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**CERTIFICATION OF PERSONS AND
ITS DEVELOPMENT SOLUTIONS IN LATVIA**

Summary of the Doctoral Thesis



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AND ITS DEVELOPMENT SOLUTIONS
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DOCTORAL THESIS PROPOSED TO RIGA TECHNICAL UNIVERSITY FOR THE PROMOTION TO THE SCIENTIFIC DEGREE OF DOCTOR OF SCIENCE

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DECLARATION

I, Maija Kavosa, hereby declare that the Doctoral Thesis submitted for review to Riga Technical University for promotion to the Ph. D. in Social Sciences is my own. I confirm that this Doctoral Thesis has not been submitted to any other university for promotion to a scientific degree.

The Doctoral Thesis has been written in Latvian. It consists of an Introduction, 3 chapters, Conclusions and Proposals, 53 figures, 31 tables, and 21 appendices; the total number of pages is 273, including appendices. The Bibliography contains 318 titles.

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INTRODUCTION

Relevance of the research

Conformity assessment procedures enable the assessing of the conformity of a particular facility and making a decision on whether the facility meets the requirements set for it. Conformity assessment is described as a process of comparing two variables, where an object is compared with its original requirements or criteria, to determine whether or not the object conforms, i.e. whether or not it meets requirements set for it. Conformity assessment plays a key role in ensuring safe and secure products and services, thus contributing not only to the application of the principle of mutual recognition in the free movement of goods and services, but also to the reliability of the activities carried out within them.

One of the most widely used conformity assessment procedures is certification, and the concept of certification is very closely linked to the concept of conformity assessment, which involves evaluating a specific object to determine whether it meets the necessary requirements. Certification involves the assessment of an object against its requirements, with a certificate issued as proof of compliance, and can apply not only to a good, service, process or activity but also to a person. Certification of persons is defined in the scientific literature as a conformity assessment procedure and a control mechanism to protect society from unskilled labour. The certification methodology thus provides a control approach as a guarantee of public safety and economic requirements. Certification is, therefore, becoming one of the most important mechanisms for controlling competence in regulated professions, where a person is not entitled to practise without adequate evidence of competence.

However, despite the important role of certification of persons in shaping society and a safe environment, the process of certification of persons in Latvia has been studied very little. So far, it has been considered only in the context of regulatory changes as a conformity assessment procedure and control mechanism for potential risks to public and environmental safety. At the same time, in practice, there are often cases where the performance of certificate holders is not properly monitored and professional skills are not upgraded to the required level of professional competence. Thus, the quality of services provided by certification bodies and the timely identification and elimination of the associated inhibiting factors of influence or barriers also play an important role.

Today, the assessment of professional competence and social responsibility are described in the scientific literature as major challenges arising from globalisation processes. Consequently, the industry is increasingly demanding that the certificate issued by conformity

assessment bodies should not only attest to the compliance of a person's qualifications with the requirements, but also to their ability to deliver a high quality and sustainable professional performance outcome. At the same time, the social dimension of service provision is also linked to human behaviour, which allows the certification of persons to be seen as a transaction, where the conformity assessment body becomes an entity that can restrict and influence the parties involved in the certification process, while also changing their behavioural patterns. The ultimate goal is the creation of shared value, i.e. a person carries out his or her professional duties in a way that benefits society as a whole in the long term.

As the social dimension and sustainability issues are gaining momentum, including in the field of conformity assessment, there is interest from certification bodies to use new approaches to ensure that the quality of the certified person's performance also meets the requirements of the stakeholders.

In view of the above, in order for certification to evolve from a conformity assessment and control mechanism to a long-term professional development tool, the certification process needs to be seen as a coherent set of elements operating in a defined environment and receiving information from the environment. To ensure this, a paradigm shift from the current certification methodology, which sees certification solely as a control mechanism, is needed to an approach that sees certification as an integrated system. The new paradigm describes certification not only as a qualification control for public safety purposes, but also as a control based on cost reduction, reallocation of economic resources, and organisational changes to create value for the parties involved in the certification process.

Research questions formulated in the Thesis

1. What elements are assessed in the certification process?
2. What is the relationship between certification as a conformity assessment procedure and quality?
3. How can the certification process ensure that the certificate attests not only to professional competence but also to the quality of professional performance?
4. What approach to certifying persons could contribute to the sustainable development of a certified individual's professional competence in a particular industry?

The **research object** of the Thesis is certification of persons and the process of its implementation.

The **research subject** of the Thesis is the evaluation and improvement aspects of the process of certification of persons.

The Doctoral Thesis aims to assess the process and impact factors of certification of persons as an assessment of professional compliance and competence in order to develop approaches and solutions for sustainable certification of persons.

To achieve the aim of the Thesis, the following **tasks** have been set:

1. To study the theoretical aspects and the essence of the concept of certification, its relationship with the field of conformity assessment and quality management, as well as the specifics of the concept of certification of persons.
2. To understand the problems of defining the term "certification of persons" and clarify the term while assessing the interactions between the elements of the certification process and the components of quality management.
3. To assess the certification of persons system in Latvia, as well as the industry's understanding of the impact and role of the certification of persons process in assessing professional competence.
4. To identify the needs of stakeholders in the certification of persons process and the inhibiting factors of influence or barriers.
5. To develop a sustainable approach for the certification of persons, which would allow for a paradigm shift in the current certification methodology, integrating quality and sustainability aspects.
6. To test the sustainable approach to certification of persons in one of the certification bodies in Latvia.

Limitations of the research

An in-depth analysis of the system of certification of persons in Latvia is carried out on the basis of an example of certification of natural persons in the regulated spheres of activity in accordance with the regulatory enactments of the Republic of Latvia (hereinafter – LR). The approach to the improvement of the certification process of persons developed within the Thesis is being tested in the Certification Unit of Construction Specialists of the State Construction Control Bureau of Latvia (hereinafter – Bureau BSN). In the framework of the development of improvement solutions, the author of the Doctoral Thesis analyses in depth the inhibiting factors of influence or barriers to the process of certification of persons and does not consider the financial issues related to the implementation of the proposed improvement approach.

The **theoretical and methodological basis of the research** is the theories of quality management and control, conformity assessment, stakeholders and systems, works of scientists and researchers from Latvia (Atstāja, Dz., Gaile-Sarkane, E., Geipele, I., Kozlovskis, K., Lapiņa, I., Lāce, N., Liepiņa, R., Mazais, J., Mežinska, I., Mjakuškina, S., Ņikitina, T., Reinholde, I., and others) and abroad (Abdelzaher, T., Auriola, E., Benett, B. G., Bertalauffy, L., Deming, W. E., Domingues, M., Freeman, R. E., Garza, A. S., Griffin, P., Goldrick, B. A., Guerrero, D., Juran, J. M., Lachaud, E., Lagnick-Hall, E., Lambrechts, W., Latham, G., Uhlir, Z., and others) related to the conformity and quality management system, professional competence assessment, its improvement possibilities and the inhibiting factors or barriers of the certification service.

Sources of information

Several sources of information have been used to obtain the data for the research:

- academic databases Science Direct, Web of Science, IEEE Xplore Digital Library, EBSCO host, SCOPUS, ACM Digital Library, Wiley Online Library for analysis of scientific literature;
- Latvian Standards Online Reading Room www.lvs.lv to identify the requirements set out in international standards for conformity assessment bodies certifying persons;
- public portal of the legislation of the Republic of Latvia www.likumi.lv to identify the requirements laid down in the laws and regulations of the Republic of Latvia concerning the certification of persons;
- public portal on European Union law www.eur-lex.europa.eu to identify the requirements for the recognition of professional qualifications as part of the certification process;
- Construction Information System www.bis.gov.lv to conduct a survey of certified persons and employers of certified persons;
- the website of the State Agency "Latvian National Accreditation Bureau" www.latak.gov.lv for up-to-date information on conformity assessment bodies accredited in Latvia.

Logic of the research

The logical structure of the research is determined by the aim of the research and the logical sequence of the research steps. The logical structure of the Thesis is presented in Fig. 1.

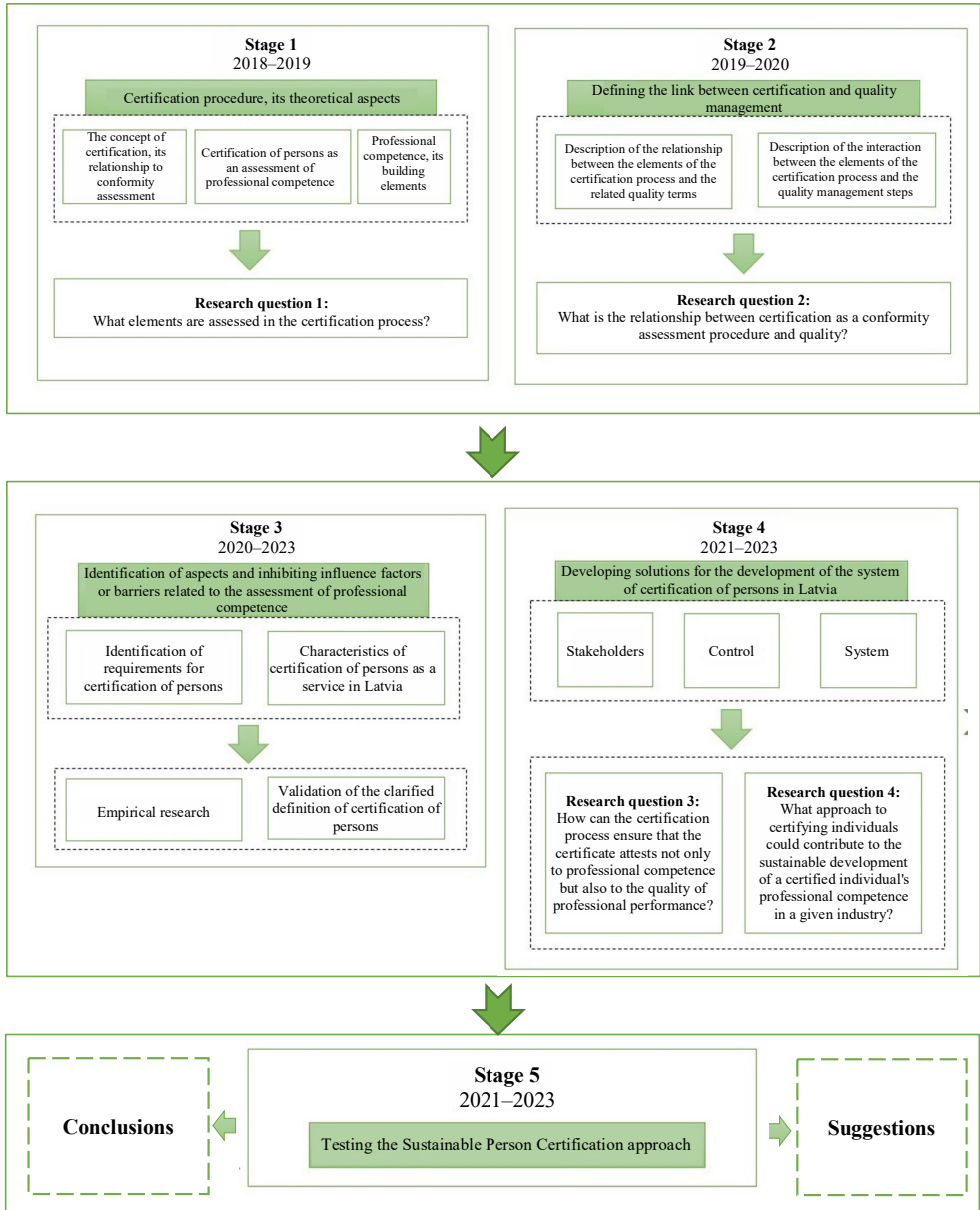


Fig. 1. Logic of the research.

