

Assessment report  
Limited Framework Programme Assessment

**Master Information Science**

Utrecht University

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*Contents of the report*

1. Executive summary .....	2
2. Assessment process .....	4
3. Programme administrative information .....	7
4. Findings, considerations and assessments per standard.....	8
4.1 Standard 1: Intended learning outcomes.....	8
4.2 Standard 2: Teaching-learning environment.....	10
4.3 Standard 3: Student assessment .....	13
4.4 Standard 4: Achieved learning outcomes .....	15
5. Overview of assessments .....	16
6. Recommendations.....	17

## 1. Executive summary

In this executive summary, the panel presents the main considerations which led to the assessment of the quality of the Master Information Science programme of Utrecht University, which has been assessed according to the standards of the limited framework, as laid down in the NVAO Assessment framework for the higher education accreditation system of the Netherlands, as published on 20 December 2016 (Staatscourant nr. 69458).

The panel considers the objectives of the programme to be sound and relevant. The panel feels, however, the programme profile could be defined more precisely. In addition, the panel recommends programme management to be more clear on the balance of the academic research and professional orientation of the programme. The programme objectives are within the MSIS 2016 Global Competency Model of ACM/AIS and therefore match the international requirements for the information science domain.

The panel appreciates the programme objectives to prepare students for information science positions on the labour market.

The intended learning outcomes of the programme meet the programme objectives and are adequate, addressing, among others, information science knowledge, research skills, communication skills and learning skills. The panel proposes, however, to specify the disciplinary knowledge with respect to the application domains of the programme more clearly. The intended learning outcomes conform to the master level, as exemplified by the Dublin descriptors.

The panel noted programme management not having relations on a structural basis with the professional field. The panel recommends to put mechanisms in place to maintain regular contact with the professional field and to ensure input from this field feeding into the programme.

Although the programme is managed conscientiously, the panel recommends to strengthen the position of the programme within the Faculty of Science.

The curriculum of the programme complies with the intended learning outcomes and is regarded by the panel to be up to standard. In the programme, relevant research methods are addressed, including qualitative, quantitative and design science research methods and techniques. The panel advises to restructure the curriculum by reducing the complexity in the curriculum design, now being founded on domains, tracks and profiles and by reorganising the electives, now being quite numerous. The panel also advises to add specific information science oriented courses, as they seem to be lacking to some extent.

The panel considers the lecturers in the programme to be very motivated, the group of lecturers being coherent. The students expressed being content about the lecturers. The panel suggests, however, to involve more full professors, as the current number of only two is too limited. The panel recommends also to strengthen the relation between research and teaching. In addition, the panel advises to increase the proportion of UTQ-certified lecturers further. The panel feels the programme could be less dependent upon the deployment of students and PhD-students as teaching assistants.

The admission requirements and admission procedures of the programme are appropriate. The programme exemptions policy and regulations are regarded by the panel to be up to standard.

The panel regards the study methods to meet the contents of the programme and to promote student-centred learning. The panel notes the programme to be quite challenging, students spending about 40 hours per week on their studies. The panel regards the number of hours of face-to-face education to be satisfactory. The study pace monitoring is appropriate. The student-to-staff ratio could be improved. The panel advises to analyse student success rates to be able to detect any causes for delay.

The panel considers the examination and assessment policies for the programme as well as the formal position and the authority of the Board of Examiners for this programme to be appropriate.

The panel approves of the examination methods adopted in the programme. The measures taken by programme management to ensure the validity of examinations and the reliability of assessments are adequate. This is exemplified by the assessment plan for the programme, examiners being required to be UTQ-certified and by adopting test matrices for the courses. The Board of Examiners inspects examinations. The panel advises not to have teaching assistants grade examinations.

The process design and the assessment of the Graduation Research Project are adequate. The projects are appropriately organised. The assessments are up to standard, involving two examiners and the usage of scoring forms with relevant assessment criteria. The panel recommends to have all scoring forms filled out adequately and to require the supervisor and the second reader to grade the projects independently.

