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RESEARCH ON IMPROVING ORGANIZATIONAL PERFORMANCE OF INDUSTRIAL SERVICES

PhD Thesis Summary

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INTRODUCTION

In the literature, one of the most discussed topics in recent years refers to organizational performance, a topic highlighted by the concerns of companies in recent times, which although quite varied, most revolve around the same goal - improving organizational performance.

This doctoral thesis aims to research improving organizational performance in the area of industrial service. The main objective of the doctoral thesis is to develop an instrument used to identify solutions to improve the organizational performance of companies in the service industry and to achieve excellence.

Several specific objectives are derived from the main objective. These specific objectives will form the basis of the structure of the doctoral thesis.

- **O_1**- Identification of research directions regarding the measurement of organizational performance in the services industry, based on the analysis of the specialized literature;

  • **$O_{1.1}$**- Identifying the most common concepts that describe the performance of companies in the field of services;

  • **$O_{1.2}$**- Identifying the financial indicators that are the most used to measure the performance of the service companies;

  • **$O_{1.3}$**- Identifying the main criteria used for the evaluation of Romanian service companies;

- **O_2**- Identifying the main processes that contribute to improving the organizational performance of companies in the service industry;

  • **$O_{2.1}$**- Determining the main processes within a service provider;

  • **$O_{2.2}$**- Analysis of the influence of the main processes of a service provider on the organizational performance;

- **O_3**- Development of an instrument that can help a company to improve its organizational performance and achieve excellence;

  • **$O_{3.1}$**- Alignment of the EFQM excellence model with the APQC operational model;

  • **$O_{3.2}$**- Development of an instrument that can help a company to improve its organizational performance and strive for excellence;

  • **$O_{3.3}$**- Validation of the proposed instrument within a company providing industrial services.

To achieve the main goal of the doctoral thesis, several studies were carried out, as follows:

- "Bibliographic research on identifying the main concepts that are associated with measuring the organizational performance in the field of industrial services";
- "Bibliographic research on identifying the financial indicators that are the most used to measure the organizational performance of the service companies";
- " Documentary research on determining the main criteria used to evaluate Romanian companies in the field of services";
- "Research on determining the main processes of the service companies";
- "Research on analyzing the influence of the main processes of a service provider on the organizational performance";
- "Study on the alignment of the EFQM excellence model with the APQC operational model";

- "The development of the analysis instrument used to improve organizational performance and achieve excellence - PACEEx";
- "Comparative study on the advantages of the PACEEx instrument and other methods of evaluating organizational performance";
- "Study on the evaluation of the usefulness of the PACEEx instrument within the analyzed company".

This doctoral thesis brings important contributions both theoretically and practically, the results of the thesis being useful both for practitioners and for scientific researchers in academia.

CHAPTER 1. THE CONTEXT AND GENERAL STRUCTURE OF THE DOCTORAL THESIS

For almost a century, organizational performance has been associated with the philosophy of total quality management, this philosophy being used by many companies to improve their activities, processes, or even their performance (Alonso, et al., 2006). However, previous models associated with quality management have made the transition to business excellence models (Mann, et al., 2011), where excellence refers to "achieving and sustaining higher levels of performance that meet or exceed the expectations of all stakeholders" (EFQM, 2020).

Regarding the area of excellence, it can be stated that one of the most used business excellence models in Europe is the EFQM model. Through this business excellence model, companies can assess their performance and identify areas where it excels or areas where they should make improvements to continually increase their value. Another area in which companies have begun to look for solutions to improve organizational performance is the area of organizations specializing in benchmarking, performance improvement, and merit recognition. American Productivity & Quality Center - APQC is one of the most important authorities in the world in terms of benchmarking, process improvement, and organizational performance (APQC, 2020).

In Romania, there are problems both in terms of applying the business excellence models (Drăgulănescu & Acomi, 2018) and in terms of defining the existing processes within an organization. If we refer strictly to the EFQM excellence model and the operational model offered by APQC, despite their notoriety and the potential benefits that can be obtained from their application, the two models approach the issue of performance differently. This causes these models to be approached separately by organizations that want to improve their performance, thus concentrating their efforts in one direction.

On this foundation stands the need for this doctoral thesis, which highlights the discrepancy between the APQC operational model and the EFQM excellence model, especially in the service industry. Despite the advantages offered by them, the company faces the problem of allocating considerable resources in the area of their implementation, as the two models still have barriers to work that cannot be overcome without special knowledge in this field or specialized help. Companies need to choose how to dose their effort, developing their business based on a certain model. These models are not yet fully aligned, which implies different ways of organizing information.

Thus, the topic of the doctoral thesis refers to a current issue, important in the field of improving organizational performance in the service industry. The novelty brought by the doctoral thesis consists in an alignment of the EFQM excellence model with the operational model APQC, as well as in the elaboration and validation of the PACEEx analysis instrument within a company providing industrial services. Both the alignment of the two models and the developed instrument bring important contributions in the theoretical field, providing a unitary framework for improving organizational performance. The instrument involves determining performance improvement measures based on the results obtained by reviewing the proposed algorithm, with great emphasis on determination, internal process analysis, and process standardization, aspects that contribute to consolidating and expanding the process architecture. In addition, the PACEEx instrument, developed based on the alignment made, makes important contributions in practice, with companies making less effort in terms of resource allocation, benefiting from both the advantages of using the EFQM excellence model and the advantages of the APQC operational model.

This doctoral thesis consists of 7 chapters, comprises 24 annexes, and covers 304 pages.

The first chapter includes the general presentation of the doctoral thesis, which highlights the research context, the importance and scientific relevance of the topic, the problems identified in the research field, the objectives of the doctoral thesis, the expected results, and the structure of the thesis.

The second chapter deals with the subject of measuring the performance of organizations in the field of industrial services. First, the concepts used to measure organizational performance are defined and addressed, and then the methods used to measure the performance of organizations in the service industry are analyzed.

The third chapter presents the transition from the general concept of services to that of industrial services, highlighting the place of industrial services in the service industry. Also, this chapter presents the five main categories of industrial services in Romania, categories for which are addressed issues related to the definition of the service, operating schemes, their place in the economy, advantages, and disadvantages.

The fourth chapter aims to highlight the importance of improving processes within a service industry organization, as well as the role of identifying the main processes that contribute to improving the organizational performance of service industry companies.

The fifth chapter presents the development of the PACEEx analysis instrument used to identify solutions to improve the organizational performance of companies in the service industry. In this regard, the research aimed at aligning the EFQM excellence model and the operational model developed by APQC is presented. The results of this research are the basis for the development of the mentioned instrument, for which are presented the phases of documentation, design, elaboration, as well as the advantages of using the PACEEx instrument.

Chapter six aims to validate the PACEEx analysis instrument through a case study applied to a company providing industrial design and consulting services.

Chapter seven presents the conclusions of the doctoral thesis, as well as the perspectives and future research directions. In addition, personal contributions are highlighted, the paper ending with the list of the published and presented papers in scientific events

CHAPTER 2. THE CURRENT STATE OF RESEARCH ON MEASURING ORGANIZATIONAL PERFORMANCE IN THE SERVICE INDUSTRIES

Often, performance is seen as a concept, which can be operationalized through other concepts for which indicators can be found more easily. The classical approach to performance measurement provides that this is a complex relationship between six performance criteria: effectiveness, efficiency, quality, productivity, innovation, and profitability (Rolstadas, 1998).

The current state of research that focuses on the concept of "performance" is completed by the determination of the most used elements that are associated with measuring the organizational performance of the industrial service companies. This objective is achieved through bibliographic research - "Bibliographic research on identifying the main concepts that are associated with measuring the organizational performance in the field of industrial services", whose results indicate that financial indicators, customer orientation, customer loyalty and satisfaction, investment in technology, equipment, information systems, cost reduction, processes, satisfaction, development, education, and training of employees are the most analyzed elements when it comes to measuring the organizational performance of a company in the field of industrial services.

