



EUROPEAN ² LANGUAGE EQUALITY

D3.2

Missing resources and relevant stakeholders

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List of Acronyms

AI	Artificial Intelligence
CF	Contextual Factors
CLARIN	Common Language Resources and Technology Infrastructure
DLE	Digital Language Equality
EC	European Commission
ECSPM	European Civil Society Platform for Multilingualism
EFNIL	European Federation of National Institutes for Language
ELE	European Language Equality
ELE1	European Language Equality (preceding project)
ELE2	European Language Equality (<i>this project</i>)
ELEN	European Language Equality Network
ELG	European Language Grid (EU project, 2019-2022)
ELRC	European Language Resource Coordination
EU	European Union
LT	Language Technology/Technologies
META	Multilingual Europe Technology Alliance
META-NET	EU Network of Excellence to foster META
MT	Machine Translation
NLP	Natural Language Processing
TF	Technological Factors

Abstract

ELE2 continues to review key research areas and gaps in research that need to be addressed to ensure that the current inequality in LT support for Europe's languages can be overcome. This deliverable reports on missing resources and relevant stakeholders. It introduces updates to the ELE dashboard, analyses which language resources remain the most underrepresented, and discusses whether potential stakeholder types remain to be consulted.

1 Introduction

This deliverable reports on missing resources and relevant stakeholders. We utilised a newly updated version of the ELE dashboard and drew from the grassroots knowledge contained in each of the 35 language reports prepared for the ELE project (Rehm and Way, 2023). The updated dashboard now provides three additional modes to visualise the current state of LT support for Europe's languages. As will be discussed below, these novel visualisations offer unique lenses through which to analyse the LT gaps in Europe. This discussion is complemented by an analysis of potential missing stakeholder types. Because only a concerted and coordinated effort on the part of all LT stakeholders can build and deploy the language resources that are necessary to ensure digital language equality, we have endeavoured to establish whether any significant stakeholder type remains to be consulted.

2 Extension of ELE Dashboard

In order to provide a mechanism for dynamically exposing and monitoring the support languages receive through LT, the ELE project has designed and implemented an interactive dashboard that is available as part of the European Language Grid platform (ELE Dashboard¹). The dashboard is based on the ELG database and provides an overview of the DLE metric (Gaspari et al., 2022, 2023), and the two components contributing to the DLE metric, i. e., the technological (TFs) and contextual factors (CFs). The dashboard exposes the TFs (based on the contents of the ELG catalogue) and the CFs as interactive visuals dynamically created by user queries. With regard to the TFs, as the ELG catalogue organically grows over time, the dashboard provides an up-to-date overview of LT support that each language enjoys, also showing where the status is less than ideal or not at the expected level.

The first version of the user interface of the ELE dashboard consisted of three entry points (tabs). The first tab displayed the bar charts of the DLE metrics for CFs and TFs for the languages selected by the user. The other two tabs enabled users to dive into a more detailed comparison of a subset of the TFs across languages or within a language respectively. The comparison can be made on datasets and software resources and, by selecting one of the two, for a number of features characteristic of the corresponding resource class. The updated version of the dashboard introduces three new tabs, each providing a new table- or chart-based way to visualise data.

2.1 Heat Maps and Tables

The *Heatmaps and tables* tab provides the ELG source data in the form of actual number of resources or percentages representing the contribution of each language per resource type. These measurements are visualised as tabular data or heatmaps. Figure 1 shows an example

¹ <https://live.european-language-grid.eu/catalogue/dashboard>

of the percentages corresponding to English, French, German, Irish, Greek and Spanish. In this type of visualisation, darker cells have more resources than the lighter ones.



Figure 1: Example of percentages representing the contribution of English, French, German, Irish, Greek and Spanish per resource type.

2.2 Radial Bar

The *Radial bar tab* enables users to create charts that display data using a circular layout, with bars radiating out from the center of the circle. Each bar represents a category for each language (resource subclass or software), and the length of the bar corresponds to the number of available resources in the ELG catalogue. As an example, Figure 2 displays the gaps and the relevant factors necessary for further development of language technology for English, French, German, Irish, Greek and Spanish.

2.3 Evolution over Time

The *Evolution over time tab* enables users to create charts displaying either the overall data evolution over time, or the intensity at which data evolved over each time quantum.

The *Overall evolution* of the number of resources shows data as a series of points connected by a line. In these charts, the data is plotted on a coordinate system, with the horizontal axis representing time and the vertical axis representing the number of resources. Multiple languages can be selected for comparison and the time periods can also be viewed per semester or quarter. As an illustration, Figure 3 displays the evolution of English, French, German, Irish, Greek and Spanish resources over periods of six months.

The *Intensity evolution* chart provides an overview of the rate at which data for each language has become known to the (underlying) ELG Catalogue over time. Again, multiple languages can be selected for comparison and the time periods can also be viewed per semester or quarter. In this chart, the data for each language is plotted on the vertical and time on the

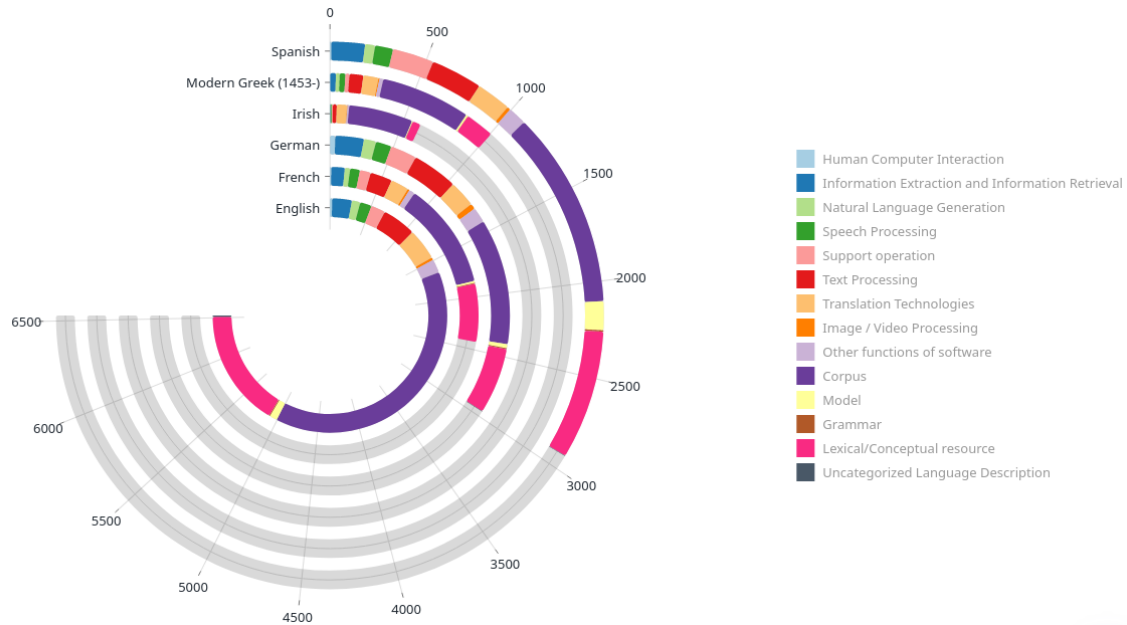


Figure 2: Example of the charts for English, French, German, Irish, Greek and Spanish per resource type.

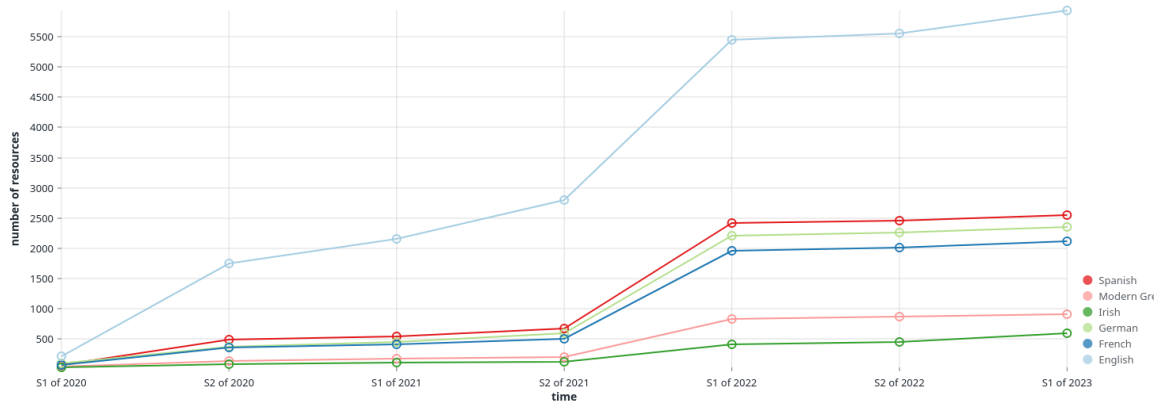


Figure 3: Evolution of English, French, German, Irish, Greek and Spanish resources over semester periods starting in the first semester of 2020 until first semester of 2023.

horizontal axis. Each language is represented by a separate line that is drawn as a filled-in area. The areas are arranged in such a way that the language that has the highest number of resources appears wider. As time progresses, the areas become wider or thinner, reflecting changes in the relative positions of the language's contribution. Figure 4 shows the intensity evolution chart for English, French, German, Irish, Greek and Spanish resources per quarters.

