ROMANIAN AGENCY FOR QUALITY ASSURANCE IN HIGHER EDUCATION
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Annex No. 3

The External Evaluation Report of a Doctoral Study Domain

Contents

I. Introduction[1]

In this chapter, the following shall be summarized:

- the context in which this external evaluation report was drafted (**the type of evaluation, the period of the evaluation visit, the composition of the Experts Committee** etc.);
- details about the doctoral school(s) of which the doctoral domain under review is part (number of doctoral advisors, number of students, institutional context, short history etc.);
- details about the doctoral study domain under review (number of students, institutional context, short history etc.).

This External Evaluation Report is based on the Internal Evaluation of University Doctoral Studies in the field of Computer Science, several online meetings with employers' respresentatives, members of the school council / doctoral schools (CSD) members, PhD students, PhD supervisors, old graduate students, etc. Due to the present COVID-19 scenario, the external evatulator cannot visit to the Department / University in person. The Expert Committee for Computer Science domain consists three members, Prof. Dr. Andrei Paun (internal), Prof. Dr. Qamrul Hasan Ansari (External) (My self) and Mr. Sebastian Stefaniga (PhD student).

The Computer Science field falls under the Faculty of Mathematics and Computer Science (FMI). The Doctoral School of Mathematics and Computer Science (SDMI) is responsible for the doctoral Studies in doctoral programs in the field of Mathematics and Computer Science with the main purpose of the programs is to promote high quality fundamental and applied research, as well as interdisciplinary research. The main objectives of the doctoral programs wthinin SDMI is to produce a valuable scientific activity, visible internationally, scientific publications, methods and algorithms, etc. The SDMI emphasises on quality educational process for PhD students, scientific traning of doctoral students at international standard and high level scientific research.

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[1] Each time when applicable the information shall be presented gender-wise.

There are eight PhD supervisors in Computer Science domain out of which 6 are full-time and 2 are retired. All the supervisors are working in the hot and emerging topics in their field of specializations. In the current academic year (2020-2021), there are 54 doctoral students in the domian of computer science. Several PhD students are involved in the internship.

With a very high vision and a very high mission, the computer science domain has almost all mordern faciliites for the PhD students. A very high number of research papers is published by the doctoral supervisors and their PhD students. All these papers are on the current topics in their field and also in SCI journals with high impact factor.

II. Methods used

This chapter will contain the methods and tools used in the external evaluation process, before and during the evaluation visit, including at least:

• The analysis of the internal evaluation report of the doctoral study domain under review and its Annexes;

• The analysis of documents made available by the IOSUD, in physical format, during the evaluation visit (if such documents have been requested);

• The analysis of documents, data and information available on the IOSUD/Doctoral School(s) website, in electronic format;

• Visiting the buildings included in the institution's property, comprising (indicative and non-exhaustive list, which shall be changed according to the context):

- classrooms;
- laboratories;
- the institution's library;
- research centers;
- the Career Counselling and Guidance Center;
- lecture halls for students;
- the student residences;
- the student cafeteria;
- sports ground etc.;

• Meeting/discussions with doctoral students in the doctoral study domain under review;

• Meeting/Discussions with the graduates of the doctoral study domain under review;

• Meeting/Discussions with employers of the graduates in the doctoral study domain under review;

• Meeting/Discussions with the school officials of the Doctoral School(s) in which the doctoral study domain under review is operating;

• Meeting/Discussions with the doctoral advisors in the doctoral study domain under review;

• Meeting/discussions with the representatives of the various structures of the IOSUD/Doctoral School(s) in which the doctoral study domain under review is operating:

- The Council of the Doctoral School, the University Senate, the Board of Directors, the Quality Assessment and Assurance Commission, the Quality Assurance Department, the Ethics Commission (including with the student representatives of these structures);
- the Career Counselling and Guidance Center;
- student organizations;

- secretariats;
- various departments/administrative offices (Social/Student residences-Cafeterias etc.);

• Application of questionnaires to doctoral students or academic staff in the doctoral study domain under review.

The method of evaluation is used on the prescribed format provided by the ARACIS. It is based on the Internal Evaluation of University Doctoral Studies in the filed of Computer Science Report and several online meetings with employers' respresentatives, members of the school council / doctoral schools (CSD) members, PhD students, PhD supervisors, old graduate students, etc. Due to the present COVID-19 senero, it was not possible for the external evatulator to visit the Department / University.

During the discussion with several online meetings, it is found that almost all the students are very much satisfied with the facilities provided by the university. No old student had any complaint about the facilities in the university. Most of the students are very much safisfied with their PhD advisor and working in the hot / current topic in their field.

III. Analysis of ARACIS's performance indicators

Domain A. INSTITUTIONAL CAPACITY
general description of domain analysis.

*The SDMI opertaes on the basis of the **Regulations for the Doctoral School of Mathematics and Computer Science.** The SDMI Regulation complies with all the provisions of the Regulation of the Babes-Bolyai University for the organization and development of doctoral studies. The director of the doctoral school is apponted by CSUD based on the proposal made by the Doctoral School Council following the internal elections. The Doctoral Scholl of Mathematics and Computer Science is led by the Doctoral School Council (CSDMI). At the level of SDMI there are internal procedures for analysis and approval of proposals on the topc of doctoral studies and procesures for internal evaluation of the quality. The SDMI Regulation contains regulations on Doctoral studies and Doctoral School of Mathematics and Compluter Science.*

Criterion A.1. The administrative, managerial institutional structures and the financial resources
general description of the criterion analysis.

