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ELRC Workshop Report for Malta



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1 Executive Summary

The regional ELRC workshop for Malta was held on Friday 21st January at the premises of the Ministry for The National Heritage, The Arts and Local Government (MHAL), 35, Old Bakery Street, Valletta. Originally, the event had been scheduled for October 2021, but the NAPS felt that the number of attendees would be boosted considerably by pursuing a hands-on approach to the issue of invitations, involving many personal phone calls. Although this strategy engendered a certain delay, it paid off and resulted in an unprecedented number of participants from the public administration.

The workshop was organised as a fully online event for participants. The organisers and support team were physically hosted at the Ministry premises.

This report is structured as follows: section 2 provides details of the programme. The content of each presentation is summarised in section 3. Section 4 is a synthesis of discussion points that arose during the panel session which was explored the theme of Human-Centric Language Technologies (HCLTs) for the public administration, SMEs, and citizens. Section 5 deals with theme of language data creation, management and sharing from the perspective of the ongoing NLTP (National Language Technology Platform) project which is creating national platform for translation services and resources. Section 6 reports on participation drawing directly on login data from the zoom platform used to host the workshop.

2 Workshop Agenda

09:00 – 09:10	<p>Welcome and introduction</p> <p>Dr Donatienne Spiteri, Legislation Unit - Office of the State Advocate ELRC Public Services National Anchor Point</p>
09:10 – 09:30	<p>Welcome by the European Commission</p> <p>Philippe Gelin, Head of Sector Multilingualism, DG CONNECT, European Commission</p>
09:30 – 10:00	<p>The potential of Language Technology and AI - where we are, where we should be heading</p> <p>Dr Albert Gatt, University of Utrecht and Institute of Linguistics and Language Technology, University of Malta</p>
10:00 – 10:30	<p>Language Technologies in Malta for Maltese</p> <p>Dr Claudia Borg, Department of Artificial Intelligence, University of Malta</p>
10:30 – 10:45	<i>Coffee Break</i>
10:45 – 11:15	<p>eTranslation: an introduction and live demo</p> <ul style="list-style-type: none"> ● Christopher Scott, Computational Linguist, Directorate General for Translation (DGT) - European Commission ● Mark Vella, Language Officer – European Commission Representation in Malta
11:15 – 11:45	<p>Language Technologies by/for the public sector: a focus on the new National Language Technology Platform [INEA/CEF/ICT/A2020/2278398]</p> <ul style="list-style-type: none"> ● Tom Eric Hanson, Development Project Manager, Tilde ● Keith Cortis, Enterprise Architect, Malta Information Technology Authority (MITA)
11:45 – 12:45	<p>Human-Centric Language Technologies for public administrations, SMEs, and citizens: existing practices and challenges - Panel discussion</p> <p><i>Moderators:</i></p> <p>Michael Rosner, Department of Artificial Intelligence - University of Malta, ELRC Technology National Anchor Point</p> <p>Dr Judie Attard, Enterprise Data Manager, Malta Information Technology Authority (MITA)</p> <ul style="list-style-type: none"> ● Andrew Aquilina, Head of Policy, Malta Chamber of SMEs ● Joseph Izzo Clark, Head of the Maltese Language Unit, ECJ ● Thomas Pace, Director, National Council of the Maltese Language ● Lincoln Grixti, Head (ICT & Branding) - servizz.gov ● Donald Mangion, CIO, Ministry for Justice and Governance
12:45 - 13:00	<p>Conclusions</p> <p>Mr Alistair Borg – Director (Strategy and Support), Ministry for The National Heritage, The Arts and Local Government</p>

3 Summary of Content of Sessions

3.1 Welcome and introduction

ELRC: Dr. Donatienne Spiteri, ELRC Public Services National Anchor Point

The seminar was opened by Public Administration National Anchor Point Donatienne Spiteri who welcomed participants and introduced the *eTranslation* platform, stating *inter alia* that this is available to all public officials working within one of the EU public administrations. She also mentioned developments since the previous 2019 seminar, stating that *eTranslation* is now also available to all European SMEs and that other non-EU languages have been added to the *eTranslation* platform.