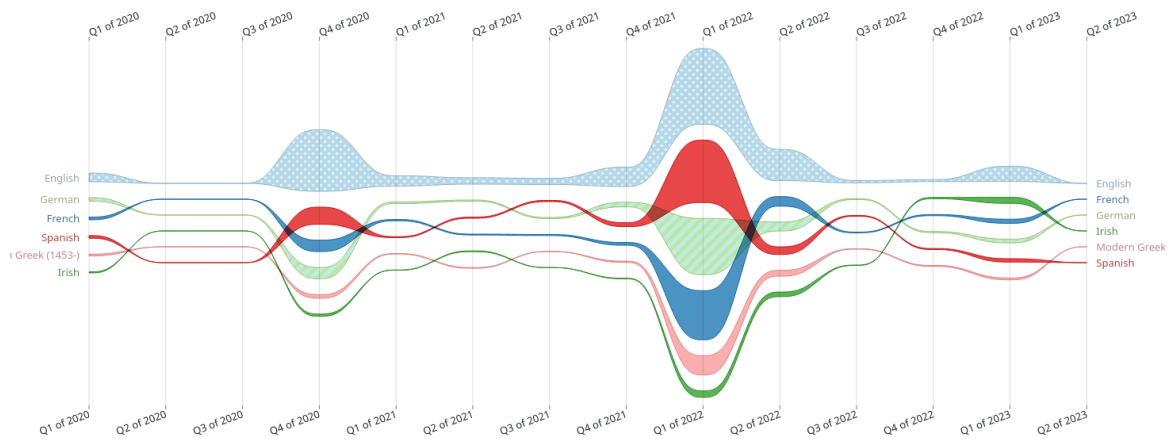


Figure 4: Evolution of English, French, German, Irish, Greek and Spanish resources per quarters starting in 2020 and finishing in 2023.

2.4 Dashboard Architecture

The ELE dashboard consists of two layers. The ELG database provides the data to be exposed, in particular the data for the technological factors. The ELG database contents are indexed and saved in JSON files. Each user query retrieves the respective results from JSON and exposes them to the front end. All results are visualised as interactive graphs. For the front end implementation, multiple libraries are utilised, i. e., the react-chartjs-2² library for charts, the Nivo library³ for the heatmap, radial bar and time evolution charts, while the table view is created using the Data Grid component from Material UI.⁴ Finally, the chartjs-plugin-zoom⁵ library is used for additional features like pan and zoom options on a selected chart.

3 Missing Resources

3.1 Methodology

We analysed the number of resources per resource type and language looking at the heat maps and tables provided by the updated version of the dashboard. This means we analysed the resources available in ELG for 94 national, regional and minority European languages grouped in four categories: 24 EU official languages, 7 (co)-official at national level, 12 (co)-official at regional level and 51 other European languages. The aim was to detect the biggest gaps among resource types and languages. For the purposes of this analysis we considered each language resource type of equal importance, although, in practice, the true value of a language resource type is based on other factors, such as the quality, performance, utility, size, etc. of the individual language resources grouped in the language resource type. Figures 5 to 11 present the absolute numbers of resources for the 94 languages. The distribution of those numbers is visualised as violin plots from Figure 6 to 12.

² <https://react-chartjs-2.js.org>

³ <https://nivo.rocks>

⁴ <https://v4.mui.com/components/data-grid/>

⁵ <https://www.chartjs.org/chartjs-plugin-zoom/latest/>

3.2 Results

3.2.1 Results for the 24 EU official Languages

Figure 5 presents the total number of resources for the 24 EU official languages. In terms of absolute numbers, the top three language resource categories that consistently demonstrate the weakest support across the majority of languages are *Image and video processing*, *Human-computer interaction*, and *Grammar*. In fact, for a number of official EU languages, some language resource categories present very few resources or even not a single resource at all (e.g., Human Computer Interaction for Irish and Maltese, Grammar for Croatian, Czech, Slovak and Slovenian).

