

JOINT REPORT BY THE EXPERTS ON THE INCLUSION OF A LICENSED STUDY
PROGRAMME ON THE ACCREDITATION FORM

TRANSPORT AND TELECOMMUNICATION INSTITUTE

Study field

“MANAGEMENT, ADMINISTRATION AND MANAGEMENT OF REAL PROPERTY”

Doctoral study programme

“DIGITAL ECONOMY AND BUSINESS”

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I. Summary of the Assessment

The Doctoral study programme (DSP) "Digital Economy and Business" was created in 2021 to strengthen the business orientation of the Transport and Telecommunication Institute (TTI, university of applied science) to ensure a platform for combining technical knowledge and business innovative development. Both in the study programme description and during the face-to-face visit, the digitization of the economy and business was emphasised, as well as the importance of the development of digital economy, based on which this study programme is built. The DSP is implemented in the study field "Management, Administration and Management of Real Property" and is in the scope of this direction with number 51345.

The aim of the study field is clearly stated. The aim and objectives of the study programme are developed in accordance with the scope of the activity of TTI, directions of strategic specialisation, development needs and trends of the society and economy, as defined by the EU, Latvian national strategy and TTI Development Strategy 2020-2025.

The study programme is run fully in line with government policies and principles of good quality management. The structure of the management of the study field in general and the study programme in particular are oriented towards further development. The procedures for effective implementation of the study process are developed and implemented.

The doctoral study programme is unique in Latvia, thus ensuring a competitive advantage, it offers an interdisciplinary approach among management and engineering fields. The outcomes of external evaluations of the study programme are used for the improvements. The premises for studies the teaching and learning equipment are adequate in size and quality. Teaching materials (textbooks, books, periodical publications, databases) are adequate and accessible.

Professional and qualified staff with academic and practical experience in the field of study regularly improve their competencies and ensure the study process also in English.

Industry representatives – practitioners are invited as doctoral seminar participants. High research potential of the doctoral study programme. The study programme plan includes a comprehensive range of business and management and engineering study courses, and the study courses combine specific areas from both directions.

International cooperation in the field of scientific research within the study programme is ensured and improved in a target-oriented manner. The choice of partner universities complies with the TTI overall strategy toward internationalization and interdisciplinarity. However, the doctoral study programme should be more highly internationally oriented.

Scientific research is well-functioning and efficient, involving students. The relation between scientific research in the study programme and the study process has been defined and ensured appropriately, especially at the levels of rectors, study programme director. Scientific research and the outcomes thereof are integrated in the study process in the study programme in ways that complies with requirements. Scientific work of the academic staff of the program resulting in high-level publications (including SCOPUS Q1/Q2).

International cooperation in the field of scientific research within the study programme is ensured and improved in a target-oriented manner that complies with and fulfils requirements.

There is still a room for the improvements for choosing appropriate research directions and including of scientific articles written by the academic staff in study course descriptions and for closer cooperation with foreign professors in the study process.

The study programme has had great success in attracting foreign students, but attention needs to be paid to attract more Latvian students, thus fully ensuring the Latvian flow of studies in Latvian.

The teaching staff is very professional and motivated, the students are very satisfied with their studies and cooperation with the thesis supervisors, most of the thesis topics should be clarified.

II. Description of the study programme

1. Indicators describing the Study Programme

1.	Name of the higher education institution/college	Transport and Telecommunication Institute
2.	Name of the study field corresponding to the study programme	Management, Administration and Real Estate Management
3.	Name of the study programme	Digital Economy and Business
4.	Code of the study programme in accordance with the Latvian Education Classification	51345
5.	Language of study programme implementation	Latvian and English
6.	Amount, duration, form and type of the study programme (also distance-learning)	120 CP (180 ECTS) Full time studies - 3 years Part time extramural studies - 4 years
7.	Admission requirements	<ul style="list-style-type: none"> • Master Degree in Management, Economics and Business or equivalent education • Master degree in other social sciences, educational sciences or equivalent education, for a person with at least two years of professional work experience in the management of companies and institutions • Master degree in natural sciences, engineering or equivalent education, for a person with at least two years of professional work experience in the management of companies and institutions • All applicants must take the entrance exam for the doctoral study programme • For studies in English: a test score of at least B2 level from an internationally recognized testing institution, or the TTI entrance exam must be taken in English, except in cases where the previous education was obtained in English
8.	Address of the study programme implementation, indicating whether the study programme is implemented in the branches of the higher education institution / college	Lomonosov Str. 1, Riga, LV-1019, Latvia

9.	Degree, professional qualification or degree and professional qualification to be awarded	Doctor of Science (Ph.D.) in social sciences.
10.	Date of study programme licensing	October 13, 2021
11.	Date of starting the implementation of the study programme	2021/2022 spring semester (February 2022)
12.	Accreditation term of the study field	September 2, 2026

Analysis

1. Compliance of the study programme with the study field.

The doctoral programme was created in accordance with the development trends of the industry in Europe and the world and the requirements to promote innovations based on original research in doctoral studies; as well as being together with the UN Sustainable Development (SD) Program for 2030 and assistance with quality education (Goal 4); industrialisation, innovation and infrastructure (Goal 9) and sustainable cities and communities (Goal 11). During the visit, it was mentioned by the rector of TTI and the director of doctoral studies, and the descriptions of the study courses show that TTI's operational strategy complies with these principles and the Doctoral study programme includes a wide range of business and economics courses.

Implementing the doctoral study programme, which can be considered unique as it combines aspects of digitization with modern business, is in line with the overall strategy of TTI to be a leading private University in terms of Research Innovation and Engagement in Business/ Industry. During the on-site meeting, the TTI administration emphasized that this strategy is internationally oriented and was developed with the involvement of foreign consultants from the UK.