As the results of this first research indicate that financial indicators are the most used when measuring the performance of a company, another bibliographic research is conducted - "Bibliographic research on identifying the financial indicators that are the most used to measure the organizational performance of the service companies", which, this time, aims to determine the most important financial indicators that are used by companies in the service industry to measure organizational performance. The research indicates that return on assets (ROA), return on equity (ROE), and sales value are the financial indicators that are the most used to measure organizational performance.

In addition, another secondary research is carried out - "Documentary research on determining the main criteria used to evaluate Romanian companies in the field of services", which is based on consulting the 3 most important ranking of Romanian performing companies: "Top 50 best-performing companies in Romania", "The World Skills Romania Awards in Strategy and Performance", "National Top of Companies". Following this research, it was found that the most important criteria used to evaluate Romanian service companies refer not only to the financial part but also to the way it is conducted, to how the processes within the companies are approached and implemented, how the human resource is used, its satisfaction, everything related to customers and the evolution on the market, as well as the satisfaction of the other stakeholders.

From the analysis of the results of the bibliographic researches, it was found that there is still a possibility to make important contributions in terms of measuring the organizational performance of the service companies, there is still much potential in this area. The results also indicated that improving the performance of service industry organizations through process approaches (as vectors of improvement) has been less treated so far, which can lead to new solutions to improve the organizational performance of service companies, especially if the research focuses on analysis and process improvement.

The above-mentioned results are also supported by the methodologies for applying the excellence models and the methodologies for excellence awards, which emphasize that the orientation towards customers, employees, other stakeholders, but also the orientation on processes should be part of the ongoing concerns of service organizations. However, the study of the literature has shown that in

Europe, models of excellence are easier to use by large, professional organizations, which are not so sensitive to the high costs associated with consulting, managing, and evaluating it.

Following the analysis of the EFQM excellence model, the existing situation in Romania regarding the companies that tend to obtain excellence awards and the characteristics offered by the process taxonomy made by APQC, it is found that there is a problem both in terms of application the excellence model within Romanian companies, as well as in terms of defining existing processes within an organization in the service industry.

On one hand, the operational models according to which European companies operate are not aligned with the EFQM excellence model (which includes a series of criteria that cannot be met following the application of the processes in the company's operational model). On the other hand, within the operational working models, such as the APQC model, some processes and activities take place, and the excellence model makes no reference in its criteria to these elements. There is only one common area in which the EFQM excellence model aligns with the APQC operational model, the other two areas not yet being integrated into a complete model.

Thus, the current state of research on measuring organizational performance in the service industry highlights the existence of an opportunity related to the development of a unitary framework to align the APQC operational model to the EFQM excellence model, the analysis of processes within companies being one of the central elements on which any company that wants to improve its organizational performance should focus on.

CHAPTER 3. THE CHARACTERISTICS AND ROLE OF INDUSTRIAL SERVICES IN ECONOMIC DEVELOPMENT

A special place in the evolution of the modern economy is represented by the services sector, which has a special contribution both in terms of economic progress and in terms of social progress. Services differ from material goods by several features. Of these, the most important are: intangibility, inseparability, variability, and perishability (Rust, et al., 1996).

Researching the literature, it was found that there are several classifications of services, Figure 3.1 presenting the classification criteria. Within these classifications, the determination of the place of industrial services was pursued.

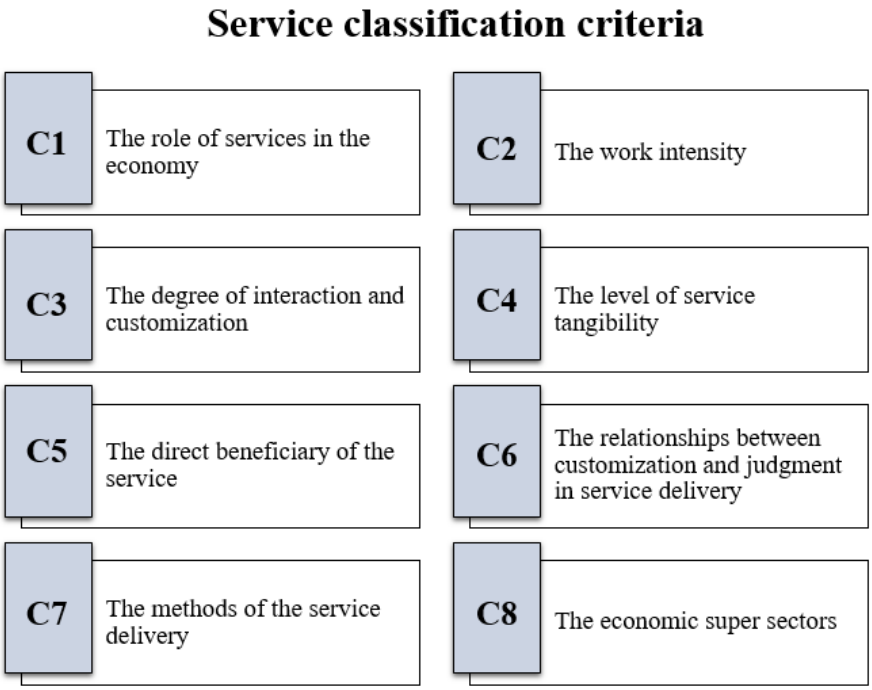

Figure 3.1. Service classification criteria

From the analysis of the 8 types of classifications, it is found that only the classification in terms of economic supersectors (FTSE Russell, 2019) is the only analysis performed on the literature that clearly shows the place of industrial services in the classification of services. After consulting the literature, the emphasis was then shifted to the classification of services in Romania.

In 2020, the National Institute of Statistics (National Institute of Statistics, 2020) prepared a report according to which, depending on the final type of consumer, services can be of two types: services provided mainly to the population and services provided mainly to enterprises. Thus, the concept of "industrial services" does not appear explicitly, but they are presented as services provided mainly to enterprises. Taking into account this aspect, the study continues with the analysis of the industrial services sector. It is noted that although the term "services" is often addressed in scientific papers, industrial services are not clearly presented among them. However, it is mentioned that industrial services are distinguished by specific features "specialization" and "technology" (Jackson & Cooper, 1988). As there is no single definition of industrial services, but several definitions that are

based in principle on certain features of this category, at the end of the subchapter dedicated to the typology of services, the aim is to achieve a more comprehensive definition for industrial services:

"Industrial services include activities with specialized and technological content, which aim to create value for companies or industrial customers, to define service strategies, develop service offerings, provide customer service or effective service delivery, positively influencing customers' industrial processes. "

CHAPTER 4. DETERMINING THE MAIN PROCESSES THAT CONTRIBUTE TO IMPROVING THE ORGANIZATIONAL PERFORMANCE OF THE SERVICE COMPANIES

Studies consulted in the literature review have shown that the orientation of companies towards business processes leads to better financial and non-financial performance, service industry companies striving to achieve higher levels of process orientation, managing to improve performance as well as the relationship with key stakeholders.

Thus, the purpose of this chapter is to identify the main processes that influence organizational performance in the case of a service company. To achieve this goal, two types of researches were carried out. The first research is a focus group: "Research on determining the main processes of the service companies", which aims to determine the main existing processes within companies in the service industry, as well as determining the main elements for monitoring and evaluating processes.

Following the focus group research, the main processes within the service providers were identified, processes that were grouped in 8 large groups: supply processes (P1), human resources management processes (P2), financial-accounting processes (P3), marketing and sales processes (P4), service delivery processes (P5), customer service processes (P6), management processes (P7), innovation processes (P8). Regarding organizational performance, following the results of the focus-group research, it was found that the main elements that can influence the performance of companies are quality, flexibility, time, costs, productivity, customer satisfaction, and employee satisfaction.