She proceeded by giving a general overview of the various topics to be discussed during the seminar, including a live demo of the *eTranslation* platform by the DGT, as well as other presentations regarding linguistic tools which are still in the process of being developed. She made a special mention to the new National Language Technology Platform (NLTP) currently under development, which also has a special connection with *eTranslation*. Indeed, the platform will be integrating *eTranslation* but will be further trained on local data, such as the Laws of Malta for more refined and precise results. Two specific features were highlighted, namely that NLTP will serve as a 'data repository' for language data, a crucial feature, given the importance of language data for neural machine translation, as well as the fact that NLTP will be available to the public at large as a free open tool.

Systems should be 'inclusive' and human-centric; the more human-centric they are, the greater the uptake and the more widespread their use will be. Reference was made to the fact at this topic would be discussed in more detail by the panel. Finally, all such technologies will strengthen the presence of Maltese in digital environments; Maltese is a language spoken by a small nation, but with very rich roots, which deserves to have at its disposal the necessary linguistic tools to support its digital evolution.

Philippe Gelin, Head of Sector Multilingualism, DG CONNECT - European Commission

Mr. Gelin expressed his thanks to the organisers and noted the impressive number of attendees. He then provided a definition of Language technologies (LT) illustrated by a range of concrete examples including machine translation, named entity recognition, noting that LT has not only become faster and cheaper but far more accessible to more people with different linguistic backgrounds, including speakers of languages outside the 24 official languages of the EU. The EU, he said was united in diversity and also in the use of LT for addressing linguistic diversity. LT not only supports people in their daily activities but guards against the risk of digital extinction. He also emphasized the role of LT in achieving competitiveness in a growing global market and this was the rationale behind the access granted to the EC's LT platforms to SMEs and the expansion beyond EU languages to include Russian, Turkish and Arabic.

The EC, he said has three tools at its disposal to promote the use of LTs: (i) laws and legislation (ii) the provision of coordination measures such as ELRC and (iii) funding through programmes such as CEF, Horizon EU, and in future, Invest EU, Interred, ELE Horizon. The overall aim is that data production remains in EU and there is provision for a Language Data space that includes adequate language tools and models in an ecosystem where support for business intelligence and market access is the main priority. The offer includes free tools for translation, terminology (IATE), services

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such as NER and of late, the ELG which currently contains 193 tools as a catalogue of EU companies working in individual languages including Maltese.

3.2 The potential of Language Technology and AI – where we are, where we should be heading

Prof. Albert Gatt, University of Utrecht and Institute of Linguistics and Language Technology, University of Malta

Prof. Gatt's presentation was divided into three parts: (i) how work in NLP and AI is now driven by *models* using machine learning techniques based on neural network technology; (ii) caveats concerning the use of this technology; (iii) future prospects for Maltese LT.

Regarding models, he noted the major advances during the last 10-15 years derive from the twin abilities of acquiring huge amounts of language data and having the power to process it in useful time. These enable the construction of models for special purposes (or specific domains). The general technique employed is transfer learning, whereby a large, general purpose language model is first created using a large amount of training data on a general task such as masked word prediction. The result is then *retrained* by fine-tuning on more specific tasks using a limited amount of data. This approach has not only helped to train models for specific tasks and domains, but even for languages that have never been seen, particularly if they are similar to other languages for which models already exist. In a nutshell:

- With increasingly large models, we learn better linguistic representations.
- With the right pretraining setup, we learn *transferrable* representations with little data engineering effort.
- Multilingual models can also be created by pre-trained on several languages at once.
- Possibly, we can leverage such knowledge to perform tasks on new languages, even ones which are not part of the original pre-training set.

He then turned to caveats associated with this approach. There is a significant carbon footprint associated with the creation of large models, and besides environmental impact, their creation requires high performance computing facilities that are typically only available for large, well-resourced laboratories, thus putting richer countries in an undesirably privileged position. A second problem is that the data for large models is often sourced *opportunistically*, whereby it is difficult to control the knowledge that models actually learn. This can make it difficult to interpret a model's behavior. Although there are currently efforts to improve "explainability" of model-based decisions, the problem is by no means solved. Third, large scale models can acquire biases if based on skewed data. He gave the example of the bias in associating of male gendered terms with statistically male professions acquired through simple co-occurrence. When such models serve as the backbone of other systems, the biases tend to percolate with unintended consequences for civil society. Hence, very careful curation guaranteeing representativeness of data is a key aspect of data acquisition that is not always followed and difficult to assure. Prof Gatt also alluded to "linguistic bias", pointing out that linguistic data and therefore, models, are available for very small proportion of the world's 7000 languages with implications for their digital survival.

