracy of audits is an important issue [...] Organizations choose their audit technologies based on both direct and strategic benefits” (Finkle & Shin, 2007).

With respect to the frequency of conducting audits Karapetrovic et al. (2006), Casadesus et al. (2008), Simon et al. (2014) and Durdevic (2014) showed that the majority of organizations surveyed did internal audits in the range of six months to less than a year. However, audit frequency for internal audits reported by Nitkin & Brooks (1998) was *“29%for audits conducted annually, 12%for audits conducted every two years, and 21%for audits conducted every three or four years”*. Nevertheless, the organizations surveyed in Nitkin & Brooks (1998) only reported results regarding audits for environmental MSSs. Casadesus et al. (2008), Karapetrovic et al. (2006) and Simon et al. (2014) found that a high percentage of external audits were conducted between six months and one year. Durdevic et al. (2013) showed that external audits were mostly conducted between one and two years. Simon et al. (2014) and Karapetrovic et al. (2006) found that 40% of external audits were conducted between one and three years.

2.2.3. Audit outcomes

According to ISO 9000 (ISO, 2005) audit findings are *“[...] results of the evaluation of the collected audit evidence agents audit criteria”*. ISO 9000 clarifies (ISO, 2005) that *“[...] audit findings indicate conformity or nonconformity”* .

In the surveys by Karapetrovic et al. (2006), Simon et al. (2011) and Simon et al. (2014) audit outcomes were investigated with possible answers *“show improvement opportunities for the implementation of the standard”* and *“only detects nonconformities”*. The studies reported a low percentage for the answer *“only detects nonconformities”*. Conversely, Durdevic (2014) reported the response *“detect nonconformities”* for internal auditing from 90% of organizations.

2.2.4. Structure of audits

According to Kraus & Grosskopf (2008), “[...] a key benefit to an integrated MSs is that it enables and promotes integrated audits [...] Professionals who have conducted integrated audits recognize how much more efficient they can be: the process under review, along with all its controls (environmental, health, safety, and quality) has to be evaluated only once [...] There is less duplication of effort during the planning, execution, and even follow-up phases of the audit”. The core reasoning behind having integrated audits combined with the frequency of conducting audits is to “[...] show improvement opportunities for the implementation of each standard”. This answer was reported for both internal and external audits by Casadesus et al. (2008) and Karapetrovic et al. (2006). Simon et al. (2011) and (2014) reported that audit outcomes for internal and external audits were “improvement opportunities for the implementation of each standard and for integration”. Furthermore, Simon et al. (2011) reported “[...] benefits mentioned by some of organizations are simplification of audits and the opportunity in the future to integrate other MSSs into the whole system”. Bernardo et al. (2011) stated that organization with a high level of MS integration “[...] are still receiving suggestions on how to improve the integration of their MSs from internal auditors”. Also, organizations with a lower level of MS integration described that “[...] benefit from external auditors' suggestions for improvement of the integration of the organizations' MSs”.

Casadesus et al. (2008) explain that “[...] full integration requires the establishment of one single audit system for all company's functions that covers all of its objectives, processes and resources”.

Taking into account the integration of audits, Bernardo et al. (2010) clarified three levels of integration of audit systems:

- “Not Integrated- indicating different audit teams; different times when audits are conducted; audits of independent management systems; as well as different plans and reports,
- ‘Partially Integrated -meaning single audit teams and/or simultaneous audits, but only for the selected standardized management systems or against certain management system

standards; audits of interrelated management systems; as well as single audit plans, but different audit reports, and

- *‘Fully Integrated- referring to single audit teams and/or simultaneous audits for all management systems or standards; audits of integrated management systems; and single audit plans and reports’.*

2.2.5. Integration of audit time

In regards to audits of different MSs, the majority of the studies reported that internal and external audits were conducted at the same time for all MSSs, Simon et al. (2011), Simon et al. (2014), Bernardo et al. (2010) and Bernardo et al. (2011). Karapetrovic et al. (2006) stated that “[...] *the majority of responders conduct their audits in simultaneously [...] the fraction is slightly higher in the case of external audits (73% compared to 68% of internal ones)*”. However, Durdevic et al. (2013) reported slightly lower results compared to the other studies. Internal audits were conducted at the “*same time for all standards*” in 50% of observed organizations (Durdevic et al., 2013).

2.2.6. Integration of audit teams

According to the research by the Danfoss Group, Jorgensen (2008), concluded that saving money and time could be achieved by having “[...] *one system and one audit with the same audit team for all three systems (QMS, EMS and OHSAS), [with] all three systems are audited during the same period*”.

In addition, Simon et al. (2011) reported the main benefit stated by the four examined firms is the ability “[...] *to change the audit team every two or three years in order to receive a better feedback*”, thus the audits were successfully being as used tools for continuous improvement.

Having integrated audit teams for QMS, EMS, OHSAS and other MSSs, was present in the majority of studies. Karapetrovic et al. (2006), Douglas & Glen (2000), Bernardo et al. (2010), Karapetrovic et al. (2010), Bernardo et al. (2011), Simon et al. (2011) and Simon et al. (2014) reported in their studies that more than 60% of the surveyed organizations have the same audit

teams for MSSs implemented. With external audits, most organizations reported different audit teams for different standards. Simon et al. (2011) and (2014) and Karapetrovic et al. (2006) reported that more than half of participants in their research had the same audit team for MSSs. However, in Bernardo et al. (2010) and (2011) the usage of the same team for external audits was slightly lower than 50%.

2.2.7. Integration of audit plans and reports

Full integration of documents, plans and reports for internal audits was found in studies by Karapetrovic et al. (2006), Karapetrovic et al. (2010), Bernardo et al. (2010), Bernardo et al. (2011), Casadesus et al. (2008), Simon et al. (2011) and Simon et al. (2014). They reported that more than 50% of surveyed organizations had integrated audit plans and reports for internal auditing. Durdevic et al. (2013) obtained different results in Canada, namely that 38% of the organizations had full integration of these documents.

In reference to the research on external audits, Karapetrovic et al. (2006), Bernardo et al. (2010) and Simon et al. (2014) concluded that external audits in more than half of the participating organizations had integrated plans and reports.

2.2.8. Audit perspective

Audits can be performed on completely independent systems (“not integrated”), on interrelated systems (“partially integrated”) and on a single integrated system (“fully integrated”) (Karapetrovic et al., 2006).

Studies show that internal audits were undertaken viewing MSs as integrated in a high percentage of organizations (e.g. in Karapetrovic et al., 2006 reported and 54%, Bernardo et al., 2010 reported 66%). Simon et al. (2014) and (2011) examined four organizations where three audited their MS as a single system. However, Durdevic (2014) studies showed different results in Canada. She said that only 15% of internal audits were conducted on MSs as a single system.

Referring to externally audits view audited systems as an integrated system was proven in studies by Karapetrovic et al. (2006), Simone et al. (2014), Simon et al. (2011) and Bernardo et al. (2010). Durdevic (2014) showed 26% of organizations only reported that same results.

2.3. Augmentative and customer satisfaction standards

This subchapter contains what has been done in research the field of augmentative and customer satisfaction standards. The first part displays studies of augmentative standards (ISO 10005, ISO 10012, ISO 19011 and ISO 14031). Furthermore, the second part presents customer satisfaction standards ISO 10001, 10002, 10003, 10004 and 10008.

Karapetrovic (2005) explained “[...] *expansion of the MSS from the minimum requirement “seed” (referring to: ISO 9001:2000 or ISO 14001:2004) is characterized by three spatial dimensions, which can be called “augmentation”, “ascension” and “assimilation”*”. Moreover, he noted that augmentative MSSs “[...] *can be expanded to include additional processes, which are developed according to different guidance standards and are subsequently built into the MS itself*”.

Furthermore, Karapetrovic (2007) and (2012), Karapetrovic et al. (2006) and (2012) and Nowicki et al. (2014), explained that augmentative standards apply to any industry sector or any size organization.

Another study by Nowicki et al. (2014) showed that Polish and Spanish spa enterprises are not familiar with augmentative standards. Nowicki et al. (2014) reported that the reasons for deficiencies in their implementation of augmentative standards were the “*cost of implementation, lack of time to prepare it and then maintenance while also dealing with bureaucracy it caused*”. Karapetrovic & Spasojevic-Brkic (2014) also mentioned that Serbian organizations were not aware of augmentative and CSS standards. In addition, they outlined that difficulties of not implementing augmentative and CSS standards we related to “*lack of human resources*” and “*lack of awareness about augmentative standards*”.

According to Karapetrovic (2007) augmentative standards are easier to integrate into the MS because they present “[...] *a fairly narrow, but a much more focused scope*”. Augmentative standards are very useful in organizations from “[...] *the public sector from which there is increasing demand for better service*” Dee et al. (2004).

2.3.1. Augmentative standards

This subchapter focuses on their usage by describing studies that were conducted regarding usage of this group of standards. The fact that there are few studies done focusing on this group of standards was motivation to conduct the study.

Salerno-Kochan & Salerno-Kochan (2015) stated that some Polish organizations interviewed reported that ISO 10005 “*[...] deals with the problems too narrowly or superficially and the procedures and methods employed by organizations are better than those proposed by the standard*”. Moreover, they noted that familiarity of ISO 10005 was present in 14 organizations out of 40. Additionally, Karapetrovic & Spasojevic-Brkic (2014), reported that usage of ISO 10005 by Serbian organizations was present in 21% of organizations, which was double the usage of ISO 10012.

Payne (2007) describes the benefits of having ISO 10012 in organizations. Also, he explained that “*taken as a whole, ISO 10012 provides a rigorous method for determining whether every measurement being made is necessary, is being made with appropriate measuring instruments, is being made correctly and is reviewed at regular intervals*” Payne (2007).

Beltran et al. (2010) used 11 organizations to develop a model for meteorological management, “*[...] which is then validated through an experimental analysis of the results obtained from the application of an audit process*”. Moreover, Beltran et al. (2010) concluded that “*organizations with certified EMSs have a great potential for improvement in their metrological processes [...] These processes guarantee compliance with all the environmental requirements that need to be measured and that ultimately evaluate the environmental behavior of the organization.*”.

When it comes to an organization’s knowledge and awareness of ISO 10012, the Polish study conducted by Salerno-Kochan & Salerno-Kochan (2015) reported that out of 40 organizations 26 were familiar with the standard. However, Karapetrovic & Spasojevic-Brkic (2014) showed the number of Serbian organizations with knowledge and awareness of ISO 10012 was much lower than in Polish organizations, with just 10% of awareness of ISO 10012. It should be noted that the literature lacks in studies regarding ISO 10012.

Russell (2000) describes ISO 19011 as “[...] *flexible and user-friendly [...] that emphasizes the importance of achieving customer satisfaction*”. Moreover, Russell (2007) describes five ISO 19011 principles and the importance of auditors to practice those principles. Simon et al. (2011) and (2014) and Karapetrovic et al. (2006) proved in their studies that ISO 19011 was widely used as guidance for auditing. When it comes knowledge of augmentative standards, it could be said that the majority of studies conducted showed that ISO 19011 comes out on top when it comes awareness of augmentative standards. Studies by Karapetrovic & Spasojevic-Brkic (2014), Salerno-Kochan & Salerno-Kochan (2015) Karapetrovic et al. (2006) and (2010) back up this conclusion.

One of the studies done by Lokkegaard (1999) on Malaysian organizations reported that “[...] *organizations improved the evaluation process by introducing better indicators and expanding the scope of performance evaluation*”. Moreover, the Malaysian organizations “[...] *established an EMS using the principles of ISO 14031*”. Morhardt et al. (2002) researched “[...] *the extent to which current voluntary corporate environmental reports meet the requirements of two new sets of guidelines: the Global Reporting Initiative (GRI 2000) sustainability reporting guidelines and the ISO 14031 environmental performance evaluation standard*”. 39% of organizations said that ISO 14031 was “*already implemented*” or consider it “*important to implement*” in Karapetrovic & Spasojevic-Brkic (2014). The much lower percentage was found in studies Karapetrovic et al. (2006) and (2010).

2.3.2. Customer satisfaction standards

Regarding CS ISO 10001, ISO 10002 and ISO 10003 are “[...] *conceptually linked and together form a comprehensive approach for all phases of managing customer complaints*” (Dee et al., 2004). According to Karapetrovic et al. (2012), we can add ISO 10004 and ISO 10008 to this group of standards. In addition, it should be noted that CSSs are relatively new. Therefore, there are few empirical studies on these standards available.

In studies by Karapetrovic et al. (2006), Casadesus et al. (2008) and Salerno-Kochan & Salerno-Kochan (2015) familiarity of the organizations with ISO 10001 was 20%. Karapetrovic & Spasojevic-Brkic (2014) reported that 26% of organizations said ISO 10001 was “*already implemented*” or consider it “*important to implement*”. Furthermore, the study of Khan & Karapetrovic (2015) “*[...] explored ISO 10001: 20007 in planning, designing and developing a customer satisfaction promise intended for inpatient care*”.

With respect to the familiarity of ISO 10002, organizations scored well in the studies by Karapetrovic et al. (2006) and (2010) and Casadesus et al. (2008). The studies by Karapetrovic & Spasojevic-Brkic (2014) reported that 25% of Serbian organizations already implemented ISO 10002 and considered to “*important to implement*”. Salerno-Kochan & Salerno-Kochan (2015) said that 30% of organizations in Poland knew about the ISO 10002 standard.

Ang & Buttle (2006) conclude that “*effective complaints handling [...] can generate two benefits. First, when a customer complaint, companies are being given a chance to fix the particular customer’s problem [...]. Second, a well-designed complaints handling process allows management to collect and analyze complaints data over time*”.

The Ang & Buttle (2012) study showed that organizations that had implemented ISO 10002 appreciate its’ benefits. Moreover, the organizations noted, “*[...] beneficial marketing-related outcomes, particularly in terms of enhancing levels of customer advocacy, higher levels of customer satisfaction, and improvement to the process of facing the customer*” (Ang & Buttle, 2012).

There have been a few studies of usage and benefits of ISO 10002 and ISO 10001. Karapetrovic (2012) used ISO 10001 and ISO 10002 in engineering management courses at the University of Alberta. Similar studies by Karapetrovic & Doucette (2009) and Karapetrovic (2010) were done in “*[...] engineering economics and financial management courses; two graduate courses on quality and production; and design and integration of standardized systems*”. ISO 10001 and ISO 10002 were implemented in these four courses, giving very positive feedback from participating students. “*79% and 94% of the students surveyed in courses would recommend the use one of the codes (e.g. “24-hour responds code”), in other courses*”, (Karapetrovic & Doucette, 2009).

Research by Karapetrovic et al. (2006), Casadesus et al. (2008), Karapetrovic & Spasojevic-Brkic (2014) and Salerno-Kochan & Salerno-Kochan (2015) reported a very small percentage of the organizations that knew ISO 10003 standard. Karapetrovic & Doucette (2009), demonstrate usage of CSSs in engineering courses, describing that ISO 10003 “[...] can be used to augment or connect an ISO 10002 based system to existing facility or university procedures on the external resolution of teaching related disputes”.

There was a high number of 15 out of 40 organizations in Poland with the knowledge of ISO 10004 (Salerno-Kochan & Salerno-Kochan, 2015), yet 67% of the organizations knew nothing about the standard. However, results in Serbia (Karapetrovic & Spasojevic- Brkic, 2014) showed that 36% of Serbian organizations already had the standard in place with more than 50% of Serbian organizations planning to implement the standard. One of the discoveries made by Karapetrovic & Doucette (2009) is that ISO 10004 “[...] is applicable to the development and use of various surveys of students and other “customers” in order to measure, monitor and ultimately improve their satisfaction with teaching”. Khan et al. (2010) reported potential usage of ISO 10004 in the field of health care. Moreover, Khan et al. (2010) noted that a process is still in the modeling phase and it has “[...] not yet been tested”.

There has been one study that recently done by Vargas-Villarroel (2015), where she created a model for an undergraduate course using the course website, achieving integration using ISO 10008, ISO 10001, ISO 10002 and ISO 10004 MSSs. In adopting integration of these standards, Vargas-Villarroel (2015) concluded, “[...] course quality and satisfaction improved through of surveys and a redesigned course website”.

According to Karapetrovic et al. (2006) and Karapetrovic (2012), their study that was conducted in 2006 in Spain revealed that, the majority of surveyed organizations was not familiar with ISO 10001, ISO 10002, ISO 10003 or ISO 10004 and that “[...] they were not planning to implement them in the future”. The study did qualify that, at the time the survey was taken these standards were relatively new. Interesting, though was the fact that 33% of the organizations surveyed had plans to implement ISO 10002 or they had already implemented it. Similar studies were done in Poland by Salerno-Kochan & Salerno-Kochan (2015) showing that a very low percentage of Polish organizations was familiar with ISO 10000 standards. Such issues, Salerno-Kochan & Salerno-Kochan (2015) revealed: “[...] deficient information on these standards, lack of reference to the standards, lack of willingness and lack of motivation”.

In studies conducted by Karapetrovic & Spasojevic-Brkic (2014) and Salerno-Kochan & Salerno-Kochan (2015) said that a very small percentage of organizations were familiar with the standards.

2.4. Methodology

The survey presented here was conducted in Serbia 2013 by Dr. Stanislav Karapetrovic and Dr. Vesna Spasojevic-Brkic. The survey was approved by the University of Alberta Research Ethics Board. It is a follow-up to the survey that was already done in Spain in 2006 and 2010 (e.g., Karapetrovic et al., 2006; Casadesus et al., 2008; Karapetrovic et al., 2010; Simon et al., 2014; Bernardo et al., 2009; Bernardo et al., 2012a and Simon et al., 2012). Serbia followed a similar pattern that Spain had followed up to 2013 regarding the implementation of ISO 9001 and ISO 14001 (see Table 1.1 and Table 1.2).

The survey contained a cover letter and a questionnaire (Appendix E). The cover letter gave general information about the questionnaire such as investigators names', the background of the empirical study, the purpose of the study, study processes, benefits of the study, participation, confidentiality and anonymity and contact information. The questionnaire was divided into nine sections. All the sections contained questions related to MSSs. Section 1 provided questions asking for the general information from the organizations, i.e. demographic questions that are contained in the most surveys (namely the number of employees and the industry sector). Sections 2 and 3 dealt with the implementation of MSSs and the integration of MSs. Section 3 explained tools used for the integration of MSS, listing the main difficulties that organizations experience during the process of integration and finally the extent of integration concerning human resources, organizational goals, documents and processes. Section 4 examined audits and auditors employed by the organizations. Finally, Sections 5 to 9 examined augmentative standards, their implementation in MSs and their audits.

A link to the survey was emailed to 320 organizations registered to ISO 9001 and ISO 14001. Once an organization received that survey, it needed to be filled out by the person responsible for quality and/or environmental management systems.

The first round of survey questionnaires was sent on September 12, 2013, providing a total of 20 survey responses. A reminder was sent to the organizations on September 24, 2013, generating an additional 19 survey responses. The last reminder for completing the survey was sent on December 10, 2013, and returned 11 survey responses. Fifty completed surveys were received, for

a total response rate of 15.6 %. The data received covered the period of 9/12/2013 to 12/19/2013, and it took 71 working days for data received to be collected.

Monthly responses varied. September generated 48% of the data received, October generated in 28% of data received, in November, only one organization returned a completed survey (2% of the data). Finally, December yielded 22% of the data received. Similarly, the responses were obtained in a four-month interval, represented in Figure 2.4.1.

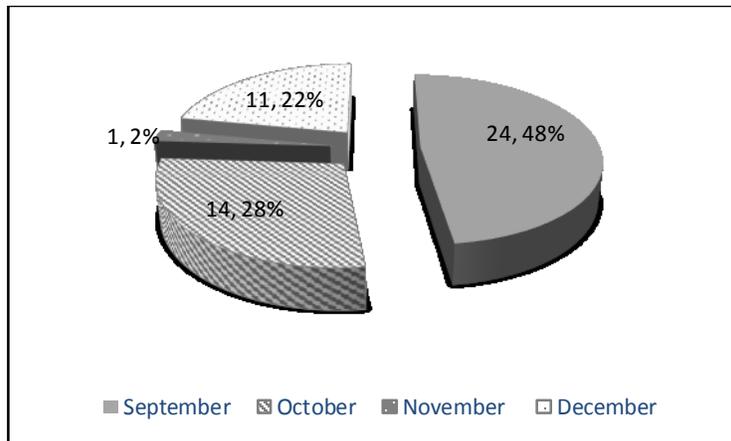


Figure 2.4-1: Number of responses as a function of time when data was received

The participants who completed the survey consisted of various organizations from different industry sectors. 46% of the responding organizations came from the manufacturing sector, followed by 14% from the construction sector, 10% from the energy/utilities sector and 8% from “other” (Figure 2.4.2).

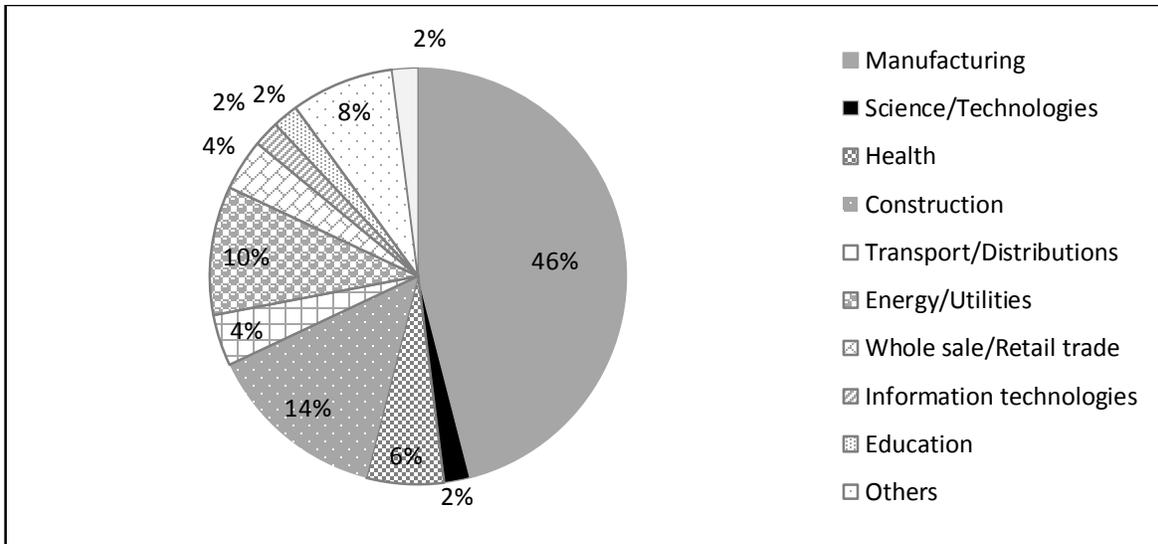


Figure 2.4-2: Breakdown of responding organizations with respect to industry sector

For future analysis, all offered sectors from Chapter 3, Chapter 4 and Chapter 5 will be divided into three groups.

The first group will be labeled “manufacturing” and it will contain organizations that selected the “manufacturing” option in the survey. The second group will be categorized as “service” and will include science/technologies, health, transport/distributions, energy/utilities, whole sale/retail trade, information technologies and education. The final group is classified as “other”, and contains the mining sector, construction and organizations that indicated “others” in the survey. Figure 2.4.3 illustrates the number of organizations that participated in the survey and the percentage of participation from each of the three groups.

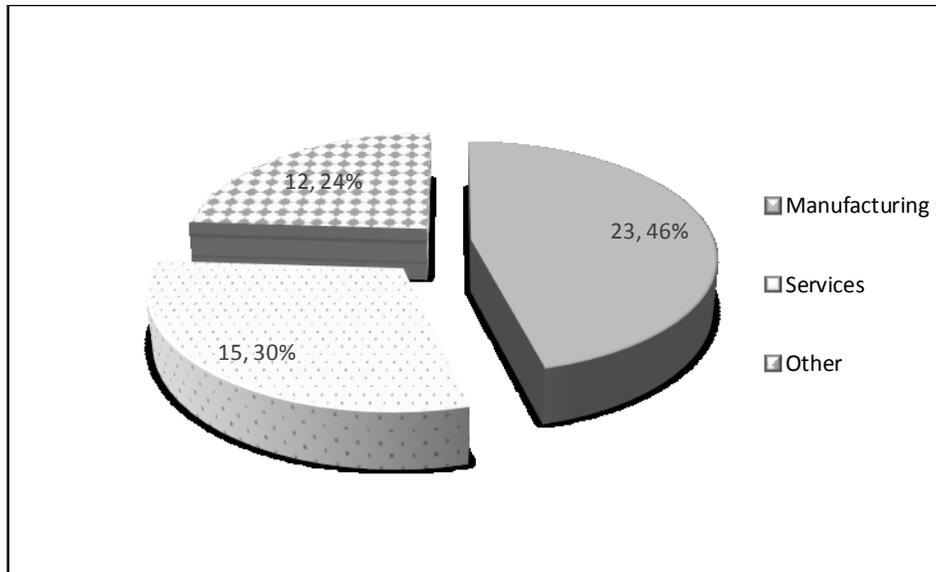


Figure 2.4-3: Groups of surveyed organizations per industry sector

Figure 2.4.4 illustrates the sizes of organizations that participated in this survey. Of 50 participants, the majority was “small” organizations (42%). These organizations had less than 100 employees. There were 15 organizations with more than 100 employees and less than 500 employees. These organizations were classified as “medium” and comprised 30% of the sample. 14 organizations were “large”, having more than 500 employees.

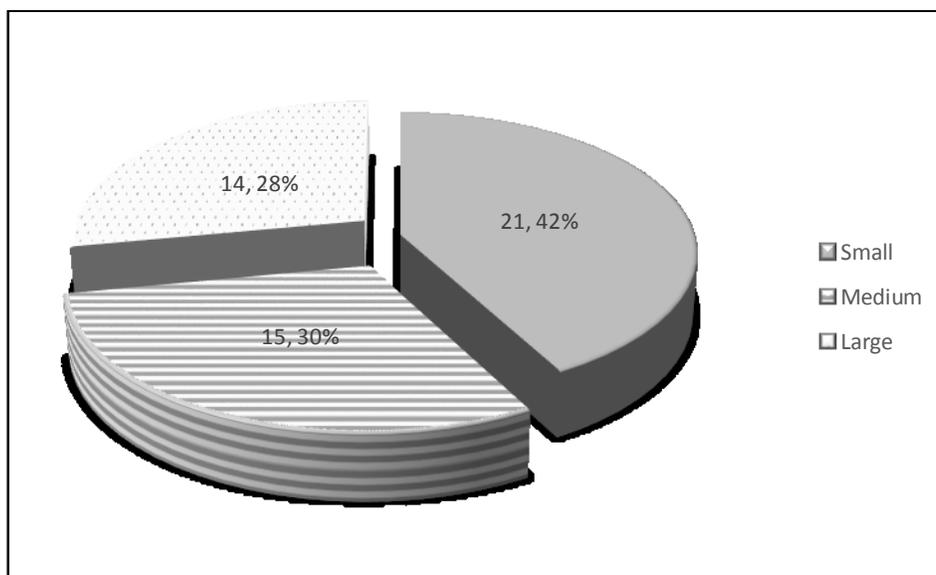


Figure 2.4-4: Groups of surveyed organizations per organization size

After the data was collected, a descriptive analysis was performed. Various charts and Microsoft Excel software were used. For further statistical calculation IBM SPSS Statistics 22 software was used. The data was analyzed for separate topics such as integration, auditing and customer satisfaction standards.

The following chapter describes the analysis of the integration topics.

3. Integration

This chapter is organized into three parts. The first part relates to specific aspects of integration of MSs in Serbian organizations. Subchapter 3.1 discusses the order of implementation and subchapter 3.2 discusses the required time to implement the standards in these organizations. These two subchapters cover answers to questions 2.1 and 2.2 from the questionnaire (see Appendix E).

The second part of this chapter discusses the integration of MSs in general. Specifically, subchapter 3.3 refers to the extent of integration of MSs and subchapter 3.4 discusses integration difficulties. Results of questions 2.5, 2.6 and 3.2 of the questionnaire are covered in these subchapters.

The third part of this chapter discusses the levels of integration of MSs by examining elements of the MS such as goals, resources and processes. From question 3.3 of the questionnaire subchapters, 3.5 refers to the integration of goals, subchapter 3.6 to the integration of human resources, subchapter 3.7 to the integration of documentation resources and subchapter 3.8 to the integration of processes. The last subchapter (3.9) gives a summary of main results obtained in this research. Moreover, hypothesis testing (Z-test) was performed (Jovanovic, 1996 and Triola, 2007) in subchapters 3.4 and 3.8 to demonstrate differences between the difficulties organizations experienced during the integration of MSs and differences between levels of integration of MS processes.

3.1. Order of implementation

Answers to question 2.1 from the questionnaire (see Appendix E) give the information related to the order of implementation of MSSs.

Figure 3.3.1 illustrates that, for most organizations, the first implemented MSS was ISO 9001. This exact answer was reported in 35 (71%) of the Serbian organizations surveyed. The reason could be that Serbian organizations were influenced by stakeholders such as owners or requirements of customers to utilize ISO 9001. Out of the 50 organizations surveyed four organizations (8%) reported a simultaneous implementation ISO 9001 and ISO 14001 as the first

MSS implemented. In addition, three organizations (7%) implemented ISO 9001, ISO 14001 and “ISO 18001”. Also, three organizations (7%) implemented ISO 9001, ISO 14001 and OHSAS 18001. A small number of organizations answered “ISO 18001”. Since “ISO 18001” does not exist and it was likely meant as OHSAS 18001, for future analysis they will be grouped together as number or percentage for OHSAS 18001.

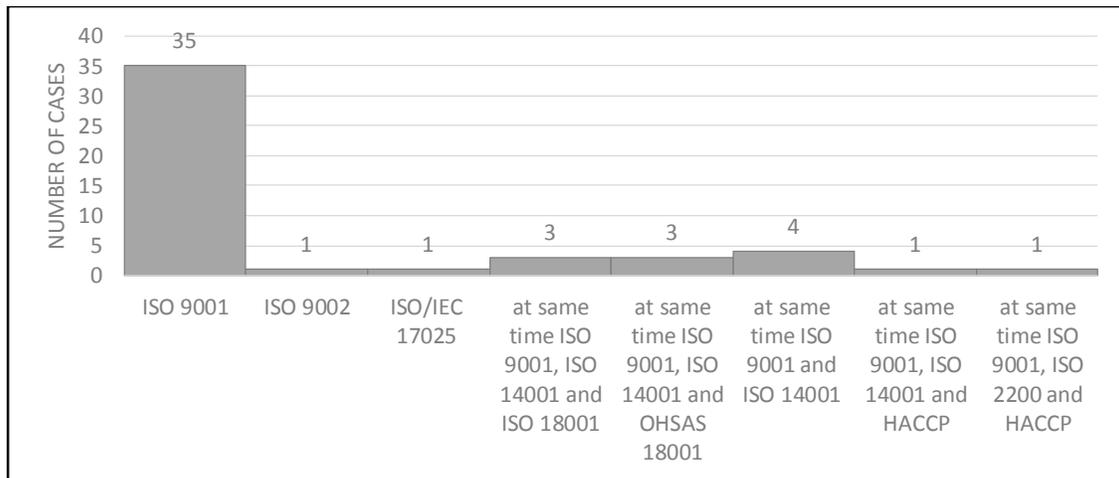


Figure 3.1-1: The first implemented standard

The next phase illustrates that when the organizations surveyed required the second MSS, the majority of organizations implemented ISO 14001 (Figure A.3, Appendix A). This is most likely because organizations that participated in this research were organizations that were already registered to ISO 9001 and ISO 14001.

The third most implemented MSS was OHSAS 18001, reported in nine Serbian organizations (Figure A.4, Appendix A). Two organizations (4%) surveyed implemented : OHSAS 18001, ISO 14001 and HACCP (Figure A.4, Appendix A).

The order of implementation of MSSs as shown in Table 2.1.1.1 in Serbian organizations did not significantly differ from other studies in other countries. Similar results were obtained by: Karapetrovic & Casadesus (2009), Salomone (2008), Simon & Douglas (2013), Douglas & Glen (2000), Zutshi & Sohal (2005), Bernando et al. (2012), Simon et al. (2012a), Karapetrovic (2002), Khanna et al. (2010), Casadesus et al. (2008), Zeng et al. (2007) and Karapetrovic et al. (2010).

The next subchapter discusses results from the survey with respect to the time required for the implementation of MSSs.

3.2.Required time for implementation of MSSs

This subchapter contains results collected from the survey questions 2.1 and 2.2 (see Appendix E). Question 2.2 required that organization's answer, in terms of months, what the required time was for implementation of each MSS. This time (known as “lead time”) is counted from the moment when the organizations decide to implement the MSS until the certification body confirms that the organization meets the requirements of that MSS (when the organization is registered).

Figure 3.2.1 displays the time required for the implementation of first, second, third and fourth MSS.

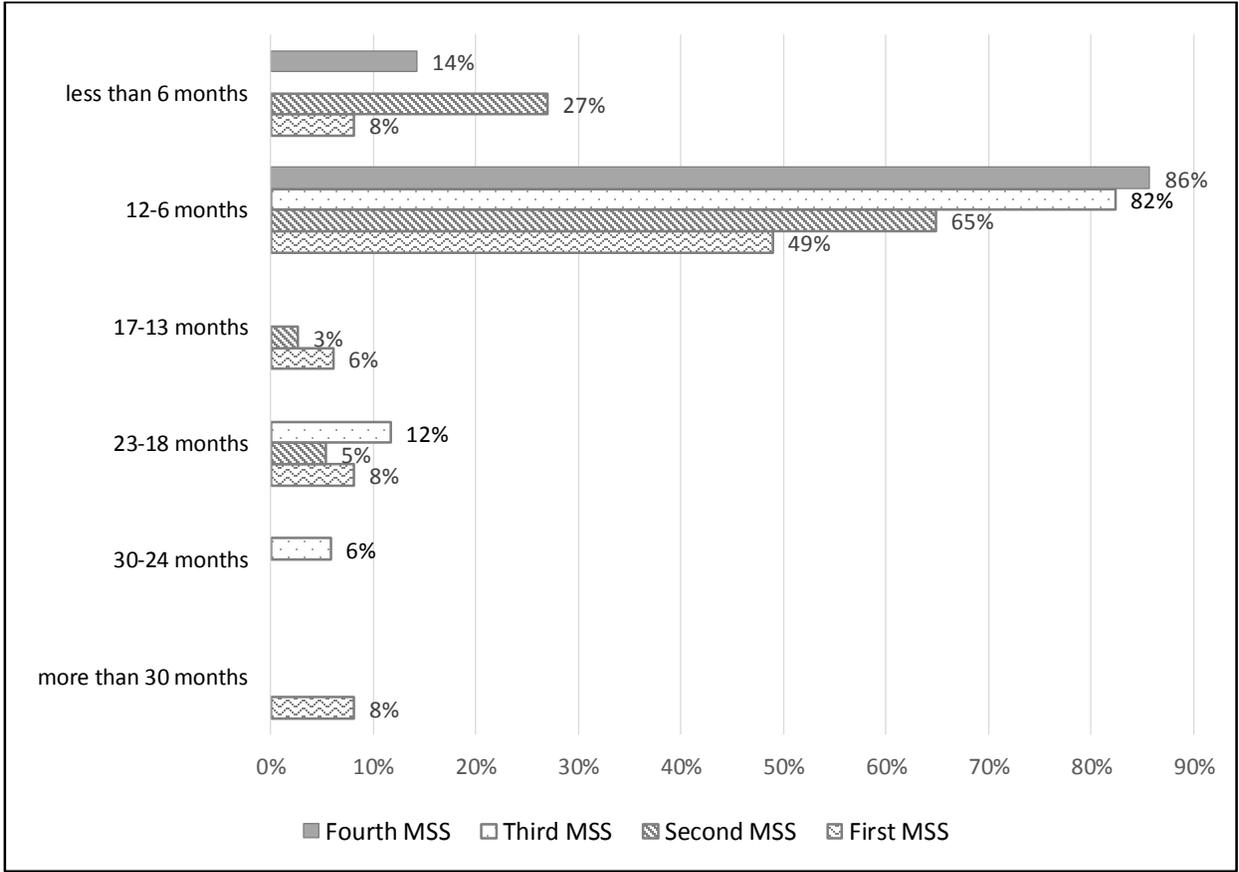


Figure 3.2-1: Time to implement MSSs by order of implementation

49% responders reported a lead time for the first MSS between six months and a year. For the second MSS, 65% reported a lead time between six months and a year. The lead times required for implementing the third and fourth MSSs were reported to be 82% and 86% respectively. Furthermore, 27% of the organizations reported the lead time for the second MSS of less than six months. The reason can be that organizations were already familiar with the content and methodology of MSSs, meaning less time needed to implement an MSS. The answer “more than 30 months” for the implementation of an MSS was recorded only for the implementation of the first MSS. Average lead time for implementations of the first MS, second MS, third MS and fourth MS standards were 16, 8, 11 and nine months, respectively. Looking at this average time string, it could be said that lead time gets smaller and smaller for each subsequent MSSs.

The majority of Spanish organizations reported a lead time between six months and a year (Karapetrovic & Casadesus, 2009 and Karapetrovic et al., 2006).

Question 2.1 (see Appendix E) is used to analyze “time elapsed from the implementation of the first standard”. Moreover, the question 2.1 also examines if “two or more standards were implemented at the same time”. Multiple MSSs implemented at the same time were reported in 12 of surveyed Serbian organizations (24%) (Figure 3.1.1). The percentage of Serbian organizations having multiple MSSs at the same time is double than Karapetrovic et al. (2006) mentioned. These results are possible due to the fact that there are significant differences connected to the period of when the survey was completed, with more resources (e.g. knowledge) becoming available for the Serbian organizations. Political sanctions in Serbia during the 1990s that had an impact on Serbian organizations and organizational management could be yet reasons. In the early 2000s, Serbia was a candidate for the European Union. These can be the reasons why Serbian organizations were late when it came to the implementation of MSSs and therefore needed to implement multiple MSSs at the same time. In connection with starting late to implement MSSs, organizations needed to integrate MSs, whereas Spanish organizations had done this earlier with the implementation of ISO 9001 and then ISO 14001.

Results from this study show that Serbian organizations needed less time (after deciding to implement MSSs) to reach MSS certification, contrary to other results from studies by Karapetrovic et al. (2006) and Zeng et al. (2011). In research by Karapetrovic et al. (2006) the lead time for the implementation of first MSs, second MSs and fourth MSs was higher than in Serbian organizations, while the lead time for the third MSs is in line with the time reported by

Karapetrovic & Casadesus (2009). The reason for such a difference could be due to the time when the research was conducted: the study in Spain was done in 2006 and the study in Serbia occurred seven years later. However, in that time, increased resources and materials become available for Serbian organizations. Nonetheless, Figure 1A, Appendix A illustrates that the most of the organizations implemented their first MSS within the last ten years. Compared with the previous research from Spanish organizations, Serbian organizations started the implementation of MSSs later (Marimon et al., 2008). The knowledge that Serbian organizations had their first MSSs in the last five to 13 years (59% of organizations surveyed) can be due to the same reasons mentioned above for the lead time of implementation of MSSs.

The following subchapter illustrates the extent of integration in Serbian organizations.

3.3. Integration of standardized MSs

Question 2.5 from the questionnaire (see Appendix E) investigated whether organizations integrated management system standards into a single management system or if they chose to keep management systems separate. Organizations had three options to answer the question. The first option was to answer “all”, meaning the organizations integrated all MSs. The second option was to answer “only the following standards”, meaning the organizations integrated some MSSs. The third option was to answer “none”, meaning that all MSs in the organizations were separate.

The survey results show that 76% organizations answered “all”. 16% of organizations surveyed integrated “only some standards,” and 8% of organizations surveyed had completely independent MSs (Figure 3.1.1).

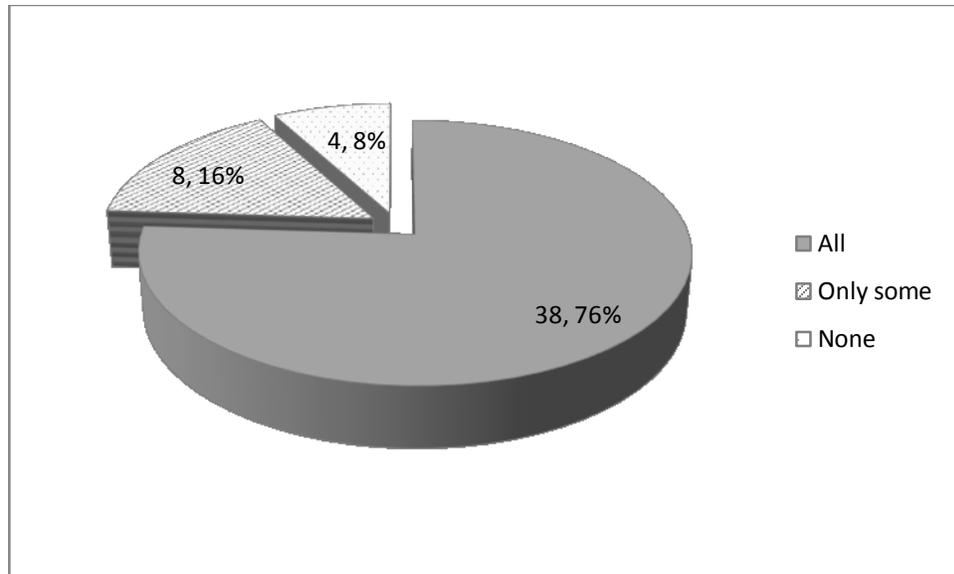


Figure 3.3-1: Integrated standardized management systems

The reason for such a high percentage of Serbian organizations having complete integration of their standardized MSs could be that the organizations have more resources available to them than in past years. Increased resources could also be the reason for less time required for implementation of MSs (see subchapter 3.2). A high level of integration of MSs was also reported in other studies by Bernardo et al. (2009), Harjeev et al. (2010), Karapetrovic & Casadesus (2009) and Bernardo et al. (2010). However, studies such as Karapetrovic et al. (2006), Douglas & Glen (2000), Simon et al. (2013) and Casadesus et al. (2008) reported different results regarding the extent of integration of MSs namely their results were slightly lower (38% organizations), especially for the answer “all”. A lower result could be expected, since research by Karapetrovic et al. (2006), Douglas & Glen (2000), Simon et al. (2013) and Casadesus et al. (2008) was conducted in earlier years when the concept of integration was a relatively new topic.