The Babes-Bolyai University (BBU) is well organized and run with its own regulations, methodologies and procedures developed in accordance with national regulations and legislation. SDMI operates on the basis of the Regulations of the Doctoral School of Mathematics and Computer Science. The SDMI Regulation complies with all the provisions of the Regulation of the BBU. The Doctoral School of Mathematics and Computer Science is led by the Doctoral School Council (CSDMI).

Besides 11 research or institutional / human resources develop grands, BBU also allocate some fund for research grant. During 2019-2020, 6000 lei was granted to the domain of Computer Science. 47.36% from the 19 doctoral students are on the state budget.

Standard A.1.1. The institution organizing doctoral studies (IOSUD) has implemented the effective functioning mechanisms provided for in the specific legislation on the organization of doctoral studies.
*general description of the standard analysis.

Legislative framework, regulations of Council of Doctoral Studies (CSUD), organizing and conduct of the competition for admission, methodology to conduct the election of CSUD, etc are framed according to the national policy.

Performance Indicator A.1.1.1. *The existence of specific regulations and their application at the level of the Doctoral School of the respective university doctoral study domain:*
(a) the internal regulations of the Doctoral School;
(b) the Methodology for conducting elections for the position of director of the Council of doctoral school (CSD), as well as elections by the students of their representative in CSD and the evidence of their conduct;
c) the Methodologies for organizing and conducting doctoral studies (for the admission of doctoral students, for the completion of doctoral studies);
d) the existence of mechanisms for recognizing the status of a Doctoral advisor and the equivalence of the doctoral degree obtained abroad;
e) functional management structures (Council of the doctoral school), giving as well proof of the regularity of meetings;
f) the contract for doctoral studies;
g) internal procedures for the analysis and approval of proposals regarding the training for doctoral study programs based on advanced academic studies.
- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself
Recommendations:

The indicator is fulfilled.

Performance Indicator A.1.1.2. *The doctoral school' Regulation includes mandatory criteria, procedures and standards binding on the aspects specified in Article 17, paragraph (5) of the Government Decision No. 681/2011 on the approval of the Code of Doctoral Studies with subsequent amendments and additions.*
- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself
Recommendations:

The indicator is fulfilled.

Standard A.1.2. The IOSUD has the logistical resources necessary to carry out the doctoral studies' mission.
general description of the standard analysis.

The logistic resources (AcademicInfo) provides the space to store the data related to the progress report of the doctoral program. The entire activity in the doctoral study program is ensured through personal folder. The BBU provides the logistic resources to support the mission of achieving doctoral studies. The BBU has one of the best performing analysis programs. The BBU acquired and annually renewed the software (iThenticate) license to facilitate verufying the similarity procentage in all doctoral theses

Performance Indicator A.1.2.1. *The existence and effectiveness of an appropriate IT system to keep track of doctoral students and their academic background.*
- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself
Recommendations:

The indicator is fulfilled.

Performance Indicator A.1.2.2. *The existence and use of an appropriate software program and evidence of its use to verify the percentage of similarity in all doctoral theses.*
- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself
Recommendations:

The indicator is fulfilled.

Standard A.1.3. The IOSUD makes sure that financial resources are used optimally, and the revenues obtained from doctoral studies are supplemented through additional funding besides governmental funding.
general description of the standard analysis.

The financial resources of SDMI are optinally used, while the incomes obtained by doctoral studies are complemented by funding in addition to that offered by the government.

Performance Indicator A.1.3.1. *Existence of at least one research or institutional / human resources development grant under implementation at the time of submission of the internal evaluation file, per doctoral study domain under evaluation, or existence of at least 2 research or institutional development / human resources grant for the doctoral study domain, obtained by doctoral thesis advisors operating in*

the evaluated domain within the past 5 years. The grants address relevant themes for the respective domain and, as a rule, are engaging doctoral students.

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Performance Indicator *A.1.3.2. *The percentage of doctoral students active at the time of the evaluation, who for at least six months receive additional funding sources besides government funding, through scholarships awarded by individual persons or by legal entities, or who are financially supported through research or institutional / human resources development grants is not less than 20%.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Performance Indicator *A.1.3.3.[2] *At least 10% of the total amount of doctoral grants obtained by the university through institutional contracts and of tuition fees collected from the doctoral students enrolled in the paid tuition system is used to reimburse professional training expenses of doctoral students (attending conferences, summer schools, training, programs abroad, publication of specialty papers or other specific forms of dissemination etc.).*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Criterion A.2. Research infrastructure

*general description of the criterion analysis.

Standard A.2.1. The IOSUD has a modern research infrastructure to support the conduct of doctoral studies' specific activities.

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[2] The indicators marked with an asterisk (*) hold a special status, referring exclusively to the evaluation of doctoral studies domains, as per Article 12 from the annex No.1 of the Order of the minister of education No. 3651/12.04.2021 approving the Methodology for evaluating university doctoral studies and the system of criteria, standards and performance indicators used in the evaluation. In case they are not met, the Agency extends a period of maximum 3 years to IOSUD to correct the respective deficiencies.

general description of the standard analysis.

