Expert group joint opinion

Evaluation Procedure: Assessment of Study Field

Higher Education Institution: Rēzekne Academy of Technologies

Study field: Information Technology, Computer Hardware, Electronics, Telecommunications, Computer Management, and Computer Science

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Summary of the Assessment of the Study Field and the Relevant Study Programmes

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The expert group found that the Rēzekne Academy of Technologies (RTA) offers education programmes in the fields of Programming, Software Engineering, Electronic Commerce Information Systems and Sociotechnical System Engineering with a strong emphasis on academic excellence, regional development, and research infrastructure. The study field (SF) has clear aims and objectives aligned with the strategic development fields and the needs of the society and the national and especially regional economy. Regulations and other documents show a willingness to have a comprehensive quality assurance system. However, it seems that various strategies, guidelines and regulations could be better mutually connected in order to ensure synergy effects. The experts were not assured that the Quality Management System (QMS) as a whole was working effectively to ensure regular improvement and development of the SPs and the SF. The existing SF management system and internal quality improvement processes could be improved.

Teachers are competent and use appropriate pedagogical approaches and methods. In general, employers and graduates are satisfied with the level of skills and knowledge that RTA provide and they are ready to contribute even more in possible further improvements of study programs. This willingness must be taken advantage of in the future as much as possible.

It is praiseworthy that students are included in scientific work. It is needed to focus more on certain topics scientifically in the future in order to have a clear competitive advantage in comparison to other similar institutions in Latvia.

Learning management system (LMS) offers various possibilities to support the teaching process, but the level of implementation differs strongly. Thus, an action plan for a higher level of LMS implementation for all courses is needed, as well as corresponding key performance indicators (KPIs) and supervision mechanisms which will ensure successful results.

Some weaknesses, which were already also identified in RTA’s own SWOT analysis, should be addressed in the new Strategy and corresponding regulations which will reflect and support RTA’s goals, e.g. to motivate mobility activities through accordingly adapted “Procedure for Evaluation of Work Quality of Academic Staff”. It is worth mentioning the collaboration with ViA in the framework of the “Sociotechnical System Engineering” to strengthen the research potential and regional development.

In any case, the importance of RTA for the region and its economy is obvious and it should be supported also in the future. It means also that the cooperation and involvement of all stakeholders like students, academic staff, graduates, employers and regional institutions has to become an integral part of the RTA QMS.

However, the expert group also identified weaknesses, such as a limited level of international mobility, a lack of support services available to students, and employer feedback seemed to work more efficiently than formal surveys. Some study programmes (SPs) have high drop-out rates, raising concerns about their sustainability. We should highlight that experts have concerns about the relevance of the academic Master's programme "Electronic Commerce Information Systems" to the SF and the relevance of the degree to be awarded to the content of the studies.

There is room for improvement in providing access to online sources like the Institute of Electrical

and Electronics Engineers (IEEE) sources, and ensuring a balanced workload for academic staff with multiple courses and administrative roles. Research impact and visibility of RTA's academic staff are under expectations, with low H-indexes and weak dissemination efforts.

RTA has made progress in implementing previous recommendations but RTA needs to further improve research impact and visibility, update the curriculum, and attract a more diverse student body. Overall, RTA´s strengths outweigh its weaknesses, and the institute has commendable aims for research and education in its fields of focus especially to support local industry growth.

Thereby, current weaknesses like:
● lack of evidence that QMS helps to improve SF and SPs;
● limited access to ekursi.rta.lv does not allow to use study course descriptions as SF marketing material;
● technology study courses are based on 20+ years old mandatory to read books;
● no real feedback comes from students and graduates to modernize study courses and SPs;
● latest self-assessment report (SAR) lists exactly the same employers' suggestions as SAR from 2019/2020;
● technical books about programming and databases in the library are outdated and are not good motivators for students,
can and should be fixed with strong involvement of all stakeholders (students, teaching staff, graduates, employers, partner companies and institutions).

In general, the RTA Management and staff are aware of their deficiencies, but there are missing clearly measured KPIs which must be followed in order to check defined measures to improve the indicators.

I - Assessment of the Study Field

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1.1 Management of the Study Field

Analysis

1.1.1. The aims of the SP are clearly defined and attainable (p. 14, SAR), (meeting with the higher education institution (HEI) management, SF and SP directors, academic staff, employers).
The SF and the relevant SP comply with the main directions of the strategic development of the RTA and meet the needs and development trends of the society and the national economy, for example (see Operation and Development Strategy of RTA 2016-2023):
- C 1.1 To become the leading center for engineering, technologies, research and innovations in Eastern Latvia
- C3.3. To maintain and improve infrastructure of studies and science
- C 2.1. To define the study directions that are appropriate to the RTA development strategy and are oriented to the development, acquisition and application of modern technologies
- C 5.1. To modernize and integrate the research and education sector by enhancing its ability to respond to future challenges related to research, technology development and innovations, and to increase the introduction of products already created during the studies into the national economy, thus raising the welfare of society.

The goals of SF are well defined but they are not explicitly listed as a part of strategic documents (or defined as separate strategic documents), which does not help RTA IT to continuously focus on fulfilling them (SAR, Development strategy 2016-2023).

The interconnection of the SPs included in the SF is clear and logical, with the exception of “Electronic Commerce Information Systems (45483)” SP, which is in detail analyzed in the SP assessment sections.

1.1.2. The RTA has identified and analyzed the strengths, weaknesses, opportunities and threats of the SF (English version sent in additionally needed documents, question Nr. 1) and integrated them also into annual self-evaluation reports (Gadagramata 2021/2022). SWOT analysis is well-done, it identifies most of the relevant topics and issues. For example:
- strength of RTA is mostly based on their regional relevance as the HEI that provides graduate profiles needed for labour market
- weakness of RTA is low international relevance and high dropout rate, but there are no visible active measures. Even in SWOT analysis RTA wrote, regarding the international mobility, vaguely “For various reasons, international exchange opportunities are underused by staff”, which shows lack of focus and precise measures to solve defined weaknesses
- there is a big opportunity for RTA in greater cooperation with IT companies. However, there are no clear measures how to achieve it. Namely, the cooperation is mostly based on informal contacts without clear defined goals, measures and KPIs.
- the biggest threat is that number of Latvian students is decreasing. It can be tackled by attracting more international students. However, there are again no clearly defined

In general, there are no defined sought levels of KPIs and the KPIs are not measured, and it is not possible to assess the level of reached goals and the effectiveness of defined measures (with the exception of indicators defined in Strategy of Scientific Activity 2019-2023).
Furthermore, strategic goals (and corresponding strengths, weaknesses, opportunities, threats but also regulations that should support reaching the goals) are scattered across various documents (annual self-evaluation reports, RTA Development Strategy, RTA Academic staff development plan, Strategy of Scientific Activity, various regulations, etc.), but there is no clear connection between them. It is needed to connect all relevant strategic documents and regulations to propel synergy effects and avoid possible overlappings. On the contrary, RTA will have the situation that they “can't see the forest for the trees”, i.e. it will be (and already is) very hard to focus on measuring the efficiency of defined measures and, in the end, reaching the strategic goals.

1.1.3. The management structure of the SF and the corresponding SPs is oriented towards the development of the SF, i.e. teachers have reported the possibility to express proposals for needed changes of SP and general needs for the development of SP (meeting with teachers). Decision-making takes place mainly through directors of SPs and directors of SF, for example when it is decided about changes in the composition of the teaching staff. It is a clear and efficient hierarchy (meeting with directors of SF and SPs, academic staff) but its highly centralized nature could lead to a “silo mentality”. Decision-making should be more connected between the SPs in order to improve SF as a whole, for example through periodical formal meetings where teachers from the whole SF participate in discussions about the SF and the role of the SPs within. Thereby, also the graduates and employers' representatives could be included.
The support provided by the administrative and technical staff ensures all the needs of the SPs corresponding to the SF, e.g. IT support provides support for the DMS (Document Management System), LMS (meeting with academic staff, LMS presentation). However, the potential of systems is not fully used, e.g. LMS is fully implemented only in some courses and its wider full implementation should be pursued.

1.1.4. A system is well defined through various regulations (Regulation on academic recognition of study courses, Regulation on recognition of competencies acquired outside and prior education),

and involved stakeholders are informed about the system and find it effective. For example, different bachelor background is accordingly recognized in enrolling on the master study program, professional experience can be recognized as professional practice, etc. (meeting with students). At the moment students (and other stakeholders) get info about regulations when they need them (mostly through administrative staff and DMS), but the regulations should be more visibly presented to all stakeholders, especially to the students and possible future students, e.g. through a dedicated publicly available web page section where all relevant content would be presented in a user-friendly way.
For foreign students, there is an information package (My Academy - a collection of RTA regulations that regulate studies) and the foreign student reported accessibility of all needed information, through documents and administrative staff (meeting with students).

1.1.5. Methods, principles and procedures for assessing the achievements of students are defined in corresponding regulations (Methodological Recommendations for Organising Students' Independent Work approved by RTA Study Council). For example, the professional practice was examined and recognized for 6 students (SAR, subsection 2.1.4, and additionally needed documents, question Nr. 2).
Student surveys are conducted after each semester, but low survey turnout gives no possibility for proper analysis. One of the reasons is that students do not have a feeling that their feedback has any impact (meeting with students), and also based on "Analysis of the results of surveys of students, graduates and employers" (Annex 8.7z) there are no actions taken based directly on surveys. Thus, students should be more involved in defining the questions and also in subsequent analysis and changes made based on surveys. Furthermore, several evaluators participate in the evaluation of learning outcomes, including the representatives of employers but this interaction is mostly of informal nature and, therefore, conclusions of evaluation and their implementation is not possible to follow systematically. In general, the SPs' aims are met with RTA's methods, but a more systematical approach is needed - with clearly defined actions and measurable outcomes.

1.1.6. Principles of academic integrity and mechanisms for their observance are properly defined and described in Regulations on Plagiarism Control and Prevention. The final research works at RTA are tested in the Unified Computerized Plagiarism Control System of Latvian Higher Education Institutions. It is applied as mandatory and stakeholders are informed properly (meeting with academic staff and students). In addition, there is a PlagScan module for LMS and it is intended mainly for teachers and their material. However, it could be used as mandatory for students' papers/tasks done during the semester, not for the final papers only.

Conclusions on this set of criteria, by specifying strengths and weaknesses

In conclusion, RTA University has well-defined study programs with attainable aims and complies with the needs of society and the national economy. However, the university needs to address the issue of the scattered strategic goals across various documents to achieve synergy effects. For example, "Operation and Development Strategy of Rezekne Academy of Technologies 2016 – 2023" and "Strategy of Scientific Activity 2019-2023" should be better mutually harmonized.
The RTA also needs to establish the KPIs measurement system to assess the level of reached goals and the effectiveness of defined measures. The KPI measurement system and KPIs that should be measured must be based on the strategic goals - and strategic goals should be defined in revised/harmonized strategy documents.
There is a risk of a "silo mentality" in decision-making which must be addressed in future management structure and procedure updates.

Strengths
1. Clear and well-defined regulations make it easy for staff and students to follow the rules and principles of RTA.
2. Good IT support provide good potential for the digitalization of education (where applicable) and processes in general, making the more efficient.
3. Relevance of SF and SPs implementation for the region's economy by providing graduates to the labour market, which shows big interest in experts of such a profile.

Weaknesses.
1. Scattered strategic goals across various documents (strategic documents and regulations), without clear connection between them.
2. Risk of “silo mentality” in decision-making processes.
3. Insufficient formal interaction with employers prevents a more systematic implementation of proposals given by employers. With current mostly informal cooperation (e.g. Coffee Hours reported in RTA’s annual SAR 2019/2020 or personal contacts reported in meeting with teachers) there is a risk that some relevant proposals could be ignored and vice versa, i.e. RTA could accept some proposals which are based on the narrow interests of individual employers.
4. Low survey turnout does not enable a proper feedback analysis and there are no actions taken based directly on surveys.

1.2. Efficiency of the Internal Quality Assurance System

Analysis

1.2.1. The RTA has developed a RTA Quality Management Handbook, which is available on the internal DMS, but is not publicly available to the general public. Information on the RTA Quality Policy is not publicly available on the RTA website (https://rta.lv/par-rta) . The Quality Management Handbook sets out the principles of quality management, defines the criteria of The European Foundation for Quality Management (EFQM) Excellence Model in the context of the RTA, describes the assessment cycle of these criteria, and reflects the RTA's organizational structure and risk management approach.
RTA have established main policies and procedures (SAR Annex No. 1 and additionally provided documents) in accordance with Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG): study quality assurance policy and its implementation processes; development, approval and updating of the SP and their component; student-centered teaching, learning and assessment; matriculation of students, study process, recognition of qualifications and certification; quality assurance and assessment of the work of the teaching staff, resources of academic work and research, support for students; information management, providing information to the public, but incompletely; programme monitoring and periodical review. However, there is a weak link and even fragmentation between regulatory documents of study processes and quality management processes, several of which are outdated and require updating (e.g, Study Quality Assessment and Control System at RTA (Approved 2009, SAR Annex No. 1, document No. 14 (Latvian version)). The methodological regulations "Study results-based quality system at RTA" provide guidelines for the formulation of learning outcomes, but despite these procedures and annual SARs, the mechanisms for measuring and analysing KPIs (e.g. by adding specific KPIs to the strategy and including them in the analysis during the annual self-assessment process) and learning outcomes can be improved, including how to relate them more to the quality of studies rather than just measuring quantitative indicators, such as the number of students.
Overall, the existing system ensures that SPs are improved and revised, as evidenced by the decisions to make changes in the SF by closing the Master's SP "Computer Systems" and making significant changes in other SPs of the SF. However, mechanisms for regular internal review and

improvement of SPs (more than just external evaluation procedures) could be improved.

1.2.2. The RTA has established procedures regulating the development, approval, improvement and revision of SPs ("Regulations on Academic and Vocational Studies and Study Programmes", SAR Annex No. 1, document No. 2), which provides for procedures and conditions for SPs of different types and levels (vocational and academic bachelor, master, first-level SPs, joint SPs, doctoral studies), procedures for the development and approval of new SPs, provisions for SP management, as well as procedures for making changes to them. Based on this Regulation, changes to the SP may be proposed by RTA academic staff or students, and must be accepted by the Study Field Council and approved by the Faculty Council. Regulation on director of SP/ module/ specialization at RTA (SAR Annex No. 1, Document No. 19) sets out the conditions for the election of SP directors, their rights, duties and responsibilities.
The Annual Self-Assessment Procedure for Study Fields and Related Study Programmes at the RTA (SAR Annex No. 1, Document No. 4 (Latvian version)) regulates the procedures for the annual assessment of SPs, including guidelines for the organization of surveys for students, graduates and employers. Student and alumni surveys are mostly organized in DMS or electronically in other ways (meetings with SP directors, students and alumni), but analysis of the results of student and alumni surveys shows very low engagement rates (after the experts' request for additional information, RTA provided an analysis of the results of student surveys for all SPs (additional requested documents, see Annex 16), for example, for the SP "Programmer" there are years when only 3 students or even none have completed the survey, similar situations when less than 5 students have completed the surveys are also found in other SPs), which mostly cannot provide objective data on study quality and processes (analysis of results of student surveys, Annex 16 in additional documents requested). Employers often use more informal formats for their feedback - discussions, thesis committees, private communication with programme management (meetings with employers, programme directors). There are also formal methods of engagement, such as membership in expert councils of academic disciplines (SAR Annex No. 1., Document No. 18), but neither during meetings with employer representatives nor when requesting additional documents experts were assured that this format works effectively in practice.
Although there are various formats of cooperation within the SF where stakeholders can get involved in the improvement of the study process, such as the Faculty Council, the SF council, SF expert councils, student and staff surveys (SAR p. 25-26, expert meeting at RTA), the experts are not convinced that the full potential of these formats is achieved (meetings with students, academic staff, employers, as well as additional requested documents - minutes of meetings and results of the analysis of student surveys), there is a very low response rate to surveys, employers are unable to mention formal platforms for involvement in the improvement of SPs, the governance structure of the study area is very centralised around SP directors, reducing the opportunities for involvement of academic staff and students.

1.2.3. The RTA's internal regulations are available to students in the DMS and regulate the procedure for students to submit complaints and proposals in various cases. It should be noted that the procedure for complaints and proposals is set out in various documents, which may cause confusion for students (SAR p. 26-27), but there is also an electronic complaints and proposals form available on the RTA website, which can be filled in anonymously or by authorizing the student if they wish to receive a reply. The form is very simple, the student has to enter the text of the message and select one of the proposed recipients, e.g. the Rector's Office, the study department, the library, the hostel or the Dean's Office of the Faculty of Engineering, and press the submit button. The suggestions and complaints form is available at: https://forms.office.com/pages/responsepage.aspx?id=9rzp4Y4yekqY7Fea9rhdmgsYcGxN7bVOrGUhSNIMdK1URFdaOTNBNkNHVFRVNUxNNlg2MjRJVFZHMy4u

It should be noted that both in the SAR (p. 28) and in meetings with programme directors and students, there were no examples of complaints received, so it is difficult to assess the effectiveness of the system. During meetings with students and alumni, examples of improvements to the study process were given, with students providing direct feedback to lecturers, which is more about improving the day-to-day study process. However, it is positive that the RTA Students' Council has also set up a student trust e-mail where students can address their complaints and suggestions, which will be primarily addressed by the Students' Council in cooperation with the Vice-Rector of Studies. In light of the above, and the fact that during the interviews students and graduates were not able to give clear answers about their possibilities to make suggestions and complaints, the RTA is recommended to do more to inform students about their possibilities to also formally submit suggestions and complaints, and to provide clear feedback that they have been considered and taken into account to the extent possible.

1.2.4. The RTA mainly collects statistical data in accordance with national rules and provides them to public authorities and their information systems (SAR p. 28). According to the SAR and interviews with the students, graduates and employers, RTA collects various kinds of information from them, starting with lecture attendance and employment, ending with further qualification and other data. All of this data is analysed by RTA. Unfortunately in the interviews, students, graduates and employers were not able to provide sufficient proof about how their recommendations are taken into account. For some student surveys, data summaries are available as infographics in the DMS for DMS users, including students.
Given the low involvement of students and graduates in providing feedback, existing mechanisms need to be improved to improve engagement rates in order to obtain more objective and representative data. To date, changes have been made to SPs mainly on the basis of analysis of quantitative indicators, such as declining enrolments and current numbers of students in SPs, to justify their closure. However, it would be useful to establish more regular feedback mechanisms for students, graduates and employers. In conclusion, RTA should seek more ways to provide feedback regarding the changes in the SP implemented upon the feedback from surveys, as well as new ways to gather and discuss potential and needed changes with various stakeholders.

1.2.5. For the first level professional SP "Programmer" there are currently differences between the information provided in State Education Information System (VIIS), e-platform, RTA website and the information provided to the experts, due to the fact that significant changes have been submitted for accreditation of this SP, changing the name of the SP, the way and form of implementation, as well as the qualification to be obtained. After accreditation, the relevant information must be updated in the official registers and on the RTA website.
For the professional bachelor SP "Software Engineer" there are also discrepancies between the information submitted for evaluation, the information provided in VIIS and E-platform and the information available on the RTA website. All platforms have to match the name of the SP, type and form of study, language of study, as well as the degree and qualification to be obtained in Latvian and English.
The academic Master's SP "Electronic Commerce Information Systems" also has discrepancies between the information submitted for evaluation, the information provided in VIIS and E-platform and the information available on the RTA website. The name of the SP, the admission requirements (the website provides more details), the duration and volume of the SP, the degree to be obtained in Latvian and English should match on all platforms.
Also in the PhD programme "Sociotechnical System Engineering" there are discrepancies between the information submitted for evaluation, the information provided in VIIS and E-platform and the information available on the RTA website. The name of the SP, the admission requirements (the

website provides different details than the information submitted for evaluation), the degree to be obtained should match on all platforms in Latvian and English, the E-platform should indicate that the SP is also offered in English, and VIIS and the RTA website should indicate that it is a joint SP.
Moreover, only some SPs have a description of SP content on the RTA website, and the website lacks information on more detailed SP content, study outcomes, study plan and study courses. This information should also be provided in English for those SPs that are also offered in English - Professional bachelor SP "Software engineer", Academic master SP "Electronic Commerce Information Systems" and Doctoral SP "Sociotechnical System Engineering". The availability of such information is essential, because the content of the SP and courses is one of the main things that could attract more students to the RTA and study programs.

Conclusions on this set of criteria, by specifying strengths and weaknesses

As mentioned above, the RTA has a QMS, which consists of a set of regulatory documents. However, the quality management policy is not publicly available. The QMS looked good in the SAR, but the interviews lacked evidence of implementation of the recommendations, and the additional documents requested (analysis of the results of student surveys, minutes of the meetings of the Expert Board of the field of study) show relatively low involvement of students in providing feedback, as well as extensive involvement of employers and industry organisations in improving the quality of the study process.
The RTA has a good and varied system for submitting proposals and complaints, but students could not give specific examples of when they had used it; on the other hand, they were not well informed about how they could submit complaints about their SPs, so it can be concluded that they never felt the need to submit formal complaints. Information about this possibility is available online, so they have the option to look it up if they need to.
The RTA collects various statistics and information from stakeholders, but there is a lack of follow-up meetings so that stakeholders are aware of the process of implementing their recommendations.
The RTA website currently provides dissimilar information on SPs from the information provided in the official registers and the information submitted for evaluation, additionally it should be updated with more detailed information in Latvian and English (if applicable) on the content of SPs and study outcomes.

Strengths:
1. There are different documents regulating the study process, which regulate in detail the elements of the study process required by the laws and regulations.
2. Various complaints and suggestions procedures have been established and are easily accessible to students.
3. A user-friendly DMS has been created, which stores both internal normative acts and other documents relevant to the study process and is accessible to RTA staff, including students.

Weaknesses:
1. Fragmented and poorly implemented QMS for the SF, quality management policy not publicly available.
2. Low response rates to student and alumni surveys, which prevents objective and representative data.
3. The governance model of the field of study is rather centralised on programme directors, reducing the possibilities for academic staff, students and employers to be actively involved in the day-to-day processes of improving the quality of studies.
4. Currently, there are several discrepancies between the information available on the RTA website and the official registers (VIIS, E-platform, information submitted for evaluation) in all SPs, and there

is minimal information available on the RTA website about the content of SPs and study courses.

Assessment of the requirement [1]

1 R1 - Pursuant to Section 5, Paragraph 2.1 of the Law on Higher Education Institutions, the higher education institution/ college shall ensure continuous improvement, development, and efficient performance of the study field whilst implementing its internal quality assurance system:

Assessment of compliance: Partially compliant

Information on the RTA Quality Policy is not publicly available on the RTA website, however the RTA has created the RTA Quality Management Handbook, which together with other internal normative documents is available to RTA staff and students in the DMS. There is a weak link and even fragmentation between regulatory documents of study processes and quality management processes, several of which are outdated and require updating. The experts were not assured that the QMS as a whole was working effectively to ensure regular improvement and development of the SP and the SF, beyond the external quality assessment (accreditation) procedure established by the legislation. The existing SF management system and internal quality improvement processes could be improved as indicated by very low response rate to surveys, employers are unable to mention formal platforms for involvement in the improvement of SPs, the governance structure of the study area is very centralised around SP directors, reducing the opportunities for involvement of academic staff and students. The RTA has a good and varied system for submitting proposals and complaints, however, efforts should be made to raise students' awareness of such opportunities. The RTA collects various statistics and information from stakeholders, but there is a lack of follow-up meetings so that stakeholders are aware of the process of implementing their recommendations. The RTA website currently provides dissimilar information on SPs from the information provided in the official registers and the information submitted for evaluation, additionally it should be updated with more detailed information in Latvian and English (if applicable) on the content of SPs and study outcomes.

2 1.1 - The higher education institution/ college has established a policy and procedures for assuring the quality of higher education.

Assessment of compliance: Partially compliant

RTA has a QMS, which consists of a set of regulatory documents. However, the quality management policy is not publicly available. The QMS looked good in the SAR, but the interviews lacked evidence of implementation of the recommendations, and the additional documents requested (analysis of the results of student surveys, minutes of the meetings of the Expert Board of the field of study) show relatively low involvement of students in providing feedback, as well as extensive involvement of employers and industry organisations in improving the quality of the study process. There is a weak link and even fragmentation between regulatory documents of study processes and quality management processes, several of which are outdated and require updating. The experts were not assured that the QMS as a whole was working effectively to ensure regular improvement and development of the SP and the SF, beyond the external quality assessment (accreditation) procedure established by the legislation.

3 1.2 - A mechanism for the development and internal approval of the study programmes of the higher education institution/ college, as well as the supervision of their performance and periodic inspection thereof has been developed.

Assessment of compliance: Fully compliant

The RTA has established procedures regulating the development, approval, improvement and

revision of SPs ("Regulations on Academic and Vocational Studies and Study Programmes", SAR Annex No. 1, document No. 2), which provides for procedures and conditions for SPs of different types and levels (vocational and academic bachelor, master, first-level SPs, joint SPs, doctoral studies), procedures for the development and approval of new SPs, provisions for SP management, as well as procedures for making changes to them. Based on this Regulation, changes to the SP may be proposed by RTA academic staff or students, and must be accepted by the Study Field Council and approved by the Faculty Council. Regulation on director of SP/ module/ specialization at RTA (SAR Annex No. 1, Document No. 19) sets out the conditions for the election of SP directors, their rights, duties and responsibilities. The Annual Self-Assessment Procedure for Study Fields and Related Study Programmes at the RTA (SAR Annex No. 1, Document No. 4 (Latvian version)) regulates the procedures for the annual assessment of SPs, including guidelines for the organization of surveys for students, graduates and employers.

4 1.3 - The criteria, conditions, and procedures for the evaluation of students' results, which enable reassurance of the achievement of the intended learning outcomes, have been developed and published.