The submitted description and the explanations of the TTI administration and the study programme director indicate that the Doctoral study programme "Digital Economy and Business" has been created and developed as part of the study field "Management, Administration and Real Estate Management" in the Educational Programme Group (Management and Administration - 345), which is a logical continuation of studies in the framework of already implemented programmes at the bachelor's and master's level. The previous experience of TTI's management and academic staff in successfully implementing the Doctoral study programme in Engineering is essential.

Study programme admission requirements, in general, correspond to a Doctoral study programme in Economics and Business field and are in line with Articles 46, 47 and 83 of the Law on Higher Education Institutions, Regulation of the Cabinet of Ministers No. 846 of October 10, 2006 on Requirements, Criteria and Procedures for Admission to Study Programmes (with amendments) and Amendment to the regulations of the Cabinet of Ministers of October 10, 2006 no. 846 "Rules on requirements, criteria and procedures for admission to study programmes" (No. 399, July 5, 2022).

The study programme "Digital Economy and Business" is delivered in Latvian and English, in full-time and part-time. Starting with admissions from the spring semester of the 2021/2022 school year (4 students were initially admitted), there is a significant increase in the number of students (as of September 2023, a total of 17 students are studying in the doctoral study

programme), of which the English group is by far the largest, where mostly foreigners are studying, during the visit it was found out that only 4 students are studying in the Latvian. The aim of the study field is “to provide students with a sustainable high - quality education in the field of management studies, ensuring the development of competitive careers in the Latvian and international labour market and preparing internationally recognised, highly qualified specialists meeting the requirements of the modern employers' market in various fields of management and administration, using the results of research in the relevant scientific fields” (DSP Description, p.3)

The goal of the study programme is “to enable to acquire top-level study methods and principles of research work organisation and management, to be fluent in navigating the digital entrepreneurship and economics, to prepare qualified specialists for independent scientific and pedagogical work, to acquire internationally comparable competence in economics and business science and an internationally recognised scientific doctoral degree in Social Sciences” and its seven objectives are logically linked with the name, degree and qualification.” (DSP Description, p. 7)

Thus, generally the goal of the doctoral study programme is in frames of the aim of study field and the corresponds to the study field, however, no sustainability and ethics aspects are mentioned in the programme tasks and the description.

2. Compliance between the title of the study programme, the degree to be awarded and the qualification.

The title of the Doctoral study programme "Digital Economy and Business" provided by the TTI corresponds to the Doctor of Science (Ph.D.) in social sciences, which is awarded after a defence at the Promotion Council and complies with Cabinet of Ministers regulations no. 595 "Rules on groups of Latvian scientific branches, scientific branches and sub-branches" (27.09.2022). The sample of the diploma (SAR, Annex 1) generally complies with Cabinet of Ministers regulations no. 202 "Procedure in which state-recognized documents certifying higher education are issued" for the specified requirements, with the exception of use PhD instead of Ph.D. The same can be said about study contract sample (SAR, Annex 2). Thus the title and degree awarded fully correspond, but technical improvements in diploma and study agreement are needed.

3. Compliance of the study programme indicators (study programme code, amount, implementation duration) with the learning outcomes.

The study programme intends to award a corresponding Scientific Doctoral Degree - Doctor of Science (Ph.D.) in Social Sciences. By the recommendations of the study programme licensing experts, the Doctoral study programme “Digital Economy and Business” code was changed from 51311 to 51345 by adjusting the rest of the documentation. Now the title of the study programme and the degree are logically related to each other.

The doctoral programme now complies with Appendix 2 of Cabinet of Ministers Regulation No. 322 "Regulations on Latvian Education Classification"; The obtaining doctoral degree corresponds to Regulation of the Cabinet of Ministers No. 595 "Regulations on the groups,

branches and sub-sectors of Latvian science", 27.09.2022. However, the Science sub-sector was not specified in the Programme accreditation documents and during the on-site meeting.

The amount of the Doctoral study programme "Digital Economy and Business" is 120 CP (180 ECTS), implemented in full-time face-to-face form (duration - 3 years) in Latvian and English and part-time extramural studies (duration - 4 years) in Latvian and English too.

The study programme admission requirements for studies in Latvian are the following:

- Master Degree in Management, Economics and Business or equivalent education;
- Master degree in other social sciences, educational sciences or equivalent education, for a person with at least two years of professional work experience in the management of companies and institutions;
- Master degree in natural sciences, engineering or equivalent education, for a person with at least two years of professional work experience in the management of companies and institutions;
- Additionally, all applicants must take the entrance exam for the doctoral study programme (admission requirements are published on the TTI website (https://tsi.lv/study_programmes/digital-economy-and-business/));
- For studies in English: a test score of at least B2 level from an internationally recognized testing institution, or the TTI entrance exam must be taken in English, except in cases where the previous education was obtained in English.

There are additional language skills requirements for English studies: a test score of at least B2 level from an internationally recognized testing institution, or the TTI entrance exam must be taken in English, except in cases where the previous education was obtained in English. There is no clear explanation of the requirements for English skills on the website.

Admission conditions at least one scientific article or thesis on participation in an international conference is published on the TTI website but is not included in the Study programme parameters (DSP Description, p.7).

Study programme's intended results or learning outcomes are formulated as knowledge and understanding, skills and competences, which are in line with Latvian and European qualification framework (LQF and EQF) Level 8; in total 14.

The knowledge and understanding expected to be gained:

- expanding knowledge about the basic principles of the digital economy and business functioning, economic and political development trends in Latvia, Europe and the world;
- in-depth knowledge and understanding of the role of economic and political research in the development of the society;
- ability to manage methodologies and modern research methods in the field of economics and business;
- understanding of the interdisciplinary approaches both in research and in general pedagogy (DSP description, p. 8).