Based on these results of the focus-group, another research is carried out: "Research on analyzing the influence of the main processes of a service provider on the organizational performance", to analyze the influence of processes on the performance of companies in the service industry. The study was conceived as a quantitative approach, being exploratory research, which used the questionnaire as a data collection instrument. The research sample was represented by 150 people working in Bucharest within companies in the service industry. In this research, the possibility of determining the organizational performance according to each of the performances of the analyzed process groups was analyzed. Figure 4.1 presents the conceptual model that includes the hypotheses formulated using the literature.

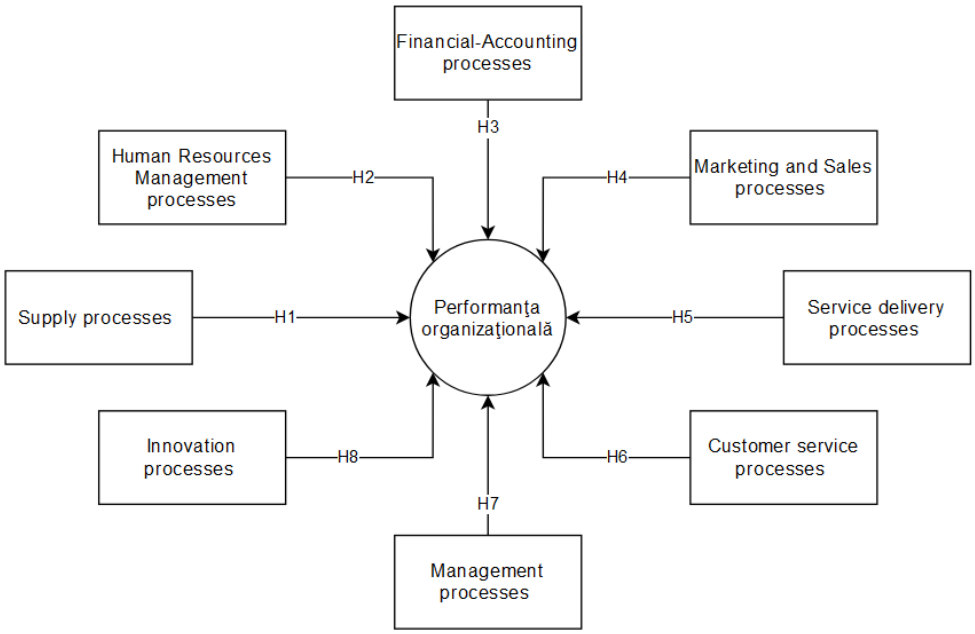

Figure 4.1. The conceptual model of the research on the analysis of the influence of processes on the performance of service organizations

To test the proposed model and the hypotheses formulated in this research, a series of operations were performed using the SPSS statistical program. Thus, table 4.1 presents the coefficients of the 8 analyzed models, which have as a dependent variable the organizational performance.

Table 4.1. Coefficients of the analyzed models

Model[a]		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% confidence interval for B	
		B	Std. Error	Beta			Lower Limit	Upper Limit
1	(Constant)	2.526	0.263		9.617	0	2.007	3.045
	Supply processes (P1)	0.401	0.064	0.457	6.248	0	0.274	0.527
2	(Constantă)	2.317	0.198		11.699	0	1.926	2.709
	Human resources management processes (P2)	0.461	0.049	0.612	9.402	0	0.364	0.558
3	(Constantă)	2.19	0.242		9.046	0	1.712	2.669
	Financial-accounting processes (P3)	0.473	0.058	0.558	8.187	0	0.359	0.588
4	(Constant)	2.253	0.197		11.414	0	1.863	2.644
	Marketing and sales processes (P4)	0.472	0.048	0.626	9.759	0	0.377	0.568
5	(Constant)	2.401	0.281		8.557	0	1.847	2.955
	Service delivery processes (P5)	0.412	0.066	0.459	6.291	0	0.283	0.542
6	(Constant)	2.446	0.278		8.792	0	1.896	2.996
	Customer service processes (P6)	0.397	0.064	0.453	6.182	0	0.27	0.524
7	(Constant)	2.606	0.193		13.486	0	2.224	2.988
	Management processes (P7)	0.39	0.048	0.556	8.141	0	0.296	0.485
8	(Constant)	3.002	0.163		18.468	0	2.681	3.323
	Innovation processes (P8)	0.297	0.041	0.513	7.271	0	0.216	0.378

Analyzing the 8 models, it is found that all 8 hypotheses were confirmed. Their graphical summary is presented in Figure 4.2.

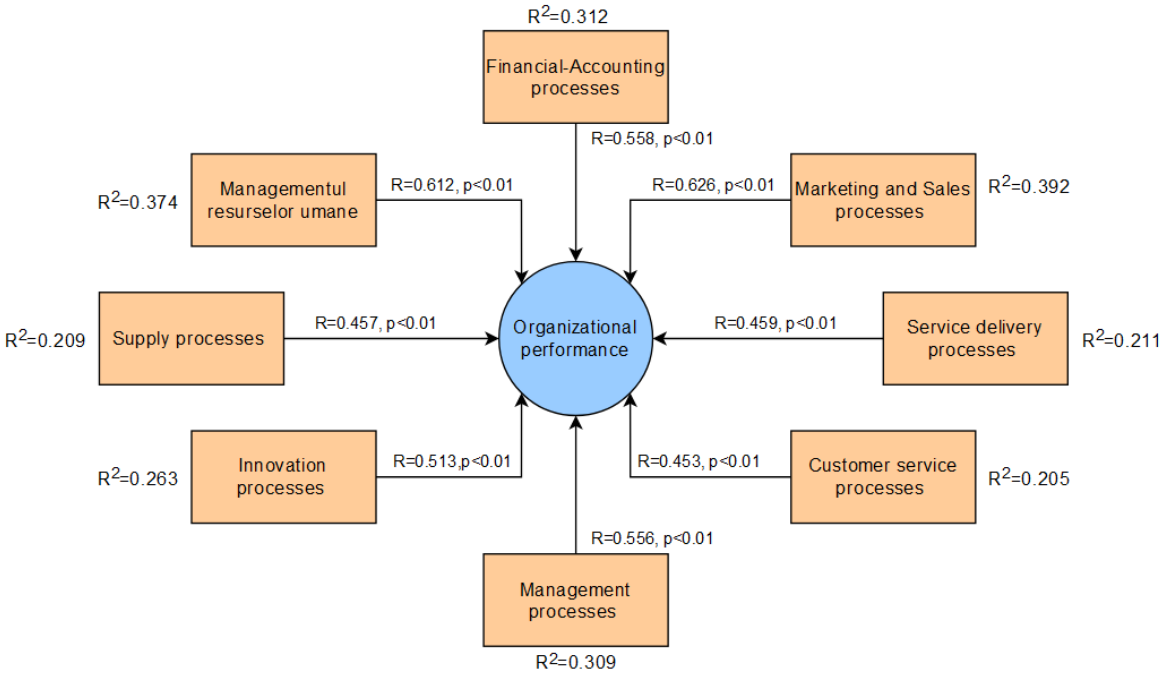

Figure 4.2. The results of the research hypotheses

The results of the two types of research helped to validate a proposed conceptual model, which highlights the fact that any contribution that has the role of improving any of the supply processes, human resources management, financial-accounting, marketing and sales, service delivery, customer service, management, and innovation processes, contribute to improving the organizational performance of companies in the service industry.

In addition, the results obtained highlighted the fact that the processes of human resources management, marketing and sales, as well as the financial-accounting processes influence the most the organizational performance of the companies in the service industry.

