Achievements, Milestones and Challenges in Biomedical and Health Informatics
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Milestones and Outcomes in Health and Human Services Informatics Education Programmes

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Abstract. This chapter describes the milestones and outcomes of Health and Human Services Informatics (HHSI) education programmes at master and doctoral degree level. In Finland, since the year 2000 the programmes have been based on the International Medical Informatics Association (IMIA) recommendations on biomedical and health informatics and the master's degree programme has been twice accredited by the IMIA Accreditation Committee. The paradigm created to advance and support both education and research in the health and human services fields is used to analyse and synthesize the research focuses of students' theses and evaluate milestones. The outcomes of HHSI programmes are described using quantitative and qualitative data from a student administrative database and student theses. The research focuses and research methods were coded for master's and doctoral theses based on the HHSI paradigm. Experiences from the accreditations and feedback are summarized to provide insights for future development. Based on the results, recommendations for further development of the programmes are provided.

Keywords: accreditation, education, paradigm, informatics, curriculum, thesis

1. Introduction to Health and Human Services Informatics education

In Finland, as in many countries, health and biomedical informatics education has expanded along with the development of the information management systems and electronic health records (EHRs) used in health care since the 1990s [1-2]. Digitalization continues to play an important role in the current health and social services reform [3]. Information and communication technology (ICT) solutions and digital services are tools for improving healthcare and social welfare services and creating better opportunities to maintain and improve citizens' health and functional capacity. Digital services can also help people to follow their health and functional capacity themselves [4]. Information system services have been adopted in healthcare and social welfare across the country and the coverage for EHR usage in hospitals is 100% [2, 5]. The national Kanta services are designed to serve both citizens and professionals in healthcare and social welfare. At present, the Kanta services include electronic prescriptions, a Patient Data Repository, and the opportunity for everyone to view their health information online (My Kanta) [6]. The content of Kanta services is expanding and will in time include social welfare

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services, oral health services, and the Personal Health Record designed for citizens' use [7]. All of these developments and changes in service systems clearly require advanced knowledge and skills among all experts working in the health and social welfare services.

The University of Eastern Finland (UEF, previously University of Kuopio) established the very first programme 'Information Management in Health and Social Care' in 2000, which was regarded as the first step towards expansion of health and biomedical informatics education. Initially, the programme was partly financed by the EU (European Social Fund). In 2005, a permanent degree programme was established and funded by the Ministry of Education. The programme currently operates under the title Health and Human Services Informatics (HHSI), which reflects its present focus. A clear objective from the outset has been to combine the perspectives of two key service sectors – health and social care – within the education programme based on the developments in Finnish society [8].

Health and Human Services Informatics is understood as the management of the information resources of an entity, e.g., an organization, covering the activities, actors, and methods involved in the production of health and welfare services for public and private sector organizations. Information resources are understood as systems, applications, devices, communications tools, data repositories and, most importantly, people as sources and utilizers of information. Management of information resources is crucial when changes in practice are planned [9-10]. The HHSI master's programme is the first of its kind in Finland and aims to produce professionals, developers and researchers in informatics and information management for the needs of society [11]. From its outset, the programme has been based on the Recommendations on Education in Health and Medical Informatics of the International Medical Informatics Association (IMIA) [12-13].

The HHSI programme is offered at UEF's Department of Health and Social Management, which aims to conduct interdisciplinary research and offer high quality postgraduate study programmes. The department is considered a pioneer in its field regionally and nationally. The Department of Health and Social Management provides education in three disciplines: 1. Health and Social Management (MSc, PhD, since 2017; previously Health Management Sciences, since 1979); 2. Social and Health Economics (MSc, PhD, since 2017; previously Health Economics, since 1997); and 3. Health and Human Services Informatics (MSc, PhD, since 2000). All of the disciplines belong to the joint doctoral programme Welma (Welfare, Health, and Management) at the Faculty of Social Sciences and Business Studies, launched in 2016 [14]. The department employs approximately 35 professional staff. As a nationally unique interdisciplinary community, the department's researchers and teachers participate as experts in developing services in the health and social care sector and their management, as well on a regional, national, and international level.