In the last part of his talk Prof. Gatt addressed the problem of how to proceed with small languages like Maltese. The main problem of such languages is to build models with less data. First, we should, where possible, note that similar languages can help each other and therefore we should where possible leverage multilingual representations since they do reflect typological and other similarities.

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Second, we should exploit data augmentation techniques to artificially expand data with new examples. Finally, we should take advantage of curated data since if you know what your data contains, you can design effective training regimes to do more with less. Examples of such techniques are (i) active learning which identifies the “hard nuts” and boosts learning on selected instances (ii) contrastive learning, which explores more efficient learning schedules. He noted that at present there are currently many initiatives under way and that working on a relatively under-represented language can push us towards novel and interesting research directions.

3.3 Language Technologies in Malta for Maltese

Dr Claudia Borg, Department of Artificial Intelligence, University of Malta

After pointing out that in the 2012 META-NET report that the Maltese language was classified as having low digital support, the first part of Dr Borg’s talk described the building blocks currently available for the Maltese language processing. Some of these are available through the Maltese Language Resource Server (MLRS).

- **Korpus Malti**, an online text corpus containing 250M tokens of various genres. This is large enough to provide some insight into the use of the language. In addition, a user friendly interface facilitates access and there are c. 1500 user accounts. A new release is planned which will be double the size of the corpus.
- The **part-of-speech tagger**, a statistical tagger that uses 47 tags with generic classes. The tagger is also available as a web service.
- **Ġabra**, an online lexicon, mostly conjugations of Maltese verbs automatically generated, using rules.
- The **Text to Speech Engine**, operated by FITA (Foundation for IT Access). Present efforts are directed towards improving output quality and producing an interoperable version of the engine that works on all platforms.
- The **MASRI Headset Corpus** – a freely downloadable speech corpus that includes c. 8 hrs of read speech with 12 female and 13 male speakers has been augmented. A current prototype based on an augmented version of this data achieves 48% WER. She noted that this is not yet adequate for public release

She then turned to Malta’s MDIA (Malta Digital Innovation Strategy) which overall envisions the realisation of bilingual interaction with all government services. Some funding has been secured and is being directed towards new tools for Named Entity Recognition (NER), Dependency Parsing and Morphological Analysis and towards **KMM (Korpus tal-Malti Mitkellem)** which is collecting more high quality, gender-balanced speech data, representative of standard Maltese to extend and transcribe the MASRI speech data transcribing it. The KMM resource will serve different speech applications in future,

Automated anonymisation is an area of great importance that has been the subject the recently completed MAPA project (Multilingual Anonymisation for Public Administrations) . This offers a toolkit for effective and reliable anonymization of texts with a focus on medical and legal fields. The complete system will shortly be released as a European resource for use by all member states. At present an online demo available from the project website.

One very important goal for LT development in Malta is that the country becomes more integrated into the established European Research and Innovation scene for AI-based language technologies. The LT-Bridge project (2021-2023) is designed to take important steps towards this goal by increasing the level of interaction with well-established partner laboratories who provide expertise in low-resource language processing, dialog systems, machine translation and language generation. A series of Summer schools, shared tasks and specialized training workshops are envisaged not only

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to increase UM's participation and involvement in the research scene but also to raise its profile and visibility within global LT bodies.

Concluding, she stated that although Maltese is experiencing improved support & funding, there is a lot more to develop for proper digital support to be achieved.

3.4 The CEF AT platform

Christopher Scott, Computational Linguist, Directorate General for Translation (DGT) - EC
Mark Vella, Language Officer – EC Representation in Malta

Christopher Scott began with a brief history of Machine Translation within the EU, tracing the path from MT@EC – the use of SMT for translating “legalese” - through to the efforts of CEF to provide neural MT and additional language tools towards the new orientation of the EU's upcoming Digital programme which focuses on technological autonomy for businesses, citizens, and public administrations.