Assessment of compliance: Partially compliant

The RTA has developed methodological regulations "Study results-based quality system at RTA" provide guidelines for the formulation of learning outcomes (Annex No. 6 (only in Latvian version)). The RTA also has a "Regulation on Study Course Examinations and Requirements at the Academy of Rezeknes Technologies (RTA)" (Annex No. 7), which clearly defines the conditions and procedures for the assessment of study results obtained in a study course at the end of the study course. However, it should be noted that the documents submitted for assessment differ in Latvian and English. The Latvian version of the submitted Regulation has been approved by the RTA Senate on 18.01.2022, while the equivalent document in the English version "Regulation for the Procedure of Examination and Test Session in Rezekne Academy of Technologies (RTA)" (Annex No. 11, English version) has been approved by the Prorector for Studies and Science A. Juško-Štekele on 05.11.2018. The content of the documents is also different, so it is not possible to draw a full conclusion whether RTA has a unified system for the assessment of students' results. At the same time, it is also important to note that the RTA has poorly developed the process of obtaining feedback from students on the quality of the study process, as a low proportion of students complete surveys on the quality of the study process. The regulatory documents are available to students in the DMS.

5 1.4 - Internal procedures and mechanisms for assuring the qualifications of the academic staff and the work quality have been developed.

Assessment of compliance: Fully compliant

The RTA has a number of documents regulating the work of academic staff, such as duties, rights, election procedures, calculation of academic workload, and evaluation of the quality of work:
1) Regulation for Lecturers of the Rezekne Academy of Technologies (RTA) (Annex No. 9, English version)
2) Regulation of Academic Positions in Rezekne Academy of Technologies (RTA) (Annex No 15, English version)
3) Procedure for Evaluation of Work Quality of Academic Staff at Rezekne Academy of Technologies (RTA) (Annex No. 6, English version)
4) Procedures for Planning and Accounting of Study Work Amount of Academic Staff in Rezekne Academy of Technologies in Academic Year 2020/2021 (Annex No. 14, English version).
Accordingly, the RTA has developed procedures and mechanisms for assessing the qualifications

and quality of work of academic staff.

6 1.5 - The higher education institution/ college ensures the collection and analysis of the information on the study achievements of the students, employment of the graduates, satisfaction of the students with the study programme, efficiency of the work of the academic staff, the study funds available and the disbursements thereof, as well as the key performance indicators of the higher education institution/ college.

Assessment of compliance: Partially compliant

The Annual Self-Assessment Procedure for Study Fields and Related Study Programmes at the RTA (SAR Annex No. 1, Document No. 4 (Latvian version)) regulates the procedures for the annual assessment of SPs, including guidelines for the organization of surveys for students, graduates and employers. Student and alumni surveys are mostly organized in DMS or electronically in other ways (meetings with SP directors, students and alumni), but analysis of the results of student and alumni surveys shows very low engagement rates. Student surveys are conducted after each semester, but low survey turnout gives no possibility for proper analysis. One of the reasons is that students do not have a feeling that their feedback has any impact (meeting with students), and also based on "Analysis of the results of surveys of students, graduates and employers" (Annex 8.7z) there are no actions taken based directly on surveys. During interviews, academic staff confirmed that the performance evaluation system is working effectively and that various types of questionnaires are carried out for staff. KPIs are analysed in annual SARs, but currently include basic quantitative indicators such as the number of students in different sections, etc.

7 1.6 - The higher education institution/ college ensures continuous improvement, development, and efficient performance of the study field whilst implementing its quality assurance systems.

Assessment of compliance: Partially compliant

The experts were not assured that the QMS as a whole was working effectively to ensure regular improvement and development of the SP and the SF, beyond the external quality assessment (accreditation) procedure established by the legislation. The existing SF management system and internal quality improvement processes could be improved as indicated by very low response rate to surveys, employers are unable to mention formal platforms for involvement in the improvement of SPs, the governance structure of the study area is very centralised around SP directors, reducing the opportunities for involvement of academic staff and students.

1.3. Resources and Provision of the Study Field

Analysis

1.3.1. Mostly state funding has been used for the implementation of the SF and the corresponding SP. 3-4% on average of funding comes from private funds. (SAR, p.32) The financial situation is regarded as stable. (SAR, p.31). Experts recommend focusing more on additional income sources besides state budget funding. Cooperation, joint projects with regional companies, research/consulting/training contracts for regional enterprises - are opportunities that could bring both extra income as well as experience/interesting research topics to RTA. Large part of income comes from the State budget and a small amount from students' tuition fees making this a key risk and at the same time an opportunity for further growth. Latvia continuously experiences a decrease of new students, and this has an impact also on RTA. Besides the overall decrease of students, the global pandemic in recent years had another negative impact on attracting new students. This means a greater challenge for starting new non State funded projects. Funding of scientific activity is not divided by SFs, but is directed to scientific institutes of RTA. (SAR, p.32)
Funding for the acquisition of RTA’s library collections has decreased significantly during the last 6

years which might lead and in certain technical areas already led to outdated content of the library.
Samples: Library lists only old books about programming and databases, graduates mentioned that they had to learn outdated topics during their studies, Study course descriptions (Databases DatZ4018, Computer Architecture DatZ3101) list too old mandatory literature to keep students motivated. The situation refers to unused potential in collaborating with other HEIs in Latvia to access electronic databases. In the ICT field one of the essential databases is the IEEE Database (www.ieee.org) which was not even mentioned during the experts' visit.

1.3.2. All necessary infrastructure resources are available to students and teaching staff.
The infrastructure of the Faculty of Engineering consists of:
1) Engineering faculty building (put into operation in 2014) with laboratories, workshops, lecture rooms, staff and student premises;
2) Information Technology Centre (computer rooms, electronic publications room, computer equipment service room, server room);
3) Laser Technology Centre (put into operation in 2019). (SAR, p.35)
Experts visited computer classes and laboratories. There are about 100 computers available for Engineering faculty students. Taking into account the relatively small number of students and the fact that a large part of SF students uses their own laptops during classes - infrastructure resources could even be shared with regional school students or employers from the region.
During the visit, two computer classes including servers were demonstrated that had some new network and modelling software available and allowed students to access the resources remotely. Laser Technology Center is used mainly for teaching and research in other programmes at RTA as well as other laboratories that are not used directly in the ICT programmes. The computing resources are enough for today´s BA and MA level teaching but might need some renovation and update in the near future and it was positive during the visit some collaboration in this direction was mentioned. IT infrastructure, hardware and software equipment does cover the needs of remote and on-premise delivery of courses for electronics, computer science and other SPs.
No additional facilities like a gym, or collaboration spaces to support students’ well-being and promote collaborative activities were visited by the experts during the visit.

1.3.3. Library resources and databases are available to students, but funding for the purchase of new copies has been decreasing during the last six years. There are procedures in place for the purchase of new books (SAR, p.37), however, not all important topics for the SF got covered during the last 10 years. Appears the procedure either has not been used or does not function for some reason as books in technical areas like programming or databases have not been purchased since long ago. Funding for the library got decreased during last six years and amounts in 14 177 EUR in 2022 which is less than 10 EUR per student. Therefore it might be essential to seek collaboration at the regional level and for electronic databases at the State level in sharing the library resources and accessing the newest information.
Sample: RTA library lists 28 books about programming (including conference thesis).
- 27 of those are 10+ years old. The only book from 2017 is a collection of conference thesis. 5 titles are even from the previous century. Programming textbooks get outdated very fast. We would not recommend keeping 10+ years old technical books on library shelves except there is a good justification for that, like e.g. the top rated algorithm theory book “Introduction to Algorithms” by Thomas H. Corman (2009) or "The C Programming Language" by Brian W. Kernighan and Dennis M. Ritchie (1978) because Elon Musk used to read it.
To get students attracted to programming it must be taught from recent books using modern technologies and frameworks. The same is correct for all the fast-changing technologies. Experts advise reviewing library content on a regular basis (at least every 3 years) and archiving or utilising outdated titles, for example not to keep on open shelves books older than 10 years. Experts advise

also to encourage teaching staff to review/update their study course descriptions by including new paper or e-books as mandatory literature, assuring that corresponding books have been purchased by RTA as hard or electronic copies. Young people prefer electronic copies and therefore the priority should be given to book electronic copies (which are usually cheaper than hard copies) and to electronic databases.

1.3.4. RTA uses Moodle system (ekursi.rta.lv) to support the study process. (SAR, p.39), MS Teams and Google Meet for remote classes and communication. DMS is in place (MS SharePoint based) to support students, lecturers and administration in sharing files, data, and other resources and keeping the strict files and data structure. However, the DMS has not been used broadly and intensively. Samples: All 4 meeting minutes of SF Council meetings for this academic year were added on May 2, 2023. System does not contain any Students Council meeting minutes for 2022 and 2023. LMS/Moodle has not been used to the full extent (Meeting with IT Support personnel). It's very important to find ways to motivate/mandate all the teaching staff to use the LMS more.
RTA uses surveys to obtain information about the support required for students and lecturers. However, a very small percentage of students and lecturers respond to the surveys. LAIS system has been used by students and lecturers offering all the information regarding the study process. (SAR, p.40). IT support system usage by IT SF has to serve as a good sample for the rest of RTA. Experts have noticed deficiencies in usage of all the IT support systems by SF staff. LMS, DMS, web page, the institutional repository of RTA, social networks. In order to attract and keep students the SF has to be fluent in all the digital system usage maintaining up-to-date digital content. Experts recommend including "digital content creation and publishing" as a part of the annual academic staff performance evaluation procedure.

1.3.5. RTA has established transparent procedures for attracting teaching staff (See REGULATION OF ACADEMIC POSITIONS IN REZEKNE ACADEMY OF TECHNOLOGIES (RTA) in DMS) which set forth election procedures for Professors, Associate Professors, Docents, Lecturers, Assistants.
The whole workflow, which starts with the RTA Senate decision to open a vacancy and follows 12 steps (for Docents, Lecturers, Assistants vacancies) or 3 steps (Professors and Associate Professors), has been clearly described in the Regulation document. The Regulation document has been mentioned and linked to in any advertisement to openly set the rules for the competition process. RTA publishes advertisements on the official local site vestnesis.lv and also Euraxess.lv portal to attract foreign teachers (SAR, p.40) in addition to publication at rta.lv/vakances.
The teaching staff attraction procedure proves to be effective as currently there are no vacancies to fill for the SF. The Regulation document describes the hiring workflow and all the notifications and document flows between the involved stakeholders.

1.3.6. RTA QMS (see Quality Management Handbook) sets forth principles and procedures for staff development, improvement and continuous learning. Both mandatory and voluntary options have been provided to the teaching staff for professional and didactic development (SAR, p.42). Experts recommend using mobility and cooperation as a staff development measure more intensively. SF staff had 45 outgoing mobility episodes during 2021/22 academic year. All the trips were just 2-5 days long. SF should be more open, and more "outgoing" for longer periods of time to raise an interest in incoming mobility for all kinds of cooperation. IT as any other field of science and research is very global by its nature, communication, cooperation, networking have crucial importance in order to get new technology insights for teaching and research, new partners for new projects, new contacts who could turn into guest professors for RTA, etc. Such goals are generally not achievable during a couple of days-long trips.
Several academic staff members have significant IT industry experience which helps a lot in offering high-quality courses and attracting students' interest. Most SF students come to RTA for studies to

become professionals in IT and for them it is very useful to meet real professionals at an early stage of their studies. That would give an insight into what the software engineering profession really is. That would help to motivate them to finish their studies. All the technical IT topics are very practical and the lecturer with current industry experience can give much more real use cases, advices to students.
However, experts did not notice any evidence of evaluation of measures implemented towards professional and didactic development of academic staff.

1.3.7. RTA Procedures for Planning and Accounting of Work Amount of Academic Staff regulate the staff workload (see Procedures for Planning and Accounting of Study Work Amount of Academic Staff in Rezekne Academy of Technology in Academic Year 2020/2021). It is known and followed by the academic staff. The RTA procedures are developed according to the Cabinet Regulation No. 445 "Regulations Regarding Remuneration of Teachers" and provide for a full-time workload of 900 hours per year for a professor and an associate professor, 950 hours per year for a docent with a doctoral degree, and 1000 hours per year for a docent without a doctoral degree, a lecturer, and assistant. Scientific work is a mandatory part of the academic staff's work. It may be performed working as a scientist, scientific technical personnel or scientific service personnel.
But the academic workload prevails over the amount of scientific work.
Characteristic samples (from Annex 9. Basic information on the teaching staff involved in the implementation of the SF):
prof. Pēteris Grabusts teaches 14 different study courses,
prof. Artis Teilāns - 12 study courses,
assoc. prof. Sergejs Kodors - 9 study courses,
guest assoc. prof. Imants Zarembo - 6 study courses,
lecturer Mihails Kijaško - 6 study courses.
Such academic workload is impossible to combine with significant involvement in scientific research. In some cases administrative duties have been added and this prohibits participation in large-scale research projects. (SAR, p.43, Meeting with the academic staff)

1.3.8. There are many options to obtain support for students. (SAR, pp.44-45).
Besides supportive structural units of Administration (Dean's offices, Department of Studies, Department of Science and Project Managament, External Relations Department, etc.), RTA offers the following support to students:
● individual services of a psychologist concerning such psychological issues as organisation of personal studies, mutual relationships and other issues related to studies and communication in the study process.
● individual career counseling services thus helping students to identify their interests, skills, abilities and values, deepen understanding of the career choice, professional suitability;
● an opportunity to create an individual study plan for independent learning.
Students from abroad get special attention from the International Office of the RTA. Besides all the regular support (see above) offered to foreign students too, the International Office offers (RTA website):
● help with all of the logistics of studying abroad, including assisting with visa and immigration processes, finding accommodation, and adapting to life in a new country;
● language classes and study skills workshops;
● a variety of cultural and social events throughout the year to help to connect with other international students and experience the rich cultural diversity of our community.

Each professor has officially scheduled consultations weekly but due to the small number of students - individual consultations are available almost all the time.

All buildings of RTA are adapted to needs of students with reduced mobility. In order to inform the teaching staff about the impact of disability on the study process, in 2021 RTA organized a cycle of professional development classes Disability Awareness and Communication in Education. (SAR, p.45)

Conclusions on this set of criteria, by specifying strengths and weaknesses

RTA provides all the resources necessary for students and lecturers. Computer classes and laboratory rooms might be even too much for the current number of students. Experts recommend reconsidering shared use of computer classes and laboratories with regional schools and enterprises. Library textbooks should be reviewed periodically to archive outdated ones. Purchase of new books and/or e-books in relevant technical areas has to be as important task as attracting of new students and research partners.Worth considering opening all resources to public (school students, industry professionals) fostering the community and marketing RTA as a welcoming partner and the right place for studies.
RTA offers many opportunities for support for students, students from abroad have a chance to use one-stop-support from the International Office of RTA.
Outgoing mobility should be used more in order to promote RTA abroad, and find new partners, lecturers and students.

Strengths:
1. Very personal support opportunities for students.
2. Recently built premises incl. a library and laboratories, serve as a particular attraction point to potential students, providing a better environment for studies and teaching.
Weaknesses:

1. All the information systems (ekursi.rta.lv, lais.lv) are limited access systems and do not help to market SF and SPs outside RTA.
2. Surveys do not present a real picture regarding ICT solutions for the study process in place (low percentage of responses).
3. Outdated technical books should be neither kept on library shelves nor used in the study process.
4. SP directors and some other senior teaching staff members have too high academic workload, which limits their participation in large-scale research activities.
5. IT support systems have not been used to the full extent by SF staff.
6. Academic staff's outgoing mobility is too low.

1.4. Scientific Research and Artistic Creation

Analysis

1.4.1. The “Strategy of Scientific Activity of RTA 2019–2023” (https://rulv.sharepoint.com/:b:/g/Ec7J8omf8kJEspOIwuIDafsBk4bRaq9W6EZzQaVGZto-dQ?e=8fYUbC) document clearly states that the near future objectives of RTA in the field of research are including intentions concerning performing high-quality impactful applied research, developing internationally-recognized research and innovation active staff, establishing new multi-disciplinary research clusters, and promoting the research achievements globally. Now, at the end of the given period, it can be stated that these aims are only partially fulfilled. The impact of the research performed by the own teaching staff, as concerning especially the publications in high-impact factor journals, is under the expectations - weak (see section 1.4.4 of this joint report), and as a consequence, their H-index is relatively low (mostly ≤5). Concerning establishing new multi-disciplinary and high-level research clusters, it is hard to estimate in which fields this could be made since the long term goal in

this document states “to strengthen strategic role of the RTA in the Latgale region, in the Latvian and European system of higher education and scientific institutions, positioning itself as an academy of technologies focusing on development, acquisition, research, popularization and application of multi sectoral technological solutions''. On the other hand the SAR and list of research and development projects do not demonstrate the growth of scientific projects targeted to Latgale region or to Latvian industry in general. The Strategy (“Operation and Development Strategy of Rezekne Academy of Technologies 2016 – 2023”)is the main pillar of the research directions (environmental technologies, materials and laser cutting research and various modeling techniques for business, public sector, transportation and logistics and production sector). Nearly all address prominent research areas, and correspond to the development goals of RTA, but cover a very wide area and, considering the strategy document SWOT analysis, there is a lack of scientific capacity for the implementation of projects. Moreover, these are in line with the directions of the evaluated SF in general and the future development aims of the RTA but do not represent a focused strong research for the Latgale region. These definitively have inter- and multidisciplinary features and are in line with national priorities.

At RTA exists a research-administrative structure which is coordinated by the Vice-Rector for Studies and Science, and research at the Faculty of Engineering is coordinated by the Institute for Engineering (Annex 2 “Rezekne Academy of Technologies. Structure”) Unfortunately, its catalytic role in scientific research could not be observed. During the visits in the laboratories, some software and well equipped computer classes for researchers, students, and academic staff could be observed. The rules for using these (establishing who, when, and for what purposes can use them, who provides the consumables, and the users' responsibilities) could not be found in the SAR. The financial incomes of the research entities (from projects, consulting, equipment rental, etc.) connected with the regional industry or international scientific projects are not transparently distributed.

The use of the software is organized implementing a kind of open-access policy for providing a share of the software is demonstrated to the experts during the visit to the RTA. Once every two years, the Faculty of Engineering of RTA hosts an international scientific and practical conference "Environment. Technology. Resources” (SAR p.46) and each year, the RTA Faculty and Engineering holds an international scientific and practical student conference "Human. Environment. Technology” (SAR p.46), which is a good support for young researchers and students but the conferences are not focused on ICT. Obviously, the Ph.D. students from the "Sociotechnical System Engineering" doctoral SP are contributing to fulfilling the research goals of RTA, but their involvement in RTA scientific and academic activity could be increased, as during the reference period 10 out of 15 doctoral students' field of activity is related to higher education and/or professional activity (SAR p.138).

As indicated on page 5 of the strategy document the mission of the RTA is “to contribute to the transformation and growth of society and national economy through education, research, science and innovation system ensuring creation of new products and technologies in the fields and cross-disciplines of science represented in the RTA, both nationally and internationally”.

Summarizing all mentioned above it shall be concluded that scientific research is considered an important area of the development of RTA. At the same time, there are places for improvement related to commercialisation, publishing activity and joint research projects with international partnerships. Considering that RTA is university of the applied sciences it would be expected intensive activities targeted at collaboration with the local and regional industry and commercialisation activities, while SAR does not provide details on commercialisation policy in RTA. SAR reports a number of the projects completed within the frame of the international cooperation, but in the majority of the projects RTA takes the role of one of the partners (list of projects document “Projects.xlsx”).

1.4.2. Both students and graduates emphasized the need to modernize the curricula and the content of the disciplines equally, to be more practical and in line with modern technological trends. The same was mentioned in the meeting with the graduates (meeting with graduates) during the expert visit. For these purposes, the intensive educational employment of their own research results and clear focus should be the most obvious way. All the infrastructure acquired by using funds obtained from research projects is at the disposal of the students from all three educational levels (B.S., M.S., and Ph.D.), both for education and research. B.S. students are adequately prepared for meeting the demands of their future research activities (both during their second and third-level studies and after graduating though quite a few students continue their studies after graduating first level) by study courses oriented towards the project activities and methodologies. One essential step to support research activities that is mentioned “The Latvian Laser Technology Centre” has been created at RTA on the basis of the existing Physical Processes and Laser Technology Research Centre (Strategy of Scientific Activity 2019-2023).
The involvement of some Ph.D. students in the teaching process is also a positive approach since they are well-informed in their narrow research field and their acceptance from the side of the students is very good due to their close stage of life but the involvement of the employers and graduates in the teaching could be improved (some graduates and employers expressed readiness to participate in the teaching and/or programme development more). The deeper involvement of the employers in the development of the programmes and having more guest lectures could improve collaboration with the regional companies too.
Page 48 of the SAR provides good examples of how bachelor level and master level students are involved in research activities. In addition, there is an annual RTA Research Grant available allocating a small funding (1500 to 2000 EUR) to allow a broader community of students to become involved in scientific research and therefore the students are capable of participating in research and projects conducted by RTA.

1.4.3. Nowadays, due to the complexity of the addressed research topics, successful R&D cannot be performed without strong inter-institutional collaboration. RTA has a number of agreements with universities and public research institutes both from abroad and from Latvia (SAR p.46). A great part of these agreements includes research-related activities in the research areas of this SF, such as mutual publishing, project proposal writing and running, development of the study materials, etc. Additional document “Projects.xlsx” lists the projects run during the reporting period at RTA, where the data provision about the partners and RTA allocated project funding is poor. The international scientific and practical conference "Environment. Technology. Resources” hosted bi-annually at RTA gives a good dissemination option for the research as publishing and making it available public conference proceedings and these are good opportunities for both local and partner researchers for publishing valuable papers. The other side of this medal is that the academic staff involved in the evaluated SF is seemingly more active in publishing here than in other journals having a higher impact (Annex 14 “The list of publications of the teaching staff of the field of study "Information technologies, computer engineering, electronics, telecommunications, computer management and computer science" during the reporting period (2017-2022)”). The recognition of the RTA on an international level is limited by the specific field connected mostly with various computer modelling techniques. HEI is not a leading institution in the projects mentioned in SAR but a partner (list of projects document “Projects.xlsx”). The internationalization goals are given in the document “Rezekne Academy of Technology (RTA) internationalization strategy 2023-2025”, specifying that “Internationalisation as one of the cornerstones of the activities of the RTA and, in accordance with the recommendations of the Organisation for Economic Cooperation and Development (OECD), covers areas of RTA such as mobility of staff (including learners), international experience in quality assurance, regional development, promotion of innovation, etc.”. The document also specifies some specific steps to reach the goal. On the other hand the strategy documents “Rezekne Academy of

Technology (RTA) internationalization strategy 2023-2025" and "Strategy of Scientific Activity of RTA 2019–2023" are quite general and do not give answers to questions about what is the research focus in the field of ICT and what are the steps to strengthen the related R&D at RTA.
The research capacity of the RTA is limited and improvement in this field as well as increasing the cooperation with regional companies and regional planning could potentially raise the number of the projects and improve international collaboration, which would include not only joint projects but also joint publications.

1.4.4. The requirements concerning the involvement in research activities of the academic staff are established in the document (Strategy of Scientific Activity 2019-2023) of RTA. The strategic objectives in this field are adequate and could lead to high performances in the covered research fields. The research-related obligations of the academic staff are clearly established and strictly monitored (every year). There are also several motivating actions including extra remuneration for high-level scientific publications, patents, participation in conferences, etc. Since these were implemented only recently, their beneficial effect cannot be yet assessed.
Most of the research activities are performed by the own academic staff of RTA (besides hard teaching loadings for some persons) which does not have sufficient international visibility. Looking at their WoS statistics (considered as most relevant by the Joint Research Centre, the main science and knowledge service of the European Commission) (Annex 11 and Annex 14), very low H-indexes are noted. The research dissemination results are also weak. During the reporting period, only a few journal papers in high-impact journals were published. Different mechanisms proposed in these strategy documents could be considered as supportive activities (must be), but they are not forming systematic motivation schemes, with a clear vision from the management perspective of the KPI, activities, and possible motivation actions, which would raise RTA to the next level. Among the listed mechanisms several could be noted, as positive examples of motivation - self-initiated projects, budget for conferences and publication. Considering that RTA is more applied science-focused HEI, it would be useful and important also to stimulate research-to-business (R2B) activities and propose the motivation scheme for teaching staff participation in such activities etc.

1.4.5. The integration of students of all levels in the ongoing research projects and their encouragement for innovation is appreciable, for example "Continuously variable transmission for micro-mobility vehicles" project of the Investment and Development Agency of Latvia (IDAL) and "Interdisciplinary Research for the Application of Laser Machining Technology in Textile Materials", etc. (SAR p.47-48), but a more intensive involvement should add more value for them when they enter the labour market.
At RTA once a year the "Human. Environment. Technology" student scientific conference is organized, where students from all three educational levels can participate and present their research results. It should be emphasized that participation in this conference is very useful for the M.S. students to present the results of their research activities before the final examination. The conference is also attended by B.S. students, young scientists, Ph.D. students, as well students from partner universities are invited. It should be mentioned that it is advantageous to organize conferences that are just open to students since this gives them a great occasion to participate in an interdisciplinary scientific meeting and to be also listened to by experienced scientists and teachers. Unlike at conventional conferences, the participating students are not under pressure from other, more experienced presenters.
M.S. and Ph.D. students are involved in some European ERASMUS+ actions in which RTA is a partner, which are good opportunities for them to join pan-European research communities, accumulate knowledge, and last but not least validate their research results through a great variety of specialists in the field. Despite there exist several research mobility possibilities (in the framework of some research programmes) the students are very poorly taking advantage of such actions,

which surely could improve their scientific knowledge and experience. Upon the meetings experts had with students, it seems that this is due to the impossibility of leaving their workplace for a longer period. “Strategy of Scientific Activity 2019-2023” existing mechanisms of the students' involvement in scientific research. Some of them are a part of the study process, like for example specific courses/topics which improve knowledge and skills regarding research. The final thesis at all levels utilizes the topics promoted by public and private partners of the RTA. The mentioned SAR student conference (SAR p.46) also could be considered a step forward in the “promotion” of the research activities, but as it has been reported conference is not obligatory. Running the joint PhD programme “Sociotechnical System Engineering” in collaboration with ViA provides the full path (BA, MA and PhD) for the students interested in doing research and is a kind of perspective for them for even deeper involvement in the field. On the other hand, the PhD programme is supporting academic sustainability in RTA and ViA.

