Foundational eHealth Curricula for the health care workforce

Alpo Värri, Johanna Tolonen, Tampere University of Technology, Finland

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 727552
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Tampere University of Technology

Established in 1965

Approx. 1,700 employees and 8,300 students (2015)

Collaborates with approx. 230 universities around the world

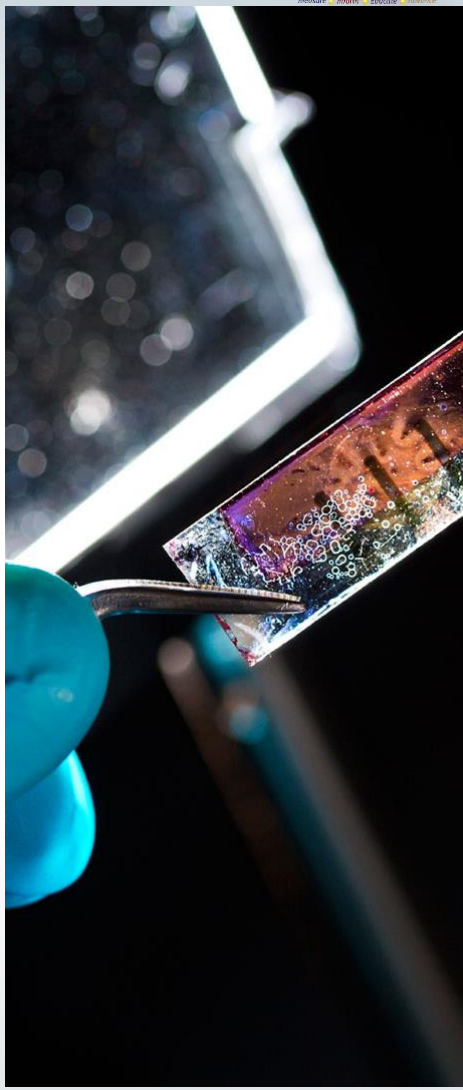
Quality assurance system audited by The Finnish Higher Education Evaluation Council in 2014