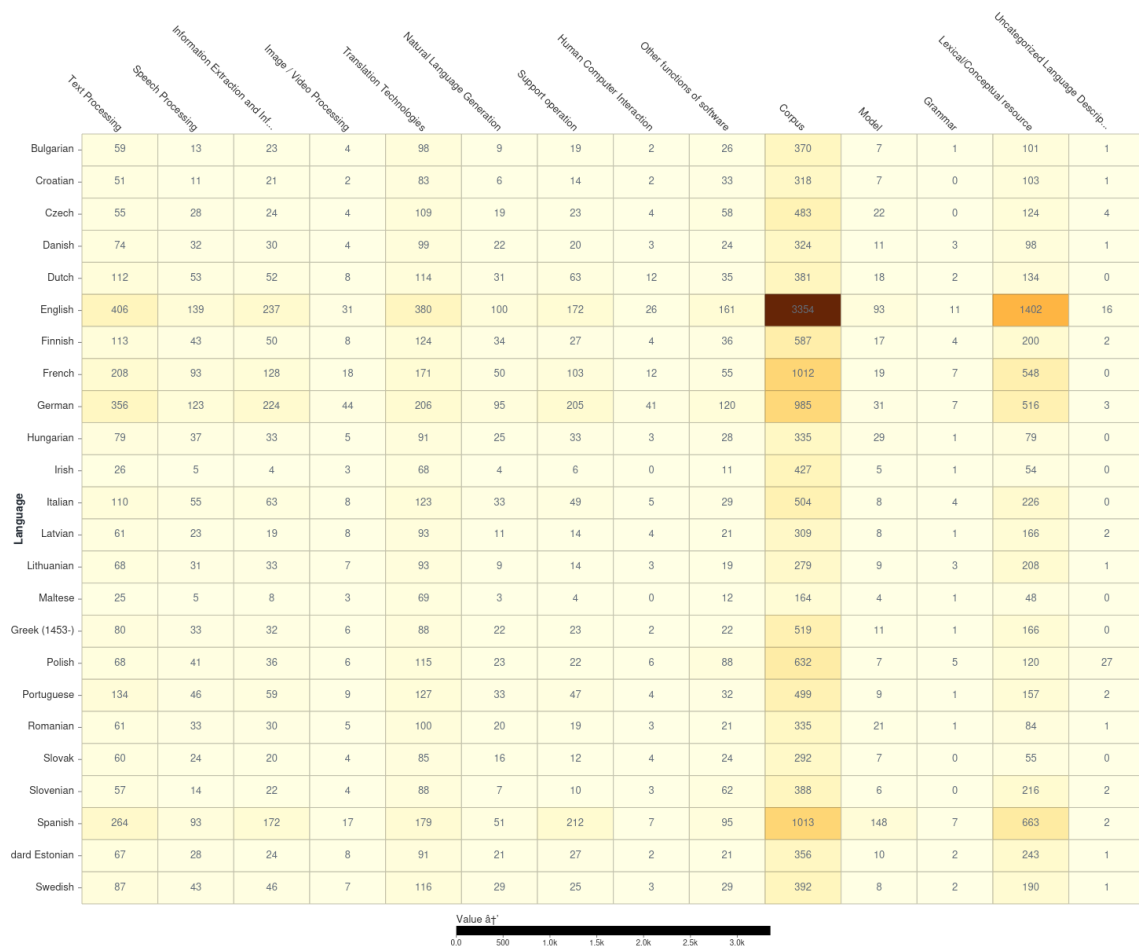


Figure 5: Number of resources of EU official languages

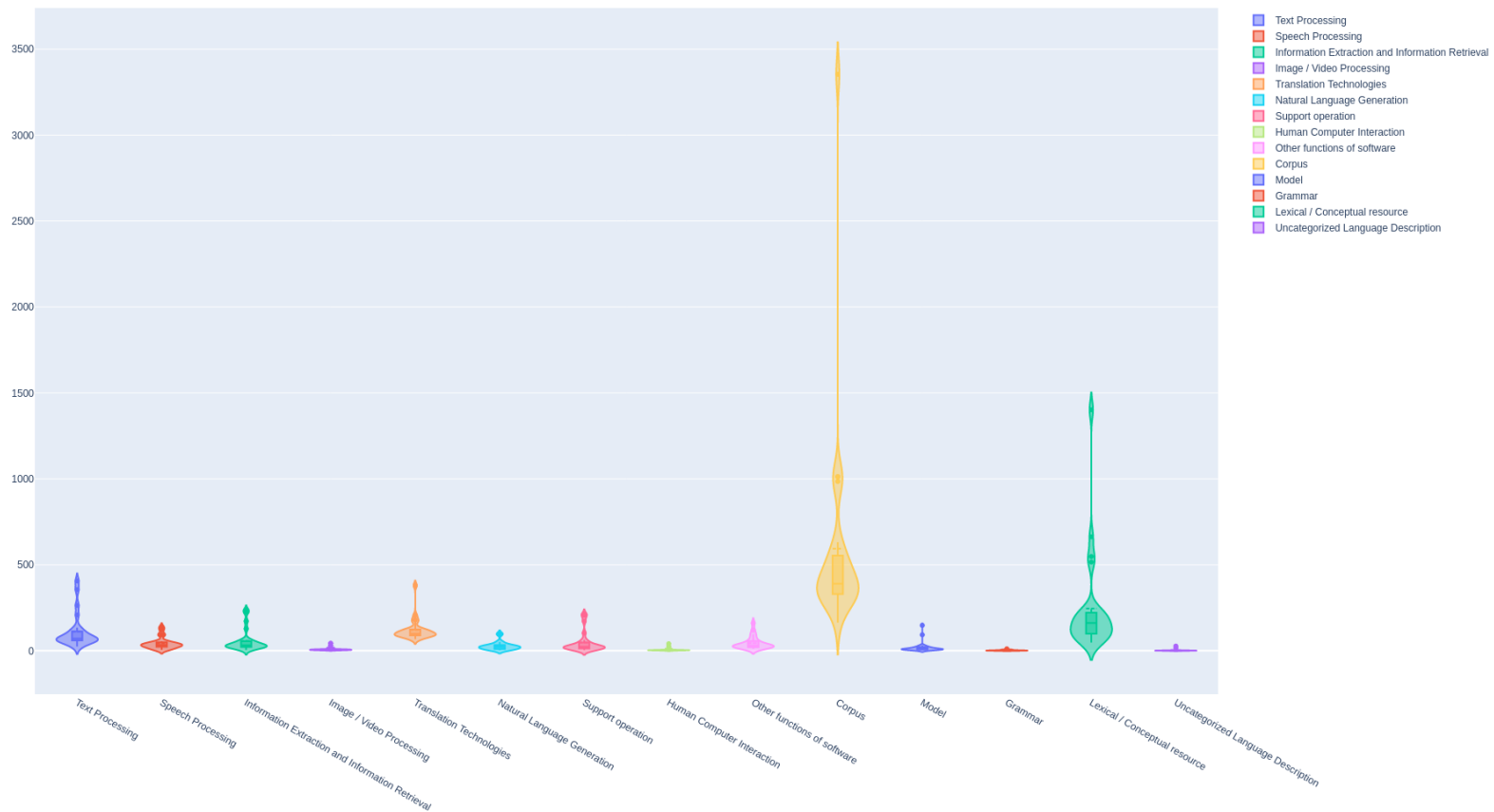


Figure 6: Number of resources of EU European official languages

Using the actual numbers provided by the dashboard we generated the plot presented in Figure 6. This plot presents the distribution of the total number of languages resources per category. As expected, every language resource type presents a very different distribution. This plot also shows that in addition to *Grammar* and *Human Computer Interaction*, the language resource category *Image and video processing* also presents low numbers across all EU official languages. Thus, these three resource language categories appear to be underdeveloped with respect to the others. Next, the *Model* language resource category is followed by *Other functions of software*, *Natural Language Generation*, *Speech processing* and *Information Extraction and Information Retrieval*. The *Translation technologies* and *Text processing* language categories are in slightly better condition. The list can be finished by *Lexical or Conceptual resource* and *Corpus* language resource categories. All in all, most of these categories seem to be underdeveloped for most of the EU official languages including English.

3.2.2 Results for the 7 (co)-official Languages

Figure 7 presents the total number of resources for the 7 (co)-official languages. Again, in terms of absolute numbers, the top three language resource categories that consistently demonstrate the weakest support across the majority of languages are *Image and video processing*, *Human-computer interaction*, and *Grammar*. In fact, for a number of official EU languages some language resource categories present few resources or no single resource at all (e.g., *Human Computer Interaction* for Luxembourgish, *Grammar* for Albanian, Bosnian, Luxembourgish and Macedonian, and *Image and Video processing* for Macedonian).

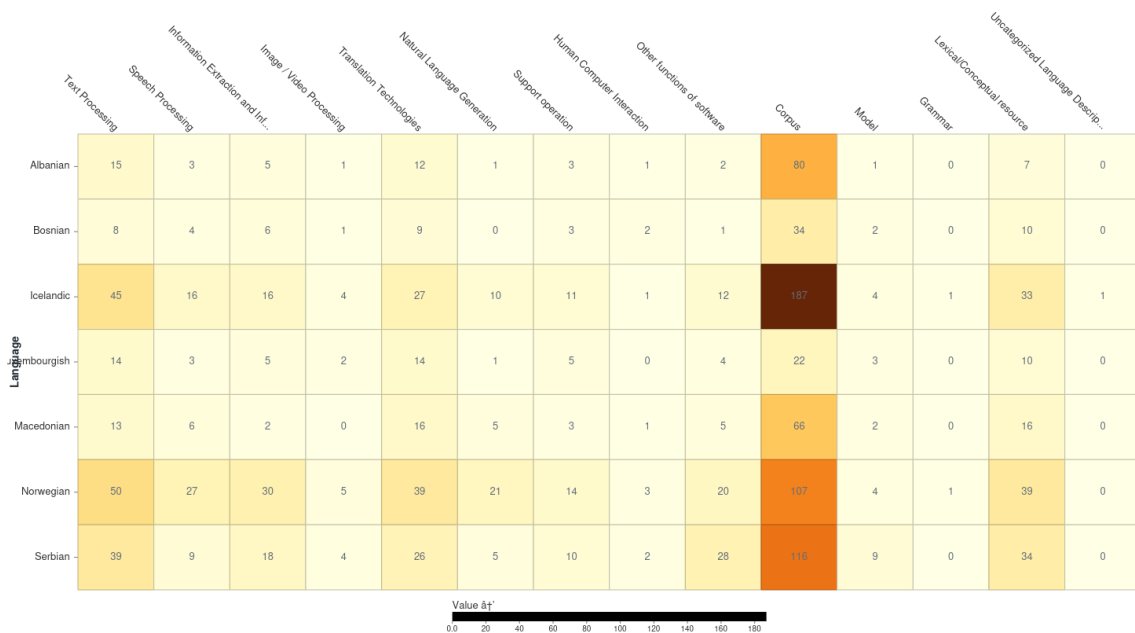


Figure 7: Number of resources of (co)-official languages at national level

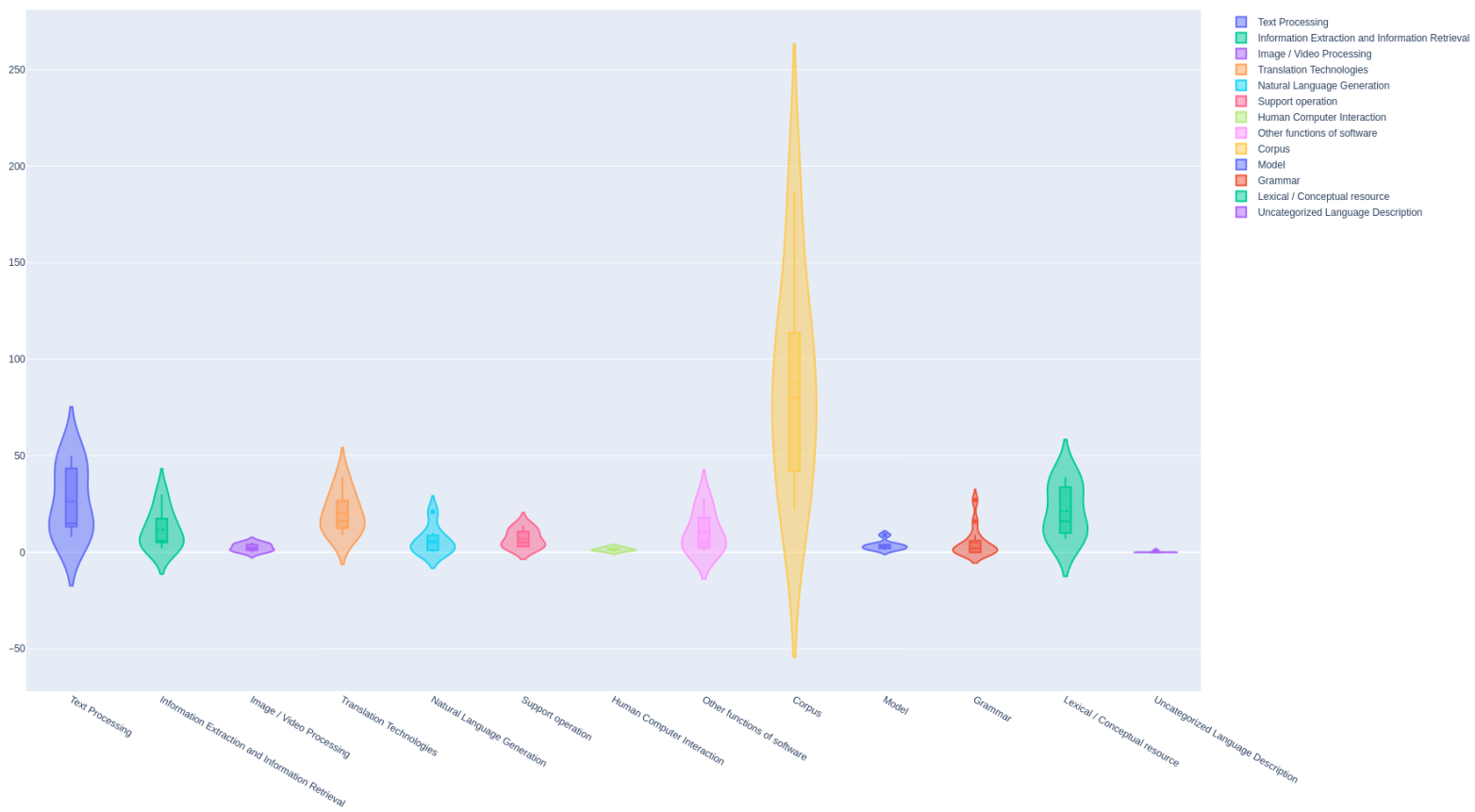


Figure 8: Number of resources of (co)-official European languages at national level

Using the numbers provided by the dashboard we generated the plot presented in Figure 6. This plot presents the distribution of the total number of languages resources per category for the 7 (co)-official languages. Again, every language resource type presents a very different distribution. However, the order of language resource categories from less developed to more developed seems to change. In this case, the group of less developed language resource categories consists of *Human Computer Interaction*, followed by *Model* and then *Image and Video processing*. The second group of language resource categories consists of *Grammar*, *Natural Language Generation* and *Support operation*. The language resource categories *Other functions of software*, *Information Extraction and Information Retrieval* are followed by *Translation technologies*, *Lexical or Conceptual resources* and *Text processing*, and finally *Corpus*. In summary, the language resource categories that exhibit poor coverage for all 7 (co)-official European languages at national level are *Human Computer Interaction*, *Model*, *Image and Video processing*, *Grammar*, *Natural Language Generation* and *Support operation*.

