

PROGRAMME REVIEW

Master of Science in Enterprise Architecture

Inno.com

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PROGRAMME REVIEW MASTER OF SCIENCE IN ENTERPRISE ARCHITECTURE

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Preface VLUHR Quality Assurance Board

This assessment report deals with the programme review of the Master of Science in Enterprise Architecture at INNOCOM¹. This programme review was conducted by an independent panel of experts in February 2022.

This report is intended for all stakeholders of the programme and provides a snapshot of its quality following the review principles for quality assurance for programme assessments in Flanders. As chair of the VLUHR Quality Assurance Board I hope that the panel's findings, judgements, recommendations and commendations will advance this programme. Additionally, this report intends to provide information regarding the quality of the programme to a wider audience. For this reason, this report is published on the website of VLUHR QA.

I would like to thank all members of the panel for the time they invested and the dedication they showed carrying out this programme review. At the very same time, this review was only possible because of the commitment of all those involved at the programme. I hope this report does justice to their efforts.

Petter Aaslestad
Chair VLUHR Quality Assurance Board

¹ Inno.com is the legal name of the institution, but INNOCOM is the name that the institution uses in all communication. INNOCOM is also the name that will be used throughout the rest of this document.

Programme review

Introduction

This assessment report presents the findings, judgements, commendations and recommendations regarding the Master of Science in Enterprise Architecture at INNOCOM. For the administrative details of the institution and the programme involved see Annex 1.

This programme review was carried out in accordance with the Manual for Programme Review.² Stefanie Van der Jeugt, Policy Advisor at VLUHR QA, was project manager of this programme review.

Panel composition

The proposal of candidate panel members was approved by the VLUHR Quality Assurance Board on the 2nd of June 2021. The composition of the panel was ratified by the VLUHR Quality Assurance Board on 14th of October 2021.

The panel was composed as follows:

- Erik Proper (chair), Adjunct Professor in Data & Knowledge Engineering at the University of Luxembourg and senior research manager at the Luxembourg Institute of Science and Technology
- Els Consuegra, docent onderwijswetenschappen, VUB
- Gerdy De Clercq, owner of AXYON BV & Partner of Business Markers CV
- Jessica Van Suetendael, first-year student, Master Handelsingenieur in de beleidsinformatica, UHasselt

A short cv of the panel members is included as Annex 2.

Review principles

The programme review was conducted in accordance with the eight quality features. These features are the characteristics of a high-quality higher education programme, defined by NVAO and tied in with the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG, 2015). For each programme whose quality is satisfactory, the presence of the following quality features is guaranteed:

1. The programme's learning outcomes constitute a transparent and programme-specific interpretation of the international requirements regarding level, content, and orientation;
2. The programme's curriculum ties in with the most recent developments in the discipline, takes account of the developments in the professional field, and is relevant to society;
3. The staff allocated to the programme provide the students with optimum opportunities for achieving the learning outcomes;
4. The programme offers the students adequate and easily accessible services, facilities, and counselling;
5. The teaching and learning environment encourages the students to play an active role in the learning process and fosters smooth study progress;
6. The assessment of students reflects the learning process and concretises the intended learning outcomes;
7. The programme provides comprehensive and readable information on all stages of study;
8. Information regarding the quality of the programme is publicly accessible.

In addition, a programme ensures the involvement of internal and external stakeholders on the one hand and external and independent peers and experts on the other hand, in a continuous pursuit of quality development.

² <https://www.qualityassurance.vluhr.be/documents>

If applicable, the programme must also comply with relevant regulations with respect to the admission of graduates to corresponding posts or professions.

Preparation

In preparation of the programme review, the programme compiled a self-evaluation report in accordance with the VLUHR QA Manual for Programme Review. The panel received the informative and conclusive self-evaluation report well in advance and studied this document and its attachments thoroughly. The panel also studied a representative sample of master's theses and consulted the virtual learning environment of the programme.

On the 23rd of December 2021 the panel members attended a training session organised by VLUHR QA. During this session, the panel members were informed about the programme review process. Special attention was given to the status of the programme, quality assurance in Flanders and Europe, the Review Principles and interviewing techniques. Also, a schedule for the site visit was agreed upon, enclosed as Annex 3. Finally, the self-evaluation report was discussed in depth to prepare the site visit.

Site visit

The panel carried out the programme review on the 9th and 10th of February 2022 at the INNOCOM site in Beerzel (Putte). During this site visit, the panel conducted interviews with all those involved in the programme in order to gain insight into the quality of the programme, including management, students, teaching and supporting staff, alumni and employers. These interviews took place in an open and constructive atmosphere and provided the panel, in addition to the documents studied (see Annex 4 for an overview), relevant insights regarding the quality of the programme. A visit of the facilities was also planned. In order to give all stakeholders the opportunity to talk confidentially to the panel there was an open consultation. At the end of the site visit, the panel discussed its findings, judgements, recommendation and commendations with the programme management in a co-creative session. After a final panel meeting, the panel shared its main conclusions with the programme management in an oral report.

