

Free Technology Master (FTM)

Project abstract

Software has become a strategic societal resource in the last few decades. The emergence of Free Technologies, such as Free Software and Open Standards, are drastically changing the economics of software development and usage, but most educational programmes in Computer Science and other related fields do not reflect this reality.

In contrast to proprietary software, Free Software (FS)¹ – also referred to as “Libre Software” or “Open Source Software”² – can be used, copied, studied, modified and redistributed freely. Thus, FS supports the freedom to learn and the freedom to teach. In addition, Open Standards (OS) are fundamental for interoperability: they enable the unencumbered flow of knowledge and information and make competition possible, since users do not depend on formats and specifications that are controlled by one stakeholder.

Two of the factors that hold back the massive adoption of these Free Technologies (FT) are the lack of skilled specialists and recognised certification.

The Free Technology Master (FTM) aims to tackle this problem by setting up an international framework for master programmes on FT with recognised certificates and multiple degrees. With this purpose the virtual campus, educational methodology and modules of the Free Technology Academy (FTA) will be used to build a common curriculum shared by several universities and research centres. This framework will include distance, blended and on-site modules that can take from one week to a full semester. It will especially target ICT students, professionals, educators and decision makers.

The FTM will provide five main results: 1) a common framework for master programmes in FT; 2) accredited master programmes in FT in various EU member states; 3) open/free educational materials (OER) for each module; 4) recognised certificates for individual modules and bilateral agreements on double and multiple degrees; and 5) a network of educational institutions, companies and civil society organisations to encourage cooperation and connect to market needs.

Building upon the FTA will enable partners to 1) kick-start the programme with reduced effort and lead time; 2) reach a critical mass of learners; and 3) promote mobility of both learners and teachers. Moreover, the project will take the production of OER one step further by applying open development processes, which will reduce development time and help maintain and translate course materials. This combination of factors will assure the sustainability of the FTM beyond the EC funding period.

<http://freeknowledge.eu/FTM>

¹ Free Software Definition, Free Software Foundation, URL: <http://www.gnu.org/philosophy/free-sw.html>

² Open Source Definition, Open Source Initiative, URL: <http://www.opensource.org/osd.html>

Aims and Objectives

The FTM aims to set up a common international framework for master programmes on Free Technologies (FT) with recognised certificates and multiple degrees. The virtual campus, educational methodology and modules of the Free Technology Academy (FTA) will be used as a starting point to build a programme shared among different universities and institutions. Partner universities will offer their own master programmes based on the common framework.

The concrete objectives of the FTM are:

1. to design a common framework for international master programmes on FT;
2. to develop the syllabus, activities and learning materials for each module, for distance education, on-site and/or blended options;
3. to ensure the recognition of course certificates, accreditations and double or multiple degrees through a multilateral framework;
4. to build a network of HEIs and VETs, companies and civil society organisations to encourage cooperation, map technologies to market needs and connect graduates with possible employers.

Pursuing these objectives, the FTM will benefit the current state-of-the-art in different ways:

1. **SHARED DEVELOPMENT** - Given that most masters on FS are offered by individual universities, the FTM will be the first shared curriculum on FT, and as such it will be most attractive for learners. At the same time, by co-organising the FTM programme, different partner universities can bring in different specialised teaching staff, so it will not be necessary for each university to have all relevant knowledge in-house;
2. **FACILITATE MOBILITY** - Given that most current masters are on-site, the FTM will focus on distance education but will also include partners that offer on-site or blended courses. The focus on distance education will facilitate virtual mobility of both learners and staff. Moreover, distance education enables more people to access and participate in the programme. This is particularly true for professionals, thus enabling lifelong learning;
3. **RECOGNITION OF MODULES AND PROGRAMMES** - Given that degree recognition is generally organised at the level of a complete cycle, the FTM will offer recognition both at module level and at full master programme level. Providing certificates at the module level has three major advantages: a) it stimulates lifelong learning by allowing learners to attend individual modules; b) it allows students to attend modules without necessarily fulfilling admission requirements; and c) it enables student mobility by allowing learners to progress to a full master programme, make use of the modules as elective courses in other programmes, or to enhance their education at another partner university.
4. **SHARED COSTS** - Given that developing and updating course materials can be costly, the FTM will establish open development methodologies to facilitate and accelerate both the production and maintenance processes;
5. **INCREASED QUALITY OF TEACHING MATERIALS** - Given that most master programmes do not share their course materials, the FTM will produce high quality course books and publish them under free licenses (as OER). This will allow informal learners to access all course materials and other universities to re-use them in their programmes.