Stage 1. Certification procedure, its theoretical aspects

In Stage 1 of the research, the author explores the issues and theoretical aspects of the certification. Stage 1 of the research includes the following actions:

- an analysis of scientific literature to describe the concept of certification and its relationship with the field of conformity assessment, while identifying certification not only as a tool for control, but also as a tool for the possible development of professional competence;
- qualitative content analysis of the literature to identify the key features and definitional issues of the concept of "certification of persons" and to identify the key elements of professional competence.

The analysis of the scientific literature provides an answer to Research question 1 – "*What elements are assessed in the certification process?*" Stage 1 of the research gathered information on certification as a conformity assessment procedure and its essential role in assessing professional competence, which was used to refine the definition of certification of persons and to develop a questionnaire for the empirical research.

Stage 2. Defining the link between certification and quality management

In Stage 2 of the research, the author analyses the interconnection between certification and quality management. Stage 2 of the research involves an analysis of the scientific literature to describe the interaction between the elements of the certification process, quality-related terms and quality management phases. The analysis of the scientific literature has provided an answer to Research question 2 – "*What is the relationship of certification as a conformity assessment procedure with quality?*" In Stage 2 of the research, the link between certification and quality was identified, which was taken as a basis not only for clarifying the definition of certification of persons, but also for the development of the author's certification improvement approach in the 3rd part of the Thesis.

Stage 3. Identification of aspects and inhibiting influence factors or barriers related to the assessment of professional competence

In Stage 3 of the research, the author describes the system of certification of persons in Latvia and conducts empirical research to identify the aspects and barriers related to the assessment of professional competence. Stage 3 of the research includes the following actions:

- identification of the requirements for certification of persons and a general description of the certification service provided in Latvia;
- surveying certification bodies, certified persons and employers of certified persons;
- multifunctional conformity analysis to process survey data in order to identify whether there is a correlation between responses to specific questions and the respondent group.

Stage 3 of the research:

- empirical research on certification of persons was carried out, gathering views of the stakeholders;
- identification of the inhibiting factors of influence or barriers related to certification;
- validation of the author's updated definition of certification of persons;
- obtained basis for the development of certification improvement solutions.

Stage 4. Developing solutions for the development of the system of certification of persons in Latvia

In Stage 4 of the research, the author develops solutions to improve the process of certification of persons. Stage 4 of the research includes the following actions:

- analysis of the scientific literature on Lean management philosophy, risk management and sustainability aspects to inform long-term process performance improvement options;
- designing and implementing solutions to improve the process of certification of persons, in order to describe the approach to improving certification of persons proposed by the author.

The analysis of the scientific literature has led to the answer to Research question 3 – *"How can the process of certification of persons ensure that the certificate not only demonstrates professional competence but also the quality of professional performance?"* and Research question 4 – *"What approach to certification of persons could contribute to the sustainable development of the professional competence of a certified person in a given industry?"* Stage 4 of the study developed a sustainable approach to the certification of persons, which allows for a paradigm shift in the current certification methodology, also integrating quality and sustainability aspects.

Stage 5. Testing the sustainable person certification approach

Stage 5 of the study involved testing a sustainable approach to certification of persons in one of the certification bodies in Latvia. Stage 5 of the study includes the following actions:

- analysis of the scientific literature on sustainability aspects, including the key risks and competences required in the industry in which the certification body certifies persons;
- the use of the Delphi method to identify professional competences that need to be assessed in an industry-specific way, as well as to provide in-depth information on failures identified in the certification process;
- survey of certified professionals in the sector, with the aim of developing the content of the competency test in such a way that the percentage of questions is proportionate to the importance of the competency in the industry;

- multiple correspondence analysis (MCA) to process survey data to identify whether there is a correlation between responses to specific questions and the respondent group;
- the application of the value stream mapping (hereinafter – VSM) method for the improvement of the selected stage of the process of certification of persons;
- failure modes and effects analysis (hereinafter – FMEA) to identify the inhibiting factors of influence or barriers to the process of certification of persons in a given industry.

In Stage 5, the sustainable approach to certification of persons developed by the author is tested, leading to conclusions and proposals that are in line with the research framework.

Research methods

Both qualitative and quantitative research methods have been used to achieve the aim of the Thesis. The data collection method is a survey:

- questionnaire survey of certified construction specialists (17.04.2018–25.11.2018) to identify solutions for improving the certification process in the sector;
- questionnaire survey of conformity assessment bodies (20.10.2022–16.02.2023), certified persons (02.02.2023–01.03.2023) and employers of certified persons (02.02.2023–26.04.2023) in order to identify stakeholders' views on the certification of persons and its inhibiting factors or barriers in Latvia.

Qualitative research methods:

- systematic literature review to analyse scientific publications;
- qualitative content analysis of the literature for an in-depth look at the concepts of certification of persons and professional competence;
- triangulation of the results of the literature analysis and the empirical research;
- Delphi method to identify the views of industry experts on the competences to be tested in the certification process and the inhibiting factors of identified failures;
- VSM method to identify opportunities for improving the process of certification of persons;
- FMEA method for identifying potential failures in the process of certification of persons.

Quantitative research methods:

- MCA method for processing survey data;
- bibliometric analysis of the frequency of the terms "competence" and "professional competence" in the scientific publications;

- descriptive statistics method, using statistical indicators and summarising the data in charts and tables.

Scientific novelties of the Thesis:

1. The term "certification of persons" has been clarified, underlining the link between certification as a conformity assessment procedure and quality aspects, so that in practice, certification of persons is understood not only as an assessment of a person's compliance with the qualification requirements, but also with the quality requirements.
2. Inhibiting factors of influence or barriers have been identified that hinder the process of certification of persons, for the first time in Latvia, conducting an empirical study on the certification of persons and the assessment of professional competence within its framework.
3. A new sustainable approach to certification of persons has been developed, which assesses professional competences and provides opportunities for monitoring quality in the long term, according to the needs of stakeholders.
4. A methodology for integrating sustainability elements into the process of certification of persons and implementing the proposed approach has been developed and tested.

Practical application of the research

The results of the research can be used to improve the system of certification of persons in regulated professions not only in Latvia but also in Member States of the European Union. The research can be valuable to various stakeholders – conformity assessment policy makers, economic operators, certified persons, certification bodies, etc.

Hypothesis for defence: If a sustainable approach is taken to the certification of persons, incorporating elements of process management, quality and sustainability, the certification of persons becomes a quality monitoring-based management of professional competence, rather than a compliance control procedure.

Theses for defence:

1. Qualifications and professional experience acquired by a person cannot be the sole evaluation criteria in the certification process.
2. If in the process of certification of persons the professional competence is assessed in accordance with the competence requirements defined in the particular field, then the

certificate issued to the person also confirms the person's ability to ensure a high-quality work performance result.

3. Certification bodies, by identifying the main requirements of the stakeholders and maintaining an integrated quality management system based on the principles of continuous improvement and process approach, ensure not only the quality of the certification process of persons but also its reliability.
4. The implementation of a process approach in all activities related to the certification of persons ensures not only continuous improvement of the process but also regular monitoring of the adequacy of professional competence.

Validation and practical application of the research results. The results of the Doctoral Thesis have been presented at 13 scientific conferences, seminars and discussions, as well as used in the implementation of projects:

1. European Commission program "Erasmus +" and "Key Action 2 – Cooperation partnerships in higher education" project "Building an Ecosystem for 21st Century Skills Education in STEM", project No. 2021-1-LV01-KA220-HED-000027581. Implementation time: 2018–2020. The author participated in the project as an expert of study process.
2. European Building Control Consortium (CEBC) project "*Building control competencies*". Implementation time: 2018–2020. The author participated in the project as an expert.

The author has applied the theoretical knowledge presented in her Thesis in her practical work – managing two certification bodies: the Latvian Association of Electric Power Engineers and Power Builders and the Certification Unit of Construction Specialists of the State Construction Control Bureau of Latvia, as a result of which a new certification scheme has been developed, a framework of professional competence in the specialty of expertise of construction, according to which the content of the assessment of professional competence has also been developed and the supervision of independent practice has been carried out.

The results of the Thesis have been used in the study courses "Conformity Assessment" and "Conformity Assessment (Study Project)".

Scientific publications. The results of the research have been published in ten international publications.

