Cracking the Language Barrier for a Multilingual Europe

1. Introduction

A truly multilingual Europe, which is realised and supported through sophisticated monolingual, cross-lingual and multilingual language technologies (LT) is still far from being a reality. Since its inception in 2010, it has been the key objective of META-NET to foster and stimulate research and technology development towards this scenario. Important milestones along the way have been the publication of the Language White Papers (Rehm/Uszkoreit 2012; Rehm et al. 2014) and the Strategic Research Agenda for Multilingual Europe 2020 (Rehm/ Uszkoreit 2013) as well as the deployment of META-SHARE (Piperidis 2012; Piperidis et al. 2014). While all these activities have had a certain amount of impact in various European countries (Rehm et al. 2016), new challenges but also new opportunities have been emerging in the last two years.

In this contribution we briefly report on the most recent developments in and around META-NET up till the end of 2015. After an overview of META-NET in Section 2, we briefly describe, in Section 3, one of the major challenges, i.e., the danger of continued community fragmentation. In Section 4 we report on the relationship between the EU's Digital Single Market flagship initiative and language technologies, which is one of the major challenges but also opportunities our field of research faces in the next couple of years. One of the milestones in 2015 was the Riga Summit 2015, which also included META-FORUM 2015 (Section 5). At this event, the very first version of the Strategic Agenda for the Multilingual Digital Single Market was presented (Section 6). As a direct follow-up action of the Riga Summit 2015, the new European initiative *Cracking the Language Barrier* was created as a federation of projects and organisations working on technologies for a multilingual Europe. Section 7 provides an overview of this federation, its setup and members as well as the topics and objectives of the collaboration.

2. META-NET: A brief overview

Our multilingual European society imposes societal challenges on political, economic and social integration and inclusion, especially in the creation of the Digital Single Market (DSM) (see EC 2010). LT will bring us closer to this goal.

42 G. Rehm: Cracking the Language Barrier for a Multilingual Europe

It is one of the key enabling technologies to boosting growth and strengthening our competitiveness. Recognising the demand and opportunities within Europe, 60 research centres in 34 European countries joined forces to form META-NET, a European Network of Excellence dedicated to the technological foundations of a multilingual, inclusive and innovative European society.¹ In its first funded phase, from 2010 to 2013, META-NET was supported through four EU projects (T4ME, CESAR, METANET4U and META-NORD). Currently, the EU-project CRACKER (2015-2017) supports selected META-NET activities such as the maintenance and extension of META-SHARE and the META-FORUM conference series (Rehm 2015).² Since its inception in 2010, one of META-NET's key goals has been mono-, cross- and multilingual technological support for all European languages as well as fostering innovative research and development by providing strategic guidance and recommendations along with a small number of priority research topics (Rehm/Uszkoreit 2013).

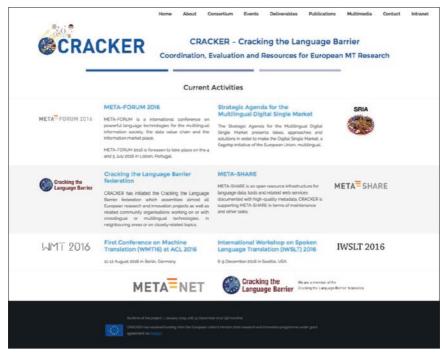


Fig. 1: The landing page of the CRACKER website

- ¹ www.meta-net.eu.
- ² http://cracker-project.eu.