1.4.6. The HEI is making a lot of efforts to improve its activities through the digitization of all sectors, including scientific research, too. Some examples are very positive and could be considered as a step forward compared to the past, while some only pretend to be innovative. Experts noticed a continuous development of Moodle teaching materials, promotion among teaching staff knowledge and skills on courses development etc. There are many Latvian-level or EU-level study materials and e-courses development projects listed in the document “Projects.xlsx”, which shows the serious contribution to this area. At the same time, it seems that all described solutions are very fragmented and do not organize a systematic approach. Also during meetings in assessment meeting with teaching staff the provided information about methodological seminars (conducted with the teaching staff) could be even more intensified focusing on the newest scientific achievements and new teaching techniques.

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall it should be stated that RTA considers scientific and research development with attention, as referred to in the HEI development strategy. RTA development strategy includes specific activities targeted to improve this domain. But at the same time, it should be stated that now in many cases used mechanisms and approaches are fragmented and do not form the system or framework of the scientific and research domain development, including students and teaching staff attraction, R2B and commercialisation activities, and further collaboration with the regional industry. ICT as a scientific and research domain could fit the profile of the RTA and Latgale region development plans. There are international projects, in which RTA is involved, but we strongly believe that RTA has enough experience not only to participate in projects as partners, but also initiate and take leading positions in some EU projects, especially taking into consideration regional specifics. The research interests of the teaching staff are in line with current trends in the fields, and their intentions regarding research are commendable. Unfortunately, the quality of the publications fructifying their results could be much improved.
Strengths:
1. The adequate research strategy of RTA.
2. Rejuvenation of the staff could be noticed.
3. Strong interest of local students to study in the region.
4. RTA, as small HEI, utilizes benefits of the student centric approach and RTA implemented personalized approaches to all the students.
5. Once a year the "Human. Environment. Technology" student scientific conference, where students from all three educational levels can participate and present their research results.
6. Inclusion of scientific and research development to the RTA strategy and underlining its importance on all levels (mission, vision, goals, specific activities etc)

7. Running joint PhD programme “Sociotechnical System Engineering” in collaboration with ViA

Weaknesses:
1. The effective involvement of the research management structure and clear focus is invisible.
2. Lack of involvement of internationally recognized research and innovation staff in the research activities. All the research activities are performed by the own academic staff, which does not have sufficient international visibility.
3. The involvement of the Ph.D. students in the research projects and their dissemination in high-impact journals are both weak.
4. Lack of the R2B commercialisation strategy/policy for the establishment of the long-running collaboration with regional industry.
5. Fragmented approach for students and teaching staff involvement in the scientific/research activity.
6. No experience in taking the leading positions (project leader) in international projects (only partner role).

Assessment of the requirement [2]

1 R2 - Compliance of scientific research and artistic creation with the level of development of scientific research and artistic creation (if applicable)

Assessment of compliance: Partially compliant

The direction of the scientific research activities connected to the evaluated SF complies with the general expectations in this educational field. Both the Institute and the Faculty of Engineering are strongly devoted to increasing the research activities connected to this SF by applying and monitoring the strategic goals. The involved academic and research staff are encouraged to perform high-value research activities, journal publishing, and participation in international conferences. The students from all three study levels are intended to be involved in the research and development activities of the University. The expectation for them regarding these activities is increasing as they step up their study levels. The obtained research results are satisfactory in quantity but could be improved in quality by publishing more in high-impact international journals.
The teaching staff is obligated to perform research activities and these are strictly monitored. Increased visibility of these actions should be welcome.
The approaches/methods/techniques used by RTA related to the research are fragmented and do not form a systematic approach, but RTA for the last years has done a lot to push forward the research domain. RTA puts the development of research and science as one of the elements of the strategic development plan. The regional opportunities should be utilized in a more effective way - leading EU-level projects, R2B activities, orientation toward commercialisation and establishment of long-running projects/collaboration with Latvian industry.

1.5. Cooperation and Internationalisation

Analysis

1.5.1. RTA has signed 26 cooperation agreements: 8 with local educational and scientific institutions, 9 with foreign educational institutions, 3 with municipalities and 6 with companies, associations and organisations (SAR, Annex 15) in various fields of interest related to studies, provision of student internships and scientific research. The main criteria for selecting new cooperation partners are possible improvements to the SF and SP itself, development of scientific research, staff involvement in the study process, possibilities for increasing the number of students, etc. (SAR, p. 55).

Software development companies that can offer real internships to students are more relevant to the SF. At the moment, this cooperation is mainly focused on local and regional companies, thus strengthening regional cooperation and preparing employees for the region, which is particularly important. Cooperation with companies takes various forms: provision of internships, support in the preparation of final theses, employment of students, teaching traineeships, study tours, research projects, and recommendations for the improvement of SPs (SAR p. 57).
From the interviews with graduates, it is also worth mentioning their high willingness to be involved in the development of the field of study, for example by providing guest lectures, which is a positive and developable area of cooperation and resource for RTA. The RTA also has the advantage of close cooperation with the Rezekne Special Economic Zone (interview with employers), which can be developed into a joint strategy to attract more national and international companies to Rezekne, for example by establishing branches of their companies in the city. Furthermore, cooperation with industry leaders in organizing joint study courses (e.g. a study course on MikroTik equipment in the field of computer networking) is highly appreciated. In addition, it is recommended to consider expanding cooperation with companies that would be willing to provide internships for students in English if the number of foreign students increases, as well as offering companies financial support for students, e.g. in the form of scholarships.

1.5.2. RTA has an Internationalization Strategy (Rēzeknes Tehnoloģiju akadēmijas (RTA) internacionalizācijas stratēģija 2023.–2025. gadam, only in Latvian, publicly available on the RTA website), it includes KPIs to increase benchmarks between 2022 and 2025, such as participation in international projects, joint scientific journals with foreign partners and participation in international organisations, increasing the number of international students, development and implementation of non-formal education courses in English, etc. There are some positive examples of mobility and international cooperation based on personal contacts, but this must be systematically improved (SAR, p. 57 and 58).
There was an attempt to cooperate with London Metropolitan University (mutual recognition of the study content and the possibility for RTA students to continue their studies at Metropolitan University) and, although in the end unsuccessful (meeting with management), it is a good initiative which should be used as an example for similar attempts in the future. There is also a considerable number of networking projects (Erasmus), see Annex 6 in additionally needed documents (request Nr. 6).
Foreign partners are selected according to the same criteria as Latvian partners. Cooperation with foreign universities/research institutes is mainly in the development and implementation of joint research projects and SPs.
The RTA has concluded more than 170 agreements for student and lecturer mobility within the ERASMUS+ project, but the mobility rates of students and lecturers are very low and short, respectively (5 to 10 students in a year; lecturer numbers are higher but with very short mobilities), with the Covid-19 pandemic cited as one of the main reasons for this, but measures are being taken to improve the situation further (SAR p. 57).

1.5.3. The incoming and outgoing mobility is at a low level (also before the COVID pandemic). Unfortunately, no analysis was carried out by RTA management about the reasons (meeting with management). There are some general assumptions, for example in the case of outgoing student mobility, the students are mostly already working and can not afford a free period for mobility or are afraid that the mobility period could endanger their study (meeting with students). In the case of outgoing teacher mobility, as reasons for low numbers are obligations at working place and private obligations (meeting with academic staff). It should be noted that neither the RTA website nor the DMS provides detailed information on Erasmus+ mobility opportunities. Therefore, it would be useful to complement the freely available information on mobility opportunities and conditions, thus

increasing the number of potential applicants.
Incoming mobility and outgoing mobility are often correlated. Consequently, low outgoing mobility causes low incoming mobility as well. However, “International Week” organized by RTA (meeting with teachers and RTA Internationalisation Strategy 2023-2025), during which incoming international students and staff are coming in contact with RTA’s students and staff, can be a way to boost networking in other directions, i.e. to use incoming mobility as a basis to enhance outgoing mobility (meeting with management).

Conclusions on this set of criteria, by specifying strengths and weaknesses

In summary, the RTA has built strong local cooperation with companies and organisations in the sector. Criteria for cooperation have been defined for both local and foreign partners with the aim of contributing to the development of the SF and the achievement of its SP learning outcomes.
However, there is potential for cooperation to develop, by expanding it with national and international companies and organisations, developing new cooperation formats and involving graduates more actively.
The RTA has developed an internationalisation strategy, which includes KPIs for the planning period as well as an analysis of potential risks.
Nevertheless, the rates of incoming and outgoing mobility of students and lecturers are relatively low, and with dominant short-term mobilities which are not promising regarding possible long-term collaborations and strong networking.

Strengths:
1. Strong cooperation with local business organisations to prepare workers for the local labour market.
2. Willingness of employers, partner companies and graduates to cooperate in the future.
3. Some positive examples of international cooperation as a foundation for further development and enhancement of global partnerships.
4. Clear objectives and indicators have been developed for the next period to facilitate the internationalisation of the RTA.
Weaknesses:
1. Low impact outside the region, relatively little cooperation with national and international companies in the sector.
2. Low incoming and outgoing mobility of teachers and students.
3. There is limited information freely available on mobility opportunities and conditions.

Assessment of the requirement [3]

1 R3 - The cooperation implemented within the study field with various Latvian and foreign organizations ensures the achievement of the aims of the study field.

Assessment of compliance: Partially compliant

RTA has established cooperation with the local business community, which is considered to be a significant benefit for the region and helps to achieve the objectives of the SF, to train ICT specialists primarily in Latgale region, but there is relatively weak cooperation with national and international industry. However, its potential is not completely reached nor there are clear activities to reach it. Furthermore, the international collaboration is at a minimum level, which disables stronger international visibility and relevance.

1.6. Implementation of the Recommendations Received During the Previous Assessment Procedures

Analysis

A total of 11 previous recommendations, of which 5 have been fully implemented, and RTA highlighting the rest will be implemented by 2027 (Subsection 2.6., Annex “Annex 19.docx”). Involvement in scientific activity has increased by looking at previous results - participation in projects that also result in scientific publications, which indicate an increase in quality. E-learning has been improved with Moodle study courses, but not all study courses are available with materials where students can familiarize themselves with the materials, tasks and general information. Instructors can choose whether or not to post materials. Young scientists are motivated by the workload and inspired by secured funding to publish scientific articles. Scientific articles are published in Q1, Q2, Q3 and Q4 journals and most are indexed in Scopus and WoS. The Alumni Association has been established, however, there is no conclusive evidence of its activities. (SAR, Subsection 2.6., Annex 19.docx). Recommendations can be implemented in a shorter period of time.

Conclusions on this set of criteria, by specifying strengths and weaknesses

The recommendations provided have been partially implemented. The contribution of the RTA to the analysis of recommendations and their application to the specifics of the SF and the corresponding SPs is evident. Formally eligible and previous requirements have been met, but have been formally met recently. Also, there are several recommendations that will be implemented in the future by 2027 RTA emphasizes, which currently cannot be evaluated for their impact on the implementation of the recommendations. Total of 11 previous recommendations, of which 5 have been fully implemented, the rest will be implemented by 2027 RTA emphasizes (Subsection 2.6., Annex “Annex 19.docx”). Recommendations can be implemented in a shorter period of time.

Strengths:
1. Potential for strong scientific infrastructure and attraction of scientists. (SAR, Subsection 2.4., Annex 13.docx, Annex 14.docx)
2. Information system infrastructure (e.g. DMS).
Weaknesses:
1. Low level of formal cooperation with local players such as companies, public institutions and graduates.
2. Low motivational system for scientists, i.e. no defined financial benefits in “Procedure for Evaluation of Work Quality of Academic Staff at Rezekne Academy of Technologies (RTA)”.
3. Although strong information structure is established, the implementation is not fully in place (e.g. LMS).

Assessment of the requirement [4]

1 R4 - Elimination of deficiencies and shortcomings identified in the previous assessment of the study field, if any, or implementation of the recommendations provided.

Assessment of compliance: Partially compliant

Some advice has been put into practice and others have been put on a long delay till 2027 by RTA. It is clear that the higher education institution has contributed to the examination of suggestions and their application to the unique characteristics of the study topic and the associated study programs. Formally qualified and prior prerequisites have been satisfied, but just lately. Additionally, there are a number of recommendations that will be put into practice in the future but whose effects on their implementation cannot yet be assessed. Total of 11 previous recommendations, of which 5 have been fully implemented, the rest partially implemented will be implemented by 2027 RTA emphasizes the deadline. Possibility of a robust

scientific infrastructure and scientist recruitment. Organized information system and availability of an online environment with the required software for students. Low level of collaboration with local stakeholders including businesses, government agencies, and graduates. There isn't a motivating structure for scientists that is straightforward.

1.7. Recommendations for the Study Field

Short-term recommendations

1. Revamp Strategy and related documents, connect them better in order to ensure synergy effects.
2. Define measurable KPIs and their thresholds, and measures how to reach them. Measures must be defined on analysis of the reasons for possible weaknesses and threats, e.g. analyze what the reasons for low outgoing student and teacher/staff mobility are.
3. Adapt teacher-related regulations, e.g. “Procedure for Evaluation of Work Quality of Academic Staff” in order to motivate them to resolve detected weaknesses and threats (low outgoing mobility, weak international network, more intense collaboration with employers and partner companies, etc.)
4. Develop a plan for the involvement of internationally recognized research and innovation visiting staff and increase international visibility.
5. Consider having deeper involvement of the employers in the development of the programmes and having more guest lectures.
6. Consider stimulating R2B activities and propose a motivation scheme for teaching staff participation in such activities.
7. Consider developing collaboration at the regional and at the State level in sharing the library resources (incl. electronic databases) and developing respective networks.
8. Include “digital content creation and publishing” as a part of the annual academic staff performance evaluation procedure.
9. Complete the English language web pages on the RTA website.
10. Increase participation in scientific research with an annual action plan.
11. An action plan for a higher level of LMS implementation for all courses is needed, as well as corresponding KPIs and supervision mechanisms which will ensure successful results. Thereby, consider including PlugScan as mandatory for all teaching materials and students’ works uploaded to LMS.
12. Consider focusing more on additional income sources besides state budget funding. Cooperation, joint projects with regional companies, research/consulting/training contracts for regional enterprises and discuss with partner companies possibilities of joint R&D projects
13. Review study courses to modernize (where applicable)
14. Technology selection. Use the most up-to-date tools and releases for study and research. Industry in most cases cannot switch quickly for many reasons like legacy systems to support, customers requesting stable and proven technologies etc. RTA can and should follow scientific and technical development promptly. Introduce a regular technology review panel with participants from the industry, graduates, students and professors.

15. Qualification/Diploma paper supervision – cooperate with industry as this will improve paper quality.
16. Foreign languages - Foster language proficiency with mobility or other intensive use. Don't waste precious student's time just to be compliant with professional standard. Make the standard requirements meaningful to students. Teach German to those who will go to the Erasmus semester in Germany. Teach Lithuanian to those who will visit/cooperate with Lithuania.
17. IT supporting systems - Regular review and improvements required. Both for functionality/usability and content. Do this in cooperation with staff, students, graduates, employers.
18. Consider sharing computer classes, laboratories and library with schools, institutions and companies in the region to promote an open RTA.
19. The Quality Management Policy should be published on the RTA website so that it is accessible to the public.
20. It is necessary to harmonise the information on RTA SPs between the information publicly available on the RTA website and the information available in the official state registers: the VIIS and the e-platform.
21. Open all the IT support systems (like LMS, DMS etc.) to the public as much as possible. Present RTA as an open partner and the right place to study.
22. Harmonize the academic workload of professors and the rest of teaching staff. SP directors should not be teaching 10+ study courses. Harmonization will help to foster sustainability of the SF as well as it will free up professors' time for scientific research.
23. Review library content regularly (at least every 3 years) in order to archive outdated books and to identify "empty shelves" - missing new books in key areas of the SF.
24. Initiate and apply and launch at least some high level international research projects as a leader of the project.

Long-term recommendations

1. Communicate more clearly with all relevant stakeholders (students, staff, employers, graduates, etc.) how their feedback (e.g. through surveys, meetings, etc.) impacts the SPs and RTA in general, i.e. what changes are made based on their feedback
2.Communicate more clearly with all relevant stakeholders (students, staff, employers, graduates, etc.) what kind of communication would result in higher turnout, e.g. surveys, live meetings, round tables, etc. Also include them in defining the communication type, form and content, e.g. Student Council in defining the questions for student surveys.
3. In interaction with all relevant stakeholders (students, staff, employers, graduates, etc.), move from existing informal to more formal communication (e.g. meeting minutes) in order to be able to follow the later implementation of conclusions
4. Decision-making based on SP directors presents a strict hierarchy, which could result in "silo mentality" if there are no more wide and inclusive discussions (also encompassing more different SPs or even more SFs). Consider appropriate changes in hierarchy structure and/or communication and decision-making procedures.

5. It is necessary to create a more coherent and linked quality management policy with the resulting documents regulating the university, SFs and the study process, updating them, as well as harmonising their versions in Latvian and English, if necessary.
6. It is also recommended to create easily accessible and understandable flow charts of RTA processes for the university staff (including students), including references to the documents regulating the processes and other relevant information.
7. To reach the goals defined in strategic documents, define measures and measure corresponding KPIs in order to evaluate the effectiveness of measures.
8.The QMS system needs to be implemented in daily work to ensure regular improvement of the study process, based on data rather than assumptions, by regularly updating course content and materials, reviewing teaching methods, and improving the content of SPs in close cooperation with employers, graduates and students.
9. Define a strategy for how to increase the impact of RTA also outside the region
10. RTA is recommended to do more to inform students about their possibilities to also formally submit suggestions and complaints, and to provide clear feedback that they have been considered and taken into account to the extent possible.
11. In cooperation with Rezekne Special Economic Zone it is recommended to develop a joint strategy to attract more national and international companies to Rezekne, for example by establishing branches of their companies in the city.
12. It is recommended to cooperate more closely with leading companies in the sector, for example by developing joint study courses, developing study materials, providing students with internships (including in English) and professional development of lecturers, as well as offering students financial support such as scholarships.
13. Boost collaboration with Alumni (like participation in SF, SP, study course review panels, final work content discussion, actions like “great technology book for students” - rating library books and presenting own books, guest lectures etc.)
14. Put more effort into increasing incoming and outgoing mobility. This is of crucial importance for opening the SF (and RTA) to cooperation and thus - raising a study quality.
15. Put more effort into preparing and launching new EU scientific projects and set a clear focus on taking the leading positions (project leader) in international projects.
16. Collaborate with local authorities and ViA and develop a joint regional strategic R&D development plan with clear focuses and targets and steps specifying the involvement of the RTA research management structure in this strategy realization.
17. Focus more on certain topics scientifically in the future in order to have a clear competitive advantage in comparison to other similar institutions in Latvia

II - "Programming " ASSESSMENT

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2.1. Indicators Describing the Study Programme

Analysis

2.1.1. The SP "Programming" complies with the SF "Information Technologies, Computer Engineering, Electronics, Telecommunications, Computer Management and Computer Science" as well as with the RTA Development Strategy 2016-2023. "Objective: prepare ITC specialists considering employer requirements" (SAR p. 73) is included in the RTA development strategy and the following first-level professional SP preparing programmers helps to achieve this objective, according to the national occupational standard "Programmer" (code 2512 05).

2.1.2. Graduates of the first level professional higher education SP "Programming" receive the 4th level professional qualification "Programmer", which is assigned according to the professional standard "Programmer" (approved on 8 June 2022).
The title of the SP and the qualification to be obtained are mutually consistent and relevant. The aim of the SP is "to prepare students for the profession of Programmer (profession code 2512 05), enhancing their personality development; promote the acquisition of knowledge and skills that ensure the attainment of the fourth level professional qualification "Programmer" and foster competitiveness in changing socio-economic conditions; create motivation for further education and provide an opportunity to prepare for attainment of second level professional higher education and fifth level professional qualification in the field of computer science" (SAR p. 72), whereas according to the Education Law of the Republic of Latvia (https://likumi.lv/ta/id/50759#p8_1), Latvian Qualifications Framework (LQF) 4. qualification level requires "the ability to demonstrate comprehensive knowledge and to plan and organise work independently in a given field, taking responsibility, working individually, in a team or managing the work of others".
The SAR lists on pages 70-71 the aim, objectives, learning outcomes and admission requirements of the SP, which are mutually agreed and developed in accordance with the (LQF), the European Qualifications Framework, as well as the Cabinet of Ministers Regulation No 141 "Regulations regarding the State Standard for First Level Professional Higher Education".
Study programme code: 41484, established in accordance with the SP content and Regulations of the Cabinet of Ministers No. 322 "Regulations on Latvian education classification" (https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitibas-klasifikaciju), corresponding to the thematic group "Natural sciences, mathematics and information technology" and area "Computing" and subgroup "Programming".

The duration of the SP is 2 years and the volume is 80 CP (120 The European Credit Transfer and Accumulation System, ECTS), which complies with the Latvian legislation on first-level professional education. The SP is conducted exclusively in Latvian, preparing IT specialists primarily for the local labour market.

2.1.3. The RTA has made the following changes to the SP parameters: due to low demand, the part-time extramural study form has been terminated, based on the new occupational standard, the SP title has been changed, as well as its content has been improved, and its implementation at the Madona branch of the RTA has been stopped. All changes have been made on the basis of the RTA analysis and are justified (SAR p. 73).
The SAR does not provide a more in-depth assessment of the impact of the changes on the future study process, so it is not possible to fully assess the impact of the changes on the quality of the study programme.

2.1.4. The economic and social substantiation of the SP is based on data from the Latvian Central Statistical Office, the Latvian State Employment Agency and data and forecasts from the Latvian Ministry of Economics (SAR p. 75-76), which indicate the future demand for specialists at both national and regional level.
For the analysis of graduate employment, data from the Ministry of Education and Science graduate

monitoring, as well as the University's own data on graduate employment were used. The data indicate that 91.3% of graduates of the SP are employed despite the high unemployment rate in Latgale as a whole. (SAR p. 77) Students are employed in various software development companies, such as SIA "Midis", SIA "Lailio Solutions", SIA "Entrypoint", SIA "TestDevLab", etc.
Taking into account the fact that in this and other SF study programmes many students are expelled due to failure in their studies, it is advisable to review in more detail the circumstances why students find themselves in such situations, e.g. very strict assessment criteria, inflexible mark revision system, etc. It would also be advisable to examine in more depth the reasons for other cases of exmatriculation, identifying opportunities for the RTA to provide additional support to students to avoid them.
The analysis of student dynamics (SAR p. 78-79) shows that over the last five years, an average of 21 students have been enrolled per year, but only an average of 5 of those enrolled graduate. The programme has a high drop-out rate, with an average of 3/4 of enrolled students not completing their studies, the most frequent reasons for dropping out being insufficient study results and voluntary exmatriculation.

2.1.5. N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

The SP "Programming" is in compliance with the field of study and the RTA development strategy. The aim, objectives, study results and qualifications of the SP are consistent with each other. The SP is designed to meet the requirements of the latest occupational standard "Programmer". The changes made to the study programme are justified and acceptable, but there is a lack of analysis of the impact of the changes on the quality of the future study process.
The SP is designed to meet the requirements of the latest occupational standard "Programmer". The changes made to the study programme are justified and acceptable, but there is a lack of analysis of the impact of the changes on the quality of the future study process.
Strengths
1. Graduates of the programme have high employment rates and are in demand in the labour market, and labour market forecasts show that there will be a need for specialists in the field in the future.
2. The SP is successfully integrated into the SF and its strategic objectives.
3. The SP title, code and the professional qualification to be obtained are interrelated with the aims, objectives and learning outcomes of the SP.

Weaknesses
1. The programme has a high drop-out rate - on average 76% of enrolled students do not complete their studies.
2. The RTA has not drawn up an action plan to reduce student drop-out.
3. The SP has a low number of graduates, which poses sustainability risks for the SP.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The content of the study courses is developed in compliance with the Cabinet of Ministers Regulation 198 No 141, the professional standard for programmers (08.06.2022). SAR page 71-72 represents details about the requirements and how programmes fulfil the requirements. The total length of the SP "Programming" is 80 credit points (CP). The content of the courses consists of General study courses (not less than 20 CP) and Specialization study courses (not less than 32) and

Internship and diploma project (28 CP, where internship consists of not less than 16 CP). The SP "Programming'' comprises general education courses including the study courses "Launching of entrepreneurship" (4 CP) helps to develop competencies in the organization and establishment of enterprises, management methods, record-keeping and financial accounting systems. The study course "Project management'' (2 CP) helps to build the core competencies of project development and management. The study course "Introduction to human studies" (2 CP) helps to build competencies in social dialogue in society. Whereas the study course "Introduction to Research" (2 CP) and "Computer networks" and "Labour protection and ergonomics" (both 2 CP) helps to build competencies in the laws and regulations governing employment relations. The programme is divided into following modules: 1st semester - "Business process modeling and graphical interface prototyping"; 2nd semester - "Software Engineering I"; 2nd semester - "Project management"; 2nd-3rd semester - "Web technologies IIII"; 3rd semester "Mobile Apps", which means having clear structure for he whole programme. It seems to start with business modelling in the 1st semester might be too complicated and not needed on this level though some knowledge about the ICT-related business processes might be beneficial.