Started operating in the form of a foundation in 2010

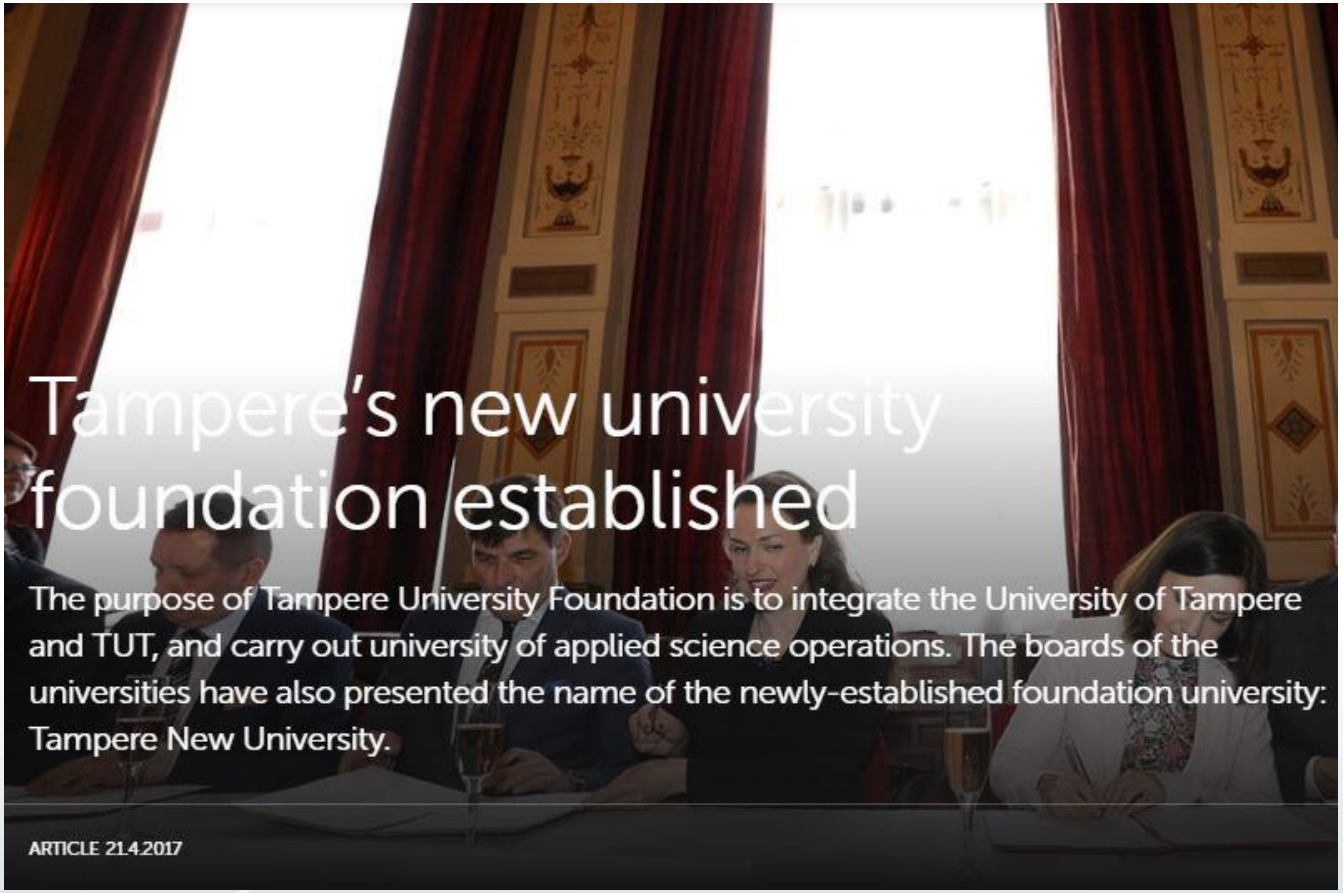
TUT Research profile

We develop technologies that reshape the competitive landscape of Finnish industry.

- **Digital operating environment**
- **Energy- and eco-efficiency**
- **Health technology**
- **Light-based technologies**



Tampere3 University Fusion



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Tampere3 University Fusion

Ideas and viable solutions at Tampere3 health seminar

13.4.2017

Health@Tampere3 seminars offer a discussion forum for researchers, experts and organisations in the health sector.

Tampere3 brings together local researchers in various health-related areas. The second Health@Tampere3 seminar held at the end of March was another opportunity for networking and planning new research openings.

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TUT in EU*US eHealth Work Consortium

Alpo Värri, Project Team Lead

Johanna Tolonen, Researcher

Milla Jauhiainen, Research Assistant

The EU*US eHealth Work Project

- Our Mission:
  - map skills and competencies
  - provide access to knowledge, tools and platforms, and
  - strengthen, disseminate and exploit success outcomes for a skilled Transatlantic eHealth Workforce
- Our overall Goal: to measure, inform, educate and advance eHealth and health information technology skills, work and workforce development throughout Europe, the United States and globally

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Key Project Deliverables on the Horizon

- Survey of Current State of Needs
- **Foundational Curricula**
- Instructional eHealth Simulator Module
- Interactive Web Platform
- eHealth Skills Assessment and Development Framework

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TUT Education in Health Informatics

Intended primarily for engineering students

Minor in Health Informatics, 25 cr

Contact

Alpo Värri, Hannu Nieminen, Ilkka Korhonen

Learning Outcomes

- The student can list the essential requirements and practices relating to the acquisition and deployment of health information systems.
- The student has the ability to design and implement health software using user centric design methods.
- The student is aware of the essential regulatory requirements for safety, security and privacy of health information systems.
- The student is aware of the most important health informatics standards and is able to apply the most frequently used standards in Finland.
- The student obtains a general idea of the orgnaisation and the processes of health care, the variety of health information subsystems and how all the parts form the whole health information system.