It seems that the BBU has a space known as "education facilities" as mentioned in the internal evaluation report. This space is to carry out research activities and equipped with all modern facilities, namely, videoprojectors, computers, speficic softwares, etc. The doctoral students from the domain computer science also have access to the high performance computing infrastructure of UBB, the HPC cluster acquired through the MADECIP project. The central University Library, PhD students can access a large number of books, magazines and journals, both in print or electronic form.

Performance Indicator A.2.1.1. *The venues and the material equipment available to the doctoral school enable the research activities in the evaluated domain to be carried out, in line with the assumed mission and objectives (computers, specific software, equipment, laboratory equipment, library, access to international databases etc.). The research infrastructure and the provision of research services are presented to the public through a specific platform. The research infrastructure described above, which was purchased and developed within the past 5 years will be presented distinctly.*
*   - description of the facts, the findings from the assessed institution's documents and the evaluation visit itself*
*   - analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself*
*   Recommendations:*

The indicator is fulfilled.

Criterion A.3. Quality of Human Resources
*   *general description of the criterion analysis.*

*   There are eight PhD supervisors out of which six are tenured within BBU and two are retired. 83.33% tenured supervisors meet the minimum stanadrds of CNATDCU. Some of the advisors are excellent as showed by their bio-data and have capability to produce and to guide high quality of research.*

Standard A.3.1. At the level of each domain there are sufficient qualified staff to ensure the conduct of doctoral study program.
*   *general description of the standard analysis.*

*   There are well qualified sufficient advisors in the domain of Computer Science. They have the capability to produce and guide excellent research as it shows from their bio-data.*

Performance Indicator A.3.1.1. *Minimum three doctoral thesis advisors within that doctoral domain, and at least 50% of them (but no less than three) meet the minimum standards of the National Council for Attestation of University Degrees, Diplomas and Certificates (CNATDCU) in force at the time when the evaluation is carried out, which standards are required and mandatory for obtaining the enabling certification.*
*   - description of the facts, the findings from the assessed institution's documents and the evaluation visit itself*

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Performance Indicator *A.3.1.2. At least 50% of all doctoral advisors have a full-time employment contract for an indefinite period with the IOSUD.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Performance Indicator A.3.1.3. *The study subjects in the education program based on advanced higher education studies pertaining to the doctoral domain are taught by teaching staff or researchers who are doctoral thesis advisors / certified doctoral thesis advisors, professors / CS I or lecturer / CS II, with proved expertise in the field of the study subjects they teach, or other specialists in the field who meet the standards established by the institution in relation with the aforementioned teaching and research functions, as provided by the law.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Performance Indicator *A.3.1.4. The percentage of doctoral thesis advisors who concomitantly coordinate more than 8 doctoral students, but no more than 12, who are themselves studying in doctoral programs[3] does not exceed 20%.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

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[3] 3 years for the doctoral university studies with the duration stipulated at Article 159, paragraph (3), respectively 4 years for the doctoral university studies with the duration stipulated at Article 174, paragraph (3) of the Law of national education No.1/2011 with subsequent amendments and additions, with additional extension periods approved as per Article 39, paragraph (3) of the Code of doctoral studies approved by the GD No. 681/2011 with subsequent amendments and additions.

Standard A.3.2. The Doctoral advisors within the domain are carrying out a scientific activity visible at international level.

general description of the standard analysis.

All the doctoral supervisors have published minimum of 5 publications in SCI journals. They also have international visibility in the form of membership of scientific committees of international publishers and conference, membership in the boards of international professonal associations, invited speakers in conferences, etc. More than 83% of the tenured doctoral advisors are active in scientific activities, obtaining at least 25% of the score required by the minimum standard of the CNATDCU.

Performance Indicator A.3.2.1. *At least 50% of the doctoral thesis advisors in the evaluated domain have at least 5 Web of Science- or ERIH-indexed publications in magazines of impact, or other achievements of relevant significance for that domain, including international-level contributions that indicate progress in scientific research - development - innovation for the evaluated domain. The aforementioned doctoral thesis advisors enjoy international awareness within the past five years, consisting of: membership on scientific boards of international publications and conferences; membership on boards of international professional associations; guests in conferences or expert groups working abroad, or membership on doctoral defense commissions at universities abroad or co-leading with universities abroad. For Arts and Sports and Physical Education Sciences, doctoral thesis advisors shall prove their international visibility within the past five years by their membership on the boards of professional associations, membership in organizing committees of arts events and international competitions, membership on juries or umpire teams in artistic events or international competitions.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Performance Indicator *A.3.2.2. *At least 50% of the doctoral thesis advisors in a specific doctoral study domain continue to be active in their scientific field, and acquire at least 25% of the score requested by the minimal CNATDCU standards in force at the time of the evaluation, which are required and mandatory for acquiring their enabling certificate, based on their scientific results within the past five years.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Domain B. EDUCATIONAL EFFECTIVENESS

general description of domain analysis.

Criterion B.1. The number, quality and diversity of candidates enrolled for the admission contest

general description of the criterion analysis.