The SP "Programming" comprises specialization study courses equivalent to 32 CP. The specialization courses include compulsory study courses, study courses for a particular profession and optional study courses and provide specific knowledge and skills in programming. The internship is organized in companies in the sector or in companies where software development and testing activities are carried out, in accordance with the internship regulations. At the final stage of the SP, students develop a qualification work (diploma work). The elaboration of the qualification work in the amount of eight credits strengthens the knowledge, skills and competencies acquired in the study courses, applying them in the development of the practical work and in the preparation of the theoretical description of the development process. Considering the goal of the SP "The study programme goal is to prepare programming specialists for professional activity in accordance with the level standards of higher professional education and profession, providing the necessary knowledge, skills, and competencies required for the programming profession and enabling successful integration into the labour market and independent adaptation to the changing labour market requirements, as well as to motivate students for professional development and further education in higher education study programmes or through non-formal education." and declared learning-outcomes " - able to demonstrate comprehensive and specialized knowledge and understanding of facts, theories, regularities and technologies relevant to the field of software development; - the student is able to develop a minimum viable product (MVP) and realize its prototype, applying the Start-Up methodology; - able to analyze requirements, design and model the system, communicate with the client and prepare appropriate software documentation; - able to implement software according to documentation, choose implementation technologies, implement programme code according to best practice principles, security and performance considerations, prevent programme errors and implement its testing, as well as maintain and implement systems; - able to manage risks, choose an appropriate project management method, plan and organize work, participate in brainstorming meetings and sprint planning, and prepare a project plan; - is motivated to engage in science, to participate in the implementation of smart and cyber-physical systems, proves readiness to improve their competences and knowledge. Declared learning outcomes and set of courses are in line with the requirements of the industry and labour market requirements and development trends. The content of the study courses is developed in compliance with the Cabinet of Ministers Regulation No 141 Regulations regarding the State Standard for First Level Professional Higher Education (https://likumi.lv/ta/en/en/id/6397-regulations-regarding-the-state-standard-for-first-level-professional-higher-education), proven in SAR complience-to-state-educational-standard and complience-with-professional-standard for the compliance of the professional standard for Programmers (08.06.2022) : https://registri.visc.gov.lv/profizglitiba/dokumenti/standarti/2017/PS-221.pdf. The learning

outcomes are formulated clearly (SAR p.72-73) and well reasoned and there is a defined mapping of the programme to achieve the study results of the SP (SAR Annex 5). It should be stated that the content of the first-level SP (set of courses and content of the courses) supports the reaching of the declared learning outcomes. Declared learning outcomes and set of courses are in line with the requirements of the industry and labour market. The presented study plan consists of relatively small (2-3CP) courses, which complicates the management of them (from an administrative point of view) and overloads students with fragmented assignments and therefore some merging could be suggested.

2.2.2. N/A

2.2.3. The form of education of the first-level professional higher education SP "Programming" is full-time studies. In order to provide students with a transparent framework for the implementation of the study course, for each study course the aim of the study course is defined, along with the content of the study course, the calendar plan, the achievable results within the framework of the study course, the evaluation methods of the results of the study course and the criteria, as well as the organization of the individual independent work of the student (this information is available in Moodle system of HEI). In order to provide students with a transparent framework for the implementation of the study course, for each study course the aim of the study course is defined (annex 7_Appendix_course_descriptions), along with the content of the study course, the achievable results within the framework of the study course, the evaluation of the results of the study course and the criteria, as well as the organization of the individual independent work of the student (this information is available in Moodle system of RTA). Study implementation methods are traditional, but still contribute to the learning outcomes of each course and programme overall. They are lectures & seminars, individual and group practical works etc. Independent work, which includes: regular study of the course material using lecture materials, study literature, internet resources, etc.; development of independent practical work; development of homework; preparation for tests, etc. To bring students closer to the industry some quest lectures are provided through the respective quest lectures and employers' involvement is low. Various methods of assessing knowledge, skills, attitudes and competencies are used both during the study course and at the end of it: test work, homework, test, project, study work, presentation demonstration, study test, and examination. During the meeting students and alumni reported about the high availability of the teaching staff for consulting and assistance, which was formed by the opinion of the HEI student-centred approach of the university. All mentioned above fit the SP's learning outcomes and aim of the SP. Also during the assessment visit, students and alumni reported about relatively good availability of the teaching staff for consulting and assistance and convenient access to the learning resources (typical for a small community), which formed by the opinion of the RTA student-centred approach.

2.2.4. The first level professional higher education SP "Programming" provides for an internship of not less than 16 CP in accordance with the Cabinet of Ministers Regulation No 141 "Regulations on the State Standard for First Level Professional Higher Education" (20 March 2001), which provides for a minimum internship of 16 CP. The internship is divided into two parts: 4 CP in semester 3 and 12 credits in semester 4. Programme description indicated the following aims: to verify the student's professional and personal suitability to work in the field of programming; to give the student the opportunity to independently continue the professional development of the acquired skills and competencies in a real working environment of a company/organization. The student's tasks during the internship are: independently carry out a software development task or participate in a software development project; develop professional skills and competencies by carrying out tasks in the framework of a software development project; become familiar with software development methods

used in the enterprise; familiarize themselves with the software development environments used in the enterprise; document regularly the progress of the traineeship; develop documentation of the internship. The internship is regulated with the document “Methodological Recommendations for Organising Traineeships” (Annex 8). Also during the meetings with alumni and students, it has been reported that internships are running smoothly, most of the students do internships in the same company they already work and this process is effectively implemented. The companies students from the programme have internships are SIA "Midis", SIA "Entrypoint", SIA "Laileo Software", SIA "Wunder Latvia" but also in neighbouring cities "Scandiweb" (Jēkabpils) and "TestDevLab" (Daugavpils) and even Riga IT companies which is an indicator for good regional coverage. Most of the internships are connected with the development of a web application. The university supports the student in finding an internship if this is necessary.
It is essential to note that employers give a written feedback about the student internship after the end of the internship (confirmed on the meetings with the employers) and the results are discussed anually with the RTA staff and employers, which should be considered as an essential action for improving the programme (p.83 SAR and meeting with the employers and staff). On the other hand it was confirmed the satisfaction of the employers is incresing (confirmed on the meeting with the employers) due this feedback taken into account in the programme.

2.2.5. N/A

2.2.6. At the final stage of the SP, students develop a qualification work (8 CP). The elaboration of the qualification work in the amount of eight credits strengthens the knowledge, skills and competencies acquired in the study courses, applying them in the development of the practical work and in the preparation of the theoretical description of the development process. SAR page 89 represents in general the qualification work topics, all of them fit well into the domain of the SP, as they are related to the development of the specific software. The qualification work consists of: developed software (includes testing); documentation of software requirement analysis (software requirements specifications, user stories or game design); 3) description of software design; 4) user manual; 5) presentations and video demonstrations of the project. During the visit several final works were demonstrated as samples, the quality of the work is sufficient and corresponds to the expectations.

Conclusions on this set of criteria, by specifying strengths and weaknesses

Considering SAR and answers collected during the meeting it shall be concluded that the presented SP fulfils formal requirements, and is in line with the requirements of the industry and labour market. At the same time, representatives of the industry pointed out that they would be happy to see more “soft” skills by the graduates of the HEI. The content of the SP supports reaching the aim and learning outcomes of the SP. An internship is an obligatory part of the SP and according to provided evidence is running smoothly and effectively. The university assists students in finding internship places if needed. The expected outcomes of the internships are in line with the programme and requirements of the industry.

Strengths:
1. The SP is balanced between the necessary knowledge, skills and competencies required to perform the duties after graduation.
2. The content of the program is relevant to the field of the relevant industry.
3. Good local internship base.

Weaknesses:

1. The programme is provided only in the form of full-time study, which limits the opportunity for some potential learners to join the SP
2. Too many small courses in the programme (2 CP), decrease the manageability of the first-level SP (from the RTA side) and at the same time overloads students with fragmented assessments.
3. More ambitious students are not challenged by the SP and teachers during implementation.
4. The teachers' usage of LMS is not at a high level in all courses.
5. Analyze part-time and/or distant study programme form adding option and discuss the option with students and employers. In case of positive impact consider options for opening the part-time or distant study programme again.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Not relevant

N/A

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. SP informative, material, technical and financial provision complies with the needs of SP.
The infrastructure of the Faculty of Engineering consists of:
1) Engineering faculty building (put into operation in 2014) with laboratories, workshops, lecture rooms, staff and student premises;
2) Information Technology Centre (computer rooms, electronic publications room, computer equipment service room, server room);
3) Laser Technology Centre (put into operation in 2019). (SAR, p.35)
Experts visited computer classes and laboratories. There are about 100 computers available for Engineering faculty students. Taking into account the relatively small number of students and the fact that a large part of SF students uses their own laptops during classes - infrastructure resources could even be shared with regional school students or employers from the region.
However, regular review of library books as well as study course content has to take place in order to be in line with the world's technological development. Students should have the right and privilege to study the latest technologies.
RTA uses Moodle system (ekursi.rta.lv) to support the study process. (SAR, p.39), MS Teams and Google Meet for remote classes and communication. DMS is in place (MS SharePoint based) to support students, lecturers and administration.
However, the DMS has not been used broadly and intensively.
Samples: All 4 meeting minutes of SF Council meetings for this academic year were added on May 2, 2023. The system does not contain any Students Council meeting minutes for 2022 and 2023.
LMS/Moodle has not been used to the full extent (Meeting with IT Support personnel). It's very important to find ways how to motivate/mandate all the teaching staff to use the LMS more.
RTA uses surveys to obtain information about the support required for students and lecturers. However, a very small percentage of students and lecturers respond to the surveys (see SAR, pp.39-40).
LAIS system has been used by students and lecturers offering all the information regarding the study process. (SAR, p.40)

IT support system usage by IT SF has to serve as a good sample for the rest of RTA. Experts have noticed deficiencies in the usage of all the IT support systems by SF staff. LMS, DMS, web page, the institutional repository of RTA, and social networks. In order to attract and keep students the SF has to be fluent in all the digital system usage maintaining up-to-date digital content. Experts recommend including “digital content creation and publishing” as a part of the annual academic staff performance evaluation procedure.

2.3.2. N/A

2.3.3. According to the SAR (p.93) the funding during the 6 last years is stable and allows the implementation of the study process for the SP.
The number of state-budget funded study places - 36 (during the last 4 years).
State budget funding - 97 584 (in 2022).
As funding is never sufficient (Meeting with RTA management) experts recommend focusing more on additional income sources besides state budget funding. Cooperation, joint projects with regional companies, research/consulting/training contracts for regional enterprises - are opportunities that could bring both extra income as well as experience/interesting research topics to RTA.

Funding for the acquisition of RTA’s library collections has decreased significantly during the last 6 years which might lead, and in certain technical areas already led to outdated content of the library.
Samples: Library lists only old books about programming (10+ years old) and databases (20+ years old), graduates mentioned that they had to learn outdated topics during their studies, study course descriptions (Databases, Computer Architecture) list too old mandatory literature to keep students motivated.

Conclusions on this set of criteria, by specifying strengths and weaknesses

RTA provides all the resources necessary for students and lecturers. The only deficiency to mention is outdated technical literature in the library.
Computer classes and laboratory rooms might be even too much for the current number of students.
Library textbooks should be reviewed periodically to archive outdated ones.
Purchase of new books and/or e-books in relevant technical areas has to be as important a task as attracting new students and research partners.
LMS and DMS should be used more broadly, students' and lecturers’ feedback would help to improve the systems.
Worth considering opening all resources (including computer classes, laboratories and library) to the public (school students, industry professionals) fostering the community and marketing RTA as a welcoming partner and the right place for studies.

Strengths:
1. Very personal support opportunities for students.
2. Recently built premises incl. library and laboratories. It’s a strength and attraction to the whole faculty, SF and each SP in particular.

Weaknesses:
1. The small number of students for all the study programs limits internal competition and development opportunities.
2. All the information systems (ekursi.rta.lv, lais.lv, DMS) are closed systems and do not help to market SF and SPs.
3. Surveys do not present a real picture for the study process in place (low percentage of response).

4. Outdated technical books should be neither kept on library shelves nor used in the study process.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Partially compliant

Library content has not been reviewed and technical literature got outdated and cannot serve as mandatory literature in study courses. IT support systems have not been used to the full extent to actually support the study process. Feedback from all the stakeholders has not been collected, reviewed and implemented due to the very low percentage of responses.

2.4. Teaching Staff

Analysis

2.4.1. In total, 20 teachers are included in the implementation of the SP. Thereby are 10 RTA's teachers with scientific positions, 9 are RTA's professors and 10 have PhD degree (see Annex 9).
In general, the qualification of the teaching staff is sufficient and teachers are competent from a technical and pedagogical point of view (meeting with students, graduates and employers). The relationship between teachers and students is professional, but it is necessary to inform more students about possibilities about ways to communicate possible individual issues (meeting with students).
Due to the fact that the SP provide basic knowledge from various areas that SP covers, more lectures from employers representatives and experienced graduates are needed in order to provide students with information about possible career paths, through presentations of real-world applications and examples.

2.4.2. Changes in the composition are successfully carried out at the level of SP and in an agreement between SP teachers and SP directors (meeting with SP director and academic staff). For example, in 2021-2022, the lecturer Dr.sc.ing doc. Imants Zarembo was invited to implement the study course "Project Management", replacing Dr.sc.ing. prof. A. Teilāns, and a doctoral student Mg.sc.comp. Ilmārs Apeināns joined the RTA staff (SAR, p. 95). In both cases, the changes were done based on the corresponding skills and competencies of teaching staff, i.e. without endangering the quality of the study programme.

2.4.3. N/A

2.4.4. Based on Annexes 13 and 14 provided by RTA as part of the list of additionally needed documents (request Nr. 21) the scientific productivity differs significantly, i.e. from a very low to a very high number of academic papers.
In addition, Annex 13 for most of the academic staff presents relevant practical experience as well, but in comparing Annex 13 with provided CVs in some cases it was not clear how the practical experience is related to the implementation of the SP. Namely, the practical experience in this context is relevant only if it is gathered outside the academic environment and benefits the quality of implementation (for example, like in the case of I. Zarembo, A. Teilans, etc.). In future documents (for internal needs and accreditation processes), RTA should distinguish more clearly the practical experience gathered outside and within the academic environment.

2.4.5. Teachers meet at least twice per year and discuss the implementation of the SP. This mechanism seems to be efficient (meeting with academic staff), but highly centralized due to the role of the SP director, who is the sole authority in decision-making at the SP level. Beter cohesion between teaching staff can be achieved by organizing brainstorming meetings to discuss various teachers' proposals. Thereby, anonymous proposals should also be possible to encourage teachers to raise possibly more sensitive issues. Additionally, there is also a model to include more teachers in conducting some courses, which could improve collaboration between teachers even more (meeting with academic staff).
There are also examples of cooperation between SFs, e.g. students support projects and activities of SF related to mechatronics. This kind of interdisciplinary cooperation should be supported even more.

Conclusions on this set of criteria, by indicating strengths and weaknesses

The teaching staff demonstrates a satisfactory level of qualification and competence. However, improvements can be made in areas such as updating teaching materials and promoting interdisciplinary cooperation with other SFs. By addressing these areas, RTA can enhance the overall effectiveness and quality of its SP, attracting a wider range of students and preparing them for successful careers in their respective fields.

Strengths
1. Competent teachers.
2. Good collaboration between teachers regarding the implementation of the SP.
3. Changes in the composition of the teaching staff are efficiently implemented, without any risks regarding the quality of SP.
4. Interdisciplinary cooperation between students and teaching staff of different SFs.
5. Relationship between teachers and students is professional.

Weaknesses:
1. Highly centralized decision-making due to the role of the SP director.
2. Outdated teaching materials are not systematically reviewed and updated.

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Teachers are technically and pedagogically competent to deliver the learning outcomes, which was confirmed by students, graduates and employers. Thereby several teachers also have significant practical experience. They fulfil the requirements set out in the regulatory enactments (Regulation of Academic Positions in RTA, Annex "15. Regulation of academic position.pdf").

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

Full compliance of Regulations of the Cabinet of Ministers of March 20, 2001 No. 141 "Regulations on the state standard of first-level professional higher education". The goal of the SP is to prepare students for the profession of Programmer (occupation code 2512 05), promoting the development of their personality; To promote the acquisition of knowledge and skills that ensure the acquisition of the fourth-level professional qualification "Programmer" and promote competitiveness in changing socio-economic conditions; To create motivation for further education and provide an opportunity to obtain second-level professional higher education and fifth-level professional qualification in the field of computer science. The volume of the SP is 80 CP, lengths – 2 years. The other requirements meet the standard.

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Fully compliant

Fully compliance, Annex 4 shows compliance of the SP with the professional standard "Programmer", meeting of June 8, 2022, protocol no. 3. The required study courses are attached to the SP Annex 5.

3 3 - The descriptions of the study courses and the study materials have been prepared in all languages in which the study programme is implemented, and they comply with the requirements set forth in Section 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Partially compliant

Study course descriptions are not developed according to uniform guidelines, and there are several pieces of information that are not specified. For example, main literature should be one resource but it is six resources per study course, see Annex "7.pielikums.7z" inside "2_16_IF-it-pkol-PD-Mākslīgais intelekts-Grabusts.docx". The evaluation criteria for the final exam in study course description missing grading from 1-4 that should be like this (https://likumi.lv/ta/id/266187-noteikumi-par-valsts-akademiskas-izglitibas-standartu) Order #240 25. grades from 1 to 10. RTA has only from 4-10.

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Full compliance. A sample of the diploma and its annexes to be issued for completing the SP is in Annex 1, which corresponds to the Law on Higher Education Institutions.

5 5 - The academic staff of the academic study programme complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions.

Assessment of compliance: Not relevant

6 6 - Academic study programmes provided for less than 250 full-time students may be implemented and less than five professors and associated professors of the higher education institution may be involved in the implementation of the mandatory and limited elective part of these study programmes provided that the relevant opinion of the Council for Higher Education has been received in accordance with Section 55, Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Not relevant

7 7 - At least five teaching staff members with a doctoral degree are among the academic staff of an academic doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field of science. At least five teaching staff members with a doctoral degree are among the academic staff of a professional doctoral study programme in arts (if applicable).

Assessment of compliance: Not relevant

8 8 - The teaching staff members involved in the implementation of the study programme are proficient in the official language in accordance with the regulations on the level of the official language knowledge and the procedures for testing official language proficiency for performing professional duties and office duties.

Assessment of compliance: Fully compliant

Full compliance. The academic person teaches study courses in Latvian, which is the native language and it corresponds to the parameter of the SP - Latvian language. Knowledge of the national language of the academic staff is visible in Subsection 3.4. and in the common Annex 9 and Annex 10.

9 9 - The teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language, if the study programme or any part thereof is to be implemented in a foreign language (if applicable).

Assessment of compliance: Not relevant

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Full compliance. The study agreement sample meets with the requirements for what must be in the research agreement. A standard sample of the study contract is visible in Annex 7.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

Full compliance. A document certifying that the RTA will provide students with opportunities to continue their education in another SP or at another university if the implementation of the SP is interrupted. Is available and signed with a secure electronic signature see Annex "5.pielikums.7z"

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme's license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

Full compliance. A document certifying that the RTA guarantees compensation for losses to the students if the SP is not accredited due to the actions (activity or inaction) of the university or college or the license of the SP is revoked and the student does not want to continue his studies

in another study program. Is available and signed with a secure electronic signature see Annex “6.pielikums.edoc”.

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Not relevant

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Partially compliant

Partially compliant. Study course descriptions are not developed according to uniform guidelines, and there are several pieces of information that are not specified. For example, the evaluation criteria for the final exam are clearly incomprehensible, but the evaluation criteria for the entire study course are missing. Several mandatory literature are indicated, but good practice indicates that it is correct to have one mandatory literature source.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

The programme demonstrates notable strengths, including the provision of opportunities for interdisciplinary cooperation between students and teaching staff from various SFs. This collaboration fosters a rich learning environment and promotes the exchange of diverse perspectives. Additionally, the well-functioning internship component of the programme enables students to gain practical experience and develop crucial skills relevant to their future careers. Furthermore, the professional relationship between teachers and students contributes to a positive and supportive learning environment.
However, there are also identified weaknesses that require attention and improvement. Firstly, some teaching materials are outdated, which hinders the incorporation of the latest tools and technologies used in the industry. It is crucial to regularly update the curriculum to ensure that students are equipped with relevant and up-to-date knowledge and skills. Secondly, more emphasis should be placed on providing challenging content and activities for highly motivated and ambitious students. This can be achieved through extracurricular activities, collaboration with employers, or involvement in scientific projects. Lastly, the usage of LMS is not consistently at a high level across all courses. Encouraging and supporting teachers in effectively utilizing LMS platforms, such as Moodle, can enhance the learning experience and provide students with valuable online resources and tools.

Strengths:
1. Reviewable courses of study.
2. Demand for graduates.
3. Dominance in the local region.
4. Interdisciplinary cooperation between students and teaching staff of different SFs.
5. Well-functioning internship.
6. Relationship between teachers and students is professional.

7. The SP is successfully integrated into the SF and its strategic objectives.

Weaknesses:
1. All study course descriptions are not developed according to uniform guidelines, and there are several pieces of information that are not specified.
2. Some teaching materials are outdated.
3. More ambitious students are not challenged by the SP
4. The usage of LMS is not at a high level in all courses.
5. The programme has a high drop-out rate - on average 76% of enrolled students do not complete their studies.
6. The RTA has not drawn up an action plan to reduce student drop-out.
7. The SP has a low number of graduates, which poses sustainability risks for the SP.

Evaluation of the study programme "Programming "

Evaluation of the study programme:

Average

2.6. Recommendations for the Study Programme "Programming "

Short-term recommendations

- Offer personalized content (as curricular and/or extra-curricular activity) for more ambitious students.
- Clearly inform students about possibilities about ways to communicate possible individual issues with teachers.
- Analyze in collaboration with employers and experienced graduates, which course content must be updated and proceed accordingly.
- Provide students with information about possible career paths, through presentations of real-world applications and examples, e.g. lectures given by employers and experienced graduates.
- The RTA needs to analyze student drop-out rates more thoroughly and develop a plan to reduce it, for example by providing additional support to students to ensure the sustainability of the SP.
- Do not go too broad. Focus on programming. Experts advise setting up a review panel of SF staff, students, graduates and employers to discuss the content of the SP.
- Programming as a skill: Experts recommend doing analysis about learning sources (digital vs paper, user documentation vs programming books, programmer fora, blogs, vlogs etc.). Open and encourage to use the whole world of information as it is available today. Do not teach from outdated books. Neither to program, nor database management, nor computer architecture. Do not prefer essays over practical exercises.
- Modify the course "Business process modeling and graphical interface prototyping" skipping the business process modeling part from the course and introducing only ICT related business topics and graphical interface development.
- Consider merging small 2 CP courses into bigger courses.

Long-term recommendations

- Efforts should be made to provide training and support for teachers to effectively utilize LMS platforms, ensuring students have access to valuable online resources and tools.

II - "Software engineer" ASSESSMENT

II - "Software engineer" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1. The SP "Software engineer" complies with the SF "Information Technologies, Computer Engineering, Electronics, Telecommunications, Computer Management and Computer Science" as well as with the RTA Development Strategy 2016-2023. "Objective: prepare ITC specialists considering employer requirements" (SAR p. 73) is included in the RTA development strategy and the following professional bachelor's SP preparing programming engineers helps to achieve this objective, according to the national occupational standard "Programming engineer" (code 2512 02).
The SP is developed in accordance with the requirements of the State Cabinet of Ministers Regulation No.240 "Regulations on the State Standard of Academic Education". The basic procedures for the SP completion comply with the requirements of Article 40 of the National Standard for Academic Education according to Level 7 of the European Qualifications Framework of Latvian Education Classification (SAR p.176). There are four options for the programme: 2 years 80 CP option in Latvian; 2 years 80 CP option in English; 1,5 years 60 CP option in Latvian and 1,5 years 60 CP option in English. All the programme options are full-time study. The difference between the 80 CP and 60 CP option is that for the 80 CP version the admission requirements are: academic bachelor's degree (duration of studies at least 3 years (120 CP) or second-level professional education in electronic commerce or computer science or information technology, economics or social sciences. For studies in English: a certificate of proficiency in English at least at B2 level. And for the 60 CP option the admission requirements are professional bachelor's degree (duration of studies at least 4 years (160 CP) or second-level professional education in electronic commerce or computer science or information technology, economics or social sciences. For studies in English: a certificate of proficiency in English at least at B2 level.
SAR (p.104) is specifying following: The degree to be conferred, professional qualification or degree and professional qualification: Professional bachelor's degree in information technology and qualification of an engineer programmer."

2.1.2. The name of the professional bachelor's SP in Latvian is " Programmēšanas inženieris", while in English it is named "Software engineer". The degree and professional qualification to be awarded is Professional bachelor's degree in information technology and the qualification of an engineer programmer, which is granted in accordance with the occupational standard " Programming engineer" (approved on 17 June 2009, Minutes of Session No 5).
The SP aim “is to provide training of highly qualified specialists in the field of software engineering, who will be ready to professionally join software development projects, adapt to the requirements of the labor market, as well as continue their education in the master’s pogramme” (SAR p. 104), which is consistent with the definition of LQF qualification level 6 in the Law on Education of the Republic of Latvia (https://likumi.lv/ta/id/50759#p8_1) "the ability to demonstrate basic and specialised knowledge in the field and to use it for professional, artistic, innovative or research activities; the ability to apply a scientific approach to problem solving, to take responsibility and initiative; the ability to make decisions and find creative solutions in changing circumstances". More detailed compliance is justified by the SP objectives and learning outcomes defined in SAR p.

100-101, for example, the objectives "to acquire the knowledge of natural sciences, mathematics, information technology, basic sciences relevant to the industry and the theoretical basics of the industry necessary for the qualification of a programming engineer, to develop the ability to apply this knowledge", "to ensure the acquisition of project development, implementation and management skills", and learning outcomes: "Z1. Demonstrates the basic and specialized knowledge of the programmer's profession and a critical understanding of this knowledge. Knows industry standards, terminology, technologies and has the knowledge of information technology development trends", "K1. Able to obtain, analyse, evaluate and systematize information, find solutions to identified problems, learn the latest industry technologies".
The admission requirements for the SP are specified differently in the evaluation application and the SAR, which should be harmonised. For the Latvian language version of the SP, the admission requirements are secondary education and passed centralised examinations, while for the English language version the admission requirements in the assessment application are secondary education and English at least at B2 level, which is reasonable as the studies will be conducted in English.
Study programme code: 42484, established in accordance with the SP content and Regulations of the Cabinet of Ministers No. 322 "Regulations on Latvian education classification" (https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitibas-klasifikaciju). The first two digits '42' indicate the correspondence to the second level of professional higher education (fifth level professional qualification and professional bachelor's degree). The next three digits “484” indicate the SP correspondence to the thematic group "Natural sciences, mathematics and information technology" and area "Computing" and subgroup "Programming".
Overall the title, code, degree and professional qualification of the SP, aims, objectives, learning outcomes and admission requirements are interrelated, in addition to ensuring the continuity of the SP with the 1st level professional SP "Programmer".

