POLYTECHNIC UNIVERSITY OF BUCHAREST

FACULTY OF INDUSTRIAL AND ROBOTIC ENGINEERING

DEPARTMENT OF MACHINE CONSTRUCTION TECHNOLOGY

DOCTORAL THESIS

ABSTRACT

DEVELOPMENTS AND CONTRIBUTIONS REGARDING THE IMPLEMENTATION OF QUALITY-RISK MANAGEMENT IN PUBLIC ADMINISTRATION

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INTRODUCTION

Starting with 1989, with the fall of the communist regime in Romania, but especially after 2007 when our country joined the European Union, many changes took place at the level of public administration. Given the current extremely dynamic context, due to the process of alignment with European Union standards and procedures, marked by the increase in quality as a determinant of the competitiveness of public entities, the Romanian public administration is constantly concerned with implementing quality management with specific tools and techniques, out of the desire to improve its performance and fully meet customer requirements. Increasing the quality of services and minimizing risks in public administration is the main objective of quality-risk management, in the current context in which the Romanian public administration is constantly changing due to the alignment with the new European standards.

The state acts in all sectors of our existence, both economically, socially and culturally, so public institutions have a wide scope. Since the twentieth century, economic and social life is constantly changing, a change that continues in the twenty-first century, amid the expansion of the public sector. After 2009, ISO 31000: 2009 regulates the risk at international level, and starting with 2015, the risk is brought to the forefront by the ISO 9001: 2015 standard, which regulates all quality management and risk management processes. The two systems have the primary role of achieving the necessary conditions for the activity to run well from the beginning. Thus, the two systems become a way to respond to customer expectations and requirements, to size the overall risk and even to correct actions during the process.

The integrated quality-risk management system (IQRMS) is in fact a unique management system in which the quality management system and the risk management system are incorporated. Within the integrated quality-risk management system, all the internal management practices of the entity are reunited.

Universities are public institutions financed from their own revenues and from subsidies granted from the state budget, from special funds budgets, or from local budgets.

The research in this doctoral thesis started primarily from the quality-risk correlation, observing the way in which quality management is combined with risk management. This integrated quality-risk management system deals with the optimal management of all activities and processes carried out at the university level, emphasizing the assessment of all risks in this type of public institution.

The paper performs a study on current trends in quality management in higher education.

This doctoral thesis is structured in 5 chapters.

Chapter 1
THE CURRENT STATE OF RESEARCH ON QUALITY MANAGEMENT - RISK IN PUBLIC ADMINISTRATION AND ROMANIAN HIGHER EDUCATION

1.1 QUALITY AND RISK MANAGEMENT IN PUBLIC ADMINISTRATION

In the first chapter I conducted a study of the current situation from the point of view of the organization of public administration and then from the point of view of quality-risk management, first at European level and then at national level.

In the field of public services, quantifying the quality of services is very difficult because services have few physical dimensions that can be used for comparison or measurement. This is the main reason why we cannot appreciate or quantitatively express the quality of public administration services. The quality of services can be measured by customer reviews. The citizen is the main customer of public services, and the quality of these services can be expressed as a ratio between consumer expectations and the actual performance of the service provided. The management of public institutions aims to increase the quality of services by exceeding consumer expectations.

By changing the perspective of the approach, the quality of services can be analyzed according to the stage of delivery, i.e. from the initial order to the actual provision of the service and even in the post-delivery period.

In conclusion, we can say that according to the requirements of the customer / consumer, quality can be defined according to the two components: the quality of the actual service provided to the customer and the quality of the service process.

Given the dynamism of contemporary society, especially in terms of the activity of public administration in Europe, quality and risk are two present and accepted components whose correlation can no longer be ignored. There is no field of activity in which these two components are not present.

Table 1.1 Quality characteristics (author's contribution)

Crt. no.	**Quality feature**	**Definition**	**Examples**
1.	Relative size	its level being appreciated in relation to the requirements that constitute a standard	declared expectation = the requirement which is met
2.	Complex character	Determined by the totality of the characteristics that define it	quality characteristics can be: aesthetic, technical-functional, economic, operational, ergonomic, ecological
3.	Wide scope	associated with products and processes, services as well as with organizations, people, life, the environment	**Product**=the result of a process **Process**= activities that transform human resources, material resources, information into **products and services**
4.	Dynamic size	varies continuously	Quality change is closely linked to the evolution of consumer needs, as well as to the evolution of the economic, social and technological progress.

The quality of products and services that are provided to consumers is closely related to the quality of resources used in the process, as shown in Figure 1.1.

As a historical dimension, **risk** and **risk management** are modern concepts. Starting with the definition of the concept of risk, discoveries in science and technology have led to significant leaps forward, especially in terms of the development of all mankind. Over time, the notion of risk took on different nuances and as a result expanded into several structures of contemporary society. This modern society is based on forecasts of what could happen and on decisions made based on these forecasts.

The concept of risk appears in a wide range of applications, such as environmental protection, public health, education, public administration and others fields.

When analyzing **risk management at the level of a public entity**, it can be stated that:

- it is a cyclical process and precisely for this reason in relation to the measures implemented by the internal control and the risks that have been intervened, the current residual risk can become an inherent risk for the next stage of internal control;

- It engages and involves all the employees of the public entity, at all levels. As with self-assessment, both the general manager of the institution and the employees with executive functions participate in the risk management.

1.2 THE QUALITY-RISK CORRELATION

Quality and risk are in a permanent mutual correlation that is considered to be a strategic issue for the management of public entities.

Quality and risk are two fundamental notions and cannot exist without each other, which is why there is a dependence between their changes and their size variations, respectively. This reciprocal link between quality and risk is in fact the **QUALITY-RISK CORRELATION [41]**.

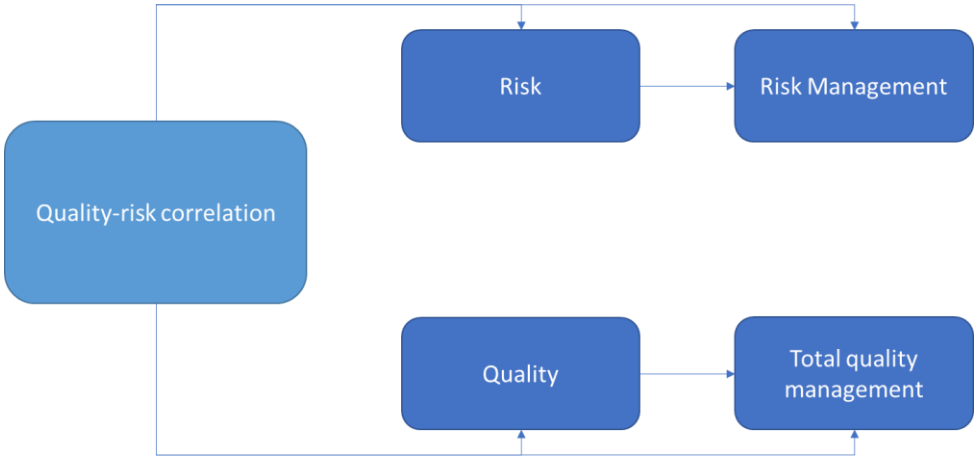

Fig. 1.6. Quality-risk correlation (author's contribution)

In figure no. 1.6. I have described **the fundamental elements that define the quality-risk correlation and the way in which they interact.** The quality-risk correlation is based on the convergence of the risk management system with the global quality system. The convergence of these management systems is fully reflected in the principles reunited in a strategy which is applied at the level of the entire entity.

What follows is an analysis of European directives in terms of public administration, but also in terms of risk. I continued the study by reducing the analyzed area to the national level. The strategies and directives in force at national level regarding risk in public administration were examined.

As shown in Figure 1.7, the size of risks is determined by the size of two elements: the probability of occurrence of the risk and the magnitude of the impact on the public entity. The desire of any manager is to minimize one of the two dimensions, i.e. to decrease the probability of occurrence of the risk or to diminish the impact that the risk produces.