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TUT Education in Health Informatics

Compulsory courses

Course	Credit points	Class	
SGN-57106 Health Care Processes and Information Systems	5 cr		V
SGN-57407 Standards, Interoperability and Regulations in Health Informatics	3 cr		V
SGN-57606 Health Information Systems Laboratory	5 cr		V
Total	13 cr		

Optional Compulsory Courses

Must be selected at least 3 credits of courses

Course	Credit points	Class	
TIE-04100 Käyttäjäkokemuksen perusteet	3 cr		IV
TIE-04106 Basic Course on User Experience	3 cr		IV
TIE-41206 Human-Centered Product Development	5 cr		IV

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TUT Education in Health Informatics

Complementary Courses

The student is allowed to study more than the required minimum of 25 credits of courses. The student can, for example, choose a focus area like data security, usability, knowledge management or medical signal and image processing and select a set of course from the chosen area. It is also possible to include the following courses (or their Finnish versions) to this module from the University of Tampere: HEAPH02 Health Promotion, 5 cr, HEAPH03 Health Care Systems and Management, 5 cr and TERKANA4 The Application of Economics to Health Care, 5 cr. From Tampere University of Applied Sciences it is possible to include courses 7Y00CJ66-3001 Terveysteknologiaratkaisut ja ICT 5 cr and 7Y00CJ72 Terveys- ja sosiaalian johtamisen tietojärjestelmät, 2 cr.

Course	Credit points	Class	
ELT-61500 Terveysteknologia	5 cr		IV
ELT-62100 Viranomaisvaatimukset lääkinnällisten laitteiden suunnittelulle ja valmistukselle	3 cr		IV
SGN-41007 Pattern Recognition and Machine Learning	5 cr		IV
SGN-43006 Knowledge Mining and Big Data	5 cr		IV
SGN-52606 Processing of Biosignals	5 cr		IV
SGN-55006 Introduction to Medical Image Processing	5 cr		V
TIE-22200 Tietokantojen suunnittelu	6 cr		IV
TIE-22306 Data-intensive Programming	3 cr		IV
TIE-30101 Tietoturvallisuuden perusteet	2 cr		IV
TIE-30400 Verkon tietoturva	5 cr		V
TIE-30500 Identiteetin ja pääsynhallinta	4 cr		V
TIE-30600 Turvallinen ohjelmointi	3 cr		IV
TIE-41106 User Interface Design	5 cr		V
TIE-41306 User Experience: Design and Evaluation	5 cr		V
TLO-11000 Tietojohtamisen perusteet	4 cr		IV
TLO-11006 Basics of Information and Knowledge Management	4 cr		IV
TLO-32201 Tietohallinto ja sen johtaminen	5 cr		V
TLO-35200 Liiketoiminnan ja tietojärjestelmien yhteensovittaminen	4 cr		V
TLO-35236 Information Security Management	4 cr		V
TLO-35246 Software Business	4 cr		V
TLO-35256 Data and Information Management	4 cr		V

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Establishing the health IT education baseline in Finland – a local survey

- Interviews and a literature survey
- Results to be presented by Johanna Tolonen

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Survey of health informatics education in Finland in 2017

The objective:

- **identify the existing IT related education to the health care work force in Finland.**

A secondary objective:

- **get an impression of the experience and attitudes of the members of this workforce about health IT education.**

1. Literature survey: the study guides of many major health care professional education organizations,
2. 24 telephone interviews of health care professionals in different fields in Finland

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Literature survey

- Curricula from
  - 5 Universities (medical doctors)
  - 9 Universities of Applied Sciences (registered nurse)
  - 3 Vocational Schools (practical nurse) and a national guideline
  - 6 organizations for continuing education
- The literature review covered all the universities giving physician education, 9/23 universities of applied sciences
- The practical nursing education is most tightly controlled by the national plans of the ministry

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Survey framework

Literature survey:

- Basic IT skills (added widened theme)
- Information confidentiality and security
- Documentation
- Patient record systems
- Use of technology in patient care
- Information and communications technologies
- eHealth services
- Social media