The domain of Computer Science has the capacity to attract a large number of candidates from outside the institution from Roamian and abroad and also more candidates than the position financed from the goernment.

Standard B.1.1. The institution organizing doctoral studies has the capacity to attract candidates from outside the higher education institution or a number of candidates exceeding the number of seats available.
general description of the standard analysis.

The doctoral domain of Computer Science has high reputation and therefore many students from other universities within Romania and abroad intend to join BBU as a PhD students.

*Performance Indicator *B.1.1.1.* The ratio between the number of graduates of masters' programs of other higher education institutions, national or foreign, who have enrolled for the doctoral admission contest within the past five years and the number of seats funded by the state budget, put out through contest within the doctoral domain is at least 0.2 or the ratio between the number of candidates within the past five years and the number of seats funded by the state budget put out through contest within the doctoral studies domain is at least 1,2.*
- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself
Recommendations:

The indicator is fulfilled.

Standard B.1.2 Candidates admitted to doctoral studies demonstrate academic, research and professional performance.
general description of the standard analysis.

The domain of Computer Science is committed to produce high quality of PhDs. Therefore, all PhD students are encouraged to do high quality of research work and to publish such work in SCI journals with high impact factor.

*Performance Indicator *B.1.2.1.* Admission to doctoral study programs is based on selection criteria including: previous academic, research and professional performance, their interest for scientific or arts/sports research, publications in the domain and a proposal for a research subject. Interviewing the candidate is compulsory, as part of the admission procedure.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Performance Indicator B.1.2.2. *The expelling rate, including renouncement / dropping out of doctoral students 3, respectively 4, years after admission[4] does not exceed 30%.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Criterion B.2. The content of doctoral programs

*general description of the criterion analysis.

The doctoral progam consists two components: one is carried out in 12 weeks teaching activityin the first semester and it contains mainly three disciplines; second component is based on reading and study the research problems and to find out their solutions in the form of research papers.

Standard B.2.1. The training program based on advanced university studies is appropriate to improve doctoral students' research skills and to strengthen ethical behavior in science.

*general description of the standard analysis.

The training program based on advanced university studies of doctoral students is equivalent to a period of 12 weeks of teaching activity. This program contains 3 disciplines. The curricula of SDMI contains the discipline Ethics and academic integrity, General research methods and methodology of scientific publicaion development, etc.

Performance Indicator B.2.1.1. *The training program based on advanced academic studies includes at least 3 disciplines relevant to the scientific research training of doctoral students; at least one of these disciplines is intended to study in-depth the research methodology and/or the statistical data processing.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

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[4] 3 years for the doctoral university studies with the duration stipulated at Article 159, paragraph (3), respectively 4 years for the doctoral university studies with the duration stipulated at Article 174, paragraph (3) of the Law of national education No. 1/2011 with subsequent amendments and additions.

Recommendations:

The indicator is fulfilled.

Performance Indicator B.2.1.2. *At least one discipline is dedicated to Ethics and Intellectual Property in scientific research or there are well-defined topics on these subjects within a discipline taught in the doctoral program.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Performance Indicator B.2.1.3. *The IOSUD has mechanisms to ensure that the academic training program based on advanced university studies addresses „the learning outcomes", specifying the knowledge, skills, responsibility and autonomy that doctoral students should acquire after completing each discipline or through the research activities[5].*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Performance Indicator B.2.1.4. *All along the duration of the doctoral training, doctoral students in the domain receive counselling/guidance from functional guidance commissions, which is reflected in written guidance and feedback or regular meeting.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Performance Indicator B.2.1.5*. For a doctoral study domain, the ratio between the number of doctoral students and the number of teaching staff/researchers providing doctoral guidance must not exceed 3:1.*

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[5] Or by what the graduate should know, understand and to be able to do, according to the provisions of the Methodology of 17 March 2017 regarding inscription and registration of higher education qualifications in the National Register of Qualifications in Higher Education (RNCIS) approved by the Order No.3475/2017 with subsequent amendments and additions.

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Criterion B.3. The results of doctoral studies and procedures for their evaluation.

*general description of the criterion analysis.

SDMI calls a significant number of external reviewers for the public presentation committees of the doctoral theses. There should be at least one research paper in SCI journals or another relevant contribution for doctoral thesis.

Standard B.3.1. Doctoral students capitalize on the research through presentations at scientific conferences, scientific publications, technological transfer, patents, products and service orders.
*general description of the standard analysis.

For the doctoral thesis, one SCI journal paper or another relevant contribution is needed. Of course, BBU encourages PhD students to present their work in international conferences / workshops.

Performance Indicator B.3.1.1. For the evaluated domain, the evaluation commission will be provided with at least one paper or some other relevant contribution per doctoral student who has obtained a doctor's title within the past 5 years. From this list, the members of the evaluation commission shall randomly select 5 such papers / relevant contributions per doctoral study domain for review. At least 3 selected papers must contain significant original contributions in the respective domain.
- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Performance Indicator *B.3.1.2. The ratio between the number of presentations of doctoral students who completed their doctoral studies within the evaluated period (past 5 years), including posters, exhibitions made at prestigious international events (organized in the country or abroad) and the number of doctoral students who have completed their doctoral studies within the evaluated period (past 5 years) is at least 1.
- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Standard B.3.2. The Doctoral School engages a significant number of external scientific specialists in the commissions for public defense of doctoral theses in the analyzed domain.
*general description of the standard analysis.