CHAPTER 5. DEVELOPING THE PACEEX ANALYSIS INSTRUMENT USED TO IDENTIFY SOLUTIONS TO IMPROVE THE ORGANIZATIONAL PERFORMANCE OF THE SERVICE COMPANIES

5.1. Study on the alignment of the EFQM excellence model with the APQC operational model

Following the analysis of the current state of research targeting organizational performance, it is found that there is an opportunity related to the development of a unitary framework, which would align the APQC operational model with the EFQM excellence model.

The results of this alignment can contribute to the improvement of the EFQM excellence model, as all the processes in the architecture proposed by APQC are necessary, each having a well-defined role. Some processes are missing from the architecture proposed by APQC and that should have existed to support the requirements of the EFQM excellence model, which is why this alignment has the role to cover this "gap". The logical scheme of aligning the EFQM excellence model with the APQC operational model (cross-industry variant) is presented in figure 5.1.

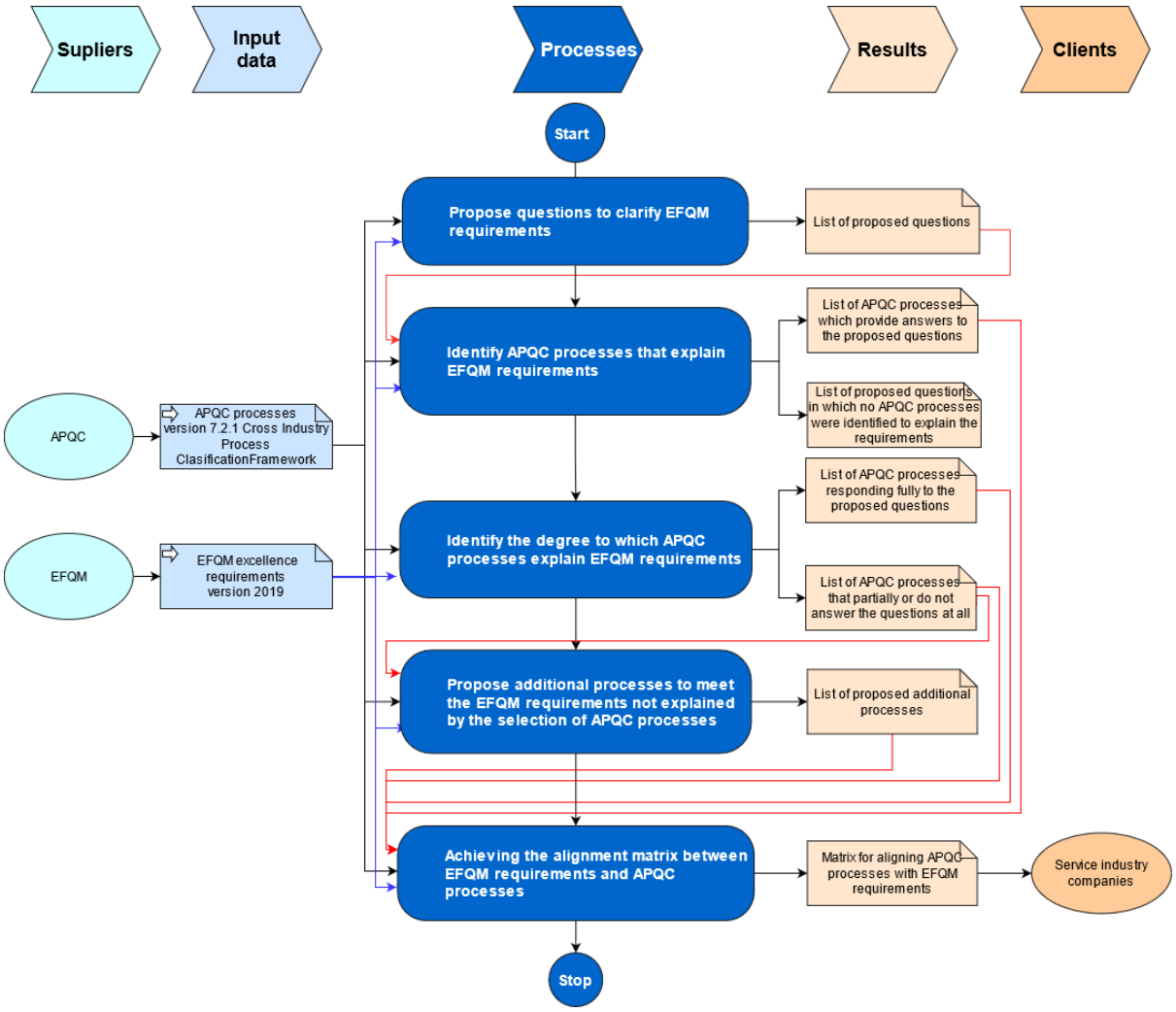

Figure 5.1. Logical scheme for aligning the EFQM excellence model with the APQC operational model (cross-industry version)

To determine which APQC processes support the EFQM excellence requirements, a matrix was developed. In this matrix were indicated the relations between the requirements mentioned in the EFQM excellence model (2019) and the main processes described by the APQC operational model (cross-industry version) (Table 5.1).

Table 5.1. EFQM-APQC correspondence matrix

		EFQM excellence requirement c_{mno}			
		c_{111}	**c_{112}**	**…**	**c_{mno}**
APQC process p_{ij}	**p_{11}**	$f(x)$	$f(x)$	$f(x)$	$f(x)$
	p_{12}	$f(x)$	$f(x)$	$f(x)$	$f(x)$
	…..	$f(x)$	$f(x)$	$f(x)$	$f(x)$
	p_{ij}	$f(x)$	$f(x)$	$f(x)$	$f(x)$

In Table 5.1, "c_{mno}" represents the analyzed requirement, m = the analyzed criterion, n = the rank 1 excellence requirement, and o = the rank 2 excellence requirement (sub-requirement). In the case of APQC processes, "p_{ij}" represents the process, i = the main group to which this process belongs, j = the rank 1 process. The function f (x) is used to describe whether or not the analyzed processes support excellence, the values associated with this function being 0 or 1 (according to the explanation in relation 5.1).

$$f(x) = \begin{cases} 0, \ if\ the\ p_{ij}\ process\ does\ not\ support\ the\ c_{mno}\ excellence\ requirement; \\ 1, \ if\ the\ p_{ij}\ process\ supports\ the\ c_{mno}\ excellence\ requirement. \end{cases} \quad (5.1)$$

Relationship 5.1. The function f (x), associated with the relationship between APQC processes and EFQM excellence requirements

In this study, an alignment of the EFQM excellence model with the APQC operational model was made. In this regard, the EFQM requirements to which no APQC process refers were determined, and for these, a set of 20 additional processes was proposed that are not found in the selection of APQC processes analyzed. In addition, the APQC processes that support EFQM requirements were determined, as well as the APQC processes that do not refer to any EFQM requirements. For the main APQC processes that do not meet an EFQM requirement, 14 excellence requirements have been proposed that could be used to improve the current EFQM excellence model.

5.2. The development of the analysis instrument used to improve organizational performance and achieve excellence - PACEEx

Based on the results of the study on the alignment of the EFQM excellence model with the APQC operational model, the PACEEx (Process Architecture Consolidation and Extension towards Excellence) instrument was developed. PACEEx is an analysis instrument developed to improve organizational performance and achieve excellence of service industry companies, even industrial service companies. The working model on which the proposed instrument is based is presented in figure 5.2, where the 3 main categories of processes specific to the instrument to be developed can be observed:

- A-Processes necessary for the architecture proposed by APQC to meet the requirements of EFQM;
- B- APQC processes that support excellence through their form and results;
- C- APQC processes that do not correspond to any EFQM requirement.