The panel assesses the course examinations to be very much up to standard. None of the Graduation Research Projects reviewed were assessed by the panel to be unsatisfactory. The grades of these projects were found to be consistent with the grades the panel would have given. The panel regards the projects to be of good quality. The research component in the projects is very strong, also in case of company-related projects. The theses are well-structured. The students invested much time and effort in the projects and the results were clearly above average.

In the panel's opinion, the programme succeeds in preparing the programme's graduates for appropriate positions in the professional field.

The panel which conducted the assessment of the Master Information Science programme of Utrecht University assesses this programme to meet the standards of the limited framework, as laid down in the NVAO Assessment framework for the higher education accreditation system of the Netherlands, judging the programme to be satisfactory. Therefore, the panel recommends NVAO to accredit this programme.

Rotterdam, 18 April 2018

Prof. dr. ir. M.F.W.H.A. Janssen  
(panel chair)

drs. W. Vercouteren  
(panel secretary)

## 2. Assessment process

The evaluation agency Certiked VBI received the request by Utrecht University to manage the limited framework programme assessment process for the Master Information Science programme of this University. This objective of the programme assessment process was to assess whether the programme would conform to the standards of the limited framework, as laid down in the NVAO Assessment framework for the higher education accreditation system of the Netherlands, published on 20 December 2016 (Staatscourant nr. 69458).

Management of the programmes in the assessment cluster Information Sciences convened to discuss the composition of the assessment panel and to draft the list of candidates.

Having conferred with management of the Utrecht University programme, Certiked invited candidate panel members to sit on the assessment panel. The panel members agreed to do so. The panel composition was as follows:

- Prof. dr. ir. M.F.W.H.A. Janssen, full professor ICT and Governance, head of Information and Communication Technology research group, Faculty Technology, Policy and Management, Delft University of Technology (panel chair);
- Prof. dr. G. Poels, full professor Management Information Systems, director Business Informatics research unit, Department of Business Informatics and Operations Management, Ghent University (panel member);
- Prof. dr. U. Frank, full professor of Information Systems and Enterprise Modelling, Institute of Computer Science and Business Information Systems, University of Duisburg-Essen (panel member);
- E.E.M. Leo BSc, student Master Educational Sciences, University of Amsterdam, (student member).

On behalf of Certiked, drs. W. Vercouteren served as the process coordinator and secretary in the assessment process.

All panel members and the secretary confirmed in writing being impartial with regard to the programme to be assessed and observing the rules of confidentiality. Having obtained the authorisation by the University, Certiked requested the approval of NVAO of the proposed panel to conduct the assessment. NVAO have given their approval.

To prepare the assessment process, the process coordinator convened with management of the programme to discuss the outline of the self-assessment report, the subjects to be addressed in this report and the site visit schedule. In addition, the planning of the activities in preparation of the site visit were discussed. In the course of the process preparing for the site visit, programme management and the Certiked process coordinator regularly had contact to fine-tune the process. The activities prior to the site visit have been performed as planned. Programme management approved of the site visit schedule.

Well in advance of the site visit date, programme management sent the list of final projects of graduates of the programme of the most recent years. Acting on behalf of the assessment panel, the process coordinator selected 15 final projects. The grade distribution in the selection was ensured to conform to the grade distribution in the list, sent by programme management. Additional criteria have been taken into account, if these had been found to be relevant for the programme.

The panel chair and the panel members were sent the self-assessment report of the programme, including appendices. In the self-assessment report, the student chapter was included. In addition, the expert panel members were forwarded a number of final projects of the programme graduates, these final projects being part of the selection made by the process coordinator.

A number of weeks before the site visit date, the assessment panel chair and the process coordinator met to discuss the self-assessment report provided by programme management, the procedures regarding the assessment process and the site visit schedule. In this meeting, the profile of panel chairs of NVAO was discussed as well. The panel chair was informed about the competencies, listed in the profile. Documents pertaining to a number of these competencies were presented to the panel chair. The meeting between the panel chair and the process coordinator served as the briefing for panel chairs, as meant in the NVAO profile of panel chairs.

Prior to the date of the site visit, all panel members sent in their preliminary findings, based on the self-assessment report and the final projects studied, and a number of questions to be put to the programme representatives on the day of the site visit. The panel secretary summarised this information, compiling a list of questions, which served as a starting point for the discussions with the programme representatives during the site visit.