Skills expected to be developed:

- highly developed skills and abilities which are necessary to independently evaluate and select methods appropriate to the research, to contribute to the extension of knowledge and to be able to provide new insights into existing knowledge and its application in practice;
- the ability to develop an understanding of the topicality and relevance and patterns of socioeconomic processes taking place in Latvia and in the world, to analyse and to evaluate the digitalisation development trends and processes, and the ability to use the most important applied achievements in the field of data science in business;
- the ability to explain and present the results of their research in a reasoned manner;
- the ability to discuss the current economic and business issues with both professionals and the public;
- the ability to lead and/or coordinate the multidisciplinary research groups and/or work and to collaborate in an international context;
- the ability to identify, formulate and solve non-standard strategic challenges from real-world practice, developing an understanding of collaboration at inter - disciplinary level (DSP description, p. 8).

Competencies that are expected to be gained:

- to be able to propose independently the research ideas in the field of digital economy based on knowledge of global economic development trends and existing policies; to plan, to structure and to manage the large - scale scientific research projects, including the international ones;
- to be able to assess independently and analyse critically the major research or innovation challenges in the digital economy and to forecast the prospects of business development;
- to be able to implement an interdisciplinary approach to research, to analyse critically and synthesise using economic research methods and theory;
- to be able to develop independently the study content, teaching methods, to apply different teaching methods and to manage the teaching process, to use successfully the self-organisation and self-improvement skills (DSP description, p. 9).

The listed learning outcomes comply with study programme code, amount, implementation duration.

The study programme director looks very motivated and communicates well with students, and student-centred learning and teaching principles are taken into account.

During the evaluation period, the study programme has been developed, changes have been made in the content of the study courses and in the course of their implementation, thus avoiding duplication of the included topics and demonstrating the progress of the digital transformation of business. However, there is a lack of topics related to green and sustainable digital business.

The topics of the doctoral theses correspond to the study programme implemented in the field of Business Management but could be more precisely formulated, by observing the specific features of the research direction.

The number of students studying Latvian is very small (only four), which can be explained by the lack of state-funded places in the study program; while the number of students studying in the English language tends to grow because the program is modern, multidisciplinary, observing the high capacity of TTI's engineering direction and is therefore attractive not only in Latvia but also abroad.

The submitted documents do not indicate the amount of study courses intended to be taught in Latvian, during the student interview it was mentioned that only one study course was taught in Latvian so far, but the LR LHEI (part 56.3) requires at least 80% of the study courses to be provided in Latvian.

In the opinion of experts, sufficient analyses and considerations have been taken into account in the development of the Doctoral study programme, including TTI achieved performance indicators as well as student dynamics trends.

During the site visit, students did not provide knowledge of the features of international possibilities (credit points from HEI from abroad, ERASMUS+ program, double degree programmes, etc).

Conclusions, strengths and weaknesses

Based on the information provided in the description of the Doctoral study programme and the information obtained during the on-site visit, it can be considered that the DSP was created in accordance with the existing legislation of the Republic of Latvia, its set goal and objectives are achievable, learning outcomes are appropriate. DSP corresponds to industry trends in the EU and the world. In the implementation of the DSP, the current directions of TTI activities, and performance indicators have been analysed and taken into account, including positive dynamics of students.

Strengths:

1. Doctoral study programme “Digital Economy and Business” is focused on internationality, the number of foreign students studying in English was increased significantly during the reporting period.
2. The study programme director looks very motivated and communicates well with students, and student-centred learning and teaching principles are taken into account.

Weaknesses:

1. There is no indication about the language/s of the study courses in the course descriptions.
2. Due to the lack of state funding, the number of local students in Latvian flow is very small.
3. Inaccurate use of PhD instead of Ph.D. thus technical improvements in diploma and study agreement are needed.
4. Students do not make enough use of mobility opportunities.

2. Topicality of the study programme

Analysis

1. The topicality of the study programme and the compliance of the content with the tendencies of the industry (area), the changes made since the licensing of the study programme.

The Doctoral study programme description (DSP description) provides the industry's development trends and explains the impact of digital technology on employment. Several studies and international reports from the World Bank, the International Labor Organization, the World Economic Forum, and Pricewaterhouse Coopers ground the programme. The study programme also corresponds to Latvian Sustainable Development Strategy 2030 and "Guidelines for Science, Technology Development and Innovation 2021-2027" (ZTAIP 2027).

DSP description also provides benchmarking with similar study programmes abroad. TTI selected several European universities (UK, Finland, Germany, Italy) offering similar study programmes for a comparative analysis. However, the DSP description must provide the reasons for selecting these universities. As unique selling propositions of the TTI study programme, the following subjects are named: Digital Business and Society, Econometrics, and Big Data Analysis for Executives. The key findings of the comparison analysis provided in the DSP description are apparent to the experts, considering that TTI already provides a Doctoral study programme in the Engineering faculty. Nevertheless, the key findings from the benchmarking exercise were grouped into three criteria: ECTS, the doctoral study system, and the most taught study courses (DSP description, pages 10-12). All together these findings and criteria ground and explain the study programme's approach and structure, which is seen as a positive aspect.

During the site visit, the TTI representatives highlighted that this niche in the higher education market is not covered yet. They offer the Digital Economy and Business study programme with a multidisciplinary framework, with a strong point of business and engineering complementing each other.

During the site visit the TTI representatives presented the added value of the PhD study programme implementation from different angles: the TTI itself (prepares the researchers and academic staff), Latvia (developing digital skills for enterprises) and EU and other regions (Digital Europe program support the European Digital Innovation Centres (EDICs)). This point corresponds to the topicality of the study programme and the compliance with the tendencies of the industry.

The description of study courses (DSP description, pages 12-14) reveals the logic and sequence of the study programme to achieve intended learning outcomes. It is noted that the study course "Contemporary Economic Issues (PhD Seminar)" mentioned in DSP description doesn't correspond to the title in the Study course "Modern Economic Problems" included in the study plan.

From the topicality point in the list of subjects, experts suggest enclosing the following subjects to strengthen and make the study programme even more diverse: "Project Management", "Sustainable Economic Development" and "Robots and Artificial Intelligence".