The current eTranslation platform targets both translators within the EC administration, and users of different kinds working outside the EC – e.g., public administrations, universities, professional translators, and more recently, SMEs.

The two-intended use-case scenarios for *eTranslation*: are (i) as a web interface for humans to perform automatic translation, gist translation, translation of web pages etc. and (ii) an API intended for machine-machine services. He gave brief demos to illustrate both cases. For the web interface he showed how a range of different target domains are catered for. Turning to the issue of translation quality, he illustrated cases where the system works well (e.g., texts related to EU policies) and less well (non-standard, new, or creative language usage) where the context might favor an incorrect translation of an ambiguous term (e.g., *chair as* chairman versus chair as furniture).

He explained that in the medium term, the EC is proposing to further extend the categories of eligible users of existing LT services, through websites such as Re-open EU (uses *eTranslation* to provide rapidly updated content in all languages), the Conference on the Future of Europe. Better interfacing with social media is also proposed. The range of LT services is being expanded beyond translation to include additional language technologies such as speech-to-text, document classification, anonymization, named-entity recognition, and further basic CAT tools. Christopher Scott concluded with information on how to register for *eTranslation* and NLP tools.

Next, Mark Vella gave a short practical demonstration of the eTranslation interface pointing out that it can be used either for translating text snippets of up to 2500 words, web pages, or longer files in a variety of formats including Word, Excel, PDF etc. He then showed how the user may choose different translation parameters, the first of which concerns the desired language pair. Translations are possible between all EU official languages + Icelandic, Norwegian and Russian: the user simply selects from a dropdown list. The user also chooses the domain from which the translation model is derived: EU formal language (oriented towards “EU speak”), General Text, Court of Justice Case Law etc. Choice of the correct domain helps with translation of certain idioms. He concluded with some examples of translation EN -> Maltese pointing out that although many special phrases were correctly translated, terminology in certain areas remain.

3.5 Language technologies by/for the public sector: a focus on the new National Language Technology Platform (INEA/CEF/ICT/A2020/2278398)

Tom Eric Hanson, Development Project Manager, Tilde
Keith Cortis, Enterprise Architect, Malta Information Technology Authority (MITA)

Tom Hanson, Development project manager at Tilde, began with a short introduction about Tilde, a Latvian company that specializes in speech technology, translation, and terminology management which has a long track record of successful collaboration in these areas with partners in the academic and government sectors. He explained that the ideas for NLTP originated in Latvia where the large number of Russian speakers who do not speak the local language gives rise to a particular need for LT translation tools. In 2013 a platform was created (www.hugo.lv) providing *eTranslation* for state services such as the government e-services and the tax declaration registry. Since then, number of participating public institutions has grown. This pattern is being repeated in Estonia where a similar platform is under development.

NLTP is a collaborative project between Lithuania, Iceland, Latvia, Malta, Estonia. It aims to create a universal platform-based LT solution adaptable to the needs of individual public administrations. The goals of NLTP are to (i) provide a platform ensuring multilingual access for public administrations, SMEs, and the general public and (ii) increase the availability of language tools, resources and digital services for the Maltese language, as required for Machine Translation, (iii) build and validate various NMT system pilots targeting multiple domains and (iv) ensure sustainability of the platform beyond the EU funding period. These goals will be achieved by creating a complete Digital Service Infrastructure for *eTranslation* that includes (i) a user interface handling a translation workspace, a website translation widget, and a terminology portal, together with (ii) technologies including Neural MT, *eTranslation*, Translation Memory, a Data repository, and Computer Assisted Translation. Speech technology (STT and TTS) will also be included in the longer term

An initial pilot for Malta's NLTP will be in the legal domain, since at present, most laws are first drafted in English and then translated into Maltese. This not only provides a naturally occurring use-case for testing, but also large amounts of bilingual data for creating an initial translation model for the Maltese/English language pair. Anybody wishing further details of NLTP or wishing to get involved with NLTP or become first users nltp-info.eu

The second part of the presentation was given by Keith Cortis who presented the Maltese partners MITA, Office of State Advocate, and the University of Malta. He set out the main goals of the project as (i) assessing and aggregating resources, (ii) development of a custom NMT for Maltese based on local data sources (iii) Deployment on the Government of Malta's Hybris Cloud Platform and (iv) integration of NLTP with multiple eGovernment services. He explained that the Implementation will enable relevant stakeholders to translate drafted legislation more easily and efficiently, facilitate the legislation enactment process and help to ensuring consistency of terms and terminology across all translations.