Interviews:

- Backround information
- 9 questions about health IT education

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Results

- **Given education varied considerably during studies**
  - Basic information technology education is often available at every level of education
  - IT skills often part of other courses
  - Registered nursing education appeared to contain more IT related education than the phycisians' and practical nursing education
- **The amount and quality of on-the-job information technology education varies**
  - Learning to use the health information systems during their training periods or later in working life
  - Health care personnel seemed to have the basic knowledge of the patient record systems but they often thought that they want to have more education to use the programs

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Conclusion

- The national recommendation of 2015 had not been implemented fully to the curricula yet
  - Educational organizations may still need support in putting the recommendations into practice
- Different roles in the health care demand different operations to be done with the IT
- Education of the use of the applications was considered more like working place specific knowledge, not as a part of the basic education given
  - This is challenging in trying to provide European-wide common educational content for the health IT field

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Conclusion

- **The results lead to suggest:**
  - health professional degrees should contain at least a minimal amount of relevant health IT education tested with an exam
  - present health care workforce should receive ear-marked in-service training for health IT (supplementary education not necessarily contain any IT related topics)
  - Education of the necessary IT-skills should be covered by the employer
  - Surviving with the IT-skills
    - potential to use the IT systems more efficiently if the skills were better

- **A two- or three-phase education:**
  1. Basics of the application
  2. Information about the more advances features after 1-2weeks
  3. rehearsal and new feature introduction 6-12 months after the first training.

IT education serves the professional's needs and is a essential tool in health care working environment

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Foundational curricula

Two target groups

- Students of health care professions
- Health care professionals at work

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Recognize different levels of education

- Everybody needs basic digital skills (office software, e-mail, web browsing, social networks, password practices…)
- Basic Health IT skills
  - Generic
  - National flavors (e.g. HIPAA/EU Data Protection Directive)
- Job role related Health IT skills
  - Generic
  - National flavors (e.g. health care cost compensation models)

Source for skills: the HITCOMP tool, http://hitcomp.org

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Foundational curricula

Basic skills first, http://ec.europa.eu/social/main.jsp?catId=1315&langId=en

European Digital Competence Framework for Citizens (DigComp)

The Commission, together with the Joint Research Centre (JRC), has developed the **European Digital Competence Framework for Citizens** — known as DigComp.

What is DigComp?

DigComp is a **tool to support a common understanding of digital competences** and to enable people to develop digital competences to support their life chances and employability

DigComp is a **common reference framework** that sets out **21 competences**, grouped in **5 key areas**, to describe what it means to be digitally competent.

Being digitally competent is more than being able to use the latest device or software. Digital competence is a key transversal competence that means being able to use digital technologies in a critical, collaborative and creative way. DigComp asks people to think about a range of issues such as storing information, protecting digital identity, developing digital content and behaviour online.

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Foundational curricula

Guidelines on the adoption of DigComp, Stefano Kluzer, 15.12.2015

1 Information and data processing Identify, locate, retrieve, store, organise and analyse digital information, judging its relevance and purpose	2 Communication Communicate in digital environments, share resources through online tools, link with others and collaborate through digital tools, interact with and participate in communities and networks, cross-cultural awareness	3 Content creation Create and edit new content (from word processing to images and video); integrate and re-elaborate previous knowledge and content; produce creative expressions, media outputs and programming; deal with and apply intellectual property rights and licences	4 Safety Personal protection, data protection, digital identity protection, security measures, safe and sustainable use	5 Problem solving Identify digital needs and resources, make informed decisions on most appropriate digital tools according to the purpose or need, solve conceptual problems through digital means, creatively use technologies, solve technical problems, update own and other's competence
1.1 Browsing, searching and filtering information 1.2 Evaluating information and data 1.3 Storing and retrieving information and data	2.1 Interacting through digital technologies 2.2 Sharing information and content through digital technologies 2.3 Engaging in citizenship through digital technologies 2.4 Collaborating through digital technologies 2.5 Netiquette 2.6 Managing digital identity	3.1 Developing content 3.2 Integrating and re-elaborating 3.3 Copyright and licences 3.4 Programming	4.1 Protecting devices 4.2 Protecting personal data and privacy 4.3 Protecting health and well-being 4.4 Protecting the environment	5.1 Solving technical problems 5.2 Identifying needs and technological responses 5.3 Creatively using digital technologies 5.4 Identifying digital competence gaps