3. The Danger of Increased Fragmentation among Communities

Parallel to META-NET, multiple stakeholders have for several years now been investing much time and resources into organising events and awareness raising activities, developing roadmaps and strategies, and communicating to key decision makers on specific aspects of the overall topic of Multilingual Europe (including, but not limited to, language technologies, language resources, language learning, industry and innovation, minority languages, under-resourced languages, etc.). In some of these areas, we have been able to establish very fruitful and constructive cooperation and collaboration, with some stakeholders inviting others to their events, often on a regular basis. A certain amount of community building has indeed successfully taken place, due to, among others, EFNIL activities (including the annual EFNIL Conference) and META-NET activities (including the annual META-FORUM conference). Nevertheless, to the non-initiated outsider, the wider community around the complex *Multilingual Europe* topic is still very much fragmented. Unfortunately, this continues to be a serious issue and also a challenge, especially when the mutual goal of all stakeholders is to communicate complex topics and suggested solutions, such as roadmaps and strategy papers, to administrators, politicians and other key decision makers with the shared goal of triggering change processes to improve the situation.

4. The Digital Single Market as a multilingual challenge

Fostering the Digital Single Market (DSM) is one of the top priorities of the European Union.³ The fully integrated and connected DSM is expected to add 340 billion European GDP and to create hundreds of thousands of new jobs. The European Commission wants to realise the DSM mainly through regulatory activities, including three policy areas or pillars (EC 2015): 1) better online access to digital goods and services for consumers and businesses (helping to make the EU's digital world a seamless and level marketplace to buy and sell through harmonised consumer rules, removing geo-blocking, copyright reform, etc.); 2) an environment where digital networks and services can prosper (by designing rules which match the pace of technology and support infrastructure development); and 3) by endorsing digital as a driver for growth, i.e., ensuring that Europe's economy, industry and employment take full advantage of what digitalisation offers.

³ http://ec.europa.eu/priorities/digital-single-market/.

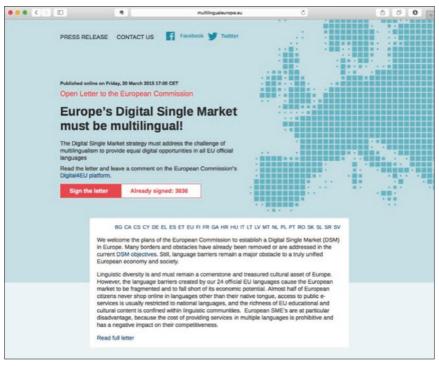


Fig. 2: The open letter campaign "Europe's Digital Single Market must be multilingual!"

In early 2015, it transpired that the EC's DSM Strategy, eventually published shortly after META-FORUM 2015 on 5 May 2015 (EC 2015), would most probably *not* contain a component dedicated to the language or multilingualism issue – even though we had already indicated in our META-NET Strategic Research Agenda for Multilingual Europe 2020 (Rehm/Uszkoreit 2013) that a truly unified digital *single* market can only exist when language barriers have been overcome through LT. As a reaction, we organised an online open letter campaign in March 2015, urging the EC to take the language issue into account for the final version of the DSM strategy.⁴ Within a few days, the open letter campaign managed to collect more than 3,000 signatures including those of researchers, professors, industry professionals, translators, administrators, officials and several Members of the European Parliament (see Figure 2).

As emphasised in the open letter, language barriers remain a major obstacle to a truly unified European economy and society. Linguistic diversity is and must remain a cornerstone and cultural asset of Europe. However, the language barriers

⁴ http://multilingualeurope.eu.

created by the 24 official EU languages cause the market to be fragmented. About half of European citizens never shop online in languages other than their native tongue and access to public e-services is typically restricted to national languages. European SMEs are particularly disadvantaged because the cost of providing services in multiple languages is prohibitive and has a negative impact on their competitiveness.

To overcome these barriers, Europe does not need to abandon its linguistic diversity. Technological development has brought solutions to automate translation and other multilingual processes. Although not perfect, these technologies already bring immense benefits, enabling multilingual and cross-lingual access to websites and e-services, extracting information from multilingual data, and boosting the efficiency of translators.

Yet online machine translation and language technology services are dominated by global non-European companies which primarily focus on English and a few other of the world's largest languages, more or less neglecting or ignoring European languages with less economic power. As a direct consequence, almost half of Europe's citizens are digitally disadvantaged due to their mother tongue (Rehm/Uszkoreit 2012).