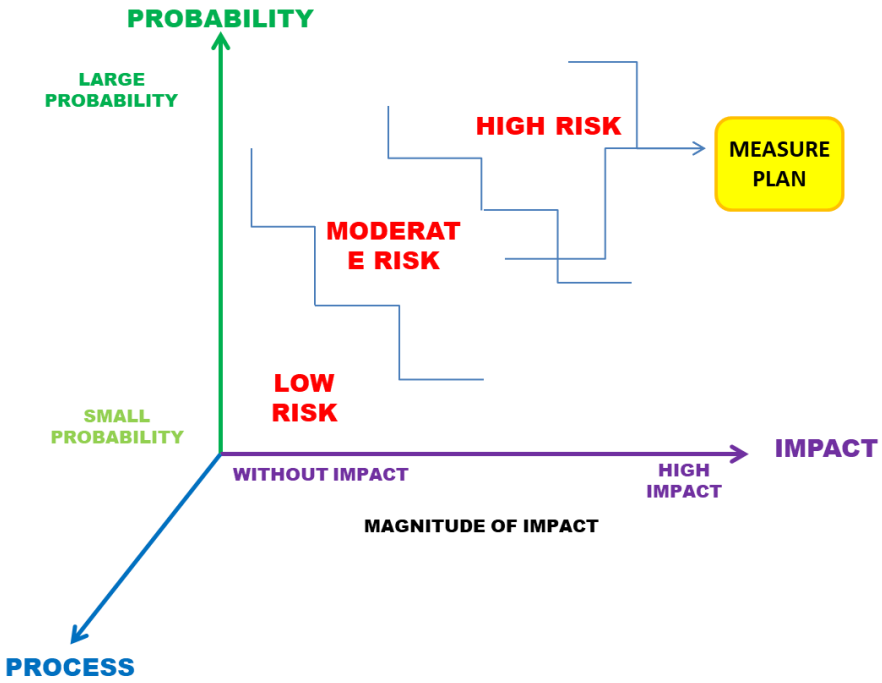

Fig. 1.7 Hierarchy of risks (author's contribution)

The next step refers to an analysis of the strategies and directives related to quality-risk management in the university environment both at European level and at the level of the Romanian higher education system.

The carrying-out, management and coordination of the services **generated at the level of public administration** cannot be reduced to the technical-technological organization because the **customer** intervenes in the execution process.

1.3 QUALITY-RISK MANAGEMENT IN PUBLIC ADMINISTRATION IN EUROPE

Throughout Europe, public institutions have a particularly important role to play in the state because through them the state fulfills its functions and role.

The main feature of **public institutions** is that their main activity consists in the production of **public services** that serve citizens, services that are priced below cost or that can be free of cost.

The carrying-out, management and coordination of the services **generated at the level of public administration** cannot be reduced to the technical-technological organization because the **customer** intervenes in the execution process.

The customer is the one who directly benefits from the administrative services or who uses them. The users of the services are the direct customers.

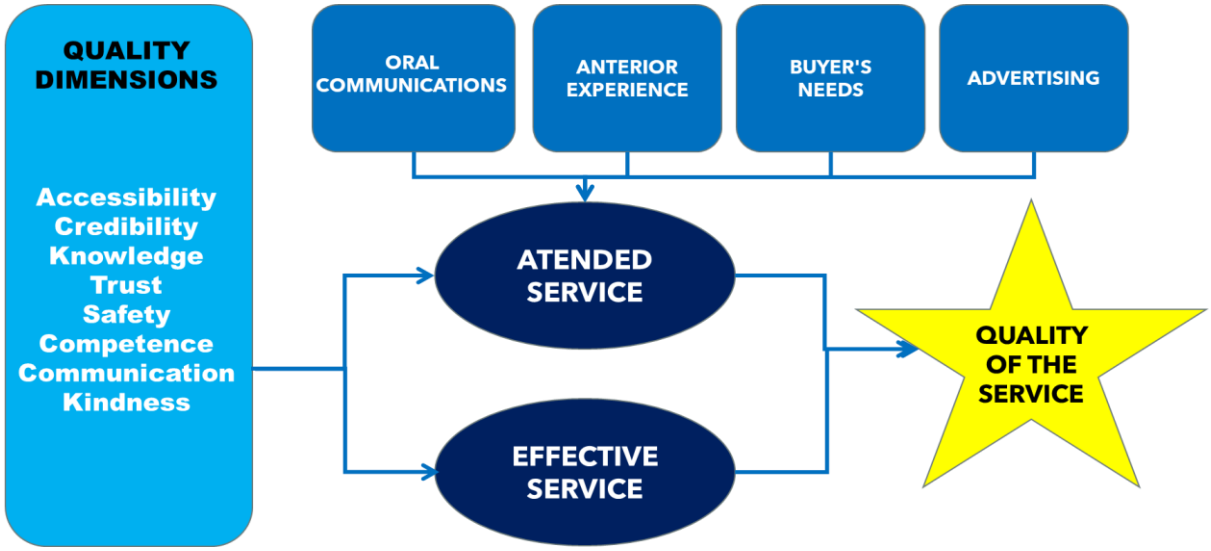

Fig. 1.9 Factors determined in the perception of services' quality (author's contribution)

As it appears from fig 1.10, the quality of public services is difficult to define, appreciate or express in quantitative terms, the service having very few physical dimensions (performance, functional characteristics or maintenance costs) that could be used in the purpose of performing measurements.

The quality management system (QMS) can be defined as a management system that monitors the level of quality in the public entity concerned.

SR EN ISO 9000: 2006 defines the Quality Management System as follows: "The quality management system is that part of the management system of the organization, oriented towards obtaining results, in relation to quality objectives, to meet the needs, expectations and requirements of stakeholders as appropriate in each case".

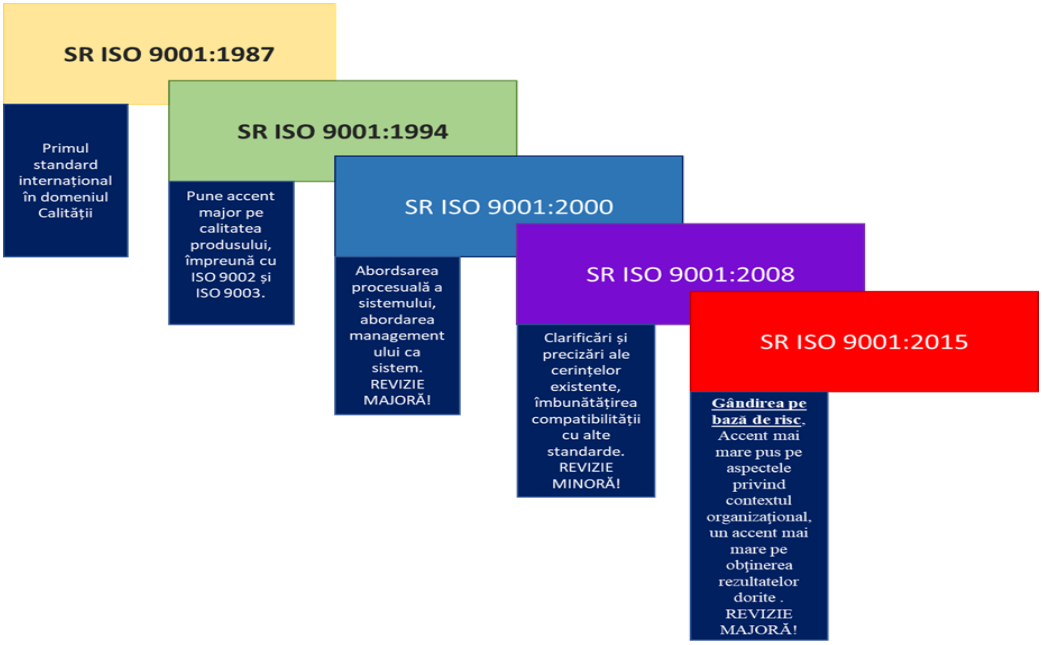

Fig. 1.11 SR ISO 9001 family of standards (adapted from [86])

As outlined in Figure 1.11, since 1987 the *International Organization for Standardization* has been developing standards for the QMS, namely ISO 9000: 1987. These standards have been revised several times. One of the major revisions was made in 2000 when the ISO 9000: 2000 series appeared. ISO also approved minor changes in 2008. The most recent change was made in 2015. SR ISO 9001: 2015 brings major changes, such as adapting the standard to the requirements of ISO / IEC directives in terms of structure, terms and basic definitions, maintaining the relevance of the standard by adapting it to economic changes around the world, increasing the implementation of the standard, by facilitating its application by all types of organizations, regardless of their size and activity profile.

Out of the desire to regulate a legislative framework on which to base the public administration reform and to help implement quality management as well as risk management, the countries of the European Union have designed the documents presented in table 1.2.

Table 1.2 Legal instruments on service quality in EU countries (author's contribution)

Crt. No.	Legal instruments	Subject
1.	**Charter on the Quality of Public Services,** Portugal 1993 [96]	consolidation of quality in Portuguese public administration
2.	**Charter of Public Services,** France 1992 [96]	increasing responsibility and developing quality-oriented services
3.	**Citizen 's Charter,** Great Britain 1991 [96]	improvement of the quality of services

By analyzing Table 1.2, we can notice that the three documents with the role of legal instruments for quality management in public administration in the European Union provide the information needed to outline a clear picture of the Member States' concerns regarding the quality of public services. The common goal of these documents is to achieve a high performance that meets the requirements and needs of citizens. These documents define the institutional framework on which quality-risk management is based when it actually addresses the quality of services provided by civil servants.

As a **conclusion** we can say that the public administration at European level is in a continuous process of change, in the attempt to interpret the content of these documents and integrate it into the general context of the European Union. The greatest scope is that all the administrative apparatuses of the Member States would adopt European good practices.

The European Union aims to achieve a strong but balanced administrative apparatus, with officials with a high degree of specialization and motivated to provide citizens with the necessary support.