The aim of this chapter is to describe the milestones and outcomes of Health and Human Services Informatics (HHSI) education programmes at master's and doctoral degree level in Finland since the year 2000. The HHSI paradigm created to support education and research is first described and then used to elaborate the outcomes of the programme. The experiences of the IMIA accreditation process are also described, and the outcomes and future direction of the programme are then presented in the discussion and conclusion section.

2. The Health and Human Services Informatics Paradigm

The education and research of the Health and Human Services programmes at master's and doctoral level follow the paradigm [15] created by the core education team based on previous studies and theoretical assumptions in Biomedical and Health Informatics (BMHI) development over the years [12-13, 16-19]. A paradigm can be generally defined as a pattern or model, an exemplar, or a typical instance of something [20]. Scientifically, the most often used citation refers to Thomas Kuhn [21], who defines a scientific paradigm as 'universally recognized scientific achievements that, for a time, provide model problems and solutions for a community of practitioners. Kuhn also highlights the development of science-like policy through revolutionary discourse leading to changes in paradigms or totally new paradigms [21]. Paradigm shift in BMHI may refer to the historical development from computers as tools to computational ubiquity, the shift to digitalization and social networking, or the shift from discipline-specific standards and systems to global and universal concepts and structures. Paradigm shift has also been of interest among BMHI researchers [13, 22-27].

Referring to Kuhn, Boon presented an expanded vision of science, an engineering paradigm of science, highlighting the interdisciplinary nature in 'real-world' problem-solving contexts of research. Essentially, the discrepancy between 'real' and 'proposed' suggests gaps regarding issues such as value, ontology, or interoperability requiring attention, development, and ultimately adoption, demanding a universal standards framework [28]. It is also highlighted that knowledge generation and usage for solving complex real-world problems require higher-order cognitive skills, because rules or algorithms for how to use a concept, theory, model, or data in this respect are usually seen as interdisciplinary. Thus, teaching higher-order cognitive skills is a crucial part of evolving expertise [28-29].

The importance of graphically representing the fields of science attached to BMHI or describing past and current trends in ICT development has been especially valued by educators [16, 17-18, 30-31]. Following Kuhn's theory [21], a paradigm indicates: What should be studied and investigated; What kind of research questions should be presented and studied; How are these questions proposed; and How are the results interpreted? These questions have guided the education and research development of the HHSI programme.

Emphasizing the interdisciplinary nature of the HHSI programme, the core concepts of the paradigm: data, action, technology, and actors, should be identified based on the literature as the body of knowledge in HHSI. The core concepts are defined as follows:

- Data: meaning a hierarchical continuum from data, information, knowledge to wisdom (DIKW) [18, 23, 32-33]
- Action: meaning planning, implementation, use, and evaluation in a service system [19, 34-37]
- Technology: meaning social and technical procedures used in gathering, processing, analyzing, storing, and retrieving data related to actions [38-42]
- Actors: meaning users, producers, and developers in the health and social service system [8, 12-13, 31, 43-49].

The core concepts with their multiple interpretations have strong connections with the context health and social care. Further, to guide research in the informatics field, the core concepts' entities were connected to each other to constitute four research areas:

- Steering and organizing of information management in work processes,
- Use of information and communication technologies (ICT),
- Knowledge management and informatics competencies, and
- Data models and structures (Figure 1.)