Assessment report

In the subsequent assessment report the panel provides the findings, judgements, recommendations and commendations regarding the quality of the programme as a whole. At the end of this report a conclusion, readable for a wide audience and including an advice for accreditation is formulated, as well as a list of commendations and recommendations. The programme management was given the opportunity to respond to the draft of this report before finalisation.

Programme report

This report covers the evaluation of the **Master of Science in Enterprise Architecture as offered by INNOCOM**, a Belgian ICT and transformation strategy consultancy firm. The Master of Science in Enterprise Architecture (MEA), a **master-after-master programme of 60 ECTS spread out over 2 years**, was founded in 2008 based on an internal need of the company and external needs as expressed by the industry for qualitatively trained, competent Enterprise Architects. INNOCOM took the initiative to develop the MEA, since there was no proper training for Enterprise Architects available on the market. In 2010 the programme earned its accreditation and in 2014 the accreditation was renewed. In 2014, INNOCOM also moved the MEA into a new, additional focused department within INNOCOM, the INNOCOM (or IC) Institute. IC Institute offers next to the Master in EA a unique portfolio of high-quality educational services and conducts research within the domains of Enterprise, Business, IT Architecture and transformational domains such as Organization design and Transformation delivery methods.

The programme has the necessary consultative bodies in place to improve the quality of the programme step by step. Within the IC Institute, the programme is managed by the programme director, with the assistance of the quality manager and the pedagogy expert. The teaching staff is involved on different levels/positions: module coordinator, lecturer, master thesis coach or master thesis assessor. For each module the programme appoints two module coordinators: an academic coordinator and an INNOCOM coordinator to ensure a healthy balance between theory and practice. They are both responsible for the quality of their module. On a general level, the programme has installed a programme commission to take responsibility for quality assurance in the MEA. The programme commission consists of the programme director, the quality manager, a few academic advisors (lecturers) and the managing partner of INNOCOM. This commission meets every 2 to 3 months. During their meetings, the quality of the MEA and its different modules is discussed as well as possible improvement actions. Lastly, the programme has assembled an intake commission (academic advisor + ombudsperson) as part of the intake procedure for enrolling students and an exam commission that analyses the distribution pattern of exam scores, among other things.

After reading the self-evaluation report (SER) the panel was already **highly impressed by the ambitious aims of the programme towards the profile of the Enterprise Architect and the unique cross-disciplinary (Business and IT) and trans-disciplinary character (academically and professionally oriented) of the programme.** Whereas the field of Enterprise Architecture initially defined the role of the Enterprise Architect from an IT point of view, the MEA of INNOCOM aims to uplift this role by equipping Enterprise Architects with in-depth knowledge of business aspects, so that they can adequately address the business challenges companies face nowadays. Thus, the focus of the programme lies on different enterprise domains: analysing and designing architecture organised around business, information technology, application technology, integration, infrastructure and the interconnectedness between these components. The MEA acts as a pioneer and takes up a forefront position in combining theory and practices based on the most recent empirical and practical evolutions. According to the panel, the uniqueness and the added value of the programme therefore lie in the way it entails the business point of view next to the IT role and the way the programme is built on collaboration between the academic world and the corporate world.

While further preparing the site visit, the panel also reviewed the attachments of the SER, a sample of master's theses and the virtual classroom on Moodle thoroughly. Based on all the information provided by the programme, the panel could already distinguish a number of **preliminary strengths**, for example: the substantiated competence profile, the well-thought-out curriculum, the enriching mix of theory and practice and the combination of teachers/experts from academia and practice to achieve this, the close relationship between the programme and the students and the quality of the master's theses. The panel also noted some **preliminary areas of concern** that needed to be explored throughout the visit. More specifically, there were questions regarding the dropout rate in the final phase of the programme (i.e., the master's thesis), student evaluation in general, student counselling and the academic underpinnings of practically oriented classes. During the site visit, the panel used the scheduled interviews to confirm the preliminary strengths and to question the main areas of concern in depth with all the stakeholders of the programme. The findings and recommendations regarding the aforementioned topics are discussed and explored in detail in the following paragraphs of this report.

Compared to the previous programme review, **the programme has invested time and effort in the development of the new competence model.** In creating the competence model, the programme relied on levels 7 and 8 of the Flemish Qualifications Framework (FQF), a literature review concerning existing models and frameworks (like TOGAF³) and feedback from colleagues. The programme also gathered input from academics, students and alumni, current Enterprise Architects and key stakeholder from the industry via focus groups and a resonance advisory board was created. In addition, the programme benchmarked itself against national and international programmes in the same domain or with an adjacent focus. **The development process resulted in a strong, substantiated competence framework built around 5 major clusters and consisting of 27 competences in total.** Furthermore, the programme has divided each competence into knowledge, skills, and attitudes. According to the panel, the programme well succeeded in translating its aims into the competence model and the derived learning objectives. Also, the panel appreciates that the programme has aligned the competence model with the academic evidence base on the one hand and the needs in the professional field on the other hand. The panel states that the competence model is attuned to the present-day demands of the professional field and moreover, it's future-proof because it anticipates on important content that might not be part of the job description today, but that should be part of the role and the knowledge-base to increase the impact of the enterprise architect on the organisation.