SDMI calls a significant number of external reviewers for the public presentation committees of the doctoral theses.

Performance Indicator *B.3.2.1. *The number of doctoral theses allocated to one specialist coming from a higher education institution, other than the evaluated IOSUD should not exceed two (2) in a year for the theses coordinated by the same doctoral thesis advisor.*
- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself
Recommendations:

The indicator is fulfilled.

Performance Indicator *B.3.2.2. *The ratio between the doctoral theses allocated to one scientific specialist coming from a higher education institution, other than the institution where the defense on the doctoral thesis is organized, and the number of doctoral theses presented in the same doctoral study domain in the doctoral school should not exceed 0.3, considering the past five years. Only those doctoral study domains in which minimum ten doctoral theses have been presented within the past five years should be analyzed.*
- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself
Recommendations:

The indicator is partially fulfilled.

Domain C. QUALITY MANAGEMENT
*general description of domain analysis.

The IOSUD UBB has internal evaluation procedures for the quality of the study programs. As mentioned in the internal evaluation report that the evaluation of quality and progress of schools / domains

of doctoral studies takes place periodically and evaluate the scientific work of doctoral advisors and PhD students.

Criterion C.1. Existence and periodic implementation of the internal quality assurance system

*general description of the criterion analysis.

There is a procedure to evaluate the scientific work of PhD supervisors as well as their PhD students that take palce periodically. At the SDMI level, there are internal analysis procdesures for the content of the programs of doctoral studies and the evaluation of their quality. At the level of the FMI council, the quality of the scientific activity of PhD supervisors is regularly monitored.

Standard C.1.1. There are an institutional framework and procedures in place and relevant internal quality assurance policies, applied for monitoring the internal quality assurance.
*general description of the standard analysis.

The IOSUD UBB has internal evaluation procedures for the quality of the study programs.

Performance Indicator C.1.1.1. *The Doctoral school in the respective university study domain shall demonstrate the continuous development of the evaluation process and its internal quality assurance following a procedure developed and applied at the level of the IOSUD, the following assessed criteria being mandatory:*
(a) the scientific work of Doctoral advisors;
(b) the infrastructure and logistics necessary to carry out the research activity;
(c) the procedures and subsequent rules based on which doctoral studies are organized;
d) the scientific activity of doctoral students;
e) the training program based on advanced academic studies of doctoral students;
f) social and academic services (including for participation at different events, publishing papers etc.) and counselling made available to doctoral students.
- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself
Recommendations:

The indicator is fulfilled.

Performance Indicator *C.1.1.2. *Mechanisms are implemented during the stage of the doctoral study program to enable feedback from doctoral students allowing to identify their needs, as well as their overall level of satisfaction with the doctoral study program in order to ensure continuous improvement of the academic and administrative processes. Following the analysis of the results, there is evidence that an action plan was drafted and implemented.*
- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Criterion C.2. Transparency of information and accessibility of learning resources

*general description of the criterion analysis.

Without transparency of information and accessibility of learning resources no institution can grow and establish its reputation. It should contain the procedure to induct PhD students, their topics, and abstract of theses, etc. All such ceriterion are followed by the Computer Science Domain in particular and BBU in general. The information is revised and updated periodically to ensure transparency.

Standard C.2.1. Information of interest to doctoral students, future candidates and public interest information is available for electronic format consultation.

*general description of the standard analysis.

The information of interest to doctoral students, future candidates and public interest information are available on the website of the UBB through IOSUD.

Performance Indicator C.2.1.1. The IOSUD publishes on the website of the organizing institution, in compliance with the general regulations on data protection, information such as:

(a) the Doctoral School regulation;

(b) the admission regulation;

(c) the doctoral studies contract;

(d) the study completion regulation including the procedure for the public presentation of the thesis;

(e) the content of training program based on advanced academic studies;

(f) the academic and scientific profile, thematic areas/research themes of the Doctoral advisors within the domain, as well as their institutional contact data;

(g) the list of doctoral students within the domain with necessary information (year of registration; advisor);

(h) information on the standards for developing the doctoral thesis;

(i) links to the doctoral theses' summaries to be publicly presented and the date, time, place where they will be presented; this information will be communicated at least twenty days before the presentation.

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

Standard C.2.2. The IOSUD/The Doctoral School provides doctoral students with access to the resources needed for conducting doctoral studies.
*general description of the standard analysis.

As mentioned in the internal evaluation report that all doctoral students can access to the resources required to successfully complete the doctoral programme.

Performance Indicator C.2.2.1. *All doctoral students have free access to one platform providing academic databases relevant to the doctoral studies domain of their thesis.*
- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself
Recommendations:

The indicator is fulfilled.

Performance Indicator C.2.2.2. *Each doctoral student shall have access, upon request, to an electronic system for verifying the degree of similarity with other existing scientific or artistic works.*
- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself
Recommendations:

The indicator is fulfilled.