1.3.1. European directives on public administration at European level

At European level, the current situation is characterized by pressures on public finances, so that at all levels of public administration across Europe the aim is to spend resources of any kind as efficiently as possible.

Table 1.3 European directives on public administration (author's contribution)

Crt. No.	European directives on public administration	Subject
1.	Council Directive 2011/85 / EU of 8 November 2011 [96]	requirements relating to the budgetary frameworks of the Member States
2.	Directive no. 97/67 / EC, Modified by the directive 2002/39 / EC and by the directive No. 2008/6 / EC [96]	establishing the internal market for Community postal services
3.	Directive no. 2010/13 / EU Which repeals the directive Nr. 89/552 / EC [96]	coordination of provisions contained in laws, regulations or administrative actions in the Member States concerning the provision of audiovisual media services
4.	Draft regarding Directive / (EU) 2015/849 of the European Parliament and of the Council [94]	preventing the use of the financial system for the purpose of money laundering or terrorist financing [94]
5.	Directive 2014/24 / EU of the European Parliament and of the Council of 26 February 2014 [95]	public procurement and repealing Directive 2004/18 / EC [95]

In Table 1.3 we note that the succession of various measures aimed at public administration reform have left their mark on public institutions in all the European Union countries.

1.3.2 European risk directives

The public institutions in the countries of the European Union must be flexible and must quickly adapt to all changes, either in the direction they are heading or in case there is a redefinition of priorities.

Table 1.4 European Risk Directives (adapted from [96])

Crt. No.	European risk directives	Subject
1.	DIRECTIVE (EU) 2016/680 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 April 2016	the protection of individuals with regard to the processing of personal data by the competent authorities for the purpose of the prevention, detection, investigation or prosecution of criminal offenses or the execution of sentences and on the free movement of such data and repealing Framework Decision 2008/977 / JHA of the Council
2.	European Systemic Risk Board (ESRB)	independent body of the European Union based in Frankfurt am Main. The ESRB is responsible for the macro-prudential oversight of the financial system in order to prevent or reduce systemic risks in the European Union.
3.	Regulation (EU) no. 1096/2010 of the Council of 17 November 2010	granting specific powers to the European Central Bank regarding the functioning of the European Systemic Risk Board
4.	DIRECTIVE (EU) 2015/849 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 May 2015	on the prevention of the use of the financial system for the purpose of money laundering or terrorist financing, amending Regulation (EU) No 182/2011 Regulation (EC) No 648/2012 of the European Parliament and of the Council and repealing Directive 2005/60 / EC of the European Parliament and of the Council and Commission Directive 2006/70 / EC

In table 1.4 I have made a brief enumeration of the normative acts that regulate the risk management at European level. The trend of globalization of procedures and methods at the level of quality-risk management can be observed.

1.4 STRATEGIES AND DIRECTIVES REGARDING RISK AT NATIONAL LEVEL REGARDING PUBLIC ADMINISTRATION

Since the 1990s, Romania has been pursuing integration into the European Union, for this reason the first years after the revolution represent the starting point of the period of transition to a market economy. This transition included countless actions aimed at reforming public management and maximizing all its performance by implementing the tools used at the level of private management.

Decentralization aims to transfer the tasks and responsibilities of the ministry to the entities under its subordination, the ministry thus trying to direct to each public entity the issue of risk management. Moreover, we can say that the ministry wants to transfer to each public entity the full responsibility and decision-making power regarding the implementation of quality-risk management. These entities represent the main users of the instrument underlying quality-risk management, **Self-Assessment.**

Table 1.5. Main elements in the risk strategy at the level of public administration in Romania (adapted after [96])

Crt. No.	Elements of Public Internal Control	Laws that formed the basis of public administration reform	Regarding	Changes/ New elements
1.	General consolidated budget	Law no. 500/2002	Public finances	Defines the categories of authorizing officers, their roles and responsibilities
		Law no. 69/2010	Fiscal-budgetary responsibility	Introduces the notion of a consolidated general budget = set of budgets that make up the budgetary system
2.	The accounting system	Law no. 500/2002	In the field of accounting	
		Law no. 82/1991	Public revenue and expenditure accounting, which reflects the settlement of revenues and the payment of expenses in a financial year; state treasury accounting; general accounting	Reflects the evolution of the financial situation
3.	Internal audit	Law no. 672/2002		
4.	Fight against fraud	EU Regulation 679/2016 approving Directive 95/46 / EC	the protection of individuals with regard to the processing of personal data and on the free movement of such data	It entered into force on May 25, 2018 It guarantees the free movement of personal data within the European Union while establishing rules designed to ensure the protection of individuals

Analyzing the evolution of the measures taken at national level as they are structured in table 1.5, it can be noticed that the reform of the Romanian public management was based on a series of legislative changes. The aim of the reform is to achieve an entire budgetary programming mechanism out of the desire of helping the Romanian public administration achieve progress.

1.5 STRATEGIES AND DIRECTIVES REGARDING QUALITY-RISK MANAGEMENT AT EUROPEAN UNIVERSITY LEVEL AND AT THE LEVEL OF ROMANIAN UNIVERSITIES

1.5.1 The use of quality-risk management systems in a public university

In today's society the role of education has acquired a major importance, and by this we refer to the growing role of education in society and how it influences the new generations. We can say without a doubt that university management occupies a leading place in the concerns of the state and its bodies, both at the level of the European Union and at the level of our country.

The first changes appeared immediately after 1989, and Romania's entry into the European Union in 2007 produced a series of changes in university education.

We can say that more than 80% of the problems related to quality-risk management that appear at the level of universities are dependent on the system. The duty of finding solutions to solve them belongs to the managers. However, in most cases they take action to resolve problems only after they have occurred, with more emphasis on problem solving than on preventing them from occurring.

Implementing an efficient quality-risk management system involves three important actions:

1. Awareness of the need for managers to take the initiative;
2. Acquiring knowledge on quality management, managers must be actively involved in order to avoid remaining mere observers;
3. The implementation of a motivating organizational environment and "the assistance of teaching and support staff in order to continuously improve quality" (P.B. Crosby)

Finally, the analysis of the current situation at European and national level regarding the quality-risk management is restricted to a department (subsystem) in a public institution of higher education.

Table no. 1.9 European directives on department-level risk in higher education institutions (author's contribution)

Crt. No.	European risk guidelines at departmental level	Subject
1.	Law no. 363 of December 28, 2018	the protection of individuals with regard to the processing of personal data by the competent authorities for the purpose of preventing, detecting, investigating, prosecuting and combating crime or for the execution of sentences, and the implementation of educational and security measures, and the free movement of such data [6]
2.	Law no. 544 of October 12, 2001	free access to information of public interest
3.	Law no. 87/2006 for the approval of the Government Emergency Ordinance no. 75/2005	ensuring the quality of education
4.	Order no. 6154/2016 of December 21, 2016	approval of the Methodology for regulating the activities carried out by the quality assurance agencies from abroad, registered in the European Register for Quality Assurance in Higher Education (EQAR), on Romanian territory
5.	Order no. 3131/2018 of January 30, 2018	the inclusion in the curricula, for all university study programs organized in the higher education institutions of the national education system, of courses on ethics and academic integrity

It can be observed that all the directives and strategies adopted at European level regarding the public administration are also reflected in the higher education institutions on the Romanian territory. In table no. 1.7 I have made a brief list of some directives adopted since 1999 by the Bologna Declaration. The adoption of these regulations in our country began in 2005 when law no. 288/2004 regarding the organization of university studies was adopted. This law supports a better integration of Romanian university graduates on the European labor market.

In conclusion, the use of quality management systems in all processes and activities in higher education institutions, in order to improve the process of change at the institutional level, is not well enough regulated, and sometimes even completely absent. [6]

1.5.2 Self-assessment - a tool of quality management in public administration

A) Self-assessment - definition and stages

The main method of measuring the quality of services is SELF-ASSESSMENT. Through self-assessment one can identify the level of performance of public institutions in relation to quality standards. What is intended through self-evaluation is the monitoring of the progress of the management of public institutions and the improvement of its efficiency.

B) Self-assessment of service quality - a tool of quality management in higher education institutions

A brief analysis shows us that in today's society the role of education has acquired a major importance. In this sense, we understand the role of education in society from the perspective of how it influences the new generations. We can say without a doubt that university management occupies a leading place in the concerns of the state and its bodies, both at the level of the European Union and at the level of our country.

1.6 STRATEGIES AND DIRECTIVES REGARDING RISK AT THE DEPARTMENT LEVEL OF A PUBLIC STATE UNIVERSITY IN ROMANIA

A) Specific objectives dedicated to quality at department level;

B) The objectives are set so as to meet several requirements;

C) The objectives of the university could be organized in five categories.