Before the site visit it was not really clear to the panel why **the programme stated in the SER that it was aiming at two levels of the FQF: level 7 (Master) and level 8 (Doctor).** However, in conversation with the programme management the sentence in the SER turned out to be phrased incorrectly due to a mistake and the programme only aims at level 7. There is a general consensus that enterprise architects need to have a level 7 at least and the panel believes that this level is visible in the competence model. Also, during the intake procedure students are well informed about the academic expectations. In the curriculum, the concretisation of academic expectations only occurs explicitly in module 17 '*Research methods & presentation techniques*' and in the module *master's thesis*. Both modules are situated at the end of the study pathway. However, the panel believes that students should be triggered to think critically throughout the whole curriculum, for example about the quality/aptness of the used instruments (methods, techniques, approaches) and about the validity and the underpinnings of solutions or directions they would propose as an enterprise architect. From this perspective, the panel suggests to move part of the research methods content forward, thereby explicitly focusing on critical thinking. Next, the programme needs to ensure that the different modules revisit this critical thinking approach.

The panel says that **the competence model can be further developed to differentiate between students with different backgrounds (IT or business),** because students commented, for example, that they are not all the same kind of enterprise architect when they graduate. From this viewpoint, the programme needs to decide what is the common core for all enterprise architects and which sub aspects may vary depending on the background of the students.

In addition, **the panel identifies several opportunities to promote the competency model more actively.** The programme already planned a first step in this regard: formalising and publishing the competence model. A second step could be sharing the competence model with the industry. This would be a socially relevant action for two reasons. First, it will allow organisations to include the model in their job descriptions and related HR policies. Second, it'll give more clarity about the role and the position of the enterprise architect in an organisation, with potential positive effects on the impact of their presence in the organisation.

The programme has built its foundation on different theoretical models and frameworks. However, a more elaborated version of the TOGAF-model, created by the programme, forms the cornerstone of the curriculum. In the first year, students enrol in 17 modules of 2 ECTS each. In the second year, they write a master's thesis, which counts for 26 ECTS. **The panel observes a clear alignment between the elaborated TOGAF-model and the curriculum on the one hand, but also between the curriculum and the competence model on the other hand.** In general, the panel sees a carefully thought-out curriculum. Students state that they see how each module is situated within the broader enterprise architecture framework, which is very positive.

³ The Open Group Architecture Framework

The content of the modules is revised each year thanks to the inclusion of various angles brought in by the teaching staff (academics and professionals), the module coordinators, the INNOCOM communities⁴ and others. The module coordinators, the programme director, the quality assurance officer and - on an overarching level - the programme commission monitor the quality of all the module, for example, in terms of relevance and being up-to-date. **The panel agrees that the content of the modules is relevant and up-to-date, but in some cases the academic underpinnings of practical perspectives is not visible in the learning materials.** More specific, attention should be paid to making visible and reflecting upon the scientific-evidence base underlying the more practical content.

Through the incorporation of academic and work-field lectures there is a nice balance between developments in the discipline and developments in the professional field. Students appreciate the good mix between theory and practice. To smooth out the integration of theory and practice lecturers visit each other's lessons on their own initiative. This is not a built-in system and it depends heavily on the individual choice of lecturers. The panel thinks it would be beneficial if lecturers could visit each other's lessons, on a structural basis, especially if they teach the same module. Aside, the students expressed that they missed practical examples or case studies in a few modules even though they were expected to make a case study on the exam of one of these modules. In summary, the panel states that the balance between theory and practice is overall ok, but could be given a little more attention in a few modules.

As the field of Enterprise Architecture is a rapidly evolving professional field, it presents the programme with a number of challenges. One of the challenges is to ensure that the established knowledge base in the curriculum stays in tune with a changing work field. **The panel sees that the programme has enough tentacles in the field to notice the changes and adapt the curriculum and modules accordingly.** At the same time, the number of topics to be covered increases while the programme remains limited to 60 ECTS. The panel recommends the programme to make choices about what is necessary and what could be optional. For starters, the panel thinks that two subjects are underemphasized in the current curriculum: the CFO⁵ perspective and soft skills. Indeed, an enterprise architect must have sufficient financial knowledge to be able to engage with a CFO and to include the CFO in the change process. Also, the panel strongly believes the programme needs to put more emphasis on soft skills in order to improve the impact an enterprise architect can have in the field. Enterprise architects need to be highly proficient in communication and coaching skills to be able to inspire, deal with resistance, demonstrate, convince, argument, collaborate, communicate, etc... The need for soft skills was confirmed by the students and the alumni. Another line of thought that the panel suggests, is to reflect on what the core modules are and which modules might be optional, depending on the prior education and/or experience of the students. Finally, the panel still feels a creative tension between the programme's ambitions and the curriculum content: most content remains IT related, so there's a challenge to rebalance the curriculum composition towards business and enterprise.