A common framework for Master Programmes on FT

One of the main objectives of the project is to design a common curriculum for international master programmes on Free Technology. In order to define such curriculum, the following need to be put into place:

- **Core programme** (of around 30 ECTS) and **different specialised tracks**. The curriculum will be in part based on the existing modules already developed by some of the partners. A mapping of existing programmes, modules, interests and plans of FTM partners and peers is being produced within the FTA Campus Wiki³. Although this is an ongoing work, the illustration 1 is a static snapshot depicting the main outline of the future FTM curriculum.
- **Learning Outcomes** (LOs). These will be defined in terms of competences and knowledge to be acquired by prospective learners, in line with the eCompetence, ACM and other, national quality frameworks.
- **Modules**. The previously defined LOs will be grouped and linked to standardised modules.
- **Governance**. This will consist of common guidelines and procedures for defining and maintaining the common curriculum. 'Rough consensus and running code'⁴ is the underlying principle.
- **Requirements for adherence**. The requirements for other programmes willing to adhere to the FTM common curriculum will be defined, including compulsory modules, quality assurance and educational methodologies. At the same time, the FTM seeks to accommodate a great degree of diversity among its partners. For instance, partner programmes can be of 60 ECTS credits or more; they can use in-place, blended and/or distance educational methodologies; or they can be research oriented or applied (professional) masters.

³ <http://campus.ftacademy.org/wiki/index.php/Master-Curriculum>

⁴ Rough consensus is a term used in consensus decision-making to indicate the "sense of the group" concerning a particular matter under consideration. The term was first used by the Internet Engineering Task Force (IETF) in describing its procedures for working groups. See: <http://tools.ietf.org/html/rfc2418>.

A common curriculum on FT

In terms of curriculum, the FTM seeks not only to reconcile and integrate the already existing programmes and studies on FS, but above all to build a common curriculum of reference that integrates various disciplines and seeks to bridge the gap between purely Computer Science specialisations, other technology fields and Social Sciences and Humanities (see Illustration 1: Snapshot Master-Curriculum).