Table no. 1.9 European directives on department-level risk in higher education institutions (author's contribution)

Crt. No.	European risk guidelines at departmental level	Subject
1.	Law no. 363 of December 28, 2018	the protection of individuals with regard to the processing of personal data by the competent authorities for the purpose of preventing, detecting, investigating, prosecuting and combating crime or for the execution of sentences, and the implementation of educational and security measures, and the free movement of such data [6]
2.	Law no. 544 of October 12, 2001	free access to information of public interest
3.	Law no. 87/2006 for the approval of the Government Emergency Ordinance no. 75/2005	ensuring the quality of education
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5.	Order no. 3131/2018 of January 30, 2018	the inclusion in the curricula, for all university study programs organized in the higher education institutions of the national education system, of courses on ethics and academic integrity

It can be said that the European directives on quality in higher education are taken over by the management teams of Romanian universities, as can be seen in Table 1.9. Also, at the level of the higher education institutions, the objectives are reflected on all the activities that take place in the entity.

Given the fact that the reform of public institutions refers to decentralization we can say that the basis for the process of improving the quality of administrative activities is the activity of the secretariat. This is the main gateway through which the higher education institutions interacts with citizens.

The analysis of the university education system in the current situation but also of the existing tendencies highlights competencies and objectives such as:

- The content of educational activities should be based on teaching graduates the necessary skills in order to facilitate their much easier positioning on the labor market;
- The human resources involved in quality-risk management (teaching and research staff, auxiliary teaching staff and administrative staff) should have a high degree of training, their professional training being done continuously;
- The material conditions should ensure that the expectations of the beneficiaries are met, whether this includes time or space resources, or facilities;
- The quality of the activities of public higher education entities should be constantly assessed and self-assessed in order to develop a plan of measures to reduce risks and maintain quality at the highest possible standard.

1.6.1. The organization of the structures at the Faculty level and the specific activities of these structures

In order to be able to define the objectives and to establish which are the activities adjacent to these objectives, whether they are general or specific, it is necessary to know the department and the organization of the department on which we carry out this study. It is no coincidence that we chose a faculty secretariat, because it is characterized by complex and diversified activities.

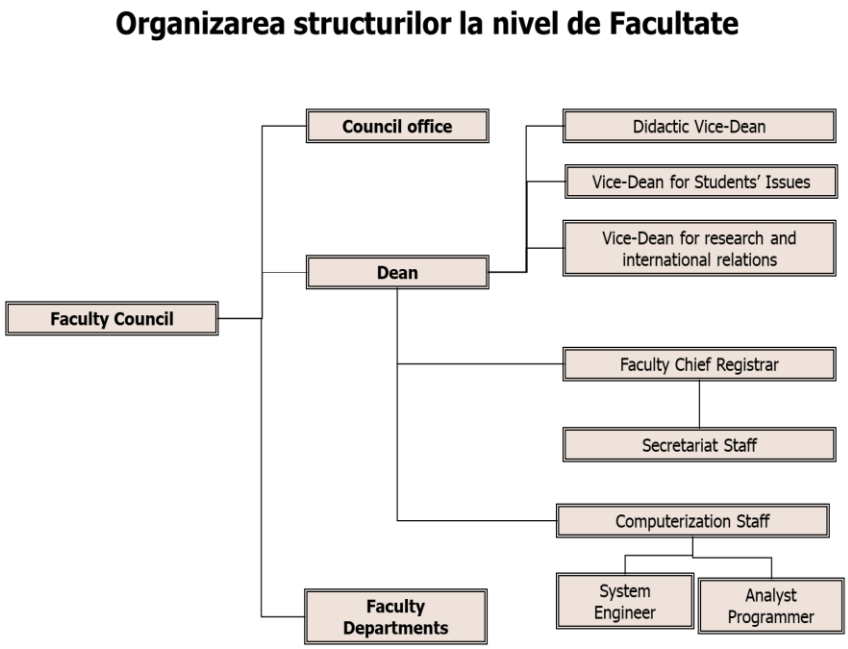

Fig. 1.12 Organization of structures at faculty level (author's contribution)

1.6.2. The organization of the Faculty secretariat

From a functional point of view, the secretariats corresponding to all levels of hierarchy are executive working structures served by auxiliary teaching staff who exercise their functions according to their job description.

1.7 CONCLUSIONS REGARDING THE CURRENT STATE

There are several agencies and associations both internationally and nationally that seek to stimulate and support the implementation of the principles of Total Quality Management at the level of higher education institutions. Among these the most important are the **International Network for Quality Assurance Agencies in Higher Education (INQAAHE) and the European Association for Quality Assurance in Higher Education (ENQA)**.

The analysis of the university education system in the current situation but also of the existing tendencies highlights competencies and objectives such as:

- The content of teaching activities should be based on promoting those skills in graduates that make it easier for them to enter the labor market;

- The human resources involved in the quality-risk management (teaching and research staff, auxiliary teaching staff and administrative staff) should have a high degree of training, their professional training being done continuously;

- The whole team should be involved in the risk management process, which should include all employees regardless of their level of participation in the self-assessment process;

- The material conditions should ensure that the expectations of the beneficiaries are met, whether this includes time or space resources, or facilities;

- The evaluation and self-assessment of the quality of the activities of public higher education entities should be done constantly in order to achieve a plan of measures in order to reduce risks and maintain quality at the highest possible standard.

Chapter 2

PRELIMINARY CONCLUSIONS AND OBJECTIVES OF THE DOCTORAL THESIS

2.1 CURRENT TRENDS IN RESEARCH ON QUALITY-RISK MANAGEMENT IN HIGHER EDUCATION

It is easy to see that at European level the aim is the alignment with **equal standards of quality and risk**. The economic success of a state is based on education.

By examining those issues that are rarely addressed in the literature, we list some preliminary conclusions:

- Taking into account the current society, which is extremely dynamic and constantly changing, there are some difficulties in approaching **risk management** and **quality management in higher education**, this system being extremely complex;
- There is also insufficient information on studies on **quality-risk** management and **the correlation between quality management and risk management in university education;**
- There is also insufficient information on **experimental studies** on self-assessment and **continuous quality improvement in the departments of the higher education institutions.**

The issue of risks is addressed in scientific papers even before 2015. The specialized papers focused on topics such as risk and risk management in public administration, and methods and techniques of risk management.

However, quality-risk management in a public university in Romania, applied and managed as provided by the new standard SR ISO 9001: 2015 is addressed to a small extent, thus leaving room for future research. This issue is topical and a study of quality-risk management in the Romanian academic environment can lead universities in our country to notable results in terms of implementing the quality standard mentioned. A correct implementation would lead to good quality risk management and therefore to high quality services at university level.

2.2 CONCLUSIONS

Following the bibliographic research studies that were performed and which are summarized in table 2.1, the following **conclusions** regarding the approaches performed **in connection with the topic of the doctoral thesis** result:

- There is a marked **development of theoretical and experimental studies on the issue of quality at the level of central and local public administration;**
- there is a marked **development of theoretical and experimental studies on the issue of quality in pre-university and university education;**
- What stands out is the research approach regarding **the development of techniques and methods of study of quality management in public administration**;
- There is a marked **development of theoretical studies on the problem of risk in university education;**
- there is **theoretical and experimental research of high scientific** value regarding the study of the cycle of **self-evaluation** and continuous **quality improvement at the level of public administration**;
- taking into account the current society, which is extremely dynamic and constantly changing, there are some difficulties in approaching **risk management and quality management in university education**, this system being extremely complex;

- There is also insufficient information on studies on quality-risk management and the correlation between **quality management and risk management in university education;**
- Similarly, there is insufficient information on **experimental studies** on **self-assessment and continuous quality improvement at the level of departments in higher education institutions.**

2.3 RESEARCH DIRECTIONS

Resulting from the bibliographic study carried out and from the presented conclusions that within the theme of the doctoral thesis the following research directions will be approached with reference to:

- **the theoretical and applied study of a model regarding the self-evaluation cycle in public administration;**
- **the theoretical and applied study on self-assessment of service quality – as a tool of quality management in higher education;**
- **the theoretical and applied study on risk in higher education;**
- **the theoretical and applied study on quality - risk management at the level of university education;**
- **an aplied study on the residual risk management method applied to a secretariat-type department considered as a subsystem.**

2.4 THE OBJECTIVES OF THE DOCTORAL THESIS

Quality-risk management in higher education institutions is an activity of extraordinary complexity. It involves the achievement of the highest standards of performance and competitiveness, regarding both the managerial and executive roles..

The thesis aims to define some of the concepts, terms and tools specific to quality-risk management used in quality assurance in higher education institutions.

2.4.1 Theoretical objectives of the doctoral thesis

As a result of the conclusions resulting from the bibliographic analysis performed and the study performed on the current state of research on the quality-risk management system in higher education, the thesis aims to achieve the following objectives:

1. Studies on self-assessment of service quality - a tool for quality management in public administration and higher education:
    - Self-assessment - a tool of quality-risk management;
    - A self-evaluation model at the level of public administration;
    - Residual risk management method applied to a secretariat-type department regarded as a subsystem.