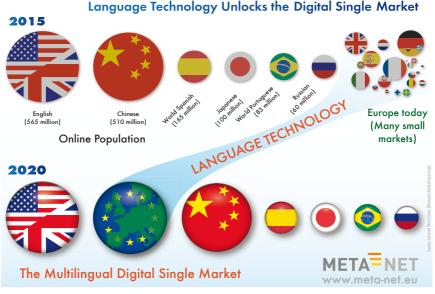


Fig. 3: Unlocking the Multilingual Digital Single Market

The market alone is unable to address this challenge, which requires immediate and concerted action at the level of the European Union. Europe needs a strategy to remove language barriers, enabling EU businesses and citizens, and providing equal digital opportunities for all EU language communities. Only if the EC's strategy includes the use of technological solutions for bridging language barriers can the full potential of the DSM be unleashed. These solutions should include, among others, a set of digital services for all EU official languages which is available to all European citizens, businesses and organisations. These services will allow technology and service companies to create numerous solutions to cover a variety of market needs and requirements.

Such technological solutions, based on European research results and industry innovations, will provide all European citizens, businesses and public institutions with access to high-quality machine translation and additional sophisticated language solutions for businesses, consumers and cross-border public services (see Figure 3). If the EC's strategy for the Digital Single Market does not recognise multilingualism as both a challenge and an immense opportunity for economic growth and social cohesion, the DSM will consist of more than 20 isolated markets that do not have any bridges between them. To address the question of technology solutions for the multilingual DSM, we have been working on the Strategic Agenda for the Multilingual Digital Single Market (Section 6), the first version of which was presented at META-FORUM 2015.

5. META-FORUM 2015 and the Riga Summit 2015

META-FORUM is META-NET's annual conference series. Previous events took place in 2010 (Brussels), 2011 (Budapest), 2012 (Brussels) and 2013 (Berlin); initially the conference series was co-funded through the EU-project T4ME, i.e., the Network of Excellence that created and was the core of META-NET. The two main goals of META-FORUM are community building and outreach to the wider research and industry community, as represented, for example, by the 800+ members of the Multilingual Europe Technology Alliance (META).

META-FORUM 2015⁵ took place on 27 April, the first conference of the series organised as a one-day event due to time constraints as a result of the other events organised under the larger umbrella of the Riga Summit 2015 on the Multilingual Digital Single Market.⁶ The idea of organising a larger, high-level event with a three-day programme focused around the topic of the EU's Digital Single Market flagship initiative, headed by Vice President Andrus Ansip, was born in a meeting with representatives of the European Commission and the two CSAs LT_Observatory and CRACKER in Luxembourg on 21 October 2014.

⁵ www.meta-net.eu/events/meta-forum-2015/.

⁶ http://rigasummit2015.eu.

Indeed, the Riga Summit was the first tangible indicator that a wider group of stakeholders had finally reached a turning point in terms of working together towards a mutual goal; it was jointly organised by META-NET (through CRACKER), LT-Innovate (through LT_Observatory), Tilde and the EC. At the Riga Summit, consisting of META-FORUM 2015, the Riga Summit Plenary Day, the Multilingual Web Workshop 2015⁷ and the CEF.AT⁸/ELRC⁹ Conference, about 350 participants from several communities came together and presented as well as discussed many different topics around Multilingual Europe and the Multilingual Digital Single Market.

On the last day of the summit, the participants prepared and signed a short one-page document, the Declaration of Common Interests (Riga Summit 2015 Declaration). In this declaration, the representatives of 12 organisations – BDVA, CITIA, CLARIN, EFNIL, ELEN, ELRA, GALA, LT-Innovate, META-NET, NPLD, TAUS, W3C – state that they stand united in their goals and interests to:

- support multilingualism in Europe by employing language technology in business, society and governance, to create a truly Multilingual Digital Single Market,
- exchange and share information in their efforts to promote their goals and interests at local, national and European levels,
- raise awareness in society at large using channels available to their associations, alliances and societies.