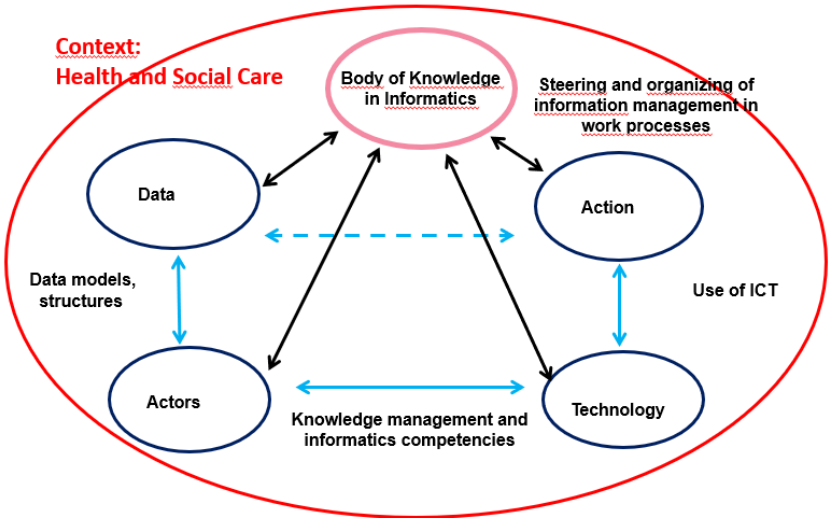


Figure 1. The health and human services informatics paradigm: core concepts and research areas.

The research area *Steering and organizing of information management in work processes* focuses on business processes and modelling, especially using data for analyses and assessing information needs and flow in practice. *Use of ICT* focuses on information system implementation and evaluation, interoperability, usability, and security concerns as well as digital services. The *Knowledge management and informatics competencies* research area focuses on data and information management, governance, decision making and leadership questions as well as education and training in developing these competencies. The *Data models and structures* research area focuses on data structures, terminologies, standards, data repositories and documentation. The paradigm has been implemented in the curricula since 2008 and is used especially in acquiring theoretical and methodological competencies for compiling theses at both master's and doctoral degree level [15,50].

3. IMIA Recommendations as the Basis of the Curricula

The Health and Human Services master's degree programme unifies in practice health care, social care and information and communication technology in a unique combination. Representing an interdisciplinary major, HHSI especially adopts management, computer and information sciences as well as health sciences (e.g., medicine, nursing, pharmacy) and social sciences (e.g., sociology) [12-13,17-18]. The aim of the programme is to build a bridge between ICT and service systems. The strategic goal is to produce generalists with competencies to elicit user needs, advise software developers, implement guidelines, and manage information resources, who have a good understanding of the field of health care and human services as a whole and of the area's special features and needs with respect to emerging technologies in digital health and

social services. The need for this kind of education and research for generalists in organizations as well as for having the competencies necessary for training future professionals is indisputable [43, 51].

In Europe, higher education studies are measured in credits based on the Bologna Agreement [52]. The structure of the two-year curriculum (120 credits in the European Credit Transfer and Accumulation System (ECTS, one credit corresponds to 27 hours of work) has been compiled and applied and updated on the basis of the IMIA recommendations' six knowledge and skills areas: BMHI core principles, Health sciences and services, Computer, data, and information science, Social and behavioural sciences, Management science, and BMHI Specialization. [12-13, 51].

Study courses are quantified according to the workload required. One year of studies is equivalent to 1,600 hours of student work on average and is defined as 60 credits. The Bologna agreement was adopted implemented by the University of Eastern Finland in 2006. In accordance with the Finnish higher education system and the Finnish way of providing health and social services, the structure of the knowledge and skill areas for the master´s degree level programme has been modified, as shown in Table 1.

Table 1. Suggested share (%) of the six BMHI domains within BMHI master's programmes compared to the HHSI programme [51]

Master's programmes		Medical informatics, bio-medical informatics, health informatics	Health and Human Services Informatics
Programme type		Postgraduate	Postgraduate
Programme length		Either 1-year OR 2-years full-time study	2-years full-time study
Knowledge/Skill Area		%	%
1	BMHI core principles	40	30
2	Health sciences and services	15	10
3	Computer, data, and information science	15	20
4	Social and behavioural sciences	5	5
5	Management science	5	5
6	BMHI Specialization	20	30
Σ		100	100

A prerequisite for the master's degree programme is a bachelor's degree (first-cycle degree). Since there is no bachelor's degree programme available in HHSI, students enter the programme with various backgrounds, e.g., first-cycle degree at a university of applied sciences or a university degree, e.g., in health sciences, computer science or social sciences. The heterogeneous first-cycle degree background has proved to be an advantage, as at the beginning of the programme the core principles are jointly discussed with the students. As a result, the new terminology gained through the concept definitions and aims of HHSI enhance the students' study process. Further, at the beginning of the first academic year each student is required to draw up a personal study plan (PSP) with the guidance of the programme tutor, who also approves the PSP. The plan is updated during the programme.