2. Risk studies in higher education:
    - Quality-risk correlation;
    - Hierarchy of risks.

3. Studies on the quality - risk management system in university education:
    - The correlation between quality management and risk management;
    - Self-assessment-risk correlation.

2.4.2 Practical objectives of the doctoral thesis

Based on successful research results and theoretical contributions, the doctoral thesis aims to carry out a case study on the **Residual Risk Management Method** applied to a secretariat-type department considered as a subsystem by conducting:

- Experimental research on the self-evaluation process in the secretarial department - as an information subsystem - within the university;
- The simulation of the algorithm of the self-assessment-risk process;
- The elaboration of an operational procedure and a plan for professional training and instruction of auxiliary and non-teaching staff;
- The completion of a risk register at secretarial department level.

The current trend at EU level is to align all public institutions in EU member countries with the European standards. The process of decentralization and alignment with EU practices is the main goal of risk management and ongoing reform at European public administration level.

Risk and risk management are those elements brought to the forefront by SR ISO 9001: 2015 standards and the aim is to increase the complexity of activities carried out in public institutions, using SELF-ASSESSMENT as a main tool in quality management.

Precisely for this reason, the chosen topic touches on a contemporary issue, as it attempts to bring a small contribution to research in the vast field of quality-risk management at university level.

Chapter 3

THEORETICAL DEVELOPMENTS AND CONTRIBUTIONS REGARDING QUALITY-RISK MANAGEMENT AT THE LEVEL OF HIGHER EDUCATION

3.1 Establishing general and specific objectives

The higher education institution will define its objectives related to the main mission of the entity in compliance with its laws, regulations and internal policies. The first step in quality-risk management at university level is to set objectives, both at general and specific level. Setting goals is done out of a desire to support the vision of the university and its management team.

If the setting of objectives is the responsibility of the university management, their achievement is the responsibility of both the management and the employees.

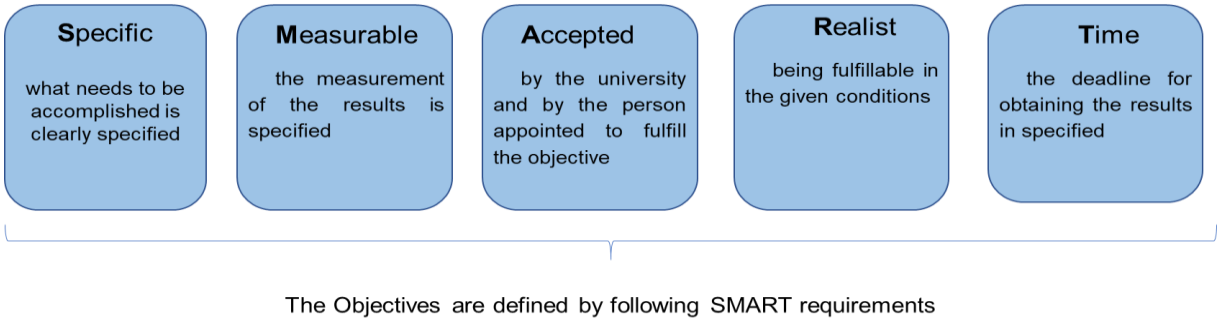

Fig. 3.1 SMART requirements used in the definition of objectives (adapted after [102])

3.2 Risks' identification

Risk identification is the second step in quality-risk management. Risk identification consists in discovering and defining all possible risks and their sources. The main goal is to reduce these risks.

The risk identification stage ends with the completion of the Risk Alert Form for each newly identified risk, or through the drawing up of the List of objectives, activities and risks.

3.3 CONTRIBUTIONS REGARDING PARTICULARITIES IN EXAMPLES REGARDING SELF-ASSESSMENT IN THE SECRETARIAT-TYPE DEPARTMENT - AS AN INFORMATION SUBSYSTEM - WITHIN THE UNIVERSITY

3.3.1 Model regarding the self-evaluation cycle in the university

The main method of measuring the quality of services is SELF-ASSESSMENT. Through self-evaluation one can identify the level of performance of public institutions in relation to quality standards. What is desired through self-evaluation is the monitoring of the progress of the management of public institutions and its efficiency.

This self-assessment tool for public administration activities refers to the techniques by which the employees identify weaknesses and strengths in the process of functioning of the institution and make proposals to provide solutions to improve the activities concerned (Petrescu, 2008).

Being a relatively new tool, self-assessment has innovative potential. It starts from within the organization, and this is both a positive aspect and a challenge. The self-assessment should start with an assessment aimed at identifying the improvement measures to be applied. Self-assessment also offers the possibility of external feedback.

In this chapter I have proposed a Self-Assessment model as it can be seen in the following figure.

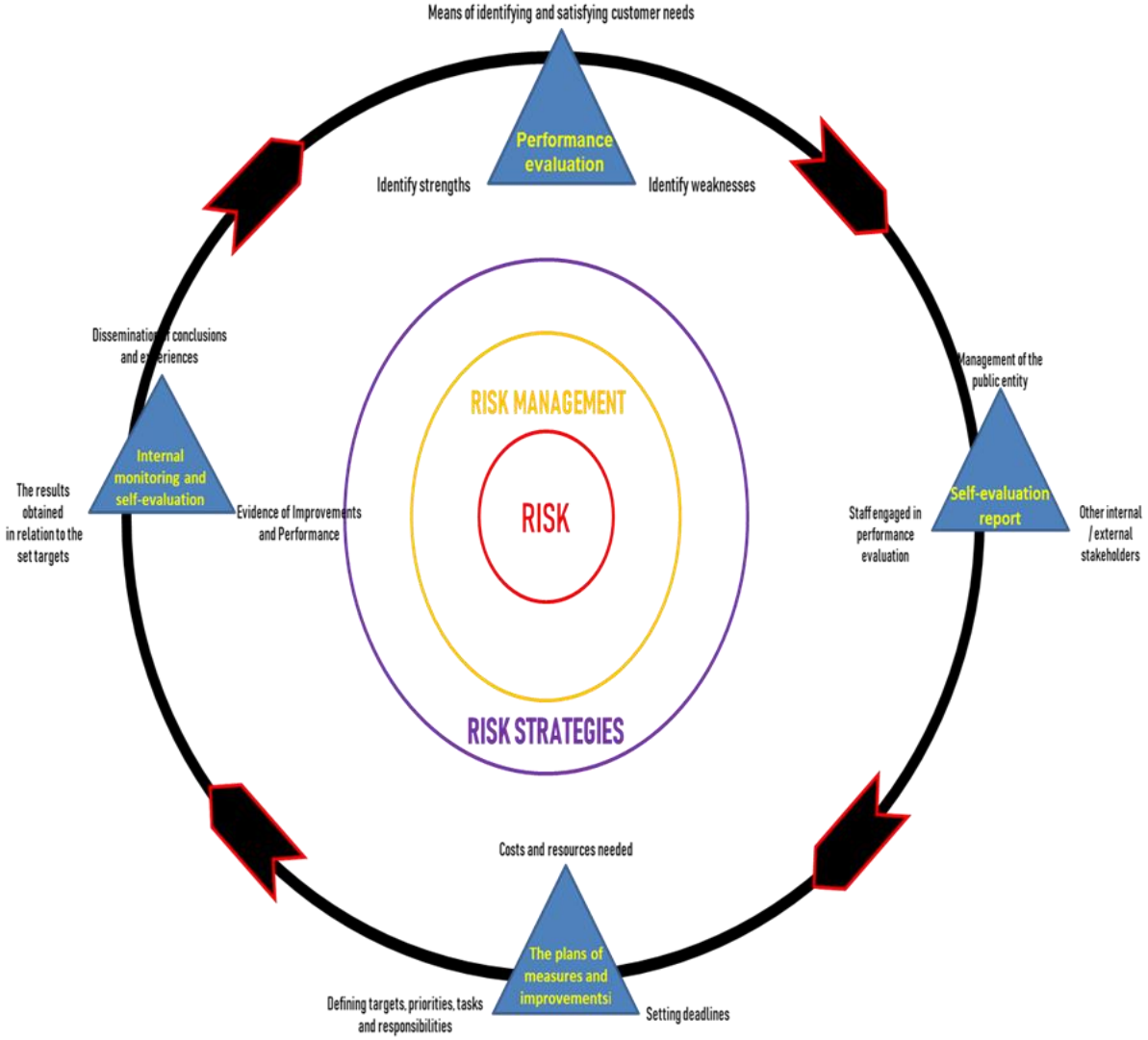

Fig. 3.2 The self-assessment cycle in public administration (author's contribution)

As shown in Figure 3.3, the process of self-assessment and continuous improvement has several stages: performance evaluation, self-assessment report, action and improvement plan targeting improvement targets and action plans, then internal monitoring and self-assessment, this stage aims to find out to what extent the action plans have been implemented and to what percentage the proposed targets have been achieved, and the last step is the external evaluation [43].