Furthermore, the establishment of a Memorandum of Understanding among the organisations was planned as a step towards forming a "Coalition for a Multilingual Europe". A few months later this 'coalition' was put together as the "Cracking the Language Barrier" federation (see Section 7).

One of the highlights of META-FORUM 2015 was a panel discussion with representatives of EFNIL and NPLD in which a position paper jointly written by these two organisations was presented (NPLD/EFNIL 2015). Another highlight was the official unveiling of the Strategic Agenda for the Multilingual Digital Single Market, presented in more detail in the following Section 6.

6. The Strategic Agenda for the Multilingual Digital Single Market

Building upon past activities, in particular the *META-NET Strategic Research* Agenda for Multilingual Europe 2020 (Rehm/Uszkoreit 2013), the EU-projects CRACKER and LT_Observatory teamed up in early 2015 and prepared the

⁷ http://www.multilingualweb.eu/documents/2015-riga-workshop/.

⁸ https://ec.europa.eu/digital-agenda/en/connecting-europe-facility.

⁹ www.lr-coordination.eu.

Strategic Agenda for the Multilingual Digital Single Market – Technologies for Overcoming Language Barriers towards a truly integrated European Online Market (MDSM SRIA 2015). The very first version of this document, Version 0.5 dated 22 April 2015, was publicly unveiled at META-FORUM 2015 and the Riga Summit 2015 (see Section 5).

We recommend setting up a strategic programme to enable the Multilingual Digital Single Market (MDSM). Due to space restrictions, it is only possible to provide a brief summary of the main components of the SRIA. The setup of the ambitious strategic programme consists of three layers (see Figure 4). On the top layer we envisage a set of focused Technology Solutions for Businesses and Pub*lic Services.* These innovative application scenarios and solutions are supported. enabled, and driven by the middle layer, which consists of a small group of Services, Infrastructures and Platforms that provide, through standardised interfaces, data exchange formats and component technologies, with different services for the translation, analysis, production, generation, enrichment and synthesis of content and information. The bottom layer connects the infrastructures to innovative Research Themes. These provide concrete scientific results, approaches, technologies, modules, components and algorithms that can then be used to enable the second and, ultimately, the top layer. Furthermore, we plan to intensify work on core resources and technologies for language production and analysis, because we need to improve the basic technologies for all languages. In order to equip every language with a set of core resources and technologies, we suggest, among others, intensifying knowledge and technology transfer between larger research centres and groups working on technologies for under-supported languages.

The SRIA, together with background information such as, for example, a fact sheet¹⁰ on the Multilingual Digital Single Market (excerpts shown in Figures 5 and 6), was delivered to EC Vice President Andrus Ansip and all other EC Commissioners as well as other high-ranking EC officials via email. A response was received on 8 June 2015. The letter, addressed to the Network Manager of META-NET, takes into account our awareness raising campaign and the Resolution and Declaration documents prepared at the Riga Summit. VP Ansip thanks the community for bringing to his attention the open letter campaign and the SRIA. Furthermore, VP Ansip invites "the European [LT] community to further develop the ideas presented in the draft Strategic Agenda for the multilingual Digital Single Market".

¹⁰ http://cracking-the-language-barrier.eu/documents/.

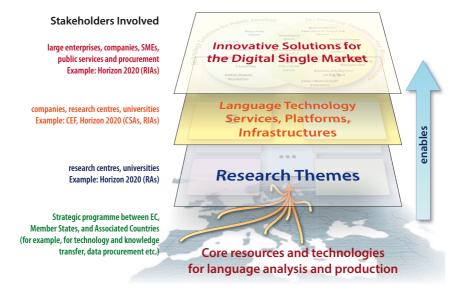


Fig. 4: The multi-layered programme for the Multilingual Digital Single Market

If we are able to secure support from the European Commission, the strategic programme will not only unlock the multilingual DSM, it will provide the European language technology community and also several different industries with the ability to compete with other markets and, subsequently, achieve multiple benefits for the European economy and future growth, as well as for our society and citizens. The plan put forward in the SRIA can only be realised through close cooperation between all stakeholders and tightly coordinated collaboration. Awareness and political will are required to take us to a leading position in this technology area. This major dedicated push also needs to include the political determination to modify and adopt a shared, EU-wide language policy framework that includes an important role for language technologies.