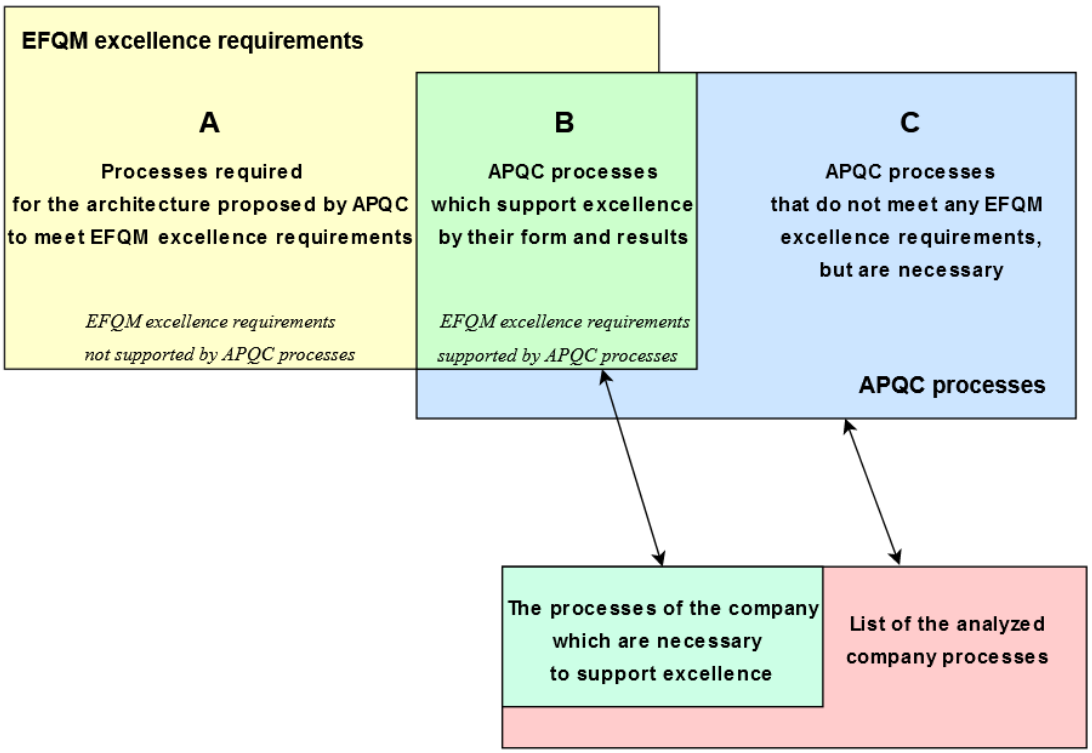

Figure 5.2. The model on which the development of the PACEEx instrument is based

PACEEx is a particular "Gap Analysis" instrument that aims to consolidate and extend the process architecture, starting from the general "cross-industry" model proposed by APQC, and facilitates the achievement of performance and excellence. In addition, the PACEEx instrument helps to convert the information generated by the organization into a format that can be easily applied to the RADAR instrument described by the EFQM excellence model.

The input data used to create the PACEEx instrument are:

- the processes presented within the universal operational model applicable to all branches of activity (version 7.2.1 „Cross Industry Process Classification Framework cross-industry) developed by APQC;
- EFQM excellence requirements (version developed in 2019);
- the APQC-EFQM alignment matrix presented in the previous subchapter;
- the RADAR instrument developed by EFQM;
- the internal data of the analyzed company;
- the list of processes of the analyzed company;

The block diagram for the realization of the PACEEx instrument is presented in figure 5.3, where the logic of making a SIPOC diagram was followed: Suppliers, Inputs, Process, Outputs, Customers.

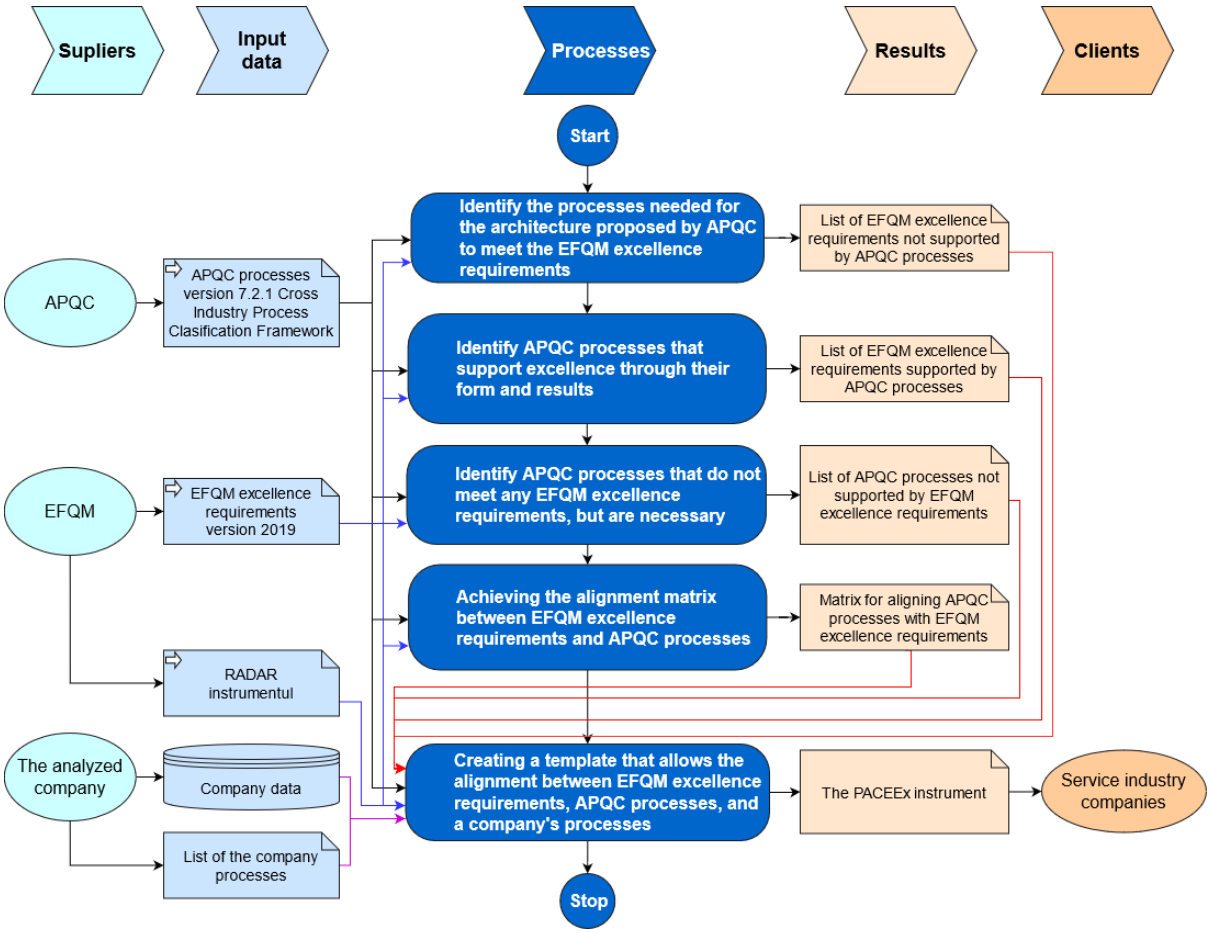

Figure 5.3. The block diagram of the PACEEx instrument

The PACEEx instrument focuses mainly on the process list of the APQC operational model. These processes are included in the instrument, the respective processes having associated the original codes from the APQC list. For each of the processes of the APQC operational model, it is mentioned whether or not they are necessary for sustaining excellences. The values used for this state are 1 - if processes are necessary to support excellence, respectively 0- if processes are not necessary to support excellence. This assignment was made following the analysis of the alignment of the EFQM excellence model with the APQC operational model.