Performance Indicator C.2.2.3. *All doctoral students have access to scientific research laboratories or other facilities depending on the specific domain/domains within the Doctoral School, according to internal order procedures.*
- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself
Recommendations:

The indicator is fulfilled.

Criterion C.3. Internationalization
*general description of the criterion analysis.

The BBU has the European programs Erasmus and CEEPUS (Central European Exchange Program for University Study) for the doctoral studies under which doctoral students in Computer Science can also benefit from these programs. The BBU also has several bilateral agreements with many known universities in Europe for study mobilities at doctoral study level. During the last last five years, the doctoral

students in the Computer Science benefited from 3 mobilities through the European programs Erasmus and CEEPUS.

Standard C.3.1. There is a strategy in place and it is applied to enhance the internationalization of doctoral studies.
  *general description of the standard analysis.

  The BBU has several international agreements with several European Universities to internationalization of doctoral studies.

Performance Indicator *C.3.1.1. *IOSUD, for every evaluated domain, has concluded mobility agreements with universities abroad, with research institutes, with companies working in the field of study, aimed at the mobility of doctoral students and academic staff (e.g., ERASMUS agreements for the doctoral studies). At least 35% of the doctoral students have completed a training course abroad or other mobility forms such as attending international scientific conferences. IOSUD drafts and applies policies and measures aiming at increasing the number of doctoral students participating at mobility periods abroad, up to at least 20%, which is the target at the level of the European Higher Education Area.*
  - description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
  - analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself
  Recommendations:

  The indicator is fulfilled.

Performance Indicator C.3.1.2. *In the evaluated doctoral study domain, support is granted, including financial support, to the organization of doctoral studies in international co-tutelage or invitation of leading experts to deliver courses/lectures for doctoral students.*
  - description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
  - analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself
  Recommendations:

  The indicator is fulfilled.

Performance Indicator C.3.1.3. *The internationalization of activities carried out during the doctoral studies is supported by IOSUD through concrete measures (e.g., by participating in educational fairs to attract international doctoral students; by including international experts in guidance committees or doctoral committees   etc.).*
  - description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
  - analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself
  Recommendations:

The indicator is fulfilled.

IV. SWOT Analysis

Strengths:	Weaknesses:
The BBU in general and Computer Science Domain in particular has good quality of infrastrure for the PhD programs. Most of the PhD supervisors are very strong in their field of specialization and have the avality to produce high quality of research work.	- The research funding / scholarship is not enough. - Number of foreign PhD students are very low.
Opportunities:	**Threats:**
As people told me that the Cluj-Napoca is known as Silicon Velly of Romania. So there is a huge possibility to attract a large number of foreign PhD students.	No threat

V. Overview of judgments awarded and of the recommendations

No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
1.	PI	**A.1.1.1.** The existence of specific regulations and their application at the level of the Doctoral School of the respective university doctoral study domain: a) the internal regulations of the Doctoral School; b) the Methodology for conducting elections for the position of director of the Council of doctoral school (CSD), as well as elections by the students of their representative in CSD and the evidence of their conduct; c) the Methodologies for organizing and conducting doctoral studies (for the admission of doctoral students, for the completion of doctoral studies); d) the existence of mechanisms for recognizing the status of a Doctoral advisor and the equivalence of the doctoral degree obtained abroad;	**satisfied**	

No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
		e) functional management structures (Council of the doctoral school), giving as well proof of the regularity of meetings; f) the contract for doctoral studies; g) internal procedures for the analysis and approval of proposals regarding the training for doctoral study programs based on advanced academic studies.		
2.	PI	**A.1.1.2.** The doctoral school' Regulation includes mandatory criteria, procedures and standards binding on the aspects specified in Article 17, paragraph (5) of the Government Decision No. 681/2011 on the approval of the Code of Doctoral Studies with subsequent amendments and additions.	**satisfied**	
3.	PI	**A.1.2.1.** The existence and effectiveness of an appropriate IT system to keep track of doctoral students and their academic background.	**satisfied**	
4.	PI	**A.1.2.2.** The existence and use of an appropriate software program and evidence of its use to verify the percentage of similarity in all doctoral theses.	**satisfied**	
5.	IP	**A.1.3.1.** Existence of at least one research or institutional / human resources development grant under implementation at the time of submission of the internal evaluation file, per doctoral study domain under evaluation, or existence of at least 2 research or institutional development / human resources grant for the doctoral study domain, obtained by doctoral thesis advisors operating in the evaluated domain within the past 5 years. The grants address relevant themes for the respective domain and, as a rule, are engaging doctoral students.	**satisfied**	
6.	PI *	**A.1.3.2.** The percentage of doctoral students active at the time of the evaluation, who for at least six months receive additional funding sources besides government funding, through scholarships awarded by individual persons or by legal entities, or who are financially supported through research or institutional / human resources development grants is not less than 20%.	**satisfied**	