As Europeans, we urgently need to ask ourselves some crucial questions. Can Europe afford continued language-blocking, market fragmentation caused by language borders, language discrimination, and, eventually, digital language extinction? Can we afford to have our information, communication and knowledge infrastructure so dependent on monopolistic services provided by foreign, non-European companies, effectively constituting technological lock-in? What is Europe's fall-back plan in case the language-related services provided by these non-European companies that we rely upon are suddenly switched off, or even more serious access or security issues arise? Is Europe actively making an effort to compete in the global landscape for research and development in language technology? Can we expect third parties from other continents to solve our trans-

lation and knowledge management problems in a way that suits our specific communication, societal and cultural needs?

Language Technology made for Europe in Europe will significantly contribute to future European cross-border and cross-language communication, economic growth and social stability while establishing for Europe a leading global position in technology innovation, securing Europe's future as a world-wide trader and exporter of goods, services and information. Only a large, coordinated push of this magnitude will be able to unlock a truly multilingual Digital Single Market.

7. The Cracking the Language Barrier Initiative

At the beginning of 2015, six new EU-funded Machine Translation projects were launched, financially supported by the call Horizon-2020-ICT-17, entitled "Cracking the Language Barrier".¹¹ One of the original goals of the CRACKER project was fostering community building within this group of projects. The start of this community building activity coincided with the Riga Summit 2015 (see Section 5) where a first meeting of the ICT-17 group and two related FP7 projects was held. In this and several follow-up discussions it became clear that a significant extension of the scope of the intended community would be worthwhile, by not only including the ICT-17 and FP7 projects in the emerging initiative but also other relevant Horizon 2020 projects, as well as longer-term and more sustainable European organisations and associations.

In CRACKER we decided to address the danger of increased fragmentation among communities (see Section 3) by creating one umbrella initiative that, ideally, would include all current and recently ended EU-supported projects and, in particular, all stakeholder organisations. Instead of the term "coalition", as initially suggested in the Riga Declaration document (Riga Summit 2015 Declaration, see Section 5), we use the term "federation" to emphasise that this is an initiative *from* the community *for* the community. One of the federation's main principles is that all members operate on an equal basis.

¹¹ https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/ 289-ict-17-2014.html.



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* Figures based on the META-NET study "Europe's Languages in the Digital Age" (2011/2012).

Technology support has improved for some languages since this study was completed.

Fig. 5: Several facts around the Multilingual Digital Single Market (1/2)

translation provided by US

tech giants does not solve

the "language problem":

automatically translated content is truly useful for

less than 30% of

online commerce.

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The federation's name was picked by simply reusing the name of the call Horizon 2020, ICT-17. It was not considered necessary to invent an overall new community brand. The strategic objective of "cracking the language barrier" (or working with or on multilingual or crosslingual technologies) can be considered the shared core of all participating projects and one of the main strategic goals that all participating organisations firmly stand behind.

Only three European languages (Spanish, English, and French) meet at least the "moderate" level of language technology support.

The Cracking the Language Barrier federation is designed as a self-organising organisation. There are no plans at the moment to establish any kind of governance structure, even though this may become necessary in the medium to long term. It is organised around a short multi-lateral Memorandum of Understanding (Cracking the Language Barrier MoU). To quote the Memorandum of Understanding, its purpose is

G. Rehm: Cracking the Language Barrier for a Multilingual Europe

52

to establish one umbrella initiative for all projects and organisations working on or supporting the idea of cracking the language barrier. The MoU contains a nonexhaustive list of general areas of collaboration [see below]; all projects and organisations that sign this document [...] are invited to participate in these collaborative activities. (Cracking the Language Barrier MoU)