3.3.2 Research study on the interconnectivity between SELF-ASSESSMENT and RISK, seen as a whole, in a self-assessment - risk process (inputs-outputs)

Next, I have conducted a research study on the interconnectivity between SELF-ASSESSMENT and RISK, seen as a whole, in a process of self-assessment - risk (inputs-outputs). Self-assessment and risk are in a permanent mutual correlation. The effectiveness and efficiency of management in the higher education institution is based on these two notions, self-assessment and risk, and they practically cannot exist independently of each other. It is obvious that self-assessment is based on the size of the initial risks and results in residual risks, so we can say that the two are dependent on each other.

Considering the previously analyzed notions, we can define the SELF-ASSESSMENT-RISK CORRELATION as a reciprocal link between the two.

At this point I have defined and measured the initial risk and the residual risk and calculated the value of the ratio between the two risks with the goal of quantifying the impact that the plan of measures had on the activities of the evaluated process.

Regarding the risk indicators, during the research I have identified two cases:

a) **Small indicators define high quality.** An example would be the absence from work of employees. The initial goal is for the number of missing employees to be zero. This means that the indicator for this goal must be zero.

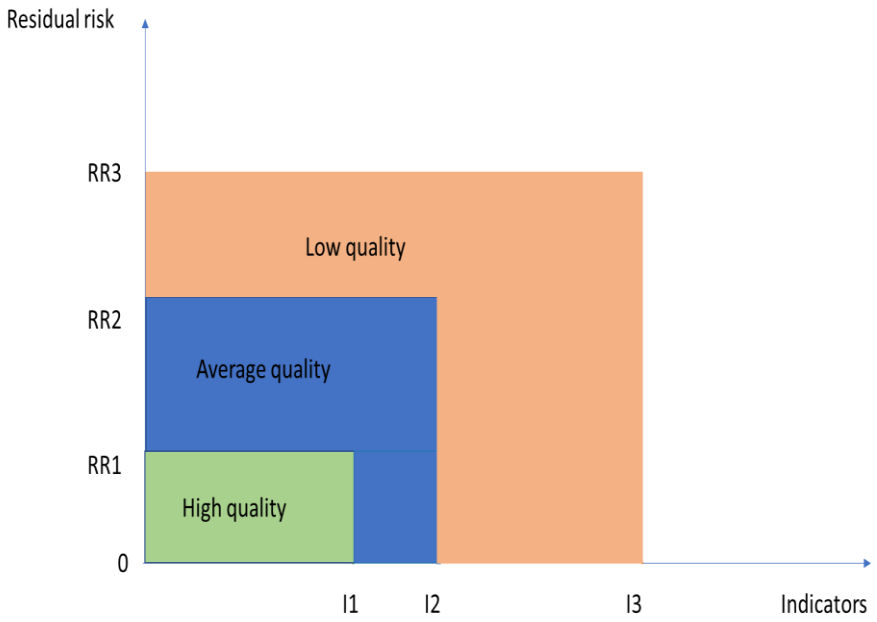

Fig. 3.5 Quality ranking – case 1 (author contribution)

In conclusion, low indicators and low residual risk will result in a higher quality of services. The higher the residual risk and the higher the objective indicator, the lower the quality, as they are inversely proportional, as can be seen in the following graph.

b) **High indicators define high quality.** A concrete example is when the goal is to download all the marks from the classbooks during an exams session. The more grades are downloaded, the higher the quality of the indicator. Residual risk influences quality in an inversely proportional manner, as in the previous case.

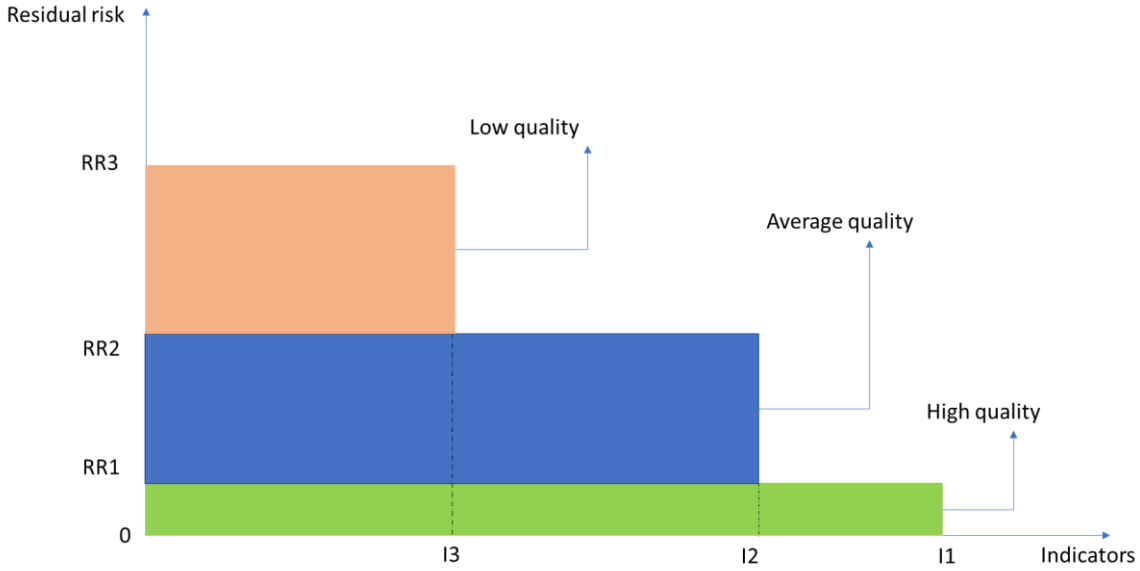

Fig. 3.6 Quality ranking - case 2 (author's contribution)

It can be noticed that the minimization of the residual risk and the achievement of the proposed objectives for each activity determines the size of the process quality. The higher the quality and the lower the residual risk than the inherent risk, the more effective was the action plan that was implemented.

3.3.3 Quality indicators. Generation, definition and analysis

This stage manages to define the quality indicators as well as the indicators of the achieved objectives, following an analysis of these indicators..

$$I_C = \frac{C\ achieved}{C\ proposed} * 100\ [\%] \quad (3.4)$$

where:
I_c represents the quality index;
$C_{achieved}$ represents the achieved quality;
$C_{proposed}$ represents the proposed quality.

B) Analysis of quality indicators

This study aims to analyze two quality indicators in the self-assessment-risk process, namely quality indicators for two objectives with high and very high risks.

$$I_C = \frac{R_{OB} * I_{OB}}{RR_{OBR} * I_{OBR}} * 100 \quad [\%] \quad (3.8)$$

By analyzing these indicators, we can determine whether the self-assessment-risk process is an efficient one. The higher the quality indicator, the more effective the implementation of the plan is. Thus, the demonstration of the interconnectivity between self-assessment and risk as a Self-Assessment-risk system can be achieved. Its goal is to obtain a high quality of services and to minimize risks in the subsystem - the secretarial department of a higher education institution.

3.3.4 The plan of measures. Procedures

When we talk about a plan of measures, we are actually discussing system procedures and operational procedures. We have defined the efficiency and effectiveness of a procedure with the calculation formulas related to each one.

In this chapter I have proposed a method to optimize the residual risk management process in a self-assessment-risk process. This model can be easily applied in different situations, for example, at subsystem level or at system level.
These procedures as well as the risk will be measured through two dimensions:

1. **Efficiency** = having a useful effect, resulting in a certain useful effect.
2. **Effectiveness** = the quality to produce the expected positive effect.

Thus, efficiency tells us if a procedure has a positive effect, and effectiveness will show us to what extent it has managed to minimize the risk, or in other words if the residual risk is minimal. Given the definition of efficiency and effectiveness, we can say that efficiency shows us whether the procedure has a positive effect and manages to bring the residual risk to a lower value than the initial value of the risk. The effectiveness of the procedure refers to how well this procedure achieves its purpose, namely if the risk has an exposure value lower than the tolerance limit, 5 in this case.

To calculate the Efficiency and Effectiveness of a procedure, the following formulas will be used:

$$Efficiency_{PO0ij} = \frac{probability\ ROB0i-Aj}{probability\ RROB0i-Aj} * 100\ \ [\%] \tag{3.12}$$

where:

- Efficiency $_{PO0ij}$ represents the efficiency of the procedure applied to the risk of the activity Aj, of the objective OB0i;
- The probability Ri represents the probability of occurrence of the initial risk of the activity Aj, of the objective OB0i;
- The probability RRi represents the probability of occurrence of the residual risk of the activity Aj, of the objective OB0i;
- i=1..n;
- j=1..m;
- n represents the maximum number of objectives;
- m represents the maximum number of activities.

$$Effectiveness_{POij} = \frac{impact\ ROB0i-Aj}{impact\ RROB0i-Aj} * 100\ [\%] \tag{3.13}$$

where:

- Effectiveness PO0ij represents the effectiveness of the procedure applied to the risk of the activity Aj, of the objective OB0i;
- Impact Ri represents the impact of the initial risk of the activity Aj, of the objective OB0i;
- Impact RRi represents the impact of the residual risk of the activity Aj, of the objective OB0i;
- i=1..n;
- j=1..m;
- n represents the maximum number of objectives;
- m represents the maximum number of activities.