While only three categories seem to be underdeveloped for the EU official languages, the group of (co)-official languages at national level has five underdeveloped categories.

3.2.3 Results for the 12 (co)-official Languages at Regional Level

Figure 9 presents the total number of resources for the (co)-official languages at regional level. Again, in terms of absolute numbers, the top three categories that consistently demonstrate the weakest support across the majority of languages are *Image and video processing*, *Human-computer interaction*, and *Grammar*. In fact, for a number of official EU languages, some language resource categories present very few resources or no resource at all (e. g., for *Human Computer Interaction* only Basque, Catalan and Galician have some resources while for *Grammar* only Basque and Catalan). Furthermore, in this group several languages exhibit zero resources in all categories (Jèrriais and Plautdietsch).

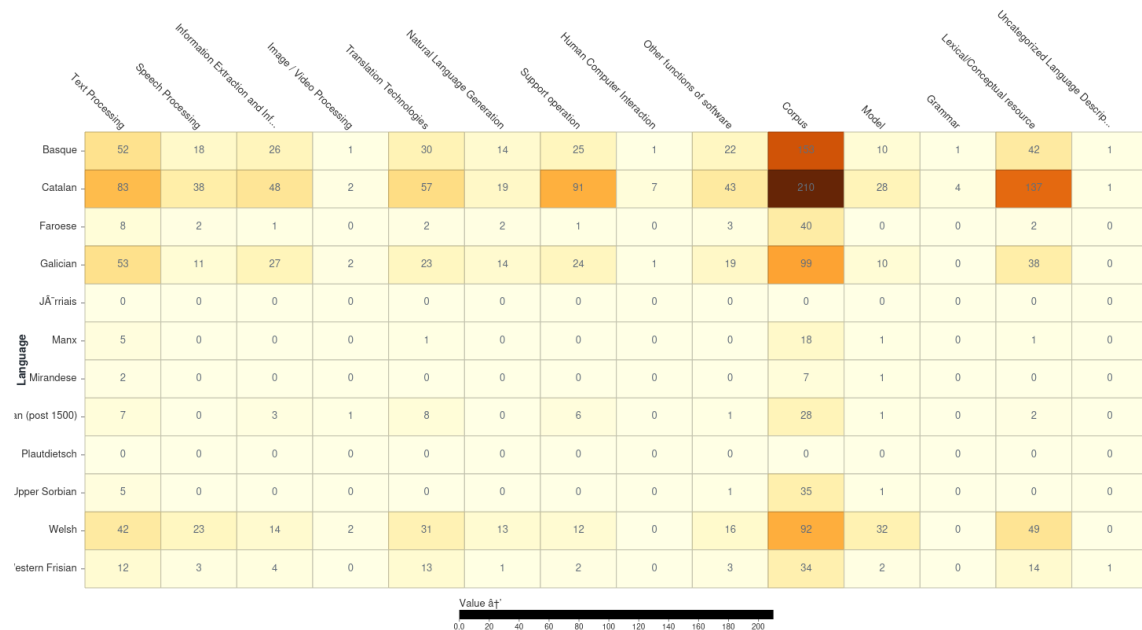


Figure 9: Number of resources of (co)-official languages at regional level

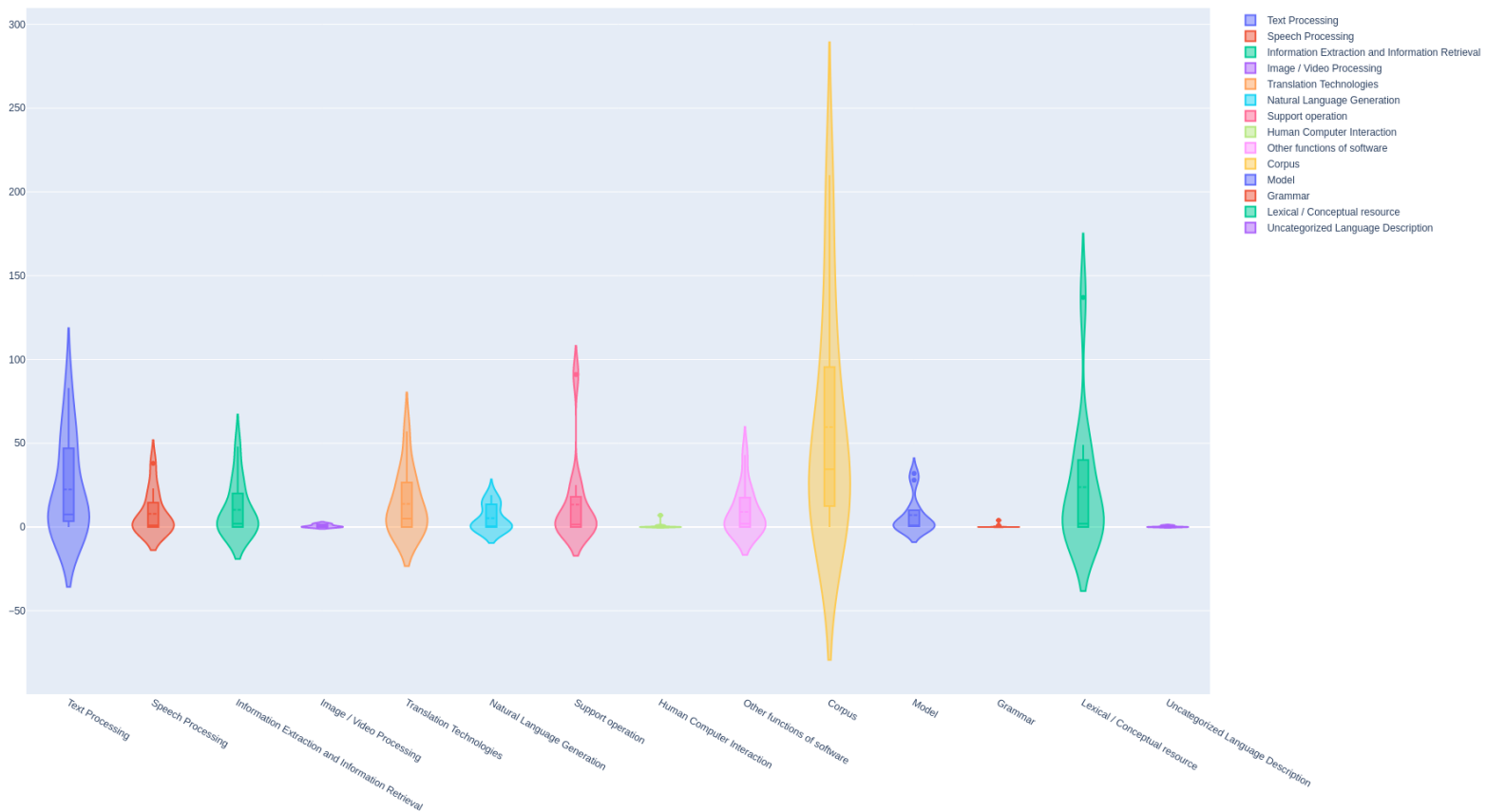


Figure 10: Number of resources of (co)-official European languages at regional level