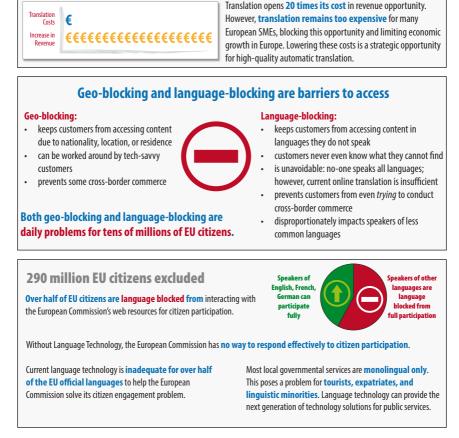


Fig. 6: Several facts around the Multilingual Digital Single Market (2/2)

Any interested European project or organisation that is considered relevant to the initiative can join the federation by signing the multilateral Memorandum of Understanding. In doing so, a project or organisation declares its commitment to cooperation and collaboration according to the non-exhaustive general areas of collaboration. Participation is optional and open to any European project or organisation working on or with crosslingual or multilingual technologies, in neighbouring areas or on related topics. At the time of writing, the Memorandum of Understanding has been signed by nine organisations and 20 projects:

- Organisations: CITIA, CLARIN, EFNIL, ELEN, GALA, LT-Innovate, META-NET, NPLD, TAUS;
- Projects: CRACKER, EUMSSI, EXPERT, Falcon, FREME, HimL, KConnect, KRISTINA, LIDER, LT_Observatory, MixedEmotions, MLi, MMT, Multi-JEDI, MultiSensor, Pheme, QT21, QTLeap, ROCKIT, XLiMe.



Fig. 7: Realising the Multilingual Digital Single Market

In addition, several other organisations and projects have been approached about participation in the initiative and the group of members is expected to grow. Interested projects are already approaching us because they want to join the federation.

An initial website for the initiative was launched in August 2015. On the website each project and organisation that participates in the initiative is allocated at least one page. This way, the initiative itself can be established as one overarching brand and activity without undermining the importance and status of the participating organisations and projects. Figure 8 shows the landing page of the Cracking the Language Barrier federation's website.¹² Each member is showcased with a brief description, further details, contact information and a link to their own website. Furthermore, the website contains an events calendar and a section on which shared documents such as the Riga Declaration (Riga Summit 2015 Declaration) or the Multilingual Digital Single Market SRIA (MDSM SRIA) are available for download. As a first common activity, the website also features the virtual home13 of the LREC 2016 Workshop "Translation evaluation - From fragmented tools and data sets to an integrated ecosystem" which will be held in Portorož, Slovenia, on 24 May 2016; this workshop is a joint activity by CRACKER, QT21 and the Cracking the Language Barrier federation. Additional features are planned, e.g., a joint newsletter and a joint blog.

¹² www.cracking-the-language-barrier.eu.

¹³ www.cracking-the-language-barrier.eu/mt-eval-workshop-2016/.



Fig. 8: The landing page of the Cracking the Language Barrier's federation website

With regard to handling and streamlining communication and coordination among the participating projects and organisations of the federation, email distribution lists were set up (e.g., to announce new members, workshops, conferences, evaluations, etc.). Any project or organisation that signs the Memorandum of Understanding is added to the mailing lists with as many representatives as they like.

By signing the Memorandum of Understanding, all members of the federation express their intention to collaborate and to cooperate with one another. A first set of areas of collaboration was discussed and agreed upon at the meeting of all EU-projects funded through Horizon 2020, call ICT-17, on 28 April, 2015, in Riga.

- Internal communication: all projects and organisations participating in the activity are invited to use the email distribution lists as internal communication channels, to exchange news and information (e.g., about upcoming events, recent funding opportunities, shared evaluation workshops, new developments on the European level, etc.).
- External communication and dissemination: all projects and organisations participating in the activity are invited to collaborate in terms of events, publications and scientific dissemination, for example, by participating in

each others' events, evaluation campaigns, shared evaluation workshops, by actively using and promoting "Cracking the Language Barrier" activity in dissemination emails, posters, presentations, panel discussions and publications, and by exchanging and harmonising communication plans.