For further analysis, different industry sectors and different sizes of Serbian organizations were evaluated, since levels of integration may vary.

Figure 3.3.2 shows that Serbian organizations in “other” industry sectors had the highest level of integration of standardized MSs (92%).

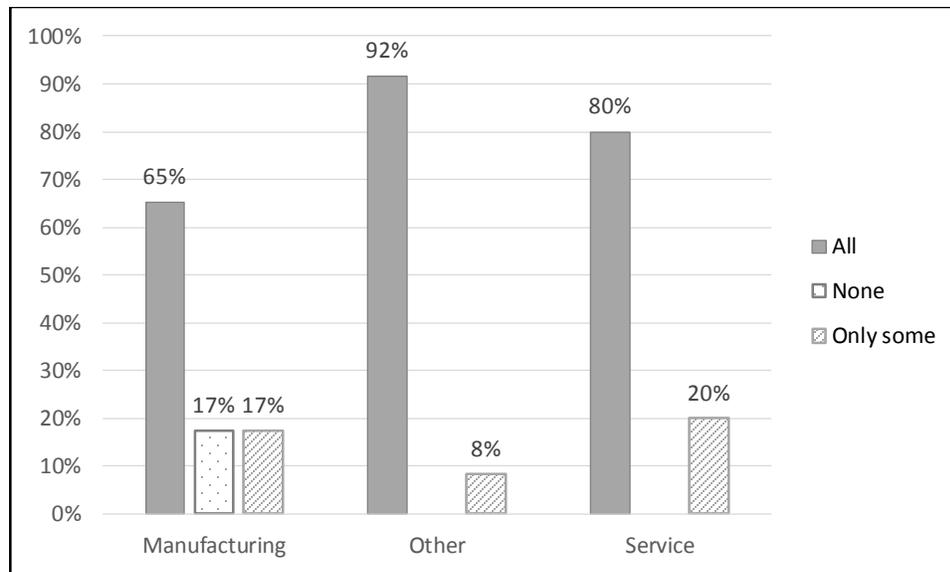


Figure 3.3-2: Integrated standardized management systems regarding industry sectors

The service had all MSs integrated in 80% of organizations. The manufacturing sector was the only industry sector at 17% of organizations operating independent MSs. This result is possible because manufacturing organizations have more diverse processes with more distinguished quality, environmental and safety aspects (e.g. use materials and equipment's) and perhaps it was not possible to integrate them.

Regarding the different sizes of Serbian organizations, Figure 3.3.3 shows the extent of the integration of systems. The highest rate of completely integrated MSs was found in medium-sized Serbian organizations surveyed, at 93%. Large-sizes organizations showed a 79% rate of completely integrated MSs, and small-size organizations showed a 62% rate of completely integrated MSs. Unexpectedly, large-size Serbian organizations recorded much higher level of integration of MSs compared to small-size organizations. It could be that large organizations pay more attention to the integration of MSs, meaning that they had more experts knowledgeable about different standards than small organizations.

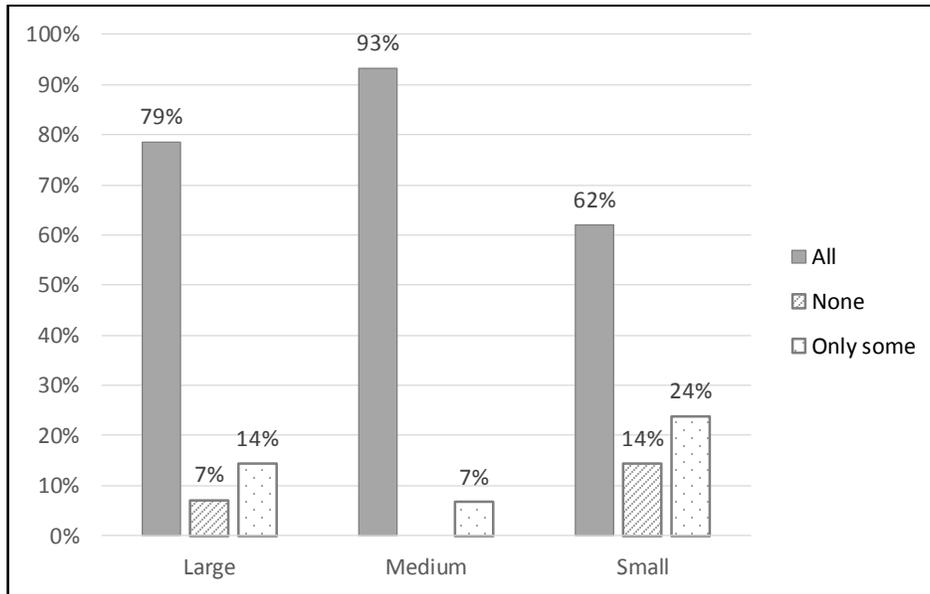


Figure 3.3-3: Integrated standardized management systems regarding organizations size

Question 2.6 relates to the reasons for organizations to not have integrated MSs. The question itself offered possible reasons, and organizations needed to define whether that reason was “not important”, “little important”, “important”, “very important” or “extremely important”. For future analysis, the answers “not important” and “little important” will be combined into one answer of “not important”. The answer “important” will be left as “important” and “very important” and “extremely important” will be combined into one answer of “very important”. It should be noted that only four Serbian organizations surveyed (8% of the total sample) answered this question (Figure 3.3.4.). This low number is due to the fact that the majority (92% of the sample) had integrated their MSs.

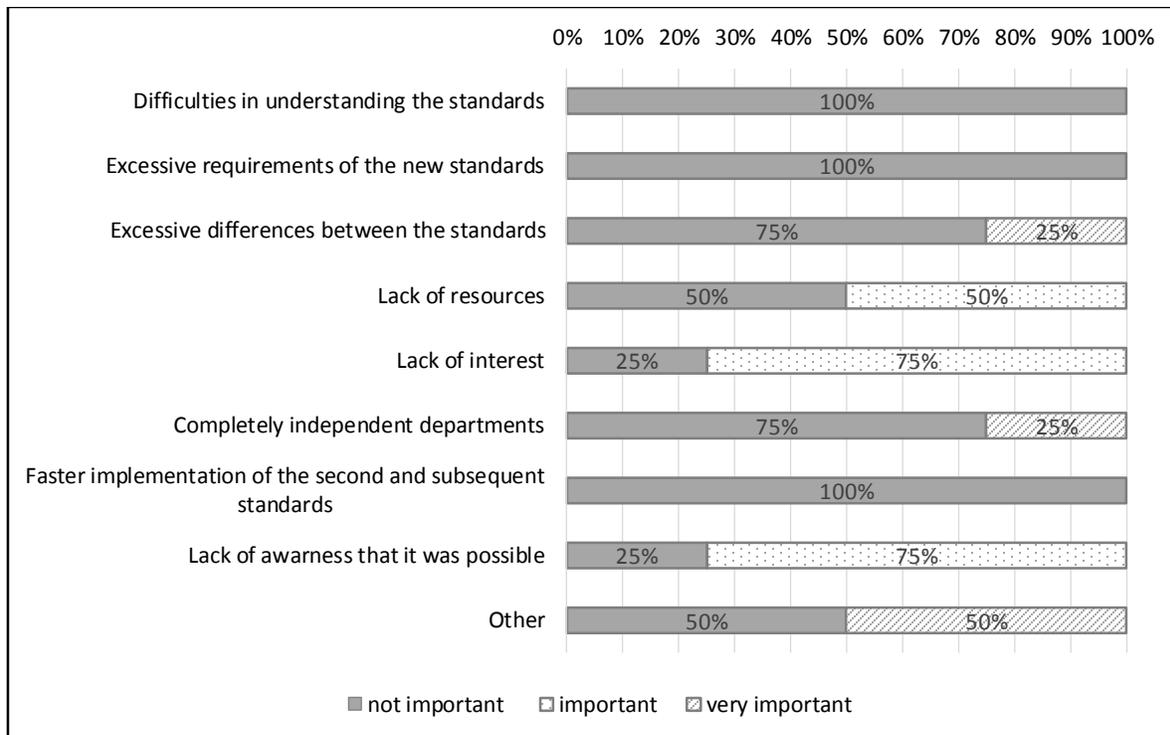


Figure 3.3-4: Reasons for having MSs separated

Two organizations considered “very important” the category named as “other”, describing “lack of training staff” and “fear of losing the current position in the market” as reasons for not having MSs integrated. However, Karapetrovic et al. (2010) reported different reasons for having separate MSs in Spain, such as “[...] *lack of interest and lack of resources*”.

Three organizations that did not have integrated MSs expressed that “important” reasons were “lack of awareness” and “lack of interest”. Only one organization conveyed as “very important” reasons for “completely independent departments” and “excessive differences between the standards”. On the contrary, all four organizations mentioned that the following reasons: “faster implementation of the second and subsequent standards”, “excessive requirements of the new standard” and “difficulties in understanding the standards” were not important reasons. With all these listed reasons of not having MSs integrated, it could be concluded that these four Serbian organizations did not have adequate knowledge (expertise) about the integration of MSs, because “lack of interest” could be related to the “lack of resources”.

Further, question 3.1 studied the tools that Serbian organizations used during the process of integration of MSs. This question was intended for organizations that implemented “all” MSs as single integrated systems and organizations that integrated “only some standards”.

Figure 3.3.5 illustrates the tools used to integrate different MSs in Serbian organizations. Tools most commonly utilized were “detailed analysis of common elements among the standards” (91%) and the “process map” (89%).

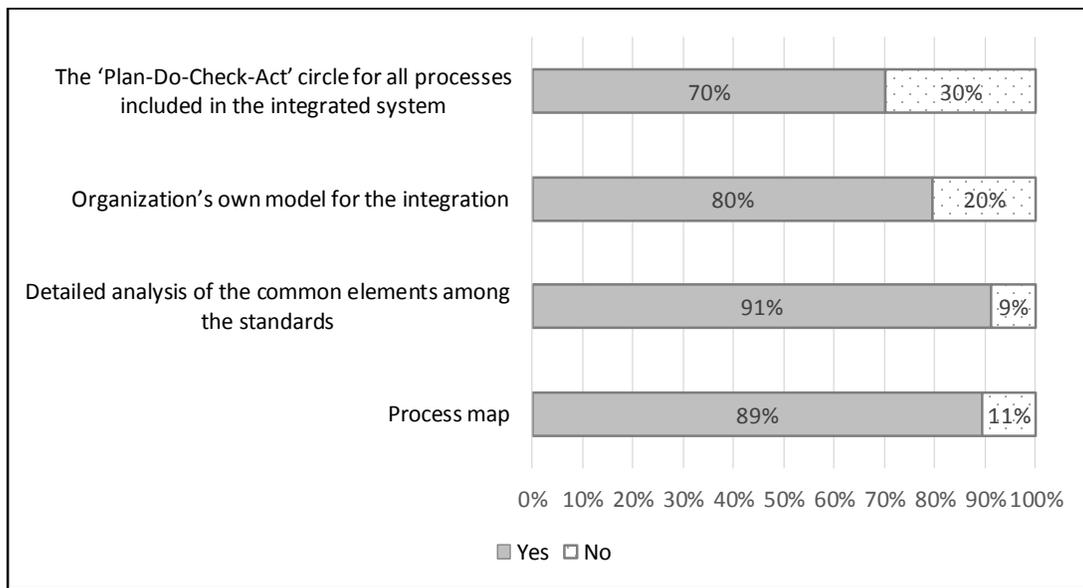


Figure 3.3-5: Models applied in the integration process

The process approach was the model used in the majority of small and medium-size Serbian organizations in the study by Rajkovic (2010). Previous research in Spain found similar results (Karapetrovic et al., 2006; Simon et al., 2012; Simon et al., 2013 and Karapetrovic et al., 2010). 80% of organizations used an “organizations own model”, while the "Plan-Do-Check-Act" (PDCA) model was found in 70% of the Serbian organizations surveyed. Using an “organizations’ own model” could be one of the reasons why this percentage is lower than for the other tools used for integrating MSs. The reason for a low percentage for the PDCA model can be because Serbian organizations implemented ISO 9001 first (see subchapter 3.3). Therefore, it could be expected that organizations were familiar with the process map more than with PDCA model. The new version of ISO 9001:2015 explains the PDCA model further. However, organizations that participated in this survey had ISO 9001:2008. Hence, the impact of this change in the standard could be interesting to study in the future.

During the integration of MSs, organizations were faced with various difficulties. In the next subchapter, these difficulties will be discussed.

3.4.Problems regarding the integration of MSs

This subchapter covers question 3.2 from the questionnaire (Appendix E). With respect to the difficulties of implementing multiple MSSs, the organizations had the option to rank the importance of every offered difficulty. The rank was: “not important”, “little important”, “important”, “very important” and “extremely important”. In Figure 3.4.1, these five were scaled down into three groups: “not important” and “little important” were combined into “not important”, the category “important” remains unchanged and lastly the categories “very important” and “extremely important” were grouped together as “very important”.

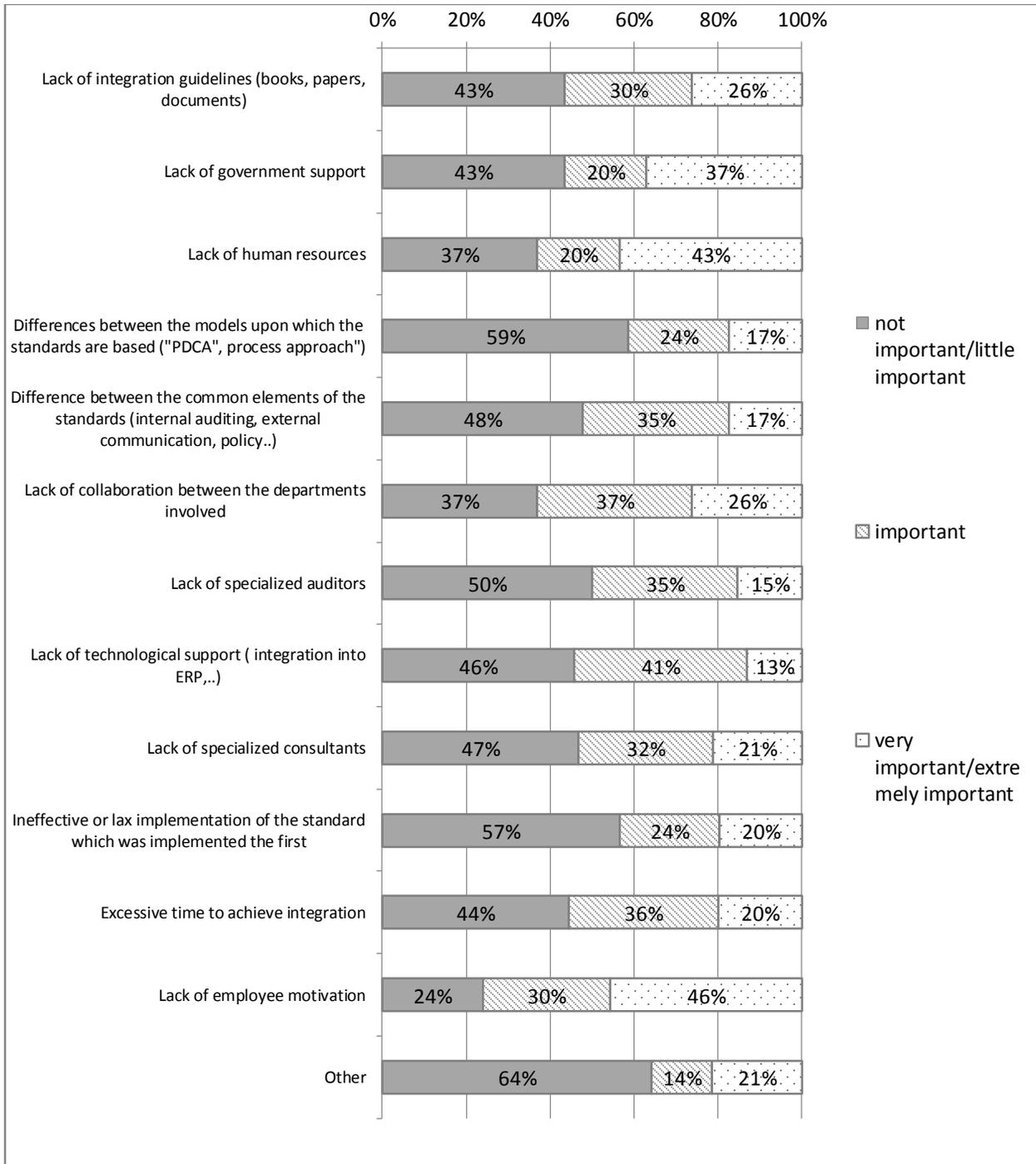


Figure 3.4-1: Difficulties in the integration process

The most important difficulties during the process of integration of MSs for organizations (indicated by the percentage that consists of organizations' answers: "extremely important" and "very important") were "lack of employee motivation" (46%), "lack of human resources" (43%) and "lack of government support" (37%). When all three important responses ("extremely important", "very important" and "important") were grouped together, "lack of employee's motivation" was still the top difficulty in Serbian organizations regarding the process of integration. Moreover, second and third most important difficulties were "lack of human resources" and "lack of collaboration between the departments involved". Organizations that used answer "other" as "extremely important" and "very important" commented that the problems were related to the employees, such as: "they do not want to change their previous habits" and that implementation of MSSs is a waste of money. Zutshi & Sohal (2005), Rebelo et al. (2014) and Kraus & Grosskopf (2008) found similar results in their studies related to the difficulties in the process of integration of standardized MSs.

The differences between two proportions presented as human resources and common elements of the standards were examined by the Z-test. The reason why these variables were examined was to see whether the problems of the integration process were related to the human resources equally as the difference between common elements of the standards. The set of equations 3.4.1 presents results of the Z-test.

π_3 = lack of employee motivation

π_4 = difference between common elements of standard

H0: $\pi_3 = \pi_4$

Ha: $\pi_3 > \pi_4$

$n_3 = 46$

$n_4 = 46$

$p_3 = 46\%$

$p_4 = 17\%$

$$P = \frac{n_3 p_3 + n_4 p_4}{n_3 + n_4} = \frac{46 * 0.46 + 46 * 0.17}{46 + 46} = 0.315$$

$$\sigma_{\Delta p} = \sqrt{p(1-p) * \frac{n_3+n_4}{n_3*n_4}} = 0.096858$$

$$Z = \frac{p_3 - p_4}{\sigma_{\Delta p}} = \frac{0.46 - 0.17}{0.096858} = 2.994$$

This is a right tailed test, therefore using the table for Z-test (Triola, 2007).

$$P\text{-value} = 1 - 0.9986 = 0.0014$$

Equation 3.4-1: The set of equations for the Z-test (lack of employee motivation and difference between common elements that standard is based)

Statistically verified by Z- test is that “lack of employee motivation” (π_3) is greater than “the difference between common elements of the standard” (π_4) (Equation 3.4.1). At the significance level of $\alpha = 0.05$, P-value is 0.0014. Since the P-value is lower than the significance level ($\alpha = 0.05$) (Triola, 2007), it could be concluded that the null hypotheses is rejected. This evidence proves that problems during the integration process were connected to the “lack of employee motivation” (human resources) more than with “the difference between common elements of standard”. This result was not surprising, as the majority of previous studies reported difficulties related to the human resources when it came to the process of integration of MSs (see subchapter 2.1.4).

The two highest integration difficulties reported (“lack of employee motivation” and “lack of human resources”), belong to the group of human resources problems. The question that arises is whether the 3% difference shown by these two samples is significant evidence to confirm that a higher percentage of organizations reported difficulty was the most important problem that Serbian organizations had during the process of integration of MSs. Having the P-Value of 0.389 greater than the significance level of $\alpha = 0.05$, it could be concluded that the null hypothesis (lack of employee motivation is equal to lack of human resources) is true (Triola, 2007 and Jovanovic, 1996). Difficulties “lack of employee motivation” and “lack of human resources” are statistically the same (Appendix D). This statistical proof is conceivable since both variables are connected to human resources. Another Z-test also showed that human resources were the highest difficulty that organizations had during the process of integration of MSs.

For further analysis, Z-test was used to observe the differences between difficulties: “differences between the models upon which the standards are based” and “lack of human resources”. The question examined was: which difficulties had the higher impact on MS integration between these

two proportions. At the $\alpha= 0.05$ significance level, the data provided statistical evidence that the proportion of having difficulties in process MS integration was that variable “lack of human resources” (π_5) was greater than the “differences between the models upon which the standards are based” (π_6) (Equation 3.4.2).

π_5 = lack of human resources

π_6 = differences between the models upon which the standards are based

H0: $\pi_5 = \pi_6$

Ha: $\pi_5 > \pi_6$

$n_5=46$

$n_6 = 46$

$p_5 =43\%$

$p_6=17\%$

$$p = \frac{n_5 p_5 + n_6 p_6}{n_5 + n_6} = \frac{46 * 0.43 + 46 * 0.17}{46 + 46} = 0.3$$

$$\sigma_{\Delta p} = \sqrt{p(1 - p) * \frac{n_5 + n_6}{n_5 * n_6}} = 0.095553$$

$$Z = \frac{p_5 - p_6}{\sigma_{\Delta p}} = \frac{0.46 - 0.17}{0.1036} = 2.72$$

This is a right tailed test, therefore using the table for Z test (Triola,2007).

P-value=1-0.9966= 0.0034

Equation 3.4-2: The set of equation for the Z-test lack of human resources and difference between models which standards are based)

The results of the Z-test makes sense, drawing the same conclusion as for previous Z-testing. The bulk of previous research studies suggest that the most common difficulties in integration of multiple MSs originate with human resources (Bernardo et al., 2012; Karapetrovic et al., 2006; Asif et al., 2009; Simon et al., 2012a; Simon et al., 2012b; Simon et al., 2013; Simon & Douglas, 2013; Casadesus et al., 2008; Salamone, 2008; Zuitshi & Sohal, 2005; Zeng et al.,2007; Zeng et al., 2011; Durdevic et al., 2013; Spilka, et al., 2009 and Castillio-Rojas et al., 2012). However, in

a study done in Serbia, Rajkovic (2010) showed that small and medium-sized Serbian organizations experienced the most difficulties integrating MSs due to “*lack of knowledge in managers and employees; resistance to change; and lack of employee motivation*”.

Participants’ answers to question 3.2 are presented using the mean, median and mode (Table 3.4.1).

Table 3.4.1 shows a very high mode number by the difficulty of “lack of human resources”. The reason could be that the employees were not very familiar with standards yet, which created the problems during the integration of MSs. The reason for not having enough employees with knowledge of MSSs could be related to the high number of organizations that implement MSSs recently (Marimon et al., 2008).

		Lack of integration guidelines (books, papers, documents)	Lack of government support	Lack of human resources	Differences between the models upon which the standards are based (“PDCA”, process approach”)	Difference between the common elements of the standards (internal auditing, external communication, policy...)	Lack of collaboration between the departments involved	Lack of specialized auditors	Lack of technological support (integration into ERP,)	Lack of specialized consultants	Ineffective or lax implementation of the standard which was implemented the first	Excessive time to achieve integration	Lack of employee motivation	Other
N	Valid	46	46	46	46	46	46	46	46	47	46	45	46	14
	Missing	4	4	4	4	4	4	4	4	3	4	5	4	36
Mean		2.70	2.85	3.11	2.26	2.52	2.87	2.50	2.54	2.60	2.43	2.71	3.28	2.07
Median		3.00	3.00	3.00	2.00	3.00	3.00	2.50	3.00	3.00	2.00	3.00	3.00	1.00
Mode		3.00	4.00	5.00	1.00	3.00	3.00	3.00	3.00	3.00	1.00	2.00 ^a	3.00	1.00

Table 3.4.1: Mean, median and mode for difficulties that acquire in the integration process

The highest mean was related to the “lack of employee motivation” and “lack of human resources”. Descriptive analysis and statistical testing (Z-test and mean, median and mode) showed that the highest problems regarding the integration of MSs were “lack of employee motivation” and “lack of human resources”. Same difficulties were reported by the majority of previous studies on the topic (Bernardo et al., 2012; Karapetrovic et al., 2006; Asif et al., 2009; Simon et al., 2012; Simon et al., 2012a; Simon et al., 2013; Simon & Douglas, 2013; Casadesus et al., 2008; Salamone, 2008;

Zuitshi & Sohal, 2005; Zeng et al., 2007; Zeng et al., 2011; Durdevic et al., 2013; Spilka, et al., 2009 and Castillio-Rojas et al., 2012).

Table 3.4.1 gives the rank of median, which was mostly on the scale of 3 (“important”). Karapetrovic et al. (2006) obtained different results. Karapetrovic et al. (2006) also used median in expressing the difficulties during the process of integration of MSs, but results were a lower than results obtained in this study. This indicates that Serbian organizations met with more problems throughout the process of integration of MSs than Spanish organizations. A plausible reason could be a lack of resources (e.g. guidelines, technology, specialized consultants, and human resources). Moreover, Spanish organizations met with implementation of MSs before, then Serbian organizations did, which then resulted in the development of more experts and available resources on that subject.

The main difficulties experienced by the Serbian organizations surveyed are broadly aligned with difficulties reported in studies Zeng et al. (2007), Simon & Douglas (2013), Salomone (2008), Rebelo et al. (2014), Karapetrovic et al. (2006), Simon et al.(2012b), Simon et al. (2012a), Bernardo et al. (2012), Simon et al. (2013), Asif et al. (2009), Spilka et al. (2009) and Zutshi & Sohal (2005). However, research by Sampaio et al. (2012) studied three organizations, and two of them “*did not report major integration difficulties*”.

Integration levels define how the different elements of the MSs are integrated. Integration of elements of the MSs is discussed below.

3.5.Integration of goals

Figure 3.5.1 illustrates the extent of integration of organizations goals, namely policy and objectives. From the previous chapter (3.4) it could be seen that a high percentage of organizations had a high level of integration of MSs, allowing the conclusion that policy and objectives are completely integrated. Figure 3.5.1 shows that more than 70% of organizations completely integrated goals. Moreover, Figure 3.5.1 shows 15% of organizations did not integrate their policies and 21% of the Serbian organizations surveyed had partially integrated their objectives.

Simon & Douglas (2013), Simon et al. (2012a), and Karapetrovic et al. (2006) obtained similar results.

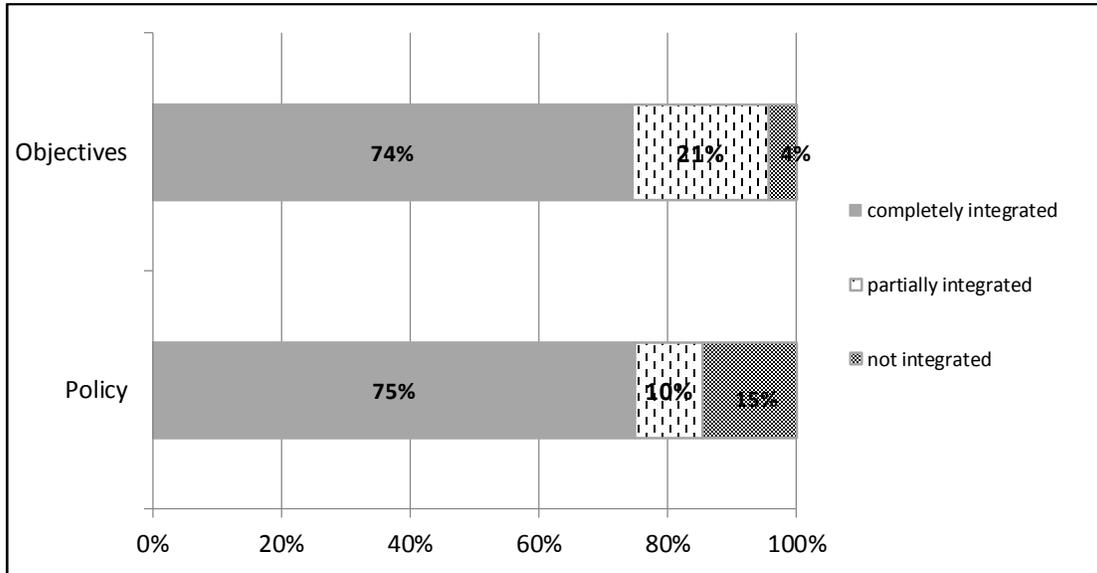


Figure 3.5-1: Integrations of goals overall

The policy and objectives are documents that are created in order to “[...] satisfy stakeholders needs and expectations” ISO (2008). Organizations that have integrated ISO 9001, ISO 14001 and OHSAS 18001 are expected to have quality, environmental and occupation health and safety policy and objectives in place as integrated documents. When organizations are starting to develop their integration process, it can be expected that organizations would integrate these goals first.

Figure 3.5.2 illustrates high levels of integrated policy in small (76%) and large (79%) organizations surveyed.

Already mentioned in Subchapter 3.3, the fact that large-size organizations surveyed had high levels of integration of policy could be due to the fact that those organizations invested more into the expertise and resources regarding IMSs. However, a small sample size is one of the limitations in this research.

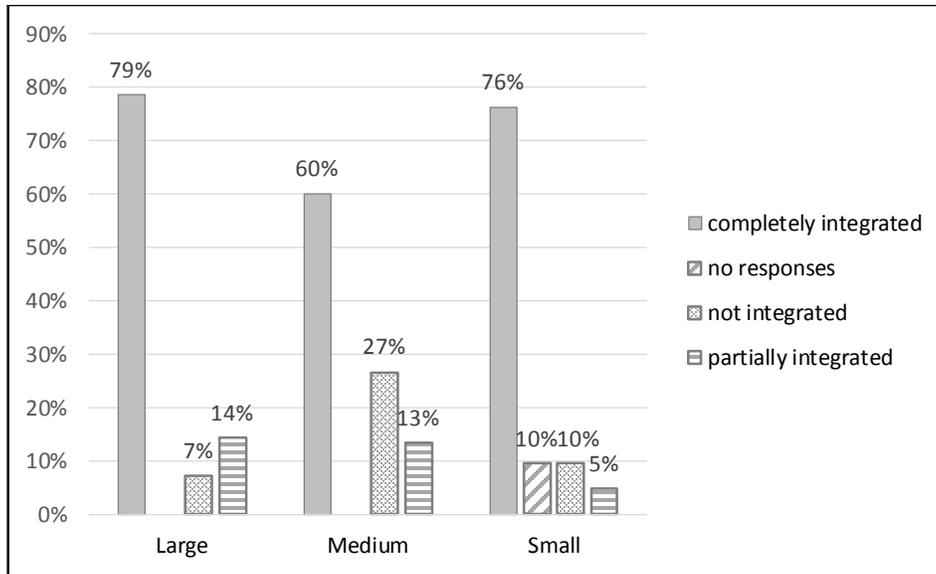


Figure 3.5-2: Integration of policy as a function of organization size

Figure 3.5.3 shows completely integrated policy regarding different industry sectors. The highest extent of integrated policy for all MSs was found in organizations defined as the “other” sector (83%) and the manufacturing (70%) sector.

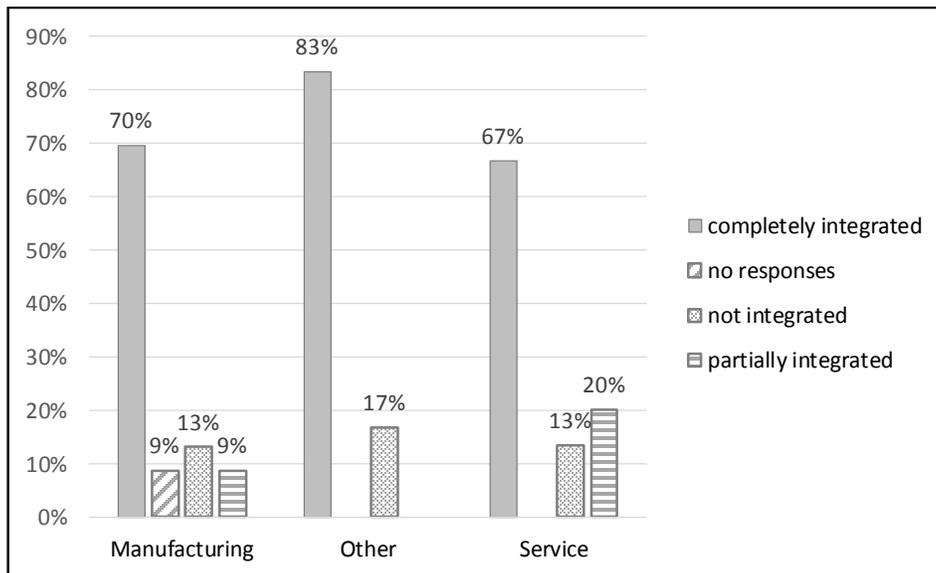


Figure 3.5-3: Integration of policy as a function of organization industry sector

Surprisingly, medium size organizations displayed the highest integration of organizational objectives (80%), with 20% more integration of organizational policies (Figure 3.5.4). Most likely,

the integration of objectives would be higher in medium or smaller size organizations than in large organizations. Small organizations do not have the specialized personnel for specific functions. On the other hand, medium size organizations have multiple departments, more specialization and more resources. Therefore, it is plausible that medium organizations have the highest integration of organizational objectives.

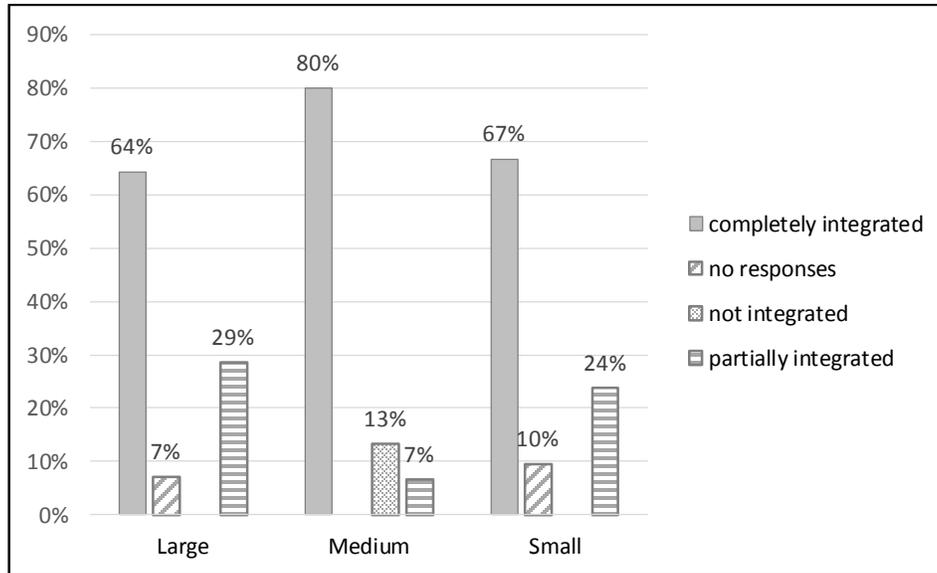


Figure 3.5-4: Integration of objectives as a function of organization size

Figure 3.5.5 shows the integration of objectives of the organizations, with a high percentage of “completely integrated” objectives present in all industry sectors. “Other” and manufacturing industry sectors showed the highest extent of integration of organizational objectives. Service industry sector organizations displayed the highest percentage (27%) of partially integrated organization objectives.

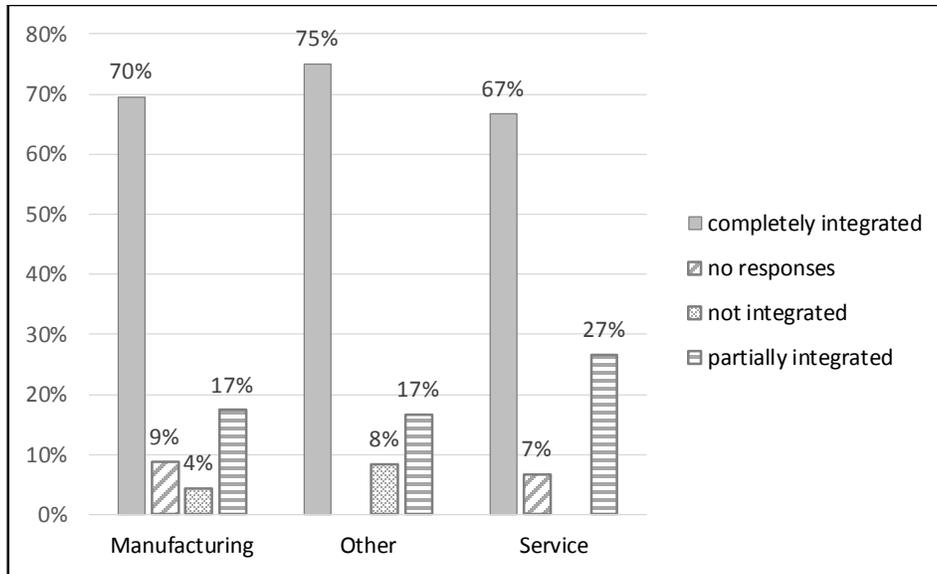


Figure 3.5-5: Integration of objectives regarding the industry sector

According to these results integration of goals is not dependent on the type or size of organizations, however, integration of policy and objectives is individual and varies from organization to organization.

3.6.Integration of human resources

Data regarding the level of integration of human resources was collected from answers obtained by question 3.3 of the questionnaire. The participating organizations needed to answer if the existing human resources (representatives, managers and inspectors) are different persons or the same person.

According to Figure 3.6.1, MSs representatives in Serbian organizations were frequently the same person in 32 organizations (68%), while different representatives were present in 15 organizations (32%).

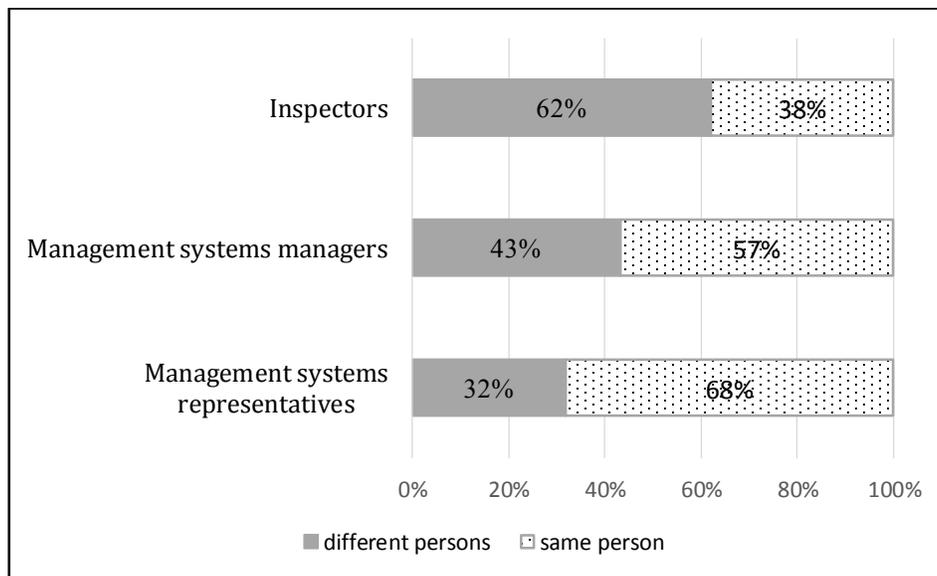


Figure 3.6-1: Integration of human resources

Organizations illustrated that a high percentage of organizations (57%) to had the same person as manager (Figure 3.6.1). 62% of the surveyed organizations had different inspectors for different systems. The reason for these results could be that “[...] top management is having more adequate resources, communication and training across the organization in aspects of integration” than the inspectors or auditors (Zutshi & Sohal, 2005). Similar results the level of human resources of integration were found in Karapetrovic et al. (2006), Simon & Douglas (2013), Simon et al. (2012a), Beckmerhagen et al. (2003) and Simon et al. (2013). However, Bernardo et al. (2009) had different results compared to this research. Bernardo et al. (2009) found that the integration of

human resources was lower (representatives were the same person in of 43% organizations, the managers were the same person in 39% of organizations and inspectors were the same person 44% organizations).