The PhD students are appointed with one supervisor and one consultant, preferably from different fields (business/economics and engineering). Due to the relatively small number of students, this study programme's financial sustainability as a stand-alone business is under question. DSP states that tuition fees are sufficient to cover the full cycle of studies. However, this sensitive point should be monitored and could encourage cooperation with authorities and business entities to attract additional financial sources.

The doctoral study process consists of preparing an annual plan encompassing the stages and scope of the doctoral thesis, the mandatory presentation of research findings, main and elective courses and the examination procedure. DSP description states that the Pedagogy course is optional, but after completing students have two choices: to teach a lecture course or supervise the Bachelor thesis. During the site visit, student representatives confirmed being informed about these pedagogical procedures waiting for them in the following stages of their studies and willing to participate.

The study course mapping exercise described in the DSP description (p. 15) corresponds to the requirements of ESG European standards and guidelines for quality assurance of higher education. This approach should be extended and continued rather than presenting quality management standards under ISO 9001.

Doctoral students are offered to research the main topics in line with TTI's strategy and scientific orientations. Research areas encompass the following keywords: “digital”, “Internet”, “big data”, “innovation”, “clusters”, etc., and this content is in line with the tendencies of the industry (area). However, the experts would like to point out that to meet contemporary economic and business development trends students need to acquire broader competencies in sustainable development, green economy and artificial intelligence.

At the end of the study programme, the doctoral student must submit a report to the Council of Science and Doctoral Studies on the number of publications, certificates of participation in conferences, completed courses and the prepared doctoral thesis. Students must prepare and publish at least three scientific articles based on their research topic during their studies.

2. Dynamics of the student number and prospects of employment for graduates.

The student numbers in the study programme tend to grow from 4 students in April 2022 to 17 students in September 2023, of which 75% are foreign students and 25% are from Latvia. DSP description states that full-time studies – 9 students, part-time extramural studies – 3 students. The study form of the rest 5 students remains unknown. It needs to be mentioned that DSDP does not reveal how many students were planning to enrol at the beginning. However, TTI expects that the study programme's accreditation and the establishment of the Promotional Council for the defence of doctoral theses will increase the number of students in the doctoral study programme (p. 17). DSP description provides examples of 12 topics for the doctoral theses. The provided topics correspond to the study field and are interdisciplinary. The involvement of academic staff from cooperating institutions in Latvia (Rēzekne Academy of Technology) and abroad (Claude Bernard University of Lyon) to supervise doctoral students is a strong positive point in developing a doctoral study programme.

There is little information provided in the DSP description regarding the prospects of employment for graduates. The DSP description does not provide information on the

cooperation and partnership with business companies. That is not in line with the presentation provided by management during the site visit, where the list of national academic, research and business industry partners was provided, with 18 company names in total. Experts suggest starting cooperation with stakeholders, especially from banking, finance, insurance and other sectors involved and affected by business digitalisation issues, as well as digital and artificial intelligence solutions providers. This could benefit both sides and serve as a source of latest information for the further development of the programme.

Conclusions, strengths and weaknesses

The doctoral study programme "Digital Economy and Business" provided by TTI by no doubt is topical and relevant to the needs of the higher education institution, the state and region. The study programme corresponds to the TTI Strategy and naturally extends the chain of the study programmes of the Transport and Management Faculty, which previously provided study programmes at undergraduate and graduate levels. The digitalisation approach to contemporary economics and business fills the niche in the Latvian higher education market. On the other side, the growing dynamics of the student numbers gives a reason to presume that the study programme is attractive for prospective doctoral from abroad and corresponds to the industry needs.

Strengths:

1. The study programme corresponds to the TTI Strategy 2020-2025 Transformation plan, National strategy and Research clusters.
2. The multidisciplinary frame of the study programme and close cooperation with Engineering faculty allow a wider analysis of scientific phenomena and seek the practical applicability of research findings.
3. The study programme was offered in a timely manner and successfully fulfilled the higher education market's niche.

Weaknesses:

1. The DSP description does not provide the reasons for choosing particular universities from abroad for a benchmarking exercise.
2. The content of the study programme (study subjects) does not reflect some very important themes, such as Sustainable Economic Development and Robots and Artificial Intelligence.

3. Resources and provision

Requirement [R1]: Compliance of the study base, science base (if applicable), information base (including library), material and technical base and financial base with the conditions for the implementation of the study programme and for ensuring the achievement of learning outcomes.

Analysis

There is a chapter on Resources and provision provided in DSP Description, pages 19-31. The premises of TTI are located at Lomonosov Street 1, Riga. The campus building has classrooms, auditoriums and rooms for practical and laboratory classes, 10 computer labs, a library and reading rooms. There is also a canteen in the building and space where students can work or spend time. A secure wireless computer network is available in the building. Office365 and Microsoft Office applications are available to the students at no extra cost.

During the site visit TTI management presented having 19 labs to support academic and research activities. Expert visits to a few labs have confirmed that they exist and are equipped with robots, 3D printers, tools and other materials necessary to make projects. The experts admire the high motivation and qualification of the staff they met in the visited labs.

The e-learning Moodle platform was presented to the experts during the site visit. This platform is still an irreplaceable tool for organising online studies, providing learning material for students and organising tasks, course projects and exams remotely. The Moodle courses were filled in English with the course information and content, allowing experts to conclude that they were used in the study process. BigBlueButton conferencing system linked to Moodle is used for the remote classes.

A brief characteristic of the Study Base provided in DSP description could be used for any other TTI study programme evaluation. Study Base links and importance to the evaluated study programme Digital Economy and Business remain unclear.

DSP description states that “the library's main goal is to provide access to the library funds, electronic resources and information systems to the university students, staff and users of the library.” (p. 21). However, the visit to the library revealed the following aspects. There were difficulties accessing the online scientific resources (databases), and outdated scientific magazines were found in the reading room. During the site visit (it was Monday afternoon), no visitors met in the library. Remarkably, DSP description provides information on the square meters of the library, numbers of inventory documents and library working hours. Experts suggest paying more attention to the content and links to the particular study programme. Purchases of books, especially in the paper format do not contribute to the digitalisation of the business and are seen as not sustainable from an environmental point. After reading the DSP Description about the E-books and subscribed databases experts were expected to find in the library the tools to analyse big data arrays, cloud computing or platforms like Bloomberg Financial Markets Lab, that could be addressed to the digitalisation field of economics and business. The way to organise library work and academic community access to learning sources is seen as room for further improvements.