Shortly before the site visit date, the complete panel met to go over the preliminary findings concerning the quality of the programme. During this preliminary meeting, the preliminary findings of the panel members, including those about the final projects were discussed. The procedures to be adopted during the site visit, including the questions to be put to the programme representatives on the basis of the list compiled, were discussed as well.

On 8 December 2017, the panel conducted a site visit on the Utrecht University campus. The site visit schedule was in accordance with the schedule as planned. In a number of separate sessions, panel members were given the opportunity to meet with Faculty Boards representatives, programme management, Examination Board representatives, lecturers and final projects examiners and students and alumni.

In a closed session at the end of the site visit, the panel considered every one of the findings, weighed the considerations and arrived at conclusions with regard to the quality of the programme. At the end of the site visit, the panel chair presented a broad outline of the considerations and conclusions to programme representatives.

Clearly separated from the process of the programme assessment, the assessment panel members and programme representatives met to conduct the development dialogue, with the objective to discuss future developments of the programme.

Due to personal circumstances, the student member of the panel could not attend the site visit nor could she be present during the preliminary meeting of the panel. Having been informed about the absence of the student member, programme management agreed to proceed with the site visit as planned. The panel chair and the panel members also were in agreement to go on with the site visit. At the completion of the assessment process, the panel agreed this process to have been conducted in a sound way.

The assessment draft report was finalised by the secretary, having taken into account the findings and considerations of the panel. The draft report was sent to the panel members, who studied it and made a number of changes. Thereupon, the secretary edited the final report. This report was presented to programme management to be corrected for factual inaccuracies. Programme management were given two weeks to respond. Having been corrected for these factual inaccuracies, the Certiked bureau sent the report to the University Board to accompany their request for re-accreditation of this programme.

### 3. Programme administrative information

Name programme in CROHO: M Information Science  
Orientation, level programme: Academic Master  
Grade: MSc  
Number of credits: 120 EC  
Specialisations: Business Informatics  
Location: Utrecht  
Mode of study: Full-time (language of instruction: English)  
Registration in CROHO: 60809

Name of institution: Utrecht University  
Status of institution: Government-funded University  
Institution's quality assurance: Approved

## 4. Findings, considerations and assessments per standard

### 4.1 Standard 1: Intended learning outcomes

The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements.

#### *Findings*

The objectives of this Master programme are to educate students to analyse information management issues in organisational environments and to develop solutions to problems in this domain within organisations and in society at large. The objectives of the programme include training students in the research methodology applied in this domain, being qualitative as well as quantitative and design science research methods and techniques.

The programme is referred to under the name of Master in Business Informatics. The programme addresses three domains within the information science field. These are *Complex Software Systems*, which involve the design, architecture, production and implementation of complex software systems, *Data Science Systems*, which deals with analysis, collection, classification, manipulation, storage, retrieval, movement, dissemination and protection of information in organisations, and *Learning and Persuasive Technologies*, which is directed towards the adoption and implementation of complex technologies for learning and the changing of behaviour by end-users. These domains may be viewed as the information systems application areas of the programme.

Programme management showed the programme objectives to meet the domain-specific framework of reference, being the international MSIS 2016 Global Competency Model for Graduate Degree Programs in Information Systems of ACM/AIS. The programme gives priority to a number of competencies listed in this international reference framework, and may be regarded as taking a predominantly technical perspective.

Programme management translated the objectives into a series of intended learning outcomes, specifying, among others, in-depth knowledge of theories, concepts and techniques in information science, research skills, knowledge and skills in analysing and interpreting research outcomes, research ethics awareness, oral and written communication skills and learning skills to keep up with developing knowledge.

Programme management presented a table to show the intended learning outcomes to correspond to the Dublin descriptors for master level programmes.

The programme is meant to educate students to enter the labour market and to find positions in the information science field.

#### *Considerations*

The panel considers the objectives of the programme to be sound and relevant. The panel feels, however, the programme profile could be defined more precisely. In addition, the panel recommends programme management to be more clear on the balance of the academic research and professional orientation of the programme.



The programme objectives are within the MSIS 2016 Global Competency Model of ACM/AIS and therefore match the international requirements for the information science domain.