No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
7.	PI *	**A.1.3.3.** At least 10% of the total amount of doctoral grants obtained by the university through institutional contracts and of tuition fees collected from the doctoral students enrolled in the paid tuition system is used to reimburse professional training expenses of doctoral students (attending conferences, summer schools, training, programs abroad, publication of specialty papers or other specific forms of dissemination etc.).	**satisfied**	
8.	CPI	**A.2.1.1.** The venues and the material equipment available to the doctoral school enable the research activities in the evaluated domain to be carried out, in line with the assumed mission and objectives (computers, specific software, equipment, laboratory equipment, library, access to international databases etc.). The research infrastructure and the provision of research services are presented to the public through a specific platform. The research infrastructure described above, which was purchased and developed within the past 5 years will be presented distinctly	**satisfied**	
9.	CPI	**A.3.1.1.** Minimum three doctoral thesis advisors within that doctoral domain, and at least 50% of them (but no less than three) meet the minimum standards of the National Council for Attestation of University Degrees, Diplomas and Certificates (CNATDCU) in force at the time when the evaluation is carried out, which standards are required and mandatory for obtaining the enabling certification.	**satisfied**	
10.	PI *	**A.3.1.2.** At least 50% of all doctoral advisors have a full-time employment contract for an indefinite period with the IOSUD.	**satisfied**	
11.	PI	**A.3.1.3.** The study subjects in the education program based on advanced higher education studies pertaining to the doctoral domain are taught by teaching staff or researchers who are doctoral thesis advisors / certified doctoral thesis advisors, professors / CS I or lecturer / CS II, with proved expertise in the field of the	**satisfied**	

No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
		study subjects they teach, or other specialists in the field who meet the standards established by the institution in relation with the aforementioned teaching and research functions, as provided by the law.		
12.	PI *	**A.3.1.4.** The percentage of doctoral thesis advisors who concomitantly coordinate more than 8 doctoral students, but no more than 12, who are themselves studying in doctoral programs does not exceed 20%.	**satisfied**	A uniform distribution of PhD. students per Ph.D. supervisor is needed
13.	CPI	**A.3.2.1.** At least 50% of the doctoral thesis advisors in the evaluated domain have at least 5 Web of Science- or ERIH-indexed publications in magazines of impact, or other achievements of relevant significance for that domain, including international-level contributions that indicate progress in scientific research - development - innovation for the evaluated domain. The aforementioned doctoral thesis advisors enjoy international awareness within the past five years, consisting of: membership on scientific boards of international publications and conferences; membership on boards of international professional associations; guests in conferences or expert groups working abroad, or membership on doctoral defense commissions at universities abroad or co-leading with universities abroad. For Arts and Sports and Physical Education Sciences, doctoral thesis advisors shall prove their international visibility within the past five years by their membership on the boards of professional associations, membership in organizing committees of arts events and international competitions, membership on juries or umpire teams in artistic events or international competitions.	**satisfied**	
14.	PI *	**A.3.2.2.** At least 50% of the doctoral thesis advisors in a specific doctoral study domain continue to be active in their scientific field, and acquire at least 25% of the score requested by the minimal CNATDCU standards in force at the time of the evaluation, which are required and mandatory for acquiring their enabling certificate, based	**satisfied**	

No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
		on their scientific results within the past five years		
15.	PI *	**B.1.1.1.** The ratio between the number of graduates of masters' programs of other higher education institutions, national or foreign, who have enrolled for the doctoral admission contest within the past five years and the number of seats funded by the state budget, put out through contest within the doctoral domain is at least 0.2 or the ratio between the number of candidates within the past five years and the number of seats funded by the state budget put out through contest within the doctoral studies domain is at least 1,2.	**satisfied**	**BBU has the capavility to attract more students from other institutions and abroad. Therefore, a cell may be formed to achieve this goal.**
16.	PI *	**B.1.2.1.** Admission to doctoral study programs is based on selection criteria including: previous academic, research and professional performance, their interest for scientific or arts/sports research, publications in the domain and a proposal for a research subject. Interviewing the candidate is compulsory, as part of the admission procedure.	**satisfied**	
17.	PI	**B.1.2.2.** The expelling rate, including renouncement / dropping out of doctoral students 3, respectively 4, years after admission does not exceed 30%.	**satisfied**	
18.	PI	**B.2.1.1.** The training program based on advanced academic studies includes at least 3 disciplines relevant to the scientific research training of doctoral students; at least one of these disciplines is intended to study in-depth the research methodology and/or the statistical data processing.	**satisfied**	
19.	PI	**B.2.1.2.** At least one discipline is dedicated to Ethics and Intellectual Property in scientific research or there are well-defined topics on these subjects within a discipline taught in the doctoral program.	**satisfied**	
20.	PI	**B.2.1.3.** The IOSUD has mechanisms to ensure that the academic training program based on advanced university studies addresses „the learning outcomes", specifying	**satisfied**	