The main income of TTI comes from the tuition fees the students pay. DSP Description states that full-time students pay 3500 EUR per year and part-time students pay 2700 EUR per year. TTI issues grants for PhD students – once a year, a 100% discount. Three grants for two PhD study directions (engineering and management).

DSP Description also provides an average cost structure in the study programme. The largest cost positions are salaries and taxes about 57%. Due to the high labour costs of the highly qualified academic staff (professors and associate professors), the TTI plans to provide only 8 contact hours per credit point.

It is notable in DSP Description that scientific research projects are very significant additional resources available to ensure the current and long-term achievement of the results specified in the study programme. The TTI is very active in participating in digital business and economics research cluster, iDEA Hub, also international, national and contract research and development projects. The organization of international scientific conferences such as “Development of Modern Economic Science in the Context of digitalization” is seen as an additional source of income and academic activity in the research area.

Cabinet regulation and legislation encourage HEI to participate more actively in international projects.

Conclusions, strengths and weaknesses

Overall, the study base is sufficient to provide the study process: the campus building equipped with classrooms, auditoriums and rooms for practical and laboratory classes, computer labs, labs to support academic and research activities, a library and reading rooms as well as canteen and space where students can work or spend their time. The TTI has sufficient premises to provide and deliver doctoral study programme to the students.

Strength:

1. Technical labs supporting academic and research activities are alive and in use. The staff is very motivated and dedicated to their projects.
2. TTI is very active in participating in digital business and economics research cluster, iDEA Hub, also international, national and contract research and development projects.

Weakness:

1. The TTI should rethink what the library should be like to become a real modern knowledge centre for academic society in the contemporary university.
2. No tools to analyse big data arrays, cloud computing, data platforms or artificial intelligence that should be addressed to the digitalisation field of economics and business were mentioned in the DSP Description or presented during the site visit.

Evaluation of the requirement [R1]:

Requirement	Compliance			Justification
	Fully compliant	Partially compliant	Non-compliant	
Compliance of the study provision, science provision (if applicable), information provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and for ensuring the achievement of learning outcomes.		X		In general, TTI provides the students with a full-fledged study process. The premises and technical labs are adequate and well-equipped. The experts find insufficient electronic and digital

				library resources to ensure the learning outcomes of the study programme.
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Requirement [R2]: 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 of the laws and regulations.

Analysis

The doctoral study programme "Digital Economy and Business" is implemented by 8 TTI academic staff members (all professors or associate professors in the fields of business, economics and engineering) and one invited lecturer (with Doctoral degree). All members of the academic staff have extensive professional experience in academic work, 8 of the 9 teaching staff involved in the implementation of the study programme are experts of the Latvian Science Council (4 - in Business and Economics science, 4 - in Engineering and Technology), thus complying with LR law and regulations.

Biographies of the teaching staff members (in Europass CV format) show that the qualification of the teaching staff members involved in the implementation of the Doctoral study programme "Digital Economy and Business" complies with the requirements for the implementation of the Doctoral study programmes and the requirements set forth in the regulatory enactments, and it enables the achievement of the aims and learning outcomes of the study programme.

Academic staff is involved in scientific research what is evident from their CV and academic publications as presented in the Appendix 10. The topics of the publications are generally related to the courses delivered by the academic staff members.

The academic staff of the study programme cooperate regularly through various events such as joint participation in seminars, round table discussions, scientific conferences and projects. Mostly academic staff carry out research work in the research fields related to the topic of their taught study course and supervised doctoral thesis. During the on-site visit, the representatives of the academic staff testified that research results are used in the study process, but the scientific publications of the academic staff are not included in the study course descriptions.

During the visit, the experts, while meeting with the academic staff, made sure that the teaching staff has appropriate and sufficient English language skills for the implementation of the study process (English at least at B2 level), as well as the confirmation from the TTI administration about the skills of the Latvian language.

The academic staff actively participates in international scientific conferences with presentations of studies related to the subject taught within the study programme.

The academic staff of the study programme develop their professional competences by participating in the ERASMUS+ teaching and staff mobility programmes (6 used this opportunity), as well guests professors from Spain and Bulgaria shared their experience with the study programme students and academic staff.

The academic staff cooperates in the form of interdisciplinary research, integrating their knowledge in various fields. During the assessment period, the academic staff of the study programme has implemented research projects, collaborated with researchers from other HEIs in the development of scientific papers.

The academic staff involved in the Doctoral study programme stands out with a high scientific and pedagogical level qualifications and meet the following criteria: a doctoral degree in the field corresponding to the field of study; publications in the fields related to the study programme, most of the academic staff participated in international and national level research and development projects during the reporting period.

Conclusions, strengths and weaknesses

The qualification of the academic staff involved in the implementation of the multidisciplinary Doctoral study programme “Digital Economy and Business” complies with the requirements for the implementation of the study programme and the requirements set forth in the regulatory enactments, and it enables to achieve the aims and learning outcomes of the study programme and the relevant study courses. The academic staff is highly involved in scientific research both at the national and international levels. The research outputs are used in the study process. There is a mutual collaboration between the academic staff members in place, which contributes to the improvement of the study courses and their correlation.

Strengths:

1. High qualification of the teaching staff, most of them are full professors and all have doctoral degrees.
2. Scientific work of the academic staff of the study programme resulting in high-level publications (SCOPUS Q1/Q2).
3. The academic staff cooperates in the form of interdisciplinary research.

Weaknesses:

1. Insufficient involvement of foreign guest professors as lecturers and industry experts as consultants in study programme implementation.
2. High-level publications of the academic staff are not included in the course descriptions for taught subjects.