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3.6 Human Centric LTs for public administrations, SMEs and citizens: existing practices and challenges (Panel Discussion)

Moderators:

Michael Rosner, Department of Artificial Intelligence - University of Malta, ELRC Technology National Anchor Point

Dr. Judie Attard, Enterprise Data Manager, Malta Information Technology Authority (MITA)

Dr Attard first introduced the members of the panel:

- Andrew Aquilina, Head of Policy, Malta Chamber of SMEs
- Joseph Izzo Clark, Head of the Maltese Language Unit, ECJ
- Thomas Pace, Director, National Council of the Maltese Language
- Donald Mangion, CIO, Ministry for Justice, and Governance

QUESTION 1 What do you understand by Human Centric Language Technologies and why are they important in your organisation?

Thomas Pace: It is important that the technology supporting digital use of Maltese develops in a way that is highly accessible to ordinary speakers helping them make the best use of the language from a digital perspective to serve their everyday needs. Support provided by the technology should be both natural, in the sense of being easy to use, and correct in the sense of encouraging usage that is accepted as correct.

Donald Mangion: Language technology, like other technologies, can be used in everyday life but we need to be clear on what it is used for. From a human-centric perspective, it can aid with international communication by focusing on real-time language translation. However even within one culture there are phenomena which we could call “human centric” in that they reflect our culture. For example, a machine should be sensitive to the code-switching which is characteristic of the way we speak. Clearly, LT can help at the level of we need so that Human Centric means that it should make our lives easier.

Joseph Izzo Clark: It is quite complex to define what Human Centric Language Technology is. The human centric aspect is reflected in the degree of access granted to technologies which serve the needs of multilingualism – supporting access to communicative activities and to information irrespective of language. Regarding how such technology is used within our own organization, it clearly has a vital role since it is used to help with the task of translating of thousands of pages of legal documents.

Andrew Aquilina: Human contact should not be lost in translation. SMEs feel the internationalisation of business where Maltese takes second place.

QUESTION 2: How are Human Centric Language Technologies currently used in your organisation? What are the associated strengths, weaknesses, and challenges?

Andrew Aquilina: Currently translation systems are hardly used but it has a great potential because of increasing levels of internationalization. Particularly with respect to exporting. On the home front Maltese almost always takes second place to English when it comes to websites and publicity

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material so it is to be hoped that the availability of translation technology will help to redress the balance. Translation technology could also be very useful for understanding foreign regulations and standards when written in their native language.

Joseph Izzo Clark: Within the Courts correct and consistent use of terminology is extremely important and there is potential for technology to assist with this. Better coordination between the resources that are used so that they are not used in different ways by different institutions. What we are looking for is a more unified approach to the creation and use of terminological resources.

Thomas Pace: We as the Council are particularly interested in coordinating the collection of collecting a representative set of resources which reflect the different uses of Maltese (informal and formal settings). A big challenge is to obtain the kind of resources needed to help with the consistent usage of Maltese on the internet. We certainly need a clean corpus which can act as the basis for a spellchecking and style checking. However, resources which are collected also include errors whose elimination cannot be carried out by Artificial Intelligence alone. The human touch is also needed. Another challenge is for the corpus to be representative of the different contexts and levels of formality in which Maltese is used naturally.

Donald Mangion: The first challenge is that our business language is English. There are many different opportunities for making use of language technology. The order in which things are introduced is important because one must balance the quality of technological support required with the impact of the multilingualism achieved. A good place to start is the translation of government websites since many of these are half-done and the technological support for translating them is available now with good results. Multilingual chatbots for interacting about government services are harder and we may have to wait longer before they reach a quality that is acceptable.

3.7 Conclusions

Mr. Alistair Borg, Director, Strategy and Support, Local Government Division, Ministry for The National Heritage, The Arts and Local Government

Mr. Borg first acknowledged that technical support for the Maltese language must grow to overcome the many challenges faced by smaller languages in adapting to the digital age, including the prospect of digital extinction as a result of widespread use of English on the digital platforms in current use. The Ministry aims to provide a platform where many linguistic tools will be held together, stored in a single place, and harmonised at a National and European level. A key requirement is that all these tools should be compatible, so that for example the spell checker which is being developed can be integrated to work with automatic translation.