Based on the SER, the panel notes that **the teaching staff consists of 39 staff members (lecturers) with very diverse academic and professional profiles.** The panel states that the mixture of these profiles creates a motivating and rich learning environment for students. The students and alumni are really enthusiastic about the expertise and the experience lecturers bring to the table.

About 33% of the staff has a PhD degree (the academics), about 49% has a Master's degree (practitioners and/or lecturers in other business/management schools) and about 18% has a Bachelor's degree (practitioners). At first, the panel thought it was strange that a master programme employs Bachelors because in universities it is common to only recruit Masters and PhDs. During the interview, the programme management explained that they rather recruit on the base of merit. Since, (a) the objective of the MEA is to provide a well-funded scientific knowledge base of Enterprise Architecture and to make students able to apply different frameworks and methods and (b) the professional field is ahead of the academic discipline, it makes sense to attract the right amount of practical experience in the teaching staff - regardless of the degree.

⁴ The 80+ experienced and specialised professionals, employed by Inno.com, are organised across multiple communities, covering different domains.

⁵ Chief Financial Officer

Most teachers-practitioners - if not all - are recruited inside INNOCOM and they bring in the in-house practical knowledge and practical experience. The panel would encourage the programme to reflect on the INNOCOM business case for the MEA and also suggests to recruit among experienced practitioners outside of INNOCOM. To work around competitive sensitivities, the programme might consider enlisting international guest lecturers who are located outside INNOCOM's geographic scope, perhaps by digital means. Despite this remark, the structural interaction between the MEA modules and the INNOCOM professionals/teachers (who are part of an INNOCOM community) could definitely be seen as an asset.

When browsing through learning materials and evaluation tasks, the panel made notice that **the academic and pedagogical-didactical quality varied greatly between modules.** This finding was confirmed in the conversations with teaching staff, students and alumni during the site visit. Considering the amount of practitioners that teach in the MEA (48%), the panel believes there are quality risks in two areas. First, the academic character of the programme and the reflection on the scientific-evidence base regarding the practical perspectives could become less visible, as mentioned before. Second, the limited availability of teaching staff with pedagogical-didactical backgrounds could impact the basic educational quality. The programme is well aware of the risks and has convinced the panel that adequate measures will be taken in the near future. For example, the programme plans to invest in the pedagogical-didactical training of the teachers to improve their teaching skills, which is a very good step and is encouraged by the panel. Another idea might be to hire practitioners as guest lecturers and provide structural support from an experienced lecturer who will take on student supervision and evaluation.

For the first-year modules, the programme creates a teaching and learning environment that encourages the students to play an active role and that fosters a smooth study progress. The lecturers encourage students to bring in their own work experience and to share the problems they encounter at the workplace. This is used as input for discussion, reflection, assignments, etcetera. Student groups are preferably kept smaller than 25 participants and this facilitates exchange and interaction among students.

Several modules make use of learning activities such as group work and presentations. Today, students do not always see the added value of group tasks (mostly evaluation tasks that must be completed within a very short period of time) and negative group dynamics seem to inhibit learning for some students. It's assumed that collaboration skills are already part of the competences of students, but testimonials do not confirm this assumption. The panel therefore firmly suggests that these modules could benefit from explicit learning goals regarding group work and the provision of theoretical frameworks to improve collaboration, group dynamics, communication and presentation skills. In addition, the panel finds it odd that the programme doesn't differentiate between students - although not structurally or explicitly. Students with a lot of prior knowledge and students with little prior knowledge are grouped together in a module and the programme wants to evoke meaningful and interesting discussion between all attendants. This is certainly a good entry point, but the panel observed that students didn't always see it that way. The panel recommends to better use the diverse backgrounds of students to achieve maximum learning gains for all students involved. The theory on heterogeneous grouping in differentiated instruction could be guiding in this matter.

Before the COVID crisis, the programme welcomed the students at the INNOCOM offices on Thursday evenings, Friday evenings and Saturday. Based on the experiences with blended learning during the Covid crisis, the programme decided to keep the digital lessons on Thursday and moreover, on-site lessons are live streamed for those who can't be present physically. The movement towards blended and hybrid learning ties in with the movement to self-regulated learning. The panel believes the partial shift to blended learning and self-regulated learning is a good thing, but also, the programme must not underestimate the power of its gatherings on Fridays and Saturdays. In fact, **during the on-site classes, the programme manages to build a community with its teachers and students.** There is a close contact between all parties involved: on a formal level in the classes, on an informal level during the shared group lunches. The panel states that this approach is truly a strength of the programme.