The duration of the SP is 4 years and the volume is 160 CP (240 ECTS), which complies with the Latvian legislation: Regulations of the Cabinet of Ministers No. 322 "Regulations on Latvian education classification" (https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitibas-klasifikaciju) and Regulations of the Cabinet of Ministers No 512 "Regulations on the National Standard for Second Level Professional Higher Education" (https://likumi.lv/ta/id/268761-noteikumi-par-otra-limena-profesionalas-augstakas-izglitibas-valsts-standartu).
The SP is conducted in Latvian, preparing IT specialists primarily for the local labour market, as well as in English, to attract international students and promote international cooperation.

2.1.3. The RTA has made the following changes to the SP parameters since the last evaluation:
1) based on the changes in the Latvian education classification (Cabinet of Ministers Regulation No 322 "Regulations on the Latvian Education Classification", link: https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitibas-klasifikaciju) the SP code was changed from 42481 to 42484, thus changing the educational programme group from "Computer Science" (481) to "Programming" (484) (SAR p. 103).
2) On 9 March 2022, the significant changes to the SP were approved, adding English as an implementation language. The changes are justified by the planned cooperation with London Metropolitan University and the plan to attract more foreign students to apply to study at the RTA (SAR p. 103). The SAR (including interviews with HEI and SP management) does not provide a deeper analysis of the changes and their implications for the future quality of the study process.
3) Changes have been made to the structure of the SP to ensure compliance with the professional standard (SAR p. 103). The occupational standard " Programming Engineer" (approved on 17 June 2009, Minutes of Session No 5) is in force at the time of the assessment. RTA has conducted a SP

compliance assessment of this standard, as well as adapted the compliance to the draft version of the "Software Engineer" standard, which is being promoted/coordinated by Latvian Information and communications technology association (LIKTA) for approval by the Ministry of Education and Science. (SAR p. 105). The SAR does not provide a deeper analysis of the changes and their implications for the future quality of the study process.
4) The RTA has decided to stop the implementation of the part-time extramural study form due to low demand (SAR p. 105)

2.1.4. The social and economic justification of the SP is based on the forecasts of the Ministry of Economics of the Republic of Latvia on employment in the ICT sector, as well as references to studies of the World Economic Forum. In addition, data from the 2022 Employer Express Survey conducted by the State Employment Agency are used (SAR p. 107). The data indicate that there is still a strong demand for ICT professionals, including in Latvia and the Latgale region.
Graduate employment analysis has been based on the Ministry of Education and Science Graduate Monitoring data, but no in-depth analysis of the data on graduates of a particular SP has been carried out, only the overall employment rates of RTA graduates have been looked at. (SAR p. 108)
The SAR (p.108) provides a very brief and general analysis of the employment of SP graduates, referring to national employment data but not specifying exactly which, and stating that all 2018-2021 graduates are said to be employed. Such a statement leads to the assumption that either the programme has almost 100% employment of graduates or a more thorough and precise data analysis is needed. Students are employed in various software development companies, such as SIA "Midis", SIA "Lailio Solutions", SIA "Entrypoint", SIA "TestDevLab", etc. It is recommended that the programme management improve the methods of collecting data on the employment situation of graduates in order to obtain a more complete picture of the employment situation of graduates in a given SP.
An analysis of student dynamics can be found in SAR p.108-109 and SP Annex 2, showing an average enrolment of 23 students per year over the last five years. The data show that the SP has so far been implemented only in Latvian. According to the data provided by the RTA, out of the number of students enrolled in the first year of study, on average 35% completed the SP during the evaluation period.
The SP has a high drop-out rate, with the main reasons for dropping out being poor progress, expiration of the student exchange programme agreement (foreign students through ERASMUS +), non-compliance with the requirements set during the study process (for example, fail to start studies at all, do not sign a study agreement,) or at own will. (SAR p. 109) However, the RTA points out that the main factor contributing to students' underachievement is working alongside their studies. Taking into account the fact that in this and other SF study programmes many students are expelled due to failure in their studies, it is advisable to review in more detail the circumstances why students find themselves in such situations, e.g. very strict assessment criteria, inflexible mark revision system, etc. It would also be advisable to examine in more depth the reasons for other cases of exmatriculation, identifying opportunities for the RTA to provide additional support to students to avoid them.

2.1.5. N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

The SP "Software engineer" complies with the SF "Information Technologies, Computer Engineering, Electronics, Telecommunications, Computer Management and Computer Science" as well as with the RTA Development Strategy 2016-2023 and national occupational standard "Programming engineer" (code 2512 02).

The aim, objectives, study results and qualifications of the SP are consistent with each other.
The admission requirements for the SP are specified differently in the evaluation application and the SAR, which should be harmonised.
The SP is designed to meet the requirements of the occupational standard "Programming engineer".

Strengths
1. Graduates of the programme have high employment rates and are in demand on the labour market, and labour market forecasts show that there will be a need for specialists in the field in the future.
2. The SP is successfully integrated into the SF and its strategic objectives.
3. The SP ensures the continuity of the 1st level professional SP "Programmer".

Weaknesses
1. The programme has a high drop-out rate - on average 75% of enrolled students do not complete their studies.
2. The RTA has not drawn up an action plan to reduce student drop-out.
3. The SP has a low number of graduates, which poses sustainability risks for the SP.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The professional SP is implemented in two forms: full-time study in Latvian (160 CP) and full-time study in English (160 CP). And the SP duration is four years. In the structure of the SP are compulsory study courses and elective study courses. The compulsory part of the SP includes the main and basic principles of field knowledge. The elective part introduces certain flexibility to the programme allowing the students to choose some courses according to their future career needs. Results of the BA Software Engineer SP are presented as skills and knowledge: demonstrates the basic and specialized knowledge of the programmer's profession and a critical understanding of this knowledge; knows industry standards, terminology, technologies and has the knowledge of information technology development trends; demonstrates understanding of the most important concepts and regularities of the industry, has knowledge of analysis of knowledge systems and its practical application in the identification, development and maintenance of information systems architecture requirements; using the acquired theoretical basic knowledge and skills of the industry, is able to perform professional activities within the professional competence of a programmer; able to develop software systems according to functionality and resource requirements, implement and maintain software, prepare a testing plan, make necessary software changes and consult software users; able to obtain, analyze, evaluate and systematize information, find solutions to identified problems, learn the latest industry technologies; able to evaluate the impact of professional activity on the environment and society, demonstrate an understanding of professional ethics in the profession of a programmer and take part in the development of the industry (SAR p.101). All the courses, their content and learning outcomes are mapped to the skills and knowledge and competencies provided by the SP (SAR Annex 5). The correlation of the aims and learning outcomes of the SP with the learning outcomes of specific study courses are described in each study course description. The goal of the SP is to provide a set of knowledge, skills and competencies according to Level 6 of the European Qualifications Framework of Latvian Education Classification. The goal of the BA Software Engineer SP is to prepare highly skilled computer science specialists with profound knowledge in computer science, higher mathematics, and engineering fundamentals that would enable them to adapt independently to professional activities in the changing labour market conditions, as well as to prepare students for further studies in higher-level programs and Master's courses, scientific activities, and further self-education. The quality assurance of the SP is based on

periodic feedback from the students and from the graduates in the form of questionnaires and on the internship reports students have to compile at the end of the internship as well as regular meetings of the RTA quality team and faculty management. The updated courses are coordinated, approved by the Study Council and included in the SP register at the beginning of the new study year. The SP is developed in accordance with the requirements of the State Cabinet of Ministers Regulation No.240 "Regulations on the State Standard of Academic Education". The basic procedures for the SP completion comply with the requirements of Article 40 of the National Standard for Academic Education.
The BA Software Engineer SP is a professional programme and the learning outcomes should be included some learning outcomes related to the scientific and research activity. The BA Software Engineer SP is a full-time study and in two languages (Latvian and English). This corresponds to the demand of the market (especially in the IT domain), but it is recommended to explore the possibility of delivering the programme as a part-time study. The key reason is a note, that many students of this programme have their position in the industry very early (latest in the end of the 2nd year) and for them it is hard to study and work in parallel. The SP implementation is supported by providing internship places and work to students by several industrial companies, like SIA "Midis", SIA "Lailio Solutions", SIA "Entrypoint", SIA "TestDevLab" and SIA "Geidans Solutions Latvia", etc. The content of the SP is topical, the content of the study course is interconnected and complementary, corresponds to the objectives of the programme and ensures the achievement of learning outcomes. But it should be stated that BA Software Engineer SP has a significant number of relatively “small” courses (2 CP), which makes the SP hard to manage (from RTA side) and overloads students with assessments.

2.2.2. N/A

2.2.3. In the light of the outcomes to be achieved within the SP, specific study courses were identified and the scope of knowledge, skills and competences to be achieved within each individual course was defined to support the teachers and students.
The study process is mainly implemented in the format of interactive lectures, seminars, workshops and student independent work. Courses include workshops, discussions, teamwork and project work focused on professional tasks and problems. The basic principles and procedure for the assessment of the acquisition of the SP comply with the requirements of Article 40 of the National Academic Education Standard. In most courses training materials (lecture slides, practice assignments, tests, a.o.) are available electronically, as has been stated in SAR (SAR p.116) and confirmed during the visit. Not looking to the fact that mentioned implementation methods correspond and contribute to the SP, it would be recommended to put attention to learning-by-doing approach, flipped classes etc. Most study courses implemented in the SP have a corresponding Moodle course and respective digital study materials (in Moodle) including lecture videos and interactive learning materials (knowledge tests, etc.). Communication with the lecturer is organized too via the Moodle system or using digital channels like e-mail etc. The course content and teaching process assessment is realized by collecting the feedback from the employers by the surveys and regular meetings organized by the Head of the Study Programme and Dean of the Faculty. The student and employers feedback is collected by filling up surveys once per year and respective adjustments are introduced according to the RTA Quality Management Handbook and described in SAR (p.83 and p.116-118). Though it seems filling the survey is not popular among the students and among the graduates and employers too. During the meetings graduates and employers stressed the importance of increasing more informal communication. The surveys analyses show that the content of the SP is relevant and overall aims and outcomes of the SP are achievable. The principles for the implementation of the BA Software Engineer SP and the methods used are identical in implementing the programme in Latvian and English. In overall the study implementation methods contribute to the achievement of the aims

and learning outcomes of the study courses described in Annex 7 next to each study course.
In particular cases would be needed to update the teaching materials according to the newest tools and technologies used in companies nowadays, e.g. Git whenever possible (meeting with students). Also the usage of LMS is not at a high level in all courses (Moodle presentation).
Related to later careers, students also need more hands-on activities, like job interview training, building social network profiles relevant to self-marketing, workshops about starting their own company, etc.
In particular cases would be needed to update the teaching materials according to the newest tools and technologies used in companies nowadays, e.g. Git whenever possible (meeting with students). Also the usage of LMS is not at a high level in all courses (Moodle presentation).
Related to later careers, students also need more hands-on activities, like job interview training, building social network profiles relevant to self-marketing, workshops about starting their own company, etc.
Furthermore, for some more ambitious students, the SP is not a real challenge, i.e. it would be needed to offer those students more challenging topics and activities (meeting with students), e.g. in the form of extracurricular activities in collaboration with employers (which are already included in professional practice and in some final papers) or as activities related to RTA's scientific projects (which is already partially implemented). More challenging and personalized content/activities could also attract more students outside the region.

2.2.4. The programme includes an internship in the amount of at least 20 CP. The goal of the internship is to strengthen the student's knowledge, to improve his professional skills in accordance with the requirements of the profession of a programming engineer. Each student has 2 internship supervisors: one from RTA, the other one from the company. RTA has basic agreements with internship providers or the students can choose the place for internship themselves. If needed, the Faculty of Engineering and the Department of External Relations of RTA help the students in finding a place for internship. Students can access the document "Internship Regulations".
The companies providing internship places are for instance SIA "Midis", SIA "Entrypoint", SIA "Laileo Software", SIA "Wunder Latvia", SIA "Geidans Solutions", SIA "Microlines" and SIA "Soaphog", but also "Scandiweb" (Jēkabpils) and "TestDevLab" and Information and Communication Technology Research Center of the RTA Faculty of Engineering. The Research Center for Information and Communication Technologies provides internships for foreign students and students of the Exchange Program Erasmus + too. During the meeting employers confirmed their ability to take international students for internships.
The programme director organizes a briefing about internships and informs twice about internship companies: the first time is at the end of the first academic year before summer holidays and the second time is at the beginning of the autumn semester of the second year.
The aims and tasks of the traineeships correspond to the learning outcomes to be achieved in the SP "Software Engineer" and full information about the organization and conducting the traineeship are given in the traineeship guidelines in the Appendix 8.

2.2.5. N/A

2.2.6. The diploma project is a functioning software product developed independently by the student, which the student must demonstrate to the committee during the final examination and respective uniform content requirements are: requirements analysis; design and modeling; development of a user guide; software development. There is an option for the students to choose the topic of the final thesis by themselves or the students can contact and ask the academic staff or bring the topic from a company. The selection of the topic of diploma thesis is done already in the 4th semester. The proposed topics will be discussed and agreed with the programme director of the

Study programme, which assures that the topics are relevant for the programme. It should be mentioned that RTA has in their internal document registry an available list of available thesis topics and the RTA library has a list of all the former theses with the author and supervisor. This helps the students interested in finding a topic to find suitable final thesis topics. The topics are ranging from web applications and respective services to data and network services, therefore covering a wide scope of the Software Engineering field. Therefore the defended thesis topics should be considered relevant to the programme. The topics presented in SAR (p.121) of the bachelor thesis are corresponding to the BA Software Engineer SP. It has been reported that some of the topics are industry targeted and initiated by the industry representatives. Also nice to see that some of the bachelor topics are contributions to the developments of the IT resources of the HEI. At the same time, it should be considered that this is a professional SP, so it would be recommended to pay more attention to the application topics. The thesis development process is controlled throughout the semester and the student must regularly report on his progress to his supervisor (at least once every 2 weeks) and to the programme director. A Pre-defence is organized a few days before the deadline for submitting the thesis. During assessment visit samples of the bachelor thesis were demonstrated, they are inline with the BA Software Engineer SP.

Conclusions on this set of criteria, by specifying strengths and weaknesses

The SP complies to Level 6 of the European Qualifications Framework of Latvian Education Classification and the basic principles and procedure for the assessment of the acquisition of the SP comply with the requirements of Article 40 of the National Academic Education Standard and has all preconditions providing good preparation of professional specialists. Considering SAR and evidence collected during the meetings it shall be concluded that the presented SP fulfills formal requirements, is inline with the requirements of the industry and labor market. The content of the BA Computer Systems SP supports reaching the aim and learning outcomes of the SP. RTA provides support in terms of finding internship places, if a student has some problem with it. During the meeting employers confirmed their ability to take international students for internships.

Strengths:
1. RTA has a Research Center for Information and Communication Technologies which is able to support development of good level applied SP.
2. Preparation of the final year thesis is accompanied with the requirement to present the thesis work on pre-defence and also starting the thesis work already on 4th semester.
3. The BA Software Engineer SP is balanced between the necessary knowledge, skills and competencies required to perform the practical work after graduation.
4. Easy to organize learning for local students

Weaknesses:
1. Collecting the student and employers' feedback by filling up surveys is not very effective as the students and graduates stress more importance of informal personal and periodic feedback. Documenting informal feedback (claims, meeting decisions, minutes, etc.) and respective SP actions is missing.
2. The BA Software Engineer SP is provided only in the form of full-time study, which limits the opportunity to some potential learners to join the SP and a new analysis about student's preferences migt be in benefit.
3. Too many small courses in the programme (2 CP) decrease the manageability of the SP (from the HEI side) and at the same time overloads students with fragmented assessments.
4. Very classical teaching approaches are reported in the frame of the BA Software Engineer SP

which should be renewed in collaboration with graduates and employers.
5. More ambitious students are not challenged by the SP and teachers during implementation.
6. The teachers' usage of LMS is not at a high level in all courses.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Not relevant

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2.3. Resources and Provision of the Study Programme

Analysis

2.3.1.
From resource provision and usage point of view, this SP is in the same situation as SP Programming. Same resources, same facilities, labs, library, professors, IT system support. Therefore the analysis is also the same. SP informative, material, technical and financial provision complies with the needs of SP.
The infrastructure of the Faculty of Engineering consists of:
1) Engineering faculty building (put into operation in 2014) with laboratories, workshops, lecture rooms, staff and student premises;
2)Information Technology Centre (computer rooms, electronic publications room, computer equipment service room, server room);
3)Laser Technology Centre (put into operation in 2019). (SAR, p.35)
Experts visited computer classes and laboratories. There are about 100 computers available for Engineering faculty students. Taking into account the relatively small number of students and the fact that a large part of SF students use their own laptops during classes - infrastructure resources could even be shared with regional school students or employers from the region.
However, regular review of library books as well as study course content has to take place in order to be in-line with the world's technological development. Students should have the right and privilege to study the latest technologies.
RTA uses Moodle system (ekursi.rta.lv) to support the study process. (SAR, p.39), MS Teams and Google Meet for remote classes and communication. DMS is in place (MS SharePoint based) to support students, lecturers and administration. However the DMS has not been used broadly and intensively. Samples: All 4 meeting minutes of SF Council meetings for this academic year were added on May 2, 2023. System does not contain any Students Council meeting minutes for 2022 and 2023. LMS/Moodle has not been used in full extent (Meeting with IT Support personnel). It's very important to find ways how to motivate/mandate all the teaching staff to use the LMS more. RTA uses surveys to obtain information about support required for students and lecturers. However, a very small percentage of students and lecturers respond to the surveys (see SAR, pp.39-40). LAIS system has been used by students and lecturers offering all the information regarding the study process. (SAR, p.40)
IT support system usage by IT SF has to serve as a good sample for the rest of RTA. Experts have noticed deficiencies in usage of all the IT support systems by SF staff. LMS, DMS, web page, institutional repository of RTA, social networks. In order to attract and keep students the SF has to be fluent in all the digital system usage maintaining up-to-date digital content. Experts recommend

to include “digital content creation and publishing” as a part of annual academic staff performance evaluation procedure.
Study process requires access to real and virtual classrooms, computers (if needed), technologies (for study process support and used in study courses), modern and attractive study program, study course descriptions and information referenced therein. All this but modern study program has been provided. The study program is never good enough and study courses have to be reviewed regularly in cooperation with students, graduates, and employers.

2.3.2. N/A

2.3.3. From resource provision and usage point of view, this SP is in the same situation as SP Programming.
Same resources, same facilities, labs, library, professors, IT system support.
Therefore the analysis is also the same. The only difference is in state budget funding and funded study places.
According to the SAR (p.124) the funding during 6 last years is stable and allows the implementation of the study process for the SP.
The number of state-budget funded study places - 74.
State budget funding - 200 589 EUR (in 2022).
As funding is never sufficient (Meeting with RTA management) experts recommend focusing more on additional income sources besides state budget funding. Cooperation, joint projects with regional companies, research/consulting/training contracts for regional enterprises - are opportunities that could bring both an extra income as well as experience/interesting research topics to RTA.

Funding for the acquisition of RTA’s library collections has decreased significantly during the last 6 years which might lead and in certain technical areas already led to outdated content of the library.
Samples: Library lists only old books about programming and databases, graduates mentioned that they had to learn outdated topics during their studies, Study course descriptions (Databases, Computer Architecture) list too old mandatory literature to keep students motivated.

Conclusions on this set of criteria, by specifying strengths and weaknesses

RTA provides all the resources necessary for students and lecturers. The only deficiency to mention is outdated technical literature in library.
Computer classes and laboratory rooms might be even too much for the current number of students.
Library textbooks should be reviewed periodically to archive outdated ones.
Purchase of new books and/or e-books in relevant technical areas has to be as important task as attracting of new students and research partners.
Worth considering to open all resources to public (school students, industry professionals) fostering the community and marketing RTA as a welcoming partner and the right place for studies.
Strengths:
1. Very personal support opportunities for students because of the relatively small number of students and academic staff availability almost 24/7.
2. Recently built premises incl. library and laboratories.This is particular strength not just to SP, SF, faculty, but top RTA in general.

Weaknesses:
1. Surveys do not present a real picture re ICT solutions for study process in place (low percentage of responds).
2. Outdated technical books should be neither kept on library shelves, nor used in study process.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Partially compliant

Library content has not been reviewed by RTA and therefore technical literature got outdated and cannot serve as mandatory literature in study courses. IT support systems have not been used in full extent to actually support study process. Feedback from all the stakeholders has not been collected, reviewed and implemented due to very low percentage of responses.

2.4. Teaching Staff

Analysis

2.4.1. In total, 27 teachers are included in implementation of the SP. Thereby are 13 RTA's teachers with scientific positions, 10 are RTA's professors and 12 have PhD degree (see Annex 9).
In general, the qualification of the teaching staff is sufficient and teachers are competent from a technical and pedagogical point of view (meeting with students, graduates and employers). The relationship between teachers and students is professional, but it is needed to inform more students about possibilities about ways to communicate possible individual issues (meeting with students).
Due to the fact that the SP provide basic knowledge from various areas that SP covers, more lectures from employers representatives and experienced graduates are needed in order to provide students with information about possible career paths, through presentations of real-world applications and examples.

2.4.2. Changes in the composition are successfully carried out at the level of SP and in an agreement between SP teachers and SP directors (meeting with SP director and academic staff).

2.4.3. N/A

2.4.4. Based on Annexes 13 and 14 provided by RTA as part of the list of additionally needed documents (request Nr. 21) the scientific productivity differs significantly, i.e. from a very low to a very high number of academic academic papers.
In addition, Annex 13 for most of the academic staff presents relevant practical experience as well, from the provided CVs is not clear how the practical experience is related to the implementation of the SP. Namely, the practical experience should not be based on the implementation of the SP, but it should benefit the quality of implementation.

2.4.5. Teachers meet at least twice per year and discuss the implementation of the SP. This mechanism seems to be efficient (meeting with academic staff), but highly centralized due to the role of the SP director, who is the sole authority in decision-making at the SP level. Better cohesion between teaching staff can be achieved by organizing brainstorming meetings to discuss various teachers' proposals. Thereby, anonymous proposals should also be possible to encourage teachers to raise possibly more sensitive issues. Additionally, there is also a model to include more teachers in conducting some courses, which could improve collaboration between teachers even more (meeting with academic staff). There are also examples of cooperation between SFs, e.g. students support projects and activities of SF related to mechatronics. This kind of interdisciplinary cooperation should be supported even more.

Conclusions on this set of criteria, by indicating strengths and weaknesses

The teaching staff demonstrates sufficient qualifications and competence. However, improvements can be made in areas such as updating teaching materials and promoting interdisciplinary cooperation will further enhance the programme. By addressing these areas, RTA University can provide high-quality education and better prepare students for their future careers.

Strengths
1. Competent teachers, which is also confirmed by students, graduates and employers. Thereby several teachers also have significant practical experience.
2. Good collaboration between teachers regarding the implementation of the SP.
3. Changes in the composition of the teaching staff are efficiently implemented, without any risks regarding the quality of SP.
4. Interdisciplinary cooperation between students and teaching staff of different SFs.
5. Relationship between teachers and students is professional.

Weaknesses:
1. Highly centralized decision-making due to the role of the SP director.
2. Outdated teaching materials are not systematically reviewed and updated.

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Teachers are technically and pedagogically competent to deliver the learning outcomes, which was confirmed by students, graduates and employers. Thereby several teachers also have significant practical experience.. They fulfil the requirements set out in the regulatory enactments (Regulation of Academic Positions in RTA, Annex "15. Regulation of academic position.pdf").

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

Full compliance of Regulations of the Cabinet of Ministers of August 26, 2014 No. 512 "Rules on the national standard of second-level professional higher education" corresponds to standard, see Annex "4.pielikums.7z".

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Fully compliant

Fully compliance of the “Software Engineer” SP with the professional standard, see Annex “Annex 4.7z”.

3 3 - The descriptions of the study courses and the study materials have been prepared in all languages in which the study programme is implemented, and they comply with the requirements set forth in Section 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Fully compliant

Fully compliance, all study course descriptions are developed according to uniform guidelines see Annex 7.

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Full compliance. A sample of the diploma and its annexes to be issued for completing the SP is in Annex 1, which corresponds to the Law on Higher Education Institutions.

5 5 - The academic staff of the academic study programme complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions.

Assessment of compliance: Fully compliant

Fully compliance; the academic staff of the academic SP complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions, which makes up 64% of elected teaching staff, see Annex 9.

6 6 - Academic study programmes provided for less than 250 full-time students may be implemented and less than five professors and associated professors of the higher education institution may be involved in the implementation of the mandatory and limited elective part of these study programmes provided that the relevant opinion of the Council for Higher Education has been received in accordance with Section 55, Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Not relevant

7 7 - At least five teaching staff members with a doctoral degree are among the academic staff of an academic doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field of science. At least five teaching staff members with a doctoral degree are among the academic staff of a professional doctoral study programme in arts (if applicable).

Assessment of compliance: Fully compliant

Fully compliance of the academic staff of the academic SP complies with the requirements, see Subsection 3.4.1.

8 8 - The teaching staff members involved in the implementation of the study programme are proficient in the official language in accordance with the regulations on the level of the official language knowledge and the procedures for testing official language proficiency for performing professional duties and office duties.

Assessment of compliance: Fully compliant

Fully compliance; the academic person teaches study courses in Latvian, which is the native language and it corresponds to the parameter of the SP - Latvian language. Knowledge of the

national language of the academic staff is visible in Subsection 3.4. and in the common Annex 9 and Annex 10.

9 9 - The teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language, if the study programme or any part thereof is to be implemented in a foreign language (if applicable).

Assessment of compliance: Fully compliant

Fully compliance the HEI's confirmation of the relevant foreign language skills of the teaching staff involved in the implementation of the SP at least at B2 level according to the levels of the European Language Proficiency assessment, see Annex 12

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Fully compliance; the study agreement sample meets with the requirements for what must be in the research agreement. A standard sample of the study contract is visible in Annex 7.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

Fully compliance; a document certifying that the RTA will provide students with opportunities to continue their education in another SP or at another university if the implementation of the SP is interrupted. Is available and signed with a secure electronic signature see Annex "5.pielikums.7z"

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme's license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

Fully compliance; a document certifying that the RTA guarantees compensation for losses to the students if the SP is not accredited due to the actions (activity or inaction) of the university or college or the license of the SP is revoked and the student does not want to continue his studies in another study program. Is available and signed with a secure electronic signature see Annex "6.pielikums.edoc".