Regarding Figure 3.6.2, more than half of the responding organizations showed a high extent of integration in the top levels of management. Large organizations had the highest integration of MS representative, while small organizations showed the lowest percentage. According to Beckmerhagen et al. (2003) “[...] in some cases, including small business, full integration is required at all organizational levels”. This statement was not backed up by small organizations. However, the small sample size of the survey could be linked to this results.

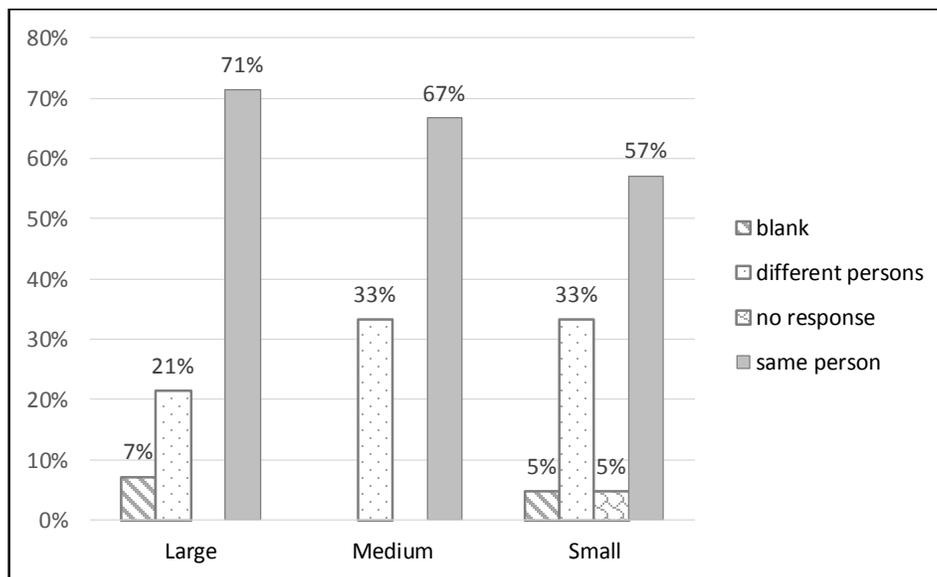


Figure 3.6-2: Integration of management system representatives as a function of the organization size

According to Figure A.6, Appendix A, in more than half of small and medium-size organizations MS managers were the “same person”. A high percentage of “different persons” being MS managers was present in large organizations. The reason for this could be that “[...] middle management still operates separate quality, environmental, financial and other function-specific MSs”, as stated by Karapetrovic (2003). However, referring industry sectors (Figure 3.6.3), results show that 48%, 58% and 47% of organizations had same persons as MS managers in manufacturing, “other” and service industry sector, respectively. The “other” industry sector

showed the highest integration at the level of managers. To conclude, “other” sector was the most integrated sector when it comes to the integration of human resources at the level of managers.

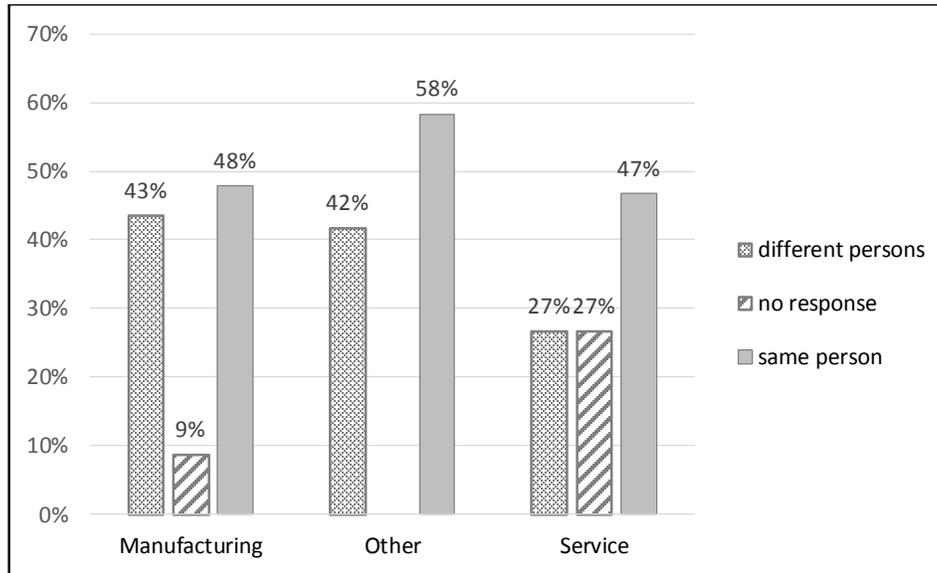


Figure 3.6-3: Integration of management system managers as a function of the industry sector

Referring to inspectors, a high percentage of having same persons as inspectors were found in small (29%) and medium-sized (33%) organizations (Figure A7, Appendix A). This makes sense because small organizations employ a small number of staff, so it follows that there are fewer inspectors, while large organizations have more resources to separate the roles. 36% of large organizations did not answer this question.

Figure 3.6.4, demonstrates the integration of inspectors regarding the industry sectors of the Serbian organizations surveyed.

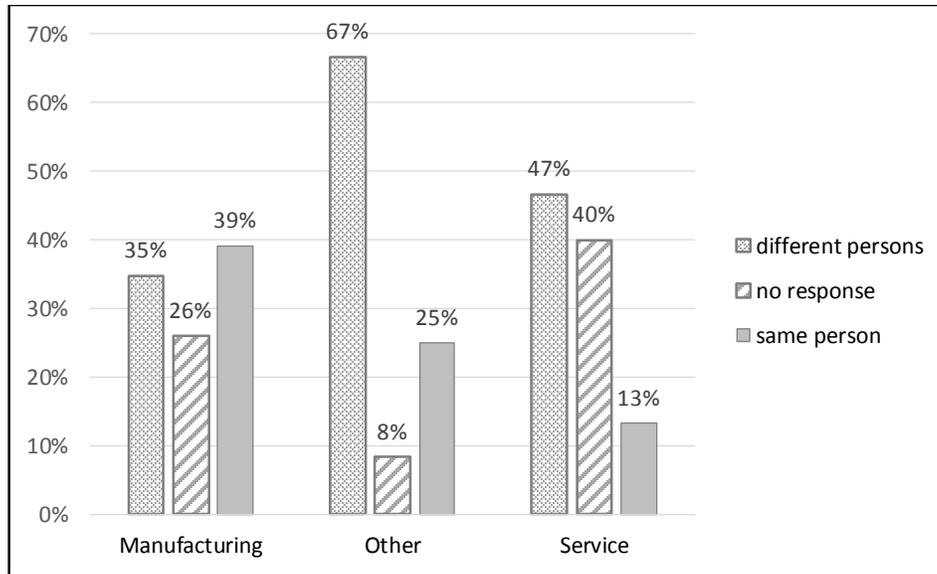


Figure 3.6-4: Integration of management system inspectors as a function of the organization size

The highest percentage of “different persons” as inspectors were present for industry sector defined as “other”. This finding makes sense since construction, mining and the “other” industries could not operate efficiently with only one inspector for all their projects and processes. Unfortunately, a high percentage of organizations from the manufacturing and service industries did not respond to this question.

Compared with Karapetrovic (2003), it could be said that this research did not fulfill its theoretical definition, especially for large organizations. Large organizations in Serbia displayed a high extent of integration at the top level of the organization, but not at the bottom. Besides, small organizations, as was mentioned by Karapetrovic (2003), should have shown a higher level of integration for all hierarchical levels.

3.7.Integration of documentation resources

Figure 3.7.1 shows the integration documentation: records, instructions, procedures and manual. For each offered document, organizations needed to answer: if the documents were “completely integrated”, referring to a single document used for all MSs, “partially integrated” (meaning that the selected document was used only for selected MSs e.g. if an organization has ISO 9001, ISO 14001 and OHSAS 18001, a single document is used for ISO 9001 and ISO 14001, but another

document is used for OHSAS 18001) and “not integrated” (demonstrating that organization have different documents for different MSs).

The majority of the organizations integrated their documentation completely. Furthermore, 23% of organizations partially integrated records and instruction. In addition, partial integration was present in 19% of organizations for the procedures and the manual. Having a high level of “completely integrated” document resources were find in studies Bernardo et al. (2009), Salomone (2008) and Karapetrovic et al. (2006). Moreover, Simon & Douglas (2013) and Simon et al. (2012a) reported a higher integration of the manual. A very small number of the surveyed organizations did not integrate their documents.

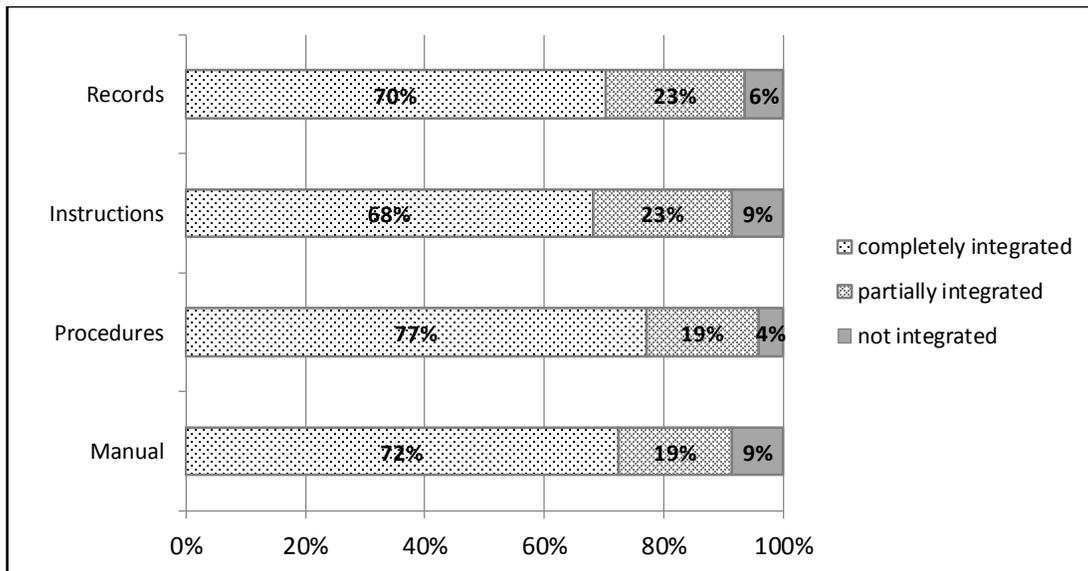


Figure 3.7-1: Integration of documentation resources

A high level of integration of documentation resources was expected in this study since ISO (2008) Case Study Annex showed that one of the most important benefits that organizations had after implementing an IMS was the integration of documents as manuals, procedures, instructions and records. Moreover, the percentages presented in Figure 3.7.1 did not show significant differences in percentages of the four types of documents as a result of the integration project, indicating that the documents were integrated at the same time and on the same level.

3.8. Integration of processes

Question 3.3 examined the level of integration of organization's processes. Organizations needed to answer if given processes were:

- “not integrated”
- “partially integrated” (“different existing procedures were added together, but a single new procedure was not created”)
- “completely integrated” (“a single, completely new procedure was created”)

The percentage of organizations that completely integrated the following processes were: management review (89%), internal audit (89%), document control (85%), corrective and preventive action (83%), record control (80%) and internal communication (80%) (Figure 3.8.1).

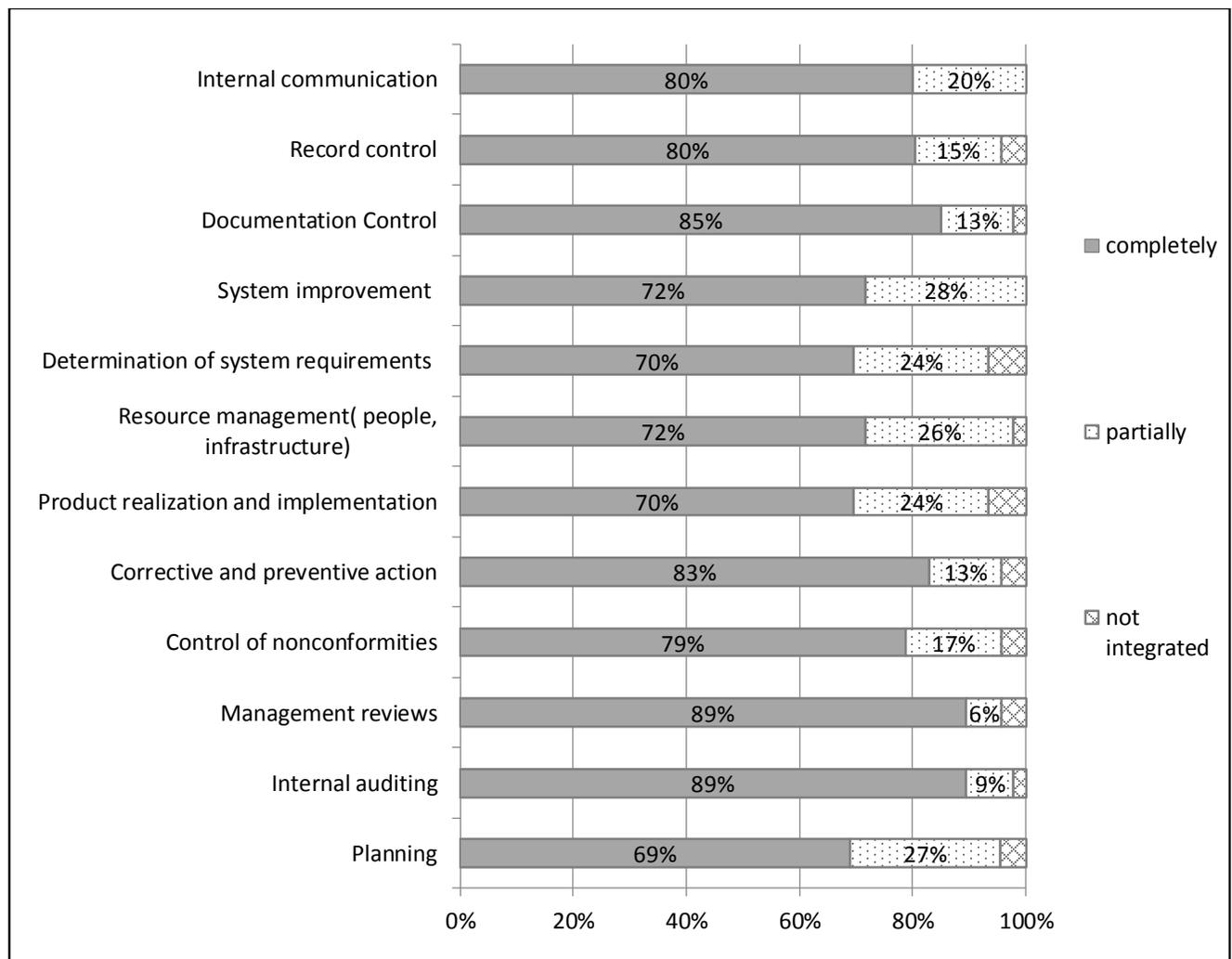


Figure 3.8-1: Integration of processes

The lowest percentages were for planning (69%) and product realization and implementation (70%), bringing to the conclusion that these processes were the most difficult to integrate in Serbian organizations. Additionally, the highest integrated process was management review, most likely due to the fact that management review was done at the top level of organizations and therefore was easiest to integrate.

A high extent of integration of MS processes was reported in studies by Bernardo et al. (2009), Simon & Douglas (2013), Salomone (2008), Karapetrovic et al. (2006) and Simon et al. (2012a). This study proves that all processes were highly integrated the Serbian organizations surveyed. Additionally, partial integration was found in the process of planning (27%), system improvement

(28%), resource management (26%), product realization (24%), and determination of system requirement (24%). “Not integrated” displayed a very low percentage.

Going to further analysis and to examine which processes were more integrated in Serbian organizations, Z-test was performed using formulas given by Jovanovic (1996). The data shows that 16% more organizations had “completely integrated” document control than planning. The question asked if percentage difference is significant ($H_a: \pi_7 > \pi_8$) or is equal ($H_0: \pi_7 = \pi_8$). Since the P-value of 0.0656 is greater than $\alpha = 0.05$, the null hypothesis was rejected in relation to the alternative hypothesis (Appendix D). In other words, there is not sufficient evidence to support the claim that integration of document control processes is greater than the integration of planning processes, thus the proportion of organizations that indicated the complete integration of document control and planning process is equal. This makes sense because both processes are a part of the ISO 9001 and ISO 14001 standards.

For the next Z-test, the record control process and product realization and implementation process were used. The reasons for performing the Z-test was that one proportion (record control) is a part of both ISO 9001 and ISO 14001 standards and the other proportion (product realization and implementation) is just part of the ISO 9001. In this case, the P-value was 0.8643, meaning that P-Value is greater than significance level $\alpha = 0.05$. This Z-test confirms the hypothesis of having these proportions as equal (Triola, 2007). Meaning that a level of complete integration of these processes is equal (Appendix D).

In consideration of the responses from the question 3.3, a pivot table was done (Figure 3.8.2) showing the different sizes of organizations and industry sectors. The idea was to perceive the groups of sizes and the industry sector that integrated the processes. Figure 3.8.2 shows which processes were partially and completely integrated and the percentage of their integration. Figure 3.8.2 shows the different sizes of organizations who integrated their processes completely.

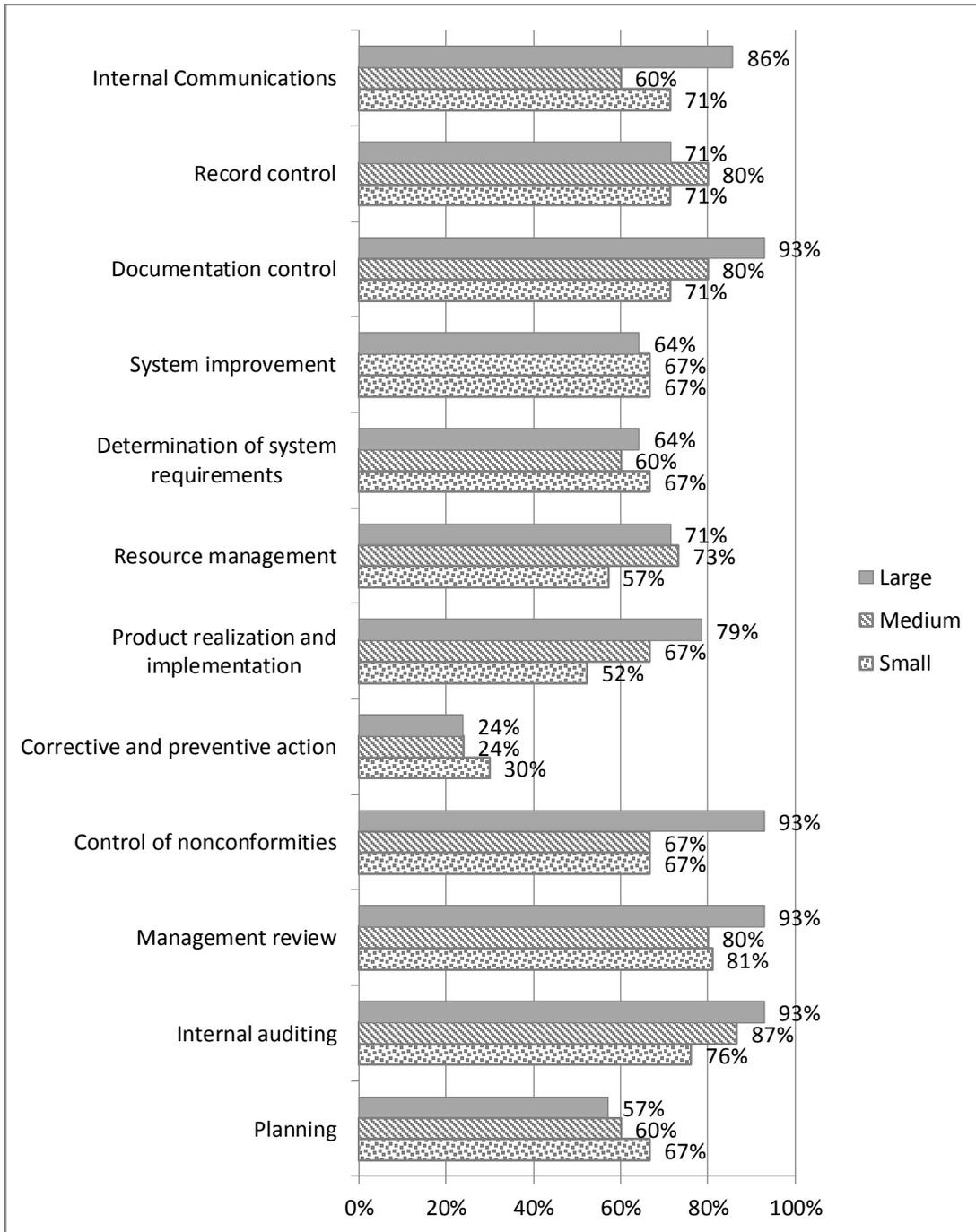


Figure 3.8-2: Level of integration of processes as a function of the organization size

Figure 3.8.2 illustrates a high level of integration of organization processes in small, medium and large organizations. Small organizations showed a high percentage of integration in internal auditing (76%), management review (81%), document control (71%), record control (71%) and

internal communication (71%). The lowest percentage of complete integration for small organizations was for corrective and preventive action (30%). Medium organizations show the lowest percentage of complete integration for the same process as small organizations (corrective and preventive action). Large organizations recorded a high level of integration of internal auditing (93%), management review (93%), control of nonconformities (93%), product realization (79%), documentation control (93%), record control (71%) and internal communication (86%). Large organizations recorded the highest percentage for complete integration of processes. It could be that large sized organizations were focused on the main processes of product realization and its continual improvement. On the other hand, a high percentage of processes being completely integrated is conceivable, since processes are covered by ISO 900 and ISO 14001, proving that organizations used common standard requirements when they integrated MSs. In addition, the majority of organizations started with the implementation of ISO 9001 and ISO 14001.

All sized organizations had the lowest percentage of “complete integration” in process corrective and preventive action. It could be because some problems that organizations had were easy to plan but not easy to deal with, e.g. quality, environmental and occupation health and safety problems.

Figure 3.8.3 illustrates organization's industry sector and percentages of their complete integration. The highest level of integration of organizations' processes was found in the “other” industry sector. Significantly, “complete integration” was found in: internal communication (100%), record control (100%), documentation control (100%), corrective and preventive action (100%), control of nonconformities (100%) and management review (100%).

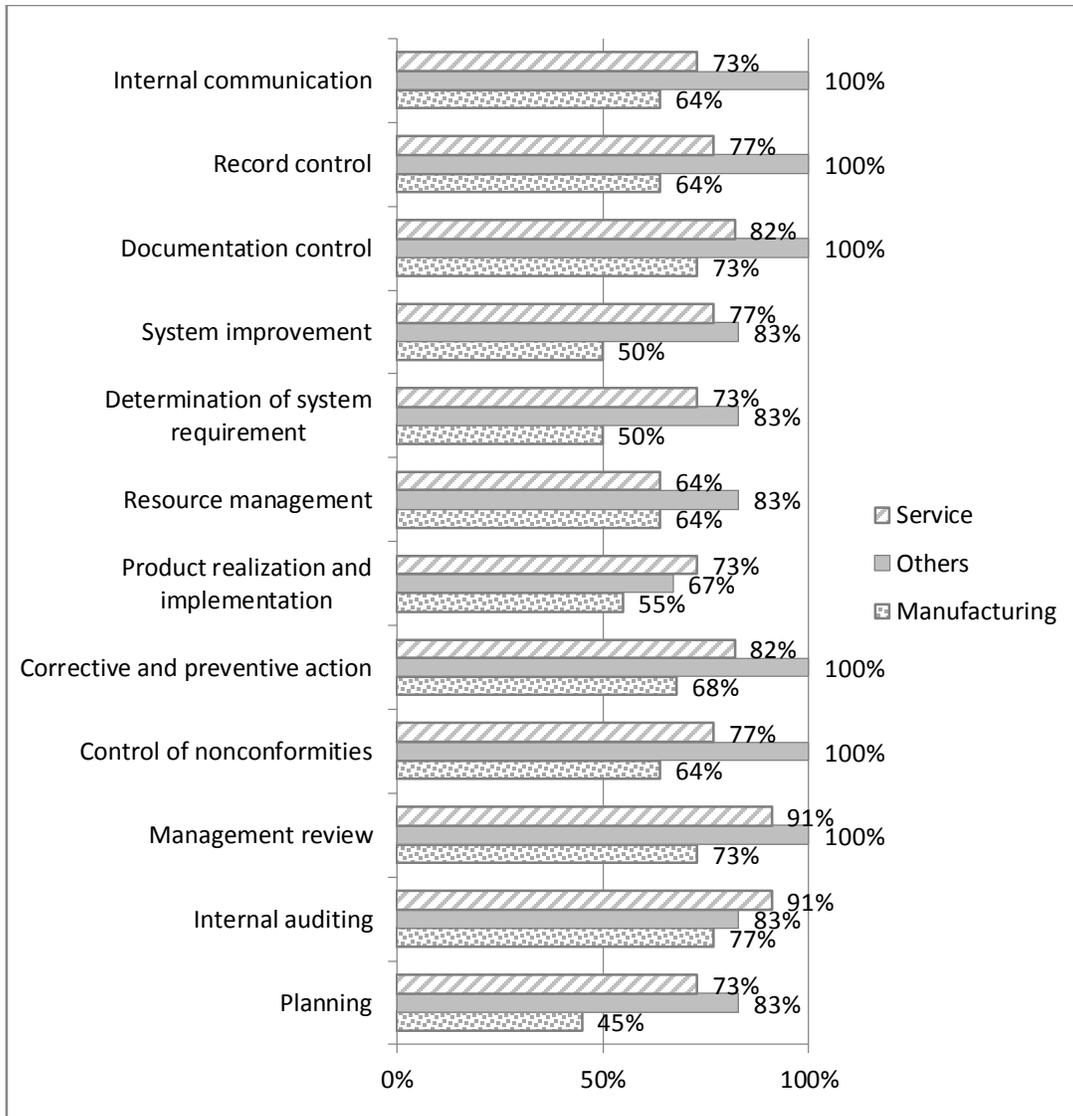


Figure 3.8-3: Level of integration of processes as a function of the industry sector

Partial integration was present more in the small organizations surveyed than in large (Figure A7, Appendix A). An interested finding was that small organizations reported more cases of partial integration of processes than the large organizations. The reasons for this result could be that organization needed to have more standards as required by customers or stakeholders. Large organizations have more experts knowledgeable and they integrate MSs whereas, small organizations did not have the time and resources to integrate them.

The medium organizations showed a high partial integration in planning (27%), determination of system requirements (27%), and system improvement (27%). Large organizations recorded partial

integration in planning (29%) and system improvement processes (27%), and a similar result was present in medium-size Serbian organizations surveyed as well.

Regarding the industry sectors, the results show that manufacturing organizations had a high level of partial integration in system improvement (36%) and planning (32%) (Figure A.8, Appendix A). The highest percentage of partial integration in the service sectors was found in resource management (32%). “Other” industry sectors recorded a high percentage of partial integration in product realization and implementation (33%). Moreover, a small sample size was one of limitation of this study.

Industry sector shows results of partial integration for manufacturing organizations was found in system improvement and planning. The highest percentage for “other” industry sectors was in processes of product realization and implementation. Moreover, services sectors recorded partial integration in resource management.

The highest percentage of the answer “not integrated” for small and medium organizations was found in product realization and resource management processes (Figure A.9, Appendix A). Similar results for product realization was found in studies Bernardo et al. (2012) and Karapetrovic et al. (2006). Moreover, processes that were not found in this list (counting by all sized organizations) were internal auditing, system improvement and internal communication. This result proves that organizations were very focused when they integrated their MSs. No medium organizations indicated not integration as the answer to internal communication, record control, documentation control, corrective and preventive action, management review, internal auditing and planning. The same percentage (0%) was found in large organizations in corrective and preventive action, product realization, and internal communication. The highest percentage of organizations that answered, “not integrated” by manufacturing organizations was for internal communication (Figure A.10, Appendix A). The process with the highest percentage indicated that is not integrated product realizations. Industry sector “other” did not display any percentage for answer “not integrated”. Again, a limitation of this study was the small sample size.

3.9. Summary

Serbian organizations had the same order of implementation as the other studies reported (see Chapter 2.1.1) (ISO 9001, ISO 14001 and OHSAS 18001). The time needed for implementation for first, second, third and fourth standards was in the range of between six months and one year.

76% of the Serbian organizations surveyed recorded “full integration” of MSs. However, the most important reasons for organizations that did not integrate MSs were “completely independent departments” and “difference between standards”.

More than 80% of the surveyed organizations used “detailed analysis of common elements among the standards” and “process map” as models for the integration of MSSs.

The top difficulties that organizations with the integration of MSs were “lack of employee motivation”, “lack of human resources” and “lack of government support”.

At the functional level, MS representatives and MS managers were the same person in more than half organizations. In regards to inspectors, organizations showed a high percentage for different inspectors for different MSs.

A high extent of integration existed with goals, policy and objectives. The same pattern was evident in the integration of documentation (records, instructions, processes and manual). The high extent of having single processes for all MSSs was recorded for management reviews, internal audits, document control, corrective and preventive actions, record control and internal communication.

4. Auditing

The following three topics show the integration of the elements of the audit system, namely audit processes, audit resources, and audit objectives. Integration of audit processes is covered in subchapter 4.1. Subchapter 4.2 discusses the guidelines used for auditing and frequency of audits, while subchapter 4.3 covers audit outcomes. Subchapter 4.4 covers integration of audit time followed by integration of audit teams at the subchapter 4.5. Integration of audit plans and reports are covered in subchapter 4.6. Finally, audit objectives for both internal and external audits are covered in subchapter 4.7. For each topic presented, pivot tables reflect groups of industry sector and size and the differences between them. Questions covered in this chapter are from section 4 of the questionnaire (see Appendix E). Furthermore, Z-tests were performed with the purpose of hypothesis-testing between internal and external audits, including the time for conducting audits, the way the audits are performed, and the integration of audit plans, reports and teams.

4.1. Guideline used in auditing

In section 4 of the questionnaire (Appendix E) the Serbian organizations surveyed were asked what guideline to use for internal and external audits. They had four options to answer: “ISO 19011”, “Other”, “None” and “I do not know”; Figure 4.1.1 shows the results. Most of the organizations answered that they did not know what guideline to use for conducting internal audits (29%) or external audits (43%), or they answered that the guideline used was ISO 19011.

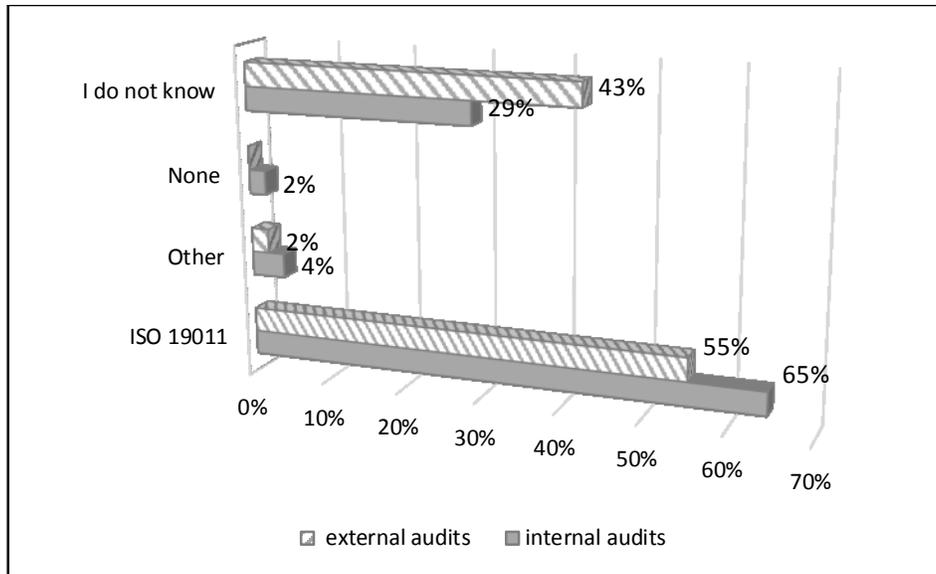


Figure 4.1-1: Guidelines used in auditing

ISO 19011 was used by 65% and 55% of internal and external auditors respectively. The results are broadly in accordance with Simon et al. (2011) and Kraus & Grosskopf (2008). On the other hand, studies by Karapetrovic et al. (2006) and Simon et al. (2014) presented a lower percentage of usage ISO 19011. Furthermore, Karapetrovic et al. (2006) and Simon et al. (2014) found a higher percentage of organizations that were not familiar with any guidelines used for conducting internal and external audits. These differences are reasonable, as the study by Karapetrovic et al. (2006) was done seven years before these numbers were compiled here for this Serbian study. The figures reported in the study by Simon et al. (2014) were compiled three years before the Serbian study. It can be concluded that the Serbian organizations surveyed in this study now have more resources and knowledge about ISO 19011 as an MSS for conducting audits, especially for internal audits.

For further analysis, a pivot table was created in order to examine the differences between different sized organizations and different industry sectors. A high percentage of ISO 19011 as a guideline for internal audits was measured in medium-size (87%) and large-size (86%) organizations, while 57% of small-size organizations were not familiar with what guideline to use for internal auditing (Figure B. 21, Appendix B). This finding is conceivable since large and medium organizations were already utilizing the ISO 19011 standard for conducting internal audits. Such a result could

also be because medium and large organizations had more expertise and familiarity of internal audits of systems than small organizations did. 15% of small organizations recorded the “none” and “other” responses. Figure B.22, Appendix B illustrates that the service industry sector showed the highest usage of ISO 19011 (73%).

External audits were done by applying ISO 19011 in more than 50% of medium and large organizations. However, 62% of small organizations reported that they were not familiar with a guideline used for external auditing (Figure B.23, Appendix B). Reasons for that could be that small organizations did not know which guideline was used when external audits were done. ISO 19011 was used for external auditing in 60% in the service industry sector when 52% of the manufacturing industry sector did not know what guidelines external auditors used (Figure B.24, Appendix B). It should be noted that the small sample size was a limitation of this study, and external registers were not included in this research.

4.2. Audit frequency

The Serbian organizations surveyed had the choice between responses of “less than 6 months”, “between 6 months and less than a year”, and “between one and three years”. Figure 4.2.1 shows that most organizations conducted their internal audits (69%) and external audits (60%) once “between 6 months and less than a year”. Karapetrovic et al. (2006), Casadesus et al. (2008), Simon et al. (2014) and Durdevic (2014) obtained similar findings.

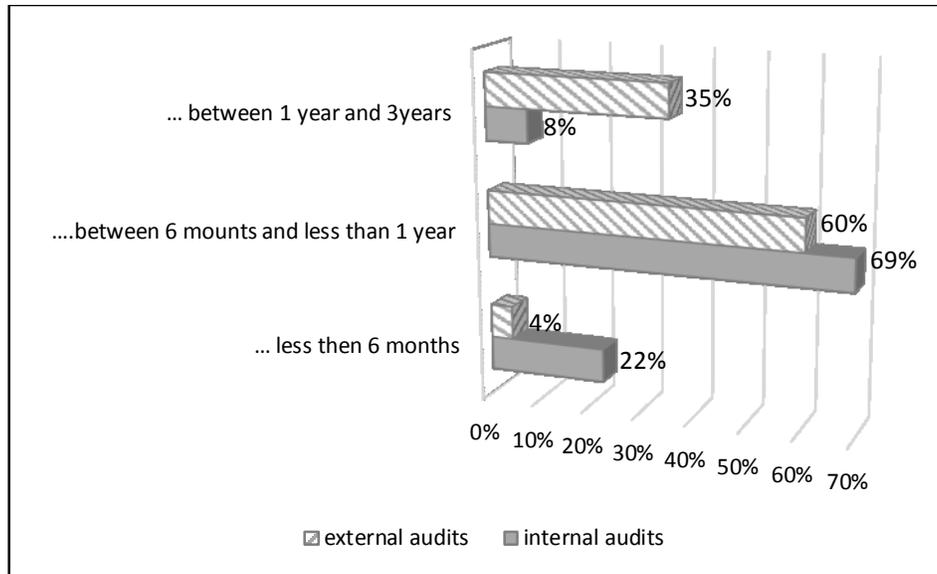


Figure 4.2-1: Auditing frequency

There was a large difference between internal (91%) and external (64%) audits when the Serbian organizations surveyed performed audits with the frequency of “less than 6 months” and “between 6 months and less than one year”.

When measuring different sizes of the Serbian organizations surveyed, the frequency of conducting internal audits was “between 6 months and less than a year” for small organizations (71%), 67% for a medium organization and 64% for a large organization (Figure B.25, Appendix B). The same audit frequency of once “between 6 months and less than a year” was observed in 70% of the manufacturing sector organizations, 67% in the service sector and 67% in the “other” industry sector organizations (Figure B.26, Appendix B). Moreover, 20% of service sector organizations, 25% of “other” and 22% manufacturing reported the frequency of conducting internal audit “less than 6 months”. Regarding the frequency of conducting external audits, the highest percentage of organizations found the answer “between 6 months and less than year” was presented at 79% large organizations, (Figure B.27, Appendix B).

It could be concluded that internal audits are done more frequently than external audits. Internal audits are conducted by the organization itself while external parties do external audits. Usually, organizations have a contract with external auditors. These contracts specify how often external audits are conducted. There are two types of external audits: registration audits (conducted every

three years) and surveillance audits for registration follow up (performed in one year or less) (McGarry & Becker, 2002).

The following subchapter 4.3 illustrates the audit outcomes that Serbian organizations received.

4.3. Audit outcomes

For the question “The auditors identify...”, organizations had three options in answering this (Section 4, Appendix E):

- “nonconformities”
- “opportunities for improvement of the implementation of each standard separately”
- “opportunities for improvement of integration of systems”.

In this question, organizations could use multiple answers (one, two or all applicable).

Figure 4.3.1 illustrates that majority of Serbian surveyed organizations did their audits to find “nonconformities”. Audits provided nonconformities as outcomes in 90% of internal audits and 88% of external audits. Internal audits showed “opportunities for improvement of integration of systems” in 66% of the surveyed organizations, whereas 60% of organizations did an internal audit for “opportunities for improvement of the implementation of each standard separately”.

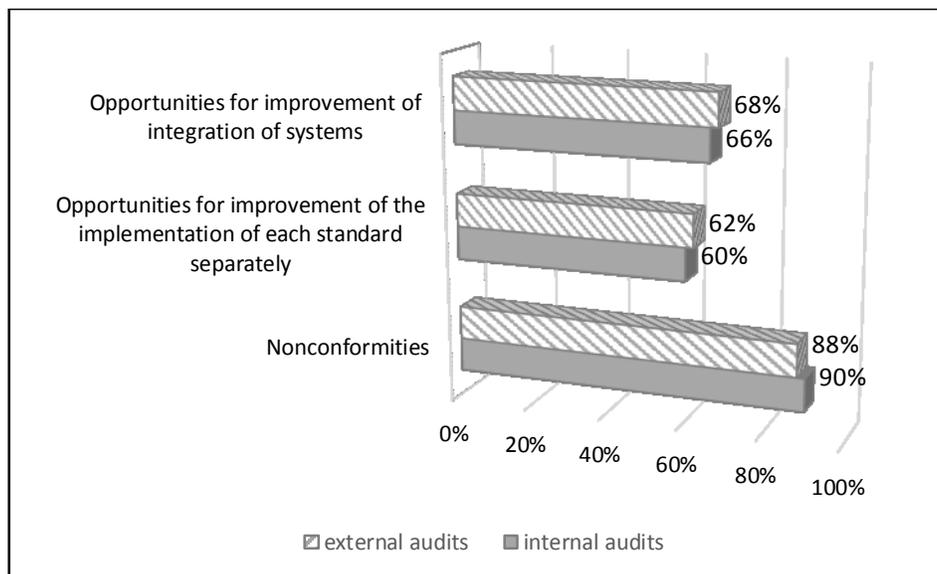


Figure 4.3-1: Audit outcomes

The percentage of external audits was very similar to both opportunities, 68% for improvement of integration system and 62% improvement of the implementation of each standard separately.

In reference to a high percentage of “opportunities for improvement of integration of systems”, results are in line with Bernardo et al. (2011) and Simon et al. (2011). On the other hand, Simon et al. (2014) and Karapetrovic et al. (2006) had different results when it comes to “*only detect nonconformities*”, in which they reported very low results. This significant difference could be because they used “only detect nonconformities” whereas this survey had just “nonconformities”. Moreover, Durdevic (2014) obtained a high percentage of internal audit opportunities for “detecting nonconformities”.

Simon et al. (2014) and Karapetrovic et al. (2006) are in line when it comes to improvement of the implementation of each standard separately. Both these studies obtained high percentages for internal and external audit outcomes.

The following subchapters will discuss the integration of the resource elements of audit systems, namely teams, time, plans and reports.