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Main results of the GAP analysis (3)

HOCHSCHULE OSNABRÜCK
UNIVERSITY OF APPLIED SCIENCES

EU·US eHealth WORK
Measure Inform Educate Advance

Many experts from different countries believed that

1. The content of the training should be better tailored to the needs of the profession, the role, the scenario, the workflow, the task and the prior level of knowledge.

2. The training should be very practically oriented with up-to-date content and directly usable in the job, also in new application fields such as clinical decision support systems, analytics and business intelligence, telehealth and other emerging topics.

3. Experts reported that vendor based training was biased and that standardized courses often did not fulfil the needs.

4. The approach of “one size fits all” was rejected by a very large majority and was reverberated in many comments.

5. The majority seemed to opt for a certificate, credit points (for continuing education as well as for an academic degree) and a formal approach.

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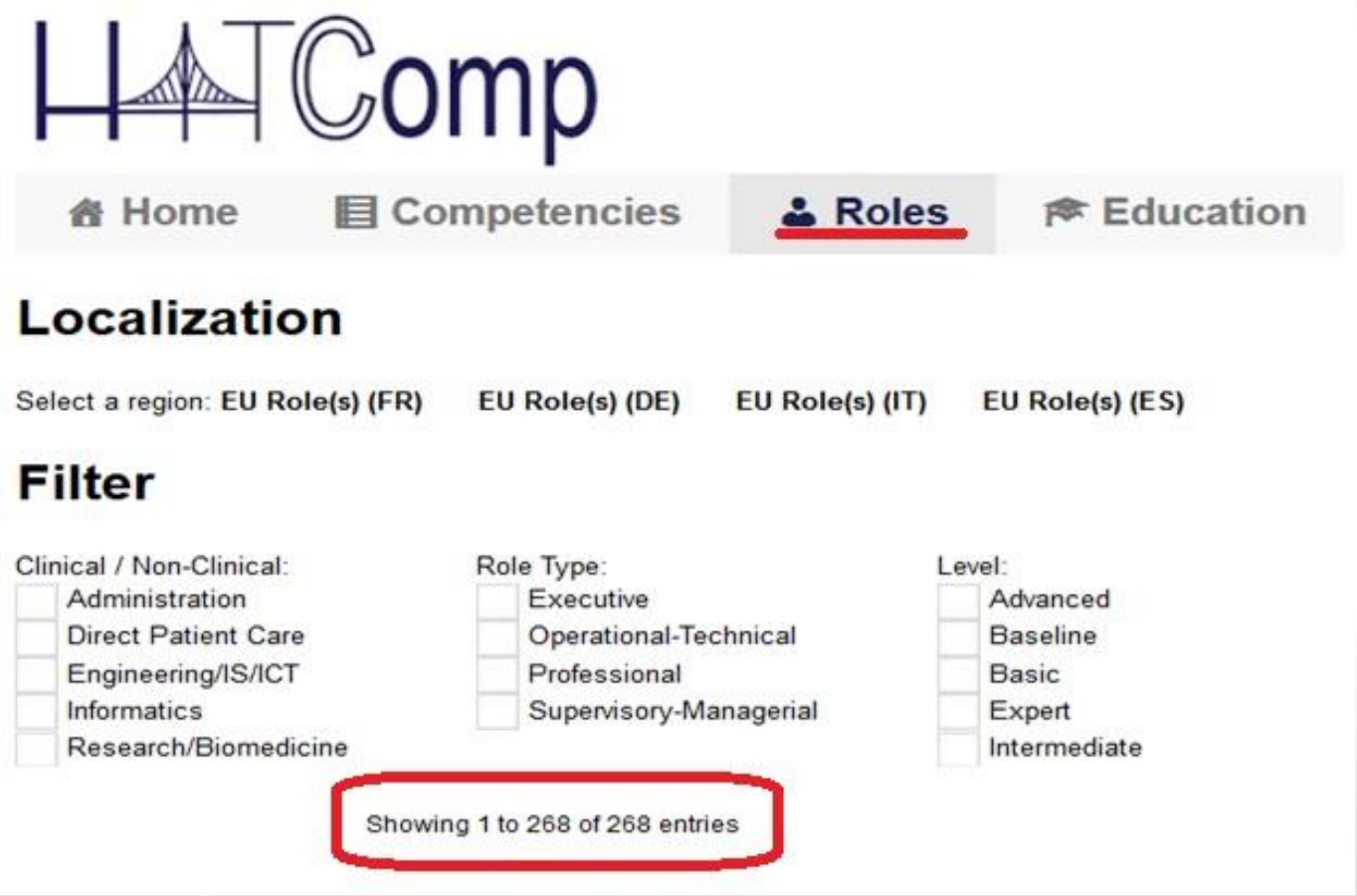
Foundational curricula