The master's degree thesis is a compulsory part of the curriculum and accounts for 30 ECTS. The methodological component of the curriculum includes the following courses: Advanced Course in Qualitative or Quantitative Research, Concept Formation and Data Modelling, Evaluation Research in Social and Health Services, Evidence-Based Health and Social Care, and HHSI Research and Methodology (Figure 2). In addition to 120 ECTS, a student entering the HHSI programme must have demonstrated competencies in research methods. Depending on the student's previous education, some

students are required to complete courses on complementary basic qualitative or quantitative methods, as well as courses on information retrieval, and health and social care legislation. The latter is required for students without a background in health or social care.

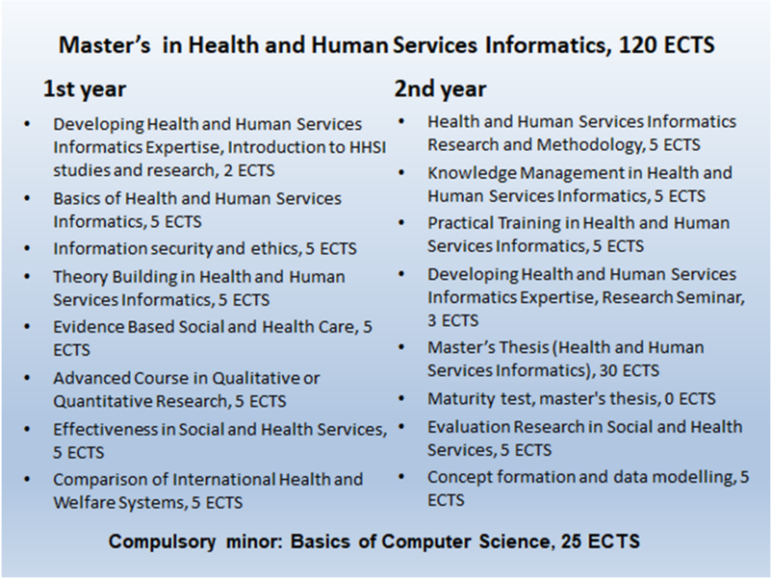


Figure 2. Curriculum of HHSI 2021-2025.

From the beginning of 2000 the programme has been carried out using multifaceted teaching including web-based studies, which has facilitated the transition to online teaching during the Covid-19 pandemic. Each study course is assessed by the students via an electronic feedback system and jointly discussed at the end of each term for development purposes.

Doctoral education in HHSI is part of the Welma (Welfare, Health and Management) doctoral programme at UEF. The curricula are joint for students studying in various fields in the Faculty of Social Sciences and Business Studies. The HHSI specialist role [51] is achieved through the personal study plan (50 cr.) and doctoral thesis. Students have joint courses in Welma, e.g., philosophy, ethics and statistics, as well as courses related to their research topic. The average length of the doctoral studies is five years but varies depending on whether studying full or part time.

4. Educational Outcomes of the Master's and Doctoral Programmes

The goal of the Health and Human Services master's degree programme is to give students an in-depth understanding of service systems and to develop informatics competencies from the needs and viewpoint of the special characteristics of the health and human services sectors.

The focus is especially on strengthening students' abilities in planning, implementation, management, and evaluation of information resources in health and

social care. In addition to the legal requirements for degree qualifications, education and research follow the above-mentioned paradigm created by the core educational team [15].

The research method chosen for the master's thesis depends on the research topic and the individual interests and skills of the student. The most used method in HHSI theses (N=197) during 2002-2021 was a survey, performed using quantitative or qualitative methods or both. Complementary research strategies are usually applied, in which other methods, such as literature review, register-based research, or observational study, are utilized in conjunction. The quantitative method alone has been used in 64 theses, and its role has increased in recent years. A qualitative method alone has been used in 39 theses. In total, 26 literature reviews have been carried out. Register-based research has been used in 24 theses. Registers utilized have most often consisted of electronic nursing records and hospital incident reports. Figure 3 presents the research methods applied in the master's degree theses during 2002-2021.

