

Educating digital linguists for the digital transformation of EU business and society

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Summary

The digital single market is one of the 10 priorities of the European Commission, recognizing the Internet and digital technologies as an opportunity for customers and businesses in the European Union to contribute to the economy, create new jobs, and enhance Europe's position as a world leader in the digital economy. In order to be able to transform to a digital economy, it is an imperative for the workforce to have the necessary digital skills and competences. Therefore, reskilling and upskilling the workforce enables the workers to develop updated task-specific skills that can contribute to the implementation of digital technologies and thereby help companies move forward in the digital era. Digital linguistics is a new interdisciplinary field of study at the crossroads between linguistics, information sciences, information technology and social sciences. Digital linguistics is not synonymous to computational linguistics or corpus linguistics, although certain skills and research methods may overlap between these disciplines. Although universities offer graduate level programs in complementary disciplines, currently no European university offers a program in the interdisciplinary field of digital linguistics. In this regard, we present a project participating in the development of crucial digital skills and

competences of future employees for the digital economy. DigiLing: Trans-European e-Learning Hub for Digital Linguistics is a 3-year project funded by the Erasmus+ program of the European Union with the purpose of a) creating an internationally approved model curriculum for digital linguistics at the graduate level, b) training the teachers in relevant disciplines in the use of digital technology with the goal of designing high quality online learning materials, c) designing online courses for core modules and making them open and accessible to a broad network of stakeholders, the widest academic community, and the public at large, d) and disseminating and sustaining the results of the project. By identifying the key skills and competences that a contemporary study program of digital linguistics at the academic level should provide, and by developing and implementing a model curriculum for a digital linguist, the DigiLing project hopes to contribute to the European digital transformation.

Key words: digital economy, digital single market, digital transformation, digital linguistics, model curriculum, DigiLing

Introduction

The European Commission, with its president Jean-Claude Juncker in the forefront, announced in May 2015 “A Digital Single Market Strategy for Europe”. It is one of the 10 priorities of the Juncker Commission, recognizing the Internet and digital technologies as an opportunity for customers and businesses in the European Union to contribute to the economy, create new jobs, and enhance Europe’s position as a world leader in the digital economy. The strategy is based on 3 pillars:

- better access for consumers to digital goods and services across Europe,
- creating the right conditions and a level playing field for digital networks and innovative services to flourish,
- maximising the growth potential of the digital economy.¹

Recent studies have estimated that digitisation of products and services can add more than €110 billion of annual revenue in Europe in the next five years.² In order to be able to transform to a digital economy, it is an imperative for the workforce to have the necessary skills. Still in 2016 the EU had 14% of non-internet users, while 44% of the population had an insufficient level of digital

¹ The European Commission. *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – A Digital Single Market Strategy for Europe*. The European Commission : Brussels 2015. 192 final. URL: <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52015DC0192&from=EN>. (8 June 2017)

² The European Commission. *Digitising European Industry*. URL: <https://ec.europa.eu/digital-single-market/en/digitising-european-industry>. (9 June 2017)

skills.³ Therefore, reskilling and upskilling the workforce enables the workers to develop updated task-specific skills that can contribute to the implementation of digital technologies and thereby help companies move forward in the digital era.⁴

DigiLing

In this regard, we present a project participating in the development of crucial digital skills of future employees for the digital economy. *DigiLing: Trans-European e-Learning Hub for Digital Linguistics* is a 3-year project funded by the Erasmus+ program of the European Union with the purpose of a) creating an internationally approved model curriculum for digital linguistics at the graduate level, b) training the teachers in relevant disciplines in the use of digital technology with the goal of designing high quality online learning materials, c) designing online courses for core modules and making them open and accessible to a broad network of stakeholders, the widest academic community, and the public at large, d) and disseminating and sustaining the results of the project.