Many target professionals



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Foundational curricula

Many target professionals

Anesthesiologist, Attending Physician / Specialty Physician, Audiologic Aide / Audiometric Technician, Audiologist, Behavioral Medicine Technician, Behavioral Therapy Assistant, Behavioral Therapist, Bereavement Coordinator, Cardiology Technician / EKG Technician / Vascular Lab Technician, Care Coordinator, Certified Medical Assistant, Certified Nurse Assistant, Certified Pharmacy Technician, Charge Nurse / Nurse Manager, Clinical Case Manager, Clinical Lab Assistant, Clinical Laboratory Technologist/Lab Technician, Clinical Nurse Specialist/Patient Care, Dental Surgeon / Doctor of Dental Medicine or Doctor of Dental Surgery / Endodontist / Periodontist / Orthodontist / Prosthodontist, Dentist, Department Head Physician, Dialysis Technician / Certified Hemodialysis Technician, Dietetic Technician, Dietitian / Registered Dietitian,…

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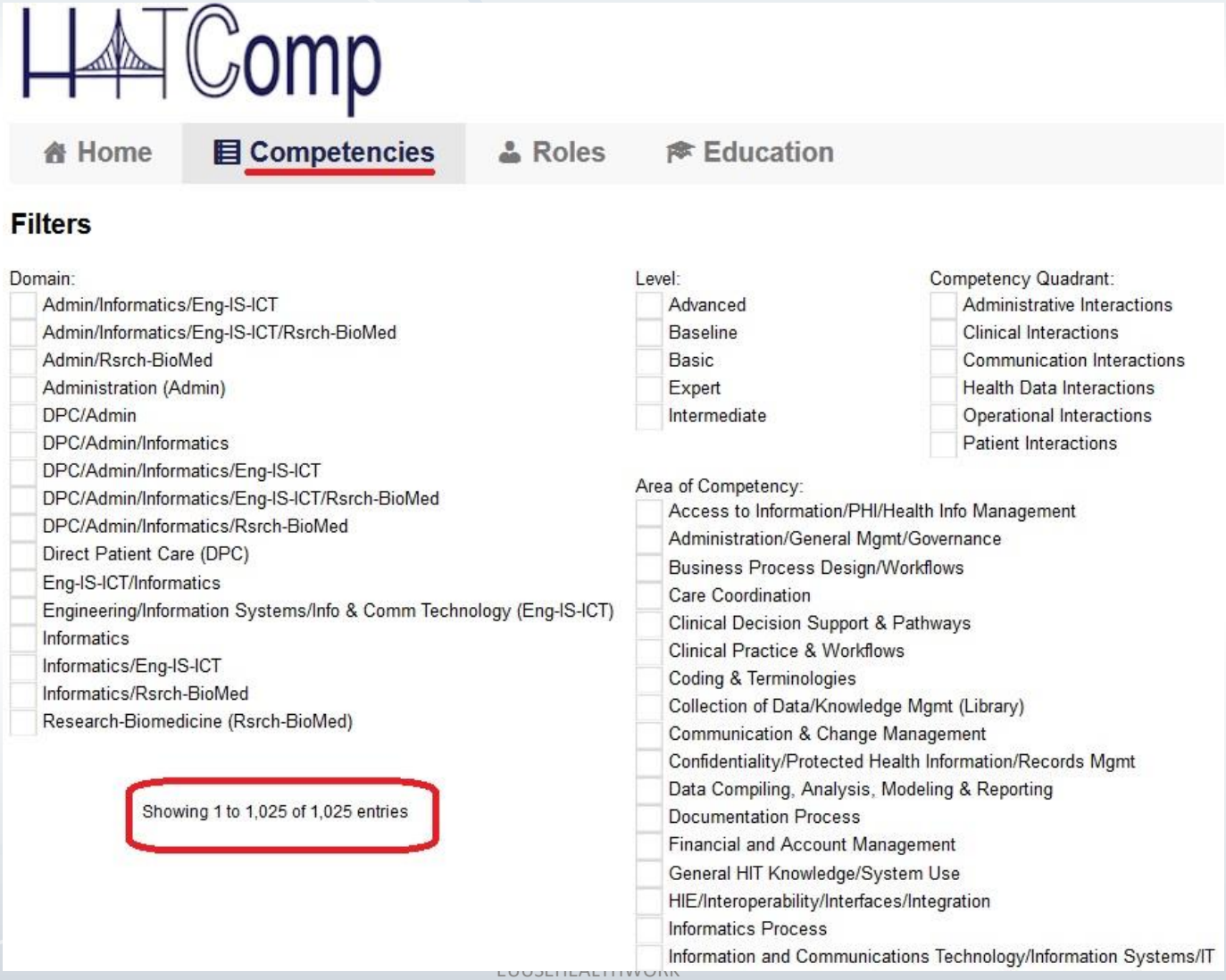
Foundational curricula

Many potential competencies



Foundational curricula

Many potential competencies

Create, manage and utilize policies for accessing, collecting, entering, retrieval and storage of patient data, including single-sign on, remote record access, access pertaining to "scribes", and other data access issues, as part of the appropriate care management team; Assess and monitor needs and requirements for access to virtual content, collections, environments and repositories by different customers, end-users and patients, including those with visual, hearing or other impairments affecting access, and align the design of virtual environments to user and organisational needs; Define the procedures, processes and techniques for knowledge development and capture, and select those that will work best in your organisation and which can be used as part of day to day work; Design and apply health IT/eHealth survey and data collection tools in research and biomedicine/emerging medical technology, and know where to source that work effort; Determine and direct processes that identify information systems, health IT and engineering knowledge assets, leveraging their value, and evaluating duplication, synergies and gaps…