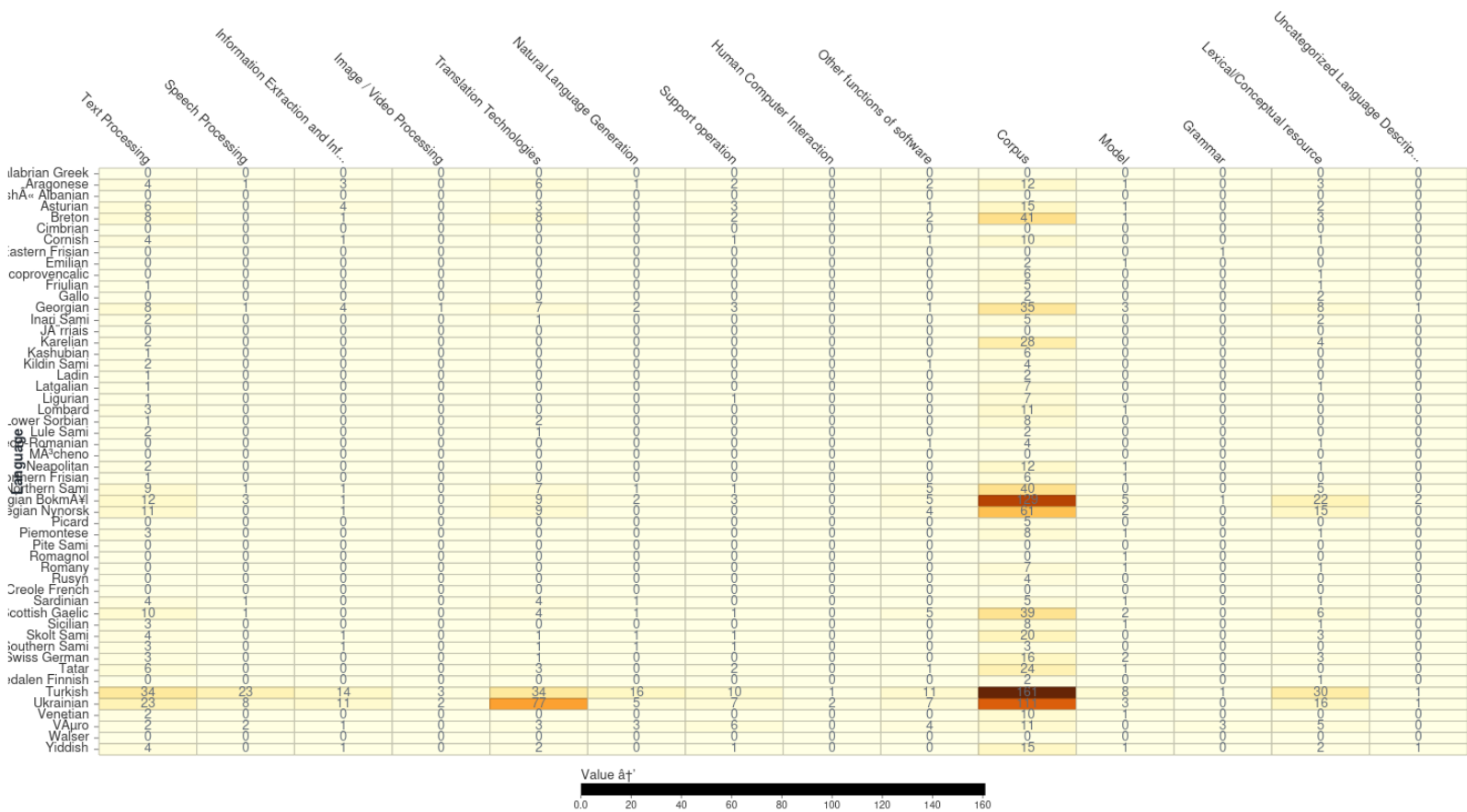


Figure 11: Number of resources of other European languages

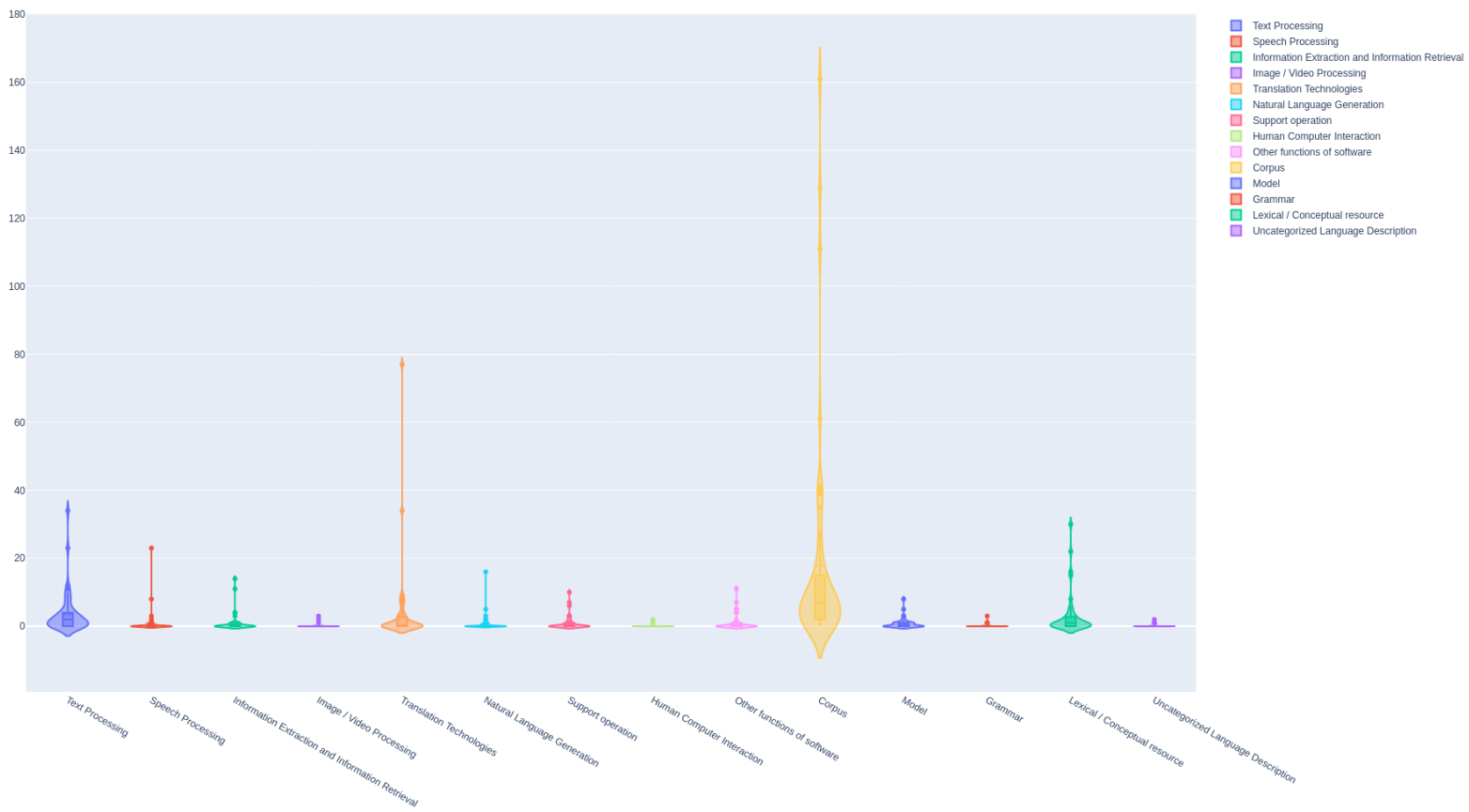


Figure 12: Number of resources of other European languages

Using the numbers provided by the dashboard we generated the plot presented in Figure 10. This plot presents the distribution of the total number of language resources per language resource category for the (co)-official European languages at regional level. Again, every language resource category presents a very different distribution. The group of less developed language resource categories consist of *Grammar*, *Human Computer Interaction* and *Image and video processing*. The second group of language resource categories consists of *Model* and *Natural Language Generation*. A third group corresponds to the language resource categories *Speech processing*, *Other functions of software*, *Information Extraction* and *Information Retrieval* and *Support operation*, followed by *Translation technologies*, *Lexical or Conceptual resources* and *Text processing*, and finally *Corpus*. In summary, the language resource categories that exhibit poor coverage for all (co)-official European languages at regional level are *Grammar*, *Human Computer Interaction* and *Image and video processing*.

3.2.4 Results for the 51 other EU Languages

Figure 11 presents the total number of resources for the group *other EU languages*. For this group of languages, most of the language resource categories (except corpora) exhibit zero or almost zero resources with some exceptions, including Turkish and to some extent Ukrainian and Norwegian Bokmål.

Using the numbers provided by the dashboard we generated the plot presented in Figure 12. This plot presents the distribution of the total number of language resources per language resource category for the group of *other European languages*. However, in this case, only the categories *Text processing* and *Corpus* exhibit some support. The rest of the language resource categories have no or very poor support.

4 Missing Stakeholders

One of the principal aims of the ELE project has been to provide a sounding board for the diverse members of the Language Technology community. Our belief is that the opinion and vision of this community is essential for digital language equality to be realised. For this reason, we have attempted to ensure that a wide spectrum of perspectives across all sectors involved in LT have an opportunity to provide relevant input. As part of this effort, we set out to determine whether any significant stakeholders had been left out of the initial consultation process.

4.1 Methodology

We analysed Section 4.3 of each language report, “Projects, Initiatives, Stakeholders”, to identify stakeholders that have yet to be adequately informed and consulted. This collaborative effort between all partners yielded an overall picture of the type of stakeholders that exist for the 35 languages covered in the reports. In total, we detected and characterised 355 relevant stakeholders mentioned in the language reports (see Appendix A for the full list of stakeholders per language report and type). Broadly speaking, these types may be categorised into the following spheres: government, industry, research institutions, and independent organisations. The diverse stakeholders grouped within these overlapping spheres belong to fairly well-defined subsets. Accordingly, we were able to compile a list of stakeholder types that helped us determine which have been approached and which might still require greater attention. Given the similarity between types of LT stakeholders that exist across most languages, the typological subsets that emerged within each sphere were generally consistent.