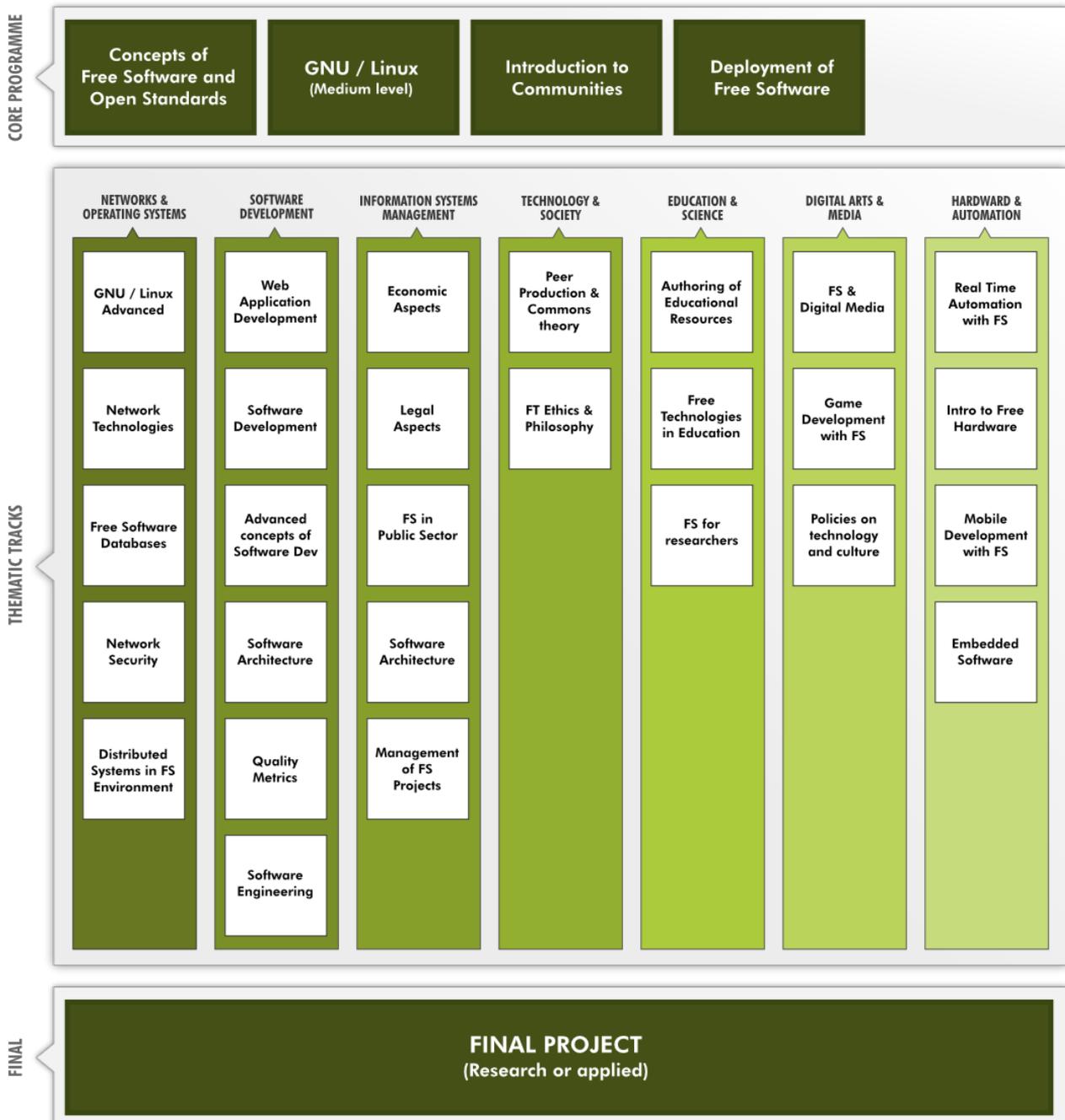


Illustration 1: Snapshot of the FTM Master Curriculum (23-02-2011)

Open Development of Educational Modules

In the context of the OER and Free Educational Materials movement, one of the main challenges is the sustainable production of course materials. The project aims to be a useful contribution to solve that challenge by setting up open processes to continuously update the course materials through non-exclusive ownership and the attribution of authorship.

A well designed open development process is expected to be more effective for the production, as it encourages peer participation from learners, and from internal and external experts. Moreover, such process should help sustaining the maintenance of the modules in the long run. The FTA⁵ has made considerable steps in this direction, which will be further improved and expanded within the FTM project. Illustration 3 shows the production process as proposed by the FTA. As all materials will become part of the common curriculum, these will be openly published under free licenses⁶, in open standard formats and with adequate open feedback mechanisms.

The long term aim is to have materials for all modules as defined in the common curriculum including:

- a) a course syllabus with clearly defined LOs and Competences;
- b) a course book;
- c) lecturing materials such as slides and videos;
- d) learning activities to be proposed during the course;
- e) exams and tests;
- f) a study guide and
- g) specific support materials for teaching staff.

⁵ Note two publications about the FTA experience: Tebbens, Wouter; Megías, David; Jacovkis, David; Lex, Bijlsma, 2010, *The Free Technology Academy: Towards Sustainable Production of Free Educational Materials*, Free Culture Research Conference 2010, Berlin, Retrieved at 9 February 2011 from: <http://wikis.fu-berlin.de/download/attachments/59080767/Tebbens-et-al-Paper1.pdf?version=1&modificationDate=1285065984000>. Tebbens, Wouter; Megías, David; Jacovkis, David; Lex, Bijlsma. (2010), *Free Technology Academy: a Joint Venture of Free Software and OER*, OpenED Conference 2010, Barcelona, Retrieved at 9 February 2011 from: <http://hdl.handle.net/10609/4850>.