Students perceive the 17 modules of 2 ECTS as manageable, but in general, they describe the first year as very rough and intensive, especially in combination with a fulltime job and a family life. On a positive note, there's no strict sequentiality between the modules which allows students to spread them over several years.

The students and alumni very much appreciate the flexible programme structure. The panel concludes that the studyability of the programme is increased by working with 'smaller' modules and by allowing sufficient flexibility.

The discussion with the students during the site visit indicated that there is a general willingness to adjust the programme to the needs of the students and/or to look for solutions. The programme systematically surveys all students after each lesson. This way, students can give (quantitative) feedback on the content, the teacher and the lesson material per lesson. Selected students are questioned qualitatively after completing the module and the programme. Also, the programme director or the staff are responsive to questions and more direct feedback.

Figures in the SER indicate that only 20% of the students successfully complete their master's thesis (26 ECTS). So, **a large share of the students drops-out when embarking on or during the master's thesis phase in the second year.** After attending and completing modules 1 to 17, students seem to become lost when transitioning to the master's thesis phase. This is a clear and important problem to address, according to the panel. All stakeholders involved in the programme are well-aware of this problem and the programme commission is currently evaluating the master's thesis concept and evaluating routes to improve the success rate and to reduce drop-out. From a pedagogical-didactic point of view the panel states that the programme provides too little structure and creates too little commitment during the second year. To be more specific, in comparison with the first year, there is a sudden lack of explicit rhythm and a lack of interaction with other students, because there are no more weekly scheduled courses. Also, the students say that the amount of structure provided is very promoter dependent: some promoters invest more than others.

The panel urges the programme to address the high drop-out rate in the second year. During the site visit, the panel and the programme management brainstormed about possible solutions. It might be worthwhile to consider or investigate the following options. A first recommendation might be to rethink the structure of the programme towards the thesis phase. The programme can, for example, consider rearranging the curriculum, more specific ideas are to bring part of module 17 - the research techniques - earlier in the programme or to move some modules to the second year to maintain the rhythm of the first year and to have extra (group) moments to discuss the thesis progress. Also, specific attention could be paid to the upcoming master's thesis phase in each module: by reflecting on possible thesis topics linked to the course subjects and/or by showing a variety of examples (master's theses that were realised in the student's work field, examples of ongoing research on the course subject, opt-ins on existing research projects...). The programme could invite alumni to present their master's thesis project to the students, while also stressing their lessons-learned and the added value of the master's thesis project. The academic staff (all professors) could present elements from their ongoing research projects, with specific attention to the research questions they work on and later on, they could be engaged as potential supervisors once the students enter the master's thesis phase. A second recommendation is to communicate the objectives and the added value of the master's thesis more clearly to all parties involved. What's in it for the students, their workplace and/or the academic discipline in general. Students say that support of their employers during the master's thesis phase is crucial. Therefore the panel suggest to set up a specific information campaign to convince companies and organisations to fully support their employees in finishing the master's thesis. Thirdly, the panel recommends to introduce more structure and social interaction in this phase of the programme. As for structure, the 5-pager from the first year can serve as a good example. Such a document gives students something to hold on to. Intermediate deadlines can help students spread out the work and it gives the promoters a chance to monitor students' progress better. Concerning social interaction, it would be good to foster the built-up community feeling during the second year: not only in terms of knowledge sharing, but also in terms of motivation and emotion regulation. Possible ways to do this are come-back moments, gatherings for students and alumni, intervision sessions under supervision of a mentor (not necessarily the promoter), etc. Finally, the programme expresses the ambition to develop a research programme connected to the master programme. This could also provide opportunities to give students a stronger context to work on the master's thesis. The idea to develop a research programme is very much welcomed by the panel.

The panel notes that the programme has made great progress in recent years, more specifically in terms of the competency model and alignment with the curriculum. **The evaluation of students is also linked to the competence profile, but the panel thinks there's still room to further and fully extend the alignment.** An

overarching view with a more transparent linkage between the overall learning goals, the learning goals per module, the examination forms used and the criteria used to evaluate the results of students can be useful in this matter.