Government Sphere (162)

- ministries, subministries, and agencies (41)
- regional and governmental local bodies (6)
- public broadcasters (6)
- national LT initiatives and strategies (20)
- national funding agencies and initiatives (21)
- national research and national language institutions (40)
- national infrastructures (28)

Industry Sphere (70)

- companies (60)
- non-IT companies (9)
- nonprofit companies (1)

Research Institution Sphere (95)

- universities (43)
- university associations (3)
- university research centers and groups (39)
- non-university research institutions (7)
- research and technologies organizations (3)

Independent Organization Sphere (28)

- foundations (4)
- nonprofits (14)
- associations (10)

The immediate conclusion to draw from this classification is that the ELE project has consulted nearly every stakeholder type reflected here at some level. This was accomplished primarily through surveys that collected feedback from LT developers, users, and consumers, on the one hand, and from members of CLAIRE, CLARIN, LT Innovate, META-NET, ELG, EC-SPM, EFNIL, ELEN, LIBER, NEM, and Wikipedia, on the other (Thönnissen, 2022; Eskevich and de Jong, 2022; Rufener and Wacker, 2022; Hajič et al., 2022; Hegele et al., 2022; Gísladóttir, 2022; Kirchmeier, 2022; Hicks, 2022; Blake, 2022; Hrasnica, 2022; Heuschkel, 2022; Way et al., 2022). A benefit of casting such a wide net is that stakeholders who were underrepresented in one survey were given voice in others.

4.2 Results

Taking the aforementioned observations into account, it may be said that rather than discover significant missing stakeholder types, our review of the language reports has found that some stakeholder types might require further consultation. As an example, feedback from the research institution and industry spheres, in particular, was extensive in the surveys. Similarly, these stakeholder types weighed heavily among those highlighted in the language reports (95 and 70 references, respectively). However, many of the specific stakeholders cited in the language reports also belong to the member states government sphere (162 references) and, although the views of various types of government stakeholders were reflected in the EFNIL and ELEN surveys, this may represent a sector that deserves a more thorough and targeted consultation process. Doing so, would not only help clarify the perspectives of these stakeholders, but also the needs and opportunities they currently foresee.

5 Conclusions

The ELE dashboard is one of the project's central contributions. The ability to visualise the LT support that each language possesses in real time provides an effective and comparative means to demonstrate the language technology level of groups of languages and resources. The recent updates to the dashboard, in the form of heatmaps, radial bars, and evolution over time, add new possible comparisons. We utilised these novel visualisations to uncover the main types of language resources that are currently lacking in order to expose the gaps that must be filled in the near future. While there is some consistency across all language groups, our main finding is that each language requires specialised attention to address its particular needs. For each language, their experts must select which are the language resource categories that should be prioritised. Furthermore, efforts to build up these crucial resources and to give languages a sufficient technological foundation must go hand in hand with the visions and strategies of stakeholders across all sectors. To this end, we have also attempted to identify potential missing stakeholder types. We believe that the multi-survey consultation conducted by ELE was comprehensive, but we also recommend initiating another round of surveys targeted at specific stakeholders, most especially within those from the member states government sphere.

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Appendix

A List of Stakeholders types per language

	Language Report on ...	Stakeholder	Stakeholder type
D1.4	... Basque	Coordinated Plan on AI	EC
D1.4	... Basque	Euskal Hirigune Elkargoa	Intergovernmental (grouping of municipalities)
D1.4	... Basque	Ministerio de Turismo, Energia y Agenda Digital	Ministry
D1.4	... Basque	Spanish strategy R+D+i for AI	Ministry
D1.5	... Bulgarian	The Bulgarian National Science Fund	Funding agency
D1.5	... Bulgarian	Bulgarian AI strategy	Government
D1.5	... Bulgarian	Ontotext	High-tech company
D1.5	... Bulgarian	Research centres in Bulgaria dedicated to LT	Research centre
D1.5	... Bulgarian	LaDA-BG	Research Infrastructure
D1.7	... Croatian	Croatian Wikipedia	Free online encyclopedia
D1.7	... Croatian	Central State Office for Croats Abroad	Government funding agency
D1.7	... Croatian	Croatian Research Council	Government funding agency
D1.7	... Croatian	Ciklopea	LT Industry
D1.7	... Croatian	Integra	LT Industry
D1.7	... Croatian	CLARIN ERIC	Research Infrastructure
D1.7	... Croatian	MARCELL	Research Infrastructure
D1.7	... Croatian	Croatian Web Archive @ Zagreb University Computing Centre (SRCE)	University
D1.7	... Croatian	Croatian Language Portal @ Zagreb University Computing Centre (SRCE)	University
D1.7	... Croatian	University of Rijeka	University
D1.7	... Croatian	University of Split	University
D1.8	... Czech	The National Artificial Intelligence Strategy of the Czech Republic	Government
D1.8	... Czech	Ministry of Industry and Trade	Ministry
D1.8	... Czech	AICzechia	National initiative
D1.8	... Czech	LINDAT/CLARIAH-CZ	Research infrastructure
D1.9	... Danish	Villum Foundation	Foundation
D1.9	... Danish	Velux Foundation	Foundation
D1.9	... Danish	Carlsberg Foundation	Foundation
D1.9	... Danish	Novo Nordisk Foundation	Foundation
D1.9	... Danish	Danish Agency for Digitisation	Government
D1.9	... Danish	Norwegian Språkbanken	Government
D1.9	... Danish	Danish healthcare system	Government
D1.9	... Danish	Ministry of Research	Government
D1.9	... Danish	Alexandra Institute	Research and development Organisation

	Language Report on ...	Stakeholder	Stakeholder type
D1.9	... Danish	Grundforskningsfonden (Danish National Research Foundation)	Government research body
D1.9	... Danish	Danish Language Council	Government research institution
D1.9	... Danish	Central Word Register for Danish, COR	Institution
D1.9	... Danish	European Language Resource Coordination (ELRC)	International consortium
D1.9	... Danish	Society for Danish Language and Literature / Danish Society for Language and Literature	Language and literature promotion body
D1.9	... Danish	Roskilde Kommune	Local government
D1.9	... Danish	Nordisk Sprogteknologi (NST)	Private sector
D1.9	... Danish	Analyse og Tal	Private sector
D1.9	... Danish	RoboBot Studio	Private sector / assistants, bots
D1.9	... Danish	SoundHound Inc.	Private sector / assistants, bots
D1.9	... Danish	Dictus ApS	Private sector / speech recognition
D1.9	... Danish	Omilon	Private sector / speech recognition
D1.9	... Danish	Semantix	Private sector / translation company
D1.9	... Danish	Danish Parliament	Public institution
D1.9	... Danish	AI Pioneer Centre	University
D1.9	... Danish	Danish Broadcasting Corporation	State broadcaster
D1.9	... Danish	University of Copenhagen	University
D1.9	... Danish	Danmarks Tekniske Universitet (DTU)	University
D1.9	... Danish	Centre for Language Technology (University of Copenhagen)	University
D1.9	... Danish	Centre for Humanities Computing at Aarhus University	University
D1.9	... Danish	Copenhagen Business School	University
D1.9	... Danish	IT University of Copenhagen	University
D1.9	... Danish	Aarhus University	University
D1.6	... Catalan	Clusterlingua	Cluster of Language Industries
D1.6	... Catalan	Secretary of State for Digitalisation	Ministry
D1.6	... Catalan	Department of Digital Policies	Government
D1.6	... Catalan	Rsearch groups in universities (CLiC, TALN, TALP, Tradumàtica, Text Mining Unit, Transducens, MLLP)	University
D1.6	... Catalan	Institute for Catalan Studies	Academic institution
D1.6	... Catalan	Acadèmia Valenciana de la Llengua	Language academy
D1.6	... Catalan	Softcatalà	Non-profit association
D1.6	... Catalan	Col·lectivaT	Non-profit cooperative
D1.6	... Catalan	NLP ComuniCat	NLP in Catalan community

	Language Report on ...	Stakeholder	Stakeholder type
D1.10	... Dutch	Nederlandse Organisatie voor Taal- en Spraaktechnologie	Foundation representing LT community
D1.10	... Dutch	Belgium NLP Meetup	Group for everyone interested in LT
D1.10	... Dutch	Nederlandstalige Spraak Coalitie (Dutch Speech Coalition)	LT Initiative
D1.10	... Dutch	CLARIN, DARIAH, Taalmaterialen	Research Infrastructure
D1.10	... Dutch	Universities	Research institutions (public)
D1.11	... English	Hugging Face	AI Industry
D1.11	... English	Apple, Accenture, Google, Amazon, Microsoft	Industry
D1.11	... English	Engineering and Physical Sciences Research Council (EPSCR)	National research infrastructure
D1.11	... English	JISC	Not for profit digital agency
D1.11	... English	SoapBox Labs, AYLIEN, CeADAR, ADAPT	Research Infrastructure
D1.11	... English	BBC News Labs	State broadcaster
D1.11	... English	University of Sheffield	University
D1.11	... English	Oxford University Press	University
D1.11	... English	Stanford University (Stanford CoreNLP, Stanford Stanza)	University
D1.12	... Estonian	National Programmes for Language Technology	Ministry
D1.12	... Estonian	National AI strategy	Ministry
D1.12	... Estonian	Ministry of Education and Research	Ministry
D1.12	... Estonian	Ministry of Economic Affairs	Ministry
D1.12	... Estonian	Ministry of Justice	Ministry
D1.12	... Estonian	CLARIN, ELRC, ELG	Research Infrastructures
D1.12	... Estonian	Center of Estonian Language Resources (CELR)	RTO
D1.12	... Estonian	Competence Center for Natural Language Processing, Institute of the Estonian Language	RTO
D1.13	... Finnish	Finnish Ministry of Economic Affairs and Employment	Government
D1.13	... Finnish	VAKE: Finnish Climate Fund	Government company
D1.13	... Finnish	Finnish Ministry of Finance	Government
D1.13	... Finnish	Finnish National Broadcasting Company (Yle)	Government
D1.13	... Finnish	University of Helsinki	University
D1.13	... Finnish	Aalto Speech Recognition Group	University research group
D1.13	... Finnish	Reaktor Innovations Oy	Company
D1.13	... Finnish	SILO AI	Company
D1.13	... Finnish	Tampere AI Hub	University research center
D1.13	... Finnish	University of Turku	University