The intended learning outcomes of the programme meet the programme objectives and are adequate, addressing, among others, information science knowledge, research skills, communication skills and learning skills. The panel proposes, however, to specify the disciplinary knowledge with respect to the application domains of the programme more clearly.

The intended learning outcomes conform to the master level, as exemplified by the Dublin descriptors.

The panel appreciates the programme objectives to prepare students for information science positions on the labour market.

The panel noted programme management not having relations on a structural basis with professional field representatives. The panel recommends to put mechanisms in place to maintain regular contact with the professional field and to ensure input from this field feeding into the programme.

*Assessment of this standard*

These considerations have led the assessment panel to assess standard 1, Intended learning outcomes, to be satisfactory.

## 4.2 Standard 2: Teaching-learning environment

The curriculum, the teaching-learning environment and the quality of the teaching staff enable the incoming students to achieve the intended learning outcomes.

### *Findings*

The Master Information Science is a programme of the Faculty of Science of Utrecht University. Within the Faculty, the programme is part of the Graduate School of Natural Sciences. The Board of Studies of the School is responsible for the quality of this and the six other Master programmes. The Education Council, consisting of students and lecturers, evaluates the programme quality and advises the Board of Studies in this respect. The Board of Examiners of the Graduate School of Natural Sciences has been given the authority to monitor the examination processes and the examinations and assessments of this programme. The director of the programme in collaboration with the programme coordinators supervises the quality and the programme contents on a day-to-day basis. The lecturers in the programme are employed at and recruited from the Department of Information and Computing Sciences of the Faculty.

The number of incoming students in the programme gradually rose to over 60 students per year in the years 2016 and 2017 from about 50 students per year in the years before. Students may enrol either in September (influx about 45 students) or in February (influx about 15 students). About 1/3 of the students come from the Utrecht University Bachelor Information Science programme, 1/3 come from Bachelor programmes in this domain of other Dutch Universities and 1/3 come from abroad.

Programme management presented a table to demonstrate the curriculum meeting the intended learning outcomes of the programme. The first part of the curriculum, the course phase, consists of ten courses (total of 75 EC). The courses *Method Engineering*, *Knowledge Management* and *Advanced Research Methods* are mandatory for all students. The other seven courses are selected from a list of electives. Programme management advises students to take courses in line with three distinct tracks in the programme, being the tracks *Analyst*, *Entrepreneur* or *Researcher*. Within the list of these electives, students may choose four primary elective courses (30 EC), being fundamental to the information science domain, or meeting the three programme domains, being *Complex Software Systems*, *Data Science Systems* or *Games* or a maximum of two courses corresponding to the teachers' research interests. In addition, students may select three courses (22.5 EC) from the range of courses offered within the Graduate School of Natural Sciences or from the wide range of courses within or outside of the University. The second part of the curriculum (44 EC), the research phase, is directed towards the final project and is composed of the *Graduation Colloquium*, being biweekly meetings of all graduating students, the *Project Proposal*, in which students draft their thesis proposal and the *Graduation Research Project*, being the final thesis. Students may select one of the profiles, such as the educational profile, preparing students to become teachers in secondary schools. In addition, students may opt for one of the University honours programmes, implying additional study load.

As has been indicated, nearly all staff are employed at the Department of Information and Computing Sciences, which is part of the Faculty of Science. For assistant professors and associate professors, the teaching load amounts to 60 % of their appointment and the research tasks are 40 % of their appointment. Lecturers teach for 90 % of their appointment and do some teaching-related research. The total staff head count is 18 persons, including PhD students and excluding teaching assistants. This represents 3.7 full-time equivalents. About 96 % of these lecturers have PhDs and about 78 % of them are UTQ-certified (figures calculated on the basis of teaching capacity). Two full professors are partly involved in the

programme. Teachers meet four times per year to discuss the programme. Students with whom the panel met expressed being content about the teachers. They noted teachers experiencing challenging workloads.

Students having completed Bachelor Information Science programmes are admitted unconditionally to the programme. Students having diplomas of other Bachelor programmes may need to take deficiency courses of 7.5 EC maximum. Students coming from Universities of Applied Sciences (HBO in Dutch) and having a GPA of 7.5 are admitted to the pre-master programme, which includes courses on research methods and on programming skills.