4.4. Structure of audits

Question, “The audits are conducted...” with answers: “at the same time for all standards”, “at the same time for the following standards” and “at different times”, was a part of section 4 of the questionnaire (Appendix E). The first answer (“same for all standards”) meant that organizations integrated their audit teams and the same team performed the audit for all MSs in organizations. The second answer (“at the same time for the following standards”) was changed for further analysis to “same time for some standards only” since organizations did not specify which “following standards” were used (meaning that some team would do audit only for selected MSSs). The last answer (“different times”) meant that organizations did not integrate audit teams. Therefore, different audit teams would be used for different MSSs.

Figure 4.4.1 illustrates the level of integration of auditing time. More than half organizations surveyed had their audits at the same time for both internal (58%) and external (60%) audits.

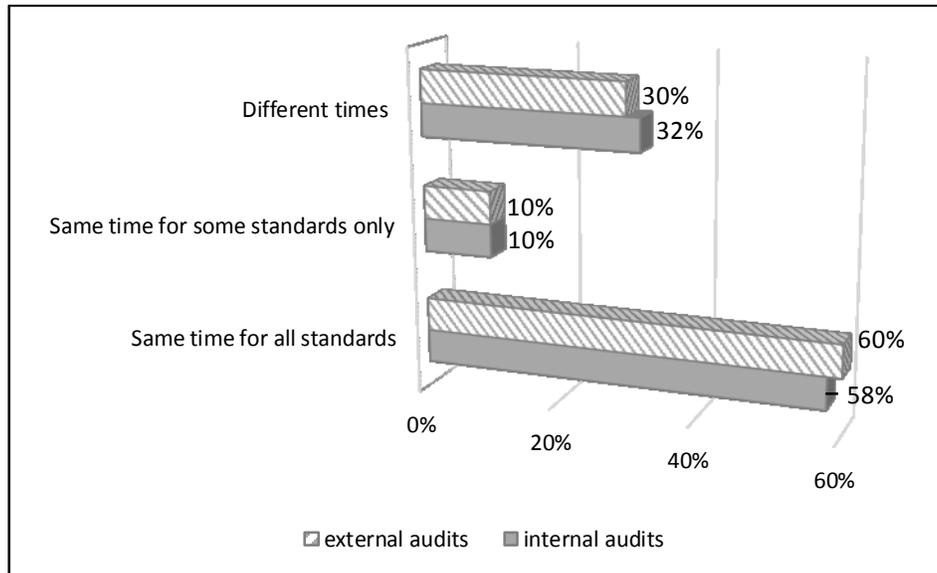


Figure 4.4-1: Simultaneous audits

This result brings a question if internal and external audits were done simultaneously in the same percentage of organizations. To examine this, two variable Z- test was performed.

The P-Value of 0.5793 was greater than significance level $\alpha= 0.05$. It could be concluded that the 2% difference is not enough to say that internal audits were performed for all standards in a larger number of organizations compared to the external audits (Appendix D). This is conceivable since the percentage differences between these two variables are relatively low. In addition, external audits were done by external party meaning that the external teams would come and do the auditing at the same time (e.g. to not trouble the organization constantly and to finish the work within the same period for all standards).

Levels of integration of audit time regarding internal and external audits were reported by Simon et al. (2014), Bernardo et al. (2011), Karapetrovic et al. (2006) and Simon et al. (2011).

32 % of internal and 30% of external audits were performed “at different times” (Figure 4.4.1). Similar results were found at Bernardo et al. (2010). However, Simon et al. (2014) obtained lower

percentage for the response “at different times” for different standards, only 13% for internal and 9% for external.

Figure 4.4.1 shows that only 10% of organizations answered “at the same time for some standards only”, for both internal and external audit.

In the case of both medium and large organizations, half of the organizations from each group conducted their audits “at the same time for all standards”. These results are likely because small organizations had their teams integrated with the highest percentage and integrated teams would do audits at the same time for all standards. Regarding external audits large (64%) organizations recorded the high percentage of integration of audit time, whereas medium (40%) organizations had the lowest.

More details regarding the integration of audit time of different industry sectors and different sizes can be found in Appendix B.

4.5. Integration of audit teams

Organizations had options to answer if the audit teams were “different for different standards”, “same for the following standards only” (which was revised to “same for some standards only”, as organizations did not note the following standards) and “same for all standards”. Figure 4.5.1 shows that the integration of auditors/ audit teams differs between internal and external audits. 46% of organizations reported the same team for all standards for internal audits, while 42% organizations reported separate teams for different standards. The remaining 12% had teams “same for some standards only”.

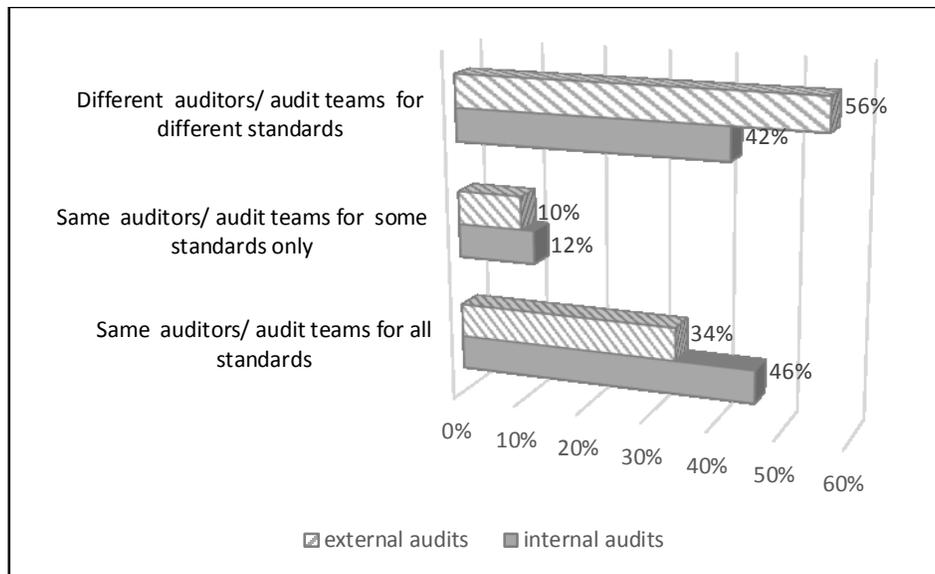


Figure 4.5-1: Auditors/ audit teams

Regarding the external auditor/audit teams, 56% of organizations use different teams for different standards. However, this result differs from many other studies by Simon et al. (2014), Karapetrovic et al. (2006), Bernardo et al. (2011), Douglas & Glen (2000), Bernardo et al. (2010), Casadesus et al. (2008) and Karapetrovic et al. (2010), where the percentage of the “same auditors/audit team for all standards” was much larger for internal audits. When it comes to external audit teams, this study is in line with previous studies by Bernardo et al. (2010), Simon et al. (2011), Simon et al. (2014), Karapetrovic et al. (2010) and Karapetrovic et al. (2006). However, Casadesus et al. (2008) reported that more than half of the surveyed organizations had integrated external audits teams.

Additionally, 17 (34%) had the same teams for all standards and five (10%) participants used the same teams for some standards only. Therefore, in Serbian organizations, the external auditors are mostly separate for different standards, probably because they have training in separate standards or systems, and external parties did not offer integrated audits services. The percentage difference between internal and external audits for “the same auditors/audit teams for all standards” is 12%. 12% looks as a relevant difference, bringing to the conclusion that internal audit teams are much more integrated than external. Using the Z-test and following the steps given in Jovanovic (1996), the H0 hypothesis describes equality between the two proportions, whereas the Ha hypothesis describes that the proportion of internal audits is greater than external auditors in terms of having

the same auditors. Nonetheless, there is sufficient statistical evidence that supports the statement that audit teams are equal in both categories (internal and external auditors). The P-Value of 0.1112 is greater than the significance level of $\alpha= 0.05$ (Appendix D).

Relating to the integrations of the auditors by the size of organizations, Figure 4.5.2 displays that the same audit teams were used for all standards in 71% of small, 29% of large and 27% of medium organizations. An explanation for a high percentage of integration of audit teams in small sized organizations could be that organizations do not have enough specialized expertise to conduct the audit for all MSs separately and therefore, they integrated teams to carry out auditing.

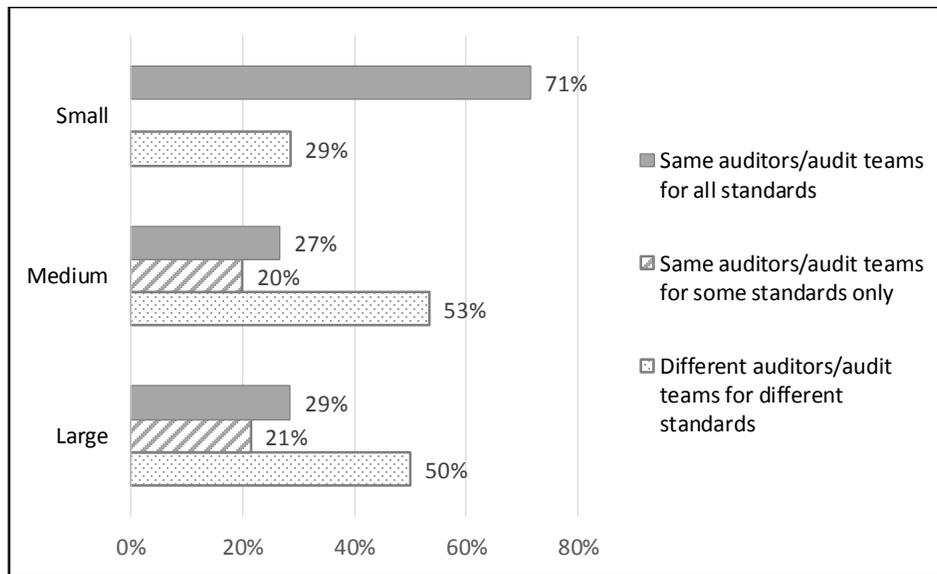


Figure 4.5-2: Auditors/ audit teams regarding the organization size for internal auditing

In addition, Figure 4.5.3 presents the situation of the integration of teams for internal audits, where the 52% of manufacturing organizations have the same team for all standards and 43% have different auditors for different standards. 47% of service organizations have the same auditors for internal audits and 27% have the different personnel for different MSSs. The category of “other” sector (mining, construction and others) presented the highest rate for heaving “different auditors/audit teams for different standards” (58%). But then again, the small sample size was one of the restrictions in this study.

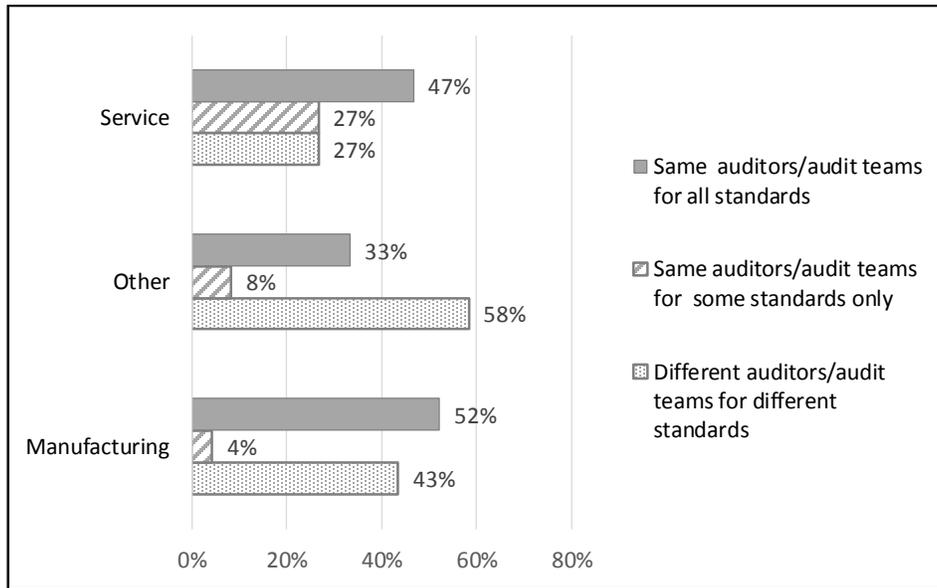


Figure 4.5-3: Auditors/audit teams regarding the industry sector for internal auditing

Figure 4.5.4 proves that external audit teams are mostly the same for all standards in small organizations. Medium and large organizations reported a high percentage of “different auditors/audit teams for different standards”.

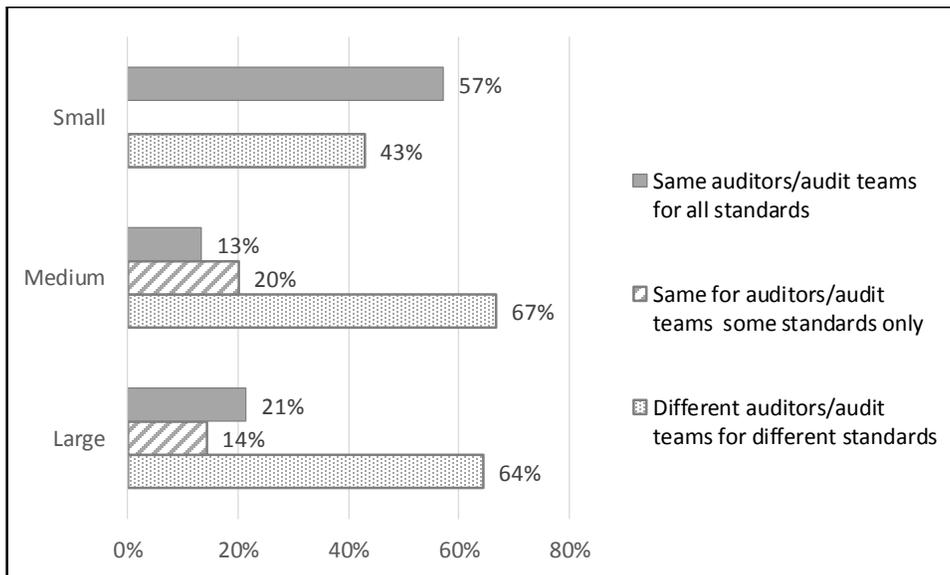


Figure 4.5-4: Auditor/audit teams regarding the organization size for external auditing

Figure 4.5.5 verifies that external teams are mostly different or the “same for some standards only”, for both “other” and manufacturing industry sector organizations, whereas organizations in the group service showed the highest percentage for having audit teams integrated for “some standards only”.

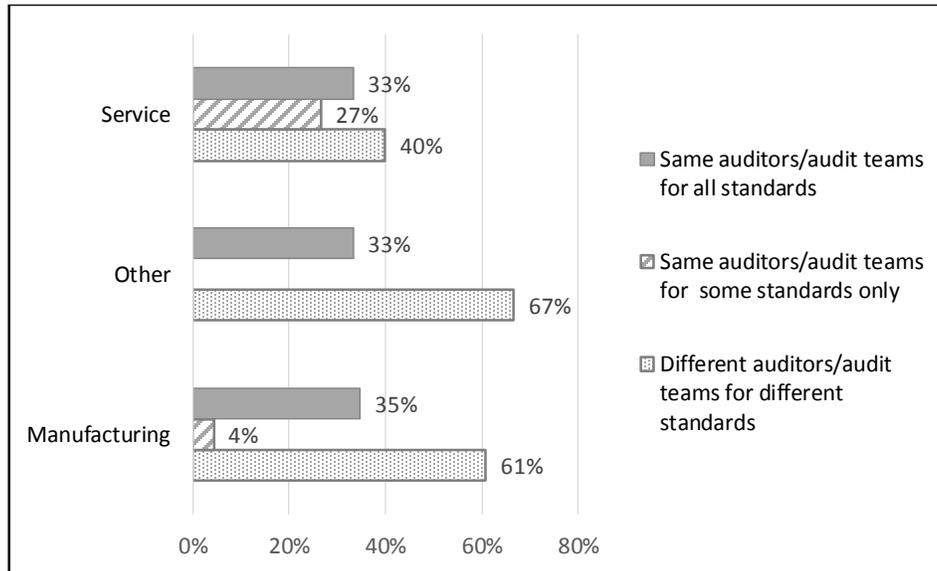


Figure 4.5-5: Auditor/audit teams regarding the industry sector for external auditing

4.6. Audit plans and reports

One of the questions that were asked (Section 4, Appendix E) was the level of integration that was present in Serbian organizations regarding audit plan. The question was if “the auditors use...”:

- “a single plan for all standards”,
- “a single plan for the following standards only” (in theses used as “single plan for some standards only”) and
- “different planes for different standards”.

Figure 4.6.1 presents the integration of audit plans in Serbian organizations. Results for internal audits show that 56% of organizations used a “single plan for all standards” and for external audits, this percentage was 42%.

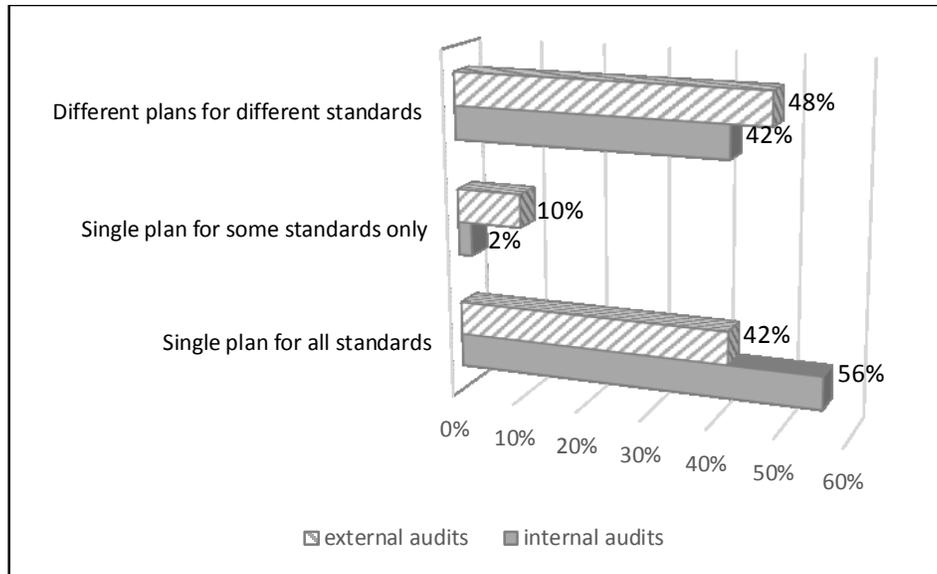


Figure 4.6-1: Integration of audit plans

However, the 14% percentage difference gives the question of whether this difference is sufficient to conclude that plans were integrated much more for internal than it was for external audits. Having two hypotheses presented in Appendix D, using the Z-test (Jovanovic, 1996), it could be said that this difference between internal and external audits is not sufficient to infer that these two proportions are different. The hypothesis testing gives the conclusion that they are equal. This kind of result was expected since both the internal and external audits were conducted at the “same time for all standards” (see subchapter 4.2). Only one surveyed organization (2%) for internal and five for external audits (10%) used the same plan for some standards only. Separate plans for different standards were used in 48% of organizations for external and 42% of organizations for internal audits.

Likewise, most organizations had “single plans for all standards” for internal audits. The reason could be that the majority of surveyed organizations did the integration of their MSs. Similar results were found in other studies (e.g. Simon et al. 2014; Karapetrovic et al. 2006; Karapetrovic et al. 2010; Bernardo et al. 2011; Karapetrovic et al. 2010 and Simon et al. 2011). But then again, the results found in other studies were more different for external audits. Simon et al. (2014), Karapetrovic et al. (2010), Casadesus et al. (2008) and Karapetrovic et al. (2006) reported that

internal audit plans were integrated into a higher percentage of organizations than external audit plans.

Most of the large organizations (57%) regarding internal audits reported a “single plan for all standards”, whereas a smaller percentage indicated “different plans for different standards” (Figure B.9, Appendix B). With respect to the industry sector, the “other” sector had the highest percentage (67%) for “a single plan for all standards” (Figure B.10, Appendix B). Additional results regarding the integration of audit plans in different industry sectors and different sizes of organizations can be found in Appendix B.

Another question in Section 4 of the questionnaire (Appendix E) asked if the auditors were using:

- “a single report for all standards”,
- “a single report for the following standards only” (this thesis used as “a single report for some standards only”) or
- “different reports for different standards”.

Figure 4.6.2 explains that the majority of auditors (52%) used a “single report for all standards” for internal audits, while 44% of auditors used “different reports for different standards”.

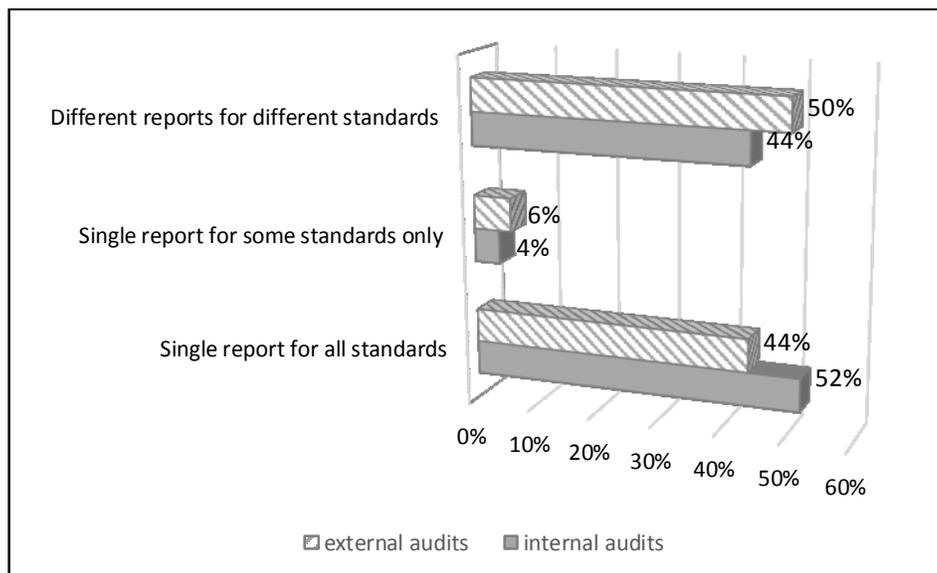


Figure 4.6-2: Integration of audit reports

These findings are roughly in line with Simon et al. (2014), Karapetrovic et al. (2006), Bernardo et al. (2011), Simon et al. (2014) and Bernardo et al. (2010).

Nevertheless, Figure 4.6.2 proves that external audits used “different reports for different standards” in 50% of organizations, which was a higher percentage than in a case of “single report for all standards”. These results differ from studies by Simon et al. (2014), Karapetrovic et al. (2006), Casadesus et al. (2008) and Bernardo et al. (2011), where this percentage was higher.

The dissimilarity between “a single report for all standards” for internal and external audits was statistically rejected by using the Z –test (Jovanovic, 1996). The test confirmed that reports are equally integrated in both tested variables (internal and external audits). The results of testing are displayed in Appendix D.

Figures presented in Appendix B (Figure B.13 and Figure B.15), show that for nearly half of small and medium-sized organizations, both internal and external audit reports were integrated.

Analogous to the previous results, regarding the industry sectors, organizations had integrated internal and external audit reports in around 48% of cases for manufacturing and 50 % for “other” industry sectors (Figure B.14 and Figure B.16, Appendix B).

The next question that needed to be examined was regarding how Serbian organizations were conducting audits. The answers offered were:

- ” I do not know”,
- “For each requirement of the standard separately”, meaning that e.g. requirements of the standards as corrective action, document review, preventive action... would be audited processes.
- “Process by process”, as the last offered answer, meaning that auditors would choose one process and auditors would audit process from beginning until its end.

Figure 4.6.3 illustrates how audits were done in organizations. The majority of the organizations in Serbia 85% for internal and 66% for external were used “process by process”.

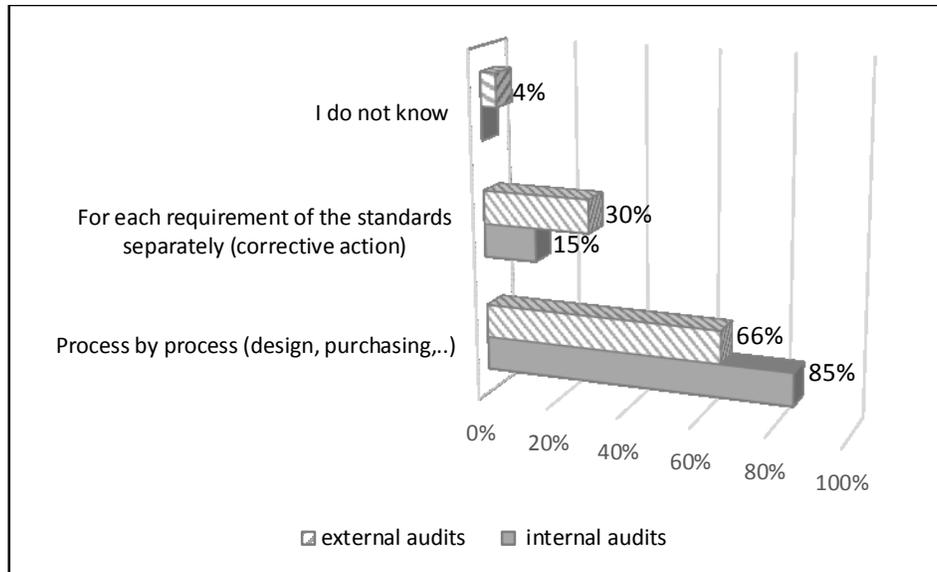


Figure 4.6-3: Audit focus

This result is credible for internal audits since the organization's employees are more familiar with the processes in organizations than with the standards. Therefore, the easiest way for conducting audits is to perform them "process by process". However, for external audits, the majority of organizations were audited "process by process". The reason for this could be that ISO 9001 uses a process approach, and as we know, the majority of organizations implemented this standard first. Moreover, 30% of external audits were performed requirement by requirement. This result is conceivable since external auditors are more familiar with the standards.

Related to the hypothesis testing, the null hypothesis describes that "process by process" method was at equal levels for both internal and external audits and the alternate hypothesis illustrates that it was more represented in internal than it is in external audits. The set of equations 4.6.1 (Jovanovic, 1996), illustrates that the P-Value is less than the $\alpha = 0.05$. Therefore, the alternate hypothesis has been accepted, giving a finding that performing audits using "process by process" is present more in internal audits than it was for external audits. This conclusion makes sense because internal auditors are much more familiar with processes in their organizations than the external auditors.

π_{25} = "process by process" for internal auditing

π_{26} = "process by process" for external auditing

$$H_0: \pi_{25} = \pi_{26}$$

$$H_a: \pi_{25} > \pi_{26}$$

$$n_{25} = 48$$

$$n_{26} = 47$$

$$p_{25} = 85\%$$

$$p_{26} = 66\%$$

$$P = \frac{n_{25}p_{25} + n_{26}p_{26}}{n_{25} + n_{26}} = 0.756$$

$$\sigma_{\Delta p} = \sqrt{p(1-p) * \frac{n_{25} + n_{26}}{n_{25} * n_{26}}} = 0.881$$

$$Z = \frac{p_{25} - p_{26}}{\sigma_{\Delta p}} = 2.155$$

This is a right tailed test, therefore using the table for Z test (Triola, 2007).

$$P\text{-value} = 1 - 0.9842 = 0.0158$$

Equation 4.6-1: The set of equation for the Z-test (“process by process” for internal and “process by process” for external audits)

Some audits were carried out “for each requirement of the standards separately”. This was done in 14 organizations (15%) for internal audits. Compared with previous studies, very similar results were found in Simon et al. (2014) and Karapetrovic et al. (2006).

A high percentage for conducting internal auditing “process by process” was commonly present in all sizes of Serbian organizations. Additional results regarding audits in different industry sectors and for different sizes of organizations can be found in Appendix B.

4.7. Audit focus

The organizations were asked if internal and external “the auditor/audit teams audit against the different implemented standards...” For this question, organizations needed to answer:

- “as completely independent systems”
- “as interrelated systems”, “

- “as a single integrated system”.

Figure 4.7.1 verifies that the majority of the organizations surveyed (50%) reported a high level of integration in both internal and external audits. This makes sense since a vast majority of Serbian organizations operate with completely integrated systems.

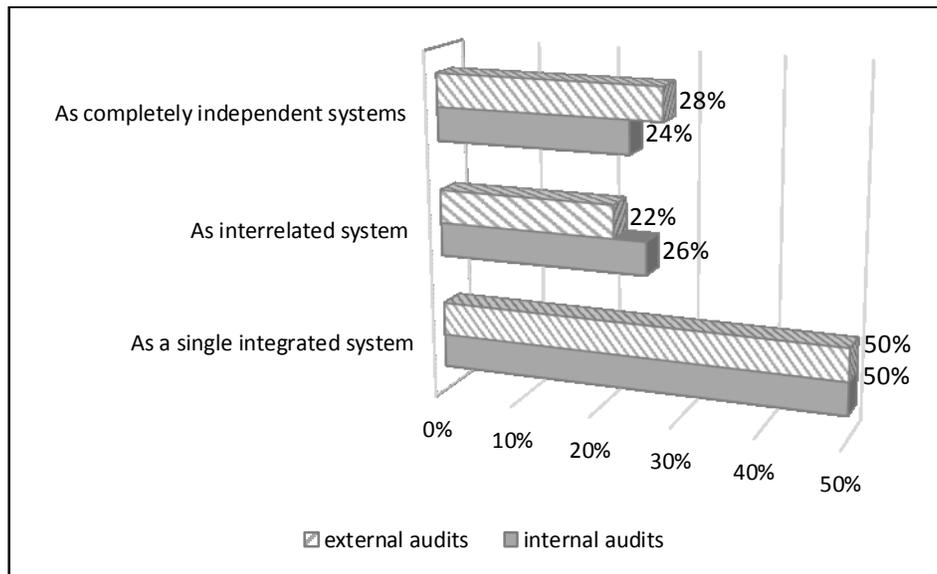


Figure 4.7-1: Integration of audit objectives

Large-sized organizations for internal and external audits showed the highest percentage of auditing “as a single integrated system” (Figure B.5 and Figure B7, Appendix B). Regarding the industry sector, significant results were reported for the service sector: 60% of the organizations surveyed reported auditing of a single integrated system (Figure B.6, Appendix B). External audits showed auditing of system “as a single integrated system” mostly in service (60%) and “other” industry sectors (58%) (Figure B.8, Appendix B). Additional results regarding audits in different industry sectors and for different sizes of organizations can be found in Appendix B.

Findings from this research are in line with studies by Simon et al. (2014) and Karapetrovic et al. (2006). However, compared to other studies, Simon et al. (2011) said that all four organizations examined conducted their own internal audits of “[...] single integrated systems”. Bernardo et al. (2011) and Simone et al. (2014) reported higher percentages of organizations using internal and external audits of integrated systems.

4.8. Summary

The majority of Serbian organizations showed they use ISO 19011 as guidance for internal and external audits. More than 50% of the organizations surveyed conduct their audits with a frequency of once between six months to a year. Most audits detect nonconformities and make way for opportunities to improve implementation of MSSs or integration of management systems.

The Serbian organizations surveyed showed a high extent of audit integration for both internal and external audits. This was especially true for internal audits which reflected higher levels of integrated time, plans, reports and objectives. Moreover, external audits showed a high level of integration of time, whereas plans and reports were still kept separate for different systems.

5. Customer satisfaction

In this part of the research, the familiarity of Serbian organizations with augmentative standards, order of implementation, audit of augmentation standards and reasons for not having those standards was studied. The comparison was made between organizations that had customer satisfaction standards (CSSs) and organizations that did not have customer satisfaction standards (non-CSS) regarding internal audits and customer benefits of having implemented both ISO 9001 and ISO 14001.

5.1. Implementation of augmentative standards in Serbia

The trend of implementing CSSs is in not developed in Serbia. From question 6.1 (Appendix E) organizations were asked whether they had been using the offered CSSs. Figure 5.1 presents the percentages of organizations that had been using CSSs (ISO 10001, ISO 10002, ISO 10003 and ISO 10004). ISO 10001 “*Customer Satisfaction-Guideline for codes and conduct for organization*” was not implemented to a high extent in Serbia. The majority of participants (96%) were not using ISO 10001. Only two organizations implemented it (Karapetrovic & Spasojevic-Brkic, 2014).

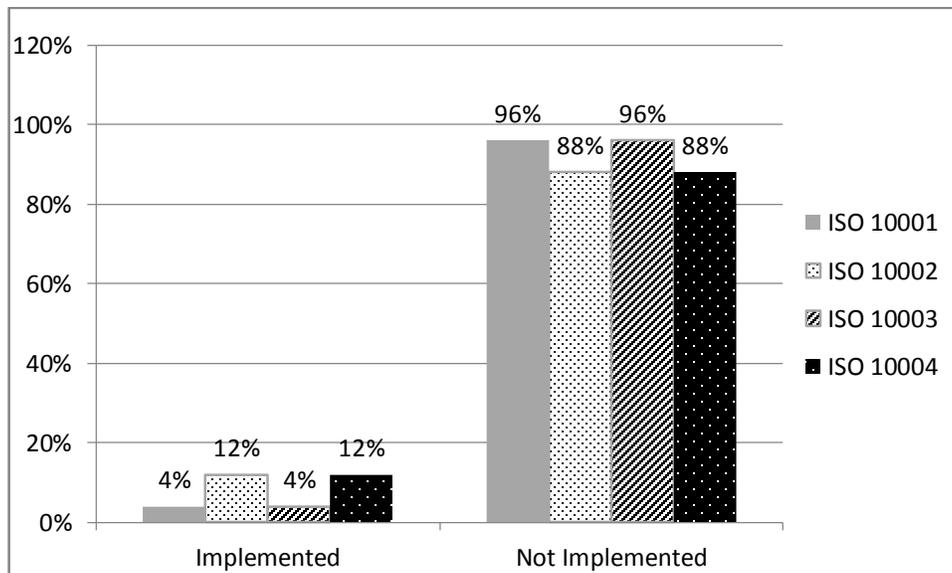


Figure 5.1-1: Implementation of augmentative standards

Furthermore, the situation with ISO 10002 is not different. The majority of 44 organizations (88%) said that they were not using ISO 10002. Only six (12%) organizations deployed this standard.

In addition, ISO 10003 was not so popular in Serbian organizations either. Only, 4% of organizations used ISO 10003 (Karapetrovic & Spasojevic-Brkic, 2014). It is interesting to note that the two organizations that had ISO 10003 also implemented ISO 10001 and ISO 10002. This is probably because those organizations were familiar with benefits of having CSSs implemented.

In regards to ISO 10004, 12% of organizations implemented. Among those six organizations, two organizations had ISO 10001, 10002, 10003 and 10004. Three organizations had ISO 10004 and ISO 10003 and one had only ISO 10004. A similar reason could be derived as for the previous organizations which had implemented ISO 10001, ISO 10002 and ISO 10003.

In relation to augmentative standards, a considerably superior picture was obtained (ISO 10012, ISO 10005, ISO 19011 and ISO 14031) (Figure 5.1.2).

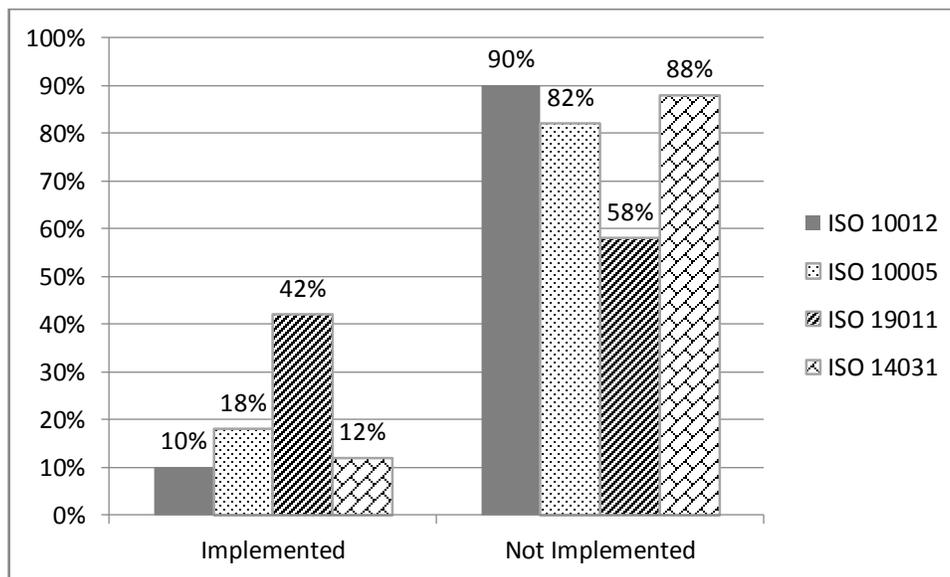


Figure 5.1-2: Implementation of customer satisfaction standards

Figure 5.1.2 illustrates that the two most used augmentative standards are ISO 19011 and ISO 10005. For ISO 10005, nine organizations (18%) responded that they have that standard. Expectedly, ISO 19011 were used in almost half of the surveyed organizations (42%).

Conducting the Z-test for further statistical proof, the proportions of the organizations using ISO 10012 and ISO 14031 were tested. The testing was to address if these two standards were used to the same extent in Serbia (H_0) or one of the standards was used more than the other one (H_a). Moreover, having the P-Value greater than significance level $\alpha = 0.05$ gives us the conclusion that these two variables are equivalent (Appendix D). Therefore, the usage of these two standards is equal. This statistical proof makes sense since the focuses of these two standards are similar but for different systems (quality for ISO 10012 and environmental for ISO 14031).

However, the comparison between ISO 19011 and ISO 10012 gives us a different statistical result. The set of equations (Appendix D) demonstrates the Z-test, with steps explained by Jovanovic (1996), the P-Value of 0.011 being lower than the significant level (0.05), evidencing that the proportion of organizations using ISO 19011 is greater than that for ISO 10012. Using this statistical proof, we can determine that Serbian organizations use ISO 19011 more than ISO 10012. This report is credible, as ISO 10012 covers a specific topic (measurement). However, ISO 19011 is a general standard for auditing the whole ISO 9000 family and other MSS families (e.g. ISO 14001 and ISO 27001).

5.2. Familiarity with customer satisfaction standards

Driving from question 5.1 (Appendix E) it could be seen that the number of Serbian organizations with any knowledge of CSSs was not very high, (Karapetrovic & Spasojevic-Brkic, 2014). Organizations were offered a list of standards and were asked if they would implement them. The offered answers were:

- “I am not familiar with these standards”,
- “I do not know”,
- “I know that standard and should not be applied”,
- “I know that standard and should be applied” and
- “I know the standard and have been applied”.

In Figure 5.2.1, the answers “I am not familiar with the standard” and “I do not know” are combined. More than 50% of the surveyed organizations do not know or were not aware with

CSSs at all (Karapetrovic & Spasojevic-Brkic, 2014). The highest percentages were for ISO 10003 (64%) and for ISO 10008 (64%) (Figure 5.2.1). The reason could be that all these standards are relatively new.

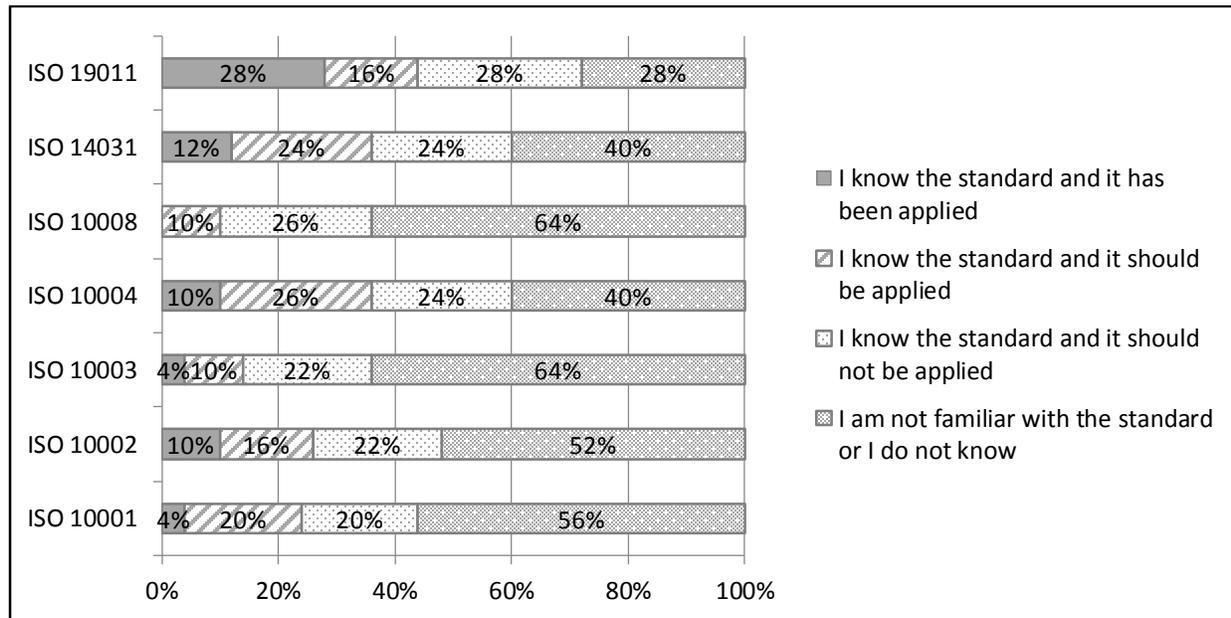


Figure 5.2-1: Importance of customer satisfaction standards

Karapetrovic et al. (2006) reported that a high percentage of Spanish organizations was not aware of augmentative standards. However, Karapetrovic et al. (2006) and Karapetrovic et al. (2010) stated that 33% of organizations were familiar with ISO 10002. Further, similar results were found in Poland, where “relatively large number of organizations has no awareness of the existence of the ISO 10000 series” (Salerno-Kochan & Salerno-Kochan, 2015). The answers “I know the standards and has been applied” and “I know the standard and it should be applied”, were indicated by 44% of organizations for ISO 19011. The reason can be that organizations need to audit their systems and ISO 19011 is the only standard that is used for auditing. A high percentage for standards that organizations want to implement in future were found for ISO 14031 (24%) and ISO 10004 (26%).