1. Kavosa, M., Lapiņa, I., Kozlovskis, K. (2022). Sustainable Approach to Certification of Persons: Ensuring Reliability and Quality. *Sustainability*, Vol. 14, 3, pp. 1–24. (indexed in WoS and Scopus).
2. Kavosa, M., Lapiņa, I. (2020). Value Stream Mapping: Effective Process Improvement Tool in the Certification Process. *Proceedings of the 24rd World Multi-Conference on Systemics, Cybernetics and Informatics (WMSCI 2020), September 13–16, 2020*. Orlando: International Institute of Informatics and Systemics, pp. 59–64. (indexed in Scopus).
3. Mjakuškina, S., Kavosa, M., Lapiņa, I. (2019). Achieving Sustainability in the Construction Supervision Process. *Journal of Open Innovation: Technology, Market, and Complexity*, Vol. 5, 3, pp. 1–11. (indexed in Scopus).
4. Kavosa, M., Mjakuškina, S., Lapiņa, I. (2019). Professional Competence Certification Process through Value Stream Mapping: A Case Study in Construction Sphere. *Proceedings of the 22nd QMOD-ICQSS Conference, October 13–15, 2019*. Lund: Lund University Library Press, pp. 1–14.
5. Kavosa, M., Lapiņa, I. (2018). Risk Analysis in Certification Process in the Field of Energy Construction: Case in Latvia. *Total Quality Management & Business Excellence*, 1, pp. 1129–1142. (indexed in WoS and Scopus).
6. Kavosa, M., Lapiņa, I. (2018). Certification Process: Conformity Assessment or Professional Competence Assessment? *Proceedings of the 21st QMOD-ICQSS Conference, August 22–24, 2018, United Kingdom, Cardiff*. Lund: Lund University Library Press, pp. 509–518.
7. Kavosa, M., Lapiņa, I., Briņķis, K. (2017). Certification of Persons: Empirical study in the field of energy construction in Latvia. *Cogent Business & Management*, 4, pp. 1–14. (indexed in Scopus).
8. Kavosa, M., Lapiņa, I. (2017). Certification Process in the Field of Energy Construction in Latvia: Risk analysis. *Proceedings of the 20th QMOD-ICQSS Conference, August 5–7, 2017, Denmark, Elsinore*. Lund: Lund University Library Press, pp. 1–13.
9. Kavosa, M., Lapiņa, I. (2016). Certification of Persons: An Important Conformity Assessment Procedure. *Proceedings of 21st International Scientific Conference Economics and Management (ICEM 2016), May 19-20, 2016*. Brno: Brno University of Technology, pp. 1–7. (indexed in WoS).
10. Kavosa, M., Lapiņa, I., Briņķis, K. (2016). The Evaluation of Certification in the Field of Energy Construction in Latvia. *Proceedings of the 19th QMOD-ICQSS International*

Conference on Quality and Service Sciences, September 21–23, 2016. Rome: Lund University, pp. 972–988.

The results of the study have been presented at thirteen **international and local conferences** (in Latvia, Poland, Denmark, Japan, USA).

1. Scientific Conference on Economics and Entrepreneurship (SCEE'2022). Riga, RTU, 13.10.2022. *Topic of the study: Conformity assessment of professionals: An innovative approach from the perspective of conformity assessment institutions.*
2. Scientific Conference on Economics and Entrepreneurship (SCEE'2021). Riga, RTU, 14.10.2021–15.10.2021. *Topic of the study: Increasing the quality of the professional competence assessment process: An innovative approach.*
3. SOI & Riga Technical University conference. Daegu, Korea, July 12–15, 2021. *Topic: New approach to certification of persons: Ensuring the Reliability and Quality.*
4. Scientific Conference on Economics and Entrepreneurship (SCEE'2020). Riga, RTU, 16.10.2020. *Topic of the study: The role of Lean management: Reducing wastes in professional competence assessment process.*
5. The 24th World Multi-Conference on Systemics, Cybernetics and Informatics (WMSCI 2020), September 13–16. *Topic of the study: Value Stream Mapping: Effective Process Improvement Tool in the Certification Process.*
6. Scientific Conference on Economics and Entrepreneurship (SCEE'2019). Riga, RTU, 11.10.2019. *Topic of the study: Understanding the role of evaluation of sustainability competences in professional competence assessment process.*
7. 22nd QMOD-ICQSS Conference "Leadership and Strategies for Quality, Sustainability and Innovation in the 4th Industrial Revolution", 13–15 October, 2019, Krakow, Poland. *Topic of the study: Professional competence assessment analysis in the certification process through Value Stream Mapping: A case study in the construction sphere.*
8. SOI_{tm}C & Meyo University conference. Nagoya, Japan, June 28 – July 1, 2019. *Topic of the study: Professional Competence Assessment as a Key Element of Sustainability and Risk Prevention: Case of Construction Industry.*
9. SOI_{tm}C & Meyo University conference. Nagoya, Japan, June 28 – July 1, 2019. *Topic of the study: Achieving Sustainability in the Construction Supervision Process.*
10. Scientific Conference on Economics and Entrepreneurship (SCEE'2018). Riga, RTU, 18.10.2018. *Topic of the study: Understanding the role of supervision in construction industry from continuous improvement perspective: Case in Latvia.*

11. 21st QMOD conference on quality and service sciences ICQSS 2018, 22–24 August, Cardiff University, Wales, UK. *Topic of the study: Certification Process: Conformity Assessment or Professional Competence Assessment?*
12. 20th QMOD conference on quality and service sciences ICQSS 2017, 5–7 August, Elsinore, Denmark. *Topic of the study: Certification process in the field of energy construction in Latvia: Risk analysis.*
13. RTU 58th International Scientific Conference «Scientific Conference on Economics and Entrepreneurship, SCEE'2017, October 13–14. *Topic of the study: The risk analysis of certification process in the field of energy.*

Volume and content of the Thesis

The Thesis consists of an introduction, three chapters, conclusions and proposals, and a reference list with 318 references. The Thesis is 273 pages long, including 21 annexes, 53 figures, 31 tables, and 3 formulas.

Part one, "**Issues and Theoretical Aspects of Certification**", looks at the issues and theoretical aspects of certification. It analyses the concept of certification and its relation to the field of conformity assessment, as well as describes the problems of defining certification of persons as an assessment of professional competence. The first part concludes with an overview of the interaction between the certification process and the quality management components.

Part two, "**Assessment of the system of certification of persons in Latvia**", describes the system of certification of persons, identifying the requirements applicable to the service and analysing personal certification as a service for the purpose of obtaining the right to independent practice in the regulated professions in the Republic of Latvia. An empirical study has been carried out to identify the aspects related to the assessment of professional competence and to identify the negative impact factors or barriers to the implementation of the service of certification of persons as assessed by the stakeholders involved in the process.

Part three, "**Improving the process of certification of persons**", develops solutions for improving the process of certification of persons, proposing a sustainable approach to the process of certification of persons that would allow for a paradigm shift in the current certification methodology, also integrating quality and sustainability aspects. Simultaneously, the results of the testing of the approach developed in the Thesis are described.

1. ISSUES AND THEORETICAL ASPECTS OF CERTIFICATION

1.1. Certification as a conformity assessment procedure

In today's service-oriented economy, quality has become one of the most important criteria for assessing the end result of a service. Consequently, the role of conformity assessment in ensuring safe and secure products and services is growing. Conformity assessment is defined in the scientific literature as the process of carrying out conformity assessment procedures to evaluate the conformity of an object (product, process, etc.) to requirements.

One of the most widely used conformity assessment procedures is certification, and the concept of certification is very closely related to the concept of conformity assessment, which involves assessing a specific object to determine whether it meets the necessary requirements (Kavosa et al., 2018; Liepiņa et al., 2014). Analysing the definitions of certification, the author concludes that certification is a conformity assessment procedure in which the object may not only be a product but also a legal or natural person, process, service or activity, and in which an independent third party inspects the object to assess whether it meets the necessary requirements, issuing a certificate as proof of conformity.

Certification is not only a way of certifying professional competence but is also one of the most important mechanisms for controlling competence in regulated professions, where a person is not entitled to exercise his or her professional activity without appropriate proof of competence. Certification thus serves not only as an essential tool for assessing professional competence but also as a mechanism for controlling qualifications, which may have direct or indirect effects on public safety, the education and professionalisation process in the field of activity to be certified, and the service sector as a whole.

In assessing the meanings of the term "personal certification", the author concludes that the term "personal certification" is most commonly used in the scientific literature to mean "certification of professional competence" or "compliance with professional requirements". As a result of the literature review, the author concludes that the certification of persons is related to professional competence and conformity assessment activities. There is a close link between them, as conformity assessment can be used in the certification process to assess the professional competence of individuals, provided that the required competence framework in a given field is clearly defined.

Most of the previous studies on the definition of personal certification also point to aspects that influence the final outcome of the personal certification process. These aspects mainly refer to certification as a conformity assessment procedure, including the claim that if a person meets the criteria set out in a standard, this automatically guarantees the person's compliance with the requirements. At the same time, studies point out that the certification of persons also includes an aspect of assessment of professional competence, to demonstrate that the knowledge, skills and abilities of the individual have been tested. Analysing the basic elements of the concept of professional competence, the author concludes that professional competence is most often associated in the literature with elements such as knowledge, abilities, skills and attitudes. Motivation and ethics are the least frequently mentioned professional competencies in literature.

Consequently, certification bodies should assess competence when certifying persons; a person's knowledge in a particular field cannot be the sole criterion for assessment. The professional competence of individuals must be assessed in the context of all elements, including their professional autonomy and responsibility, i.e. in addition to their ability to apply acquired professional knowledge and practical skills in situations related to their professional activity. Thus, the author's analysis of the literature provides an answer to Research question 1 related to the elements of the assessment of professional competence in the certification process.

Overall, the author concludes that the certification methodology provides a control approach that is interpreted in the scientific literature as a guarantee of compliance with safety and economic requirements (Jasim et al., 2007). In order for certification to evolve from a conformity assessment and control mechanism to a long-term professional development tool, the certification process needs to be seen as a coherent set of elements operating in a defined environment and receiving information from the environment.

1.2. Certification as an assessment of professional competence and its interaction with quality management

As the concept of certification of persons is also used in the context of the literature review in relation to the professional development aspect, the process of certification of persons should ensure not only "standardised achievement and measurement of competence" but also "continuous monitoring of competence". Summarising the evaluation of the certification process and the concept of quality, the author concludes that certification is very closely linked to quality. In order for the final result of the certification process to be described as "quality"

and for the certification process to include a "quality assessment" of the site, the following conditions must be met:

- if the quality of an object is understood not only as its compliance with the requirements set out in standards or regulations, it is also necessary to identify the needs of customers in relation to the object to be certified;
- the certification process must be operational, ensuring effective management of the resources at its disposal necessary to carry out conformity assessment activities;
- personnel with appropriate professional competence are involved in the certification process to carry out conformity assessment activities;
- the issuance/non-issuance of a certificate of conformity cannot be the only criterion for assessing the final outcome of the certification process ; what also matters is the client's satisfaction and his/her assessment of the fulfilment of the requirements in the process.

The conformity assessment requirements to be met by bodies carrying out personal certification are set out in the international quality standard ISO/IEC 17024:2013 "Conformity assessment. General requirements for institutions certifying persons". Therefore, the author concludes that quality management is very closely linked to the activities to be carried out in the conformity assessment, so that the final result of the conformity assessment can be described as qualitative. The interactions between the elements of the certification process, the related terms of the quality concept and the main stages of quality management according to the Juran trilogy, which are also included in the quality standard for conformity assessment bodies, are illustrated in Fig. 1.1.