Digital linguistics is a new interdisciplinary field of study at the crossroads between linguistics, information sciences, information technology and social sciences. Digital linguistics is not synonymous to computational linguistics or corpus linguistics, although certain skills and research methods may overlap between these disciplines. Computational linguistics is concerned with modelling and processing of natural language from a computational perspective and the study of appropriate computational approaches to linguistic questions⁵, while corpus linguistics is the study and analysis of natural language phenomena obtained from large collections of (machine-readable) texts of both written and spoken language⁶. However, the emerging field of digital linguistics is broader in the sense that it should provide the complete set of scientific, methodological, and practical foundations pertaining to communication in the digital age. This subsumes linguistic knowledge, such as native and foreign language competence, translation related competences and an understanding of language analysis procedures at all levels, and it also entails natural language processing (NLP) skills, particularly at the level of an in-depth understanding of state-of-the-art

³ The European Commission. *Human Capital: Digital Inclusion and Skills. Europe's Digital Progress Report 2017*. URL: http://ec.europa.eu/newsroom/document.cfm?doc_id=44390. (9 June 2017)

⁴ Probst, Laurent et al. *Digital Transformation Scoreboard 2017: Evidence of positive outcomes and current opportunities for EU businesses*. The European Commission. January 2017. URL: <https://ec.europa.eu/docsroom/documents/21501/attachments/1/translations/en/renditions/native>. (9 June 2017)

⁵ https://en.wikipedia.org/wiki/Computational_linguistics

⁶ https://en.wikipedia.org/wiki/Corpus_linguistics

NLP techniques and basic programming skills. But on top of this “traditional” interdisciplinary blend between linguistics, information sciences, and information technology, digital linguistics has several additional foci which justify its claim for a field of its own right.⁷

The first is digital content authoring, which could at first glance be understood as one of the linguistic competences formerly known as text production skills developed through text and discourse studies. But the digital age has brought profound changes to the ways texts and other types of content are produced. Digital news media have revolutionized journalism and brought new paradigms into the concepts of journalistic research, credibility, authenticity, authorship and accessibility. The personalization of digital services means that content, including web sites, ads, user manuals and posts on social platforms, is produced in a targeted and user-centered fashion, whereby the cyber-identity of the target user is not to be confused with their real-world identity.⁸

These issues can only be adequately addressed by bringing in the sociological, psychological, and cognitive perspectives, and by putting communicative behaviour in digital media into the centre of study. Another aspect of content authoring is related to multilingual contents and activities such as translation, localization, subtitling and interpreting. While traditionally the providers of multilingual services were the ones generating content, contemporary translators compose texts by selecting from available hits offered by translation memories, machine translation engines and other multilingual resources. From the cognitive point of view, as Pym (2013) points out, the process of [content] generation has been transformed into the process of selection, where the issue of critical assessment and trust has become paramount.⁹

The issues of trust, identity, authorship and reuse inevitably lead to questions concerning intellectual property rights and data protection, but also ethical aspects of communication in digital media. The legislative framework which attempts to regulate rights related to language data is lagging behind.¹⁰

Therefore, digital linguistics as a field of study combines insights and perspectives from different disciplines and does not overlap with computational linguistics, nor for that matter with digital humanities, sociolinguistics, corpus linguistics or machine translation, though it may inherit methods and tools from all of the above.¹¹

⁷ Vintar et al. (2017)

⁸ Ibidem.

⁹ Ibidem.

¹⁰ Ibidem.

¹¹ Ibidem.

The survey of labor market needs was conducted from January through March 2017¹², receiving 81 responses from companies in eight different countries, with the majority coming from the five countries of partner institutions. The needs analyses among employers reveal important trends regarding textual content processing and multilingual communication amongst European enterprises. The results of the survey were used to identify the key skills and competences that a contemporary study programme at the academic level should provide in order for its graduates to be highly employable language professionals.¹³

Currently European universities offer a variety of graduate level programs¹⁴ in the fields such as computational linguistics, applied linguistics, digital humanities, interpreting and translation, language and communication technologies, natural language processing, information sciences, computer sciences, digital media management, digital communications, social informatics etc. However, no university offers a graduate level program in the interdisciplinary field of digital linguistics. The goal of the project is to develop a programme which would combine linguistic- and translation-oriented subjects with technologies and language processing subjects, and add the cognitive, psychological and sociological knowledge to create a new graduate profile, that of a digital linguist.

DigiLing Objectives

DigiLing will bridge the gap between employers' needs and employees' skills through achieving the following objectives:

- Create an internationally approved model curriculum for digital linguistics at the graduate level,
- Train the teachers in relevant disciplines in the use of digital technology with the goal of designing high quality online learning materials,
- Design online courses for core modules,
- Disseminate and sustain the results of the project.