Students may apply for exemptions. Requests for exemptions are handled by the Board of Examiners.

The programme educational concept is meant to allow students to complete the programme, provided they put in effort themselves as well. The study methods adopted in the programme include presentations, individual assignments and papers, and group assignments. The number of hours of face-to face education are 8 hours per week in the course phase of the curriculum, and about one hour per week during the Graduation Research Project. The student-to-staff ratio is 35 : 1. At the beginning of the programme, students draft their individual study plan, outlining the courses to be taken. During the course phase of the curriculum, the programme coordinator monitors the study pace of the students and contacts students progressing slowly. In the research phase of the programme, the graduation coordinator assists students in selecting the graduation project topic and in finding the supervisor. Students regard the programme to be feasible, studying 40 hours per week. The student success rates are about 32 % for students completing the programme after two years and about 69 % for students finishing after three years (average figures for students registering in the second year, cohorts 2011 to 2013).

### *Considerations*

The panel considers the programme to be managed conscientiously. The panel recommends however to strengthen the position of the programme within the Faculty of Science.

The curriculum of the programme complies with the intended learning outcomes and is regarded by the panel to be up to standard. In the programme, relevant research methods are addressed, including qualitative, quantitative and design science research methods and techniques. The panel advises to restructure the curriculum by reducing the complexity in the curriculum design, now being founded on domains, tracks and profiles and by reorganising the electives, now being quite numerous. The panel also recommends to add specific information science oriented courses, as they seem to be lacking to some extent.

The panel considers the lecturers in the programme to be very motivated, the group of lecturers being coherent. The students expressed being content about the lecturers. The panel suggests, however, to involve more full professors, as the current number of only two is too limited. The panel recommends also to strengthen the relation between research and teaching. In addition, the panel advises to increase the proportion of UTQ-certified lecturers further. The panel feels the programme could be less dependent upon the deployment of students and PhD-students as teaching assistants.

The admission requirements and admission procedures of the programme are appropriate. The programme exemptions policy and regulations are regarded by the panel to be up to standard.

The panel regards the study methods to meet the contents of the programme and to promote student-centred learning. The panel notes the programme to be quite challenging, students spending about 40

hours per week on their studies. The panel regards the number of hours of face-to-face education to be satisfactory. The study pace monitoring is appropriate. The student-to-staff ratio could be improved. The panel advises to analyse student success rates to be able to detect any causes for delay.

*Assessment of this standard*

These considerations have led the assessment panel to assess standard 2, Teaching-learning environment, to be satisfactory.

### 4.3 Standard 3: Student assessment

The programme has an adequate system of student assessment in place.

#### *Findings*

The examination and assessment regulations for the programme are in line with the Graduate School of Natural Sciences Assessment Policy. For all seven Master programmes of the School, one Board of Examiners has been installed, having the authority to ensure and monitor the quality of examinations and assessments and the corresponding processes of these programmes. For each of the programme including for this programme, the member for this programme in the Board chairs the executive panel for this and the Master Computer Science programme.

Multiple examinations are scheduled in most, if not all of the courses. Examination methods include papers, written examinations, presentations and course projects. The assignments tend to be group products, whereas the written examinations are always individual examinations.

For the programme as a whole, the programme assessment plan has been drafted, relating intended learning outcomes to course learning goals and examinations. Examiners are appointed by the Examination Board and have to be UTQ-certified. Teachers without the UTQ-certificate or teaching assistants may grade examinations, provided an examiner confirms the grade. For all courses, examinations are accompanied by test matrices, relating the examinations to the course goals. Fraud and plagiarism procedures for the programme are in place and cases are handled by the Board of Examiners. The effect of free-riding in group projects is countered by scheduling individual examinations in each of the courses. The Board of Examiners reviews examinations on a regular basis.