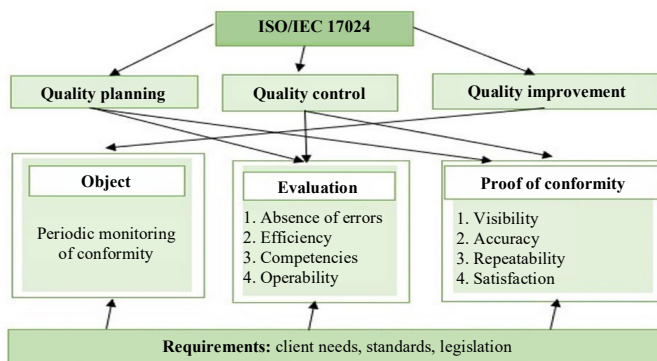


Fig. 1.5. Flowchart of the elements of the certification process and the quality management stages (created by the author).

Summarising the assessment of the aspects related to the certification process and quality management, the author concludes that certification is very closely linked not only to quality, but also to quality management, which implies that the certification process should follow the quality management stages: quality planning, quality control and quality improvement. The approach of continuous improvement of the process of certification of persons as defined in the standard is also adopted in practice: the scope of the assessment is systematically structured and designed, which allows the further development of the management system to be recorded and improvements to be documented over time (Klute-Wenig et al., 2015). Therefore, the main objective of certification of persons is not only to assess the conformity of the object/person/professional competence in accordance with the professional competence requirements of the sector but also to ensure continuous improvement of the professional competence and related conformity assessment activities. On the other hand, summarising the assessment of the aspects related to continuous improvement in the process of certification of persons, the author concludes that the person as an object of conformity assessment in the certification process becomes an element of quality monitoring from an element of conformity assessment, because:

- assessing a person's compliance is carried out not only with the qualification requirements of the profession but also with the quality requirements set by clients;
- the aspect of continuous development of the person as an object of certification implies the assessment of the professional competence of the person also in the development.

In the author's opinion, it is quality improvement that is one of the main aspects that makes certification different from other conformity assessment procedures, so that certification becomes a quality assurance, control and improvement tool as well as a conformity assessment procedure. Thus, the author finds an answer to Research question 2 of the Thesis on the relation of certification as a conformity assessment procedure to quality.

At the same time, the author finds that there is a lack of scientific literature and research on the theoretical aspects of the certification of persons, as a result of which the term "certification of persons" in scientific literature is interpreted through the prism of conformity assessment, although certification of persons also places significant emphasis on quality aspects. Taking into account the above and the above-analysed explanations and definitions of the concepts related to certification, the author proposes as an **innovation** the following clarified definition of the term "certification of persons": certification of persons is a conformity

assessment procedure whereby an independent third party assesses and certifies a person's **compliance with the professional competence and quality requirements set by the industry**. A graphic interpretation of the definition is presented in Fig. 1.8.

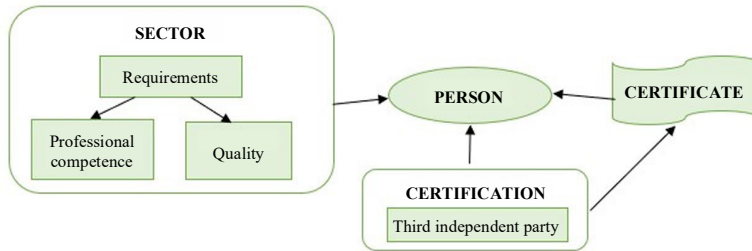


Fig. 1.8. Flowchart of the definition of the term "certification of persons" (created by the author).

By requirements in the process of certification of persons, the author means the requirements set by the sector regarding the professional competence (education, experience, abilities and skills) and quality of the person in relation to the performance of the service provided by the person. In order to underline the role of independence and non-influence in the certification of persons, the definition of certification of persons also refers to the involvement of the conformity assessment body as an independent third party, which is specifically underlined in the definition of certification as a conformity assessment procedure. However, the author's reference in the definition to the conformity assessment procedure includes a provision for issuing a certificate.

In order to ensure that the activities related to conformity assessment and attestation of conformity in the certification process also meet the quality criteria, the conformity assessment body shall clearly define the objectives to be achieved, the needs of the client and the actions to be taken to achieve these objectives. It also involves continuous process control, performance analysis and performance evaluation, thus ensuring a systematic approach to the certification process.

2. ASSESSMENT OF THE CERTIFICATION OF PERSONS SYSTEM IN LATVIA

2.1. Description of the system of certification of persons

The certification of persons plays an essential role in ensuring the free movement of services in the internal market of the European Union. According to Directive 2006/123/EC of the European Parliament and of the Council (hereinafter – Directive 2006/123/EC) on services in the internal market, services account for 70 % of GDP and jobs in most Member States, where the internal market is defined as the area without internal borders in which the free movement of services is ensured. Thus, in order to facilitate the cross-border provision of services between the Member States of the European Union, while removing obstacles to the development of service activities, a system of conformity assessment of service providers has been developed based on the recognition of the professional qualifications of service providers in order to guarantee the safety of the services provided. A diagram of the relationship between the system for recognising professional competencies and the fundamental principles of the internal market is shown in Fig. 2.1.

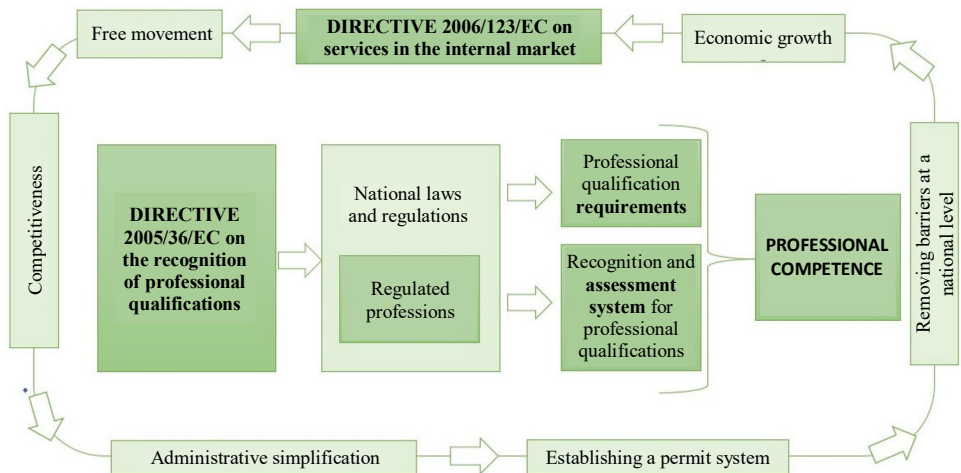


Fig. 2.1. Diagram of the relationship between the system for recognition of personal qualifications and the fundamental principles of the internal market (created by the author).

By carrying out a general analysis of the system of certification of persons in the context of international laws and regulations, the author concludes that certification of persons serves not only as a tool for assessing the adequacy of professional competence but also as one of the

prerequisites for the economic growth of the European Union. The requirements for a system of recognition and assessment of a person's professional qualifications are laid down in laws and regulations at the national level and are taken into consideration when assessing the suitability of a person's professional competence to work in a regulated profession in a given Member State, including at the international level. Consequently, the system of certification of persons established at the national level also has a major impact on the system of recognition and assessment of professional qualifications at the international level.

At the national level, uniform conformity assessment procedures in the Republic of Latvia are defined by the Law on Conformity Assessment (1996), which aims to ensure a uniform conformity assessment procedure that is harmonised with European Union legislation and international normative acts. Conformity assessment bodies carrying out conformity assessments in the regulated and non-regulated fields of a given sector must be accredited in accordance with the requirements of the regulatory enactments in that field. In accordance with the Law on Conformity Assessment, certification bodies are accredited and their activities are supervised by the national accreditation institution in accordance with the procedure established by the Cabinet of Ministers. In Latvia, the Latvian National Accreditation Bureau (hereinafter referred to as LATAK) performs the functions of a national accreditation institution in order to fulfil the accreditation and market surveillance requirements set out in Regulation (EC) No. 765/2008 of the European Parliament and of the Council of 9 July 2008.

The requirements for the development and maintenance of certification schemes to be followed by conformity assessment bodies are set out in the international quality standard ISO/IEC 17024:2013 (see Fig. 2.2).

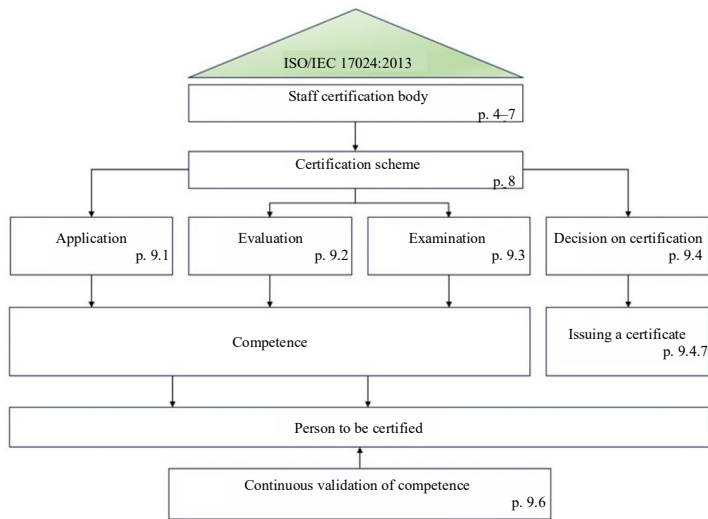


Fig. 2.2. Flowchart of the certification process according to ISO/IEC 17024 (created by the author).

The certification process flowchart shows the main activities that a conformity assessment body carries out to verify the competence of a certified person and to issue a certificate of conformity. Each certification category shall have its own certification scheme and all activities shall be carried out in accordance with the requirements of the certification scheme, which shall include the criteria and methods to be applied for each specific stage of the certification process. One of the most important operating principles for a certification body to ensure free access to its services and to respect the principle of mutual recognition is to ensure that the parties involved are able to maintain their independence. This is particularly important when it comes to the recognition of certificates issued in another country or the certification of a national of another country.

After a general review of the personal certification process, the author concludes that the functioning of these stages of the certification process should be based on independent expert judgement in order to provide an objective assessment of the professional competence of a person. To this end, the certification of persons in Latvia is organised in such a way that the professional performance of conformity assessment bodies is regularly assessed as part of the accreditation process, providing assurance that its activities comply with the requirements of ISO/IEC 17024 and the regulatory requirements set by the sector.