- Website: all projects and organisations participating in this activity are featured on a dedicated website; the website also includes additional information such as, for example, a list of upcoming events and the Memorandum of Understanding.
- Data management and repositories for language data, language tools and language technologies: all projects and organisations participating in the activity are invited to join forces and to collaborate in terms of harmonising data management plans (metadata, best practices, etc.) as well as data, tools and technologies distribution through open repositories.
- Strategic Research and Innovation Agenda: projects and organisations are invited to collaborate by providing input and feedback with regard to the current and any future versions of the Strategic Agenda for the Multilingual Digital Single Market (SRIA version 0.5, see MDSM SRIA) or related strategic documents such as, for example, roadmaps.
- Shared tasks and evaluations: projects and organisations are invited to participate in the shared evaluation workshops organised by CRACKER and QT21, among others.

This list of areas of collaboration, also contained in the Memorandum of Understanding, is not meant to be exhaustive. Additional topics can be suggested or initiated by all projects and organisations.

8. Conclusion and invitation

Despite rapid technological progress (including uptake in digital services) and many years of work by several stakeholder organisations, Europe is only just starting to recognise the potential and importance of language technologies for its future growth and digital infrastructure. The European Union has a unique opportunity for strategic investment in the future of our continent by stimulating further progress in this field and eventually overcoming language barriers through multilingual technologies that are deeply embedded into our future IT. Digital communication and information technologies play an ever increasing role in our society, forcing the European Union to decide if it wants to contribute to the development of the field or whether it can afford not to. One specific area in which we can already see some positive uptake is the inclusion of automated translation technologies in public e-services, as supported through the CEF programme (Connecting Europe Facility). This is a good first step, but more need to be taken. While the Cracking the Language Barrier federation is still in its infancy, the current membership base of nine participating organisations and 20 projects is very promising and demonstrates the growing interest among all stakeholders in taking the much needed next steps by working together instead of operating in isolation without broader coordination (also see Soria et al. 2013; Mariani 2015). In addition to a few projects that have not yet signed the Memorandum of Understanding, the initiators hope to assemble all of the 12 organisations that have signed the Riga Declaration (Riga Summit 2015 Declaration).

With the publication of the Horizon 2020 Work Programme 2016/2017 the European Commission has, unfortunately, dropped language technology as a stand-alone topic; however, LT is included in the Big Data call ICT-14 where it is envisaged as an enabling helper technology for crosslingual data value chains. The language and multilingualism topics are also disregarded in the Digital Single Market strategy, published in early May 2015. At the same time we are entering an era in which Artificial Intelligence and smart language-related technologies play an increasingly decisive role in applications such as machine translation (e.g., Google Translate, Bing Translator, Yandex Translate), interactive dialogue systems (e.g., Apple Siri, Microsoft Cortana, Google Now, Amazon Echo) and arbitrary web interfaces where natural language processing components including, among others, search suggestions, information extraction, spell-checking etc. are, by now, indispensable components that users expect to be available.

Therefore, one of the next important steps is to significantly step up our communication activities and collaborate more closely and in a more coordinated way. One tangible forthcoming document will be the next iteration of the Strategic Agenda for the Multilingual Digital Single Market. A key proposal is to have the next version prepared, published and endorsed not only by the two EU-projects LT_Observatory and CRACKER but by the whole Multilingual Europe community, as assembled in the Cracking the Language Barrier federation. This next version of the SRIA is currently scheduled to be presented at META-FORUM 2016 in Lisbon on 4/5 July 2016.

We would like to invite interested organisations, projects and other stakeholders with a vested interest in the topic of Multilingual Europe to get in touch with us regarding active participation in the Cracking the Language Barrier federation.

9. Acknowledgement

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58 G. Rehm: Cracking the Language Barrier for a Multilingual Europe

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