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Not relevant

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

The degree to which the study plan fully complies with the regulations outlined in the Law on Higher Education Institutions and other governing legislation.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

The programme demonstrates notable strengths, including the provision of opportunities for interdisciplinary cooperation between students and teaching staff from various SFs. This collaboration fosters a rich learning environment and promotes the exchange of diverse perspectives. Additionally, the well-functioning internship component of the programme enables students to gain practical experience and develop crucial skills relevant to their future careers. Furthermore, the professional relationship between teachers and students contributes to a positive and supportive learning environment.
However, there are also identified weaknesses that require attention and improvement. Firstly, some teaching materials are outdated, which hinders the incorporation of the latest tools and technologies used in the industry. It is crucial to regularly update the curriculum to ensure that students are equipped with relevant and up-to-date knowledge and skills. Secondly, more emphasis should be placed on providing challenging content and activities for highly motivated and ambitious students. This can be achieved through extracurricular activities, collaboration with employers, or involvement in scientific projects. Lastly, the usage of LMS is not consistently at a high level across all courses. Encouraging and supporting teachers in effectively utilizing LMS platforms, such as Moodle, can enhance the learning experience and provide students with valuable online resources and tools.

Strengths
1. Graduates of the programme have high employment rates and are in demand on the labour market, and labour market forecasts show that there will be a need for specialists in the field in the future.
2. The SP is successfully integrated into the SF and its strategic objectives.
3. Interdisciplinary cooperation between students and teaching staff of different SFs.
4. Well-functioning internship.
5. Relationship between teachers and students is professional.

Weaknesses:
1. Some teaching materials are outdated.
2. More ambitious students are not challenged by the SP
3. The usage of LMS is not at a high level in all courses.
4. The programme has a high drop-out rate - on average 75% of enrolled students do not complete their studies.
5. The RTA has not drawn up an action plan to reduce student drop-out.
6. The SP has a low number of graduates, which poses sustainability risks for the SP.

Evaluation of the study programme "Software engineer"

Evaluation of the study programme:

Average

2.6. Recommendations for the Study Programme "Software engineer"

Short-term recommendations

1.Offer personalized content (as curricular and/or extra-curricular activity) for more ambitious students.
2. Clearly inform students about possibilities about ways to communicate possible individual issues with teachers.
3. Analyze in collaboration with employers and experienced graduates, which course content must be updated and proceed accordingly.
4. Provide students periodic information about impacts of their feedback to formal and informal questionnaires.
5. Consider merging small courses in the programme (2 CP), which will increase the manageability of the SP (from HEI side) and in the same time makes it easier for students to plan learning loads.
6. Consider adding part-time or distant SP options.
7. Programming as a skill: Experts recommend doing analysis about learning sources (digital vs paper, user documentation vs programming books, programmer fora, blogs, vlogs etc.). Open and encourage to use the whole world of information as it is available today. Do not teach from outdated books. Neither to program, nor database management, nor computer architecture. Do not prefer essays over practical exercises.
8. Provide students with information about possible career paths, through presentations of real-world applications and examples, e.g. lectures given by employers and experienced graduates.
9. The RTA needs to analyse student drop-out rates more thoroughly and develop a plan to reduce it, for example by providing additional support to students to ensure the sustainability of the SP.

Long-term recommendations

1. Efforts should be made to provide training and support for teachers to effectively utilize LMS platforms, ensuring students have access to valuable online resources and tools.

II - "Electronic Commerce Information Systems" ASSESSMENT

II - "Electronic Commerce Information Systems" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1. The RTA states that the SP (SAR p. 172) complies with the SF "Information Technology, Computer Hardware, Electronics, Telecommunications, Computer Management, and Computer Science', but does not provide a more detailed justification. It is stated that the SP corresponds to the sub-branch of Systems analysis, modeling and design of the branch of Electrical engineering, electronics, information and communication technologies of the Engineering Sciences and Technologies group. Given that the SP is currently the only Master's level SP in the SF, it has an important role to provide continuity of SPs for Bachelor's graduates and prepare students for doctoral level studies. (SAR p. 171) However, in the next criteria, the experts provide justification for

the risks that indicate partial compliance to the SF.

2.1.2. The name of the academic master's SP in Latvian is "Elektroniskās komercijas informācijas sistēmas", but in English, it is "Electronic Commerce Information Systems". Degree to be obtained is Master of Science in Computer Systems.
Study programme code: 45483, established in accordance with Regulations of the Cabinet of Ministers No. 322 "Regulations on Latvian education classification" (https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitibas-klasifikaciju). The first two digits '45' indicate the correspondence to the Academic education (Master's degree). The next three digits “483” indicate the SP correspondence to the thematic group "Natural sciences, mathematics and information technology" and area "Computing" and subgroup "Computer systems, databases and computer networks", the corresponding ISCED-F 2013 code is 0612.
The aim of the SP (SAR p. 172) is "to prepare competitive top-level and middle-level managers in electronic commerce information systems, to prepare students for independent scientific activity in the field of information technology and electronic commerce, and to orient students to doctoral studies."
The SP has 7 defined objectives (SAR p. 172), for example, to ensure in-depth study of fundamental and theoretical courses in the field of information technology and electronic commerce areas, as well as to prepare theoretically educated specialists for scientific and professional activities.
The SP has 7 defined learning outcomes (SAR p. 168), for example, is able to demonstrate in-depth or expanded knowledge and understanding in electronic commerce information systems, some of which correspond to the latest findings of the relevant scientific branch or professional field and which provide a basis for creative thinking or research, including working in contact with different fields. The learning outcomes are overall aligned with the aim and objectives of the SP.
The SP's admission requirements are quite clearly defined and take an interdisciplinary approach, allowing to enroll students with a background in electronic commerce or computer science or information technology, as well as economics or social sciences. There are also additional admission criteria (points) for applicants with publications in the field of electronic commerce or related industries in scientific editions or professional journals, or participation in conferences with a paper or poster paper. (SAR p. 173)
However, having evaluated the information provided in the SAR as well as the attached annexes (SP plan, Annex 5, course descriptions, Annex 7), the experts have concerns about the relevance of the degree to be awarded to the content of the SP, taking also into account the different backgrounds of the students. Paragraph 16 of the Cabinet of Ministers Regulation No 240 "Regulations on the State Standard of Academic Education" (link: https://likumi.lv/ta/id/266187-noteikumi-par-valsts-akademiskas-izglitibas-standartu) states that "the content of the Master's SP ensures the achievement of study results that include the acquisition of in-depth theoretical knowledge".
International Standard Classification of Education (ISCED-F 2013) detailed field description (link: https://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-fields-of-education-and-training-2013-detailed-field-descriptions-2015-en.pdf) for code "0612" means Database and network design and administration. This is the study of the design, maintenance and integration of software applications. Computer media applications are included.
Programmes and qualifications with the following main content are classified here:
- Computer administration and management
- Computer media applications
- Computer network installation and maintenance
- Database administrator studies
- Information technology administration
- Information technology security

● Network administration
● Network design
● Web design
As we could see none of them include electronic commerce information systems, or the main study courses included in this particular SP. Additionally, description of IT and Computer Systems related courses reveal that the content is providing mostly just basic/introduction level of knowledge, i.e. it is questionable if the level of IT and Computer Systems knowledge correspond to “advanced theoretical knowledge and development of research skills and skills” in the field related to Master of Science in IT and Computer Systems/Science.
It should also be noted that the RTA mentions (SAR p. 177) that for applicants with a background in economics or social sciences, there are compensatory IT courses offered in the elective part, however, there are only 6 CP consisting of such courses: Data processing systems (2 CP), Software engineering: system analysis (2 CP) and Information systems development (2CP). As well as the 10 CPs in the compulsory part includes study courses in management, marketing and entrepreneurship.
In Latvia, there is currently a very similar SP at the University of Latvia: the Professional Bachelor's SP "E-Business Management", which provides a Professional Bachelor's degree in E-Business Management and the professional qualification "E-Business Manager" (https://www.lu.lv/studijas/fakultates/biznesa-vadibas-un-ekonomikas-fakultate/bakalaura-limena-studijas/e-biznesa-un-logistikas-vadibas-sistemas/).
In summary, the experts see a risk of mismatch between the content of the SP and the degree to be obtained. Besides, it can be an easy way for students to obtain a Master's degree in natural sciences without having to study natural sciences in depth.
To address the situation, the experts recommend the following scenarios for the RTA:
1. Clarify the aim, objectives and study outcomes of the SP, as well as the content of the study courses, by adding in-depth knowledge corresponding to the Master's level studies, and clarify the admission requirements accordingly.
2. Clarify the degree to be obtained and the SP code according to the Latvian Classification of Education to reflect the content of the SP, including an evaluation of the relevance to the thematic group "Business and Administration" and the subgroup "Management and Administration" (345).

The duration of the SP is 1.6 or 2 years and the volume is 60 CP (90 ECTS) or 80 CP (120 ECTS), which complies with Cabinet of Ministers Regulation No 240 "Regulations on the State Standard of Academic Education" (link: https://likumi.lv/ta/id/266187-noteikumi-par-valsts-akademiskas-izglitibas-standartu) and Regulations of the Cabinet of Ministers No. 322 "Regulations on Latvian education classification" (https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitibas-klasifikaciju).
The SP is conducted in Latvian, preparing specialists primarily for the local labour market, as well as in English, to attract international students and promote international cooperation.

2.1.3. The RTA has made the following changes to the SP parameters since the last evaluation:
1) Clarified admission requirements:
- The 2-year version of the SP requires a previously obtained Bachelor's degree (minimum duration of 3 years (120KP)) or a second-level professional qualification in electronic commerce or computer science or information technology, economics or social sciences. For studies in English, documentary evidence of at least B2 level of English is required.
- The 1.6-year version of the programme requires a previous professional bachelor's degree (minimum duration of 4 years (160KP)) or a second-level professional qualification in electronic commerce or computer science or information technology, economics or social sciences. For studies in English, documentary evidence of at least B2 level of English is required.
2) Degree to be awarded clarified to Master of Science in Computer Systems.

The RTA justifies the changes by the fact that until now two Master's SPs "Electronic Commerce Information Systems" (47483) and "Computer Systems" (code 47483) were implemented in the study direction. However, it was decided to discontinue the professional Master's programme "Computer Systems" in order to concentrate resources on this SP. (SAR p. 171)
The RTA justification (SAR p. 171) is based on the following circumstances:
1) the academic Master's SP is more flexible in terms of both content and admission requirements and is able to provide strategic linkages with other SFs offered by the RTA;
2) the academic orientation of the SP provides the foundation and encouragement for doctoral studies;
3) in comparison with the Professional Master in the academic Master's SP in the reference period the number of students is more stable.
The RTA does not provide a justification for the change in the degree to be awarded from "Master of Science in Information Technology" to "Master of Science in Computer Systems", nor does it provide a justification as to whether this change has any impact on the changes in the content of the studies.

2.1.4. The social and economic justification of the SP is based on the forecasts of the Ministry of Economics of the Republic of Latvia on employment in the ICT sector, as well as references to studies of the World Economic Foruma and data from Central Bureau of Statistics. (SAR p. 174). The data indicate that there is still a strong demand for ICT professionals, including in Latvia and the Latgale region.
Graduate employment rates are analysed on the basis of data from the National Employment Agency. In the reference period since 2017, 44 students have graduated from the SP (SAR p. 175). Only 2 of them are not employed at the moment, another 2 continue their studies in the RTA doctoral level SP "Modelling of Sociotechnical Systems", hence the graduates' employment rates are high. Graduates are employed in various sectors: finance, ICT, public administration, e.g. Visma Lab, Latvian road maintainer, Central Finance and Contracts Agency, SEB Bank, Rural Support Service, TestDevLab, Tieto Latvia, Preiļi hospital, TV3 Group, Midis, Scandagra Latvia, Rezekne Special Economic Zone Administration, etc. (SAR p. 175)
An analysis of student dynamics can be found in SAR p.175-176 and SP Annex 2, showing an average enrolment of 33 students per year over the last five years. More students were enrolled in the 1.6-year version of the programme during the reference period (59% of enrolments). According to the data provided by the RTA, out of the number of students enrolled in the first year of study, on average 52% completed the SP during the evaluation period.

2.1.5. N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

The aim, objectives and learning outcomes of the SP are interrelated, however, the degree to be awarded does not fully comply with the content of the SP, as well as the knowledge requirements for Master's level studies set out in the normative regulations.
Graduates have high employment rates and are employed in a wide range of sectors.
Several IT courses provide only a basic/introductory level of knowledge.
Strengths
1. Graduates have high employment rates and are employed in a wide range of sectors.
2. The SP is designed to be interdisciplinary, adapting to changing trends in the labour market.
3. The SP prepares graduates to continue their studies at the doctoral level.

Weaknesses

1. 1. Descriptions of IT and Computer Systems related courses reveal that the content is providing mostly just basic/introduction level of knowledge, which is not in line with the national academic education standard of providing advanced knowledge in the field related to Master of Science in IT and Computer Systems/Science.
2. Students without a background in IT, computer science or e-commerce only have 6CPs in the elective part of the curriculum to level up their knowledge in computer sciences.
3. The risk of graduates obtaining a Science Master's degree in Computer Systems without in-depth knowledge of computer systems and computing, which may discredit the value of a Master's degree in the field in general.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The SP is developed in accordance with the requirements of the State Cabinet of Ministers Regulation No.240 "Regulations on the State Standard of Academic Education". The basic procedures for the SP completion comply with the requirements of Article 40 of the National Standard for Academic Education according to Level 7 of the European Qualifications Framework of Latvian Education Classification (SAR p.176). There are four options for the programme: 2 years 80 CP option in Latvian; 2 years 80 CP option in English; 1,5 years 60 CP option in Latvian and 1,5 years 60 CP option in English. All the programme options are full-time study. The difference between the 80 CP and 60 CP option is that for the 80 CP version the admission requirements are: academic bachelor's degree (duration of studies at least 3 years (120 CP) or second-level professional education in electronic commerce or computer science or information technology, economics or social sciences. For studies in English: a certificate of proficiency in English at least at B2 level. And for the 60 CP option the admission requirements are professional bachelor's degree (duration of studies at least 4 years (160 CP) or second-level professional education in electronic commerce or computer science or information technology, economics or social sciences. For studies in English: a certificate of proficiency in English at least at B2 level.
The degree awarded after graduating the programme is Master of Science in Computer Systems. The goal of the programme is to prepare competitive top-level and middle-level managers in electronic commerce information systems, to prepare students for independent scientific activity in the field of information technology and electronic commerce, and to orient students to doctoral studies. The learning outcomes are defined as follows (SAR p.168) is able to demonstrate in-depth or expanded knowledge and understanding in electronic commerce information systems, some of which correspond to the latest findings of the relevant scientific branch or professional field and which provide a basis for creative thinking or research, including working in contact with different fields; is able to independently use the theory, methods and problem-solving skills of electronic commerce information systems to perform research activities or highly qualified professional functions, as well as is able to reasonedly explain and discuss complex or systemic aspects of the information technology industry or professional field both with specialists, both with non-specialists; is able to independently advance the improvement and specialization of their competences, take responsibility for the results of the work of personnel groups and their analysis, conduct business, innovations in the information technology sector, carry out work, research or further learning in complex and unpredictable conditions and, if necessary, transform them using new approaches; is able to independently formulate and critically analyze complex scientific and professional problems, justify decisions, and, if necessary, perform additional analysis of electronic commerce information systems; is able to integrate knowledge from different fields, contribute to the creation of new knowledge, development of research or professional activity methods, show understanding and ethical responsibility for the possible impact of scientific results or professional activity on the environment and society; ability to develop requirements for IT solutions and develop these

solutions as a result of economic process analysis.
The goal and learning outcomes cover a very wide and complex area and balancing ICT and management teaching in one course with quite different background students (management (electronic commerce) or Computer Science) is a tricky problem.
In the SAR and Annex 5, the descriptions of all the taught disciplines and the final MS Thesis are sufficiently detailed. In most cases, the content of the courses is pertinent and tries to follow the main aims of this master's study program. It can be identified that only following course in the obligatory SP part are directly related to ICT (12 CP from 31 CPP in total in this SP part): Information Systems Prototyping; Data Security; Software engineering: System design and implementation of business critical systems; Discrete event system simulation and Data Science. The elective block II (Information technology study courses) adds three more ICT courses in amount of 6 CP – courses Data processing systems; Software engineering: system analysis and Information systems development. The rest of the programme courses are management related or general educational and social sciences courses. The 80 CP SP version includes an additional 20 CP internship which the 60 CP version does not contain. Therefore the programme offers some individual flexibility for the students concerning their background but this is mainly in favor of the management and general courses. The curriculum has significant inclination towards commerce systems and management. The current curricula may offer the students a chance to accomplish all the foreseen learning outcomes if a student has completed BS in Software Engineer or similar ICT programme and in other cases the programme contribution to teach today's ICT on MS level to non ICT person seems to be weak. The closest thematic group for the programme is "Social sciences, commercial studies and law" in the thematic field of education "Commercial studies and administration" in the education programme group "Management and administration". The amount of CP and content of the SP corresponds to Cabinet Regulation No.240 Regulations for the State Academic Education Standards of 13 May 2014. The programme volume is 60 CP (90 ECTS) or 80 CP (120 ECTS), the duration of implementation is 1,5 or 2 years. Therefore the content of the SP is in accordance with the Cabinet Regulation No. 240 Regulation on the State Standard for Academic Education with the aim to create a competitive master’s programme ensuring knowledge, skills and competencies corresponding to the level 7 of LQF. A mapping of the SP is introduced in Annex 4, which reflects the knowledge, skills and competences specified in the SP and the corresponding study courses (in which the specific knowledge, skills and competences are acquired). Despite the mapping it is doubtful that the graduates will acquire enough knowledge and skills required for a Master of Science in Computer Systems.

2.2.2. One of the programme objectives is : to promote students' independent scientific research based on the latest scientific findings (SAR p. 172). To support the objective the Study Direction Council and at the Study Direction lecturers' meetings discuss the requirements for the development of research papers (SAR p.177). It is essential that attention is turned to the regional and professional dimension and the needs of the labor market and on the latest achievements and findings in the information technology sphere and in an interdisciplinary aspect. (SAR p.178). Mandatory requirement for master's students is the presentation of their research at a scientific or scientific-practical conference where the topics have been as an example for example: e-commerce conversion management and optimization principles; the importance of information systems in the development of social entrepreneurship; SEO and SEM advantages in digital marketing, research on the application of information systems in a healthcare industry, etc. (SAR p.179). The programme students are participating actively in research work as 2021 at the RTA Faculty of Engineering student conference in the Information Technology Section, 21 papers were presented, including 11 from MA Electronic commerce information systems programme students (SAR p.179).
The research projects and topics of the students are connected with the real needs of the local industy as for example: GPS data processing for more efficient use of resources in road maintenance

sphere; the importance of manual and automated testing in the development of an online store; monitoring the stability and security of the e-commerce IS network; decision-making for the management and optimization of e-commerce tool conversion, the possibilities of using information and communication systems in the management of loyalty programs; advertising auction technology and its application in electronic commerce; the integration of bitcoin cryptocurrency into the electronic payment system of Latvian merchants, etc (SAR 183).
Graduating students are obligated to present their research work at least in the pre-defence and advised to participate in the student conference at Rezekne before being able to defend their MS thesis (SAR p.184). For this purpose, they have a very good opportunity in the HEI yearly organized student scientific conference, where also master's degree students can participate and present their research results.
For this purpose, it is very useful for the Scientific research methodology course, which focuses on providing students with the skills necessary to carry out their scientific work leading to the master thesis.
Therefore it can be concluded the programme has a good perspective to grow research activities and increase the impact to the local industry.

2.2.3. In RTA at all education levels student-centered teaching methods are applied which have the potential to contribute to the achievement of study courses and program objectives, and foreseen results, especially by considering the general student-centered teaching and learning principles. In most cases, the recommended literature in the syllabus of the courses taught also in English comprises exclusively English resources, easily comprehensible also for visiting/foreign students.
The teaching courses contain 12 hours of contact hours (lectures, practical and laboratories) and 28 hours independent, where the division of the contact hours is as follows: lectures – 50% and 50% practical works in labs. The students can earn 40% of the total evaluation completing all independent and practical works of the study course and in some courses a student can earn up to 80% of the examination grade during the semester if he has completed the independent work him/herself and has acquired the topic (SAR p.180).
Most students work in parallel to their studies and therefore practical work can be done individually, too (upon agreement with the lecturer of the specific study course. It is mentioned in SAR (SAR p.180) that many practical works are done in the RTA Laser Technology Centre, which might raise a question about the compliance on the programme target and the speciality of the training facilities.
RTA and the programme has implemented the student-centered education and for this programme it is defined very clearly the respective principles applied: evaluating the students' previous preparedness and offering such study content that can ensure achievement of the learning outcomes; offering flexible ways of studies, including planning classes at a time convenient for students; students are provided with full consultative support and full access (on-site and remote) to the study resources; studies and research activities of each student is focused on their personal growth and personality; students receive feedback on evaluation of the learning outcomes, which to achieve learning outcomes independently. Utilization of these principles at RTA was confirmed during the expert visit and meetings with the students and graduates.
The usage of LMS is not at high level at all courses (Moodle presentation), i.e. only basic repository functionalities are used.
Although most of the students already work, more lectures from employers' representatives are needed in order to provide students with information about other possible career paths. In order to widen career opportunities, students also need more hands-on activities, like job interview training, building social network profiles relevant to self-marketing, workshops about starting their own company, etc.

2.2.4.The programme contains an internship in amount of 20 CP which is foreseen in 3rd semester

and there is available a guiding document (Annex 7) "Master thesis qualification traineeships Methodological guidance for an academic master's SP "Electronic commerce information systems"".
In the beginning all the students are introduced to the internship supervisor from the RTA and the internship guidelines. The internship supervisor from RTA familiarizes the students with the content of the internship and it is assigned an internship supervisor from the company, who formulates the topic of the individual assignment, further agrees it with the RTA, specifies and accordingly determines the specific workplace and duties to be performed by the student. The work should preferably be planned for the entire duration of the traineeship. The student needs to regularly fill in the traineeship diary. and prepare the report and present to RTA the diary; a placement report with annexes. The internship report must be submitted to the Dean's Office of the Faculty and the internship ends with the defence. The internship report is defended by the master students to the faculty committee where the content of the presentation explains the task of the internship, justification of the methods and techniques used in the analysis and research process, and list the main results achieved during the internship. The results of the internship are assessed by the board in the form of a graded assessment.
Students mostly choose to have an internship at their workplace or the programme director is ready to help to find an internship provider. Most often the students have internships in the companies as: branch of foreign merchant AKF, Decathlon Lithuania, UAB, branch of Latvia, VAS "Latvijas autoceļu uštūtējs", SIA "Vicars", joint municipal institution "Rezekne Special Economic Zone Authority", SIA" TestDevLab", LLU Malnavas College, SIA "LBRA", SIA "STRABAG", SIA "Preiļu slimnīca", SIA "DevCraft", SIA "Scandagra", SIA "Rapid Media", TERADA. Al the companies are ready to provide internships in English too. Expert meetings with the students and with employers confirmed the smoothles organization of the internship process.

2.2.5. N/A

2.2.6. The master's degree students have great flexibility in selecting their research topics (and obviously their M.S. thesis) topics since the SP covers a wide area. They are individually advised about this in the frame of the Scientific Methodology course and advised by the programme director. Also, regional e-commerce companies are offering thesis topics for graduating students. But in most cases, the M.S. students are selecting topics strongly connected to their everyday work (at the companies that employ them), which helps them in deepening their understanding of the given field and in career development. The examples of the reseach works and theses topics of the programme are listed in the section 2.2.2 of this report and it can be concluded that these topics really demonstrate very tight connection of the programme with the ICT field.

Conclusions on this set of criteria, by specifying strengths and weaknesses

The global impression of the SAR and the organized meetings concerning this criterion of the expert team is not negative but many questions raised.
The SP is compliant with the Latvian National Standard for Academic Education and it is fully supported by the Latvian Higher Education Council. There is a discrepancy in balancing between the ICT and business/commerce profiles. Some improvements or adjustments are needed to make the programme outcomes and awarded degree consistent to course topics.

Strengths:
1. Synergy of ICT and e-commerce is perspective field for the region as the commerce, logistics and tourism and ICT support to agriculture etc. fields could support the regional growth.
2. A lot of local and regional companies interested in the programme and providing internship (and job) places.

3. Dedicated studets demonstrated by active participation in regional focused research works, good participation on student conference and high employment rate.

Weaknesses:
1. The content of the SP (proportion of general, management, commerce and ICT subjects) does not assure acquiring high level ICT knowledge and is inclined towards management competencies.
2. Weak practical direct ICT training amount of studies.
3. Unclear leveraging the process of achieving comparable (and ICT speciality required) knowledge of the students for the graduation where some students have a ICT background and some management background from their BA education.
4. The teachers' usage of LMS is not at a high level in all courses.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Partially compliant

The problem of unbalanced ICT and management/commerce courses is demonstrated in Annex 5 and reveals on discussions with the students

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. From resource provision and usage point of view, this SP is in the same situation as SP Programming.
Same resources, same facilities, labs, library, professors, IT system support.
Therefore the analysis is also the same.
SP informative, material, technical and financial provision complies with the needs of SP.(SAR, p.184-186; Meeting with SP director)
The infrastructure of the Faculty of Engineering consists of:
1) Engineering faculty building (put into operation in 2014) with laboratories, workshops, lecture rooms, staff and student premises;
2) Information Technology Centre (computer rooms, electronic publications room, computer equipment service room, server room);
3) Laser Technology Centre (put into operation in 2019). (SAR, p.35)
Experts visited computer classes and laboratories. There are about 100 computers available for Engineering faculty students. Taking into account the relatively small number of students and the fact that a large part of SF students use their own laptops during classes - infrastructure resources could even be shared with regional school students or employers from the region.
However, regular review of library books as well as study course content has to take place in order to be in-line with the world's technological development. Students should have the right and privilege to study the latest technologies.
RTA uses Moodle system (ekursi.rta.lv) to support the study process. (SAR, p.39), MS Teams and Google Meet for remote classes and communication. DMS is in place (MS SharePoint based) to support students, lecturers and administration.
However the DMS has not been used broadly and intensively.
Samples: All 4 meeting minutes of SF Council meetings for this academic year were added on May 2,

2023. System does not contain any Students Council meeting minutes for 2022 and 2023.
LMS/Moodle has not been used in full extent (Meeting with IT Support personnel). It's very important to find ways how to motivate/mandate all the teaching staff to use the LMS more.
RTA uses surveys to obtain information about support required for students and lecturers. However, a very small percentage of students and lecturers respond to the surveys (see SAR, pp.39-40).
LAIS system has been used by students and lecturers offering all the information regarding the study process. (SAR, p.40)
IT support system usage by IT SF has to serve as a good sample for the rest of RTA. Experts have noticed deficiencies in usage of all the IT support systems by SF staff. LMS, DMS, web page, institutional repository of RTA, social networks. In order to attract and keep students the SF has to be fluent in all the digital system usage maintaining up-to-date digital content. Experts recommend to include "digital content creation and publishing" as a part of annual academic staff performance evaluation procedure.
Study process requires access to real and virtual classrooms, computers (if needed), technologies (for study process support and used in study courses), modern and attractive study program, study course descriptions and information referenced therein. All this has been provided. But the study program is never good enough and study courses have to be reviewed regularly in cooperation with students, graduates, and employers.