5.3. Order of implementing customer satisfaction standards

Section 7 of the questionnaire (Appendix E) examined the implementation of augmentative standards into Serbian organizations. Question 7.1 asked for the time when organizations implemented their augmentative standards in relation to ISO 9001, ISO 14001 and other MSSs. Figure 5.3.1 presents the time when an augmentative standard was implemented compared with ISO 9001. The organizations had the option to answer whether integration happened “before”, “after” or “at the same time” as ISO 9001.

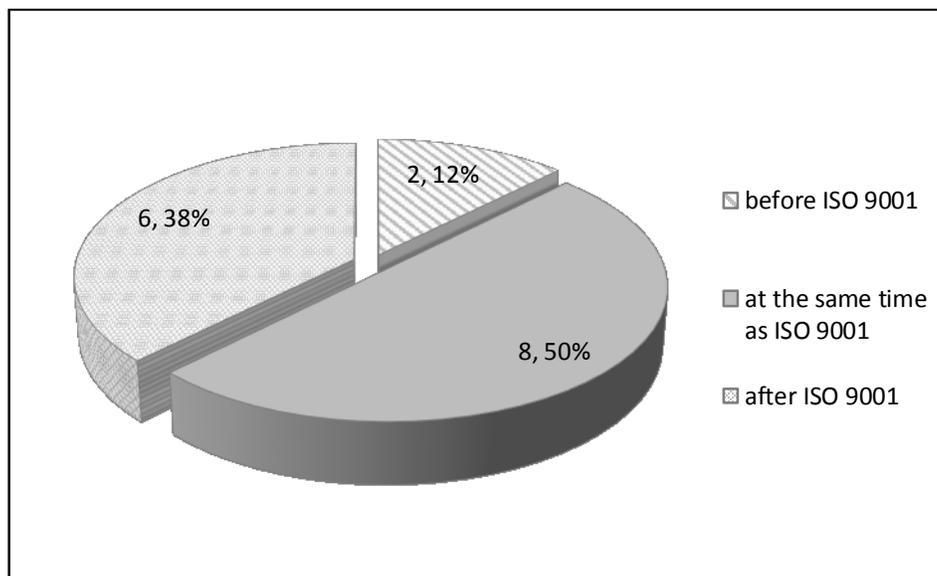


Figure 5.3-1: Implementation of CSS regarding ISO 9001

50% of the organizations that implemented CSSs did implementation at the same time as ISO 9001, while 38% implemented it after. Having CSSs implemented at the same time as ISO 9001 is plausible since quality MSs and CSSs have the same focus. ISO 10001, ISO 10002, ISO 10003 and ISO 10004 “[...] can be used as an element of a quality management system” ISO (2007a, 2007b, 2008, 2004).

The same question was asked with respect to ISO 14001. Figure 5.3.2 shows that in 57% organizations the CSS was implemented “at the same time as” ISO 14001. Moreover, 29%

implemented CSSs after ISO 14001. Since ISO 14001 and CSSs (e.g. ISO 10001, ISO 10002, ISO 10003 and ISO 10004) do not have the same function, it could be concluded that organizations implemented ISO 9001 first and then ISO 14001 and CSSs. Moreover, by the time of the second implementation of an MSS, organizations already knew what standards were needed for their MSs. It needs to be noted here that a very small sample size was present for these questions related to the CSSs.

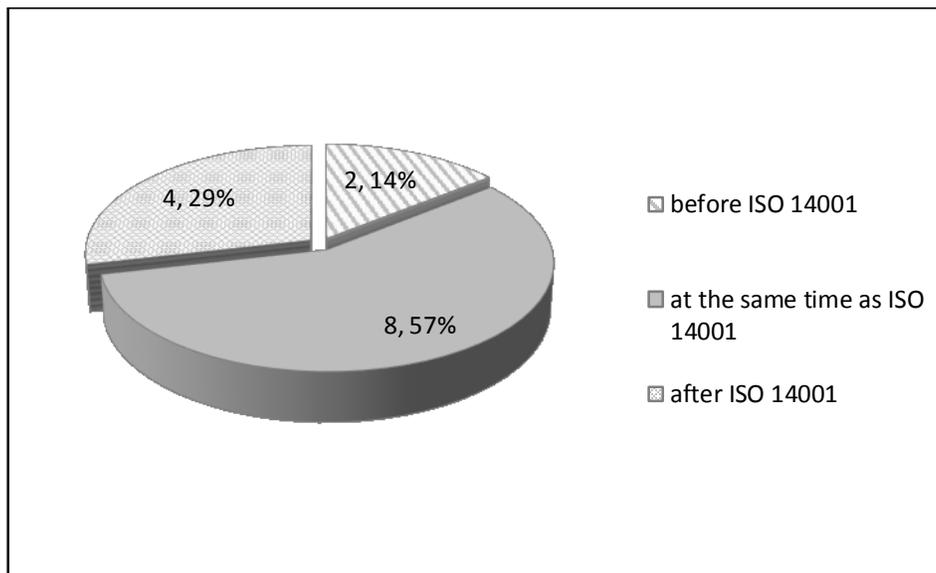


Figure 5.3-2: Implementation of CSS regarding ISO 14001

67% of organizations implemented augmentative standards after a third MSs had already been in place in the organization (Figure C.1, Appendix C).

Results from question 7.2 show that about half of the organizations had their augmentative systems as part of another system (“Quality Management System”, “ Environmental Management System” or “Integrated Management System”) while the other half of responders did not integrate augmentative systems with the other MSs. One of the limitations of this study was the small sample size regarding the augmentative standards. Namely, only 14 organizations answered this question. Please note that detailed analyses of these results can be found in Appendix C.

5.4. Audits of customer satisfaction standards

In question 7.3 from the questionnaire (Appendix E) organizations were asked if they conducted internal audits against augmentative standards. Serbian organizations that had implemented augmentative standards did not conduct internal audits in 92% of these organizations (Figure C.5, Appendix C). Only 8% said they conducted internal audits for augmentative standards. The reason for this result could be that organizations were not aware that augmentative standards could be audited or perhaps the organizations did not know the benefits of having audits for the internal audits. This conclusion could be plausible because there has been a lack of studies regarding the augmentative standards and even less for the benefits of having them audited.

Next, question 7.4 studied the guidelines that organizations used for performing internal audits. Organizations had options “ISO 19011”, “other”, “none” and “do not know”. 88% of organizations answered that they used ISO 19011 for internal audits and 8% answered that they did not know how the audit was conducted (Figure C.6, Appendix C).

Figure 5.4.1 shows that organizations performed audits as part of an IMS had the highest percentage, at the same time being the lowest percentage of organizations conducting internal audits independently. This result is conceivable since a high percentage of the organizations surveyed had completely integrated their MSs.

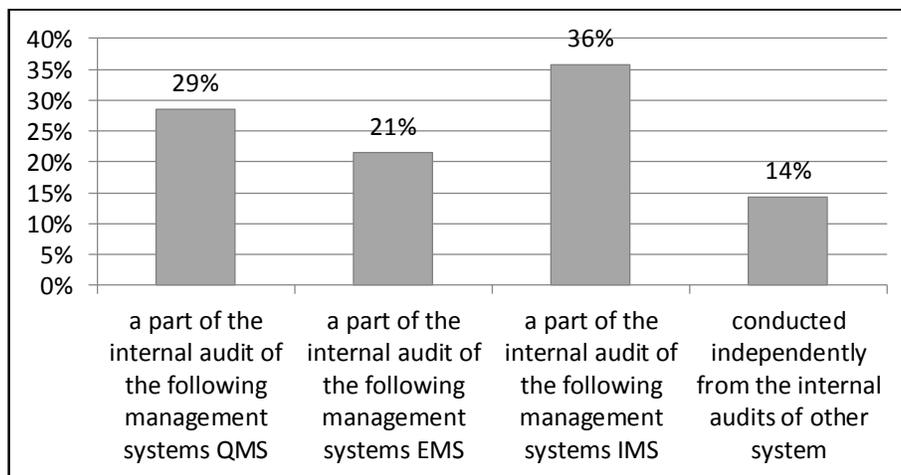


Figure 5.4-1: Internal audits for augmentative standards

5.5.Reasons not to implement customer satisfaction standards

Answers to question 9.1 from the questionnaire (Appendix E) give the reasons as to why organizations did not use augmentative standards. The organizations had the option to rank the importance of every offered difficulty. The number of organizations “not important”, “little important”, “important”, “very important” and “extremely important”, are presented in Table 5.5.1.

	not important	little important	important	very important	extremely important
Difficulties in understanding the standards	9	6	8	1	3
Differences between the standards and ISO 9001/ISO 14001	10	5	7	3	3
Lack of awareness about the standards	5	2	8	6	8
Lack of human resources	4	2	5	9	9
Lack of financial resources	6	2	4	6	11
Lack of interest	3	4	6	6	9
Lack of need	5	3	6	8	6

Table 5.5-1: Reasons not to implement customer satisfaction standards

Figure 5.5.1 shows percentages of organizations answers “not important” that was grouped as answers “not important” and “little important” (from Table 5.5.1) group “important” it was just left answer “important” and last for the “very important” it was grouped by answers “very important” and “extremely important”.

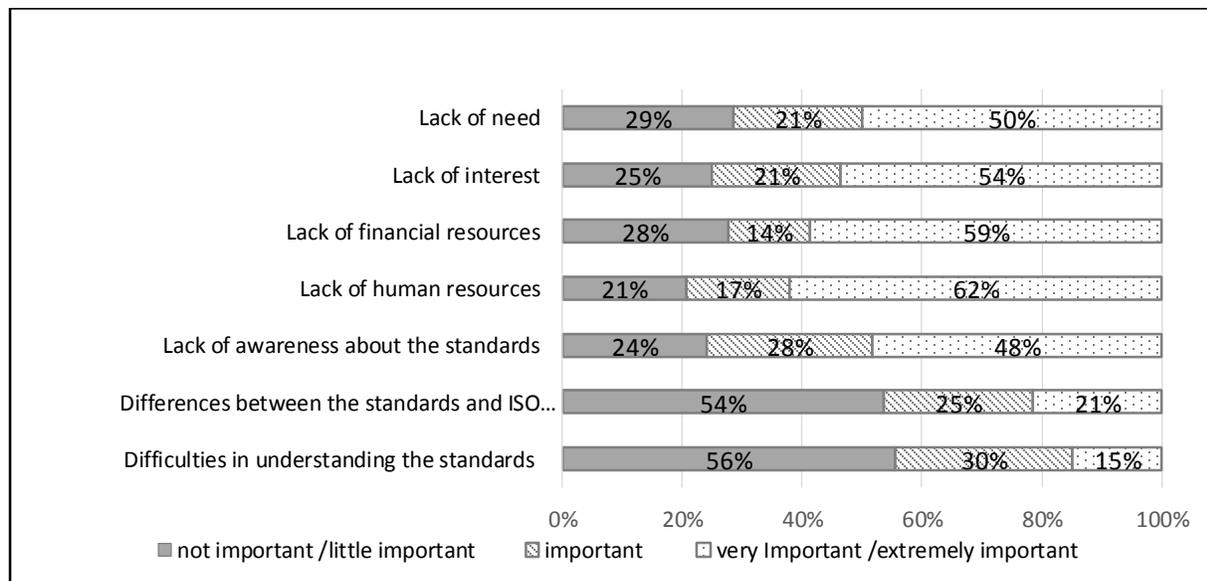


Figure 5.5-1: Difficulties to implement customer satisfaction standards

Figure 5.5.1 demonstrates that Serbian organizations do not use CSSs due to “lack of human resources”, “lack of financial resources” and “lack of interest” with the most significant problem being the “lack of human resources”. The “lack of human resources” was not just a difficulty in using CSSs. Specifically, this answer was repeated for integration difficulties (see subchapter 3.4). If the answers “important” and “very important” are joined, the top problem is again “human resources” (79%). Moreover, Salerno-Kochan & Salerno-Kochan (2015), reported the same problem for Polish organizations and their reasons for not having ISO 10000 standards. However, Nowicki et al. (2014) reported different reasons for organizations not having augmentative standards, with one of the main reasons being the “*cost of implementation and lack of time to prepare [it] and then maintain*”.

The answers “difficulties in understanding the standards” and “differences between ISO 9001 and ISO 14001” were the reasons for not having augmentative standards with the lowest percentages of 56% and 54%, respectively.

The question that was asked is whether one of two difficulties that was related to the standards is an important reason not to use CSSs. “Lack of awareness about the standards” and “difficulties between in understanding the standards” were examined by a Z-test. The null hypothesis shows that these two proportions are equal and alternative hypothesis demonstrates that a higher percentage of difficulties were the important reason for not using CSSs (Figure 5.5.1). Using calculations provided in Appendix D (Jovanovic, 1996), the P-Value of 0.038 is a lower than the significant level of $\alpha = 0.05$, proving acceptance of the alternative hypothesis. Therefore, “lack of awareness about standard” was the most important reason of not having CSSs. It could be said that the statement makes sense because the conclusion from the whole study related to CSS that Serbian organizations were not familiar with CSSs and their benefits.

Table 5.5.1 illustrates the exact number of individual answers pinpointing the extremely important problem of not having CSSs in Serbia. The “lack of financial resources” was ranked the biggest problem, followed by the “lack of human resources” and the “lack of interest”.

Table 5.5.2 illustrates the main problems presented using mean, median and mode. A high median was found with problems like “lack of human resources”, “financial resources”, “lack of interest” and “lack of need”, all factors as to why organizations do not have augmentative standards

(Karapetrovic & Spasojevic-Brkic, 2014). This table is a further confirmation of the top reasons for not having CSSs. The mean of the “lack of awareness about standards” was also high (3.34). The possible answer for not having CSSs is simply a matter of not being familiar with them and their benefits. Additionally, a lack of professional and financial resources could be a problem in Serbian organizations.

		Difficulties in understanding the standards	Differences between the standards and ISO 9001/ISO 14001	Lack of awareness about the standards	Lack of human resources	Lack of financial resources	Lack of interest	Lack of need
N	Valid	27	28	29	29	29	28	28
	Missing	21	20	19	19	19	20	20
Mean		2.3704	2.4286	3.3448	3.5862	3.4828	3.5000	3.2500
Median		2.0000	2.0000	3.0000	4.0000	4.0000	4.0000	3.5000
Mode		1.00	1.00	3.00 ^a	4.00 ^a	5.00	5.00	4.00
a. Multiple modes exist. The smallest value is shown								

Table 5.5-2: Mean, median and mode for difficulties to implement CSSs

5.6. Comparison of benefits

For further analysis, comparisons were made between organizations that had augmentative standards and ones that did not. Moreover, comparisons were analyzed regarding the benefits (e.g. Casadesus & Karapetrovic, 2005, Karapetrovic et al., 2006 and Vloeberghs & Bellens, 1996) that these two groups of organizations revealed, as outlined in question 2.4 of the questionnaire (Appendix E). Question 2.4 examines benefits that organizations reaped after implementing ISO 9001 and ISO 14001. Increased operational results, employee and customer satisfaction and financial results were the benefits to the organization operating with CSSs had in place. In this subchapter only, customer benefits will be observed as augmentative standards relate to customer satisfaction.

Figure 5.6.1 compares differences in customer loyalty between CSS and non-CSS organizations. With a 24% difference, customer loyalty was present in a higher percentage of organizations that held at least one of the CSSs.

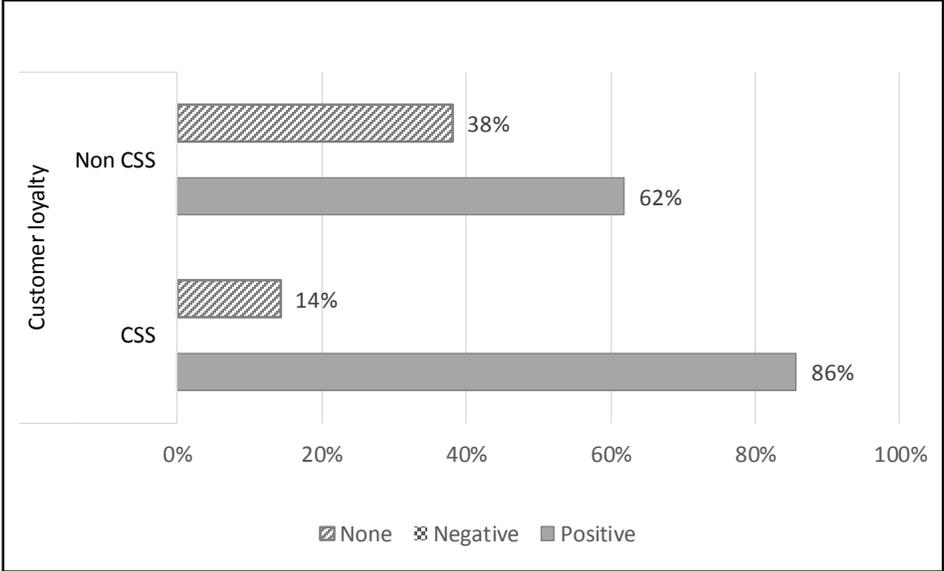


Figure 5.6-1: Loyalty of customers regarding CSS and non-CSS organizations

Figure 5.6.2 shows that all organizations, which had CSSs, reported a positive impact from having ISO 9001 and ISO 14001 MSSs in organizations. 84% of non-CSS organizations related the customer satisfaction benefit as “positive”.

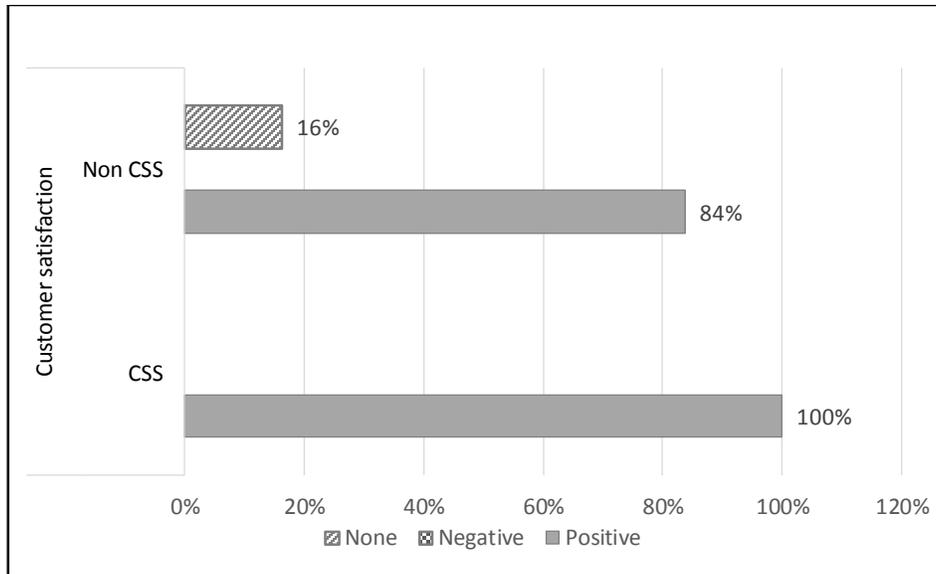


Figure 5.6-2: Satisfaction of customers regarding CSS and non-CSS organizations

Figure 5.6.3 shows that 21% more organizations that had a CSS reported positively on the benefits of reducing customer complaints in implementing both ISO 9001 and ISO 14001. This makes sense since ISO 10002 is specifically intended for compliance handling in organizations.

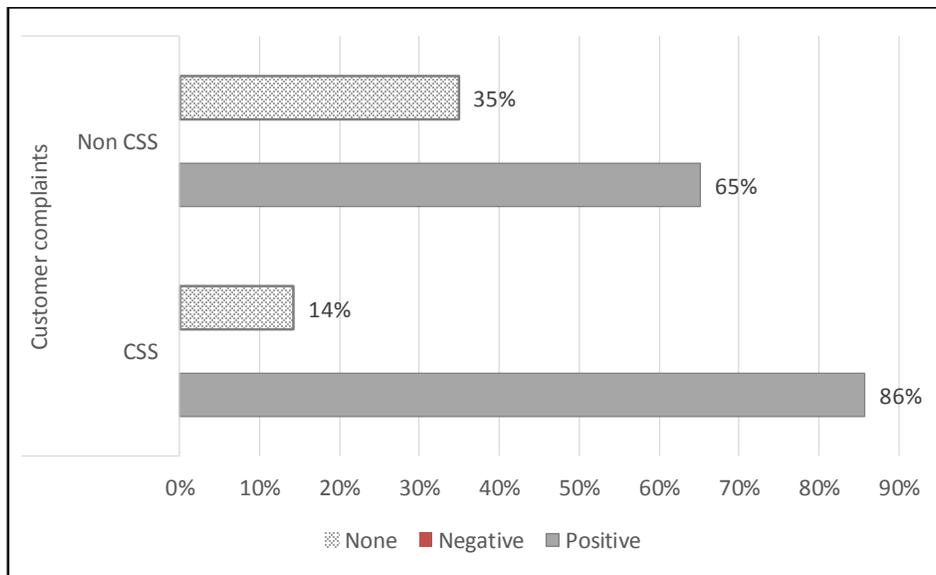


Figure 5.6-3: Complaints of customers regarding CSS and non-CSS organizations

Overall, it could be concluded that the satisfaction of customers is greater if organizations hold some CSS, as they are much more focused on customers. No organizations recorded a negative impact regarding the benefits connected to the customers. It should be noted here that a limitation of this study was its small sample size regarding the organizations that had implemented CSSs.

5.7. Comparison of audits

This section presents differences between the organizations CSS and non-CSS with respect to internal audits. Questions from section 4 of the questionnaire and question 6.1 (Appendix E) that related to the audits were used. The idea was to show the difference between these two groups of organizations. Only seven organizations had implemented CSSs, whereas 43 did not.

Figure 5.7.1 measures the integration of audit teams in CSS and non-CSS organizations. When comparing CSS and non-CSS organizations, it is evident that non-CSS organizations utilize a higher percentage of integrated audit teams than CSS organizations. Furthermore, the comparison revealed that the highest percentage of CSS organizations was for answer different auditors/audit teams for different MSs.

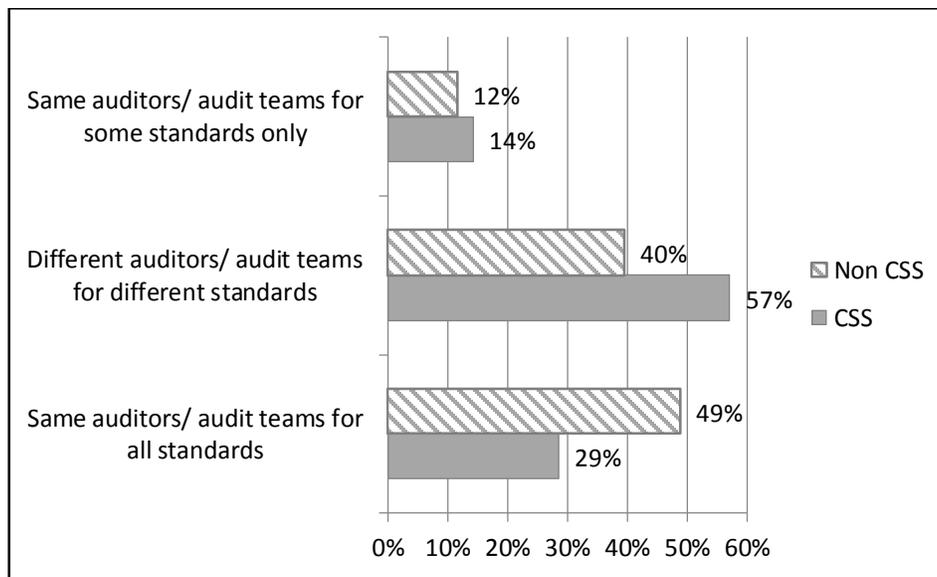


Figure 5.7-1: Auditors/ audit teams regarding CSS and non-CSS organizations

Figure 5.7.2 shows that a higher percentage of internal audits done at the same time for all standards was found in CSS organizations.

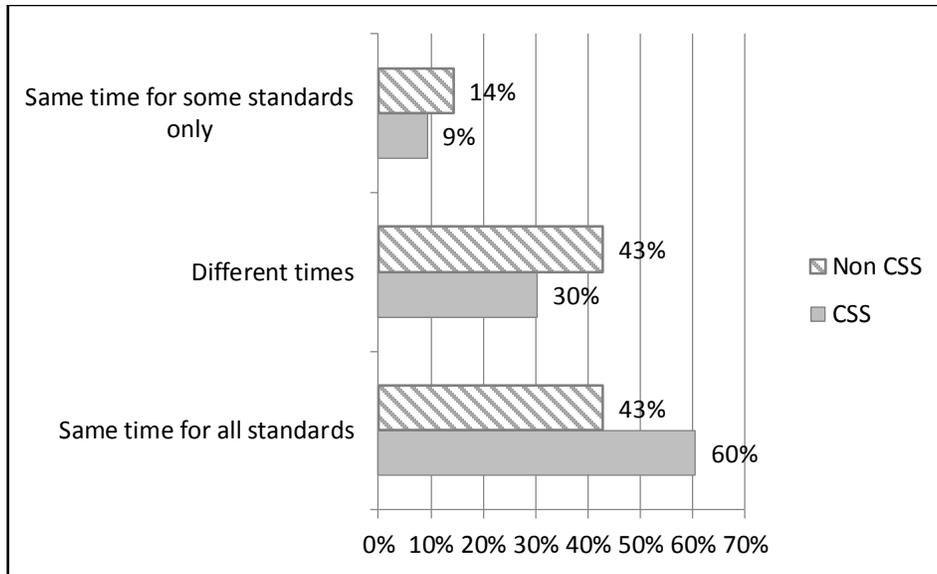


Figure 5.7-2: Audit time regarding CSS and non-CSS organizations

Both CSS and non-CSS organizations recorded a high percentage of having internal audits conducted “as a single integrated system (Figure C.7, Appendix C). Similar findings were obtained in regards to audit plans. Both groups (CSS and non-CSS) showed a high level of integration, having (CSS and non-CSS) showed a (Figure C.8, Appendix C).

In regards to integration of audits reports, they were much more integrated in non-CSS organizations (Figure C.9, Appendix C). CSS organizations had a higher percentage for the answer “a single report for some standards only”. The reason for this could be that audits reports for CSS organizations were done separately from QMS and EMS audits reports.

5.8. Summary

It could be concluded that Serbian organizations are not familiar with CSSs. The most used CSSs in organizations were ISO 19011 and ISO 10005. However, it needs to be noted that a small sample size was one of the limitations of the study. Two main reasons for not having CSSs were “lack of human resources” and “lack of the financial resources”.

Regarding the benefits to organizations that utilized CSSs, those organizations reported highly positive experiences when it came to customer complaints, satisfaction and loyalty.

Comparison between CSS and non-CSS organizations in regards to integrated internal audits showed that CSS organizations conducted their audits at the “same time for all standards” and a high level of integration of audit inputs as audit plans. However, for audit outputs, the CSS organizations used separate reports, but that would be only “for some standards only”.

6. Conclusion

This thesis presented the findings of an empirical study conducted in Serbia in 2013. The survey included the participation of organizations that had implemented both ISO 9001 and ISO 14001. In this chapter, a summary of the main results of the survey is given. Furthermore, these results are compared with the previous studies that were done on integration and Auditing of Management Systems (MSs) and Customer Satisfaction Standards (CSSs). Research contributions and limitations are defined.

6.1.Integration

Serbian organizations integrated their MSs to a high extent. Most of them used process maps as a tool to implement different MSSs. The process map was the highest used tool also in Karapetrovic et al. (2006), Casadesus et al. (2008), Simon et al. (2012a), Simon et al. (2013), Rajkovic (2010) and Karapetrovic et al. (2010). Average implementation time for the first, second, third and fourth MSS was between six months and one year, which is in line with Karapetrovic & Casadesus (2009) and Karapetrovic et al. (2006). Most Serbian organizations implement ISO 9001 first, followed by ISO 14001 and OHSAS 18001. Similar results were found in different countries in the studies of Douglas & Glen (2000), Zutshi & Sohal (2005), Zeng et al. (2007), Karapetrovic et al. (2006), Salomone (2008), Karapetrovic & Casadesus (2009), Casadesus et al. (2008), Bernardo et al. (2012), Bernardo et al. (2012a), Simon et al. (2012a), Khanna et al. (2009), Simon & Douglas (2013) and Karapetrovic et al. (2010). During the integration of MSs, the major difficulties were “lack of human resources “and “lack of employee motivation”. The same difficulties were confirmed in other studies (e.g. Bernardo et al., 2012; Karapetrovic et al., 2006; Asif et al., 2009; Simon et al., 2012a; Simon et al., 2012b; Simon et al., 2013; Simon & Douglas, 2013; Casadesus et al., 2008; Salamone, 2008; Zuitshi & Sohal, 2005; Zeng et al., 2011; Durdevic et al., 2013; Spilka, et al., 2009 and Castillio-Rojas et al., 2012). However, the Rajkovic (2010) study that was done in Serbia reported different integration difficulties: “lack of knowledge of managers and employees, resistance to change and lack of employee motivation”. A high level of the integration of human resources was presented for the organizations’ representatives and managers, which is

in line with Karapetrovic et al. (2006), Simon & Douglas (2013), Simon et al. (2012a), Beckmerhagen et al. (2003) and Simon et al. (2013), whereas contradicts with Bernardo et al. (2009). Additionally, a high extent of integration was presented by organizations' goals, objectives and processes, as in Simon & Douglas (2013), Simon et al. (2012a), Bernardo et al. (2009), Salomone (2008), Bernardo et al. (2012), Simon et al. (2013), Karapetrovic et al. (2006) and Douglas & Glen (2000).

6.2.Auditing

Serbian organizations showed a high level of integration of internal audits. A high extent of integration of audit elements for internal audits, followed by integration of teams, time, plans and reports, was found. On the other hand, external audits show a high level of integration of time. Both internal and external audits were conducted using "process by process" approach and by using ISO 19011 as guidance. The most common frequency was between six months and one year.

The most frequently used guidance for internal and external auditing in other studies, e.g. Simon et al. (2011) and Kraus & Grosskopf (2008), was also ISO 19011. Studies by Simon et al. (2014) and Karapetrovic et al. (2006) had different results. Their percentage for ISO 19011 was lower than the percentage for the answer "another guideline".

The frequency of conducting internal and external audits was the same range that Karapetrovic et al. (2006), Casadesus et al. (2008), Simon et al. (2014) and Durdevic (2014) presented in their studies.

Significant results connected to the auditing outcomes were that the majority of Serbian organizations performed their internal and external audits to obtain "nonconformities" and "opportunities to improve integration of systems". Simon et al. (2014) and Karapetrovic et al. (2006) had different results. The most reported answer was that audits "only detect nonconformities", while a high percentage of "opportunities to improve integration of systems" was reported by Bernardo et al. (2011) and Simon et al. (2011). Durdevic (2014) reported a high percentage of "detecting nonconformities".

Internal and external audits are mostly done at the same time for all standards. These results are in line with Simon et al. (2014), Bernardo et al. (2011), Karapetrovic et al. (2006) and Simon et al. (2011).

A high extent of integration for audit teams was present for internal auditors. However, a high percentage of different internal auditing teams for different standards was presented by Simon et al. (2014), Karapetrovic et al. (2006), Bernardo et al. (2011), Douglas and Glen (2000), Bernardo et al. (2010), Casadesus et al. (2008) and Karapetrovic et al. (2010). Furthermore, external auditors mostly used different teams for different standards, which is in line with Bernardo et al. (2010), Simon et al. (2011), Simon et al. (2014), Karapetrovic et al. (2010) and Karapetrovic et al. (2006).

Serbian organizations showed that a high level of integration for audit plans was present for internal audits, while for external audits it was lower. Similar results were obtained by Simon et al. (2014), Karapetrovic et al. (2006), Karapetrovic et al. (2010), Bernardo et al. (2011), Karapetrovic et al. (2010) and Simon et al. (2011). However, Simon et al. (2014), Karapetrovic et al. (2010), Casadesus et al. (2008) and Karapetrovic et al. (2006) reported different results when it comes to external audits. They found that external audit plans were much more integrated.

The majority of internal audits integrated their audit reports, while external audits used different reports for different standards. These outcomes were also found by Simon et al. (2014), Karapetrovic et al. (2006), Bernardo et al. (2011), Simon et al. (2014) and Bernardo et al. (2010).

Serbian organizations reported that audit systems were integrated to a high extent. This finding is in a line with studies by Simon et al. (2014) and Karapetrovic et al. (2006).

6.3. Customer satisfaction standards

Serbian organizations did not express a high knowledge of augmentative standards. Only 12% of organizations were using ISO 10002 and ISO 10004 (Karapetrovic & Spasojevic-Brkic, 2014). Moreover, 42% of Serbian organizations used ISO 19011, followed by 18% for ISO 10005 and 12% for ISO 14031 (Karapetrovic & Spasojevic-Brkic, 2014). Serbian organizations were mostly familiar with ISO 19011 and ISO 14031 as augmentative standards and ISO 10004 and ISO 10001 as CSSs. Furthermore, there was a high percentage of organizations that were not familiar with

CSSs, in line with previous studies (e.g. Karapetrovic et al., 2006 and Salerno-Kochan & Salerno-Kochan, 2015).

50% of organizations implemented CSSs at the same time as ISO 9001, while 57% implemented CSSs at the same time as ISO 14001. A further 67% implemented CSSs after a third standard was in place.

88% of the organizations used ISO 19011 as the standard for auditing CSSs. Audits were completed as a part of the IMS in 36% of the organizations, as a part of the QMS in 29% of organizations, and as a part of the EMS in 21% of organizations, while 14% of organizations are “conducting CSS audits independently from the internal audits of other systems”.

The “lack of human resources” and the “lack of financial resources” were reported as the major reasons for not having augmentative standards. This is in line with Salerno-Kochan & Salerno-Kochan (2015) and Karapetrovic & Spasojevic-Brkic (2014), but differs from Nowicki et al. (2014). Nowicki et al. (2014) found that the main reason for not having CSSs was the “[...] *cost of implementation and lack of time to prepare [...] and then maintain [them]*”.

Comparisons between organizations that had CSSs and organizations that did not show that CSS organizations gain more benefits regarding customer satisfaction have more integrated audit plans and conduct quality and environmental audits at the same time.

6.4. Contributions

Comparing to the studies done by the Auditing and Integration Management Systems Lab (Spain 2006, Spain 2010 and Canada 2012) and others found in literature, this study contributes to the following aspects:

- This is the first study which examines augmentative standards for auditing and customer satisfaction that was done in Serbia
- It examined the topic of augmentative standards (e.g. order of implementation, how audits are performed and reasons of not having the standards) deeper than previous studies.

- It analyzes integration and auditing topics with respect to the organization size (e.g. small, medium and large), which the other studies did not do.
- Related to the topic of integration and auditing, this study also compared different industry sectors (e.g. manufacturing, services and other), which the other studies lack.
- Related to customer benefits and internal audits, this study compared organizations that had CSSs and organizations that did not, which was not done in other studies.
- This study could be used by industry associations (e.g. “Chambers of Commerce and Industry of Serbia”) for future reference regarding integration, auditing and CSSs. For example, with respect to integration, they could see how organizations integrated their processes and documents.
- It could also be used by different organizations which have implemented MSSs. For example, seeing results from the benefits of having CSSs, organizations could become curious to know more about these standards and maybe implement them in the future.

6.5.Limitations

The limitations of this study were as follows:

- Only 50 organizations participated in the survey. This affected the possibility to perform advanced statistical testing and to have a better sample to depict the situation in Serbia.
- The research was conducted in one country only.
- Most of the organizations did not answer questions regarding augmentative standards.
- The sample had a small number of organizations which have implemented customer satisfaction standards.
- The following limitation was the same as in Bernardo et al. (2010): “*The questionnaire was sent to the managers of the registered organizations only and not to the registrars who undertook external audits of those organizations*”.

6.6.Future research

Future research could be done by using the same survey within another country or by repeating the survey in Serbia. Furthermore, it could consider a larger sample size of the organizations. Moreover, since this is an empirical study, there is a possibility to compare the development of integration and auditing in Serbia and Spain.

Serbian organizations answered (see Appendix F) to have interest for future implementation of standards connected to specific areas (e.g. social responsibility, occupational health and safety, complaint handling and measurement models). Therefore, one possible future research could be to investigate in the same organizations that participated in this survey if they implemented these standards. One of the future research objectives could be the implementation of CSSs in organizations who emphasized that they are planning to have CSSs.

Another idea is stated by Simon et al. (2011) that for the examination of external auditing, registrars could be included in answering the questionnaire.

Finally, future research could focus on the examination of the implementation of augmentative standards.