⁶ Adhering to the Free Cultural Works definition, <http://freedomdefined.org/Definition> and the Free Educational Materials definition: <http://www.selfproject.eu/EMD>.

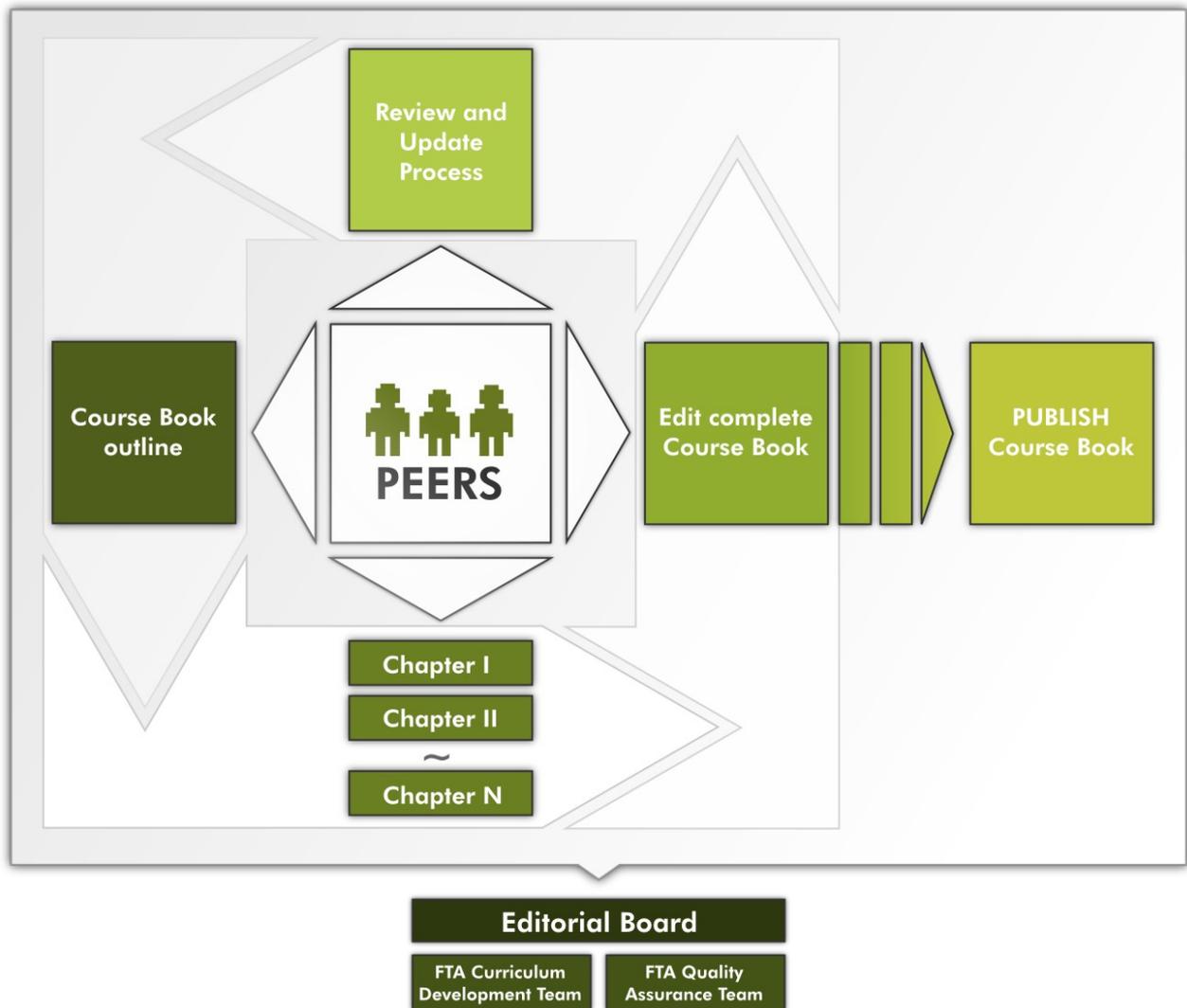


Illustration 2: The P2P model includes the participation of interested actors in all the stages of development of a new material.