The Graduation Research Projects are supervised by one of the programme staff members. Most projects are done by students outside of University, in organisations or companies. Programme management ensures an external supervisor of the organisation guiding the student. At the completion of the project, external supervisors submit their assessment of the student's performance, which serves as advice for the grade. In the project proposal phase, students are to conduct the literature survey, state the research question, select the methodology, and draft the project plan. They present this to fellow students and staff. The supervisors are to approve the plan. At completion of the project, students submit their thesis. The project is assessed by the supervisor and the second reader. They use a set of assessment criteria, among which the research results (theoretical framework, scientific quality, results), presentation of the results and attitude and motivation. The supervisors grade the project, but not independently. Only theses that can be turned into a publishable scientific paper, are graded 8.0 or more.

#### *Considerations*

The panel considers the examination and assessment policies for the programme to be adequate. The formal position and the authority of the Board of Examiners for this programme are appropriate as well.

The panel approves of the examination methods adopted in the programme.

The measures taken by programme management to ensure the validity of examinations and the reliability of assessments are adequate. This is exemplified by the assessment plan for the programme, examiners being required to be UTQ-certified and by adopting test matrices for the courses. The Board of Examiners inspects examinations. The panel advises not to have teaching assistants grade examinations.

The process design and the assessment of the Graduation Research Project are adequate. The projects are appropriately organised. The assessments are up to standard, involving two examiners and the usage of scoring forms with relevant assessment criteria. The panel recommends to have all scoring forms filled out adequately and to require the supervisor and the second reader to grade the projects independently.

*Assessment of this standard*

The considerations have led the assessment panel to assess standard 3, Student assessment, to be satisfactory.

#### 4.4 Standard 4: Achieved learning outcomes

The programme demonstrates that the intended learning outcomes are achieved.

##### *Findings*

The panel studied the examinations of a number of courses of the programme.

The panel reviewed a total number of fifteen Graduation Research Projects or master theses of graduates of the programme, these projects exhibiting a variety of grades, ranging from satisfactory to very good. Around 40 % of the graduates manage to get their thesis published in scientific journals or conference proceedings.

The results of the survey among alumni show about 10 % of the graduates of the programme being PhD students, about 40 % being employed as consultants, about 30 % of them working for software vendors and about 15 % being entrepreneurs, some of whom being very successful.

##### *Considerations*

Having studied the examinations of a number of courses of the programme, the panel assesses these examinations to be very much up to standard.

None of the Graduation Research Projects reviewed were assessed by the panel to be unsatisfactory. The grades of these projects were found to be consistent with the grades the panel would have given. The panel regards the projects to be of good quality. The research component in the projects is very strong, also in case of company-related projects. The theses are well-structured. The students invested much time and effort in the projects and the results were clearly above average.

In the panel's opinion, the programme succeeds in preparing the programme's graduates for appropriate positions in the professional field.

##### *Assessment of this standard*

The considerations have led the assessment panel to assess standard 4, Achieved learning outcomes, to be good.

## 5. Overview of assessments

Standard	Assessment
Standard 1. Intended learning outcomes	Satisfactory
Standard 2: Teaching-learning environment	Satisfactory
Standard 3: Student assessment	Satisfactory
Standard 4: Achieved learning outcomes	Good
Programme	Satisfactory



## 6. Recommendations

In this report, a number of recommendations by the panel have been listed. For the sake of clarity, these have been brought together below. These panel recommendations are the following.

- To define the programme profile more precisely on the level of the programme objectives, specifying what the programme aims for.
- To be more clear on the balance of the academic research orientation and the professional orientation of the programme.
- To specify the disciplinary knowledge regarding the application domains of the programme more clearly.
- To put mechanisms in place to maintain regular contact with the professional field and to ensure input from this field feeding into the programme.
- To strengthen the position of the programme within the Faculty of Science.
- To restructure the curriculum by reducing the complexity in the design, now being founded on domains, tracks and profiles and by reorganising the electives, now being numerous.
- To add specific information science oriented courses, as they seem to be lacking to some extent.
- To involve more full professors, as the current number in the programme of only two is too limited.
- To strengthen the relation between research and teaching in the lecturers' teaching.
- To raise the proportion of UTQ-certified lecturers further.
- To make the programme less dependent upon the deployment of students and PhD-students as teaching assistants.
- To analyse the student success rates, to detect any causes for the current figures.
- Not to have teaching assistants grade examinations.
- To have all Graduation Research Project assessment forms filled out adequately and to have the supervisor and second reader grade the projects independently.