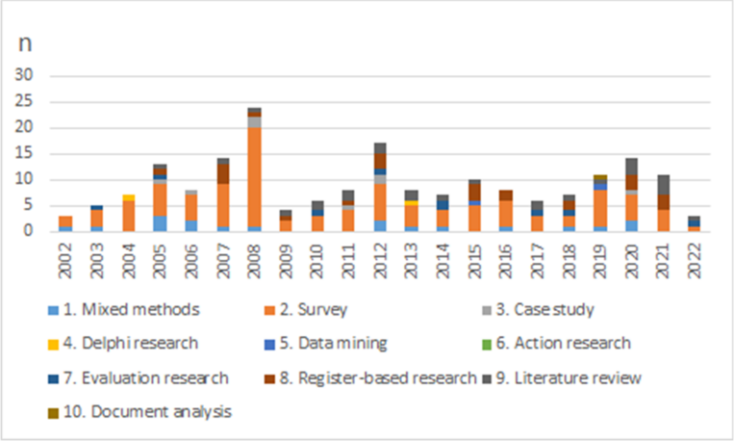


Figure 3. Research methods used in HHSI master's degree theses 2002-2022 (N=197).

The HHSI paradigm is based on previous studies and theoretical assumptions in HI development over the years. The usefulness and validity of the paradigm are accomplished with the master's theses and doctoral dissertations. To guide students in thesis planning, we have summarized the key ideas of the paradigm research areas and their connection to the research foci and applicable theories (Table 2).

During 2002-2021, 79 master's theses have focused on steering and organizing information management in work processes and, especially in the years 2008 and 2012, the research interest has mostly been in this area. The focus on data models and structures has been almost the same during the last ten years.

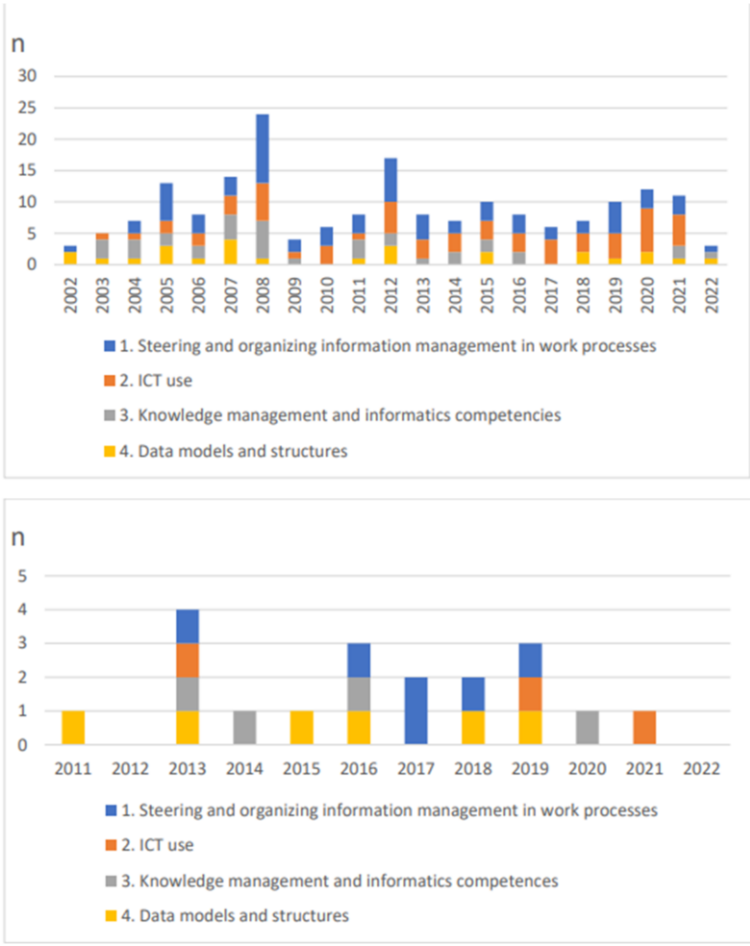
In doctoral dissertations (N = 19) the research has focused on all four research areas in the paradigm. Over the years, six topics have focused on the area of steering and organizing information management in work processes and on data models and structures. Figure 4 summarizes the research areas investigated in master's theses (a) and dissertations (b).