The PACEEx instrument has a tabular structure, containing several columns (Table 5.2):

- the extension of the EFQM requirements - where the proposed excellence requirements will appear to achieve "extended" excellence (as a complement to the excellence requirements of the EFQM model);
- the case of correspondence EFQM - APQC - where the situations of the processes from the A, B, C analyzed categories will be presented;
- APQC processes that are necessary to sustain excellence - these processes that are necessary to sustain excellence will receive the value 1, while processes that are not necessary to sustain excellence will receive the value 0;
- the list of APQC processes - contains the main APQC processes selected following the alignment of the APQC operational model with the EFQM excellence model;
- APQC code - includes the original codes of the APQC processes;
- the internal process codes corresponding to APQC processes - includes the internal codes of processes within the analyzed company;

➢ the list of the internal processes corresponding to the APQC code - includes the processes identified by the company, these being passed according to the correspondence with the APQC processes.

Table 5.2. How to complete and use the PACEEx instrument

Extension of EFQM requirements	EFQM - APQC correspondence case	APQC processes needed to sustain excellence (1 / 0)	The list of APQC processes	APQC code	Internal process codes corresponding to APQC processes	List of internal processes corresponding to APQC processes
-	B	1	APQC process 1	Code 1		Process 1
Requirement 1	C	0	APQC process 2 (does not meet an EFQM requirement)	Code 2		Process 2
-	B	1	APQC process 3	Code 3		There is no equivalent process (but there should be)
…	…	…	…	…	…	…
Requirement i	C	0	APQC process i (does not meet an EFQM requirement)	Code i		Process i
…	…	…	…	…	…	…
Requirement n	C	0	APQC process n (does not meet an EFQM requirement)	Code n		Process n
-	A	1	There is an EFQM requirement but there is no proper APQC process	-		Customization of the proposed process outside the APQC selection for the analyzed company

Note: developed using information from the EFQM 2019 excellence model (© EFQM2019) and version 7.2.1 of the APQC Cross Industry Process Classification Framework (© 2018 APQC)

The algorithm designed for the application of the PACEEx instrument involves 5 stages (marked with "S"), stage 3 containing 3 steps (marked with "s") (figure 5.6):

➢ S1. Identifying the company processes;

➢ S2. Classification of the company processes, making correspondence with APQC processes;

➢ S3. Establishing the correspondence of processes with EFQM requirements (yes-1 / no-0) through their association with the APQC processes:

- s1. The list of processes of the analyzed company is identified, corresponding to APQC processes (case B);
- s2. The list of processes of the analyzed company is identified to support the extended excellence (case C);
- s3. The list of processes of the analyzed company is identified based on the list of proposed processes (case A);

➢ S4. Evaluation of the analyzed company in terms of EFQM excellence criteria (RADAR);

➢ S5. Proposal of measures that can be taken based on the results of the application of the PACEEx instrument.

The graphical form of the algorithm can be observed in figure 5.4, where there was followed the logic of a SIPOC diagram.

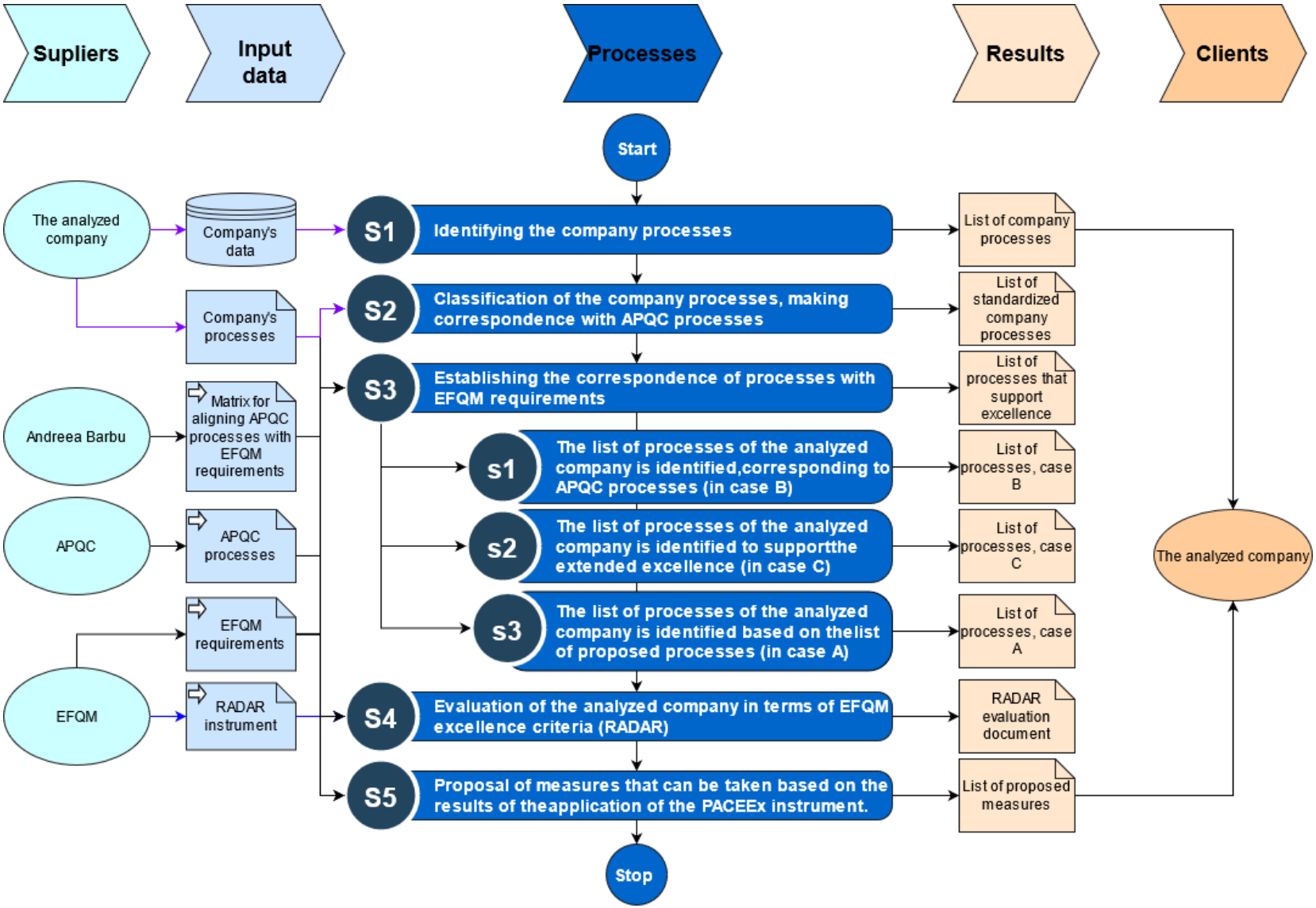

Figure 5.4. PACEEx instrument algorithm

By associating with the two models that formed the basis of the development of the proposed instrument (APQC and EFQM), the PACEEx instrument makes important contributions in the field of industrial services, an area that underlies Industry 4.0, which determines companies to make significant changes in a market, which is constantly changing. The proposed instrument involves determining measures to improve performance based on the results obtained by applying the algorithm, with great emphasis on determining processes (in the absence of their definition), internal process analysis, process standardization, aspects that contribute to consolidation, and expansion of the process architecture.