3.3.5 Conclusions

In this chapter I have proposed a **method for the optimization of the residual risk management process** in a self-assessment-risk process. This model can be easily applied in different situations, i.e.: at subsystem level or at system level.

After identifying the main objectives within the analyzed department and defining the activities related to each objective, I have applied the model for a secretarial department within a university. (Chapter 4).

Chapter 4
DEVELOPMENTS AND PRACTICAL CONTRIBUTIONS REGARDING QUALITY-RISK MANAGEMENT IN PUBLIC ADMINISTRATION

4.1 The identification the objectives and activities related to their achievement

In Chapter 4 I have carried out a practical study at the level of the secretarial department, namely, I have implemented the risk management model developed in the previous chapter.

The first step is to identify the objectives and activities related to their achievement. The next step in the process is to attach the risks to the previously defined activities and to choose a risk for each activity. I have also defined the indicators for each activity attached to the three defined objectives.

Risk assessment also involves defining several elements, such as:

Risk probability;
The impact of the risk on the objectives and activities related to them;
Risk exposure. It is calculated according to the formula:

$$E_{Ri}=P_{Ri}*Imp_{Ri} \quad (4.1.)$$

where:
E_{Ri} represents the exposure to risk Ri;
P_{Ri} represents the probability of the apparition of risk Ri;
Imp_{Ri} – the impact of risk Ri.

4.2 Contributions to the improvement of residual risk management methods applied to a secretariat-type department regarded as a subsystem

After having gone through the first stage in the previous subchapter (namely, I have established the objectives and the activities related to these objectives and the initial risks), what follows is a presentation of the second stage, which involves taking over the data and centralizing them.

Given that it is desired to achieve a high level of quality, it is assumed that this quality can only be achieved by meeting the objectives in proportion of 100%.

For this reason, I have established that the initial objectives have an optimal value of 100%, and the risk tolerance in this department can reach a maximum value equal to 5 from the very beginning of the self-assessment-risk process.

Activities affected by these risks will be subject to a system procedure or, as the case may be, an operational procedure. The implementation of some procedures aims at organizing the activities in such a way that the values of the residual risks obtained fall within the accepted range, of maximum 5.

Thus, there are two possible scenarios:

1. The value of the residual risks is in the tolerance range, i.e. it is less than 5, and in this case it is proceeded to the next stage;
2. The value of the residual risks exceeds the maximum accepted value, namely they are higher than 5 and then the action plan is revised, the old procedures are improved or new ones are designed.

Table 4.2 Summary table of the results of the self-assessment-risk process (author's contribution)

Nr. crt	*OBIECTIV PROPUS/ COD-OBIECTIV*	*ACTIVITĂȚI*	*INDICATORI* $I = \frac{realizat}{propus} * 100[\%]$	*RISC INERENT*			*PLAN DE MĂSURI*	*RISC REZIDUAL*			*Raportul RISC INERENT / RISC REZIDUAL*	*INDICATOR OBIECTIV REALIZAT*	*INDICATOR AL CALITĂȚII*
				Probabilitate	*Impact*	*Expunere*		*Probabilitate*	*Impact*	*Expunere*			
1.	**OB** 01	OB_{01-A1} OB_{01-A2} OB_{01-A3}	950/1000= **95%**	2	1	**2**	Nu	2	1	**2**	**1**	**93,92**	**1%**
			7/8=**87,5%**	1	3	**3**	Nu	1	3	**3**	**1**		
			267/269=**99,25%**	1	4	**4**	Nu	1	4	**4**	**1**		
			248/255=**97,25%**	3	1	**3**	Nu	3	1	**3**	**1**		
2.	**OB** 02	OB_{02-A1} OB_{02-A2} OB_{02-A3}	7/8=**87,5%**	2	2	**4**	Nu	2	2	**4**	**1**	**94,92**	**1%**
			8/8=**100%**	1	1	**1**	Nu	1	1	**1**	**1**		
3.	**OB** 03	OB_{03-A1} OB_{03-A2} OB_{03-A3}	5/8=**62,5%**	3	2	**6**	PO-031	**1**	**2**	**2**	**3**	**64,16**	**1,80%**
			4/5=**80%**	1	4	**4**	Nu	**1**	4	**4**	**1**		
			2/4=**50%**	2	4	**8**	PO-033	**1**	**4**	**4**	**2**		

Finally, I have described and applied the risk management method by calculating the initial and residual risk exposure using the two dimensions of risk, impact and probability.

I have followed the evolution of the risks and the quality indicator, but also the interdependence between the quality index, the initial risks, the residual risks, and the efficiency and effectiveness of the implemented procedures, with the help of the charts.

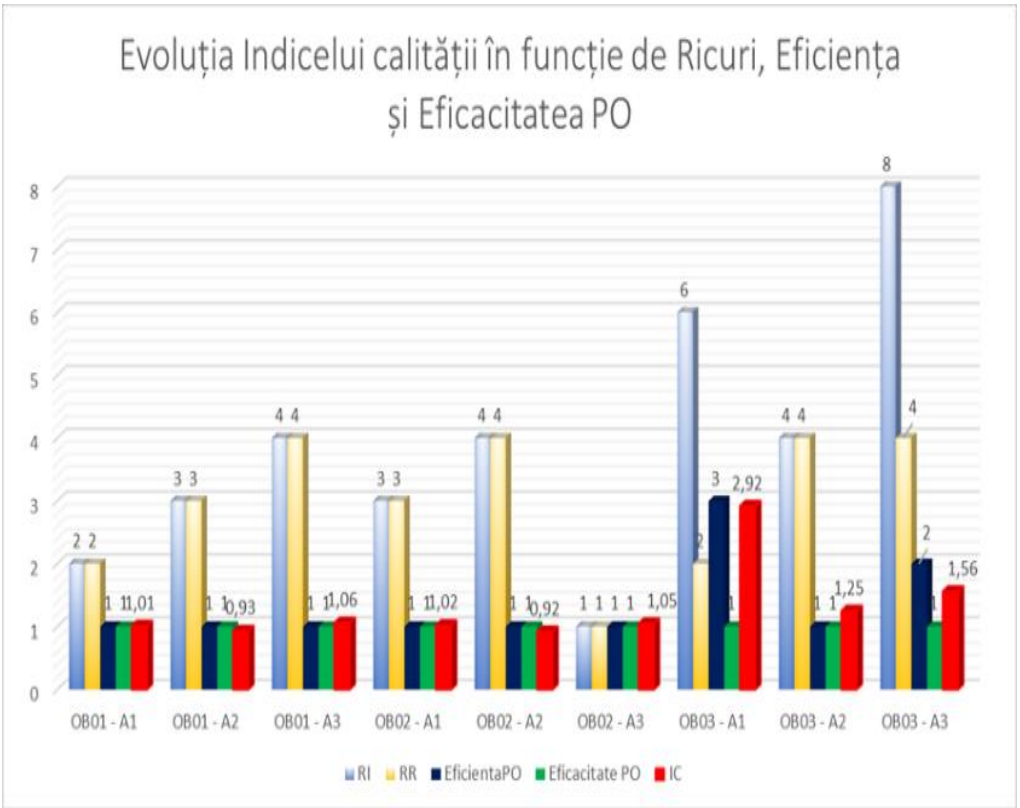

Fig. 4.3 Evolution of the quality index according to risks, efficiency and effectiveness of the OP

At the end of the analysis I have developed an algorithm regarding the management of the Self-Assessment-risk process with the mathematical model of the management of the Self-Assessment-Risk process (**MMGPAR**).

I have summarized everything in a graphical representation of the Self-Assessment-Risk process management algorithm.

4.2.1 Algorithm regarding the management of the Self-assessment-risk process

1. Definition and formalization

1.1 **The Risk-Self-Assessment Process** is an organized set of activities which interact in order to minimize initial risks resulting in minimal residual risks.

1.2 **Self-assessment** is a tool for identifying weaknesses and strengths, based on internal and external indicators. Self-assessment proposes solutions to improve the targeted activities.

1.3 **Risk**

1.3.1 **The inherent** risk is that type of risk which occurs when the process is exposed to a certain hazard, before the application of the measures provided in the action plans that aims to reduce that risk.

1.3.2 When the process is exposed to a certain risk, after the plan of measures has been drawn up and measures have been taken to minimize that risk, the resulting risk is called **residual risk**.