Table 2. Paradigm research areas connected with research foci and theories

Research areas	Research focus	Theoretical background*
Steering and organizing of information management in work processes	1.1 Operational process modelling 1.2 Operational process evaluation and analysis 1.3 Information needs in operational processes 1.4 Safety	Information process model (Choo) Innovation theory (Rogers) System theory (Bertalanffy) Organizational theory (Hatch) Theory of planned behaviour (Ajzen)
ICT use	2.1 Information system development 2.2 Evaluation of information system implementation 2.3 eBusiness and eServices 2.4 Usability 2.5 Interoperability 2.6 Enterprise architectures 2.7 Data security and protection	Innovation theory (Rogers) Implementation theory (Myers) Organizational theory (Hatch) Change theory (Lewin) Socio-technical approach (Avgerou) Nielsen's heuristics EUCS model TAM model (Davis) Success model (Delone & McLean)
Knowledge management and informatics competencies	3.1 Educational planning 3.2 Evaluation of education 3.3 Competency development 3.4 Personnel's skills and competencies 3.5 Data re-use 3.6 Management and leadership 3.7 Decision making 3.8. Governance	Stagger's levels of informatics knowledge and skills IMIA recommendations TIGER initiative (HIMSS) Various tools for ICT literacy assessment Knowledge management (Nonaka) Evaluation models, Activity theory, theory of expansive learning (Engeström) Management theories (Mintzberg)
Data models, structures	4.1 Data repositories, data sets 4.2 Terminologies, classifications, codes; use and re-use 4.3 Mapping (e.g., terminologies) 4.4 Standards	Data mining methods Information reference model (Goossen) Terminology models, structures (Cimino) Information process model (Choo) Sociology of information Standards (e.g., ISO, FAIR)

*Possible bibliography

At the beginning of the doctoral programme, it was evident that not all students will have a master's degree in HHSI. The first doctoral students with varying backgrounds started in a joint group of health economics, management, and informatics students in the Department of Health and Social Management of UEF. This was a practical but also inspiring solution to teach students in a cross-disciplinary group. As the number of students increased, a HHSI doctoral student group was established leading to a more coherent and goal-directed group of students. The intended learning outcomes are connected to the substance of the paradigm entities and their implications for both research and practice.



Figures 4 a and b. Research areas used in master's and doctoral theses/dissertation, 2002-2021.

The alumni work in various positions in the public, private and third sectors. They have positions at ministry level, in national operational units such as the Finnish Institute of Health and Welfare and the National Supervisory Authority for Welfare and Health, in ICT enterprises, and in various managerial and expert levels in the health and social care sector, as well as in education and research institutes. In recent years, surveys of alumni have not been conducted due to the Covid-19 pandemic; however, based on the contacts no cases of unemployment after HHSI education have been reported to the programme leaders. On the contrary, some alumni hold leading positions in development and digitalization of health services.

5. Experiences from IMIA Accreditation

The World Health Organization has launched a strategy to guide countries to establish bodies for accreditation to guarantee high quality education for health care workers [53]. Accreditation can be defined as the process or actions of officially recognizing someone

as having a particular status or being qualified to perform a particular activity or an official certification that a university or course has met standards set by external regulators [20]. All in all, accreditation relates to quality assurance and improvements. Accreditation can be defined as an independent, third-party evaluation of a conformity assessment body (such as a certification body, inspection body or laboratory) against pre-existing standards, and conveying formal demonstration of its impartiality and competence to carry out specific conformity assessment tasks (such as certification, inspection, and testing) [54-55].