Evaluation of the requirement [R2]:

Requirement	Compliance			Justification
	Fully compliant	Partially compliant	Non-compliant	
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	X			The qualification of academic staff complies with the requirements. Publications indexed in Scopus Web of Science databases, academic staff takes part in organization

programme and the requirements of the laws and regulations.				and participation of scientific conferences, projects.
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Requirement [R3]: 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 artistic creation (if applicable).

Analysis

The directions of scientific research in the study programme comply with the development aims of TTI are relevant to the study programme and are also relevant to the industry. Room for enhancement nonetheless exists. There are signs that the level of ambition for all research professors could be even higher. The publication of scientific articles could be distributed more evenly among the streams. The doctoral level study programme is of decisive importance for all study field “Management, Administration and Real Estate Management”. This study programme has a potential influx of PhDs to TTI and other internal and external Latvian HEIs and scientific institutions.

In most cases, the relation between scientific research in the study programme during the study process has been defined and ensured appropriately, especially at the levels of rector, vice-rectors and study programme director. Scientific research and the outcomes thereof are integrated in the study process in ways that complies with requirements. However, as the publications of the staff shows, more focus on conducting interdisciplinary research is needed.

Scientific research is well-functioning and efficient. The students are involved in scientific research and present their reports at international scientific conferences or seminars, as well as modern methods of data analysis and data processing have been used within the research. Students can use laboratories, databases, diverse software and scientific resources at the disposal of TTI for their research. The laboratories of TTI provide the access to equipment and special software purchased for scientific research purpose. More information on the laboratories and research clusters: <https://tsi.lv/research/research-at-tsi/research-clusters/>. However, there are not enough laboratories and databases available for doctoral students to conduct empirical research in economics and business (e.g. Bloomberg lab, ORBIS etc.)

International cooperation in scientific research within the study programme is ensured and improved in a target-oriented manner that complies with and fulfils requirements. However, there is still room for improvement in having more professor visitors to TTI. Such international collaboration would contribute to more research and more research publications and, thus, indirectly contribute to the quality of education, as perceived by students in study programme.

According to the study programme description students during the study process develop their Doctoral Thesis. Part of the development of a Doctoral Thesis is also scientific articles on the results of studies (in total 5, including at least one in an anonymous peer-reviewed scientific journal indexed in SCOPUS or Web of Science and having an Impact Factor (IP) indicator) and their presentation at scientific conferences.

For the time being, TTI has not yet been delegated the right to award a doctoral degree in Economics and Business (per Article 11 Part 3 of the Law on Scientific Activities of the Republic of Latvia). An agreement has been concluded with the Turība University of Business,

where the Promotional Council has already been established, which is delegated to award the doctoral degree in Economics and Business.

The experts conclude that the study programme for obtaining a doctoral degree is based on the achievements and findings of digitalisation in the Business and Economic sector and is therefore fully compliant.

Conclusions, strengths and weaknesses

The direction of scientific research complies with the development aims of TTI, is relevant to the study field and to industry. The doctoral study programme has potential to supply TTI and other Latvian and foreign institutions with researchers and/or academics.

In most cases, the relation between scientific research in the study process has been defined and ensured appropriately, especially at the levels of rector, vice-rector as well as study programme director. Scientific research and the outcomes thereof are integrated in the study process in the study programme in ways that comply with requirements. Even so, in some study programmes there is not enough sufficiency of the level of scientific activity and applied research in the field of industry which is linked with a respective study programme.

International cooperation in the field of scientific research within the study direction and the relevant study programmes is ensured and improved in a target-oriented manner that complies with and fulfills requirements. There is still room for improvement in terms of having more professor-level visitors to TTI.

Strengths:

1. High research potential of the doctoral study programme in the fields of Business, Economics and Engineering in the direction of digitization.
2. International cooperation in the field of scientific research within the study programme is ensured and improved in a target-oriented manner.
3. Scientific research is well-functioning and efficient, involving students. The academic staff is well in step with the students.

Weaknesses:

1. Scientific research does not live up to their full potential in conducting interdisciplinary research.
2. Not enough laboratories and databases available for doctoral students to conduct empirical research in the field of economics and business

Evaluation of the requirement [R3]:

Requirement	Compliance			Justification
	Fully compliant	Partially compliant	Non-compliant	
The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the	X			Achievements and insights in the relevant field are integrated into the implementation of

respective field of science or artistic creation (if applicable).				the study programme and therefore the Doctoral study programme is fully compliant
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Requirement [R4]: Compliance of the study programme with the requirements of the Law on Higher Education Institutions and other laws and regulations.

No.	Requirement	Full y complia nt	Part iall y complia nt	No n-co mp lia nt	Justification
1.	<p>The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard, including the minimum requirements for the content of the compulsory civil protection course and the content of civil protection training for employees specified for the implementation of the study programme.</p> <p>The study courses of the professional study programmes include a module for the development of professional competence of entrepreneurship in the amount of at least 6 CP, if it has not been acquired in the previous professional study programme or is not included in the theoretical basic courses of the study programme branch (field of professional activity).</p>	X			<p>The study programme complies with Regulations of the Cabinet of Ministers No. 1001 “Procedure and criteria for the awarding of a scientific doctoral degree”.</p> <p>According to Regulations of the Cabinet of Ministers No. 1000 “Regulations on the delegation of the right to award doctoral degrees to universities”, TTI does not have the promotion rights, but TTI has submitted an agreement with the University of Business “Turība”</p>
2.	The study programme complies with a valid professional (occupational) standard, or with the requirements of professional qualification (if it is not necessary to develop a professional standard for the profession), if a				<i>Not applicable</i>