No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
		the knowledge, skills, responsibility and autonomy that doctoral students should acquire after completing each discipline or through the research activities.		
21.	PI	**B.2.1.4.** All along the duration of the doctoral training, doctoral students in the domain receive counselling/guidance from functional guidance commissions, which is reflected in written guidance and feedback or regular meeting.	**satisfied**	
22.	CPI	**B.2.1.5**. For a doctoral study domain, the ratio between the number of doctoral students and the number of teaching staff/researchers providing doctoral guidance must not exceed 3:1.	**satisfied**	
23.	CPI	**B.3.1.1.** For the evaluated domain, the evaluation commission will be provided with at least one paper or some other relevant contribution per doctoral student who has obtained a doctor's title within the past 5 years. From this list, the members of the evaluation commission shall randomly select 5 such papers / relevant contributions per doctoral study domain for review. At least 3 selected papers must contain significant original contributions in the respective domain	**satisfied**	
24.	PI *	**B.3.1.2.** The ratio between the number of presentations of doctoral students who completed their doctoral studies within the evaluated period (past 5 years), including posters, exhibitions made at prestigious international events (organized in the country or abroad) and the number of doctoral students who have completed their doctoral studies within the evaluated period (past 5 years) is at least 1.	**satisfied**	
25.	PI *	**B.3.2.1.** The number of doctoral theses allocated to one specialist coming from a higher education institution, other than the evaluated IOSUD should not exceed two (2) in a year for the theses coordinated by the same doctoral thesis advisor.	**satisfied**	

No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
26.	PI *	**B.3.2.2.** The ratio between the doctoral theses allocated to one scientific specialist coming from a higher education institution, other than the institution where the defense on the doctoral thesis is organized, and the number of doctoral theses presented in the same doctoral study domain in the doctoral school should not exceed 0.3, considering the past five years. Only those doctoral study domains in which minimum ten doctoral theses have been presented within the past five years should be analyzed.	**satisfied**	
27.	PI	**C.1.1.1.** The Doctoral school in the respective university study domain shall demonstrate the continuous development of the evaluation process and its internal quality assurance following a procedure developed and applied at the level of the IOSUD, the following assessed criteria being mandatory: a) the scientific work of Doctoral advisors; b) the infrastructure and logistics necessary to carry out the research activity; c) the procedures and subsequent rules based on which doctoral studies are organized; d) the scientific activity of doctoral students; e) the training program based on advanced academic studies of doctoral students; f) social and academic services (including for participation at different events, publishing papers etc.) and counselling made available to doctoral students.	**satisfied**	
28.	PI *	**C.1.1.2.** Mechanisms are implemented during the stage of the doctoral study program to enable feedback from doctoral students allowing to identify their needs, as well as their overall level of satisfaction with the doctoral study program in order to ensure continuous improvement of the academic and administrative processes. Following the analysis of the results, there is evidence that an action plan was drafted and implemented.	**satisfied**	
29.	CPI	**C.2.1.1.** The IOSUD publishes on the website of the organizing institution, in compliance with the general regulations on data protection, information such as:	**satisfied**	

No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
		a) the Doctoral School regulation; b) the admission regulation; c) the doctoral studies contract; d) the study completion regulation including the procedure for the public presentation of the thesis; e) the content of training program based on advanced academic studies; f) the academic and scientific profile, thematic areas/research themes of the Doctoral advisors within the domain, as well as their institutional contact data; g) the list of doctoral students within the domain with necessary information (year of registration; advisor); h) information on the standards for developing the doctoral thesis; i) links to the doctoral theses' summaries to be publicly presented and the date, time, place where they will be presented; this information will be communicated at least twenty days before the presentation.		
30.	PI	**C.2.2.1.** All doctoral students have free access to one platform providing academic databases relevant to the doctoral studies domain of their thesis.	**satisfied**	
31.	PI	**C.2.2.2.** Each doctoral student shall have access, upon request, to an electronic system for verifying the degree of similarity with other existing scientific or artistic works.	**satisfied**	
32.	PI	**C.2.2.3.** All doctoral students have access to scientific research laboratories or other facilities depending on the specific domain/domains within the Doctoral School, according to internal order procedures.	**satisfied**	
33.	PI *	**C.3.1.1.** IOSUD, for every evaluated domain, has concluded mobility agreements with universities abroad, with research institutes, with companies working in the field of study, aimed at the mobility of doctoral students and academic staff (e.g., ERASMUS agreements for the doctoral studies). At least 35% of the doctoral students have completed a training course abroad or other mobility forms such as attending international scientific conferences.	**satisfied**	

No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
		IOSUD drafts and applies policies and measures aiming at increasing the number of doctoral students participating at mobility periods abroad, up to at least 20%, which is the target at the level of the European Higher Education Area.		
34.	**PI**	**C.3.1.2.** In the evaluated doctoral study domain, support is granted, including financial support, to the organization of doctoral studies in international co-tutelage or invitation of leading experts to deliver courses/lectures for doctoral students.	**satisfied**	
35.	**PI**	**C.3.1.3.** The internationalization of activities carried out during the doctoral studies is supported by IOSUD through concrete measures (e.g., by participating in educational fairs to attract international doctoral students; by including international experts in guidance committees or doctoral committees etc.).	**satisfied**	

VI. Conclusions and general recommendations

All the indicators mentioned above are satisfied. Therefore, I strongly recommend the accreditation of the domain (Computer Science) by ARACIS. However, I would like to suggest that there should be a strategy to attract more international PhD students, specially, from Middleast, North Africa, South Asian Countries, Indian Subcontinent, as Cluj-Napoca is known as Silicon Valley of Romania. There is a need to admit more PhD students as there are enough high quality PhD supervisors in the department and there should be a uniformity to distibute the PhD students among the PhD supervisors . The financial support through research project should be increased.

VII. Annexes

The following types of documents shall be attached:
* *The detailed schedule of the evaluation visit – MANDATORY.*