Along with frameworks for teaching BMHI, accreditation of educational programmes was seen of importance [12-13, 16, 56-57]. Based on the survey by the European Federation of Medical Informatics (EFMI), the AC2 Committee mapped all of the academic programmes related to the field of Biomedical and Health Informatics (BMHI) across Europe [58]. A draft online catalogue was created and validated by EFMI national societies to describe the state of the art in various European countries. Cooperation with national societies was essential to have a valid catalogue of programmes. In autumn 2022, BMHI education programmes number 1,000 in 13 thematic areas across 30 EFMI countries [59]. The unique work of the AC2 Committee is supported by the EFMI Education Working Group (EDU WG) especially in promoting and fostering the accreditation process of BMHI programmes in Europe and assisting the AC2 certification process of the knowledge and skills of users in BMHI [60-62]. The AC2 accreditation follows the accreditation model launched by the IMIA in 2010 [63-64] and strengthens the accreditation process from European perspective. A programme accredited by a national accreditation committee does not necessarily follow a European quality level in BMHI [13, 51]. Thus, international accreditation provides a competitive advantage to the programme and gives learners and collaborators of the institution insight into the programme's quality [51].

In the United States, a corresponding accreditation system was originally launched by the American Health Information Management Association (AHIMA), which was established to mandate curricula in Health Information Management (HIM) at multiple educational levels. AHIMA has been collaborating with the American Medical Informatics Association (AMIA) on developing accreditation standards for both HIM and informatics. At present, the Commission on Accreditation for HI and Information Management Education (CAHIM) is responsible for quality monitoring and programme accreditation processes [11, 65].

The IMIA accreditation process [62-63] starts with agreement between IMIA and the applying institute for accreditation and then follows the following three phases: 1) Internal assessment of the educational programme by the institution is carried out and a written self-assessment report is drawn up in accordance with the IMIA accreditation framework. The report, containing narrative descriptions and tables, is structured to provide basic data on the educational programme, a description of the institute, the goals of the programme, the programme staff and facilities, and internal quality assurance. The report is submitted to the Accreditation Committee. 2) The IMIA Accreditation Committee convenes an external Assessment Panel (usually consisting of three experts) that is responsible for the external assessment of the educational programme on location. The Assessment Panel assesses the potential quality of the programme and whether the programme fulfils the criteria set out in the IMIA accreditation framework. The Assessment Panel creates an Assessment Report that contains objective findings, subjective considerations, and conclusions. The report contains an explicit proposal to the IMIA Accreditation Committee to take either a positive or a negative accreditation

decision. 3) Evaluation of the assessment report and the overall conclusions expressed in it by the IMIA Accreditation Committee. This committee verifies whether the programme meets the standards that are defined in the IMIA accreditation framework. The IMIA Accreditation Committee takes a final accreditation decision and lays down its findings in a final accreditation report [56, 63, 66-67].

The master's degree programme in HHSI was accredited in February 2012 and again in January 2018. Based on the IMIA instructions to draw up a 'Self-Assessment Report for the site visit of the Accreditation Committee of IMIA', statistical data and information on the programme was gathered by the staff in charge of the programme for both accreditations. The reports were sent before the site visits to the experts invited by the IMIA Accreditation Committee to carry out both the accreditation and the re-accreditation procedure. The three-day site visits included discussions from several points of view of the self-assessment report. Professors, senior lecturers, the academic rector and the library director of the university, representatives of the faculty and department, alumni, master's and doctoral students, representatives of working life, and cooperation partners were included in the site visit programme.

The main actions carried out in the HHSI programme after the first accreditation were the IMIA Accreditation Committee's recommendations focused on the number of personnel, quite high study load, more possibilities for supplementary studies, corporation collaboration, and teaching collaboration with the Department of Computer Science. These notifications were discussed with educators, students and the department's leadership team, and improvements were made to the curricula, teaching methods and collaboration with partners [15]. Re-accreditation again followed the IMIA guidelines and the improvements made after the first accreditation were approved according to the IMIA guidelines [67]. The site visit was valued not only by educators but also students and partners, e.g., the Finnish Institute for Health and Welfare, for offering opportunities to reflect on the programme's development and outcomes.