2.2. Personal certification process in Latvia – empirical research

The aim of the study is to analyse the aspects of professional competence assessment related to the certification of persons and the conduct of the assessment according to the requirements of the stakeholders, in order to develop a new sustainable approach to the process of certification of persons that ensures the quality and reliability of its performance. The relevance of the research is based on the fact that the industry is increasingly demanding that the certificate issued by the certification body should not only certify the compliance of a person's qualification with the requirements but also the person's ability to provide a high-quality and sustainable professional performance result.

Taking into consideration that this is the first study in Latvia on the certification of persons and the assessment of professional competence within its framework, which also identifies the inhibiting factors of influence or barriers that hinder the process of certification of persons, the author proposes this research within the framework of her Thesis as an **innovation**.

In order to gather stakeholders' views on personnel certification issues in relation to the assessment of the adequacy of a person's professional competence, a questionnaire and correspondence analysis were used.

The questionnaire is structured according to the thematic focus of the study, including closed and open-ended questions and appropriate measurement scales:

1. The **introductory section** provides general information about the respondent, including the field of activity and length of experience.
2. The **second part** provides information on the understanding and purpose of the definition of "personnel certification" by asking respondents:
 - to provide an assessment of the understanding of the concept of "personnel certification" by including in the questionnaire the most widely used **definitions of the concept**, the analysis of which was carried out in Part 1 of the Thesis;
 - to describe the **purpose of certification of persons**, offering a choice between the most widely proposed characterisation of the purpose of personnel certification in scientific publications, analysed in Part 1 of the Thesis, and the characterisation of the purpose proposed by the author.
3. **In the third part**, the author of the Thesis clarifies:

- how respondents rate the elements of professional competence identified by the contingency analysis on a 6-point ordinal scale, with the first measurement being the "least important element" and the sixth measurement being the "most important element". The analysis of the elements of professional competence was carried out within the framework of Part 1 of the Thesis;
 - aspects that respondents feel should be taken into consideration in order for the certification process to objectively assess a person's professional competence and confirm his or her ability to deliver quality performance. The questionnaire includes the aspects identified as a result of the analysis of the scientific literature, identifying the theoretical aspects of the concept of "personnel certification", which are described in more detail in Part 1 of the Thesis;
 - the methods that respondents consider most appropriate for assessing the adequacy of a person's professional competence in the certification process. The author has included in the questionnaire the methods identified in Part 1 of the Thesis, by carrying out a contingency analysis of the most widely used methods of competency testing in the scientific literature.
4. **In the fourth part**, the author obtains information on how respondents evaluate common statements regarding the certification of persons, which are widely found in scientific studies on the certification of persons and analysed in Part 1 of the Thesis.
 5. **In the fifth part**, the author obtains information on the most important benefits that both the certified person and his/her employer perceive to be gained by the respondents, based on the analysis of the scientific literature and described in more detail in Part 1 of the Thesis.
 6. **In the sixth part**, the author obtains information on the most important negative influencing factors or barriers to certification of persons, identified as a result of the literature analysis and which, according to the respondents, have the most significant impact on the final outcome of the certification of persons process.

The author conducted the empirical study in four stages (see Fig. 2.3).

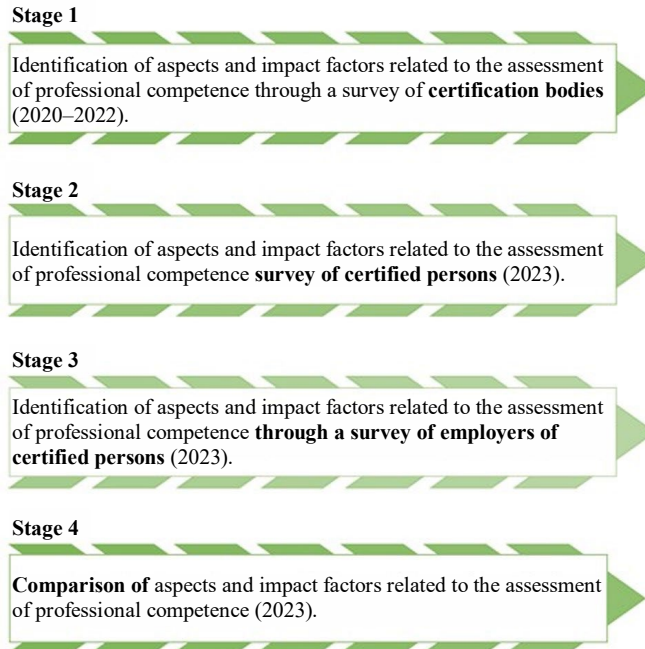


Fig. 2.3. Phases of the empirical research.

- **Stage 1** involved a survey of certification bodies. The general assemblage of the survey consists of 25 certification bodies that have been granted the right by LATAK to assess the professional competence of persons in specific sectors. Assuming 95 % confidence and a 5 % margin of error, the sample size should be at least 9 respondents to ensure the representativeness of the study. Considering that the entire master sample was included in the sample and that 20 questionnaires have been obtained, the results are reasonable.
- During **Stage 2**, a survey of certified persons was carried out. Regarding the survey of the opinion of certified persons on the issues of certification of persons, the author carried out the survey on the example of certification of construction specialists by conducting a survey of all certified construction specialists in Latvia. The author's choice is based on the fact that certified construction specialists are not only the largest group of certified persons (45 % of all certification bodies certify construction specialists, which is the highest number of certification bodies and certified persons compared to other sectors) but also play an important role in relation to environmental and public safety. Assuming 95 % confidence and a 5 % margin of error, the sample size should be at least 362 respondents to ensure the representativeness of the study.

Considering that the sample included the entire master sample, i.e. 6170 construction specialists, and resulted in 721 questionnaires, the results of the research are reasonable.

- **Stage 3** involved a survey of employers of certified persons. Taking into account the share of certification bodies in the construction sector compared to the total number of certification bodies in Latvia (see the description of Stage 2), the author carried out a survey of construction companies registered in Latvia. According to the information available in the Register of Construction Companies in the Construction Information System, at the time of the survey, there were 228 construction companies registered in Latvia, which are employers of the largest percentage of certified persons in the construction sector and meet the author's selection criteria. Considering that the sample included all 228 construction companies as a master sample and resulted in 113 questionnaires, the results are reasonable.

Within the framework of the research, the author obtained information on the system of certification of persons in Latvia and the understanding of the parties involved in the issues of certification of persons on the part of conformity assessment bodies/service providers, certified persons/service recipients and employers of certified persons/recipients of the final result of the service. Summarising the general information about the respondent, the most widely represented target audience is:

- 1) from certification bodies – institutions assessing the professional competence of persons in the construction sector (45 %);
- 2) from certified persons – construction specialists certified by the Latvian Association of Civil Engineers (44.6 %), aged between 50 and 65 years and with level 2 professional higher education, corresponding to level 6 of the European Qualifications Framework (EQF) in the field of European higher education;
- 3) from employers of certified persons – construction contractors, of which the majority of respondents are engaged in commercial construction management (34.9 %) and have not been awarded the construction contractor qualification class.

The results of the research, which reflect the understanding of the concept of both the provider and the recipient of the service, as well as purpose, negative inhibiting factors of influence or barriers and aspects to be taken into account in the assessment of professional competence, are summarised in Table 2.1.

Table 2.1

Summary of Empirical Results

Research section on the certification of persons		Respondents (%)		
		Certification bodies	Certified persons	Employers of certified persons
1	2	3	4	
Understanding of the definition of the concept				
A conformity assessment procedure whereby an independent third party assesses and certifies a person's compliance with the professional competence and <u>quality</u> requirements of the sector		52	29	27
Staff certification is the process of certifying that a person's education, practical experience and skills <u>meet the</u> requirements of a professional field of activity		29	57	57
Understanding the purpose				
Means for demonstrating that a person's professional competence meets the requirements of the sector		71	59	55
Understanding the elements of competence to be tested				
The personal capabilities and skills required to carry out the tasks related to the job		86	45	52
Practical experience of the person		81	58	60
Theoretical knowledge relevant to the person's field		52	32	28
Attitude of the person		33	33	38
Understanding the aspects that need to be respected to achieve an objective result				
Clearly defined competence requirements for the sector		24	27	27
Understanding the most appropriate method				
Practical tasks based on the analysis of events in concrete situations		26	16	18
Professional experience summary or portfolio assessment		13	29	29
Understanding of common statements in the scientific literature, rated as "strongly agree"				
The assessment of professional competence in the certification process cannot be limited to a first examination but must also include periodic assessment of independent practice		67	26	27
There is a close link between quality and certification of individuals, as the assessment of professional competence can be used to assess an individual's ability to perform a job to a high standard if the quality requirements are defined in the sector		62	17	20
Certification cannot be the sole criterion for assessing whether a staff member's professional competence meets the requirements of the sector, as it needs to be assessed in the context of the staff member's experience, abilities and personal character		24	37	43
Understanding the benefits of being a certified person				
Right to provide services in the sector		86	67	63
The opportunity to demonstrate professional competence		62	30	25
The possibility of formally meeting the industry requirements		29	27	30
Understanding employer benefits				
Right to provide services in the sector		81	61	57
Opportunity to increase the competitiveness of the company		57	41	37

Table 2.1 continued

1	2	3	4	
Understanding the negative impact factors or barriers with the highest impact scores				
Lack of a common approach to the application of legislation in the industry		38	16	22
Formal approach from the supervisory institutions		33	17	20
Professional competencies required in the industry are not clearly defined		33	16	22
Bureaucracy		19	25	33

By identifying the perception of certification bodies, certified persons and their employers about the system of certification of persons in Latvia, the author finds that, in practice, the sector understands personnel certification not only as the assessment of conformity to the requirements set in the professional field of activity but also as the assessment of quality. This is also confirmed by the results of the research with regard to the statements obtained from the analysis of the scientific literature, namely that the certification of persons as a conformity assessment procedure is very closely linked to the quality aspect, both in terms of performance and in terms of monitoring the adequacy of professional competences.

In turn, the industry considers the objective of the certification of persons to be the assessment of the compliance of the professional competence of a person with the requirements set by the industry, thus confirming that the certification of a person is classified and understood as a conformity assessment procedure.

Regarding the elements of professional competence that need to be evaluated in the process of certification of persons, the industry also indicates the individual character traits and attitude of the person as the most important with the highest priority rating, which confirms that the industry understands that professional competence is not just the professional qualification of the person and the acquired practical experience. So, it can be argued that **Thesis 1** –the qualifications and professional experience acquired by a person cannot be considered as the sole evaluation criteria in the certification process, **is confirmed**.

In order for the certification process to objectively assess a person's professional competence and demonstrate their ability to deliver quality performance, the industry points to the need to define competence requirements for the industry. It can, therefore, be argued that **Thesis 2** – if in the process of certification of persons, the professional competence is assessed in accordance with the competence requirements defined in the particular field, then the certificate issued to the person also confirms the person's ability to ensure a high-quality work performance result, **is confirmed**.