	professional qualification is awarded after acquisition of the study programme				
3.	The code of the study programme complies with the Cabinet regulations on the Latvian Education Classification	X			The code of the Doctoral study programme - 51345 is in accordance with the Latvian Education Classification
4.	The qualification of the teaching staff ¹ complies with the conditions and requirements set for the implementation of the study programme, which are specified in the regulatory enactments in the field of education including the participation in the implementation of an academic study programme of at least five professors and associate professors together who have been elected to academic positions in the respective higher education institution, except in the cases provided for in Section 55, Part two of the Law on Higher Education Institutions.	X			The composition of academic staff complies with the requirements set out in Section 55, paragraph 1. 3 of the Law on Higher Education Institutions. 8 Professors and Associate Professors elected at TTI participate in the implementation of the Doctoral study programme “Digital Economy and Business”
5.	Confirmation of the higher education institution/college that 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, according to the European Language Proficiency Assessment levels (the division of levels is available on the website www.europass.lv), if the study programme or any part thereof is to be implemented in a foreign language or proficiency of the Latvian language at least on the	X			Confirmation from the TTI administration about the English language proficiency of the teaching staff involved in the implementation of the study programme at least at the B2 level according to the levels of the European Language Proficiency assessment and the Latvian language proficiency

¹ As used in this document, the term “teaching staff” refers to the academic staff and visiting professors, visiting associate professors, visiting lecturers, visiting lecturers, and visiting assistants of the corresponding higher education institution / college.

	B2 level, if the study programme or a part thereof is intended to be implemented in the Latvian language and the lecturer has not acquired secondary or higher education in the Latvian language.				
6.	The study programme, which is intended to be implemented in a foreign language, complies with the requirements of Section 56, Part three of the Law on Higher Education Institutions	X			Annex 4 Study plan in Latvian, no information has been provided about the planned study courses in Latvian. During the meeting students said that only one course so far was in Latvian
7.	The sample of the study agreement complies with the mandatory provisions to be included in the study agreement (if applicable).		X		Annex 2 Sample of study contract, in study agreement the name study field is not updated, and use of <i>PhD</i> instead of <i>Ph.D.</i>
8.	The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure by which state recognised documents of higher education are issued (if applicable).	X			Annex 1 Sample of diploma to be issued for completing the study programme, however <i>PhD</i> is used instead of <i>Ph.D.</i>
9.	The higher education institution/ college has confirmed that it will provide the students with the options to continue the acquisition of education in another study programme or at another higher education institution/ college (a contract with another accredited higher education institution/ college), in case the implementation of the study programme is discontinued (if applicable).	X			<i>Information has not changed since the licensing of the study programme</i>
10.	The higher education institution/ college has confirmed that it guarantees to the students a compensation for losses if the	X			<i>Information has not changed since the licensing of the study programme</i>

	study programme is not accredited or the licence of the study programme is revoked due to the actions of the higher education institution/ college (actions or omissions) and the student does not wish to continue the studies in another study programme (if applicable).				
11.	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).	X			Annex 17 and Annex 18 (of additionally submitted information by TTI)
12.	The scientific and pedagogical qualification of doctors of science complies with the criteria specified in the regulatory enactments regarding the evaluation of the scientific and pedagogical qualification of a candidate for the position of a professor and an associate professor (if applicable).	X			Annex 18 and additional information provided by TTI
13.	The joint study programme complies with the requirements prescribed in Section 55 ¹ , of the Law on the Higher Education Institutions (if applicable).				Not applicable

Evaluation of the requirement [R4]:

Requirement	Compliance			Justification
	Fully compliant	Partially compliant	Non-compliant	
Compliance of the study programme with the requirements of the Law on	X			DSP mostly complies with requirements of the Law on Higher Education Institutions

Higher Education Institutions and other laws and regulations.				and other relevant regulations.
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4. Implementation of the recommendations received during the licensing of the study programme

Assessment of the implementation of the recommendations provided by the licensing experts of the study programme.

Analysis

There is a list of 11 recommendations provided by the licensing experts during the licensing of the study programme. Of these, 3 are short-term, and 7 are long-term (DSDP page 31). In the DSDP document, TTI provided the list of Higher education institution activities and achieved results and as a result, states that the recommendations were fully completed.

Response to the short-term recommendations.

Experts agree with TTI that there is no need to change the name of the study programme “Digital Economy and Business”. This study programme is well-grounded and can achieve the intended learning outcomes. Because TTI has not been delegated the right to award the doctoral degree in Economics and Business, the Cooperation Agreement No. 589 - 2021 with "Turība University of Business " was signed on November 5, 2021.

One of the recommendations suggested that “Before the admission of students, it is recommended to place the course "Project Management...”. In response to this TTI states that “the structure of the doctoral study programme has been specified by including the relevant topics in the existing study courses”; however, the experts believe that this does not correspond to the initial means of recommendation and still suggest to include “Project Management” course, especially to the students with no prior education in Economics and Business. This recommendation is considered by experts as partially implemented.

To respond to the issue and clarify how the methods used in the student's research are assessed, the 2 documents were approved: February 1, 2022, a new form of the study course description and September 27, 2022, the amendments to the Regulations for Doctoral Studies.

Response to the long-term recommendations.

In response to the recommendation to prepare a plan or strategy for more active involvement of foreign guest professors and/or lecturers in the implementation of the study programme, the TTI responded with several initiatives such as training and certification of existing academic staff in accordance with the UK Professional Standards Framework for Teaching and Supporting Learning in Higher Education, allocating a budget of 3 000 EUR to recruit foreign visiting professors or lecturers, to promote of ERASMUS+ BIP (Blended Intensive Programme) mobility to attract visiting professors and ensure the internationalisation opportunities of

doctoral students, also to involve the doctoral students in summer schools through COST Actions and recognition of credit points.

To conclude cooperation agreements with the representatives of the business community they have concluded the agreements and action plans with Accenture Latvia, and Riga International Airport with an action plan of cooperation.