The accreditation processes have influenced the education and research development of the HHSI programme. The accreditation committee guidance on improving the structure and content of the curricula was especially rewarding for educators. The committee's suggestion to focus on student lead-times and to improve procedures in organizing teaching and research more intensively together improved both students' and educators' motivation to develop courses together. The balance between quantitative and qualitative research methods was discussed with a view to facilitating focusing on more thoroughly on the outcomes of the education, especially on the significance of students' thesis work.

International accreditation also helped to value educational accomplishments at national level and to affirm that the programme is an established national brand. Cooperation with alumni has been intensified and some are regular speakers on special course topics. Cooperation with research units with convergent research interests has increased and joint proposals have been made easier to submit.

6. Discussion and Conclusions

The establishment of a new major at a university is always challenging and raises considerable debate as to whether the discipline in question is sufficiently scientific to be included in a faculty. The establishment of the Health and Human Services Informatics degree programme was no exception in this respect. However, the strategic

plans and national developments in electronic records and information systems in the health and social sector highlighted the need for experts and the importance of education in this area. Thus, the national ICT strategy was brought under discussion several times already in 1995 [68] before the HHSI programme started.

In 2022, there is still a clear need for users, generalists, and specialists in BMHI and for effective guidelines and procedures to help educators establish and launch new programmes and renew existing programmes in BMHI [51]. Thus, the support of the IMIA recommendations on teaching Biomedical and Health Informatics since 2000 [12-13] has been highly valued in academic settings. The international group of experts behind the recommendations harmonize the establishment of BMHI programmes globally. The IMIA, with its established services and recommendations for the accreditation of high-quality educational programmes in the field of BMHI worldwide, acts as an international benchmark for programme accreditation [62].

By investing in the establishment of new, strategically significant areas of expertise in education and research, the role of the UEF has been strengthened in the national and international innovation system. The university's education and research meet the needs of society and respect academic freedom. Besides education and research, the aim of third-sector activity is to be actively engaged in cooperation with various organizations, stakeholders and society. Such cooperation is highly rewarding in terms of feedback and benchmarking for a newly established education programme such as HHSI. It opens up opportunities to update teaching and create new research initiatives. It has also proven very beneficial for student internships, providing new placements for training, areas of research for master's theses, and even permanent positions after graduation.

International cooperation with other higher education institutes has provided possibilities not only to work together but also given insights to benchmark curricula and education in practice. The joint Erasmus project eHealth4all@eu is an example of how teaching and learning can be implemented and reach outcomes that are not possible with only a local group of students and educators [69]. Collegial feedback and discussion during the IMIA accreditation process has also been highly rewarding. The evaluation process itself was already familiar due to various evaluations previously carried out at the UEF, but the focus on health informatics was particularly valued. Instructions for completing the self-assessment report were clear and guided the analysis of the programme in a comprehensive way [66]. The timeframe of the process was optimal for HHSI as the programme had already existed for several years. However, the data collection proved challenging due to fragmented databases at the university administration. The administrative information system has however since been modified, which should facilitate more fluent data gathering for progress reports. The level of expertise of the panel members was high, and the site visit was highly valued by the university staff and partners.

The HHSI curriculum has been updated based on the re-accreditation feedback since 2019, but also due to changes in legislation, harmonization of curricula at the university level, and advances in the field. Additionally, the UEF aims to standardize the qualification structures of its master's programmes. This will enable students to choose courses not only from their own programme, but also from other programmes. The recently updated IMIA guidelines for teaching BMHI will guide the future development of the HHSI programme at both master's and doctoral level [51]. The guidelines will also support harmonization of teaching and learning BMHI globally. This will be reflected in the quality of the workforce with respect to competencies in BMHI corresponding to their roles as a user, generalist, or specialist.

The accreditation process, i.e. third-party evaluation, was a demanding but well-planned process and the guidelines provided to support the process mitigated the excitement of the expected outcomes and the final report. An outsider can identify aspects and solutions that may be too close to daily practice to be noticed by insiders, including critical questions and arguments that may be disruptive and unexpected. The experiences of the HHSI programme accreditation positively influenced not only the education itself, but also cooperation with partners and, most importantly, students' motivation to study in the accredited programme.

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