Regarding the method which the industry considers most appropriate for assessing a person's professional competence in the certification process, the most effective method is the "assessment of practical experience": analysis of events based on specific situations or the use of the portfolio principle. Given that the industry is currently using methods such as written and oral examinations as methods of assessing competence in accordance with regulatory requirements, the author sees here an opportunity to improve the certification of individuals. This is confirmed by the fact that these methods have been described by the industry as the least suitable for objectively assessing professional competence.

Regarding the benefits of the certification process for persons, the industry agrees that, first and foremost, they have the right to provide their services to the industry and to demonstrate their professional competence, as well as to formally meet the requirements of the industry as set by the legislator. For the employer, the industry sees it as a right to provide its services to the sector, as well as an opportunity to increase its competitiveness.

Regarding the negative inhibiting factors of influence or barriers of the process of certification of persons, the results of the study show that the industry mentions bureaucracy, formal approach on the part of supervising institutions, as well as not defining a competency framework against which the professional competence of a person should be assessed as the most important negative inhibiting factors of influence or barriers to the process of certification of persons.

Summarising the results, the author concludes that, overall, the industry confirms that the system of certification of persons in Latvia needs to be improved both in the area of supervision of independent practice and in the mechanism of assessment of professional competence. The author also concludes from the analysis of the results that the industry understands personal certification not only as a conformity assessment but also as a quality assessment, which also includes an aspect of improvement and dynamic development. Taking into account that in Part 1 of the Thesis, the author, having analysed the concept of certification of persons, concluded that certification of persons is understood exclusively as the assessment of the conformity of professional competence in accordance with the requirements defined by the industry, the author proposed as an innovation a new definition of the concept of certification of persons, which, taking into account the results obtained, can be considered successfully validated.

3. IMPROVING THE PROCESS OF CERTIFICATION OF PERSONS

3.1. Developing solutions to improve the process of certification of persons

The problem of the Thesis is related to the paradigm of the certification methodology based on the control approach. However, the results of the research described in Part 2 of the Thesis indicate that nowadays, the client wants the certificate to certify not only the compliance of the person's qualification with the requirements but also the person's ability to deliver a high-quality and sustainable professional performance. Given that the certification methodology does not ensure a sustainable approach, it is necessary to develop a new approach to shift the paradigm of the certification methodology from a control mechanism to an approach that also integrates quality and sustainability aspects. This is based on the distinction found in the study between the certification of persons as an element of conformity assessment in the theoretical sense and the certification of persons as an element of quality in the industry sense on the one hand, and the assessment and monitoring of professional competence in the process of certification of persons according to the needs of the industry on the other hand.

In Part 2 of the Thesis, the author also identified the most significant negative inhibiting factors of influence or barriers to certification of persons, which are mainly related to bureaucracy, formal approach on the part of supervising institutions, as well as failure to define a competence framework against which a person's professional competence should be assessed.

In order to achieve this, the author proposes an **innovation** within the framework of her Thesis – a systematic, structured and sustainable approach to the certification of persons, where certification from a conformity assessment element becomes a quality element, ensuring the interaction between these two elements, so that the professional competence of a person can also be assessed in development. Certification of persons is thus changing from a test of compliance with minimum requirements to a test of professional competence in the context of sustainable development, while at the same time changing the current decision-making processes regarding certification of persons and the behaviour and attitude of the person to be certified, as well as the mutual relations between the parties involved in the certification process.

The improvement of the certification of persons developed by the author consists of:

- 1) **competency-based approach** to the certification of persons, in terms of assessment of professional competence and supervision of independent practice;

- 2) **integrated approach** to the quality management, including the application of quality improvement and risk management techniques to the process of certification of persons;
- 3) **sustainable approach** to the process of certification of persons, based on awareness of the needs of stakeholders and the sustainability aspects of the quality of professional performance in the sector.

The new approach to certification of persons is considered as a whole and is based on a systemic, structured, sequential approach, with interconnections based on the analysis of the following theoretical aspects in Part 1 of the Thesis:

- 1) stakeholders – to highlight the interdependent relationships between the stakeholders in the certification process in order to add value to them, while providing for the identification and management of stakeholders;
- 2) control – maintaining the controlling nature of the certification mechanism, which is being developed to ensure the manageability of the process through administrative means, including the establishment of a defined policy;
- 3) system – viewing certification of persons as a single system made up of interrelated and interdependent groups of components.

The detailed approach to improving the process of certification of persons is illustrated in Fig 3.1.

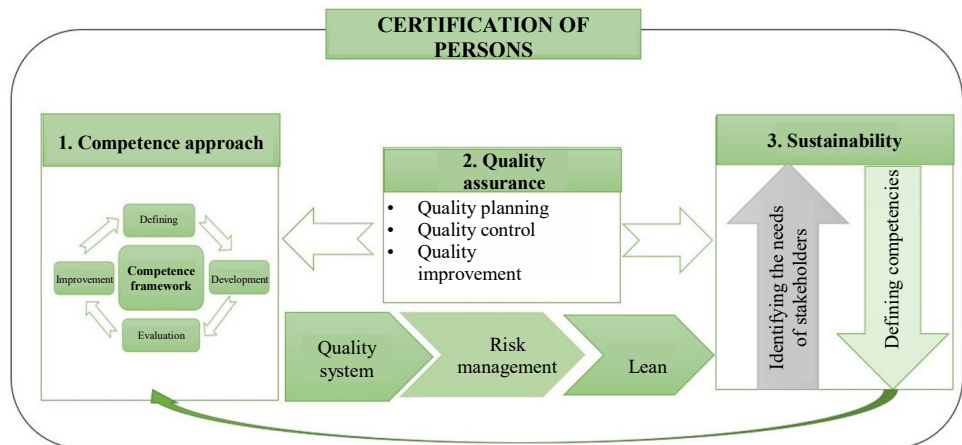


Fig. 3.1. Approach to improving the process of certification of persons.

The sustainable process of certification of persons approach proposed by the author consists of three main building blocks and their interaction:

- **Block 1** provides for the certification of persons based on the competence approach, which determines the establishment of a professional competence framework in line with the PDCA concept.
- **Block 2** deals with the certification of persons as an element of quality management, incorporating the concept of Juran's quality trilogy, thus envisaging the establishment of a quality management system based on the identification of negative inhibiting factors of influence or barriers and on the application of the lean management philosophy principles regarding the continuous improvement aspect of competence.
- **Block 3** looks at the certification of individuals as a socially responsible and sustainable process, which involves identifying the needs of stakeholders and defining competencies related to sustainable professional performance.

The competency approach proposed by the author is based on the principle of continuous improvement, based on the PDCA (*Plan-Do-Check-Act*) concept (Silva et al., 2013) to ensure that the necessary changes to the professional competency assessment order are made in a timely manner in order to achieve gradual and continuous improvement. As the PDCA concept involves cyclical and iterative activities, thus including the principle of continuous improvement, the author has identified four main stages in the development of a professional competence framework:

- **Stage 1. Defining.** Meets the "*Plan*" component of the PDCA concept. The key performance indicator of the phase is that professional competencies (knowledge, experience, abilities and skills) required by the sector are defined, identifying the sector's needs for quality professional performance.
- **Stage 2. Development.** Meets the "*Do*" component of the PDCA concept. The main output of the phase is the development of a professional competence framework based on the knowledge, experience, competencies and skills defined in the previous phase, according to which the certification body will assess the professional competence of the person during the certification process.
- **Stage 3. Evaluation.** Meets the "*Check*" component of the PDCA concept. The main performance indicator of the phase is the assessment of the person's professional competence in accordance with the competency framework developed in the previous phase.
- **Stage 4. Improvement.** Meets the "*Act*" component of the PDCA concept. The key performance indicator of the phase is the periodic monitoring of the professional

competence framework and the competence verification mechanism developed by the certification body in the previous phase.

Thus, the author concludes that with the integration of the PDCA concept in the definition and development of the professional competence framework, the competence assessment mechanism chosen by the certification bodies and the development of the monitoring solutions, the certification of persons is changing from a conformity assessment procedure into a process of professional competence assessment with dynamic development.

Certification of persons is one of the most common ways of assessing professional competence, with the aim of certifying that a person is able to carry out his or her work in accordance with the requirements of the professional field. In order to achieve this goal, the author believes it is necessary to identify not only the professional competence framework required by the industry but also the quality requirements set by the industry. According to the sources of literature, the systems approach is a way of ensuring a close link with all the components of an organisation (system, structure, internal organisation, functions, methods, etc.) (Arnold et al., 2015). This means that a personal conformity assessment body must take a systematic approach to the certification process while ensuring continuous monitoring, performance analysis and evaluation of the process. To achieve this, the ISO/IEC 17024 standard contains common and general requirements for a quality management system for the assurance of the process of certification of persons. In the scientific literature, a quality system is defined as the organisational structure, procedures, processes and means to ensure quality (Frank et al., 2011). There are several approaches to quality system performance, but research suggests that the Lean management philosophy, based on the PDCA concept, is one of the most effective. The Lean management philosophy can, therefore, be easily integrated into any quality system that is developed and maintained according to ISO standards. Therefore, the author recommends developing an integrated approach to the quality system that encompasses not only the Lean management philosophy but also the principles of risk management (see Fig. 3.2).

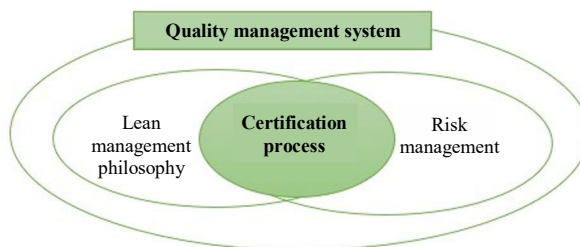


Fig. 3.2. An integrated approach to the quality system (created by the author).

The integrated approach to the quality system in a certification body illustrated in Fig. 3.2 provides a more versatile approach to the phase of defining, developing and assessing professional competence in collaboration with industry. The integrated approach is based on collaboration between different stakeholders (Gopinathan et al., 2006) and, as a result, it enables certification bodies to develop specific strategies for the implementation of the process of certification of persons in order to manage risks and take advantage of newly discovered opportunities. To ensure this, each of the elements integrated into the quality system must be managed, which requires focused planning, organisation and implementation by the certification bodies.

As the social dimension and sustainability issues are gaining momentum in the context of organisational process improvement, including in the field of conformity assessment, certification bodies are interested in adopting new approaches to ensure that the quality of a certified person's performance also meets the requirements of stakeholders in terms of the person's ability to apply the acquired knowledge and skills in situations related to his/her professional activities.