As mentioned before, the programme plans to invest in the pedagogical-didactical training of the teachers. The panel believes student evaluation is an important topic to address in the training since the panel observed that **the quality of the evaluation materials varied between modules. According to the panel, a great part of the evaluation tasks is valid, reliable and transparent, but for some modules it is an important area for improvement.** Also, the interviewed students stated that the expectations regarding evaluation aren't transparent in some modules. The communication concerning the evaluation is - in their opinion - well-structured for a large amount of modules, but for some modules the communication goes less smoothly. During the site visit, the following recommendations were made by the panel. Firstly, the programme should - for some modules - work on clearer, less generic evaluation criteria and communication about these criteria. Based on the evaluation criteria, students must be able to derive what is expected of them and if there are multiple assessors, the programme must ensure that all assessors evaluate in the same way. Secondly, the agreements concerning the speed of marking exams must be followed more strictly. Students spoke of an exam result that only reached them a year after submission. Thirdly, the programme should make agreements on how and when to give feedback to students, because students perceive feedback from lecturers as an important part of their learning process and feedback isn't always planned structurally. Finally, the panel observes that the programme relies heavily on written exams and assignments. In line with the need for more attention on soft skills in the programme, the panel recommends the programme to add evaluation forms in which communication skills have to be demonstrated.

Quality control on student evaluation is done by module coordinators and examiners, the exam commission and the programme director. The programme commission supervises the quality control process. The programme has developed an assessment policy. It is good that the programme has an assessment policy and the necessary structures in place, but it must be ensured that the agreed upon quality criteria are fully respected.

Before the programme review the programme had made a few master's theses available to the panel. **The panel judged that the scores on these master's theses were in line with their expectations.** During the interview, the alumni testified that they are very satisfied with the programme. The programme has given them a broad view of the subject matter, has provided them with the necessary tools to solve problems and has enabled them to function on a higher level. The added value of the programme is clear for the stakeholders involved: students, alumni and professional field.

The INNOCOM classroom is located in a green, peaceful environment and it is well-equipped for on site, online and hybrid forms of teaching and learning. The programme also provides access to the virtual classroom (Moodle), access to scientific databases, spaces to work or study, food and parking. The programme creates rich learning opportunities through the design of the learning environment: very intense lecture weekends with lots of informal activities (e.g. lunches and dinners) and the visible commitment of all staff involved (the programme director and the teachers). To conclude, students appreciate the easily accessible services and facilities very much.

The programme provides good counselling for the students. There is a very familial atmosphere, so questions and problems can be addressed easily. The lecturers are responsible for counselling regarding the content and the planning of their modules (content, deadlines...). In case of issues regarding the study trajectory of students, the programme director is the go-to person. However, the panel found it striking that the interviewed students didn't know who the ombudsperson was, so this should be communicated more clearly. Also, there is no mechanism in place in case the ombudsperson can't solve the problems and there's no external confidential counsellor. **The panel believes the appointment of a neutral external counsellor is desirable, especially considering the intimate, familiar setting of the programme.** Since INNOCOM has such an external counsellor in place for their staff, this counsellor can easily be appointed to also take up a role towards the MEA students.

In general, the panel finds that the programme provides comprehensive and readable information on all stages of study. On the MEA website potential students can find an overall description of the programme (and why it's different from comparable programmes). There's also information about the programme structure and

a few testimonials of alumni. In addition, potential students can register for an info session or they can book a personal call with the programme director. **Before enrolment, the programme invests in a robust intake procedure where the expectations of the students are verified and corrected if necessary.** During the intake procedure the programme provides in depth information on the programme, so students know exactly what is expected from them. The panel thinks the thorough intake procedure forms a good practice in the programme. **Enrolled students get information about the modules through the Moodle platform (e.g. ECTS fiches, learning materials).** Although students are generally satisfied with the available information, the panel noticed that this could be better for a few modules. For example, for some modules the students didn't find the ECTS-fiche (although they exist because all the ECTS fiches were attached to the SER). Students also said that the structure of some modules and the expectations within these modules weren't always clear. The panel stresses the importance of transparent communication and therefore recommends that the programme ensures that information supply is sufficient for all the modules.

The programme mentions the accreditation by NVAO on its website. The report of the previous programme review can be found on the website of NVAO and VLUHR QA. Perhaps it's an option to place the new programme review report (or a direct link) on the website, so potential students can find information about the quality of the programme without taking a detour.

Conclusion

The panel's overall judgement on the Master of Science in Enterprise Architecture of INNOCOM - based on the documentation provided and on the further evidence provided and discussions that took place during the visit - is positive. In their opinion, the presence of the quality features is guaranteed. Therefore, the panel notes that the quality of the programme is satisfactory and recommends further accreditation of the programme.

Overall, the programme has made a lot of progress since the previous programme review. The impressive ambitions of the programme and the unique cross-disciplinary and trans-disciplinary character are now translated into a substantiated competence profile and a well-thought-out curriculum. During the visit the other preliminary strengths were also confirmed by students and alumni: the enriching mix of theory and practice, the experienced teachers from the academic and the professional world, the close relationship between the programme and the students and the high-quality graduates.

The preliminary areas of concern were discussed in depth with the programme management. The programme is well-aware of existing issues and reacts adequately, although it sometimes turns out to be a challenge to find the right solution. During a follow-up in two to three years - as provided in the VLUHR QA manual for programme review - the panel would like to rediscuss the drop-out in the master's thesis phase, the adjustments made and the impact of these adjustments.