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A. Appendix

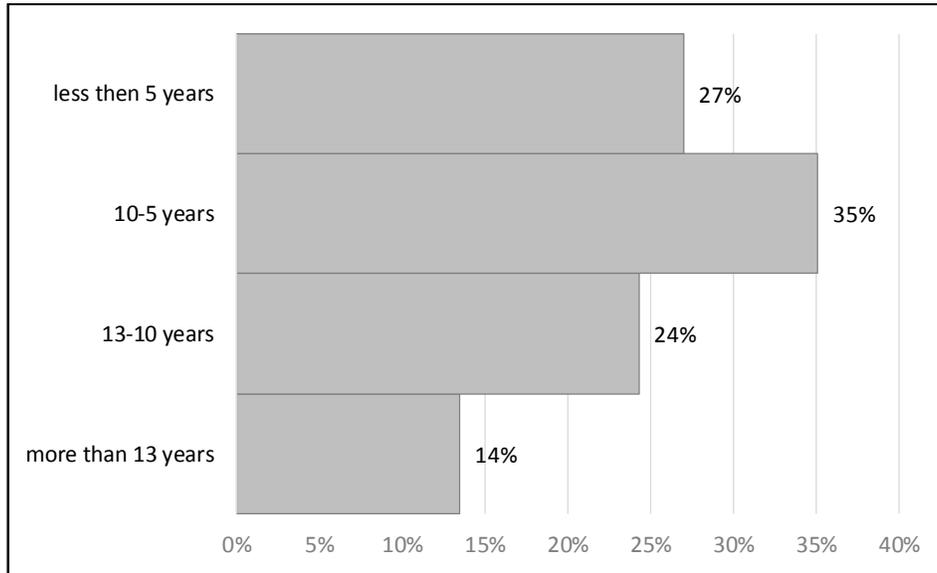


Figure A-1: Time when the first standard implemented

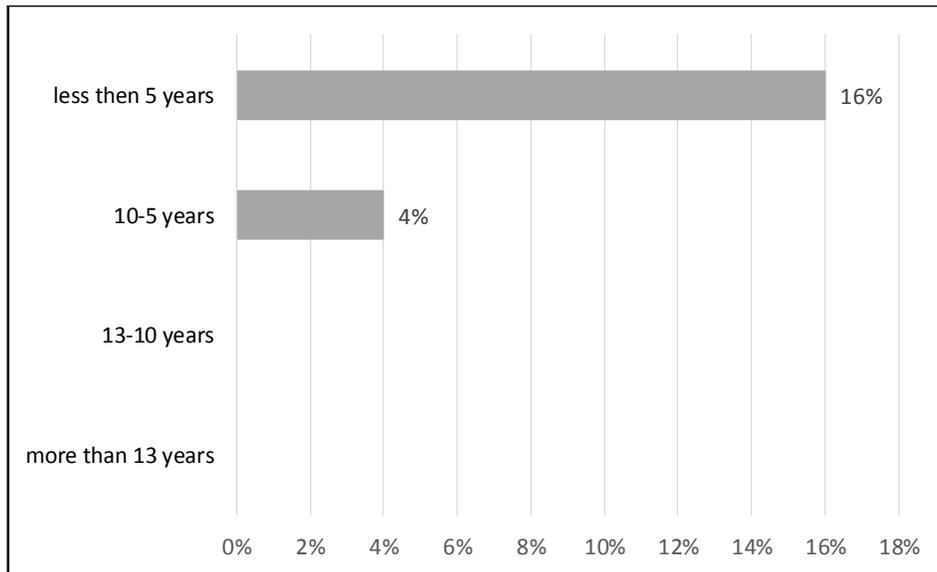


Figure A-2: Time when the multiple standards implemented

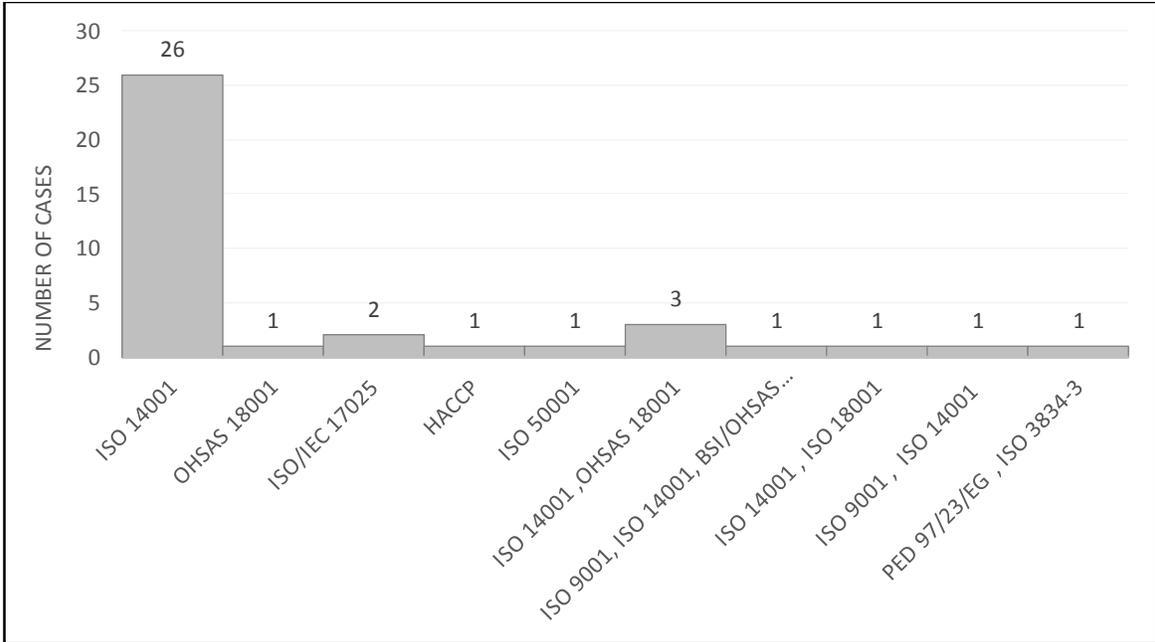


Figure.A-3: The second implemented standard

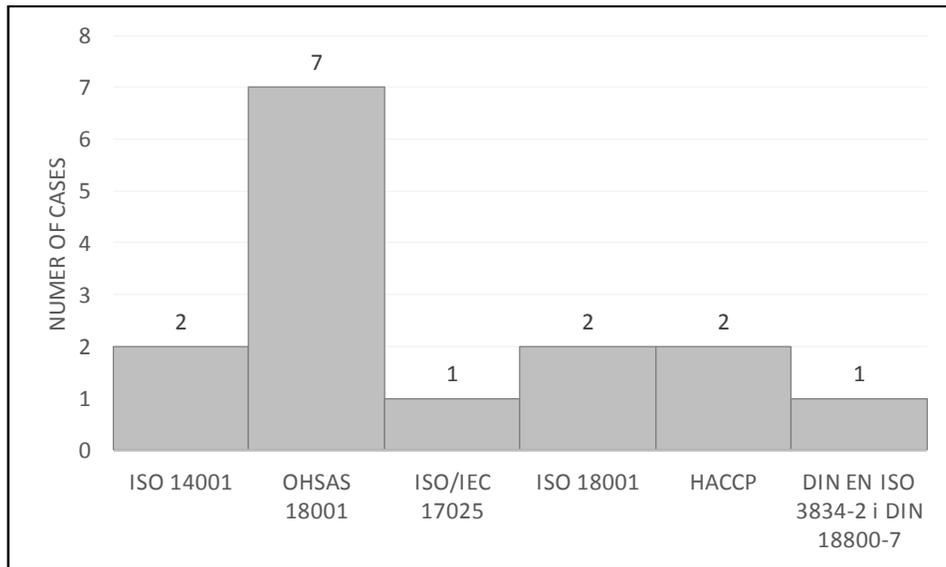


Figure A-4: The third implemented standard

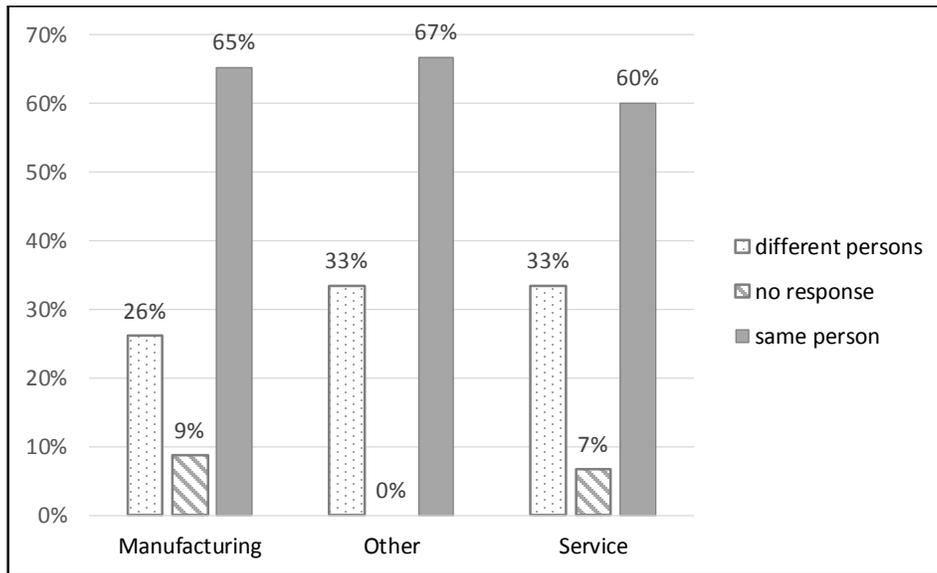


Figure A-5: Integration of management system representative as a function of the industry sector

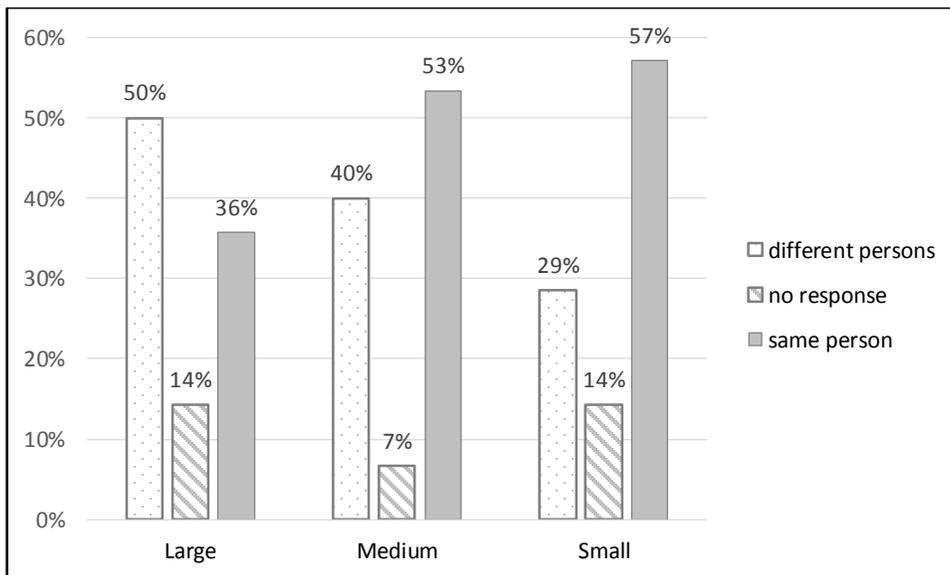


Figure A-6: Integration of management system managers as a function of the organization size

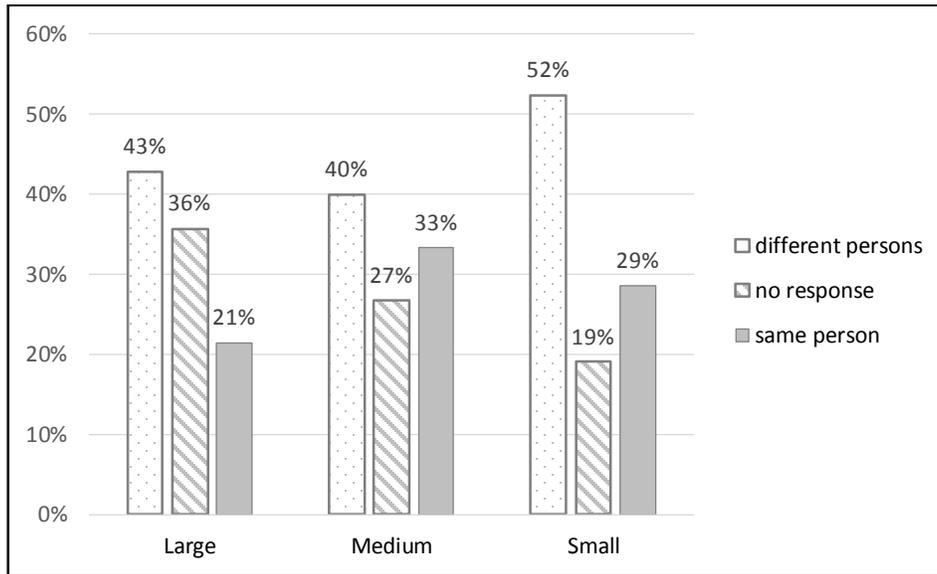


Figure A-7: Integration of management system inspector as a function of the organization size

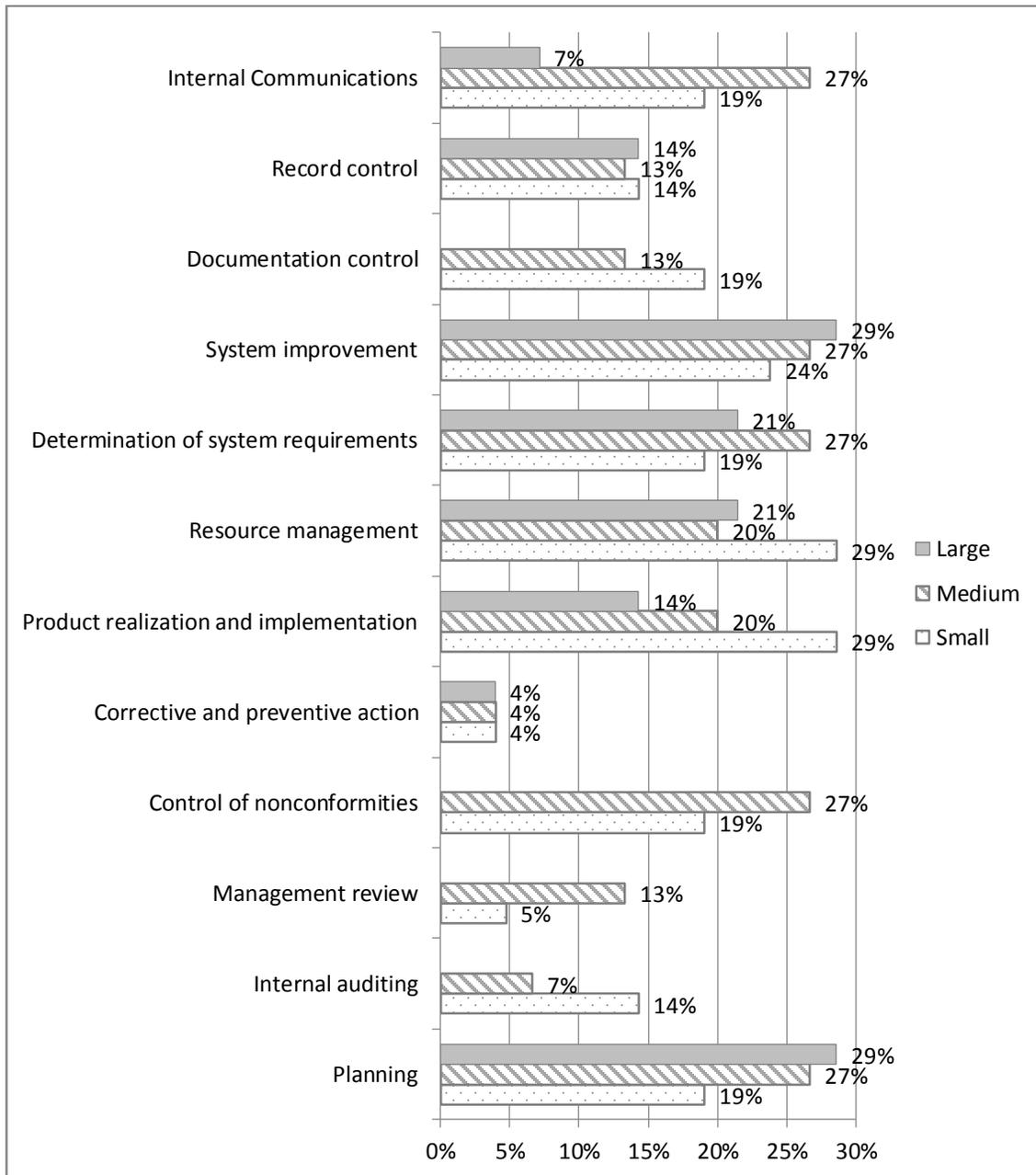


Figure A-7: Partially level of integration of processes as a function of the organization size

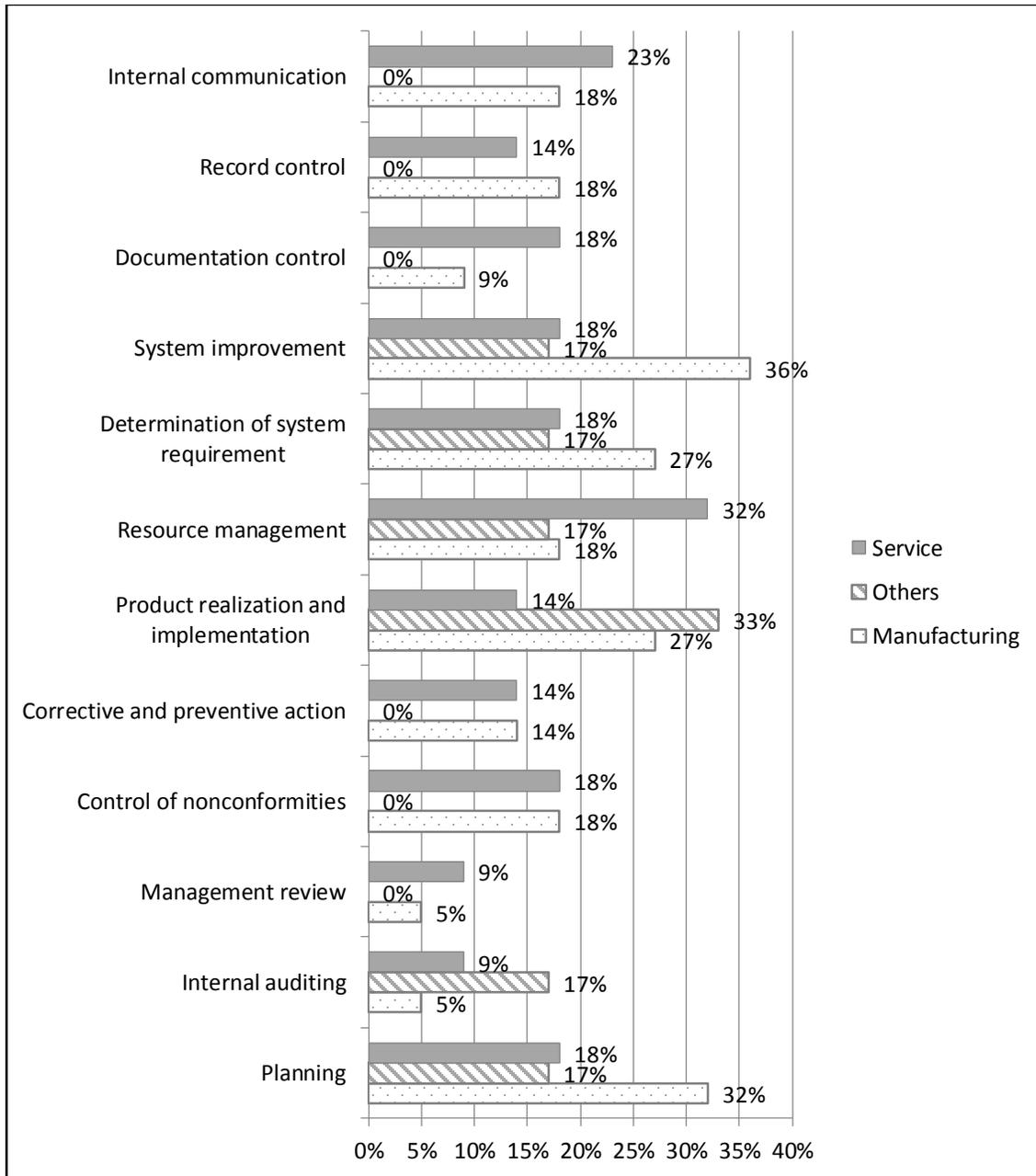


Figure A-8: Partially level of integration of processes as a function of the organization sector

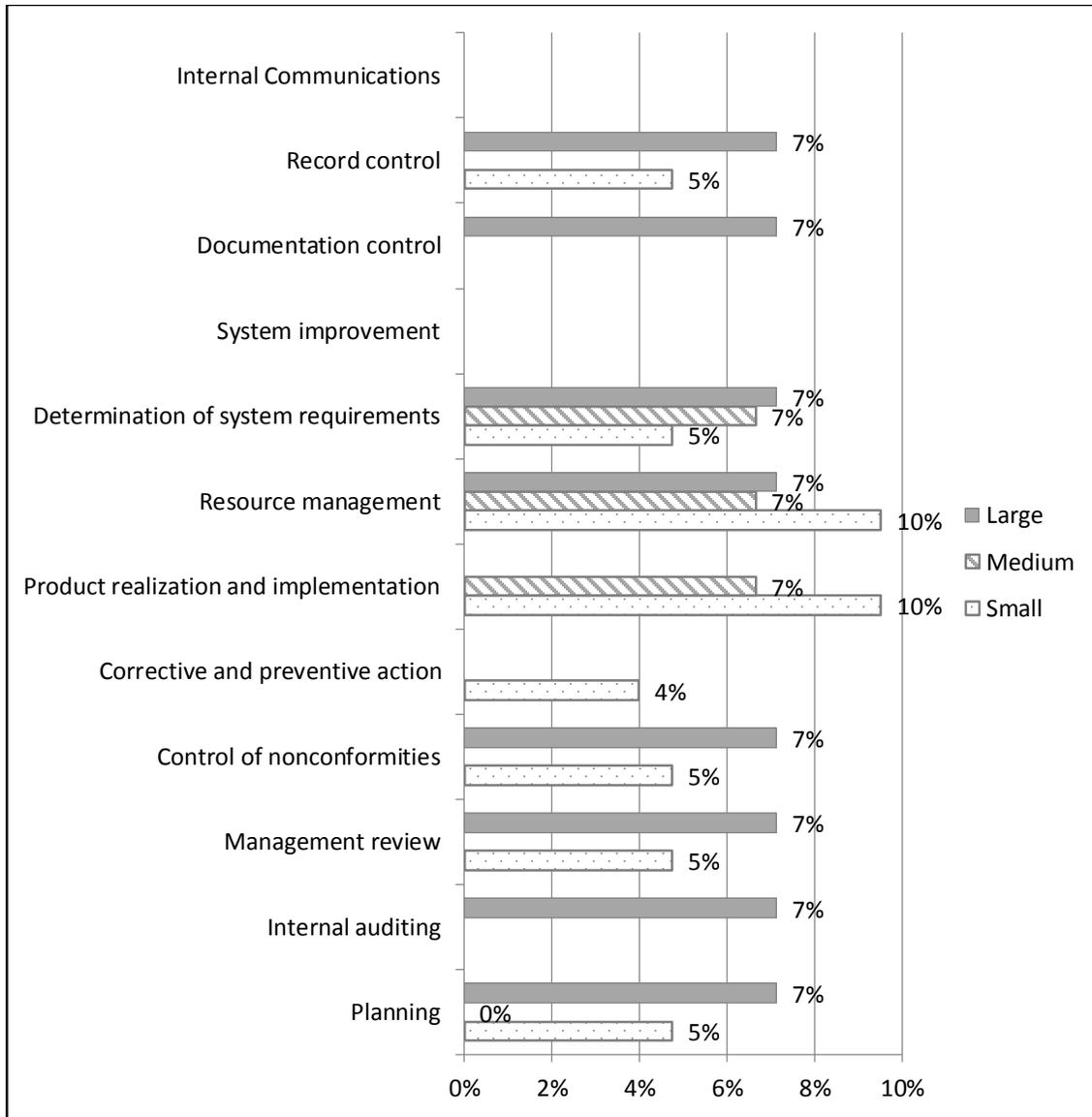


Figure A-9: No integration level of integration of processes as a function of the organization size

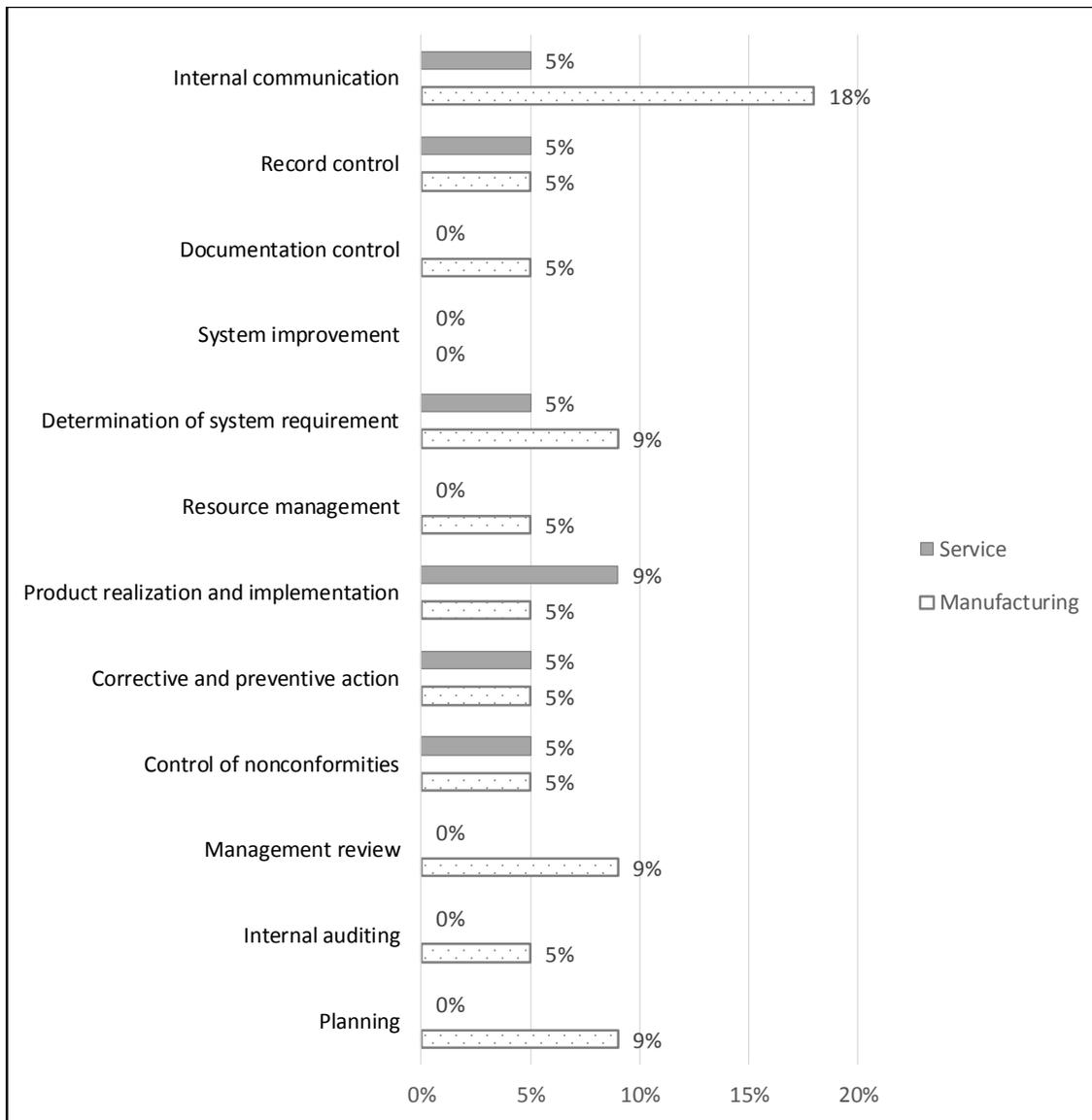


Figure A-10: No integration level of integration of processes as a function of the organization sector

B. Appendix

Figures Figure B.1 and Figure B.2, Appendix B, show results regarding the same question based on size and industry sector of organizations, taking in account internal audits. Small organizations had the highest percentage (71%) of integration with respect to audit time. Moreover, in the case of both medium and large organizations half of organizations from each group conducted their audits “at the same time for all standards”. These results are likely to happen because small organizations had their teams integrated with the highest percentage, and integrated teams would do audits at the same time for all standards. Internal auditing was conducted “as same time for all standards” for 70% of the manufacturing sector. More than half of organizations had integrated audit time in “other” industry sector.

Similar information was obtained for the external audits. The highest amount of integration of time operating external audits regarding was present mostly in small (71%) organizations. Large (64%) organizations recorded high percentage of collecting the audit at the same time for all standards, whereas for the medium (40%) organizations that percentage was much lower. Furthermore, there is no significant difference between three industry sectors, all around 50% of organizations performed audits at the same time, while the manufacturing industry reported it as the highest (70%), (Figure B.3 and Figure B.4, Appendix B).

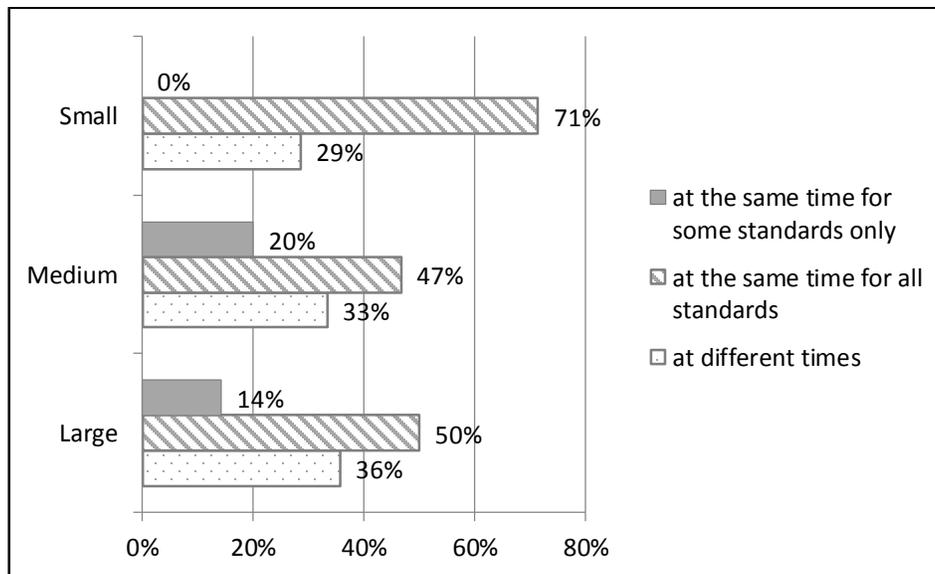


Figure B-1: Simultaneous audits regarding the organization size for internal auditing

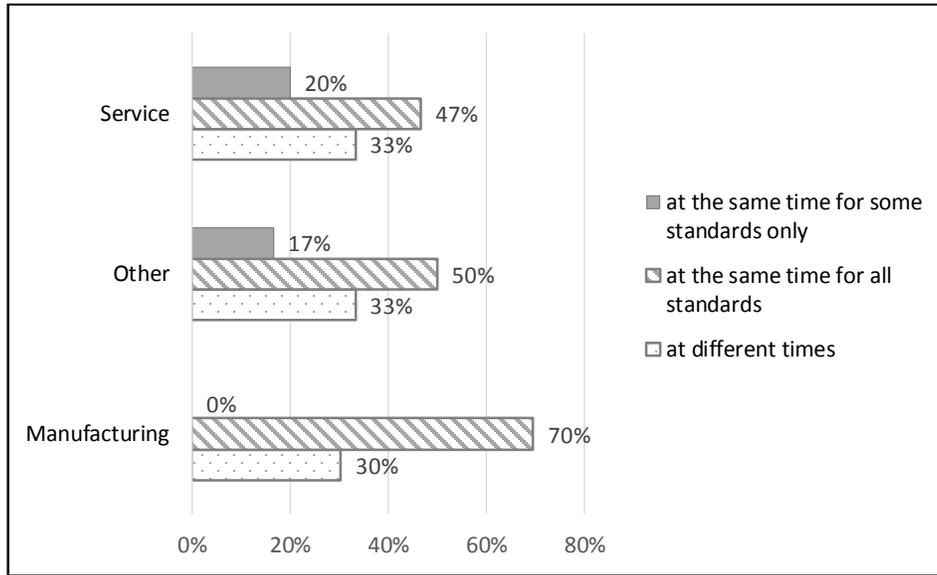


Figure B-2: Simultaneous audits regarding the organization sector for internal auditing

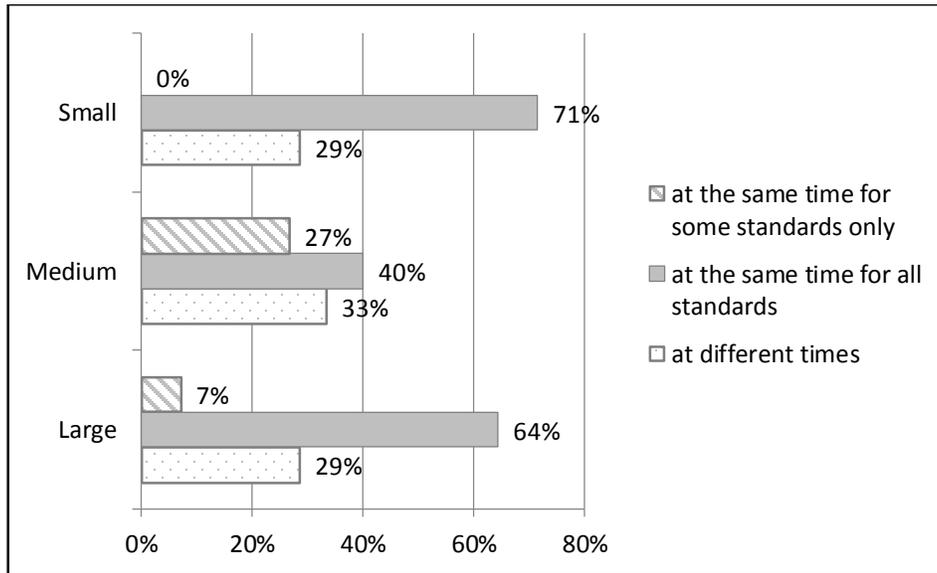


Figure B-3: Simultaneous audits regarding the organization size for external auditing

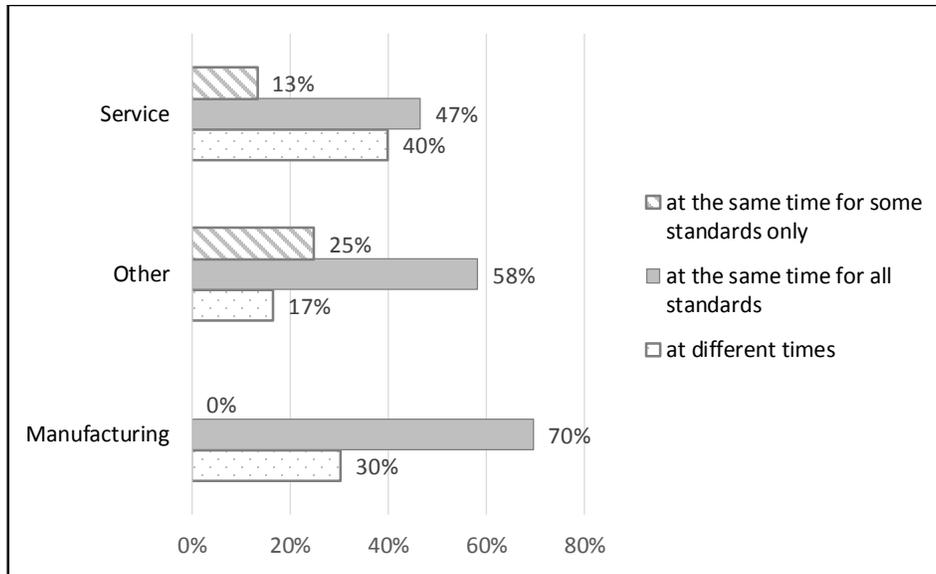


Figure B-4: Simultaneous audits regarding the organization sector for external auditing

In the case of internal audits (Figure B.5. Appendix B), the highest percentage integrated of audits into the system was present in large organizations. Small organizations divided answers between three offered responses, around 30% for each audit objective. In addition, medium organizations showed the highest percentage for integration followed by the interrelated system. Regarding the industry sector, a significant result was reported for the service sector (60%) for integration as a single integrated system (Figure B.6, Appendix B). Manufacturing organizations displayed less than half for having auditing system “as single integrated system”. With respect to the external auditing, small and large organizations illustrated that audit system was integrated in more than half for small and large size organizations (Figure B.7. Appendix B). External auditors for industry sector were integrated mostly in service (60%) and other (58%) industry sectors, whereas manufacturing sector showed the high percentage for “as completely independent systems”, (Figure B.8. Appendix B).

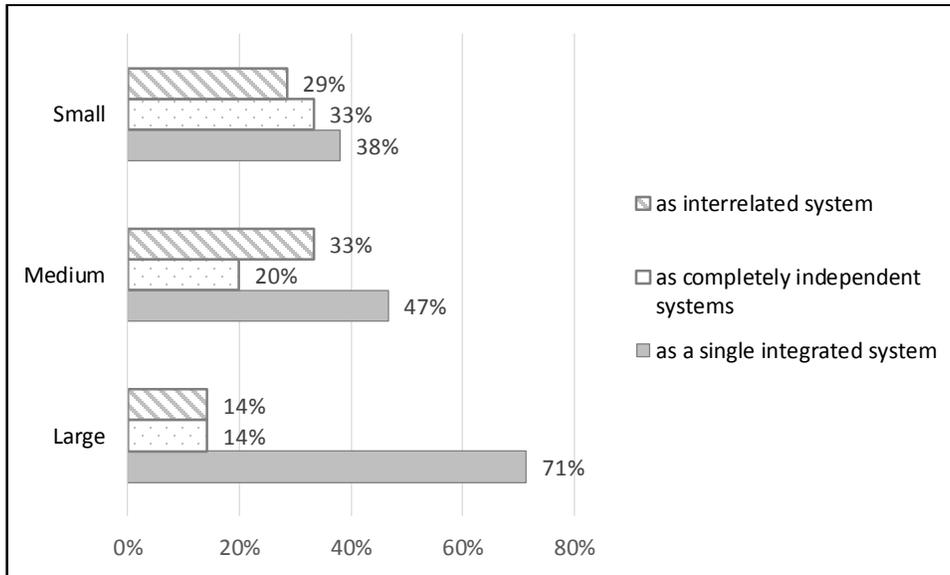


Figure B-5: Integration of audit objectives regarding the organization size for internal audits

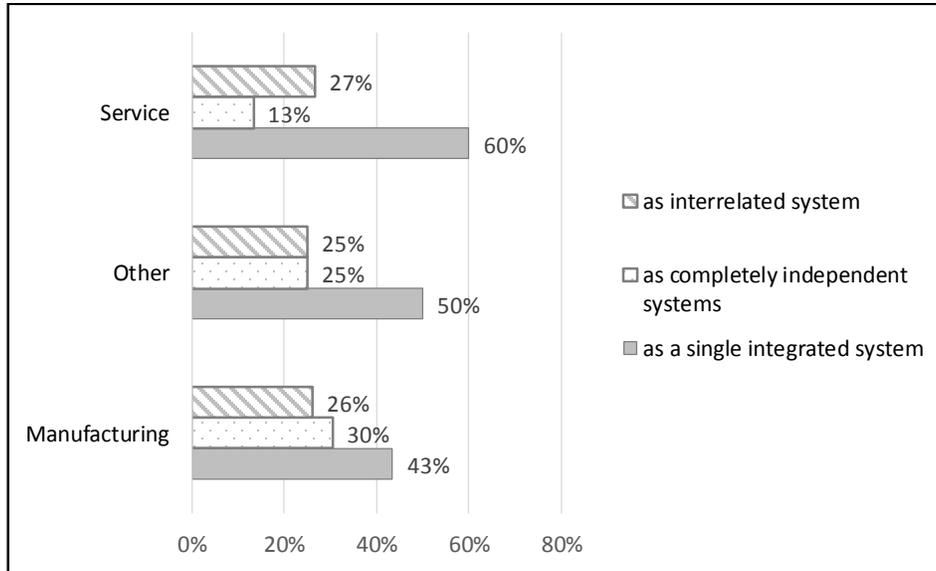


Figure B-6: Integration of audit objectives regarding the organization sector for internal audits

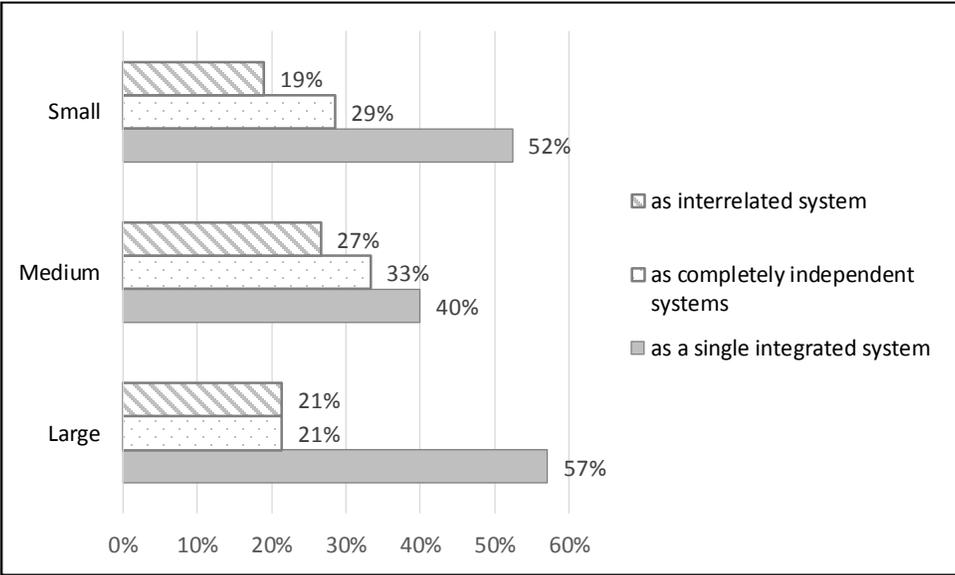


Figure B-7: Integration of audit objectives regarding the organization size for external audits

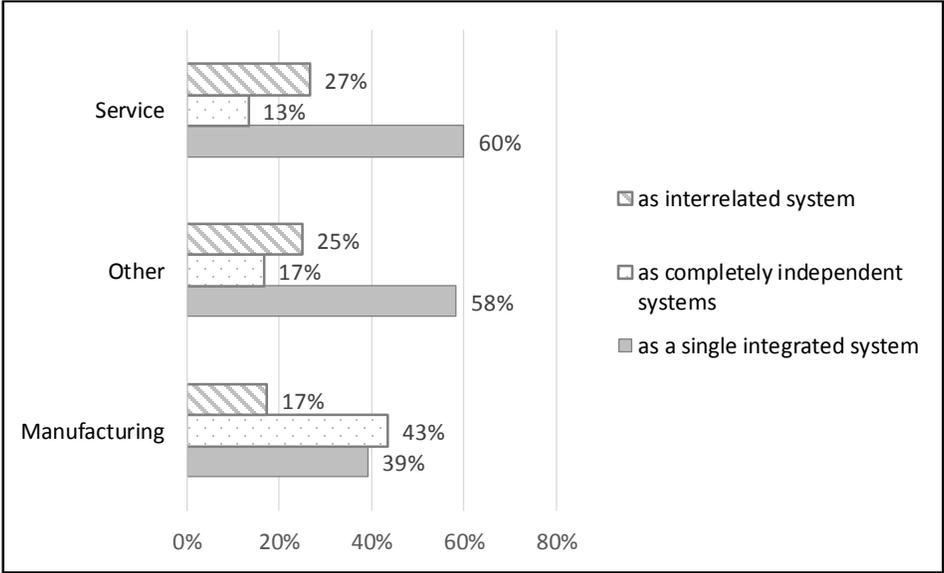


Figure B-8: Integration of audit objectives regarding the organization sector for external audits

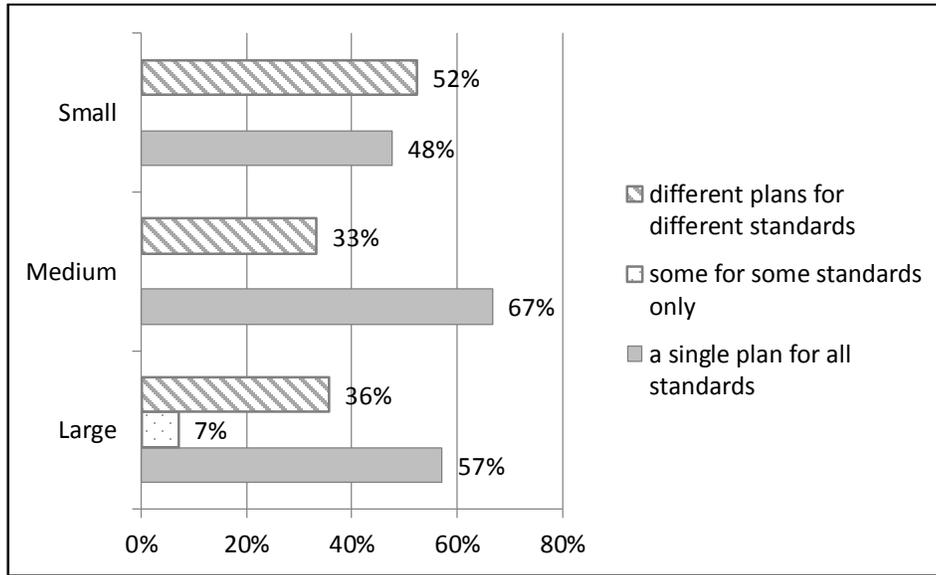


Figure B-9: Integration of audit plans regarding the organization size for internal audits

Most of the large (50%) organizations for the internal audits reported “single plan for all standards”, whereas smaller percentage counted “different plans for different standards” (Figure B.9, Appendix B). With respect to the industry sector, the “other” sector had the highest percentage (67%) “a single plan for all standards” (Figure B.10, Appendix B). The high percentage in the manufacturing industry sector was for “different plans for different standards” (52%). External audits compared with size and sector, stated “a single plan for all standards” in the large and “other” sector, respectively (Figure B.11 and Figure B.12, Appendix B).