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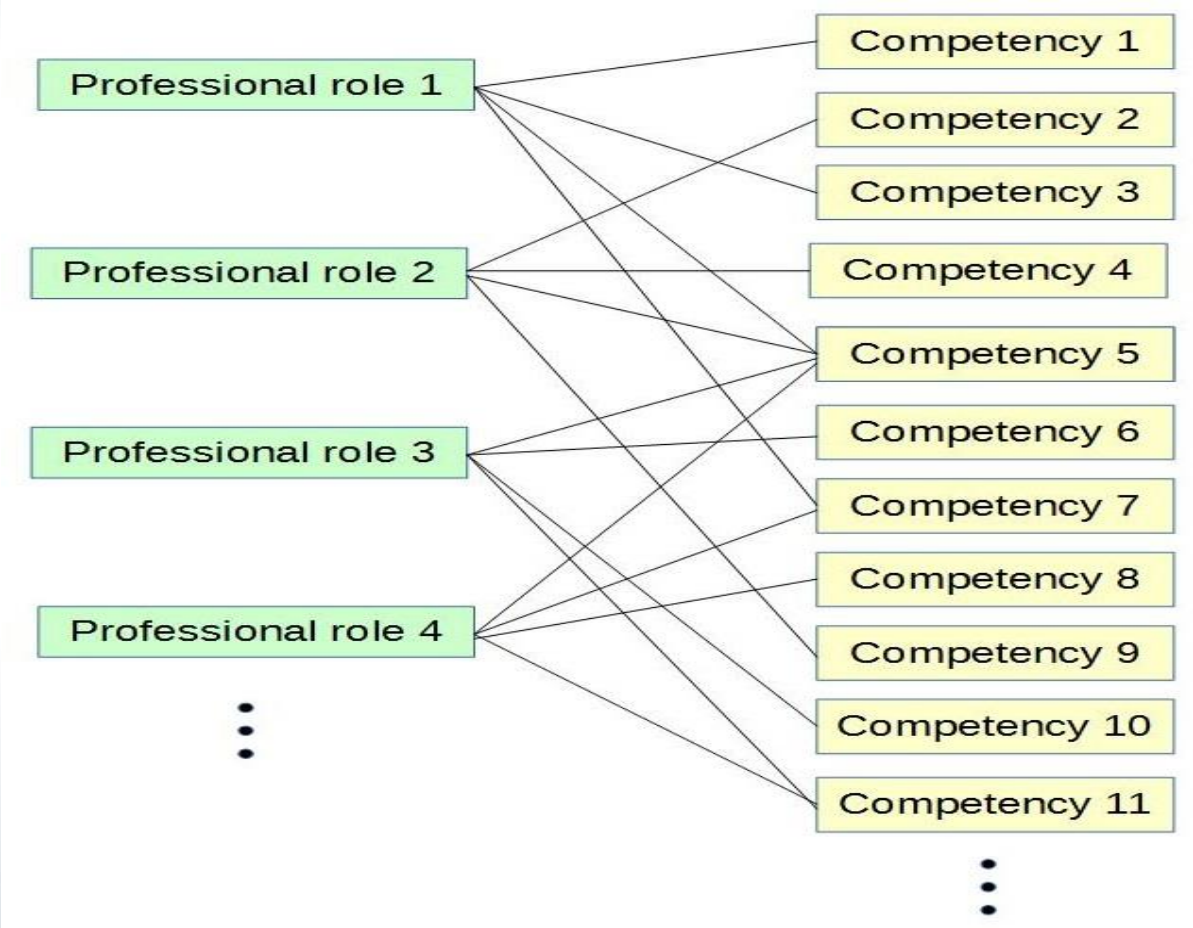
Foundational curricula

Mapping the roles to competencies



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Challenges to Address

- Convincing the education administrators to recognize the importance of Health IT skills in health professional degrees
- What to remove from the basic health professional degrees to make space for Health IT
- Who wants to bear the costs of supplementary education
- Motivational issues of the personnel
- Maintenance of the foundational curricula – an organization to keep the curricula up-to-date is needed

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Bringing the work to a wider context

New Skills Agenda for Europe

The new Skills Agenda for Europe launches a number of actions to ensure that the right training, the right skills and the right support is available to people in the European Union. It will aim at **making better use of the skills that are available**; equip people with the new skills that are needed - to help them find quality jobs and improve their life chances. The Commission invites Members States, social partners, the industry and other stakeholders to **work together to**:

- improve the quality and relevance of skills formation
- make skills more visible and comparable
- improve skills intelligence and information for better career choices

This is set out in the Communication: A New Skills Agenda for Europe - Working together to strengthen human capital, employability and competitiveness.

The Commission proposes **10 actions** to be taken forward over the next two years. A number are announced with the adoption of the new Skills Agenda for Europe on 10 June 2016 **http://ec.europa.eu/social/main.jsp?catId=1223&langId=en**

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