To respond to the request for the collection of feedback and quality management process (discussions with doctoral students as a permanent mechanism for collecting the feedback at the doctoral studies level) the TTI presented the amendments to the Rules on the Organisation of Students, Alumni and Employers Surveys, also Doctoral programme students survey results (Appendix 13)

Licensing experts group also suggested to consider to conclude the cooperation agreement on the establishment of the planned joint doctoral school with the foreign HEI. TTI selected the University of Genoa as a cooperation partner. The agreement of a Memorandum of Understanding with the University of Genoa on the implementation of the doctoral programme is expected to be signed by the beginning of the next academic year. This aspect is considered partially implemented.

Another recommendation was to promote the research of faculty members in the topics relevant to the Doctoral Study Programme - "Digital Economy/Business/Society" and scientific publications in this research field. To respond to this since the time when the study programme was licensed, 50 publications have been published by the faculty both in journals and conference proceedings indexed in Web of Science and Scopus.

There was a recommendation to provide students with access to the second most common indexing database Web of Science. TTI states that "students have access to the indexing and citation database Scopus through the Ministry of Education and Science of the Republic of Latvia." Access to the Web of Science is available to the students by becoming users of the Latvian National Library. This aspect is considered partially implemented.

The recommendation "to consider the possibility of concluding a cooperation agreement as referred to in Criterion 2 of Requirement V of this opinion with another HEI which implements a study programme in the field of study "Management, Administration and Real Estate Management" corresponding to the Doctoral Study Programme to be licensed" was responded by the signed cooperation agreement No. 589-2021 with the Turība University of Business, which has been delegated the right of promotion doctoral studies in Economics and Business and which has established the Promotion Council. The agreement also foresaw the possibility, if the study programme is closed or the study programme is not accredited, to provide study opportunities in the doctoral study programme of a similar field of study at the Turība University of Business. During the site-visit TTI representatives stated that there is plan and steps made to acquire the right of promotion doctoral studies in Economics and Business and establish the Promotion Council themselves.

Conclusions, strengths and weaknesses

In total, out of 10 recommendations, 7 have been implemented and 3 have been partially implemented.

Strengths:

1. Most of the recommendations have been implemented and timely responded to the issues pointed out by the licensing experts group.

Weaknesses:

1. The TTI should ensure access to the main indexing and citation database for the doctoral students.
2. Cooperation with foreign Higher education institutions to strengthen the internationalisation of studies, and establish summer doctoral school for doctoral students is seen as one of main shortcomings of TTI activity.

III. Assessment of the study programme

Excellent	<u>Good</u>	Average	Poor
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IV. Recommendations

Given the findings in the expert evaluations, the expert team recommends the study programme “Digital Economy and Business” to be included in the “Management, administration and management of real property” study field

Recommendations for the elimination of the deficiencies identified (on a short-term basis):

1. Make TTI Quality Policy publicly available in English language on the website of TTI for Erasmus+ students, foreign visiting professors, foreign partners.
2. Organize more efficient external evaluation of the study programme for the possible improvements. Provide this evaluation involving all stakeholders (students, academic staff, especially potential employers).
3. Make technical changes in use of PhD instead of Ph.D. in diploma and study agreement are needed.
4. Provide information in course descriptions on which study courses are taught in Latvian and which study courses are taught English.
5. Increase cross-disciplinary across the study programme, including increasing the role of digitalization and artificial intelligence.
6. Increase research intent among academic staff and especially doctoral students, including intent to publish more in Scopus and especially WoS journals. Consider to provide incentives for TTI academic staff to engage with international journals that are WoS and/or Scopus journals.
7. Consider to have more support for journals with TTI chief editor or editorial-board members.
8. Create an interactive space for Ph.D. students to discuss research topics, promote the use of ResearchGate.net for these purposes.
9. Invite digital transformation leaders of companies and public administrations to participate in doctoral seminars.

The short-term recommendations should be implemented without delay, before next enrolment of students.

Recommendations for improving the study field (on a long-term basis):

1. Update the Development Strategy of TTI from 2020 – 2025 by including quantitative and qualitative indicators to monitor the plan's progress and ground it on the available human and financial resources needed to implement the actions, emphasising overcoming the weaknesses.
2. Extend interaction and collaboration with other higher education institutions in Latvia, other Baltic states, and beyond.

3. More closely cooperate with internationally recognised professors and industry leaders in the multidisciplinary Doctoral study programme.
4. Recruit professors and researchers from abroad to contribute to an increasingly international and cosmopolitan innovative milieu, as well as to bring students closer to world-class research.
5. Rethink the existing Quality Management System and reform it to correspond to the European Standards and Guidelines for Higher Education. Develop user friendly TTI Quality Assurance Handbook with clearly and simply described management procedures.
6. Develop the procedure for obtaining feedback from academic staff, masters study programmes graduates - potential doctoral students, potential employers.
7. Taking into account the lack of state funding and the low number of students in Latvia, strengthen its development by redistributing internal funding or consider conducting studies only in English.
8. In the long term, cooperate more closely with potential employers from HEIs, scientific institutions, public administration and businesses.
9. Develop, popularize and utilize incentives and possibilities offered at TTI (software, laboratory etc.).
10. Focus and prepare the human potential of the doctoral study programme to explore new ways of distance learning and online teaching, learning and assessment; optimize the learning experience of doctoral students using technological e-tools, including artificial intelligence, maximize the use of open materials and e-resources.
11. Explore international cooperation that would offer academic staff and students more opportunities for international exchanges in order to extend the Erasmus+ exchange directions. Take the opportunity to disseminate information among HEIs involved in the ERASMUS+ programme for attraction of incoming professors and students.
12. Consider the possibilities of creating a joint study programme with leading European universities in the field of studies.
13. Review the number of grants and other internal funding between two TTI doctoral study programmes in order to develop a new multidisciplinary field of study.
14. Research capabilities and publications in high-quality journals and high-quality publishers should be spread by disseminating research ideas, interdisciplinary research could be increased.
15. Follow up on the implementation of the new doctoral model developed by Latvian higher education and find opportunities to use new mechanisms and thus further develop the study programme.

The long-term recommendations should be implemented before the next accreditation of the study programme.