For the programme - and for the panel - the site visit was an enriching experience: ideas were exchanged and elaborated upon. The programme team proves to be enthusiastic, passionate, self-critical and competent in the continuous pursuit of quality development. Therefore, the panel has confidence in the programme to further address the issues in a qualitative manner.

To conclude, the panel states that the programme acts as a true pioneer in the field and has established a firm base, but now it is time to mature and to make sure this solid basis gets translated to the entire programme.

Summary of commendations

- The cross-disciplinary (Business and IT) and trans-disciplinary character (academically and professionally oriented) of the programme is unique and adds value for all stakeholders involved.
- The programme developed a new competence model. The development process resulted in a strong, substantiated competence framework built around 5 major clusters and consisting of 27 competences in total. This competence model is aligned with the academic evidence base on the one hand and the present-day needs in the professional field on the other hand.
- The curriculum is well thought-out, founded on different theoretical models and frameworks and aligned with the competence model. Each module is situated within the broader enterprise architecture framework. The content of the modules is relevant and up-to-date. Through the incorporation of academic and work-field lectures there is a nice balance between developments in the discipline and developments in the professional field.
- For the first-year modules, the programme creates a teaching and learning environment that encourages the students to play an active role and that fosters a smooth study progress. The lecturers encourage students to bring in their own work experience and to share the problems they encounter at the workplace. This is used as input for discussion, reflection, assignments, etcetera. Also, several modules make use of learning activities such as group work and presentations.
- The programme manages to build a close community with its teachers and students through formal and informal initiatives. The programme also provides good counselling for the students. There is a very familial atmosphere, so questions and problems can be addressed easily.
- The studyability of the first-year modules is increased by working with 'smaller' modules and by allowing sufficient flexibility.
- Before enrolment, the programme invests in a robust intake procedure where the expectations of the students are verified and corrected if necessary.
- The INNOCOM classroom is located in a green, peaceful environment and it is well-equipped for on site, online and hybrid forms of teaching and learning.
- Quality control on student evaluation is done by module coordinators and examiners, the exam commission and the programme director. The programme commission supervises the quality control process.
- Master's theses reviewed by the panel demonstrate high quality.
- The added value of the programme is clear for the stakeholders involved: students, alumni and professional field. The programme offers students a broad view of the subject matter, provides them with the necessary tools to solve enterprise architectural problems and it enables students to function on a higher level.

Summary of recommendations

- Promote the competency model more actively by sharing it with the academic field and the industry.
- Reflect upon the scientific-evidence base underlying the more practical module content. Make the scientific-evidence base underlying the more practical module content visible in each module. Also make sure that there are enough practical examples to illustrate theory in each module.
- Trigger students to think critically about the quality/aptness of the used instruments (methods, techniques, approaches) and about the validity and the underpinnings of solutions or directions they would propose as an enterprise architect throughout the whole curriculum. Suggestions might be to move part of the research methods content forward, thereby explicitly focusing on critical thinking and/or to revisit this critical thinking approach in different modules.
- Rebalance the curriculum composition towards business and enterprise. Include the CFO perspective and soft skills more prominently in the curriculum.
- Formulate explicit learning goals regarding group work and make use of theoretical frameworks concerning group work to improve collaboration, group dynamics and communication.
- Differentiate more between students depending on the background of the students (IT or business). Decide what's the common core for all enterprise architects and which sub aspects may vary depending on their background. The differentiation can be translated into the competence model, the curriculum and the learning environment.
- Further invest in the pedagogical-didactical training of the lecturers to improve their teaching skills and pair up guest lecturers and practitioners with pedagogical-didactical experienced lecturers for structural support regarding student supervision and evaluation.
- Give more attention to transparent alignment of the overall learning goals, the learning goals per module, the examination forms used and the criteria used to evaluate the results of students. Address student evaluation explicitly in training initiatives for lecturers.
- Ensure that the assessment policy and the agreed upon quality criteria are fully respected.
- Make sure that more students embark on and finish the master's thesis phase. Several strong recommendations were made in this regard:
 - Rethink the structure of the programme towards the thesis phase and rearrange the modules.
 - Mention the upcoming master's thesis phase in each module by reflecting on possible thesis topics linked to the course subjects, by showing a variety of master's thesis examples, by inviting alumni to present their master's thesis project to the students, by giving more insight into ongoing research projects of lecturers, etc.
 - Communicate the objectives and the added value of the master's thesis more clearly to all parties involved. What's in it for the students, their workplace and/or the academic discipline in general.
 - Introduce more structure and social interaction in the end phase of the programme: structured documentation, intermediate deadlines, come-back moments, gatherings for students and alumni, intervision sessions under supervision of a mentor or the promotor, etc.
- Encourage lecturers to visit each other's lessons on a structural basis, especially if they teach the same module.
- Recruit among experienced practitioners inside and outside of INNOCOM. Also, consider enlisting international guest lecturers outside the INNOCOM circle.
- Appoint a neutral external counsellor for students.
- Ensure that information supply is sufficient for each module.
- Place more information about the quality of the programme on the website (for example a direct link to the review report).