Thus, companies using the PACEEx instrument can enjoy the following benefits:

- achieving the conversion from the internal specifics of the organization into a format that can be easily applied to the RADAR instrument, described by EFQM, helping to standardize the names of the processes used by the company;
- providing indications on how the company can determine its processes if it does not have a manual of procedures;
- identifying the additional processes that must be implemented within the company to achieve excellence (case A);
- identification of the analyzed company processes that correspond to the APQC processes that support excellence (case B);
- identifying the processes that must be adopted by the company if it wants to reach a high level of excellence (case C);
- easier application of the RADAR instrument, described by EFQM, to evaluate the organizational performance;
- determining the various measures that can be implemented within the company to introduce the additional processes necessary to improve organizational performance and to achieve excellence;
- adoption of key performance indicators suitable for the company's needs (for certain categories of processes or dimensions pursued) that can be found by the company using the PACEEx instrument in the APQC database, using standardized codes from the PACEEx instrument (the company can track the values that these indicators will have in time to be able to determine whether or not the company registers performances at the established time intervals);
- performing an internal analysis compared to the industry in general;
- the use by any qualified person in the operational management, the consumption of time and financial resources being much lower than in the case of contacting a consulting company;
- offering all the advantages of the EFQM excellence model and the APQC operational model, used in the development of the instrument;
- compatibility with other methods, models or instruments for measuring performance;
- the possibility of offering local or international recognition of the registered performance (by associating with the EFQM model of excellence and the APQC operational model).

CHAPTER 6. VALIDATION OF THE PACEEX INSTRUMENT-CASE STUDY APPLIED TO A COMPANY PROVIDING DESIGN AND INDUSTRIAL CONSULTANCY SERVICES

To validate the proposed instrument, this chapter presents a case study applied to a company providing industrial design and consulting services. For this company, its main problems are analyzed, being treated separately the identification of current problems, known, that the company faces, respectively the identification of problems highlighted by the application of the PACEEx instrument. Thus, this chapter presents how the PACEEx instrument is applied step by step within the analyzed company. Figure 6.1 shows the scheme of application of the PACEEx instrument within the analyzed company, as well as the main results of each stage.

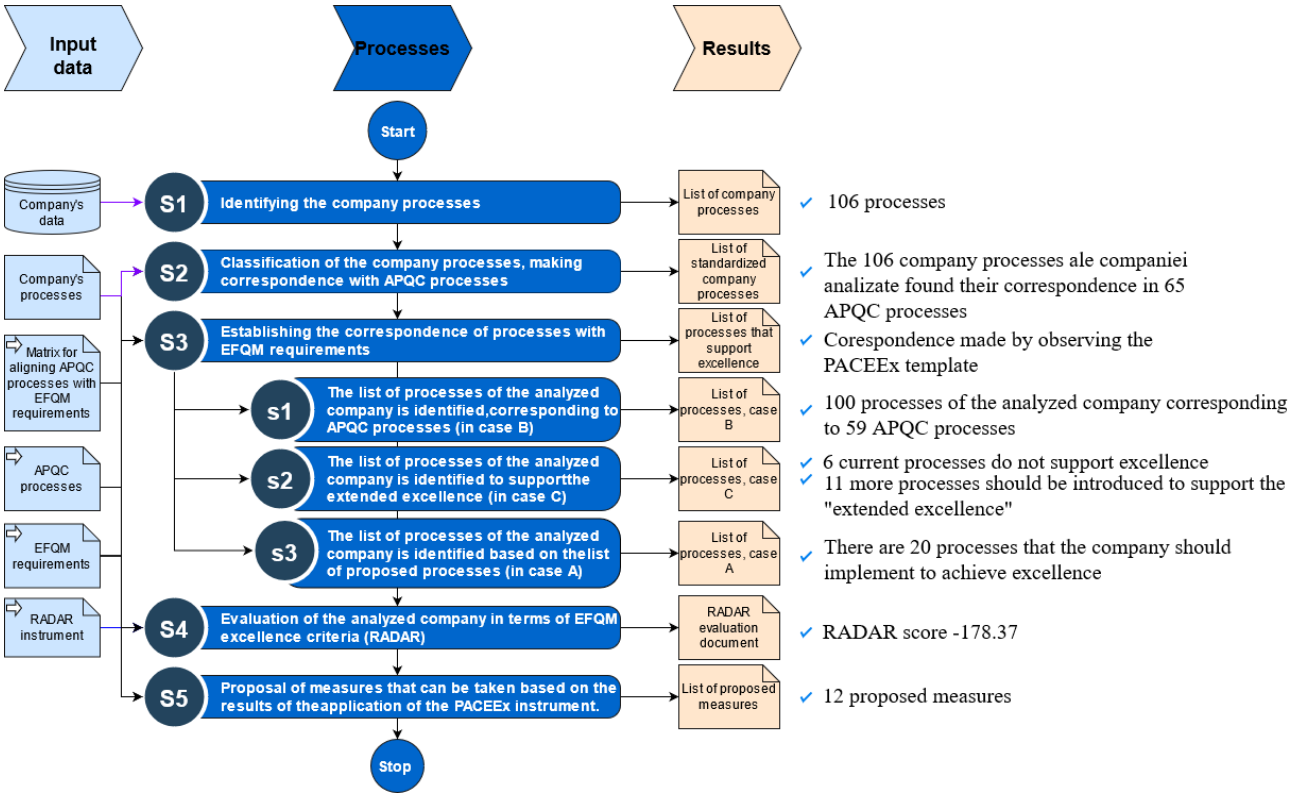

Figure 6.1 Scheme of application of the PACEEx instrument within the analyzed company

Following the results obtained, twelve measures are proposed to improve the organizational performance of the company referred to in the case study. After analyzing these results, but also the most important problems facing the company, two important measures are selected that can be taken by the analyzed company to improve organizational performance in marketing and sales processes, but also financial processes. accounting and administrative. For these two directions, following the application of the PACEEx instrument, the processes necessary to be implemented and developed by the analyzed company to improve the organizational performance are determined.

This chapter ends with the evaluation of the utility of the instrument, being presented how the proposed instrument is perceived by the analyzed company. To evaluate the usefulness of the PACEEx instrument, the aim was to determine the value that this instrument brings within the analyzed company. To test the importance of this instrument, a questionnaire in the form of a scorecard was completed

which includes a set of 10 criteria and a total of 40 sub-criteria. The proposed criteria consist of the 10 hypotheses stated, which are considered equal in importance for the evaluation of the instrument. This questionnaire was distributed within the two service providers, being completed by a total of 5 people.

The centralization of the final weights of each analyzed criterion is presented in table 6.1, where it is found that all the stated criteria obtained a final score over 8% of their weights. The final score of the scorecard used in the evaluation of the instrument is 94.69% of the maximum of 100%, which means that the PACEEx working instrument is useful, but it requires little help (according to the proposed evaluation).