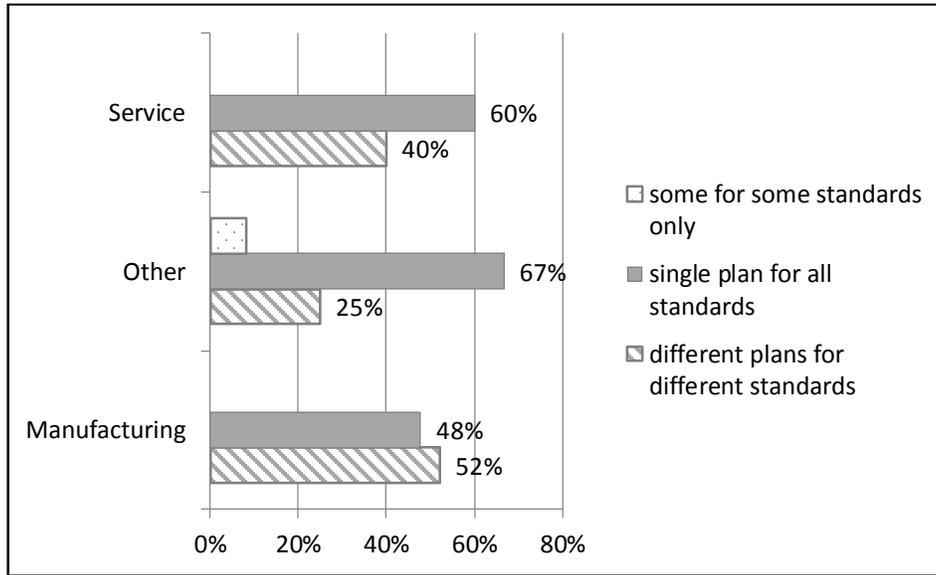


Figure B-10: Integration of audit plans regarding the organization sector for internal audits

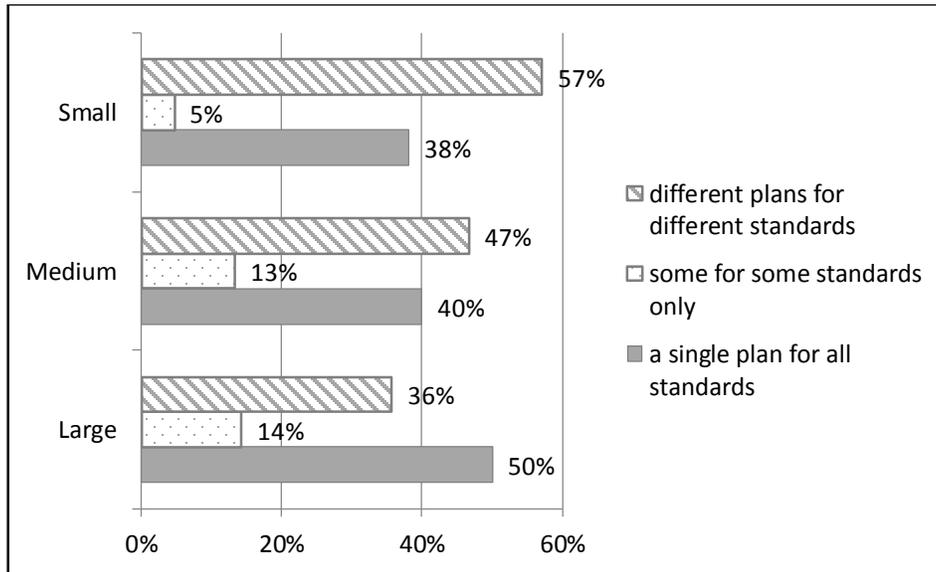


Figure B-11: Integration of audit plans regarding the organization size for external audits

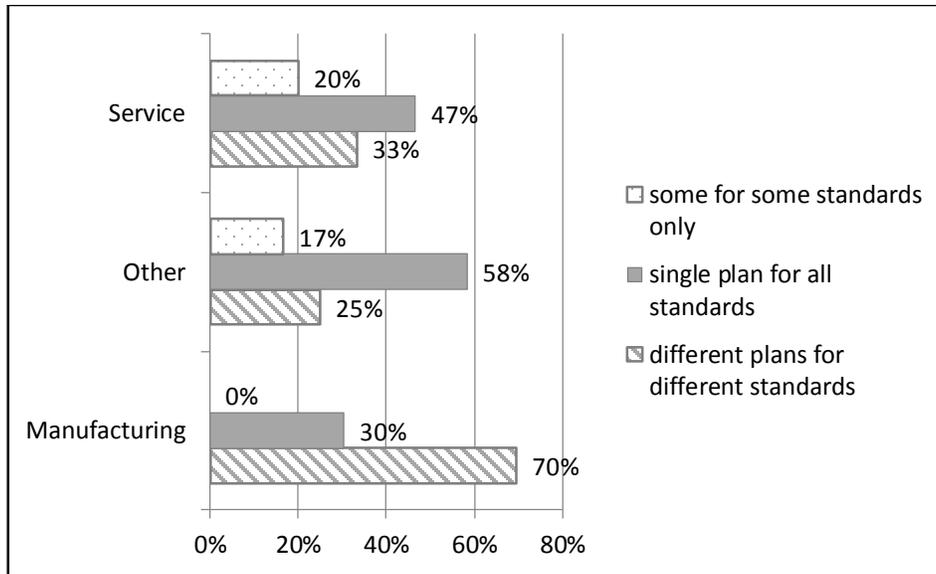


Figure B-12: Integration of audit plans regarding the organization sector for external audits

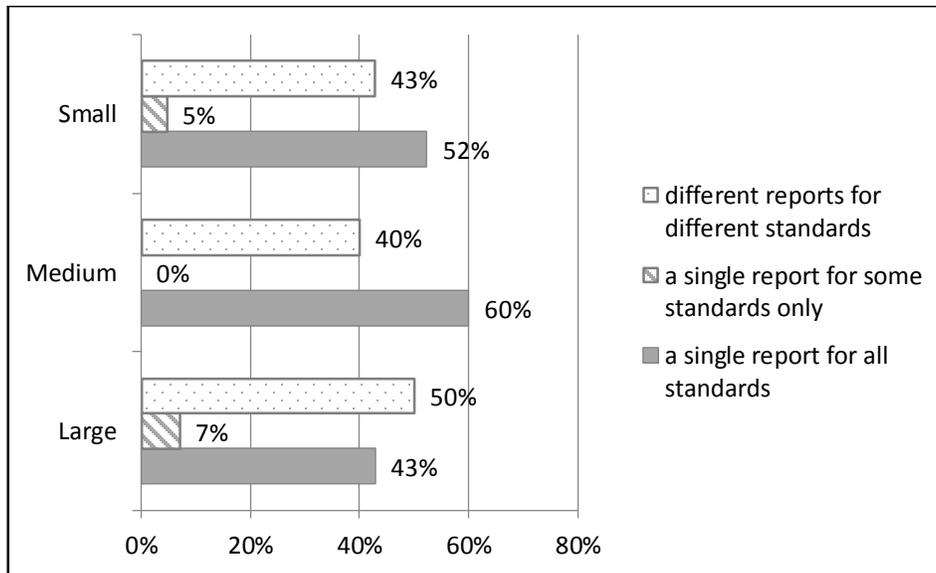


Figure B-13: Integration of audit reports regarding the organization size for internal audits

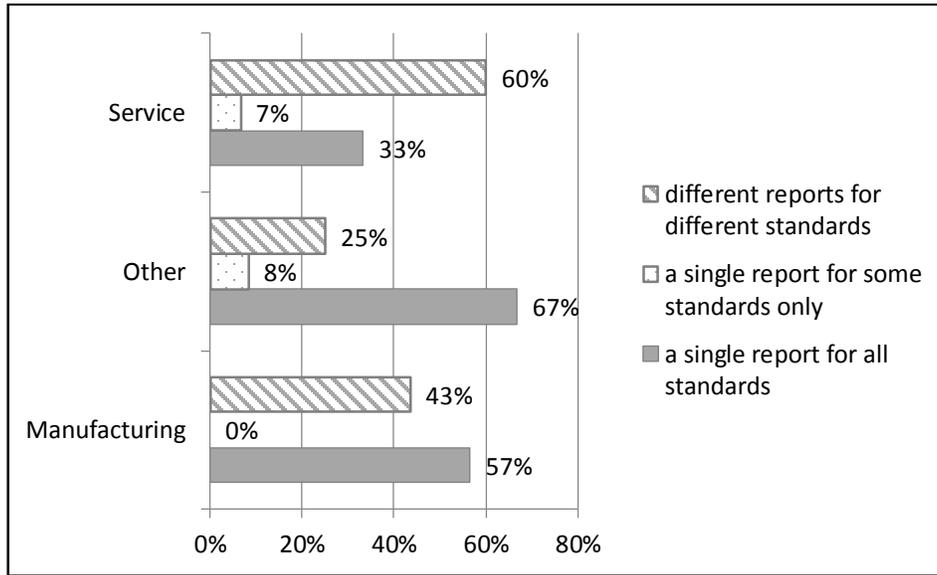


Figure B-14: Integration of audit reports regarding the organization sector for internal audits

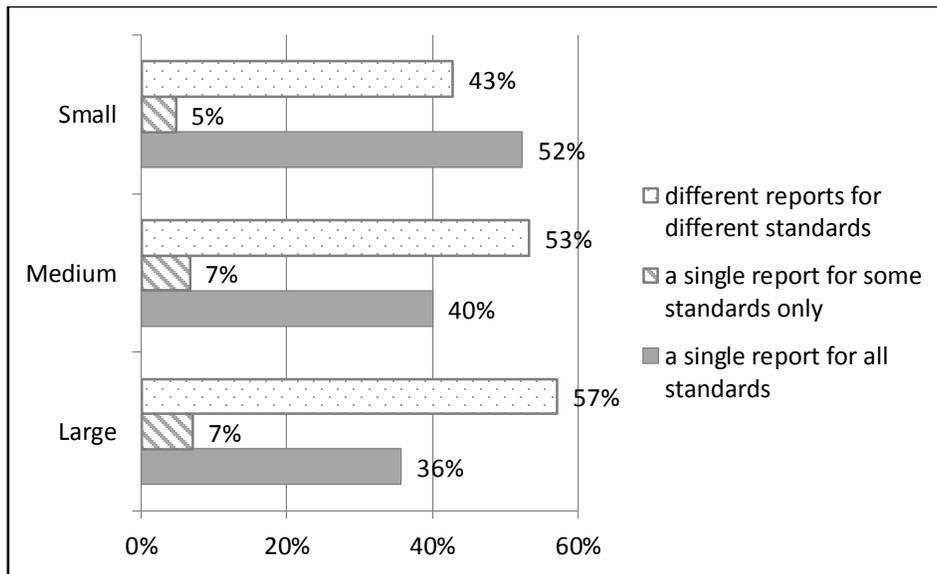


Figure B-15: Integration of audit reports regarding the organization size for external audits

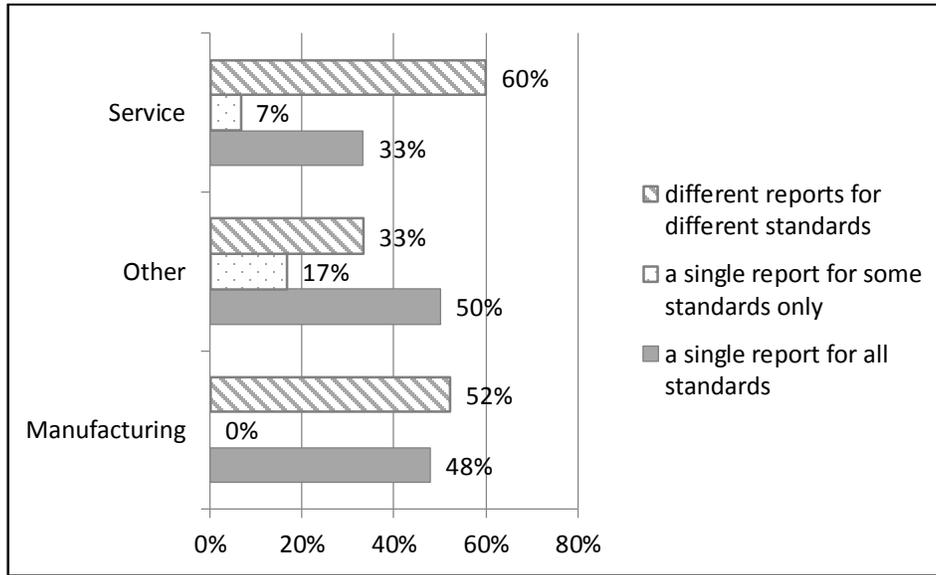


Figure B-16: Integration of audit reports regarding the organization sector for external audits

A high percentage for conducting internal auditing “process by process” was commonly present in all sizes of Serbian organizations. The significant result was that 100% of medium size organizations conduct internal audit “process by process”, (Figure B.17, Appendix B). Around 80% for all industry sectors was used “process by process”, (Figure B.18, Appendix B). More than organizations all three sectors were using the same way (“process by process”) of conducting audits in organizations, Figure B.20, Appendix.

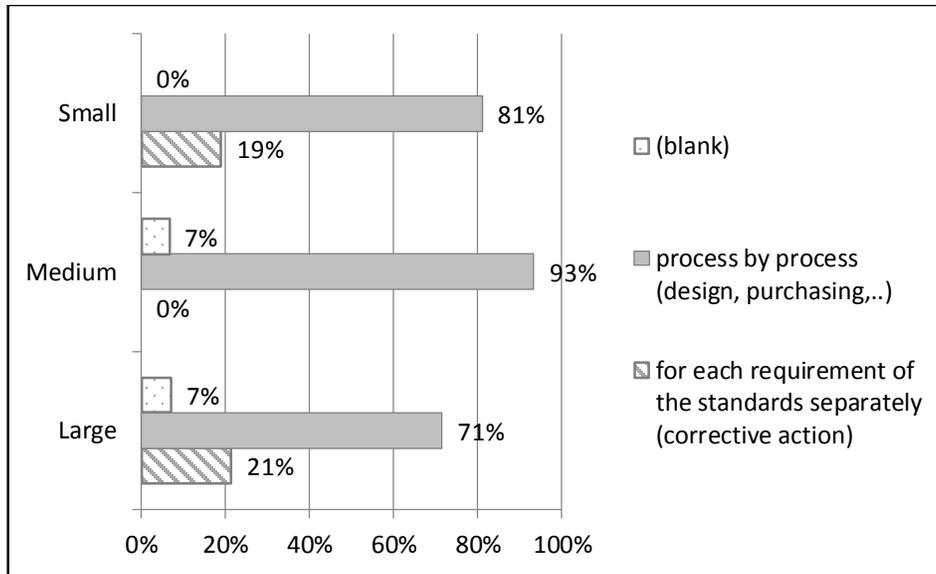


Figure B-17: Auditing focus regarding the organization size for internal audits

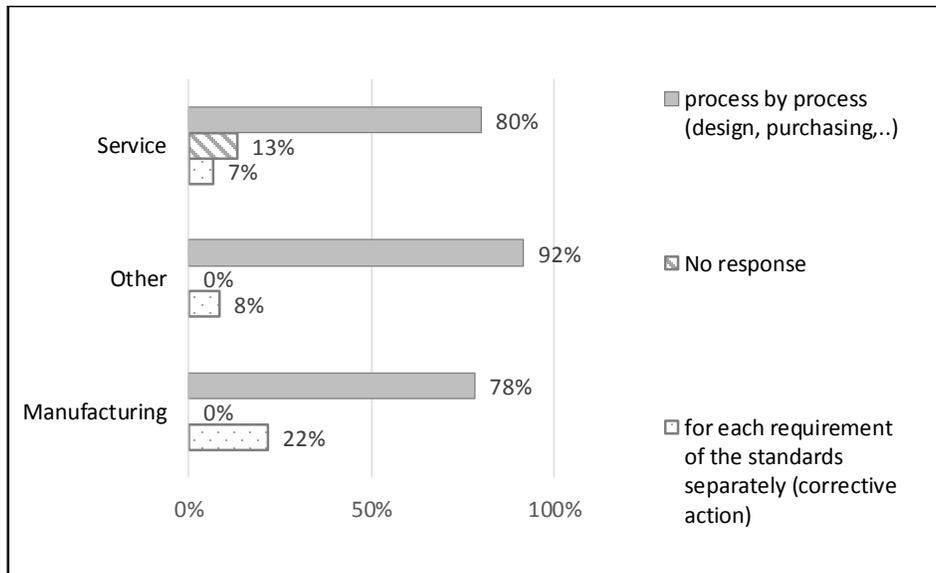


Figure B-18: Auditing focus regarding the organization sector for internal audits

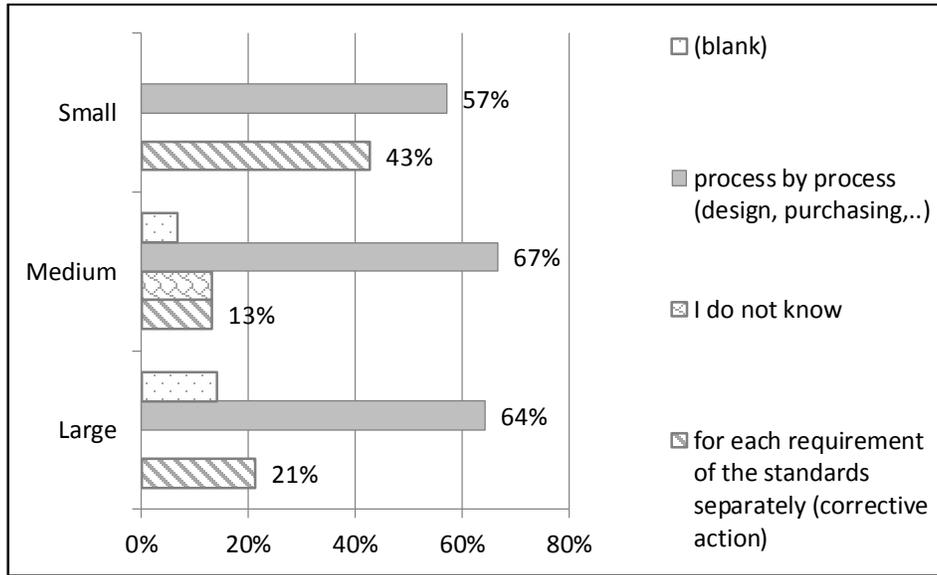


Figure B-19: Auditing focus regarding the organization size for external audits

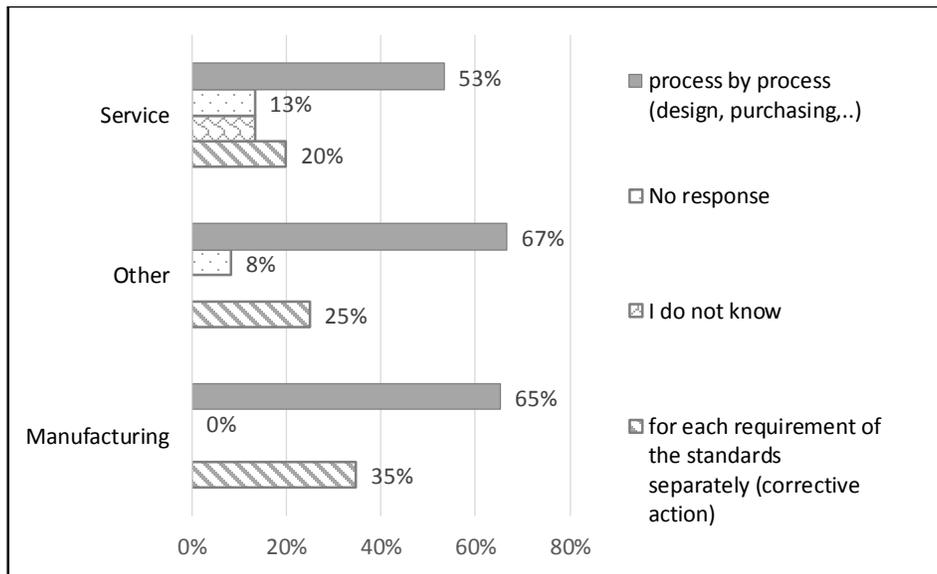


Figure B-20: Auditing focus regarding the organization sector for external audits

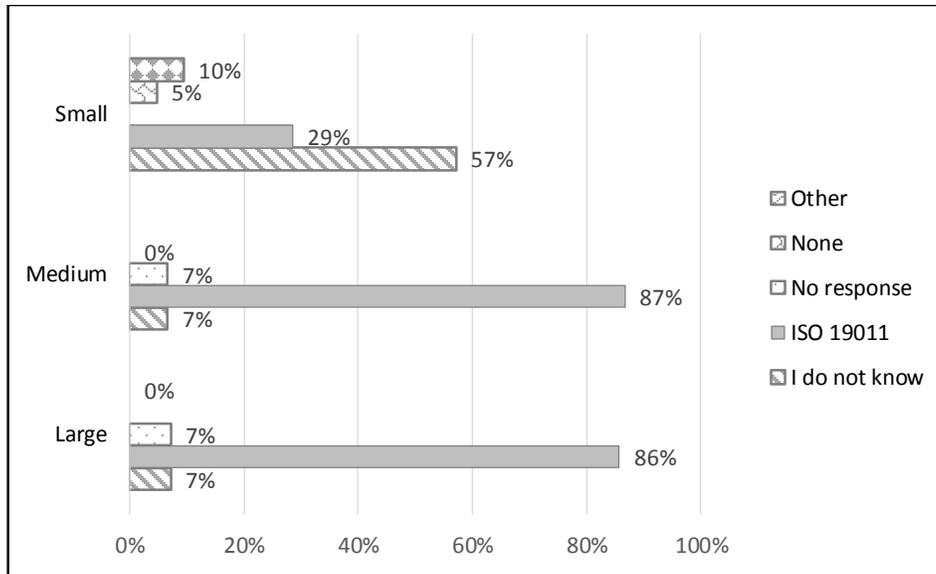


Figure B-21: Guidelines used regarding the organization size for internal audits

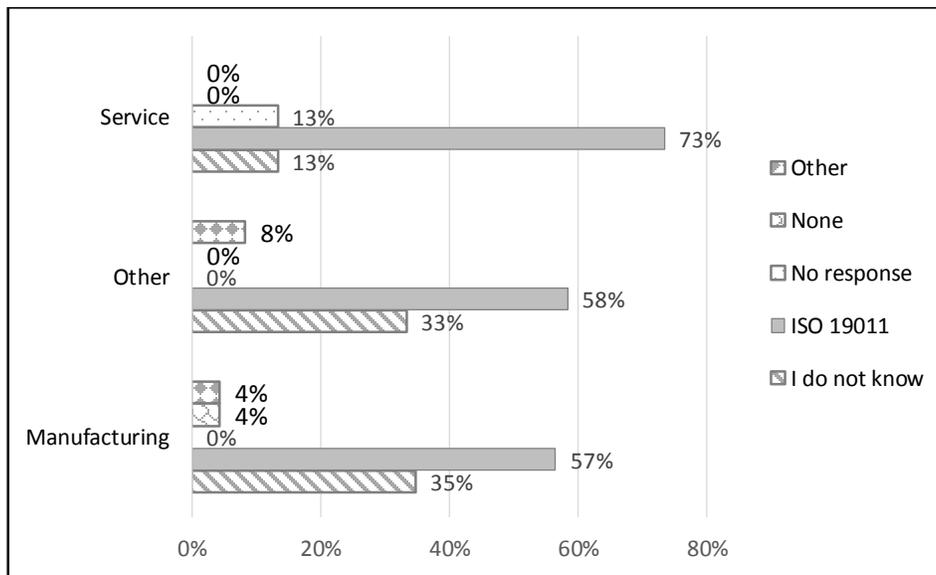


Figure B-22: Guidelines used regarding the organization sector for internal audits

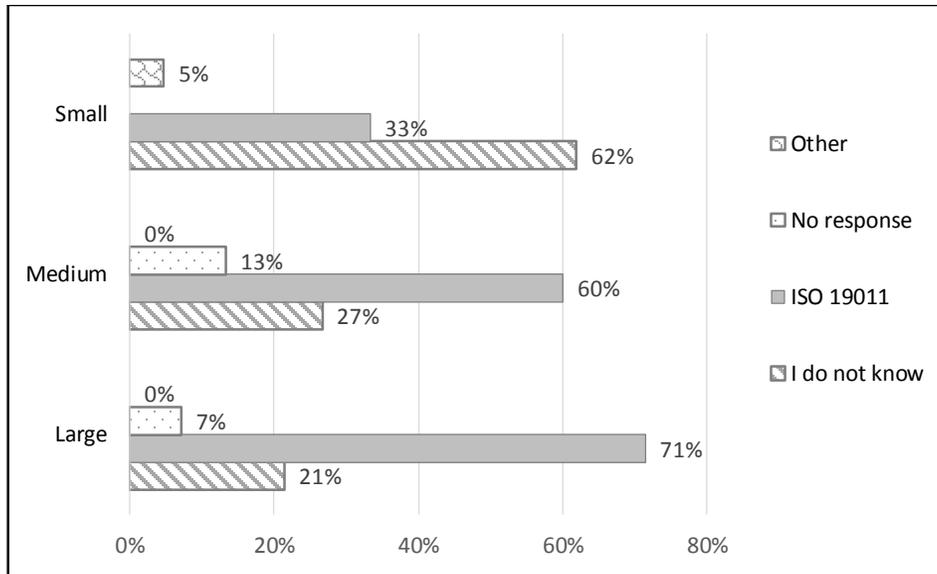


Figure B-23: Guidelines used regarding the organization size for external audits

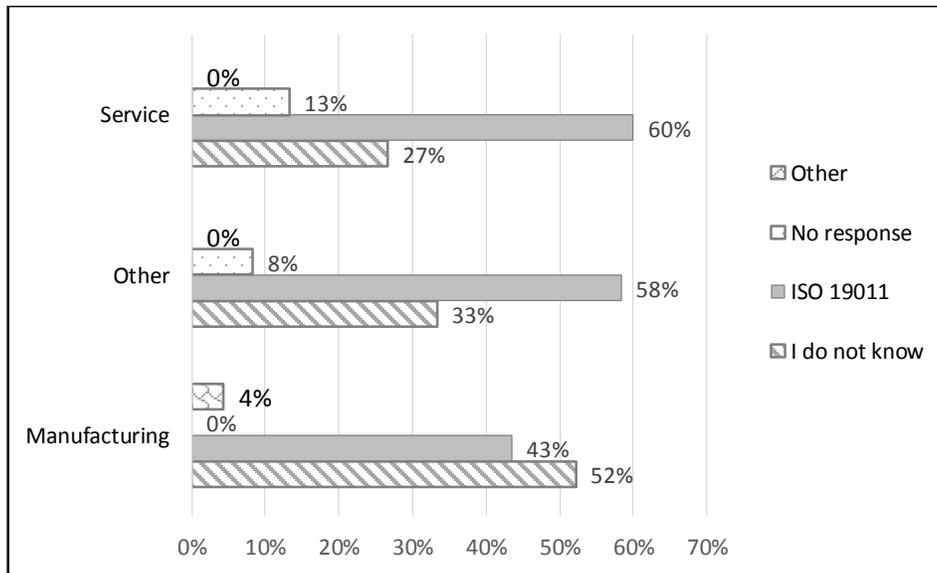


Figure B-24: Guidelines used regarding the organization sector for external audits

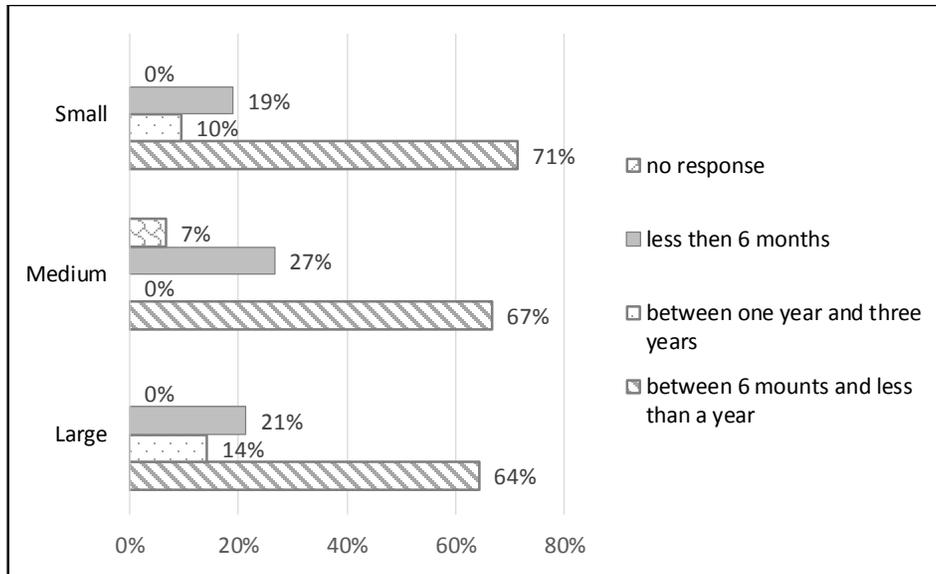


Figure B-25: Auditing frequency regarding the organization size for internal audits

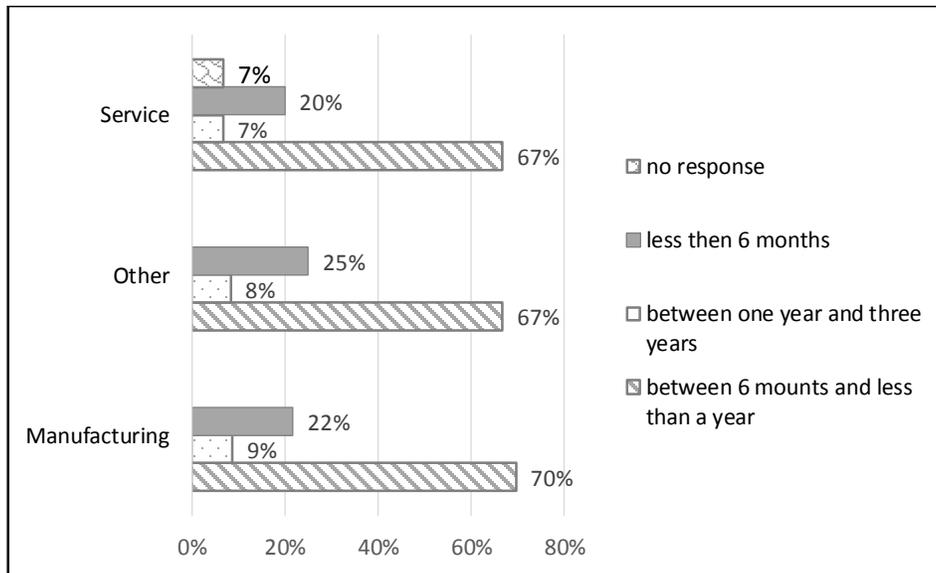


Figure B-26: Auditing frequency regarding the organization sector for internal audits

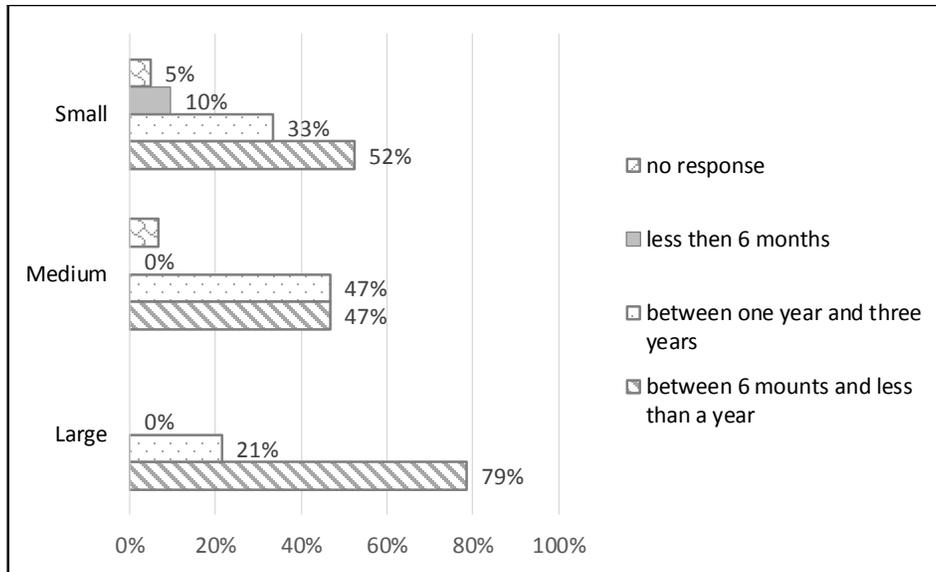


Figure B-27: Auditing frequency regarding the organization size for external audits

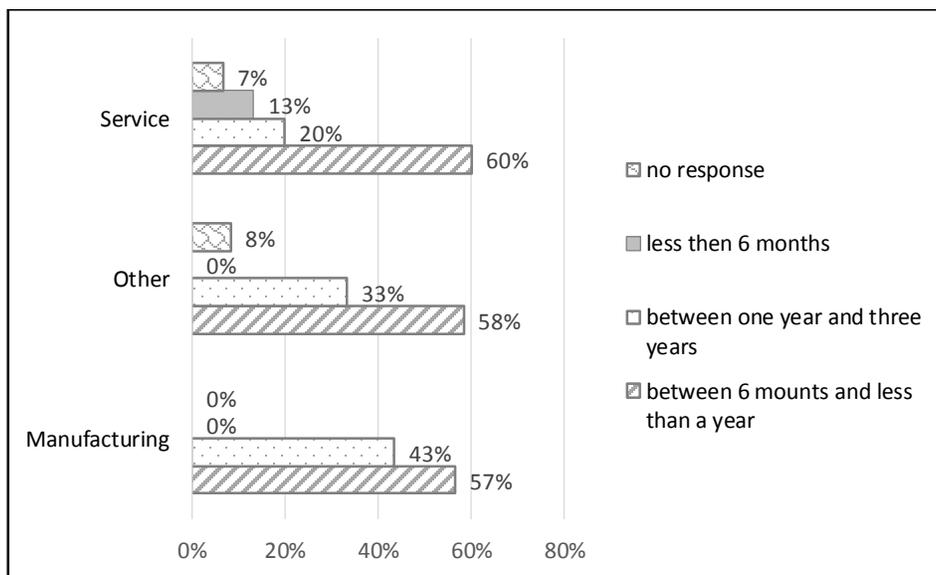


Figure B-28: Auditing frequency regarding the organization sector for external audits

C. Appendix

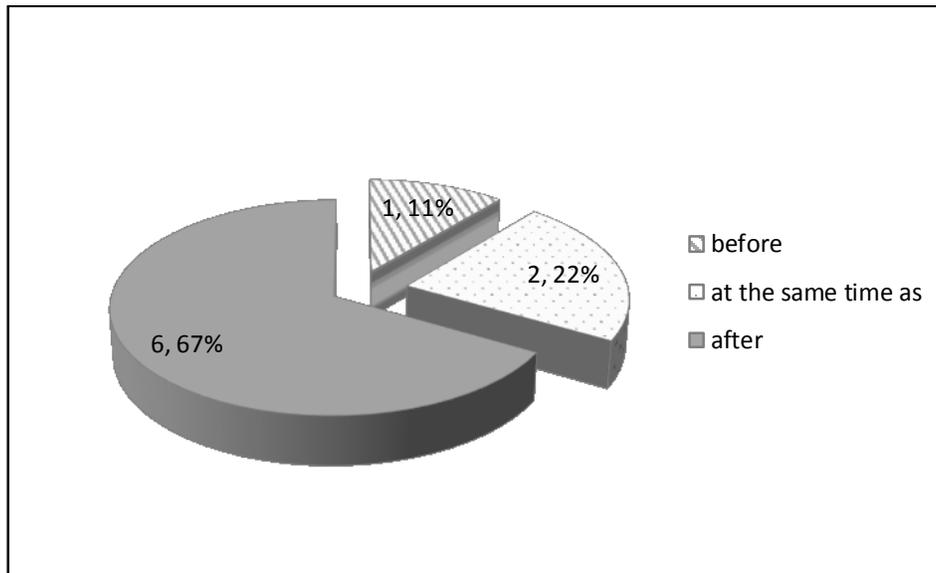


Figure C-1: Implementation of CSS compared with third implemented standard

Regarding question 7.2 (which was answered only if the previously organizations answered that they hold augmentative standards) “relationship between the systems (processes) and augmentative standards” organizations needed to answer if the augmentative standards were part of the “Quality Management System”, Environmental Management System” or “Integrated Management System”. Answer that augmentative standards were part of Quality Management System was presented found by 50% part . However, 50% said that augmentative standard was not part of this system (Figure C.2, Appendix C). The augmentative standard was part of Environmental Management System by 50% organizations whereas 50% answered that they were not part of the particular system (Figure C.3, Appendix C). Lastly, 54% of the organizations answered that augmentative standard was a part of the Integrated management system while 46% answered negatively (Figure C.4, Appendix C). One of the limitations of this study was small sample size regarding the questions for augmentative standards.

Further, question 7.5 of the questionnaire (Appendix E) asked: “how is the internal audit against the augmentative standards conducted”. One of the answers was “the audits is conducted at the same time as the audit of the...” “QMS”, “EMS”,” IMS” and “no other system”. The second

answer was “the audits us conducted by the same people as the audit of the...” “QMS”, “EMS”, “IMS” and “no other system”. Third answer was “the audits us conducted with the same audit plan as the audit of the...” “QMS”, “EMS”, “IMS” and “no other system”. And last, fourth answer was “the audits us conducted with the same audit report as the audit of the ...” “QMS”, “EMS”, “IMS” and “no other system”.