Annexes

Annex 1: administrative details

Naam van de instelling	inno.com cv
Adres, telefoon, e-mail, website instelling	Heiststeenweg 131 B-2580 Beerzel T +32 15 25 82 00 F +32 15 25 82 01 info@icinstitute.be info@inno.com www.icinstitute.be www.inno.com
Naam, functie, telefoon, e-mail contactpersoon	Jonas Van Riel, program director jonas.vanriel@inno.com Jurgen Van De Sompel, partner jurgen.vandesompel@inno.com +32 15 25 82 00
Naam opleiding (graad, kwalificatie)	Master of Science in Enterprise Architecture
Afstudeerrichtingen	/
Niveau en oriëntatie	Master-na-master
(Delen van) studiegebied(en)	Industriële wetenschappen en technologie toegepaste wetenschappen, bedrijfswetenschappen en bedrijfsmanagement
Onderwijstaal	Engels
De vestiging(en) waar de opleiding wordt aangeboden	Hoofdkantoor van Inno.com cv Heiststeenweg 131 B-2580 Beerzel
Studieomvang (in studiepunten)	60 ECTS

Annex 2: cv panel members

Erik Proper is a senior research manager within the Computer Science (ITIS) department of the Luxembourg Institute of Science and Technology (LIST). He is also Adjunct Professor in Data & Knowledge Engineering at the University of Luxembourg, and a visiting Professor at the TUWien in Austria. He regularly provides (guest) lectures within different MSc programmes offered by the University of Luxembourg (LU), the University of Lorraine (FR), TU Wien (AT), the University of Namur (BE), Antwerp University (BE), and TIAS (NL).

Gerdy De Clercq is owner of AXYON BV & Partner of Business Markers CV. He supports businesses in their digital transformation as independent advisor or interim CIO. His experience lies mainly in government, financial services & ICT industries, where he focused on balancing innovation with operational resilience while building more agile organizations. He was CIO & Member of the Executive Team at Fednot, CIO & Boardmember at Baloise Insurance, vice-CIO at Proximus and Officer of the Belgian Airforce. He holds a degree of Master in Military & Aeronautical Sciences (Royal Military Academy, 1989).

Els Consuegra holds a PhD in Educational Sciences (2015) and is a tenure track professor at the Multidisciplinary Institute of Teacher Education (MILO) at the Vrije Universiteit Brussel (VUB). Formerly, she was a Guest Professor at the Department of Educational Sciences of Ghent University. Her research addresses teachers' initial and continued professional development with a focus on equity and diversity issues.

Jessica Van Suetendael is a first-year master student Handelsingenieur in de Beleidsinformatica at Hasselt University with an interest in research. She has been a student representative for four years. Her interest lies in quality management and that is why she is active at degree-level as a student member of the education management team of her degree program for three years.

Annex 3: site visit schedule

Wednesday 9 February 2022

11:00 - 13:30	preparatory panel meeting + lunch
13:30 - 14:30	interview with programme management
14:30 - 15:00	panel meeting
15:00 - 16:00	interview with students
16:00 - 16:30	panel meeting
16:30 - 17:45	interview with teaching staff
17:45 - 18:15	panel meeting
18:15 - 19:15	interview graduates and professional field
19:45	diner panel

Thursday 10 February 2022

9:00 - 10:00	programme-specific infrastructure
10:00 - 10:30	interview with supporting staff
10:30 - 11:30	consultation hour
11:30 - 13:30	panel meeting + lunch
13:30 - 15:00	co-creative conversation with programme management
15:00 - 16:00	final panel meeting
16:00 - 16:15	oral report

Annex 4: documents consulted

Self-evaluation report Master of Science in Enterprise Architecture (INNOCOM), including the following attachments:

- Attachment 1: ECTS fiches
- Attachment 2: Competitive analysis (Other master education)
- Attachment 3: Competence model
- Attachment 4: Full list of professors and lecturers, including related frameworks they use
- Attachment 5: Intake and EVC procedure
- Attachment 6: MEA module 17 and Thesis guiding document
- Attachment 7: Capability map of IC Institute
- Attachment 8: Organigram of INNOCOM and IC Institute
- Attachment 9: Constructive alignment table
- Attachment 10: Example focused conversation alumni & action points
- Attachment 11: Example feedback to guest lecturer
- Attachment 12: Sample of recent assessors and promotors
- Attachment 13: Example of a program commission report
- Attachment 14: Example of student feedback report across modules with benchmarking

Representative sample of master's theses and evaluation forms

Overview of action points in follow-up of the recommendations made by the previous review panel

Access to Moodle (virtual classroom): learning materials for each module

Evaluation examples (two modules)