2.3.2. N/A

2.3.3. From resource provision and usage point of view, this SP is in the same situation as SP Programming.
Same resources, same facilities, labs, library, professors, IT system support.
Therefore the analysis is also the same. The only difference is in state budget funding and funded study places.
According to the SAR (p.186) the funding during last years is stable and allows the implementation of the study process for the SP.
The number of state-budget funded study places - 24.
State budget funding - 94 398 EUR (in 2022).
As funding is never sufficient (Meeting with RTA management) experts recommend focusing more on additional income sources besides state budget funding. Cooperation, joint projects with regional companies, research/consulting/training contracts for regional enterprises - are opportunities that could bring both an extra income as well as experience/interesting research topics to RTA.

Funding for the acquisition of RTA's library collections has decreased significantly during the last 6 years which has to be fixed in order to keep library at the level of today's scientific and technological development to serve staff, students as well as regional cooperation partners.

Conclusions on this set of criteria, by specifying strengths and weaknesses

RTA provides all the resources necessary for students and lecturers.
Computer classes and laboratory rooms might be even too much for the current number of students.
Library textbooks should be reviewed periodically to archive outdated ones.
Purchase of new books and/or e-books in relevant technical areas has to be as important a task as attracting new students and research partners.
Worth considering to open all resources to the public (school students, industry professionals) fostering the community and marketing RTA as a welcoming partner and the right place for studies.

Strengths:

1. Very personal support opportunities for students because of the relatively small number of students and academic staff availability almost 24/7.
2. Recently built premises incl. library and laboratories serve as a particular attraction to potential students as well as motivate for studies and teaching.
Weaknesses:

1. Surveys do not present a real picture re ICT solutions for study process in place (low percentage of responses).

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

All the provisions are in place (informative, material, technical, financial) to support the study process. The SP is cross industry one and could serve as a good sample for other programms to span the gap between industries.

2.4. Teaching Staff

Analysis

2.4.1. In total, 17 teachers are included in implementation of the SP. Thereby are 12 RTA's teachers with scientific positions, 9 are RTA's professors and 10 have PhD degree (see Annex 9). Their experience is a benefit to SP from a scientific point of view (e.g. lecturers are intensively engaged in the implementation of research projects, see SAR p. 187-188), but also from a professional point of view as well (for example, Imants Zarembo has been working in ICT companies since 2005 and is currently a project manager at AS "Printful", Artis Teilāns has been working at AS "Exigen Services Latvia" for more than 20 years, see SAR p. 187 and teachers' CVs).
In general, the qualification of the teaching staff is sufficient and teachers are competent from technical and pedagogical point of view (meeting with students, graduates and employers), and approach is adapted according to the (IT or non-IT) background of the students (meeting with students).
The relationship between teachers and students is professional, but it is needed to inform more students about possibilities about ways to communicate possible individual issues (meeting with students), for example via a "trust e-mail", on which students can write their complaints, objections and proposals (SAR, p. 28).

2.4.2. Changes in the composition are successfully carried out at the level of SP and in agreement between SP teachers and SP directors (meeting with SP director and academic staff). For example, lecturers Dr.sc.ing Imants Zarembo and Dr.sc.ing. Sergey Kodor were invited to implement the study courses. The decision was made to attract a new generation of lecturers to the programme, thus improving the quality of studies. So, in both cases, the changes were done based on the corresponding skills and competencies of teaching staff, i.e. without endangering the quality of study programme.

2.4.3. Not applicable.

2.4.4. Based on Annexes 13 and 14 provided by RTA as part of the list of additionally needed

documents (request Nr. 21) the scientific productivity differs significantly, i.e. from a very low to a very high number of academic academic papers.
In addition, Annex 13 for most of the academic staff presents relevant practical experience as well, from the provided CVs is not clear how the practical experience is related to the implementation of the SP. Namely, the practical experience should not be based on the implementation of the SP, but it should benefit the quality of implementation.

2.4.5. Teachers meet at least twice per year and discuss the implementation of the SP. This mechanism seems to be efficient (meeting with academic staff), but highly centralized due to the role of the SP director. Beter cohesion between teaching staff can be achieved by organizing brainstorming meetings to discuss various teachers' proposals. Thereby, anonymous proposals should also be possible to encourage teachers to raise possibly more sensitive issues. Additionally, there is also a model to include more teachers in conducting some courses, which could improve collaboration between teachers even more (meeting with academic staff).

Conclusions on this set of criteria, by indicating strengths and weaknesses

The overall competence of the teachers in both technical and pedagogical aspects is commendable. However, there is room for improvement in certain areas. Enhancements should be made to increase student awareness of communication channels for addressing individual issues and to improve the utilization of the Learning Management System across all courses. Additional efforts are required to provide students with a wider range of career opportunities through guest lectures from employers' representatives and hands-on activities such as job interview training and workshops on entrepreneurship. The collaboration between teachers through regular meetings is efficient, but there is potential for further improvement by including more teachers in course delivery. By addressing these areas, RTA University can enhance the SP and better prepare students for their future careers.

Strengths:
1. Competent teachers, which is also confirmed by students, graduates and employers. Thereby several teachers also have significant practical experience.
2. Good collaboration between teachers regarding the implementation of the SP.
3. Changes in the composition of the teaching staff are efficiently implemented, without any risks regarding the quality of SP.
4. Relationship between teachers and students is professional.

Weaknesses:
1. Highly centralized decision-making due to the role of the SP director.

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Teachers are technically and pedagogically competent to deliver the learning outcomes, which was confirmed by students, graduates and employers. Thereby several teachers also have significant practical experience. They fulfil the requirements set out in the regulatory enactments (Regulation of Academic Positions in RTA, Annex "15. Regulation of academic

position.pdf").

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

Full compliance of Regulations of the Cabinet of Ministers of May 13, 2014 No. 240 "Regulations Regarding the Standard for National Academic Education" corresponds to standard, see Annex 3.

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Not relevant

Not applicable

3 3 - The descriptions of the study courses and the study materials have been prepared in all languages in which the study programme is implemented, and they comply with the requirements set forth in Section 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Fully compliant

Fully compliance, all study course descriptions are developed according to uniform guidelines see Annex 6.

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Full compliance. A sample of the diploma and its annexes to be issued for completing the SP is in Annex 1, which corresponds to the Law on Higher Education Institutions.

5 5 - The academic staff of the academic study programme complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions.

Assessment of compliance: Fully compliant

Fully compliance; the academic staff of the academic SP complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions, which makes up 81% of elected teaching staff, see Subsection 3.4.1.

6 6 - Academic study programmes provided for less than 250 full-time students may be implemented and less than five professors and associated professors of the higher education institution may be involved in the implementation of the mandatory and limited elective part of these study programmes provided that the relevant opinion of the Council for Higher Education has been received in accordance with Section 55, Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Not relevant

7 7 - At least five teaching staff members with a doctoral degree are among the academic staff of an academic doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field of science. At least five teaching staff members with a doctoral degree are among the academic staff of a professional doctoral study programme in arts (if applicable).

Assessment of compliance: Fully compliant

Fully compliance of the academic staff of the academic SP complies with the requirements, see Subsection 3.4.1.

8 8 - The teaching staff members involved in the implementation of the study programme are proficient in the official language in accordance with the regulations on the level of the official language knowledge and the procedures for testing official language proficiency for performing professional duties and office duties.

Assessment of compliance: Fully compliant

Fully compliance; the academic person teaches study courses in Latvian, which is the native language and it corresponds to the parameter of the SP - Latvian language. Knowledge of the national language of the academic staff is visible in Subsection 3.4. and in the common Annex 9 and Annex 10.

9 9 - The teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language, if the study programme or any part thereof is to be implemented in a foreign language (if applicable).

Assessment of compliance: Fully compliant

Fully compliance; the HEI's confirmation of the relevant foreign language skills of the teaching staff involved in the implementation of the SP at least at B2 level according to the levels of the European Language Proficiency assessment, see Annex 12.

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Fully compliance; the study agreement sample meets with the requirements for what must be in the research agreement. A standard sample of the study contract is visible in Annex 7.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

Fully compliance; a document certifying that the RTA will provide students with opportunities to continue their education in another SP or at another university if the implementation of the SP is interrupted. Is available and signed with a secure electronic signature see Annex "5.pielikums.7z"

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme's license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

Fully compliance; a document certifying that the RTA guarantees compensation for losses to the students if the SP is not accredited due to the actions (activity or inaction) of the university or college or the license of the SP is revoked and the student does not want to continue his studies in another study program. Is available and signed with a secure electronic signature see Annex "6.pielikums.edoc".

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Not relevant

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

The degree to which the study plan fully complies with the regulations outlined in the Law on Higher Education Institutions and other governing legislation.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

The aim, objectives and learning outcomes of the SP are interrelated and formal regulatory requirements have been met. However, the degree to be awarded does not fully comply with the content of the SP, as well as the knowledge requirements for Master's level studies set out in the normative regulations.

Graduates have high employment rates and are employed in a wide range of sectors.
Several IT courses provide only a basic/introductory level of knowledge.
Study programme demonstrates a professional relationship between teachers and students. However, there is a need to improve the usage of LMS throughout all courses to enhance the learning experience.

Strengths:
1. Graduates have high employment rates and are employed in a wide range of sectors.
2. The SP is designed to be interdisciplinary, adapting to changing trends in the labour market.
3. The SP prepares graduates to continue their studies at the doctoral level.
4. Relationship between teachers and students is professional.

Weaknesses:
1 Descriptions of IT and Computer Systems related courses reveal that the content is providing mostly just basic/introduction level of knowledge, which is not in line with the national academic education standard of providing advanced knowledge in the field related to Master of Science in IT and Computer Systems/Science.
2. Students without a background in IT, computer science or e-commerce only have 6CPs in the elective part of the curriculum to level up their knowledge in computer sciences.
3. The risk of graduates obtaining a Science Master's degree in Computer Systems without in-depth

knowledge of computer systems and computing, which may discredit the value of a Master's degree in the field in general.
4. The RTA does not provide a justification for the change in the degree to be awarded from "Master of Science in Information Technology" to "Master of Science in Computer Systems", nor does it provide a justification as to whether this change has any impact on the changes in the content of the studies.
5. The usage of LMS is not at a high level in all courses.

Evaluation of the study programme "Electronic Commerce Information Systems"

Evaluation of the study programme:

Average

2.6. Recommendations for the Study Programme "Electronic Commerce Information Systems"

Short-term recommendations

- Clarify the aim, objectives and study outcomes of the SP, as well as the content of the study courses, by adding in-depth knowledge corresponding to the Master's level studies, and clarify the admission requirements accordingly. - Or clarify the degree to be obtained and the SP code according to the Latvian Classification of Education to reflect the content of the SP, including an evaluation of the relevance to the thematic group "Business and Administration" and the subgroup "Management and Administration" (345).
- Consider balancing and increasing MA level ICT content in the SP if the degree awarded is “Master of Science in Computer Systems” as proportion of general, management, commerce and ICT subjects does not assure acquiring high level ICT knowledge or consider changing the programme field.
- Increase practical and MA level ICT training amount in the programme.
Efforts should be made to provide training and support for teachers to effectively utilize LMS platforms, ensuring students have access to valuable online resources and tools

Long-term recommendations

- Efforts should be made to provide training and support for teachers to effectively utilize LMS platforms, ensuring students have access to valuable online resources and tools.
- Introduce a clear pathway in the programme to assure achieving comparable (and ICT speciality required) knowledge of the students for the graduation where some students have a ICT background and some management background from their BS education.

II - "Sociotechnical System Engineering" ASSESSMENT

II - "Sociotechnical System Engineering" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1. Joint doctoral SP “Sociotechnical Systems Engineering” complies with the SF "Information

Technologies, Computer Engineering, Electronics, Telecommunications, Computer Management and Computer Science" as well as with the RTA Development Strategy 2016-2023.
The SP corresponds to the thematic area "Computing" of the educational programmes. The SP covers the thematic groups of studies and research (computer use, computer systems, databases and computer networks, programming), forming an analytical basis for the doctoral SP "Sociotechnical Systems Engineering", which correlates with the sub-fields of Electrical Engineering, Electronics, Information and Communication Technology such as Computer Control and Systems Analysis, Modelling and Design. (SAR p. 135) The SP also provides a full sequential cycle of study at the RTA, providing the opportunity to complete an academic journey within a doctoral-level programme of studies.

2.1.2. The joint doctoral SP is called "Sociotehnisko sistēmu inženierija" in Latvian and "Sociotechnical System Engineering" in English. Degree awarded is Doctor of Science (Ph. D.) in Engineering and Technology.
Study programme code: 51482, established in accordance with the SP content and Regulations of the Cabinet of Ministers No. 322 "Regulations on Latvian education classification" (https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitibas-klasifikaciju). The first two digits '51' indicate the correspondence to the Doctoral studies (PhD), to be followed by a Master's or Professional Master's degree. The next three digits “482” indicate the SP correspondence to the thematic group "Natural sciences, mathematics and information technology" and area "Computing" and subgroup "Computer use".
The aim, objectives and learning outcomes of the SP are defined in accordance with the European Qualifications Framework national classification frameworks (SAR p. 135-136). The doctoral SP corresponds to level 8 of the LQF, its learning outcomes are defined in accordance with the descriptions of knowledge, skills and competences corresponding to level 8, available in Regulations of the Cabinet of Ministers No. 322 "Regulations on Latvian education classification" (https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitibas-klasifikaciju) and
Regulations of the Cabinet of Ministers No. 522 "Procedures and Criteria for the Award of the Doctoral Degree (Doctoral Dissertation)" (https://likumi.lv/ta/id/124787-zinatniska-doktora-grada-pieskirsanas-promocijas-kartiba-un-kriteriji).
The aim of the studies, which is aligned with the partner university, is "to promote the development of the field of electrical engineering, electronics, information and communication technologies and to create a competitive generation of young scientists of an international level, who are able to introduce the latest scientific knowledge of system engineering into the national economy, achieving an increase in the efficiency of the industry and the reliability of the systems, and improvement in product and service quality" (SAR p. 136). The SP has clearly defined objectives, for which 9 learning outcomes are defined.
The SP has defined justified admission criteria (SAR p. 132): "Master's degree in modelling of socio-technical systems or in information technology, or in computer science, as well as in other natural sciences and management sciences, or an equivalent higher education, if mathematical and/or computer simulation has been studied in the previous education." For studies in English, a certificate confirming English language proficiency at B2 level is also required.
Overall the title, code, degree and professional qualification of the SP, aims, objectives, learning outcomes and admission requirements are interrelated, in addition to ensuring continuity of SPs in the SF.

The duration of the SP is 3 years and the volume is 120 CP (180 ECTS), which complies with the Latvian legislation: Regulations of the Cabinet of Ministers No. 322 "Regulations on Latvian education classification" (https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitibas-klasifikaciju)
.

The SP is conducted in Latvian, preparing a competitive generation of young scientists of an international level, as well as in English, to attract international students and promote international cooperation. Foreign students are additionally provided with Latvian language training. (SAR p. 137)

2.1.3. The RTA has made the following changes to the SP parameters since the last evaluation (SAR p. 134):
1) The aim and learning outcomes of the doctoral programme have been clarified;
2) The content of the SP has been supplemented with courses in the IT field, the distribution of CPs has been revised and changed between compulsory study courses, special courses of the branch of science and elective courses;
3) Having evaluated the existing cooperation between Vidzeme University of Applied Sciences and RTA and the perspectives of the SP development, it has been decided to change the SP title from "Sociotechnical Systems Modelling" to "Sociotechnical Systems Engineering";
4) Taking into account the change of the SP title, the admission requirements have been clarified, based on previous years' experience with student enrolment.
The SAR does not provide a more in-depth assessment of the impact of the changes on the future study process, so it is not possible to fully assess the impact of the changes on the quality of the study programme.

2.1.4. The social and economic justification of the SP is based European Union policy development documents, in coherence with Latvian and EU strategic documents and development challenges. Also data of the OECD are provided. (SAR p. 132)
An analysis of student dynamics can be found in SAR p.132 and SP Annex 2, showing an average enrolment of 2 students per year over the last five years. According to the data provided by the RTA (SAR p.138), in the reference period (from 2017), 15 PhD students have studied in the RTA doctoral programme and 3 have obtained doctoral degrees. Four have completed the theoretical part of the SP, 2 have been dismissed as not having returned from sabbatical leave, 6 have left their studies of their own volition (1 has transferred to the doctoral programme in social sciences), 6 are currently studying (one is on sabbatical leave).
Despite the low number of graduates, RTA points out that graduates and students are employed, for example, as academic and scientific staff at RTA. Graduates also have the opportunity to participate in postdoctoral grants and to write and participate in research projects. With only 3 students graduating from the SP as a whole, it is not possible to objectively assess graduate employment rates to understand graduate employment trends. Given the relatively low student enrolment rates and the low number of students graduating from the SP overall, it would be advisable to assess how to improve the advertising and promotion activities of the SP in order to increase student enrolment. It is also recommended to further examine the reasons for student drop-out in order to improve the support system provided by HEIs and reduce the risk of drop-out as much as possible, e.g. by providing additional mentoring to students.

2.1.5. The implementation of the joint SP with Vidzeme University of Applied Sciences started in 2011 and is in line with the RTA strategic planning documents, for example, the RTA Doctoral Study Programme Development Plan 2020-2026 (SAR p. 139).
In cooperation with Vidzeme University of Applied Sciences, doctoral seminars and summer schools are jointly organised, as well as the exchange of academic staff in study courses and joint work in the doctoral council. (SAR p. 140) The doctoral SP is designed to enable students who have completed a master's degree in sociotechnical systems modelling or information technology or computer science or other natural and engineering sciences (if mathematical and/or simulation modelling has been studied during their studies), to deepen their knowledge of systems modelling and continue their thesis work in the scientific sub-discipline and application environment. (SAR

p.141)
The SP Annex 2 also shows the compliance of the SP with the requirements of the Higher Education Act for joint SPs: a cooperation agreement has been concluded between the higher education institutions, a joint programme council has been established for the management of the SP, the quality assurance system is integrated into the QMS of each partner university, mobility of students and teaching staff is ensured, etc.
It should be noted that the SAR contains very general information on how the cooperation between RTA and VIA in organising the study process is carried out in practice, how the joint HEI resources are used. The agreement between RTA and ViA on the implementation and development of the joint study programme, as well as additional information provided by RTA in the additional annexes to the SAR, indicate that the planning of joint resources is organised by the Doctoral Council through the preparation of study and research plans. The Joint Programme Board is composed of three members of SP staff from each HEI, but does not include students (additional annexes to the SAR and additional information provided by the RTA).
Accordingly, the establishment and implementation of the joint SP is considered to be justified and to ensure a qualitative study process, which is also confirmed by the students and graduates (interview with students and graduates).

Conclusions on this set of criteria, by specifying strengths and weaknesses

The joint doctoral SP with Vidzeme University of Applied Sciences has been implemented since 2011 and has had 15 students, 3 of whom have defended their doctoral thesis and obtained a doctoral degree. The SP also provides a full sequential cycle of study at the RTA, providing the opportunity to complete doctoral-level programme of studies. For the purpose of evaluation, the SP of RTA has implemented a few changes, which are justified and based on the aim to develop the SP in the future. The establishment of the SP is justified and helps to strengthen the scientific capacity of the RTA.

Strengths
1. Long cooperation experience with Vidzeme University of Applied Sciences and joint development plans for the future.
2. Well-defined SP aims, objectives and learning outcomes that comply with the regulatory requirements.
3. Students who have graduated or studied in the SP in most cases continue to work in HEIs as academic or research staff, which is positive for staff retention.

Weaknesses
1. Although the SP has been running since 2011, only 3 graduates have successfully completed it so far, which is relatively low.
2. The low number of students and graduates poses risks to the sustainability of the SP.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The topics of the program (at least as the name implies) cover a very wide scientific area, not being directly correlated with one or another strong research field at RTA. Therefore the programme name refers more to the social sciences of a kind integration of social sciences and ICT. The Ph.D. SP is supported by the Latvian Higher Education Council. Its curriculum of the program is established considering the Latvian regulations in general. The structure of SPs at RTA is regulated by the Regulations on Development of Study Course Programmes approved by the Senate of RTA.

The target of the programme is to provide PhD students the acquired ability to analyze various systems (environmental protection, tourism, business processes, computer networks, telecommunications, politics, public relations, etc.) with the help of simulation modeling, to analyze processes, to model and visualize them in an electronic environment as closely as possible to real life, allows to predict the development of various processes as accurately as possible in the future. This seems adequate for strengthening the regional development and ICT trends in the world and can give a good support for local industry. A major focus in the programme is the cooperation with Latvian and foreign companies in the ICT industry, which reveals many opportunities for doctoral students to perform scientific research important for the industry. At least the discussions with the PhD students confirmed this focus and support for this.
It is not understandable the statement in the SAR (p.141) “A volume of 90 CP, which is equal to 75% of the doctoral SP Laser Technologies, is allocated for scientific work, encompassing the development of a doctoral thesis, preparation of scientific publications and presentations at scientific conferences, participation in the development and implementation of scientific projects.”. So the question is how the Laser Technologies programme is related to this programme as the focuses should be quite different.
The programme contains several general courses needed by Ph.D. students to perform their research and prepare their thesis. The presented document “Mapping.xlsx” demonstrates the mapping of the doctoral SP "Sociotechnical Systems Engineering" to achieve the study results of the SP. The descriptions of the study courses are generally adequate and comply with the provisions outlined in the regulatory authorizations. The contents of the courses are relevant and complementary only if solely computer sciences are considered. The foreseen courses can contribute to the achievement of the envisaged learning outcomes and the defined outcomes of the SP and study courses correspond to the LQF and the European Qualifications Framework. The outcomes of the SP correspond to the European Qualifications Framework (EQF) and the LQF level 8, third cycle qualification level of the Framework for Qualifications of the European Higher Education Area. The recommended literature in the study course descriptions partly needs to be updated. Many suggested course literature is 15-20 years old, which is inappropriate in the field of ICT and especially on the PhD course level where the PhD students should acquire the latest knowledge.
It should be considered important to stress that RTA and ViA regularly organize summer schools for doctoral students, where there is an academic exchange of ideas between doctoral students, scientists and industry professionals, which supports the PhD preparation process. RTA and ViA cooperate in allowing the study courses to be acquired in the remote study mode allowing students to participate in the class regardless of their country of residence and geographical location, which support international students and also mobility. It should be mentioned too that the number of admitted PhD students is low (have been 0 in some years) and does not assure academic and research sustainability in the region.

2.2.2. Both RTA and ViA have the right to award doctoral degrees in electrical engineering, electronics, information and communication technologies for the period of accreditation of doctoral SPs (according to the Cabinet of Ministers regulations No. 1000 of 27.12.2005). The basic task of the doctoral SP is defined as "to prepare scientists in the sub-sector of systems analysis, modeling and design of electrical engineering, electronics, information and communication technologies and to promote the application of students' theoretical knowledge, cognition, as well as research skills and research results" (SAR p.145). The actual content and the title of the programme refers to the ICT field and therefore defining it as one subtask to prepare scientists in the subfield "design of electronics and electrical engineering" is a little bit misleading.
It is required for PhD students to publish their scientific results in scientific journals that "are reviewed and are internationally available in repositories of scientific information and several are included in SCOPUS/Web of Science; whether the scientific results of the doctoral thesis have been

reported in at least 3 international congresses, conferences or symposia" (SAR p.145). The statement leaves it open whether it is required at least 3 highest level Web of Science referenced journal papers and whether it is required the PhD student to be a leading author or not or it would be accepted even some international conference papers with numerous authors that are lower level. So the minimum publication requirements assuring the high level of publication is not clearly set and should be adjusted.