	Language Report on ...	Stakeholder	Stakeholder type
D1.13	... Finnish	CSC – IT Center for Science	Nonprofit state enterprise
D1.14	... French	Secretary of State for Digital Affairs and Innovation	Advisory Commission
D1.14	... French	Systran, Reverso, Druide, Synapse, Synomia, Sinequa, Pertimm, Qwant, Exalead-DS, Syllabs, Vocapia Research, Jouve, A2IA, Expert Systems, Acapela Group, Voxygen, Davi, Hellomybot.io, Julie Desk, Konverso, Kwaly, Linagora, ViaDialog, Vivoka, Zaion	Companies developing LTs
D1.14	... French	Airbus, AFP, CapGemini, EDF, Engie, Renault, Sanofi, SNCF, Société Générale	Companies outside the IT sector
D1.14	... French	General Delegation for the French language and languages of France	Funding agency
D1.14	... French	ANR	Funding agency
D1.14	... French	Jean Zay platform	HPC infrastructure
D1.14	... French	Apple, Fujitsu, Huawei, IBM, Google/Deepmind, META/FAIR, Microsoft, NaverLabs, Samsung, Sony, Orange, Thales, Dassault-System	International Technology Provider (Industry)
D1.14	... French	Ministry of Higher Education and Research, Ministry of Industry, Ministry of Defense	Ministry
D1.14	... French	ORTOLANG	National initiative
D1.14	... French	Huma-Num	National research infrastructure
D1.14	... French	only generally mentioned	Regional Funding Initiatives
D1.14	... French	CLIQ-ai	Research initiative
D1.14	... French	CNRS, Inria, CEA-LIST, INRAe	Research institution (public)
D1.14	... French	ATALA, AFCP, ARIA, AFIA	Scientific Association
D1.15	... Galician	Xunta de Galicia	Local government
D1.15	... Galician	Gobierno de España	Government
D1.15	... Galician	SEPLN	Academic association
D1.15	... Galician	Red Temática en Tecnologías del Habla	Academic association
D1.16	... German	German Research Foundation (DFG), Federal Ministry of Education and Research (BMBF), Austrian Research Promotion Agency (FFG)	Funding agencies
D1.16	... German	Joint Science Conference (Gemeinsame Wissenschaftskonferenz, GWK), wiss National Science Foundation (SNF) and the Swiss Innovation Agency (InnoSuisse)	Funding initiatives
D1.16	... German	German and Austrian government	Government
D1.16	... German	Gaia-X Initiative	Infrastructure initiatives
D1.16	... German	SAP, Bosch, Explosion.AI	LT industry
D1.16	... German	Federal Ministry of Education and Research (BMBF)	Ministry

	Language Report on ...	Stakeholder	Stakeholder type
D1.16	... German	Sprachressourcenportal Österreichs	National Language Data Infrastructure
D1.16	... German	Nationale Forschungsdateninfrastruktur initiative and programme (German National Research Data Infrastructure)	Research and Data Infrastructure
D1.16	... German	Saarland University, Institute for Natural Language Processing (IMS) at Stuttgart University, Centre for Translation Studies of the University of Vienna, the Language Institute of the Austrian Armed Forces, Austrian Academy of Sciences (ÖAW), Austrian Centre for Digital Humanities and Cultural Heritage (ACDH-CH), Swiss Federal Institutes of Technology in Zurich (ETH) and Lausanne (EPFL), the University of Zurich (UZH), the Zurich University of Applied Sciences (ZHAW)	Research institutions (public)
D1.16	... German	RG GUT (Arbeitsgruppe Gouvernementaler Uebersetzungs- und Terminologiedienste)	Working group in public administration
D1.17	... Greek	Greek Recovery and Resilience Plan	Government
D1.17	... Greek	ELEVATE Greece	Industry
D1.17	... Greek	Digital Transformation Bible	Ministry
D1.17	... Greek	National Strategy of AI-Greece	Ministry
D1.17	... Greek	Centre for the Greek Language	Ministry
D1.17	... Greek	The National AI strategy-Cyprus	Ministry
D1.17	... Greek	CLARIN:EL, ELRC, ELG, META-SHARE	Research Infrastructures
D1.17	... Greek	Archimedes	RTO
D1.17	... Greek	ILSP/Athena RC	RTO
D1.17	... Greek	Institute of Informatics & Telecommunications of the National Centre for Scientific Research "Demokritos"	RTO
D1.17	... Greek	KIOS Research and Innovation Centre of Excellence, University of Cyprus	RTO
D1.17	... Greek	Cyprus University of Technology's Software Engineering and Intelligent Information systems research lab	RTO
D1.17	... Greek	University of Nicosia's AI Laboratory	RTO
D1.17	... Greek	Athens University of Economics and Business	University
D1.17	... Greek	Greek Language and Multilingualism Laboratory, University of Thessaly	University
D1.17	... Greek	Centre for Excellence for Multilingualism and Language Policy, University of Athens	University
D1.18	... Hungarian	Artificial Intelligence National Laboratory	RTOs

Language Report on ...	Stakeholder	Stakeholder type
D1.18 ... Hungarian	Artificial Intelligence Coalition.	RTOs
D1.18 ... Hungarian	e-magyar	RTOs
D1.18 ... Hungarian	Hungarian Research Centre for Linguistics.	RTOs
D1.19 ... Icelandic	Association of the Visually Impaired	Association
D1.19 ... Icelandic	National Broadcasting Service	Broadcaster
D1.19 ... Icelandic	AI strategy document	Icelandic Government
D1.19 ... Icelandic	Icelandic Audio Library	Library
D1.19 ... Icelandic	Árni Magnússon Institute for Icelandic Studies	RTO
D1.19 ... Icelandic	Almannarómu	self-owned foundation (>20 academic, industrial orgs)
D1.19 ... Icelandic	SIM consortium	Universities,
D1.19 ... Icelandic	University of Iceland	University
D1.19 ... Icelandic	University of Reykjavik	University
D1.20 ... Irish	Foras na Gaeilge	Language promotion body
D1.20 ... Irish	Trinity College Dublin	University
D1.20 ... Irish	Fiontar	Scoil na Gaeilge in DCU and TCD & University Department
D1.21 ... Italian	Associazione Italiana di Linguistica Computazionale (Italian Association for Computational Linguistics, AILC)	Academic association
D1.21 ... Italian	Working Regional Programme from the European Fund for Regional Development (2014-2020)	EU funding body
D1.21 ... Italian	Ministero dell'Università e Ricerca (Ministry for University and Research)	Government
D1.21 ... Italian	European Language Resource Coordination (ELRC)	International consortium
D1.21 ... Italian	Società Dante Alighieri	Language and culture promotion body
D1.21 ... Italian	Accademia della Crusca	Language preservation academy
D1.21 ... Italian	Consiglio Nazionale delle Ricerche (National Research Council, CNR)	National research funding agency
D1.22 ... Latvian	Latvian Science Council	Government
D1.22 ... Latvian	Institute of Mathematics and Computer Science	University research center
D1.22 ... Latvian	CLARIN Latvia	National infrastructure
D1.22 ... Latvian	Tilde	Company
D1.22 ... Latvian	Artificial Intelligence Laboratory	University research group
D1.22 ... Latvian	Latvian Academy of Sciences	Government
D1.22 ... Latvian	Institute of Latvian Language	University research center
D1.22 ... Latvian	Livonian Institute	University research center