A sustainable approach to the process of certification of persons means that certification of persons is transformed from a conformity assessment procedure into a professional competence assessment process, thus ensuring the quality and credibility of the results in the interests of all stakeholders. A sustainable approach ensures that the certification of individuals not only assesses a person's knowledge and professional experience in a particular field but also their competence or ability to apply the acquired knowledge and skills in situations related to their professional activities. A competent and professional workforce can not only ensure the provision of quality and reliable products (technologies, goods or services) in the industry, but also innovation, which in turn ensures sustainability.

The author proposes a new sustainable approach to the certification process as an **innovation**, where quality and credibility are the proof of a person's ability to apply the acquired knowledge and skills not only in line with industry requirements but also in the interests of stakeholders (see Fig. 3.3).

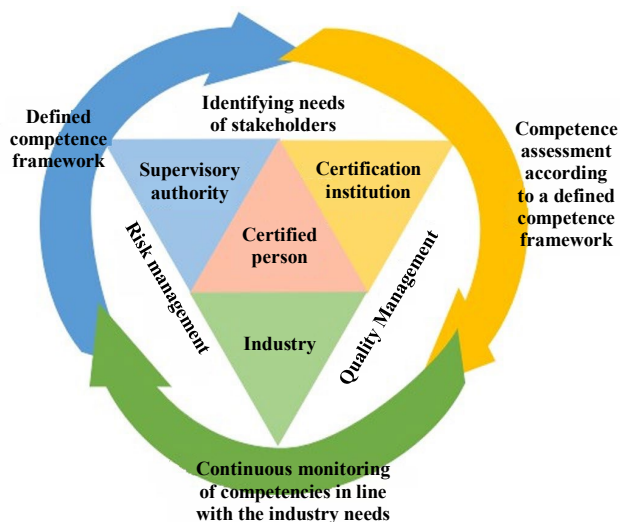


Fig. 3.3. Sustainable approach to the certification of persons (created by the author).

Figure 3.3 illustrates a new approach to the assessment of individuals' professional competencies, based on mutual cooperation with stakeholders and defined process management principles to ensure sustainable development of professional competencies. The approach is based on literature research on the concepts of certification of persons and professional competence, as well as the links with the components of quality management and the PDCA concept.

Taking into account the above, in the author's opinion, the process of certification of persons should be organised in such a way as to ensure timely identification of negative impact factors or barriers to the process of assessment of professional competence and compliance of the quality system with the requirements of ISO/IEC 17024. If the parties involved in the certification process have clearly defined professional competencies required by the industry, which are monitored periodically according to their needs, the certificate issued as a result of the certification process will not only demonstrate the professional competencies required, but also the quality of the professional performance. This can be reliable proof of a person's professional competence, and, in the long term, it can change people's habits and public behaviour with regard to policies in a given field of activity. Thus, the author answers Research question 3 – how to ensure that the certificate does not certify only professional competence.

Thus, the author concludes that **Thesis 3** – to ensure the quality and reliability of the process of certification of persons, certification bodies need to manage the key risks of the

certification process, identify the key stakeholder requirements and maintain an integrated quality system based on the principles of continuous improvement and a process approach, **is confirmed.**

3.2. Planning and implementing solutions to improve the process of certification of persons

In line with the improvement solutions for the process of certification of persons, which aim to ensure the improvement and development of professional competence in the long term, the author of the Thesis has developed a flowchart for the planning and implementation of improvement solutions (see Fig. 3.4).

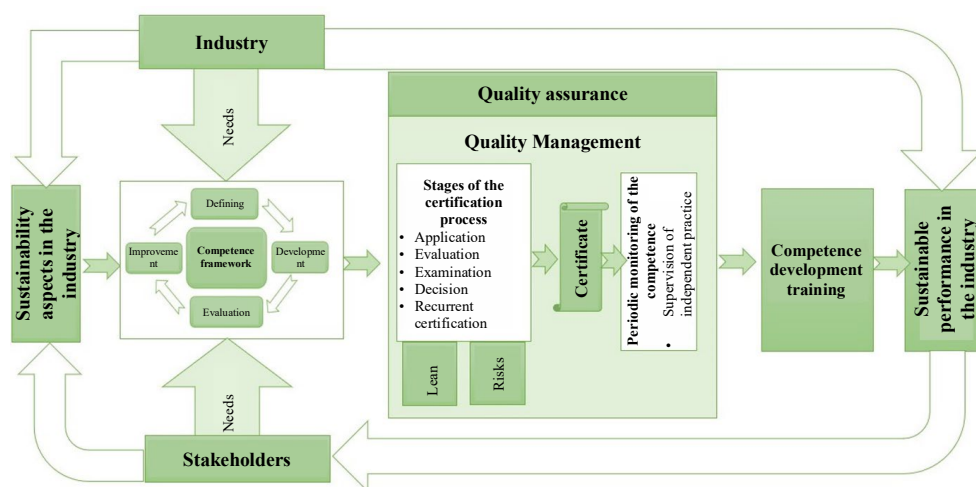


Fig. 3.4. Flowchart of the approach to designing and implementing solutions to improve certification of persons (created by the author).

The sustainable approach to the process of certification of persons developed by the author is a recommendatory approach based on a literature analysis, where certification bodies can use the developed approach in its entirety or only certain stages of it. In the approach to the sustainable certification of persons process, the following key steps can be identified in the design and implementation of solutions, as illustrated in Fig. 3.4:

- **Stage 1.** Identification of stakeholder and industry needs in terms of the professional competence framework and the requirements regarding the quality of professional performance in relation to industry-related sustainability aspects. The relevant stage includes defining the stakeholders and setting up working groups of industry representatives.

- **Stage 2.** Identification of industry-specific aspects of sustainability, both in terms of assessing professional performance in the context of sustainable development and its negative impacts or barriers, and the core competencies required for sustainable and effective performance according to the needs of the industry and its stakeholders.
- **Stage 3.** Developing a professional competency framework in collaboration with the industry to define the competencies needed in the industry, taking into account both the needs of the industry and stakeholders, as well as sustainability aspects.
- **Stage 4.** An integrated approach to the quality system that integrates elements of Lean management philosophy and risk management into the quality management of the certification bodies, thereby also ensuring continuous monitoring of professional competence compliance.
- **Stage 5.** Organising competency development training in line with the results of the monitoring of professional competence.

By implementing the approach of the sustainable process of certification of persons proposed by the author as an **innovation** in the framework of the Thesis, certification of persons is transformed from a conformity assessment procedure into a quality element based on process management principles and mutual cooperation with stakeholders to ensure the sustainable development of professional competence in a given field. Therefore, it can be argued that **Thesis 4** – if realizing a process approach in all activities related to the certification of persons, it ensures not only continuous improvement of the process but also continuous monitoring of the adequacy of professional competence, **is confirmed**. The Thesis thus answers Research question 4 regarding an approach to certification of persons that could contribute to the sustainable development of a person's professional competence in a specific industry.

3.3. Testing the approach to improve the certification of persons process

The author tested the approach to the sustainable process of certification of persons in one of the certification bodies for construction specialists – Bureau BSN, which grants the right of independent practice in the speciality of expertise of construction. The testing of the improvement approach was carried out by the author between November 2018 and April 2023, according to the phases described in Subsection 3.2 of the Thesis:

- **Stage 1.** Identifying needs of stakeholders and industry in terms of professional competence framework and quality of professional performance.

- **Stage 2.** Identifying sustainability aspects in the construction sector in the context of assessing professional performance in sustainable development.
- **Stage 3.** Developing a professional competence framework in partnership with the industry.
- **Stage 4.** Integrating Lean management philosophy and risk management elements into the quality system.
- **Stage 5.** Organising competency development training in cooperation with the industry.

In **Stage 1**, the author gathered and compiled information on the professional competencies required in the speciality of construction expertise, as well as the inhibiting factors of influence or barriers to the quality of professional performance, which were presented to the working group. The results were used by the author as a basis for the development of the competency framework in the next stages of development of the approach.

In **Stage 2**, the author identified sustainability aspects in the construction sector in relation to ensuring sustainable construction practices. The analysis of the scientific literature shows that sustainability aspects in the industry are related not only to the application of the latest technologies but also to the professional competence of construction specialists, where the lack of skilled and qualified professionals is one of the most significant barriers to the implementation of sustainable construction practices. After summarising the results of the literature review, the author organised a discussion with the stakeholders. Given that the author observed difficulties in reaching a consensus among the parties involved in the discussions, the author used the Delphi method.

The main objective of the Delphi method is to identify the competencies that should be assessed during the assessment of the professional competence of construction specialists in order to avoid the risk of inadequate professional competence of construction specialists in relation to the implementation of sustainable construction practices. Based on the Delphi method, the author concludes that in the expert assessment strategic management, action and systemic thinking are the competencies that the construction specialist certification body needs to assess in the process of certification of construction specialists.

In **Stage 3**, the author developed a framework of professional competencies for the speciality of expertise of construction based on the results obtained in Stages 1 and 2, which were both based on a review of the scientific literature and on collaboration with stakeholders. To ensure that the competency framework developed is classified as good practice in the sector, it was integrated into the guidelines for the expertise of construction developed by the author and stakeholders.

However, before the development of the competence assessment mechanism in accordance with the competence framework, which also provides for the appropriate development of the content and method of competence assessment, the author carried out a survey of certified construction specialists to identify the situation within the existing competence assessment mechanism in the sector and the assessment of competences carried out within its framework. The results of the analysis are used as a basis for the design of a competency testing mechanism to establish the proportional distribution of the content of the competency test according to the competencies assessed as the most relevant.

Based on the results obtained, the author developed the content of the competency test in accordance with the competency framework, where the percentage distribution of questions is based on the ability of the certified person to apply knowledge in situations related to professional activity. Given that the construction specialists indicate competencies related to practical experience and construction practice as the most important competencies to be verified by the certification body in the certification process, the competence verification mechanism for obtaining the construction practice certificate developed by the author is based on several components.

In **Step 4**, according to the results of the literature analysis, the author applies the VSM method to identify solutions for improving the certification process for construction specialists, which provides the possibility to plan a future or desired process state using the current process flow and the losses found in it, which can be converted into improvements (Babris, 2016). To identify negative inhibiting factors of influence or barriers, the author applies FMEA and Delphi methods.

As a result of the VSM method, the author made the necessary changes to the quality management system procedure of the Bureau BSN regarding the activities carried out in relation to the handling of complaints in the framework of independent practice supervision.