2.2.3. In RTA at all education levels advanced teaching methods are applied which have the potential to contribute to the achievement of study courses and program objectives, and foreseen results, especially by considering the general student-centered teaching and learning principles. The main focus in the programme Sociotechnical System Modelling is in the cooperation with Latvian and foreign companies in the industry (SAR p.142). Starting from 2023 a trilateral agreement will be made upon commencement of doctoral studies between a doctoral student, RTA and the doctoral thesis supervisor (SAR p.142).
RTA and ViA cooperate in the implementation of the programme open science resources (e.g. the website of scientific journals), which is
especially relevant for doctoral students and to promote the programme RTA and ViA regularly organize a summer schools for doctoral students, where there is an academic exchange of ideas between doctoral students, scientists and industry professionals (SAR p.142).
It is essential to note that the study courses can be passed remotely allowing the students to participate regardless of their geographical location (SAR p.142), which also supports studyes while working in a company. The basic principles for the evaluation of the learning outcomes are based on European standards and guidelines (ENQUA) for quality assurance in the European Higher Education Area (SAR p.146 and RTA Quality Management Handbook). It follows the student centered approach focused on the society’s demand for innovative products and services, communicative processes involving knowledge and innovation exchange at the inter-university level, science-based higher education. At RTA the program director shall ensure that learning outcomes are achievable and receive support for the development of student skills in the field, communicate with the PhD student to show which amount they have achieved the learning outcomes and give feedback, which, if necessary, provides advice related to the study and research process (SAR p.143 and p.146-147). All the students know their research topic before starting their studies and therefore the study courses give an opportunity to analyse the specific topic broader (SAR p.143). The Sociotechnical Systems Modeling programme Promotion Council formed in collaboration of RTA and ViA evaluates whether the conducted research has been developed independently and provides new scientific knowledge in the field, as well as whether the research results published in scientific journals that are reviewed internationally and are available in international repositories of scientific information (SAR p.145). The participation in the implementation of scientific projects (SAR p.145). It is stated (SAR p.146) that each course lecturer has 1 hour per week for student consultations. For PhD students 1 hour per week (where most PhD students work outside the RTA) seems not enough for consulting. The division of studies between the theoretical part (20 CP) and scientific-academic work (100 CP) (SAR p.134) is considered to follow the principle of main attention to research topic related studies. Full-time study work is carried out according to an individual plan, which allows respecting each doctoral student’s own scientific research activities. Therefore the programme is implemented by facilitating the doctoral students’ aspiration for independence, while ensuring the support of teaching staff, as well as mutual respect in their relations (SAR p.146). The fact that the students receive needed support was confirmed on the meeting with the students. Each student have to compile the individual work plan and this plan is approved by the thesis supervisor and the programme director (SAR p.142 and p.147). The control of the implementation of the study plan is carried out by: the director of the doctoral SP and the scientific supervisor (SAR p.147). The utilization of the Learning Management System (LMS) could be enhanced across all courses.

The program director ensures that the teaching staff involved in implementation of the program know the methods of evaluation of learning outcomes and receive support for the development of their skills in this field and doctoral students receive feedback and advises necessary for their work (SAR p.146). The annual number of peer-reviewed international publications included in international databases is used as a quantitative criterion of the student work (SAR p.148). 7 professors (Assoc and Full Professors) are involved in the programme (4 from RTA and 3 from ViA) (SAR p.157) and therefore the compliance of the SP with the requirements if a doctoral SP is implemented.
The most acknowledged are the main principles implemented in develping the programme: offering flexible study paths, including observing the employment of students during studies; planning classes at a time convenient for students; students are provided with full consultative support and full access (on-site and remotely) to the study resources; students studies and research activities are focused on the development of their personality (SAR p.147).
After submitting the Thesis the Promotion Council (in participation of RTA and ViA representatives) evaluates the work in accordance with the procedure established in the regulations of the Promotion Council and Cabinet regulations no. 1001
“Procedures and Criteria for the Conferral of a Doctoral Degree in Science” and when all the requirements are satisfied the doctoral thesis is defended in the joint RTA and ViA Doctoral Council (SAR p.149).
This is a joint SP and all the programme implementation methods are applied both in Latvian and English. Experts meeting with the students (including PhD students) confirmed the observations and one of the English PhD students discussed the advantages of this small university student-centered personalized approach during the meeting.

2.2.4.N/A

2.2.5. The rules for the Ph.D. defence including the mandatorily needed conditions established by the RTA are well-known by the involved doctoral students and correspond to the amendments made by the Cabinet of Ministers to the regulations of December 27, 2005 no. 1000 “On Delegation of Powers to Confer the Doctoral Degree (Promotion) to Higher Education Institutions”.
After completing the academic part of the doctoral SP “Modeling of Sociotechnical Systems”or “Information Technology” and preparing the doctoral thesis for defense and satisfying all the requirements the PhD student has the right to defend the thesis. Before submitting the thesis it is reviewed in the structural unit and the structural unit forwards the work for submission to the Promotion Council. The Promotion Council evaluates the work in accordance with the procedure established in the regulations of the Promotion Council and Cabinet regulations no. 1001 “Procedures and Criteria for the Conferral of a Doctoral Degree in Science”. The doctoral thesis is defended in the joint RTA and ViA Doctoral Council. The Diploma awarded after the defence refers to both RTA and ViA and the programme title (example given in Annex 1 to SAR).

2.2.6. The proposed research topics (made public on the website of the RTA) are covering wide and multidisciplinary scientific areas. They also include nowadays hot topics like implementation of AI in commerce systems and data analysis, smart solutions for business applications and industry, etc. These all are relevant ICT topics in the European Union, but only partially cover all the topics of the doctoral SP.

Conclusions on this set of criteria, by specifying strengths and weaknesses

The global impression upon the self-evaluation report and the organized meetings concerning this programme confirms the adequacy of organizing the studies and sufficient scientific level of the programme. The program curriculum is established considering the Latvian regulations in the field.

The offered compulsory and limited elective courses are poorly connected to the telematics and logistic topic of the Ph.D. study program. Concerning these, some improvements would be suggested. The number of enrolled Ph.D. students is low, as well as that of the defend theses. The main principles of implementation the joint programme allow to expect successfull growth of the programme and the collaboration and participation of the joint programme partners (RTA and ViA) are well balanced.

Strengths:
1. Student-centered approach to students
2. The programme has a good potential as having well established regional collaboration ViA and own local specifics
3. The topics of the defended Ph.D. thesis cover a large spectrum of the science field.

Weaknesses:
1. Some statements in SAR refer to Laser Technologies programme and electronics-electrical engineering which is inconsistent with the programme.
2. The number of enrolled PhD students is low.
3. Some study literature is old and needs to be updated.
4. Publication requirements should be more clearly formulated and higher scientific targets for the publications set.
5. The teachers' usage of LMS is not at a high level in all courses.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Fully compliant

Although the overall impression is favorable, more effort needs to be done to fill in the gaps in this doctoral program. The SP (both in the teaching curricula and the research topics provided) strongly emphasizes emerging ICT-related themes. It involves just a few Ph.D. students, and only a small proportion of them actually defend their theses and get the desired degree. The Latvian language line of the program has a minimum level of interest.

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. SP informative, material, technical and financial provision complies with the needs of SP.(SAR, p.151-153; Meeting with SP director)
Doctoral studies are implemented in close cooperation with the Institute of Engineering of RTA and Institute of Sociotechnical Systems Engineering of ViA. (SAR, p.152)
Institute of Engineering oversees the operation of five research centres, 13 laboratories.
Students have the opportunity to use ViA laboratories:
Computer network laboratory, where it is also possible to carry out research related to various computer network technologies and computer network applications, which require the relevant hardware;
E-study management and technology laboratory, which develops the architecture, engineering and technology of e-study solutions and knowledge creation and transfer processes, using information and communication technology, which helps to create in real-time and real-place available

highquality e-study solutions in individual, organizational and societal level;
Spatial research laboratory, which provides support for the research of economic sectors using geospatial data;
Virtual and Augmented Reality Laboratory, which is engaged in the development of interactive, three-dimensional (3D) scenarios and is oriented towards the use of Virtual and Augmented Reality (VR/AR) technologies.
Resources of both institutes foster the SP and significantly support a high-quality study process.
The Doctoral study program consists of theoretical courses (20 CP) and scientific academic work (100 CP) to achieve the learning outcomes listed in SAR p.144. Experts see all resources for high level studies provided taking into account the collaboration of the SP with research institutions with numerous laboratories both from RTA and ViA.

2.3.2. The material and technical provision of the Faculty of Engineering of RTA is sufficient for the implementation of the doctoral SP Sociotechnical Systems Modelling , sufficient to carry out research and scientific work in laboratory conditions for both doctoral students and academic staff. (SAR, p.154; Meeting with students, Meeting with graduates)
As the SP is a joint program with Vidzemes HEI (ViA) it is implemented in cooperation with ViA Institute of Sociotechnical Systems Engineering. (SAR, p.154)
See list of laboratories in 2.3.1. of this report.
Joint SP like this is a win-win solution for both HEI - RTA and ViA. It allows sharing information, technical resources as well as academic staff. It gives a chance for other forms of cooperation outside the SP - professor mobility, research, etc.
Experts recognize that the cooperation in this SP is a proper landmark also for other study programs.

2.3.3. The tuition costs for one full-time Latvian or EU student per year are estimated at EUR 7335.
Financial resources are used in accordance with estimates that are prepared by structural units and approved by Rector of RTA, as well as reviewed by the Council of the Faculty. The tuition fee is primarily used for ensuring the education process, co-funding projects, guest lecturer wages. (SAR, p.155)
RTA has established guidelines for scholarship payments to students in good standing (https://rulv.sharepoint.com/:w:/g/EZnRD2Gzmk5AnjF_7RbQPL4BDESrjKs6AvENNl8MNMZ3Uw?e=26R7Oq)
Regular scholarship for doctoral students is 996 EUR/annually.
As funding is never sufficient (Meeting with RTA management) experts recommend focusing more on additional income sources. Cooperation, joint projects with regional companies, research/consulting/training contracts for regional enterprises - are opportunities that could bring both an extra income as well as experience/interesting research topics to RTA.

Funding for the acquisition of RTA’s library collections has decreased significantly during the last 6 years which has to be fixed in order to keep library at the level of today’s scientific and technological development to serve staff, students as well as regional cooperation partners.

Conclusions on this set of criteria, by specifying strengths and weaknesses

RTA in cooperation with ViA provides all the resources necessary for students and lecturers.
The joint program could serve as a positive move towards extending of the cooperation.
More openness including IT systems, library, classrooms, laboratories in addition to excellent project results will help to attract more students to RTA in general and the Doctoral SP in particular.
Doctoral SP has been financed from the state budget, the doctoral students’ own tuition fees and attracted project funding.

Students can access information from both HEI libraries as well as scientific databases like ScienceDirect, Scopus, Web of Science etc.
Regular scholarship for doctoral students in good standing is 996 EUR/annually.
The resources available for the SP have to give more in return - PhD students, graduates, regional and international cooperation.

Strengths:
1. The doctoral program is a joint program with Vidzemes HEI which provides additional opportunities for cooperation, projects. The collaboration provides additional resources and so serves for better study results.

Weaknesses:
1. Very small number of students does not lead to real impact: neither to provide skilled researchers to local/regional/country industry nor to offer an additiuon to academic staff.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

The joint SP is based on resources from two HEI - RTA and Vidzemes HEI which both combined provide all necessary resources to achieve learning outcomes of the SP.

2.4. Teaching Staff

Analysis

2.4.1. In total, 14 teachers are included in implementation of the SP. Thereby are 2 RTA's teachers with scientific positions, 5 are RTA's professors and 13 have PhD degree (see Annex 9). Due to the scientific background of the PhD SP, RTA should consider increasing the number of teachers with scientific positions (only two at the moment: Lienīte Litavniece, Sergejs Kodors, Annex 9) in order to ensure the long-term sustainability of the programme at the RTA.
In general, the qualification of the teaching staff is sufficient and teachers are competent from technical and pedagogical point of view (meeting with students). The relationship between teachers and students is professional, but it is needed to inform more students about possibilities about ways to communicate possible individual issues (meeting with students). The usage of LMS is not at high level at all courses (Moodle presentation).
Doctoral SPs in general have high importance of relationship between the students and their supervisors and there were no reported issues in that context (meeting with students). However, the students seem to be not clearly informed about possibilities on how to communicate possible individual issues with teachers.

2.4.2. Changes in the composition are successfully carried out at the level of SP and in agreement between SP teachers and SP directors (meeting with SP director and academic staff). For example, Due to Prof. O. Užga-Rebrovs' retirement in 2022, the study course "Methods of risk modeling, assessment and management" is now delivered by assoc. prof. Lienite Litavniece. S. Kodors, who is the graduate of the programme and who is also the director of the Institute of Engineering and ensures the synergy of studies and scientific work by coordinating the involvement of teaching staff and doctoral students in scientific projects, has also joined the teaching staff of the doctoral study

programme. (SAR, p. 158). In both cases, the changes were done based on the corresponding skills and competencies of teaching staff, i.e. without endangering the quality of study programme.

2.4.3. Based on Annexes 13 and 14 provided by RTA as part of the list of additionally needed documents (request Nr. 21), the quality of scientific publication varies significantly - from conferences with a low (international) reputation to papers published in journals with higher impact factors.
Based on Annex 6 provided by RTA as part of the list of additionally needed documents (request Nr. 6), there are noticeable activities related to projects and project proposals. Thereby it is identifiable that some members of the academic staff are making a significantly higher effort than the average.
Employers have expressed willingness to collaborate with joint R&D projects, which could have significant scientific contributions as well (meeting with employers) and this is also one possibility to boost scientific productivity but also to gain new income sources.

2.4.4. Based on Annexes 13 and 14 provided by RTA as part of the list of additionally needed documents (request Nr. 21) the scientific productivity differs significantly, i.e. from a very low to a very high number of academic academic papers.
Due to the importance of scientific productivity for the relevance of PhD SP, academic staff should give preference to WoS indexed peer-reviewed journals over a large number of conference papers and journals that have no relevance indexing (see A. Teilans). Of course, international conference papers should not be neglected completely because they have importance for networking and international visibility. There also appears to be a lack of leadership in scientific research which can be assumed from the fact that the academic staff is rarely placed in the first place of authors (with the exception of P. Grabusts and S. Kodors).
In addition, Annex 13 for most of the academic staff presents relevant practical experience as well, from the provided CVs is not clear how the practical experience is related to the implementation of the SP. Namely, the practical experience should not be based on the implementation of the SP, but it should benefit the quality of implementation.

2.4.5. Teachers meet at least twice per year and discuss the implementation of the SP. This mechanism seems to be efficient (meeting with academic staff), but highly centralized due to the role of the SP director. Beter cohesion between teaching staff can be achieved by organizing brainstorming meetings to discuss various teachers' proposals. Thereby, anonymous proposals should also be possible to encourage teachers to raise possibly more sensitive issues. The cooperation between RTA and ViA seems to be efficient (meeting with SP director) and it is formally defined through Study Programme Council. Good cooperation is also visible at the course level - for example, “Research methodology and modelling data processing I, II” (4 KP) is delivered by one professor from RTA and one from ViA (SAR, p. 164).

Conclusions on this set of criteria, by indicating strengths and weaknesses

The teaching staff demonstrates sufficient qualifications and competence in technical and pedagogical aspects. Collaboration between students and supervisors appears to be strong, but students would benefit from clearer information on how to communicate their possible individual concerns with teachers.
Efforts are made to make changes in the teaching staff composition through collaboration between the SP teachers and directors. The scientific productivity varies significantly among the academic staff, with variations in the quality of publications and practical experience. Practical experience should contribute to the quality of programme implementation rather than solely be based on it. The meetings between teachers and the SP directors occur at least twice a year, promoting an efficient

mechanism for program implementation, although with a centralized structure.
The collaboration between RTA and VIA universities appears to be efficient, as indicated by the meetings with the SP directors and in SAR. Further collaboration with employers in joint research and development projects could enhance scientific productivity and create new income sources. Overall, these findings suggest that the joint SP can benefit from improving communication channels with students and promoting interdisciplinary collaborations to enhance the learning experience.

Strengths:
1. Competent teachers, which is also confirmed by students, graduates and employers. Thereby several teachers also have significant practical experience.
2. Good collaboration between teachers regarding the implementation of the SP.
3. Changes in the composition of the teaching staff are efficiently implemented, without any risks regarding the quality of SP.
4. Joint nature of SP and efficient cooperation between RTA and ViA
5. The relationship between teachers and students is professional.

Weaknesses:
1. Highly centralized decision-making due to the role of the SP director.
2. Effort to prepare and apply for scientific projects is not made at the same level by all members of academic staff, i.e. it is too low in some cases.

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Teachers are technically and pedagogically competent to deliver the learning outcomes, which was confirmed by students, graduates and employers. Thereby several teachers also have significant practical experience. They fulfil the requirements set out in the regulatory enactments (Regulation of Academic Positions in RTA, Annex "15. Regulation of academic position.pdf").

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

Fully compliant; compliance of the joint SP with the requirements of the Higher Education Law.

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Not relevant

3 3 - The descriptions of the study courses and the study materials have been prepared in all languages in which the study programme is implemented, and they comply with the requirements set forth in Section 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Fully compliant

Fully compliance, all study course descriptions are developed according to uniform guidelines see Annex “KursuApraksti_LV.zip” and “KursuApraksti_ENG.zip”

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Full compliance. A sample of the diploma and its annexes to be issued for completing the SP is in Annex 1.

5 5 - The academic staff of the academic study programme complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions.

Assessment of compliance: Fully compliant

Fully compliance, see Annex “atbilstība 55-3_AL_LV.edoc” and “atbilstība 55-3_AL_ENG.edoc”

6 6 - Academic study programmes provided for less than 250 full-time students may be implemented and less than five professors and associated professors of the higher education institution may be involved in the implementation of the mandatory and limited elective part of these study programmes provided that the relevant opinion of the Council for Higher Education has been received in accordance with Section 55, Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Not relevant

7 7 - At least five teaching staff members with a doctoral degree are among the academic staff of an academic doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field of science. At least five teaching staff members with a doctoral degree are among the academic staff of a professional doctoral study programme in arts (if applicable).

Assessment of compliance: Fully compliant

Fully compliance, see Annex “0-Apliecinajums-Par SSMd akademiska personala sastavu SSMd LV ENG-signed.edoc” and “0-Apliecinajums-Par SSMd akademiska personala sastavu SSMd LV ENG-signed.edoc”

8 8 - The teaching staff members involved in the implementation of the study programme are proficient in the official language in accordance with the regulations on the level of the official language knowledge and the procedures for testing official language proficiency for performing professional duties and office duties.

Assessment of compliance: Fully compliant

Fully compliance; the academic person teaches study courses in Latvian, which is the native language and it corresponds to the parameter of the SP - Latvian language. Knowledge of the national language of the academic staff is visible in Subsection 3.4. and in the common Annex 9 and Annex 10.

9 9 - The teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language, if the study programme or any part thereof is to be implemented in a foreign language (if applicable).

Assessment of compliance: Fully compliant

Fully compliance the HEI's confirmation of the relevant foreign language skills of the teaching staff involved in the implementation of the SP at least at B2 level according to the levels of the European Language Proficiency assessment, see Annex 12

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Fully compliance, see Annex “2022-RTA_ViA-sadarb-ligums-SSMd.edoc”

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

Fully compliance a document certifying that the RTA will provide students with opportunities to continue their education in another SP or at another university if the implementation of the SP is interrupted. Is available and signed with a secure electronic signature see Annex “5.pielikums.7z”

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme’s license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

Fully compliance a document certifying that the RTA guarantees compensation for losses to the students if the SP is not accredited due to the actions (activity or inaction) of the university or college or the license of the SP is revoked and the student does not want to continue his studies in another study program. Is available and signed with a secure electronic signature see Annex “6.pielikums.edoc”.

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Fully compliant

Partially compliant; the seventh subsection "assess program and subprogram costs" - does not exist in SAR.

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Not relevant

Not applicable; in Annex 4 is added academic confirmation that the student is studying for a doctoral degree, this is required for each SP and is not specific to the doctoral program.

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Partially compliant

The degree is partially compliant, but the seventh subsection "assess program and subprogram costs" - does not exist in SAR. However, all the necessary formal documents exist and are available.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

The joint doctoral SP with Vidzeme University of Applied Sciences has been implemented since 2011 and has had 15 students, 3 of whom have defended their doctoral thesis and obtained a doctoral degree. The SP also provides a full sequential cycle of study at the RTA, providing the opportunity to complete doctoral-level programme of studies. The joint SP between RTA and ViA demonstrates efficient cooperation and a professional relationship between teachers and students. However, there is a need to improve the usage of LMS in all courses to enhance the learning experience. Additionally, there should be a more consistent effort among the academic staff in preparing and applying for scientific projects to ensure a higher level of engagement and productivity.
More effort has to be put in attracting new students including global SF measures like more clear focus in research, more cooperation, more mobility, more real ambition. Only with the base growing the top (this doctoral program) will grow too.

Strengths:
1. Long cooperation experience with Vidzeme University of Applied Sciences and joint development plans for the future.
2. Well-defined study programme aims, objectives and learning outcomes that comply with the regulatory requirements.
3. High graduate employment rates.
4. Joint nature of SP and efficient cooperation between RTA and ViA
5. The relationship between teachers and students is professional.

Weaknesses:
1. Although the SP has been running since 2011, only 3 graduates have successfully completed it so far, which is relatively low.
2. The low number of students and graduates poses risks to the sustainability of the SP.
3. The usage of LMS is not at a high level in all courses.
4. Effort to prepare and apply for scientific projects is not made at the same level by all members of academic staff, i.e. it is too low in some cases.

Evaluation of the study programme "Sociotechnical System Engineering"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Sociotechnical System Engineering"

Short-term recommendations

1. Clearly inform students about possibilities about ways to communicate possible individual issues with teachers.

2. Introduce an action plan to increase the number of students, and analyse student drop-out rates more thoroughly and develop a plan to reduce it, for example by providing additional support to students to ensure the sustainability of the SP.
3. Review and update all the study literature.
4. Introduce clear requirements to increase the level scientific publications required for defence of the PhD Thesis.

Long-term recommendations

1. Efforts should be made to provide training and support for teachers to effectively utilize LMS platforms, ensuring students have access to valuable online resources and tools.
2. Take actions to widen scientific collaboration in EU and introducing high-level EU projects.

III - Assessment of the Requirements for the Study Field and the Relevant Study Programmes

III - Assessment of the Requirements for the Study Field and the Relevant Study Programmes

Assessment of the Requirements for the Study Field

Requirements	Requirement Evaluation	Comment
R1 - Pursuant to Section 5, Paragraph 2.1 of the Law on Higher Education Institutions, the higher education institution/ college shall ensure continuous improvement, development, and efficient performance of the study field whilst implementing its internal quality assurance system:	Partially compliant	Information on the RTA Quality Policy is not publicly available on the RTA website, however the RTA has created the RTA Quality Management Handbook, which together with other internal normative documents is available to RTA staff and students in the DMS. There is a weak link and even fragmentation between regulatory documents of study processes and quality management processes, several of which are outdated and require updating. The experts were not assured that the QMS as a whole was working effectively to ensure regular improvement and development of the SP and the SF, beyond the external quality assessment (accreditation) procedure established by the legislation. The existing SF management system and internal quality improvement processes could be improved as indicated by very low response rate to surveys, employers are unable to mention formal platforms for involvement in the improvement of SPs, the governance structure of the study area is very centralised around SP directors, reducing the opportunities for involvement of academic staff and students. The RTA has a good and varied system for submitting proposals and complaints, however, efforts should be made to raise students' awareness of such opportunities. The RTA collects various statistics and information from stakeholders, but there is a lack of follow-up meetings so that stakeholders are aware of the process of implementing their recommendations. The RTA website currently provides dissimilar information on SPs from the information provided in the official registers and the information submitted for evaluation, additionally it should be updated with more detailed information in Latvian and English (if applicable) on the content of SPs and study outcomes.

Requirements	Requirement Evaluation	Comment
R2 - Compliance of scientific research and artistic creation with the level of development of scientific research and artistic creation (if applicable)	Partially compliant	The direction of the scientific research activities connected to the evaluated SF complies with the general expectations in this educational field. Both the Institute and the Faculty of Engineering are strongly devoted to increasing the research activities connected to this SF by applying and monitoring the strategic goals. The involved academic and research staff are encouraged to perform high-value research activities, journal publishing, and participation in international conferences. The students from all three study levels are intended to be involved in the research and development activities of the University. The expectation for them regarding these activities is increasing as they step up their study levels. The obtained research results are satisfactory in quantity but could be improved in quality by publishing more in high-impact international journals. The teaching staff is obligated to perform research activities and these are strictly monitored. Increased visibility of these actions should be welcome. The approaches/methods/techniques used by RTA related to the research are fragmented and do not form a systematic approach, but RTA for the last years has done a lot to push forward the research domain. RTA puts the development of research and science as one of the elements of the strategic development plan. The regional opportunities should be utilized in a more effective way - leading EU-level projects, R2B activities, orientation toward commercialisation and establishment of long-running projects/collaboration with Latvian industry.
R3 - The cooperation implemented within the study field with various Latvian and foreign organizations ensures the achievement of the aims of the study field.	Partially compliant	RTA has established cooperation with the local business community, which is considered to be a significant benefit for the region and helps to achieve the objectives of the SF, to train ICT specialists primarily in Latgale region, but there is relatively weak cooperation with national and international industry. However, its potential is not completely reached nor there are clear activities to reach it. Furthermore, the international collaboration is at a minimum level, which disables stronger international visibility and relevance.

Requirements	Requirement Evaluation	Comment
R4 - Elimination of deficiencies and shortcomings identified in the previous assessment of the study field, if any, or implementation of the recommendations provided.	Partially compliant	Some advice has been put into practice and others have been put on a long delay till 2027 by RTA. It is clear that the higher education institution has contributed to the examination of suggestions and their application to the unique characteristics of the study topic and the associated study programs. Formally qualified and prior prerequisites have been satisfied, but just lately. Additionally, there are a number of recommendations that will be put into practice in the future but whose effects on their implementation cannot yet be assessed. Total of 11 previous recommendations, of which 5 have been fully implemented, the rest partially implemented will be implemented by 2027 RTA emphasizes the deadline. Possibility of a robust scientific infrastructure and scientist recruitment. Organized information system and availability of an online environment with the required software for students. Low level of collaboration with local stakeholders including businesses, government agencies, and graduates. There isn't a motivating structure for scientists that is straightforward.

Assessment of the Requirements for the Relevant Study Programmes of the Study Field

No.	Study programme	R5	R6	R7	R8	Evaluation of the study programme (excellent, good, average, poor)
1	Programming (41484)	Not relevant	Partially compliant	Fully compliant	Partially compliant	Average
2	Software engineer (42484)	Not relevant	Partially compliant	Fully compliant	Fully compliant	Average
3	Electronic Commerce Information Systems (45483)	Partially compliant	Fully compliant	Fully compliant	Fully compliant	Average

No.	Study programme	R5	R6	R7	R8	Evaluation of the study programme (excellent, good, average, poor)
4	Sociotechnical System Engineering (51482)	Fully compliant	Fully compliant	Fully compliant	Partially compliant	Good

The Dissenting Opinions of the Experts

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