	Language Report on ...	Stakeholder	Stakeholder type
D1.22	... Latvian	Institute of Literature, Folklore and Art	University research center
D1.22	... Latvian	National Library of Latvia	Government
D1.22	... Latvian	Latvian Language Agency	Government
D1.22	... Latvian	Liepaja University	University
D1.22	... Latvian	Ventspils University College	University
D1.22	... Latvian	Rezekne Academy of Technology	University
D1.23	... Lithuanian	State Commission of the Lithuanian Language	Government
D1.23	... Lithuanian	Ministry of the Economy and Innovation	Government
D1.23	... Lithuanian	Institute of Mathematics and Informatics (Vilnius University)	University research center
D1.23	... Lithuanian	CLARIN-LT	National infrastructure
D1.23	... Lithuanian	Vytautas Magnus University	University
D1.23	... Lithuanian	Kaunas University of Technology	University
D1.23	... Lithuanian	Vilnius University	University
D1.23	... Lithuanian	Mykolas Romeris University	University
D1.23	... Lithuanian	Baltic Institute of Advanced Technologies	Research institute
D1.23	... Lithuanian	Institute of the Lithuanian Language	Government
D1.23	... Lithuanian	Tilde Informacinės Technologijos	Company
D1.23	... Lithuanian	Tokenmill	Company
D1.23	... Lithuanian	ATEA	Company
D1.23	... Lithuanian	Algoritmu Sistemos	Company
D1.24	... Luxembourgish	Digital Luxembourg	Collaborative public-private initiative
D1.24	... Luxembourgish	ZLS Centre	Government, language policy organisation
D1.24	... Luxembourgish	Ministry for Digitalisation	Ministry
D1.24	... Luxembourgish	Government IT Centre (Centre des technologies de l'information de l'État, CTIE)	Ministry
D1.24	... Luxembourgish	Luxembourg American Cultural Society and Centre (LACS)	Non-profit organisation
D1.24	... Luxembourgish	Luxembourg National Languages Institute (Institut National des Langues, INL)	Public organisation
D1.24	... Luxembourgish	Luxembourg Institute of Health (LIH)	Public RTO
D1.24	... Luxembourgish	Luxembourg Institute of Science and Technology (LIST)	Public RTO
D1.24	... Luxembourgish	Luxembourg Institute of Socio-Economic Research (LISER)	Public RTO
D1.24	... Luxembourgish	International Centre for Luxembourg Studies, University of Sheffield	Public RTO

	Language Report on ...	Stakeholder	Stakeholder type
D1.24	... Luxembourgish	Institute for Luxembourgish Linguistics and Literature Studies	Public RTO
D1.24	... Luxembourgish	University of Luxembourg	University
D1.25	... Maltese	Maltese Government	Government
D1.25	... Maltese	Malta Digital Innovation Authority (MDIA)	Government
D1.25	... Maltese	Malta Information Technology Agency (MITA)	Government
D1.25	... Maltese	Office of the State Advocate	Government
D1.25	... Maltese	National Council for the Maltese Language	Government
D1.25	... Maltese	University of Malta	University
D1.25	... Maltese	Institute of Linguistics and Language Technology (ILLT)	University Center
D1.25	... Maltese	Department of Artificial Intelligence (DAI)	University Department
D1.26	... Norwegian	Language Bank	Data repository
D1.26	... Norwegian	Research Council of Norway	Funding agency
D1.26	... Norwegian	National Archives of Norway	Government
D1.26	... Norwegian	Norwegian Labour and Welfare Administration (NAV)	Government agency
D1.26	... Norwegian	CLARINO Bergen	Infrastructure / Data repository
D1.26	... Norwegian	Norwegian Computing Center (NR)	Nonprofit
D1.26	... Norwegian	Lovdata	Nonprofit / Legal data
D1.26	... Norwegian	NTB Arkitekst	Private sector
D1.26	... Norwegian	DNB	Private sector / Bank
D1.26	... Norwegian	Kindly	Private sector / Chatbots
D1.26	... Norwegian	Max Manus	Private sector / Health (speech rec)
D1.26	... Norwegian	Gjensidige	Private sector / Insurance
D1.26	... Norwegian	BoostAI	Private sector / LT
D1.26	... Norwegian	Lingit	Private sector / LT (reading / writing)
D1.26	... Norwegian	Disputas	Private sector / LT (TA)
D1.26	... Norwegian	Semantix	Private sector / MT
D1.26	... Norwegian	NRK	Public broadcasting corporation
D1.26	... Norwegian	MediaFutures [U. Bergen, NRK, TV2, Schibsted, Amedia, Vizrt, Vimond, Highsoft, Fonn]	Research Center / Consortium
D1.26	... Norwegian	Norwegian University of Science and Technology (NTNU)	University
D1.26	... Norwegian	Language Technology Group	University (Oslo)
D1.26	... Norwegian	University of Oslo	University / Data repository
D1.27	... Polish	national Polish AI strategy	Council of Ministers
D1.27	... Polish	National Science Centre	Government funding agency
D1.27	... Polish	National Centre for Research and Development	Govt-based funding agency

	Language Report on ...	Stakeholder	Stakeholder type
D1.27	... Polish	Polish Academy of Sciences	Research institution
D1.27	... Polish	CLARIN-PL	Research Infrastructure
D1.27	... Polish	DARIAH-PL	Research Infrastructure
D1.28	... Portuguese	PORTULAN CLARIN	Research Infrastructure
D1.29	... Romanian	only generally mentioned	LT industry
D1.29	... Romanian	RELATE portal	Research Infrastructure
D1.29	... Romanian	Institute for Artificial Intelligence “Mihai Drăgănescu” of the Romanian Academy, , Institute for Computer Science (IIT)), the Polytechnic University of Bucharest (UPB), the “Alexandru Ioan Cuza” University of Iași (UAIC), the Technical University of Cluj-Napoca (UTCN)	Research institutions (public)
D1.30	... Slovak	Action Plan for the digital transformation of Slovakia for 2019 – 2022	Government
D1.30	... Slovak	Strategy of the Digital Transformation of Slovakia 2030	Government
D1.30	... Slovak	Ministry of Justice	Ministry
D1.30	... Slovak	L. Štúr Institute of Linguistics, Slovak Academy of Sciences	Research institution (public)
D1.30	... Slovak	Institute of Informatics, Slovak Academy of Sciences	Research institution (public)
D1.31	... Slovenian	National programme on encouraging the development and use of artificial intelligence by 2025	Government
D1.31	... Slovenian	Resolution on the National Programme for Language Policy 2021-2025	Government
D1.31	... Slovenian	Ministry of Culture	Ministry
D1.31	... Slovenian	Slovenian CLARIN ERIC infrastructure (CLARIN.SI)	Research Infrastructure
D1.31	... Slovenian	Bulgarian CLARIN	Research Infrastructure
D1.31	... Slovenian	CLARIN CLASSLA Knowledge centre run by Slovenian and Bulgarian CLARIN	Research Infrastructure
D1.32	... Spanish	SEPLN	Academic association
D1.32	... Spanish	Real Academia Española de la Lengua	National Institution for Language
D1.33	... Swedish	only generally mentioned	Commercial enterprises
D1.33	... Swedish	Vinnova	Innovation Agency
D1.33	... Swedish	only generally mentioned	LT industry
D1.33	... Swedish	Nationella språkbanken	National research infrastructure
D1.33	... Swedish	National Library, National Archive	Public memory institutions
D1.33	... Swedish	CLARIN ERIC	Research Infrastructure

	Language Report on ...	Stakeholder	Stakeholder type
D1.33	... Swedish	only generally mentioned	Research institutions (public)
D1.34	... Welsh	Welsh Government	Government
D1.34	... Welsh	British and Irish Council	Intergovernmental
D1.34	... Welsh	Language Technologies Unit (Bangor University)	University research group
D1.34	... Welsh	Bangor University	University
D1.34	... Welsh	Cardiff University	University
D1.34	... Welsh	Swansea University	University
D1.34	... Welsh	University of South Wales	University
D1.34	... Welsh	Celtic Language Technologies Group	Academic group
D1.34	... Welsh	Supercomputing Wales	Government funding initiative
D1.34	... Welsh	Aberystwyth University	University
D1.34	... Welsh	AHRC	Government funding agency
D1.34	... Welsh	ESRC	Government funding agency
D1.34	... Welsh	Welsh Wikipedia	Nonprofit
D1.34	... Welsh	Welsh National Library	Government
D1.34	... Welsh	Menter Môn	Nonprofit
D1.34	... Welsh	Hypermedia Research Group (Univeristy of South Wales)	University research group
D1.34	... Welsh	S4C	Public broadcasting channel
D1.34	... Welsh	Cymen Cyf	Company
D1.34	... Welsh	MSparc	Science Park
D1.35	Report Serbian	Universities of Belgrade, Novi Sad and Niš	University
D1.35	Report Serbian	Institute of the Serbian Language of the Serbian Academy of Sciences and Arts	Research institutes
D1.35	Report Serbian	JeRTeh, AlphaNum, Lexicom	Companies
D1.36	Report Bosnian	Council of Ministers of Bosnia and Herzegovina ?	Government
D1.38	... the Nordic Minority Languages	The Language Secretariat of Greenland	Government
D1.38	... the Nordic Minority Languages	Giellatekno (University of Tromsø)	University research center
D1.38	... the Nordic Minority Languages	Kvensk institutt	Government
D1.38	... the Nordic Minority Languages	National Association of Swedish Tornedalians	Association
D1.38	... the Nordic Minority Languages	Meänsuomen föreeninki - Village Finnish cultural association	Nonprofit association
D1.38	... the Nordic Minority Languages	Meänkieli Wikipedia	Nonprofit

	Language Report on ...	Stakeholder	Stakeholder type
D1.38	... the Nordic Minority Languages	Institute for Language and Folklore	Government
D1.38	... the Nordic Minority Languages	The Arctic University of Norway	University
D1.38	... the Nordic Minority Languages	Sámi University	University
D1.38	... the Nordic Minority Languages	Ministry of Local Government and Regional Development	Government
D1.39	... the West Frisian Language	Dutch Language Union	International regulatory institution
D1.39	... the West Frisian Language	CLARIN NL	National infrastructure
D1.39	... the West Frisian Language	CLARIAH NL	National infrastructure
D1.39	... the West Frisian Language	Fryske Akademy	Research center
D1.39	... the West Frisian Language	Province of Fryslân	Local government

Table 1: Stakeholders from the language reports.