The creation of such a platform forms an integral part of Malta's strategy for Artificial Intelligence which was launched in 2019 which clearly states that "the country will make a crucial contribution in resources and tools for the Maltese language".

Investment will allow computers to process, understand, and generate Maltese text and speech so that AI solutions will become a part of everyday life and be accessible in Maltese and English, Malta's 2 official languages. The development of language technology will serve the aims of this strategy whilst supporting language in general and enhancing inclusivity.

He agreed that Human Centered Language Technology, as discussed in detail by today's panel, will facilitate communication. From the perspective of public administration, it is very relevant that

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citizens and businesses will be reached more easily and our relationship with them will be strengthened.

Dr. Khalid Choukri, European Language Resource Coordination

Dr. Choukri pointed out that even though this meeting was planned as a face-to-face event, its success cannot be doubted and was probably the largest ELRC workshop ever organised. He expressed his thanks to the organisers, in particular Donatienne Spiteri and Mark Vella, to Albert Gatt, Mike Rosner, and Claudia Borg for technical support over the years, to Philippe Gelin and Christopher Scott from the European Commission, and also to the interpreters.

Dr Donatienne Spiteri, Legislation Unit - Office of the State Advocate, ELRC Public Services National Anchor Point

Dr Spiteri first expresses her gratitude to the Ministry for The National Heritage, The Arts and Local Government for hosting the workshop, to the colleagues at ELRC for continuous communication and valuable advice. Then, Dr Spiteri thanks all the speakers, the members of the Panel, the moderators, members of the support team, her colleagues Mark and Mike, and of course to all participants. As a conclusion, she invites participants to contact any of the organisers for reactions or suggestions about the workshop or the technologies discussed.

3.8 Demos session

A demo of *eTranslation* and related language technologies was provided during the main session by Mr. Marc Vella and Mr. Christopher Scott as described above.

4 Synthesis of Workshop Discussions

What you consider to be achievements in your country in terms of processes/networks established or data collected within ELRC that can be shared as best-practice examples

Concretely, the most influential achievements in this sense have been

- The creation of an AI strategy which includes certain commitments concerning Maltese language technology, and
- successful application for and participation in the NLTP project as described in detail above.

How these achievements will actually affect practice remains to be seen, since this depends on the complex interaction between realisation of the technologies developed, initiatives on the part of Government, take-up by the public services and the actual benefits experienced by users.

Within the AI strategy, Government is committed to certain specific technologies – for example the development of multilingual chatbots to facilitate citizen interaction with Government services. This is a good first step but the momentum needs to be consistently followed up with other projects that directly affect community take-up.

The main findings of your workshop/the take-home messages that ELRC should consider when planning future activities in order to more effectively follow-up within the country (or even beyond the country)

Future editions of ELRC-like workshops need to

- Avoid constant repetition of the same message.
- Consolidate the interest shown by public administration personnel.
- Put more focus on the participation of SMEs.
- Concentrate on hands-on demonstrations of the latest technologies.

5 Country Profile: Language data creation, management and sharing

The topic of Language data creation, management and sharing existing practices and challenges was fully presented and discussed in the previous 2019 workshop. Furthermore, apart from the fact that there is now greater awareness of the existence and potential of *eTranslation* throughout the public service, there have yet been no major changes in practice compared to the situation described in the latest version of the country profile.

However as a result of the NLTP platform that is currently under development, it is possible that there will be some evolution of current practice. The extent to which this happens depends upon a large number of factors, two of which stand out:

- The extent to which the platform delivers what it promises as an integrated repository of tools and resources for powering not just LT applications, but LT in conjunction with AI.
- The level of commitment by Government to ensure that the platform is used by data creators across all sectors of the community.

6 Workshop Participants

The breakdown of the attendance demographic is captured in the table below:

	Number of participants	Percentage
Public sector	100	
Industry LT providers	5	
Research / Academia	5	
SMEs	5	
EC and ELRC consortium	5	
Local organizer staff	5	
Other		
Total:		