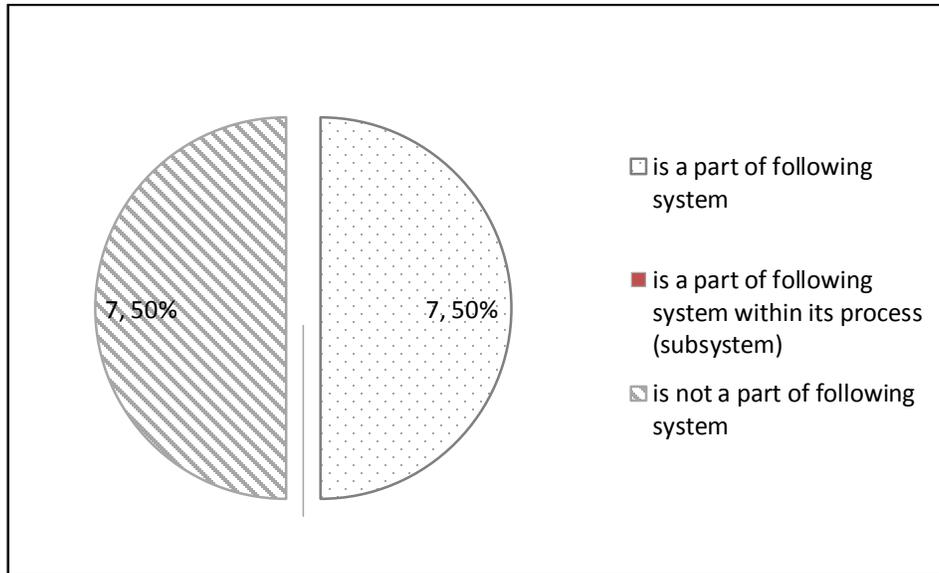


Figure C-2: Relationship between the CSS and QMS

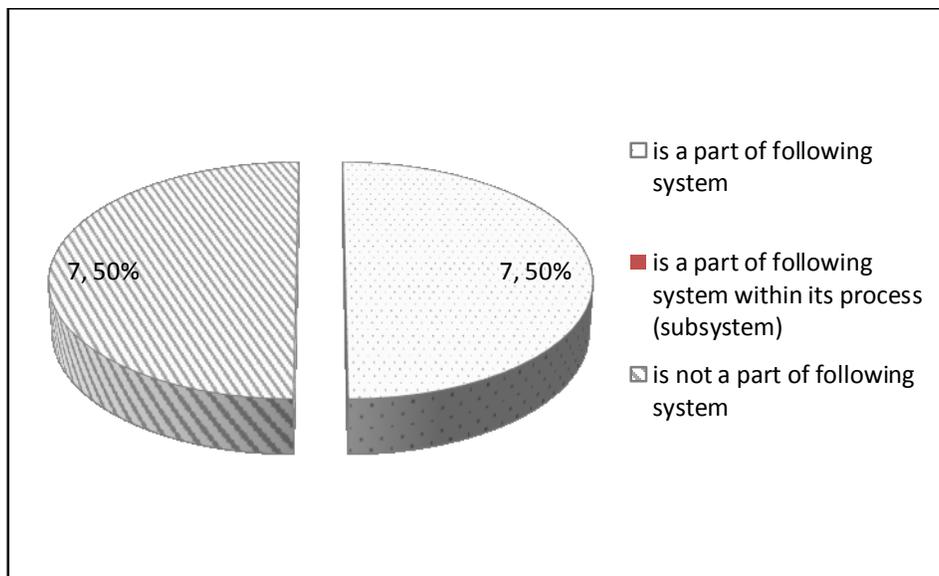


Figure C-3: Relationship between the CSS and EMS

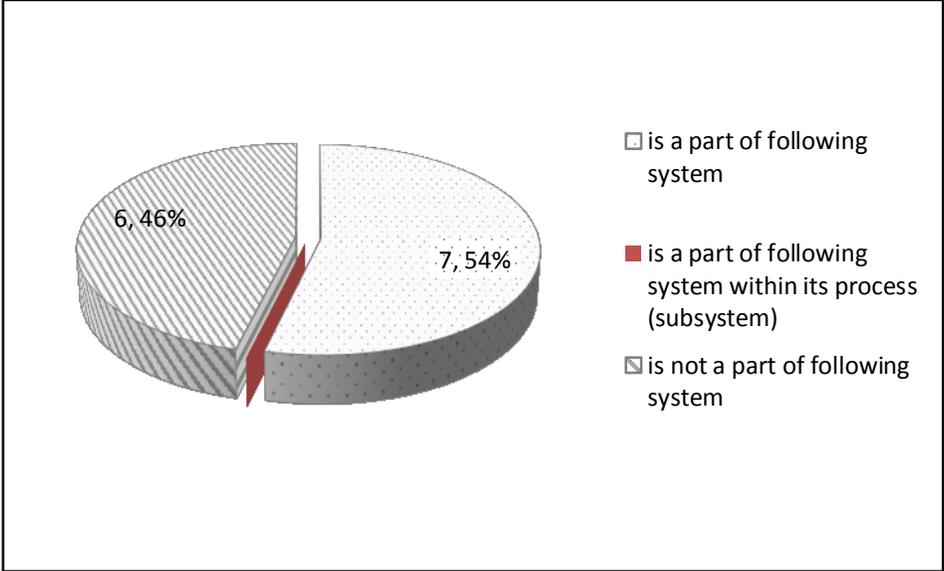


Figure C-4: Relationship between the CSS and IMS

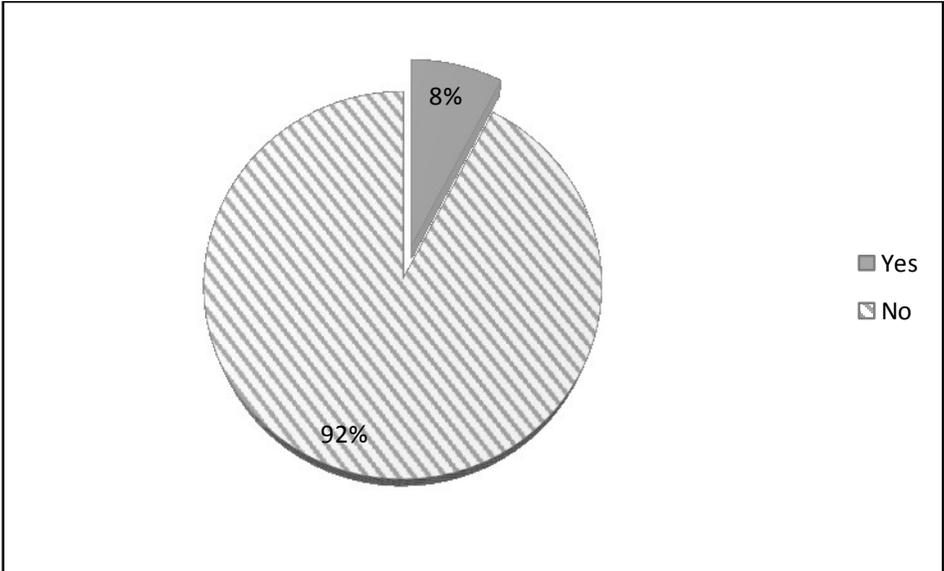


Figure C-5: Conduction of internal audits for CSS

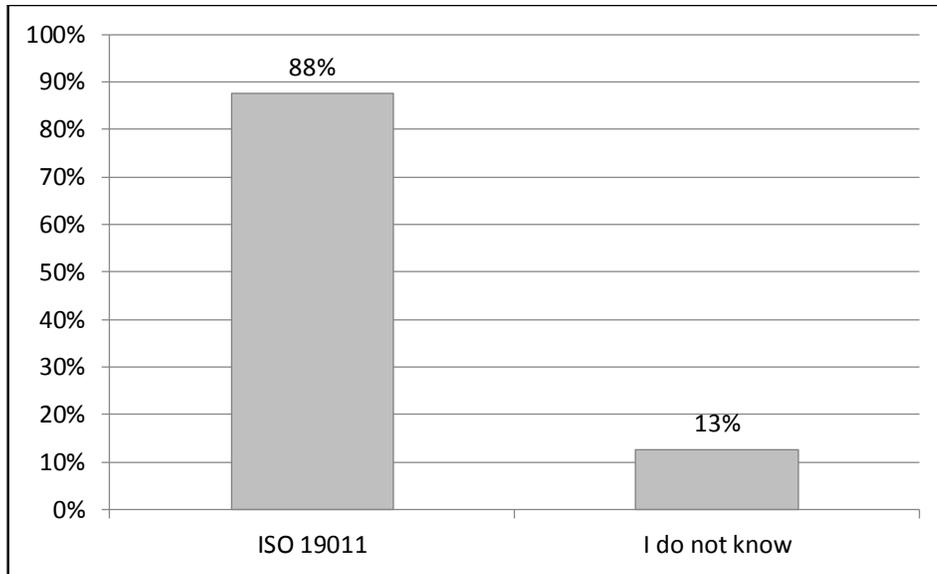


Figure C-6: Guidance for CSS audits

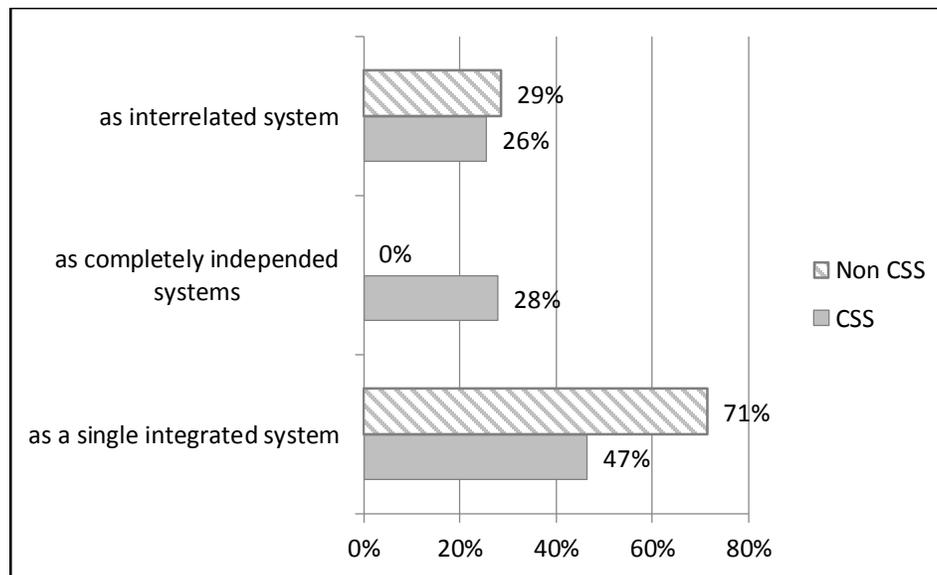


Figure C.7: Simultaneous audits in CSS and non-CSS

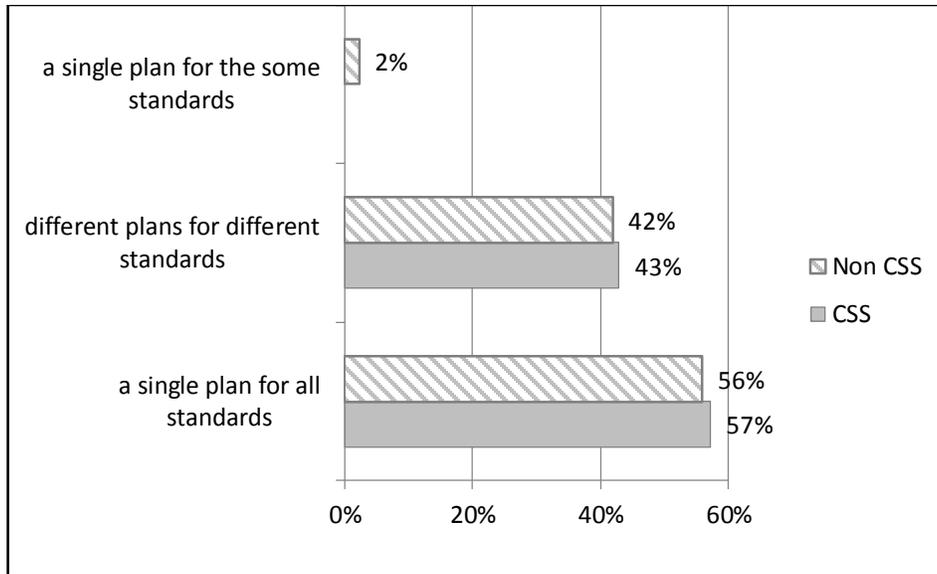


Figure C.8: Integration of audits in CSS and non-CSS objects

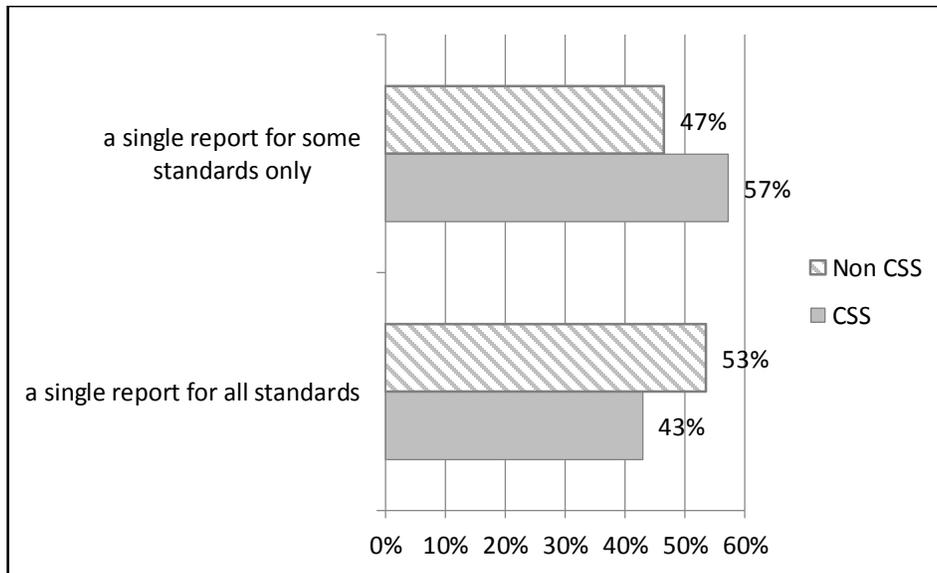


Figure C-9: Integration of audit reports in CSS and non-CSS

D. Appendix

π_1 = lack of employee motivation

π_2 = lack of human resources

H0: $\pi_1 = \pi_2$

Ha: $\pi_1 > \pi_2$

$n_1 = 46$

$n_2 = 46$

$p_1 = 46\%$

$p_2 = 43\%$

$$p = \frac{n_1 p_1 + n_2 p_2}{n_1 + n_2} = \frac{46 * 0.46 + 46 * 0.43}{46 + 46} = 0.445$$

$$\sigma_{\Delta p} = \sqrt{p(1-p) * \frac{n_1 + n_2}{n_1 * n_2}} = \sqrt{0.445(1-0.445) * \frac{46+46}{46*46}} = 0.1036$$

$$Z = \frac{p_1 - p_2}{\sigma_{\Delta p}} = \frac{0.46 - 0.43}{0.1036} = 0.289507$$

This is a right tailed test, therefore using the table for Z test (Triola,2007).

$$P\text{-value} = 1 - 0.6103 = 0.3897$$

Because the P- Value is higher than significant level of $\alpha = 0.05$, do not reject the null hypothesis.

Or

|calculated test statistic = 0.289| < |critical value = 1.96|, therefore do not reject null hypothesis.

π_3 = lack of employee motivation

π_4 = the difference between common elements of standard

H0: $\pi_3 = \pi_4$

Ha: $\pi_3 > 4$

$n_3 = 46$

$n_4 = 46$

$$p_3 = 46\%$$

$$p_4 = 17\%$$

$$P = \frac{n_3 p_3 + n_4 p_4}{n_3 + n_4} = \frac{46 * 0.46 + 46 * 0.17}{46 + 46} = 0.315$$

$$\sigma_{\Delta p} = \sqrt{p(1-p) * \frac{n_3 + n_4}{n_3 * n_4}} = 0.096858$$

$$Z = \frac{p_3 - p_4}{\sigma_{\Delta p}} = \frac{0.46 - 0.17}{0.096858} = 2.994$$

This is a right tailed test, therefore using the table for Z test (Triola, 2007).

$$P\text{-value} = 1 - 0.9986 = 0.0014$$

Because the P-Value is less than significant level of $\alpha = 0.05$, do reject the null hypothesis.

Or

|calculated test statistic = 2.994| > |critical value = 1.96|, therefore do reject null hypothesis.

π_5 = lack of human resources

π_6 = the difference between models which standard are based

$$H_0: \pi_5 = \pi_6$$

$$H_a: \pi_5 > \pi_6$$

$$n_5 = 46$$

$$n_6 = 46$$

$$p_5 = 43\%$$

$$p_6 = 17\%$$

$$P = \frac{n_5 p_5 + n_6 p_6}{n_5 + n_6} = \frac{46 * 0.43 + 46 * 0.17}{46 + 46} = 0.3$$

$$\sigma_{\Delta p} = \sqrt{p(1-p) * \frac{n_5 + n_6}{n_5 * n_6}} = 0.095553$$

$$Z = \frac{p_5 - p_6}{\sigma_{\Delta p}} = \frac{0.43 - 0.17}{0.1036} = 2.72$$

This is a right tailed test, therefore using the table for Z test (Triola, 2007).

$$P\text{-value}=1-0.9966= 0.0034$$

Because the P- Value is less than significant level of $\alpha= 0.05$, do reject the null hypothesis.

Or

|calculated test statistic =2.72 |> | critical value = 1.96|, therefore do reject null hypothesis.

π_7 = documentation control

π_8 =planning

$$H_0: \pi_7= \pi_8$$

$$H_a: \pi_7> \pi_8$$

$$n_7=45$$

$$n_8 = 47$$

$$p_7 =69\%$$

$$p_8=85\%$$

$$P= \frac{n_7p_8+n_8p_7}{n_7+n_8} = \frac{45*0.69+47*0.85}{45+47} =0.771739$$

$$\sigma_{\Delta p} = \sqrt{p(1-p) * \frac{n_7+n_8}{n_7*n_8}} = 0.087537$$

$$Z= \frac{p_7-p_8}{\sigma_{\Delta p}} = \frac{0.69-0.85}{0.087537} = -1.82781$$

This is a right tailed test, therefore using the table for Z test (Triola,2007).

$$P\text{-value}=1-0.344= 0.0656$$

Because the P- Value is greater than significant level of $\alpha= 0.05$, do not reject the null hypothesis.

Or

|calculated test statistic =1.82 |< | critical value = 1.96|, therefore do not reject null hypothesis.

π_9 = product realization and implementation

π_{10} =record control

$$H_0: \pi_9= \pi_{10}$$

$$H_a: \pi_9 > \pi_{10}$$

$$n_9 = 46$$

$$n_{10} = 46$$

$$p_9 = 70\%$$

$$p_{10} = 80\%$$

$$P = \frac{n_9 p_9 + n_{10} p_{10}}{n_9 + n_{10}} = \frac{46 * 0.70 + 46 * 0.80}{46 + 46} = 0.75$$

$$\sigma_{\Delta p} = \sqrt{p(1-p) * \frac{n_9 + n_{10}}{n_9 * n_{10}}} = 0.0909289$$

$$Z = \frac{p_9 - p_{10}}{\sigma_{\Delta p}} = \frac{0.70 - 0.80}{0.0909289} = -1.10755$$

This is a right tailed test, therefore using the table for Z test (Triola, 2007).

$$P\text{-value} = 1 - 0.1357 = 0.8643$$

Because the P-Value is greater than significant level of $\alpha = 0.05$, do not reject the null hypothesis.

Or

|calculated test statistic = 1.10| < |critical value = 1.96|, therefore do not reject null hypothesis.

π_{11} = The auditors/audit teams are the same for all standards for internal audits

π_{12} = The auditors/audit teams are the same for all standards for external audits

$$H_0: \pi_{11} = \pi_{12}$$

$$H_a: \pi_{11} > \pi_{12}$$

$$n_{11} = 50$$

$$n_{12} = 50$$

$$p_{11} = 46\%$$

$$p_{12} = 34\%$$

$$P = \frac{n_{11} p_{11} + n_{12} p_{12}}{n_{11} + n_{12}} = 0.4$$

$$\sigma_{\Delta p} = \sqrt{p(1-p) * \frac{n_{11} + n_{12}}{n_{11} * n_{12}}} = 0.09798$$

$$Z = \frac{p_{11} - p_{12}}{\sigma_{\Delta p}} = 1.224745$$

This is a right tailed test, therefore using the table for Z test (Triola,2007).

$$P\text{-value} = 1 - 0.8888 = 0.1112$$

Because the P- Value is greater than significant level of $\alpha = 0.05$, do not reject null hypothesis.

|calculated test statistic = 1.22| < |critical value = 1.96|, therefore do not reject null hypothesis

π_{13} = The audits are conduct at the same time for all standards for internal audits

π_{14} = The audits are conduct at the same time for all standards for external audits

$$H_0: \pi_{13} = \pi_{14}$$

$$H_a: \pi_{13} > \pi_{14}$$

$$n_{13} = 50$$

$$n_{14} = 50$$

$$p_{13} = 58\%$$

$$p_{14} = 60\%$$

$$p = \frac{n_{13}p_{13} + n_{14}p_{14}}{n_{13} + n_{14}} = 0.59$$

$$\sigma_{\Delta p} = \sqrt{p(1-p) * \frac{n_{13} + n_{14}}{n_{13} * n_{14}}} = 0.098367$$

$$Z = \frac{p_{13} - p_{14}}{\sigma_{\Delta p}} = -0.20332$$

This is a right tailed test, therefore using the table for Z test (Triola,2007).

$$P\text{-value} = 1 - 0.4207 = 0.5793$$

Because the P- Value is greater than significant level of $\alpha = 0.05$, do not reject null hypothesis.

|calculated test statistic = 1.20332| < |critical value = 1.96|, therefore do not reject null hypothesis

π_{15} = the auditors use a single plan for all standards for internal audit

π_{16} = the auditors use a single plan for all standards for external audit

$$H_0: \pi_{15} = \pi_{16}$$

$$H_a: \pi_{15} > \pi_{16}$$

$$n_{15} = 50$$

$$n_{16} = 50$$

$$p_{15} = 56\%$$

$$p_{16} = 42\%$$

$$P = \frac{n_{15}p_{15} + n_{16}p_{16}}{n_{15} + n_{16}} = 0.49$$

$$\sigma_{\Delta p} = \sqrt{p(1-p) * \frac{n_{15} + n_{16}}{n_{15} * n_{16}}} = 0.09998$$

$$Z = \frac{p_{15} - p_{16}}{\sigma_{\Delta p}} = 1.40028$$

This is a right tailed test, therefore using the table for Z test (Triola, 2007).

$$P\text{-value} = 1 - 0.9192 = 0.0808$$

Because the P-Value is greater than significant level of $\alpha = 0.05$, do not reject null hypothesis.

|calculated test statistic = 1.4| < |critical value = 1.96|, therefore do not reject null hypothesis

π_{17} = The auditors use a single report for all standards for internal audit

π_{18} = The auditors use a single report for all standards for external audit

$$H_0: \pi_{17} = \pi_{18}$$

$$H_a: \pi_{17} > \pi_{18}$$

$$n_{17} = 50$$

$$n_{18} = 50$$

$$p_{17} = 52\%$$

$$p_{18} = 44\%$$

$$P = \frac{n_{17}p_{17} + n_{18}p_{18}}{n_{17} + n_{18}} = 0.48$$

$$\sigma_{\Delta p} = \sqrt{p(1-p) * \frac{n_{17} + n_{18}}{n_{17} * n_{18}}} = 0.09992$$

$$Z = \frac{p_{17} - p_{18}}{\sigma_{\Delta p}} = 0.800641$$

This is a right tailed test, therefore using the table for Z test (Triola,2007).

$$P\text{-value} = 1 - 0.7881 = 0.2119$$

Because the P- Value is greater than significant level of $\alpha = 0.05$, do not reject null hypothesis.

|calculated test statistic = 0.8| < |critical value = 1.96|, therefore do not reject null hypothesis

$$\pi_{19} = \text{ISO 10012}$$

$$\pi_{20} = \text{ISO 14031}$$

$$H_0: \pi_{19} = \pi_{20}$$

$$H_a: \pi_{19} > \pi_{20}$$

$$n_{19} = 50$$

$$n_{20} = 50$$

$$p_{19} = 10\%$$

$$p_{20} = 12\%$$

$$P = \frac{n_{19}p_{19} + n_{20}p_{20}}{n_{19} + n_{20}} = 0.011$$

$$\sigma_{\Delta p} = \sqrt{p(1-p) * \frac{n_{19} + n_{20}}{n_{19} * n_{20}}} = 0.062578$$

$$Z = \frac{p_{19} - p_{20}}{\sigma_{\Delta p}} = -0.3196$$

This is a right tailed test, therefore using the table for Z test (Triola,2007).

$$P\text{-value} = 1 - 0.0007 = 0.9993$$

Because the P- Value is greater than significant level of $\alpha = 0.05$, do not reject null hypothesis.

|calculated test statistic = 0.31| < |critical value = 1.96|, therefore do not reject null hypothesis

$$\pi_{21} = \text{ISO 19011}$$

$$\pi_{22} = \text{ISO 10012}$$

$$H_0: \pi_{21} = \pi_{22}$$

$$H_a: \pi_{21} > \pi_{22}$$

$$n_{21} = 50$$

$$n_{22} = 50$$

$$p_{21} = 42\%$$

$$p_{22} = 10\%$$

$$P = \frac{n_{21}p_{21} + n_{22}p_{22}}{n_{21} + n_{22}} = 0.26$$

$$\sigma_{\Delta p} = \sqrt{p(1-p) * \frac{n_{21} + n_{22}}{n_{21} * n_{22}}} = 0.087726849$$

$$Z = \frac{p_{21} - p_{22}}{\sigma_{\Delta p}} = 3.64768$$

This is a right tailed test, therefore using the table for Z test (Triola, 2007).

$$P\text{-value} = 1 - 0.9999 = 0.00010$$

Because the P-Value is less than significant level of $\alpha = 0.05$, do reject null hypothesis.

Or

|calculated test statistic = 3.647| > |critical value = 1.96|, therefore reject null hypothesis.

π_{23} = difficulties in understanding the standards

π_{24} = lack of awareness about the standards

$$H_0: \pi_{23} = \pi_{24}$$

$$H_a: \pi_{23} > \pi_{24}$$

$$n_{23} = 27$$

$$n_{24} = 29$$

$$p_{23} = 48\%$$

$$p_{24} = 15\%$$

$$P = \frac{n_{23}p_{23} + n_{24}p_{24}}{n_{23} + n_{24}} = 0.309107$$

$$\sigma_{\Delta p} = \sqrt{p(1-p) * \frac{n_{23} + n_{24}}{n_{23} * n_{24}}} = 0.123587$$

$$Z = \frac{p_{23} - p_{24}}{\sigma_{\Delta p}} = 2.6701824$$

This is a right tailed test, therefore using the table for Z test (Triola,2007).

$$P\text{-value} = 1 - 0.9962 = 0.0038$$

Because the P- Value is less than significant level of $\alpha = 0.05$, do reject the null hypothesis.

Or

|calculated test statistic = 2.67| > |critical value = 1.96|, therefore reject null hypothesis.

π_{25} = “process by process” for internal auditing

π_{26} = “process by process” for external auditing

$$H_0: \pi_{25} = \pi_{26}$$

$$H_a: \pi_{25} > \pi_{26}$$

$$n_{25} = 48$$

$$n_{26} = 47$$

$$p_{25} = 85\%$$

$$p_{26} = 66\%$$

$$P = \frac{n_{25}p_{25} + n_{26}p_{26}}{n_{25} + n_{26}} = 0.756$$

$$\sigma_{\Delta p} = \sqrt{p(1-p) * \frac{n_{25} + n_{26}}{n_{25} * n_{26}}} = 0.881$$

$$Z = \frac{p_{25} - p_{26}}{\sigma_{\Delta p}} = 2.155$$

This is a right tailed test, therefore using the table for Z test (Triola,2007).

$$P\text{-value} = 1 - 0.9842 = 0.0158$$

Because the P- Value is less than significant level of $\alpha = 0.05$, do reject null hypothesis.

Or

|calculated test statistic = 2.155| > |critical value = 1.96|, therefore reject null hypothesis.

E. Appendix

The survey presented here was conducted in Serbia 2013 by Dr. Stanislav Karapetrovic and Dr. Vesna Spasojevic-Brkic. The survey was approved by the University of Alberta Research Ethics Board. It is a follow-up to the survey that was already done in Spain in 2006 and 2010 (e.g., Karapetrovic et al., 2006; Casadesus et al., 2008; Karapetrovic et al., 2010; Simon et al., 2014; Bernardo et al., 2009; Bernardo et al., 2012a and Simon et al., 2012). The questions used in the thesis are provided here with numbers corresponding to the original questionnaire. The questions were the same as in Spanish survey 2006 (Karapetrovic et al., 2006 and Casadesus et al., 2007)

2.1 In which order were the different management system standards implemented (ISO 9001, ISO 14001, ISO/TS 16949, OHSAS 18001, EMAS, ...)?

(If two or more standards were implemented at the same time, please put them in the same cell)

	Standard	Time elapsed from the implementation of the first standard
First:		___ Years and ___ Months
Second:		___ Years and ___ Months
Third:		___ Years and ___ Months
Fourth:		___ Years and ___ Months

2.2 How many months passed from the decision to implement each standard to the certification?

First:	
Second:	
Third:	
Fourth:	

2.5 Which standards have been integrated in a single management system in your organization?

<input type="checkbox"/> None. Different management systems (quality, environment) are completely independent.
<input type="checkbox"/> Only the following standards:
<input type="checkbox"/> All.

2.6 What were the reasons not to integrate different management systems?

(Please indicate the importance of each one of the following)

(1- not important; 2- little important; 3- important; 4-very important; 5- extremely important)

The primary reasons not to integrate management systems:	Importance				
	1	2	3	4	5
Difficulties in understanding the standards	<input type="checkbox"/>				
Excessive requirements of the new standards	<input type="checkbox"/>				
Excessive differences between the standards	<input type="checkbox"/>				
Lack of resources	<input type="checkbox"/>				
Lack of interest	<input type="checkbox"/>				
Completely independent departments	<input type="checkbox"/>				
Faster implementation of the second and subsequent standards	<input type="checkbox"/>				
Lack of awareness that it was possible	<input type="checkbox"/>				
Other:	<input type="checkbox"/>				

3.1 During the process of the integration of different systems, the following was used ...

	Yes	No
... process map	<input type="checkbox"/>	<input type="checkbox"/>
... detailed analysis of the common elements among the standards	<input type="checkbox"/>	<input type="checkbox"/>
... organization's own model for the integration	<input type="checkbox"/>	<input type="checkbox"/>
... the 'Plan-Do-Check-Act' circle for all processes included in the integrated system	<input type="checkbox"/>	<input type="checkbox"/>

3.2 In the process of integration of different systems, what were the main difficulties encountered?

(1-not important; 2- little important; 3- important; 4-very important; 5- extremely important)

Integration difficulties:	Importance				
	1	2	3	4	5
Lack of integration guidelines (books, papers, documents, ...)	<input type="checkbox"/>				
Lack of government support	<input type="checkbox"/>				
Lack of human resources	<input type="checkbox"/>				
Differences between the models upon which the standards are based ('PDCA', process approach,...)	<input type="checkbox"/>				
Differences between the common elements of the standards (internal auditing, external communication, policy, ...)	<input type="checkbox"/>				
Lack of collaboration between the departments involved	<input type="checkbox"/>				
Lack of specialized auditors	<input type="checkbox"/>				
Lack of technological support (integration into the ERP, ...)	<input type="checkbox"/>				
Lack of specialized consultants	<input type="checkbox"/>				
Ineffective or lax implementation of the standard which was implemented the first	<input type="checkbox"/>				
Excessive time to achieve integration	<input type="checkbox"/>				
Lack of employee motivation	<input type="checkbox"/>				
Other:	<input type="checkbox"/>				

3.3 Regarding the level of integration....

The following human resources...	... are ...	
	Different persons	Same person
Management system representatives	<input type="checkbox"/>	<input type="checkbox"/>
Management system managers	<input type="checkbox"/>	<input type="checkbox"/>
Inspectors	<input type="checkbox"/>	<input type="checkbox"/>

The following documentation...	...is...		
	Not Integrated	Partially Integrated (*)	Completely Integrated (**)
Policy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manual	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Procedures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Instructions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Records	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(*) Different existing documents were added together, but a single new document was not created

(**) A single and completely new document was created

The following processes...	...are...		
	Not Integrated	Partially Integrated (*)	Completely Integrated (**)
Planning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internal auditing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Management reviews	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Control of nonconformities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Corrective and preventive actions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Product realization and implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Resource management (people, infrastructure)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Determination of system requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
System improvement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Documentation control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Record control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internal communication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

() Different existing procedures were added together, but a single new procedure was not created*

*(**) A single, completely new procedure was created*

4.1 Regarding the internal and external audits against the different implemented standards:

	INTERNAL AUDITS	EXTERNAL AUDITS
The auditors / audit teams are...	<input type="checkbox"/> the same for all standards	<input type="checkbox"/> the same for all standards
	<input type="checkbox"/> the same for the following standards only:	<input type="checkbox"/> the same for the following standards only:
	<input type="checkbox"/> different for different standards	<input type="checkbox"/> different for different standards
The audits are conducted...	<input type="checkbox"/> at the same time for all standards	<input type="checkbox"/> at the same time for all standards
	<input type="checkbox"/> at the same time for the following standards only:	<input type="checkbox"/> at the same time for the following standards only:
	<input type="checkbox"/> at different times	<input type="checkbox"/> at different times
The auditors / audit teams audit against the different implemented standards...	<input type="checkbox"/> as completely independent systems	<input type="checkbox"/> as completely independent systems
	<input type="checkbox"/> as interrelated systems	<input type="checkbox"/> as interrelated systems
	<input type="checkbox"/> as a single integrated system	<input type="checkbox"/> as a single integrated system
The auditors use...	<input type="checkbox"/> a single plan for all standards	<input type="checkbox"/> a single plan for all standards
	<input type="checkbox"/> a single plan for the following standards only:	<input type="checkbox"/> a single plan for the following standards only:
	<input type="checkbox"/> different plans for different standards	<input type="checkbox"/> different plans for different standards
The auditors use...	<input type="checkbox"/> a single report for all standards	<input type="checkbox"/> a single report for all standards
	<input type="checkbox"/> a single report for the following standards only:	<input type="checkbox"/> a single report for the following standards only:
	<input type="checkbox"/> different reports for different standards	<input type="checkbox"/> different reports for different standards
The audits are conducted...	<input type="checkbox"/> process by process (design, purchasing, ...)	<input type="checkbox"/> process by process (design, purchasing, ...)
	<input type="checkbox"/> for each requirement of the standards separately (corrective action, ...)	<input type="checkbox"/> for each requirement of the standards separately (corrective action, ...)
	<input type="checkbox"/> I do not know	<input type="checkbox"/> I do not know
The audits are conducted according to the following guideline....	<input type="checkbox"/> ISO 19011	<input type="checkbox"/> ISO 19011
	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:
	<input type="checkbox"/> None	<input type="checkbox"/> None
	<input type="checkbox"/> I do not know	<input type="checkbox"/> I do not know
The audits are conducted with the frequency of once in ...	<input type="checkbox"/> less than 6 months	<input type="checkbox"/> less than 6 months
	<input type="checkbox"/> between 6 months and less than a year	<input type="checkbox"/> between 6 months and less than a year
	<input type="checkbox"/> between one year and three years	<input type="checkbox"/> between one year and three years
The auditors identify... <i>(indicate all applicable)</i>	<input type="checkbox"/> nonconformities	<input type="checkbox"/> nonconformities
	<input type="checkbox"/> opportunities for improvement of the implementation of each standard separately	<input type="checkbox"/> opportunities for improvement of the implementation of each standard separately
	<input type="checkbox"/> opportunities for improvement of the integration of systems	<input type="checkbox"/> opportunities for improvement of the integration of systems

6.1 Is your organization currently using the following customer satisfaction standards?

Customer satisfaction augmentative standards	Yes	No
ISO 10001 for customer satisfaction codes of conduct	<input type="checkbox"/>	<input type="checkbox"/>
ISO 10002 for complaint handling	<input type="checkbox"/>	<input type="checkbox"/>
ISO 10003 for dispute resolution	<input type="checkbox"/>	<input type="checkbox"/>
ISO 10004 for customer satisfaction measurement	<input type="checkbox"/>	<input type="checkbox"/>

6.2 Is your organization currently using the following other augmentative standards?

Other augmentative standards	Yes	No
ISO 10012 for measurement management systems	<input type="checkbox"/>	<input type="checkbox"/>
ISO 10005 for quality plans	<input type="checkbox"/>	<input type="checkbox"/>
ISO 19011 for auditing	<input type="checkbox"/>	<input type="checkbox"/>
ISO 14031 for environmental performance evaluation	<input type="checkbox"/>	<input type="checkbox"/>

7.1 In relation to ISO 9001, ISO 14001 and other management system standards, when was the augmentative standard from question 6.1 or 6.2 implemented?

The augmentative standard...	...was implemented...		
	Before	At the same time as	After
ISO 9001	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ISO 14001	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Third standard.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fourth standard.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7.2 Regarding the relationship between the system (process) described in the augmentative standard from question 6.1 or 6.2 and the Quality / Environmental / Integrated Management System...

The process described in the augmentative standard...	...is a part of the following system...		
	No	Yes	...within its process (subsystem) of...
Quality Management System	<input type="checkbox"/>	<input type="checkbox"/>	→
Environmental Management System	<input type="checkbox"/>	<input type="checkbox"/>	→
Integrated Management System	<input type="checkbox"/>	<input type="checkbox"/>	→

7.3 Are internal audits conducted against the augmentative standard from question 6.1 or 6.2?

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

7.4 Which of the following is used as a guideline or procedure to conduct the internal audit against the augmentative standard from question 6.1 or 6.2?

	ISO 19011	Other:	None	Do not know
Audits are conducted according to...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7.5 How is the internal audit against the augmentative standard related to the internal audits of other management systems?

The audit is...		QMS	EMS	IMS
A part of the internal audit of the following management system:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted independently from the internal audits of other systems	<input type="checkbox"/>			

9.1 What were the reasons not to use any augmentative standards (e.g., ISO 10001/2/3/4)?

(Please indicate the importance of each one of the following)

(1- not important; 2- little important; 3- important; 4-very important; 5- extremely important)

The reasons not to use augmentative standards:	Importance				
	1	2	3	4	5
Difficulties in understanding the standards	<input type="checkbox"/>				
Differences between the standards and ISO 9001/ISO 14001	<input type="checkbox"/>				
Lack of awareness about the standards	<input type="checkbox"/>				
Lack of human resources	<input type="checkbox"/>				
Lack of financial resources	<input type="checkbox"/>				
Lack of interest	<input type="checkbox"/>				
Lack of need	<input type="checkbox"/>				
Other:	<input type="checkbox"/>				

Casadesus et al. (2007) in Catalan.

F. Appendix

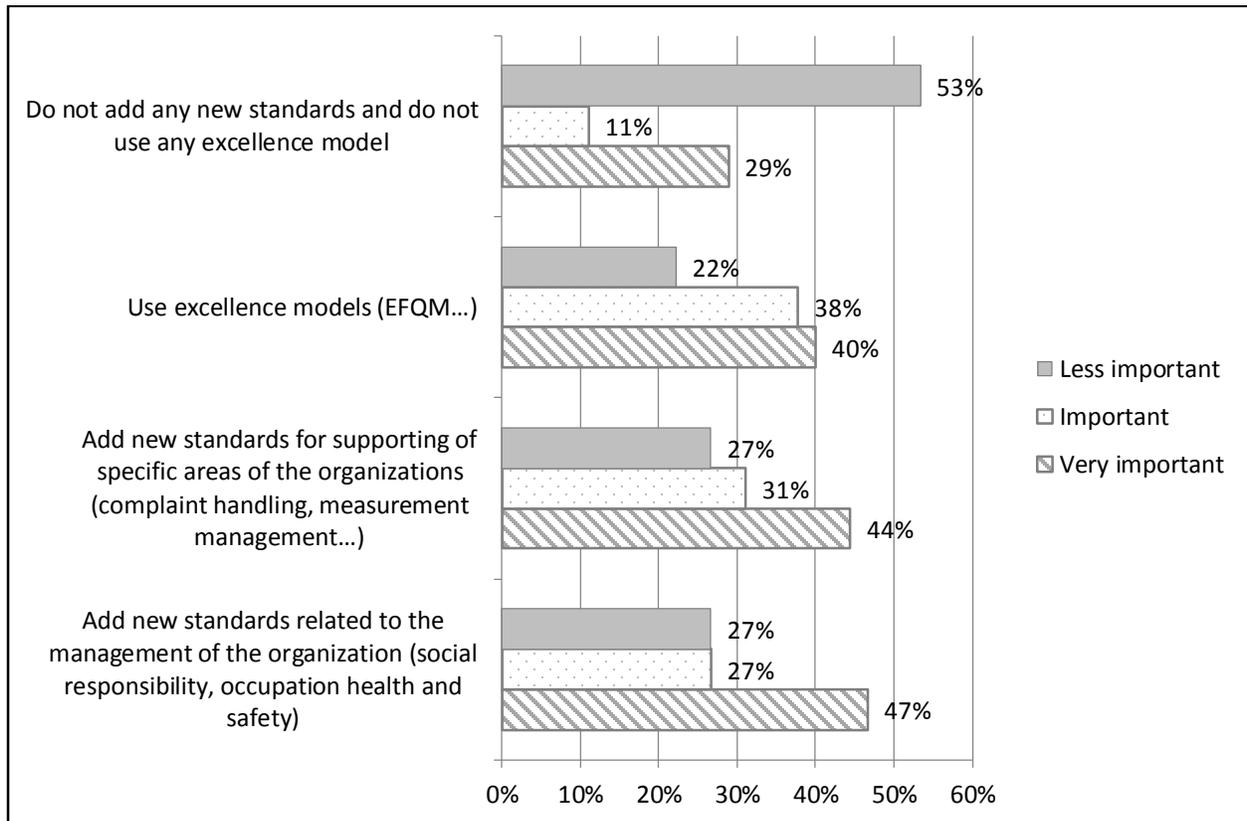


Figure F-1: A Level of importance of having additional standards