In the FMEA analysis, the author concludes that the most typical failures with the highest risk priority rating are observed in the supervision and competence assessment phase of the certification process for construction specialists, which are caused by inadequate organisation of the work process and failure to ensure the internal control system and supervisory functions. For those stages of the certification process where the above failures have been identified, the author carries out an in-depth analysis using an expert methodology to identify those factors that have the greatest impact on the occurrence of the risk in question.

Within **Stage 5**, the author developed a structured independent practice review report with structured sections to ensure that the independent practice supervision assessment is

carried out in line with stakeholder needs and industry requirements. Consequently, the mechanism proposed by the author, which will be incorporated as a mandatory section of the independent practice monitoring procedure, will significantly facilitate the way of obtaining information on the non-compliances detected, as the data on the findings of the independent practice monitoring will be collected in a structured way.

The approach to the certification of persons developed in the framework of the Thesis was tested in a certification body for construction specialists and the author received confirmation that:

- 1) it is necessary to identify the needs of stakeholders so that objective information is available on the professional competencies and requirements needed in the industry regarding the quality of professional performance;
- 2) assessing professional performance in the context of sustainable development is only possible if the sustainability aspects of the industry are identified;
- 3) a professional competency framework against which to assess competence in the certification process can be fully developed in collaboration with the industry;
- 4) the application of Lean and risk management techniques to identify process improvement solutions for a specific process also enables the certification bodies to identify necessary improvements to the quality management system;
- 5) long-term development of professional competence is possible through the cooperation of the certification body with the industry by organising development training and seminars.

CONCLUSIONS AND PROPOSALS

As a result of the scientific literature research and empirical study, several **conclusions** were drawn, which confirm the hypothesis put forward in the Thesis.

1. The certification of persons is a conformity assessment procedure whereby an independent third party assesses and certifies a person's compliance with the professional competence and quality requirements of the industry.
2. The certification of persons serves not only as an essential tool for assessing professional competence but also as a mechanism for controlling qualifications that can have direct or indirect effects on public safety, the education process and the service industry as a whole.
3. Certification is very closely linked not only to quality but also to quality management, which involves a set of activities defined by quality management during the certification process: quality planning, quality control and quality improvement. Quality improvement is one of the key aspects that distinguishes certification from other conformity assessment procedures, so that certification from being a conformity assessment procedure becomes also a tool for quality assurance, control and improvement.
4. There is a close link between the certification of persons as a conformity assessment procedure and professional competence, as conformity assessment can be used in the certification process to assess the professional competence of persons, provided that the required competence framework in a given field is clearly defined.
5. Professional competence is defined as the combination of knowledge, skills and professional autonomy and responsibility required to perform a professional activity in order to ensure sustained effective performance in a particular professional field, job or situation.
6. Certification bodies should assess competence when certifying individuals; a person's knowledge in a particular field cannot be the sole criterion for assessment. The professional competence of individuals must be assessed in a holistic way, including in their professional autonomy and responsibility, i.e. in addition to their ability to apply acquired professional knowledge and practical skills in situations related to their professional activity.
7. A certification body is defined as an entity that can constrain and influence the parties involved in the certification process, while also changing their behavioural patterns. The

- ultimate goal is the creation of shared value, i.e. a person carries out his or her professional duties in a way that benefits society as a whole in the long term.
8. In practice, the industry understands staff certification not only as an assessment of compliance with the requirements of a professional field but also as an assessment of quality.
 9. In order for the certification process to objectively assess a person's professional competence and demonstrate their ability to deliver quality performance, the industry points to the need to define competence requirements for the industry, where competence includes not only knowledge and skills but also a person's individual character and attitudes.
 10. If the parties involved in the certification process have clearly defined professional competencies required by the sector, which are monitored periodically according to their needs, the certificate issued as a result of the certification process will not only demonstrate the professional competencies required but also the quality of the professional performance.
 11. The benefits of certification of persons, according to the empirical study, are related to the right to provide one's services in the industry and to demonstrate one's professional competence, as well as to formally fulfil the requirements set by the legislator for the industry. For the employer, the industry sees it as a right to provide its services to the industry, as well as an opportunity to increase its competitiveness.
 12. According to the empirical study, the most important negative influencing factors or barriers in the process of certification of persons were bureaucracy, a formal approach on the part of the supervising institutions and a lack of clearly defined professional competencies against which to assess the certification process.
 13. Integrating risk management into the quality system will enable certification bodies not only to identify risks associated with the organisation's operating environment but also to translate risks into new opportunities to ensure continuous improvement of the certification process.
 14. In order to ensure the quality and reliability of the process of certification of persons, certification bodies shall manage the main risks of the certification process, identify the main stakeholder requirements and maintain an integrated quality system based on the principles of continuous improvement and a process approach.
 15. A sustainable approach to the certification process ensures that the certification of persons moves from an element of conformity assessment to an element of quality based

on process management principles and mutual cooperation with stakeholders to ensure the sustainable development of professional competence in the industry. The implementation of a process approach in all activities related to the certification of persons ensures not only continuous improvement of the process but also continuous monitoring of the adequacy of professional competence.

16. The new paradigm of certification methodology defines certification as a single system that ensures not only the control of qualifications for public protection purposes but also control based on the creation of value for stakeholders.

Based on the results of the research, the Thesis proposes solutions to some problems and puts forward a number of **proposals** for certification bodies, industry associations/societies and conformity assessment supervisory bodies.

For certification bodies:

- To clearly define the objectives to be achieved, the needs of the client and the actions to be taken to achieve these objectives and to ensure that the activities related to conformity assessment and attestation of conformity in the certification process also comply with the quality criteria.
- To improve cooperation with stakeholders involved in the certification process in line with the results of the empirical research, which shows that the most significant risks in the area of certification are related to bureaucracy and a formal approach to the certification of persons by supervisory institutions.
- Given that the methods used to assess competence, i.e. written and oral examinations, are described by industry as the least suitable for objective assessment of professional competence, to identify other methods of assessing competence appropriate to the specific field of activity.
- In cooperation with the stakeholders, define the professional competence framework required in the sector so that the certificate issued as a result of the certification process demonstrates not only the professional competence required but also the quality of professional performance.
- As part of the supervision of independent practice, to perform not only an overall assessment of performance but also a structured assessment of professional competence in line with the competency framework developed.

- In cooperation with industry to organise training for certified persons using as a baseline the results of the monitoring carried out on the assessment of professional performance in the independent practice test.
- In service delivery, apply the approach developed for the sustainable process of certification of persons.

For supervisory institutions of certification bodies

- For the accreditation institution to assess not only the compliance of the maintained quality system with the requirements of ISO/IEC 17024 but also the fulfilment of the requirements of the parties involved when carrying out monitoring visits to the certification bodies.
- For the Ministry of industry to amend the laws and regulations relating to the certification of persons to provide that professional competence is assessed in accordance with an industry-agreed and policy-maker-approved framework.
- Within the scope of competencies, to improve the cooperation with stakeholders involved in the certification process, in line with the results of the empirical study, which confirms that the most significant risks in the field of certification are related to the lack of a common approach to the application of laws and regulations in the sector and a formal approach on the part of supervisory institutions.
- For the Ministry of industry, in cooperation with stakeholders, to define the professional competence framework needed in the industry.

For industry associations/societies

- To cooperate with certification bodies in organising competency development training for certified persons.
- To develop a structured learning quality assessment questionnaire, where the results, once compiled, are also shared with the certification body to ensure communication between all stakeholders involved in the learning process, including corrective or preventive action on curriculum design where necessary.

For companies

- Considering that the benefits of certification for both the company and its employees are linked to the company's values and the perception of certification by both management and employees, make certification a part of the company's value system.

- To engage in constructive discussions with stakeholders in the service delivery process to improve the certification of persons system.

For the Ministry of Finance:

- Given that the certification service, which results in the issuance of a certificate of competence, can also be seen as a transaction with the creation of shared value for society in the long term, the Public Procurement Law should be amended to set certain quality criteria for certified persons according to the specifics of the relevant industry.

The solutions and proposals proposed in the Thesis can be used in the work of certification bodies to promote a competency-based certification process so that the resulting certificate not only certifies compliance but also ensures the quality and reliability of the results according to the needs of the parties involved.

The theoretical and practical significance of the research is a well-organised methodological basis describing the main concepts related to certification, the first empirical study of the system of certification of persons in Latvia, which can serve as a basis for further research of the process of certification of persons and development of improvement solutions at the national level. The solutions and proposals put forward in the Thesis have the potential to change the perception of those involved in conformity assessment of the role of certification as an element of conformity assessment in ensuring not only adequate but also quality professional performance. In this way, certification bodies can develop their business strategy by integrating a quality system approach that will not only add value for stakeholders but also contribute to sustainability.

Summarising the results of the Thesis, the author concludes that the aim set in the introduction of the Thesis has been achieved, the theses put forward for defence have been confirmed and the hypothesis has been proved.

LIST OF REFERENCES AND SOURCES

1. Arnold, R. D., Wade, J. P., (2015). A definition of systems thinking: A systems approach, in: *Procedia Computer Science*. Elsevier, pp. 669–678. <https://doi.org/10.1016/j.procs.2015.03.050>
2. Frank, E. C. & Wener, L. (2011). The Value of the CISSP Certification for Educators and Professionals. *Network Security Journal*, 3, 50–53.
3. Gopinathan, S., Deng, Z. (2006). Fostering School-Based Curriculum Development in the Context of New Educational Initiatives in Singapore. *Planning and Changing*, Vol. 37, pp. 93–110.
4. Jasim, O. A., Veres, S. M. (2017). Towards Formal Proofs of Feedback Control Theory. 21st International Conference on System Theory, Control and Computing (ICSTCC), 19–21 October, Sinaia, Romania, 43–48.
5. Kavosa, M., & Lapiņa, I. (2018). Risk Analysis in Certification Process in the Field of Energy Construction: Case in Latvia. *Total Quality Management & Business Excellence*, 29, 1129–1142.
6. Klute-Wenig, S., & Refflinghaus, R. (2015). Integrating sustainability aspects into an integrated management system. *The TQM Journal*, 27 (3), 303–315.
7. Liepiņa, R., Lapiņa, I., and Mazais, J. (2014), "Contemporary issues of quality management: relationship between conformity assessment and quality management", *Procedia-Social and Behavioral Sciences*, Vol. 110, pp. 727–637.
8. Silva, S. E. P., Calado, R. D., Silva, M. B., and Nascimento, M. A. (2013). "Lean Startup Applied in Healthcare: A viable methodology for continuous improvement in the development of new products and services". 6th IFAC Conference on Management and Control of Production and Logistics, The International Federation of Automatic Control, September 11–13, 2013, Brazil.

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