Create a model curriculum for digital linguistics

One of the objectives of DigiLing is to create an internationally approved model curriculum for digital linguistics at the graduate level by combining existing and new courses. To identify the necessary skills and competences a digital linguist should hold and to pinpoint gaps in existing curricula, a trans-European survey among employers and end-users was conducted. A highly skilled university graduate holding a master's degree in digital linguistics possesses knowledge and understanding about language and communication from several comple-

¹² <http://www.digiling.eu/deliverables/>

¹³ Vintar et al. (2017)

¹⁴ <http://www.mastersportal.eu/>

mentary disciplines. A master's graduate in digital linguistics should have the following skills and competences:

- Language competence in at least two languages,
- An understanding of the way written and spoken language works at all levels of linguistic analysis,
- An understanding of the principles of multilingual communication, including skills in intercultural mediation, translation, interpreting, localization and multilingual content authoring,
- Skills in the compilation of digital language resources, such as corpora, lexica, acoustic databases and similar, including competences in methodological design and technical implementation of LR compilation,
- Skills in analysing and processing natural language, including the ability to design and develop own tools as well as implement existing ones in order to analyse or process language data,
- Basic understanding of digital media from the sociological, psychological and legal perspective,
- Ability to perform independent research and acquire new skills,
- Ability to work in interdisciplinary/multilingual teams.¹⁵

Train the teachers in the use of digital technology

Another objective of the project is to train the teachers in relevant disciplines in the use of authoring tools and in the design of high quality online learning materials. This will be achieved through a face-to-face workshop for higher education staff in e-authoring.

Design online courses for core modules

An additional objective of DigiLing is to design online courses for selected modules covering many of the key topics in digital linguistics, as well as localizing, evaluating, testing, and implementing the courses. Courses will be designed in compliance with open e-learning standards, and will be accessible under the Creative Commons license. The content will be localized into all partner languages (except Czech) and International Sign language to facilitate inclusion into new national or joint study programs and to provide accessibility to special needs students. Courses will be cross-evaluated by partners (teachers and students), participants of the DigiLing summer school and national ECTS accreditation bodies.

Disseminate and sustain

The final objective of DigiLing is to disseminate and sustain the results of the project. DigiLing results will be publicized to a broad network of stakeholders,

¹⁵ Vintar et al. (2017)

the widest academic community, and the public at large including special needs students. Short- and medium-run sustainability will be achieved by using existing and acknowledged platforms for our DigiLing hub: the international CLARIN network and the University of Ljubljana infrastructural centre of Language Resources and Technologies (CJVT). Medium- and long-run sustainability will be achieved through national accreditation of online courses and the curriculum.

Target audience

The project directly targets an estimated audience of 2000 people, with potential benefit for many more:

- Students of partner universities studying or planning to study at any language- or IT-related study programme, including (General or Applied) Linguistics, (General or Specialised) Translation, Intercultural Communication, Natural Language Engineering or Processing, Information Technologies, Information Sciences, Informatics, Computer Science and similar,
- Teachers and researchers of partner universities in the relevant fields,
- Companies, organisations, public institutions and other users of digital language services.

Conclusion

The European Commission announced in May 2015 "A Digital Single Market Strategy for Europe" as one of the 10 priorities of the Juncker Commission, recognizing the Internet and digital technologies as an opportunity for customers and businesses in the European Union to contribute to the economy, create new jobs, and enhance Europe's position as a world leader in the digital economy. In order to be able to transform to a digital economy, it is an imperative for the workforce to have the necessary digital skills and competences. Digital linguistics is a new interdisciplinary field of study at the crossroads between linguistics, information sciences, information technology and social sciences. Digital linguistics is not synonymous to computational linguistics or corpus linguistics, although certain skills and research methods may overlap between these disciplines. Although universities offer graduate level programs in complementary disciplines, currently no European university offers a program in the interdisciplinary field of digital linguistics. In this paper we presented a project participating in the development of crucial digital skills and competences of future employees for the digital economy. *DigiLing: Trans-European e-Learning Hub for Digital Linguistics* is a 3-year project funded by the Erasmus+ program of the European Union with the purpose of a) creating an internationally approved model curriculum for digital linguistics at the graduate level, b) training the teachers in relevant disciplines in the use of digital technology with the goal of

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