Table 6.1. Results of the evaluation of the PACEEx instrument

No.	Evaluation criteria	Results
1	The PACEEx instrument is easy to be understood by a person skilled in operational management.	8.38%
2	The PACEEx instrument is easy to use by a person skilled in operational management.	8.31%
3	The PACEEx instrument has a functional design.	9.63%
4	The companies that use the PACEEx instrument have a positive attitude towards its use.	10.00%
5	The PACEEx instrument is appropriate for existing companies in the market.	10.00%
6	The PACEEx instrument helps align EFQM requirements with APQC processes.	10.00%
7	The PACEEx instrument helps companies to be aware of their current situation.	9.13%
8	The PACEEx instrument is useful for a company that wants to consolidate and expand its process architecture.	10.00%
9	The PACEEx instrument is useful for a company that wants to improve its organizational performance.	9.75%
10	The PACEEx instrument is useful for a company that wants to achieve excellence.	9.50%
Final evaluation score of the PACEEx instrument		**94.69%**

Thus, following the evaluation of the usefulness of the proposed instrument within the analyzed consultancy and industrial design company, the following benefits of using the PACEEx instrument can be mentioned:

- achieving the conversion from the internal specifics of the organization into a format that can be easily applied to the RADAR instrument, described by EFQM, helping to standardize the names of the processes used by the company;
- providing indications on how the company can determine its processes if it does not have a manual of procedures;
- evaluation of the current state of organizational performance by using the RADAR instrument proposed by EFQM
- making a "radiograph" of the company's process architecture by:
  - identifying internal processes that contribute to improving performance and that support excellence;
  - identifying internal processes that are not necessary to support excellence;
- consolidating and extending the process architecture by:
  - identifying the processes that can be implemented, developed or improved by the company to improve its performance and achieve excellence;
  - identifying the processes that can be implemented, developed or improved by the company to become eligible for awards that certify its performance or excellence;

- determining measures that can be implemented within the company to introduce additional processes necessary to improve organizational performance and achieve excellence, which are starting points in proposing projects that can strengthen and expand the architecture of processes;
  - reducing the time needed to identify the most important processes within a company that should be developed, improved or implemented to contribute to improving organizational performance;
  - adoption of key performance indicators suitable for the company's needs (for certain categories of processes or dimensions pursued) that can be found by the company using the PACEEx instrument in the APQC database, using standardized codes from the PACEEx instrument (the company can track the values that these indicators will have over time to determine whether or not the company registers performance at the set time intervals).

CHAPTER 7. CONCLUSIONS. CONTRIBUTIONS. PERSPECTIVES AND FUTURE RESEARCH DIRECTIONS

The idea of this thesis started from the analysis of the existing preoccupations in the specialized literature in connection with the improvement of the business performance in the area of industrial services. This analysis highlights that the assessment of the organizational performance must take into account the companies' objectives, financial and non-financial aspects related to them, as the business environment in which companies now operate requires a multi-purpose orientation. Industrial services must always keep pace with new trends, needs, and realities in the industry, focusing not only on quality but also on sustainability, creating sustainable value or stakeholder satisfaction.

Identifying the existence of a discrepancy between the excellence models and the operational models, proved necessary to achieve an alignment of these two types of models that are useful to a service company. This is how the idea of developing the PACEEx instrument came about, an analysis instrument used to improve performance and achieve excellence. This instrument represents the main contribution of the doctoral thesis, a contribution that was accompanied by other types of results obtained in this thesis, which aimed to improve organizational performance in the area of industrial services.

Through the work template that contains both the requirements of excellence described by the EFQM model and the APQC processes, the PACEEx instrument provides guidance points that can contribute to the application, monitoring and improvement of organizational performance. PACEEx is an instrument that focuses on identifying the processes of a service organization and translating them into a standardized format, a format that indicates whether these processes support performance and excellence through their form and results. Having this process "mapping", a record of the processes that contribute to the proper functioning of the business, their degree of development or lack thereof, companies providing industrial services can make a first organizational self-assessment. This self-assessment aims to give companies an overview of the stage of implementation and development of the processes used, to challenge them to make changes in the quality of processes to meet the requirements of excellence, to support in the sense of offering directions of action to improve the performance of processes, to implement the idea of the need for an organizational culture based on creativity, innovation, sustainability.

Changes that companies can bring to the process level, in areas highlighted by the PACEEx instrument where they would have gaps or problems to meet the requirements of excellence, can help industrial service companies to take action and make the necessary changes to it rises to the level of a successful company, as it should be found everywhere in the industry.

The fact that one of the stages of the PACEEx instrument provides for the evaluation of organizational performance through the application of the RADAR instrument described by EFQM, comes as an alarm signal that draws the company's management attention to problem areas within the organization, areas that need improvement. By consulting the association between the company's processes that support or do not the criteria of excellence, companies in the service industry can observe which processes help them reach a higher level of performance in a particular field, which is the current stage of performance compared to the stage that would characterize a company with superior performance in the industry, which are the processes they should focus on if they want to improve their situation.

Through the application of the PACEEx instrument by industrial service companies, they could receive an impetus to focus not only on quality but also on sustainability, society, and the future. Thus, these services that underlie the development of society could not only focus on concrete things to improve its organizational performance but could prepare for future transformations in the external environment and continue to bring important benefits to society.

Thus, this doctoral thesis brings important contributions both theoretically and practically, the results of this thesis being useful both for practitioners and for scientific researchers in academia.

Regarding the personal contributions highlighted in this doctoral thesis, the following actions can be stated:

- C1 - Determining the methods that are the most used to measure the performance of the service companies, through bibliographic research - "Bibliographic research on identifying the main concepts that are associated with measuring the organizational performance in the field of industrial services";
- C2 - Determining the financial indicators that are the most used to measure the performance of companies in the service industry, through bibliographic research - " Bibliographic research on identifying the financial indicators that are the most used to measure the organizational performance of the service companies ";
- C3 - Propose a comprehensive definition for the concept of industrial services;
- C4 - Determining the most important criteria used for the evaluation and ranking of Romanian service companies, through secondary research - "Documentary research on determining the main criteria used to evaluate Romanian companies in the field of services";
- C5 - Determining the main groups of processes that contribute to improving the organizational performance of companies in the service industry, through qualitative research - "Research on determining the main processes of the service companies";
- C6 - Developing an own model and testing it to determine the main groups of processes that contribute to improving organizational performance in companies in the service industry, through quantitative research - "Research on analyzing the influence of the main processes of a service provider on the organizational performance";
- C7 - Align the EFQM excellence model with the APQC operational model by:
  - determining the EFQM requirements to which no APQC process refers;
  - identifying and proposing a set of 20 additional processes for the EFQM excellence requirements to which no APQC process refers;
  - determining the APQC processes that support the EFQM excellence requirements;
  - determining the APQC processes to which no requirement of EFQM excellence refers;
  - elaboration and proposal of a set of 14 excellence requirements that can be implemented within the current EFQM excellence model, as a solution for improving the current EFQM excellence model;
- C8 - Development and validation of an instrument used to improve performance and achieve excellence - PACEEx;
- C9 - Development of measures to improve organizational performance within a company providing industrial services, following the analysis:
  - of the problems faced by the analyzed company;
  - of the problems indicated by the application of the PACEEx instrument;
- C10 - Development of a financial reporting system for the analyzed company;
- C11 - Development of a predictive reporting system for the analyzed company;
- C12 - Determining the financial processes necessary to be implemented within the analyzed company to improve the organizational performance;

- C13 - Determining the marketing and sales processes necessary to be implemented within the analyzed company to improve the organizational performance;

As future research directions, the aim is to improve the PACEEx instrument and promote it among the companies providing industrial services in Romania, supporting the efforts being made in Romania for organizing and awarding prizes of excellence.

A first improvement of the PACEEx instrument that will be treated in the future will be the proposal of a section dedicated to the analysis of the opportunity to outsource the company's processes. In this regard, the aim is to develop a procedure that companies should apply to analyze the opportunity criteria for process outsourcing, a procedure that complements the PACEEx instrument. This procedure can be used by companies in various periods of business life, being useful for determining outsourcing opportunities.

LIST OF PUBLISHED PAPERS

Below is the list of scientific papers published in national and international scientific events, this reflecting both the scientific concerns during the doctoral studies and the dissemination of research results conducted during this period. Thus, so far, the following types of papers have been published:

- 1 scientific article published in ISI indexed journals;
- 15 scientific articles published in the volumes of national and international scientific events indexed by ISI;
- 11 scientific articles published in BDI indexed journals;
- 6 scientific articles published in the volumes of national and international scientific events indexed to BDI.

List of published papers or papers in progress

- *Scientific articles published in ISI indexed journals*

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- *Scientific articles published in the volumes of national and international scientific events indexed in ISI database*

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