1.4 **The managing of the Self-Assessment-Risk process** from the following points of view:

- **Micro:** at subsystem / department level within the higher education institution;
- **Macro:** at the level of the institution and other universities;
-

2. The mathematical model of the management of the Self-Assessment-Risk process (*MMGPAR*)

4.2.2 Graphical representation of the Self-Assessment-Risk process management algorithm

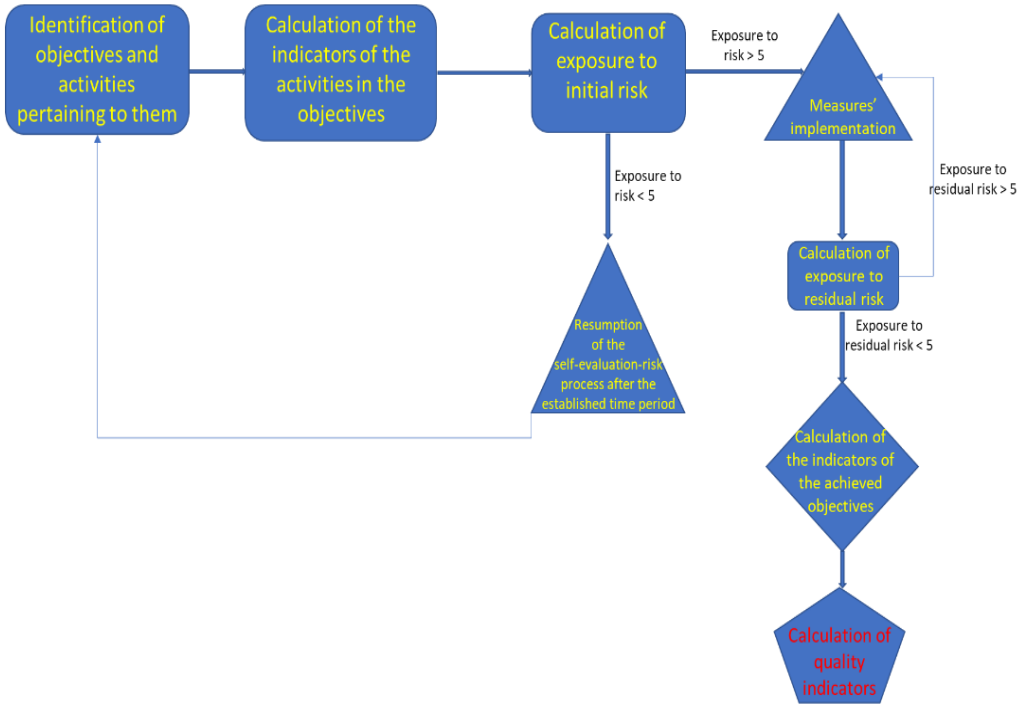

Fig. 4.6 Management algorithm of the management-Risk process (author's contribution)

The first step of the algorithm consists in the identification of the objectives and their activities.

Step 2 defines the initial risks that threaten the achievement of the initial objectives, and then identifies the objectives achieved and calculates the indicators of these objectives. If a risk tolerance equal to 5 is adopted from the beginning of the self-assessment-risk process, after calculating the value of the initial risk exposure, two situations can be distinguished:

I) The initial risk exposure is less than 5. In this case, the self-assessment-risk process will be resumed from step 1;

II) The initial risk exposure is greater than 5. In this case the process continues with step 3.

In **step 3**, the procedures to be implemented will be identified in order to minimize the values of the initial risks, the efficiency and effectiveness of each procedure will be calculated using formulas 4.13, respectively 4.14.

Next, **in step 4**, the residual risks that arise as a result of the implementation of the plan of measures will be identified, namely the operational procedures or system procedures that were established in step 3. The residual risk exposure will also be calculated, and two cases can be distinguished in this respect:

I) The residual risk exposure is higher than 5 and then the risk-self-assessment process is resumed from step 3.
II) The residual risk exposure is less than 5 and then it is proceeded to step 5.

What follows next is **Step 5**, which involves calculating the risk ratio according to formula 4.15. Depending on the value of the risk ratio, 3 cases can be identified:

I) When the risk ratio is sub-unitary, the self-assessment-risk process from step 3 will be resumed and the procedures in the plan of measures will be optimized or replaced;
II) When the value of the risk ratio is equal to the unit, the self-assessment-risk process will be resumed from step 3 and the procedures of the action plan will be optimized;
III) When the value of the risk ratio is superunitary, the self-assessment-risk process will be continued (by proceeding to step 6).

Step 6 involves calculating the indicators for each objective achieved, using formula 4.16.

In **step 7**, the quality indicator will be calculated for each objective with an impact on the process. Formula 4.17 will be used.

Step 8 involves calculating the quality indicator of the whole self-assessment-risk process according to the initial risk, residual risk, and to the indicators of initial objectives and the indicators of residual objectives using formula 4.18, but also according to the efficiency and effectiveness of procedures used and the ratio of indicators of the initial and residual objectives, using formula 4.21.

Step 9 involves analyzing the value of the quality index obtained in step 8.

Also, personal contributions regarding the following have been presented in Chapter 4::

1. The **elaboration of a procedure for the professional training of auxiliary and non-teaching staff**. The procedure aims to establish the methodology for conducting professional training courses by university employees. The procedure specifies the steps to be taken to establish the necessary training and the responsibilities of the persons involved.
2. The elaboration of a **professional training and instruction plan for the auxiliary and non-didactic teaching staff**, as an annex of the operational procedure mentioned above. The professional training and formation plan presented below aims to clarify and organize the whole professional training process for auxiliary and non-teaching staff. The operational procedure and the professional training plan can be successfully implemented in the secretarial department of the University.

3. The elaboration of a **Register of risks in the secretarial department** of the University, centralizes the results of the analysis and of the process implemented in Chapter 4.

Chapter 5
FINAL CONCLUSIONS AND PERSONAL CONTRIBUTIONS

5.1 FINAL CONCLUSIONS

The following **final conclusions** can be drawn from the analysis of the current state of the theoretical and applied approaches, respectively through the implementation of case studies in the field of quality, in the field of risk and from the research **on quality-risk management in public administration**, respectively at the level of faculty secretariat:

A) The fundamental change of the relationship between the administration and the citizen is made through:

- the achievement of a public service for the exclusive benefit of the citizen / student / entrepreneur;
- increasing the rigor in motivating and formulating the answers, as well as shortening the deadlines in which the public authorities and services have the obligation to respond to the citizens' requests;
- elimination of bureaucratic bottlenecks in the central and local administration, which citizens and economic agents face;
- the consolidation and broadening of the framework for the participation of civil society in the decision-making process ;
- improving the functioning framework of participatory democracy;
- ensuring the transparency of administrative acts and operative communication with citizens / students.

B) the main goal of the public administration reform in Romania is to create a modern and efficient administration, close to the needs of the citizens, which should meet all the requirements of the democratic society including that of economic efficiency.

We conclude that the priority in public administration reform is <u>communication with the citizen or more precisely the student.</u>

- **strategies and directions of action can be established** with the main beneficiaries: **the citizen in the case of central and local public administration, respectively, the student in the case of higher education**.

The fundamental objective of these activities is to create an **adequate academic** environment to facilitate the development of awareness – on behalf of the **higher education institution** - of the role and importance of quality-risk management, namely increasing the quality of services provided while minimizing risks of any kind, as the main determining factor of competitiveness.

5.2 PERSONAL CONTRIBUTIONS

Taking into account the complex aspects of quality-risk management in university education, we can distinguish several **original contributions**, the most important of which are, from a theoretical and practical point of view, the following:

5.2.1 Theoretical contributions:

- the problem of quality-risk management **is presented in an overview of all involved aspects**: current stage, evolution, characteristics, hypostases;
- the problem of quality management as well as the problem of risk management are thoroughly presented, including the role and influence of the implementation and certification of the quality management system according to the ISO 9001 standard, respectively the quality-risk correlation in public administration in general and in higher education in particular.
- the problem of risk is studied both at the level of the entity and at the level of the structure;
- taking into account the importance of economic aspects in the risk study, **some models are developed regarding the elaboration of the plan of measures for minimizing the risks at the level of the faculty secretariat**;

5.2.2 Practical contributions:

- a method for managing residual risks applied to a secretariat-type department as a subsystem is proposed;
- an algorithm regarding the management of the Self-Assessment-risk process is proposed;
- the elaboration of an **operational procedure regarding the professional training of the auxiliary and non-didactic teaching staff**;
- the elaboration of a **professional training and instruction plan for the auxiliary and non-didactic teaching staff;**
- **the** elaboration of a **risk register in the secretarial department** of the university.

5.3 FUTURE DIRECTIONS FOR RESEARCH IN THE APPROACHED FIELD AND CAPITALIZATION OF RESULTS

The paper is of interest as a source of documentation in the field of quality-risk management by addressing the systemic problems that were considered and their specific application in the field of public administration, at university level, where the university is assimilated to public institutions. The study reaches a more detailed level, that of the secretarial department regarded as a subsystem.

The entire material included in the paper can come to the aid of higher education specialists, through the information that is presented in the field of quality, self-assessment and risk applied in any system and subsystem of higher education entities.

Therefore, in conclusion, the author of the paper considers the SELF-ASSESSMENT PROCESS-RISK as the **main objective** of QUALITY management at the level of public administration and **the determining factor of competitiveness and integration of the Romanian education system in the European education system and, why not, worldwide**.

The paper paves the way for future research on RISK MONITORING METHODS.

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