Jordanian Translators' Use of Machine Translation and Glossary of COVID-19 Terminology with Reference to Arabic

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ABSTRACT

COVID-19 is a global health crisis which has necessitated quick dissemination of reliable information to people in a language they understand. Although translators can play a significant role in crisis situations (Al-Shehari 2019), the enormous volume of COVID-19 information online to be translated may be too demanding for human translators. Therefore, translation technologies and resources including machine translation (MT), computer-assisted translation (CAT), and translation memory (TM) may assist in responding to this challenge. This study examines Jordanian translators' views on utilising translation technologies in rendering COVID-19 material into Arabic during the pandemic. The quantitative five-scale Likert questionnaire was completed by 106 Jordanian translators. The findings show resistance to using MT by Jordanian translators, problems with translating COVID-19 related terms into Arabic, and a need to compile a unified glossary of COVID-19 related-terms that could be used across the Arab world.

KEYWORDS: Machine Translation (MT); glossaries, COVID-19 terminology; Jordanian translators; Arabic language

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1. Introduction

The World Health Organization (WHO) proclaimed COVID-19 a global pandemic on the 11th of March, 2020. By April 2022, COVID-19 had claimed the lives of over 6 million and infected 500 million people worldwide (WHO 2022). COVID-19 is a health crisis situation that has disrupted the entire world, and whose "cascading effects" (Federici et al. 2019) have impacted every single aspect of human life. In addition to its mysterious nature, aggressive infection, and death rate, COVID-19 has triggered an unprecedented need for information dissemination world-wide by governments, aid agencies, healthcare providers, and the general population to help people protect themselves. The global outbreak of the disease, the explosion of information on the virus, and the wide variety of languages spoken today, i.e. over 7000 languages (Ethnologue 2020), have led the Director-General of WHO, Tedros Adhanom Ghebreyesus, to argue that "We're not just fighting an epidemic; we're fighting an infodemic" (WHO 2020). This underscores the research within Translation Studies (TS) on the role of translation and highlights the neglect language and translation receive during crisis situations, particularly that the type of translation or interpretation required may differ from one stage of the disaster, or crisis situation, to another (Federici 2016; O'Brien 2019). Furthermore, the need for translated content on COVID-19 reveals the importance of language and communication during global crises, such as the current health crisis that the entire world is facing.

In recent years, crisis translation research has highlighted the importance of language and translation in crisis (Alexander and Pescaroli 2019). In the case of COVID-19, understanding the role of translation in conveying information and combating the pandemic is instrumental. As a global pandemic, there is an urgent need to disseminate reliable and accurate information to people in a language they can understand. In addition, technological advances have facilitated access to voluminous amounts of information online. A simple Google search on COVID-19 yields over 5 billion results in English alone. This access, however, is by no means equal, and while there are over 7000 languages spoken worldwide, 10 dominate 90% of the worldwide web content (World Economic Forum 2018). This in itself creates a digital divide which limits people's access to information and drives demand for reliable translated content, which human translators alone may not be able to meet on time. The employment of technology in such conditions can facilitate information dissemination and delivery (Olimat and Mahadin 2022).

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Kenny describes translation as "a highly technologized profession" (2011:302), where professional translators have long used a variety of tools and resources to carry out their tasks and meet constant deadlines. These include machine translation (MT), translation memory (TM), termbanks and glossaries, CAT tools, and electronic dictionaries. In crises, electronic tools and resources can expedite the translation process and provide quick information access to the wider population. The ability to provide large amounts of content at incredibly short times can be costly especially when human translation is involved (Lewis et al. 2011).

Previous studies have already established the role MT plays in increasing productivity in the translation profession (Massardo et al. 2016), but how these tools and resources can be used in crisis situations requires further research (Federici et al. 2019). Another area where research is needed lies in understanding translators' views on MT use (Macías et al. 2020). This is particularly true of the Jordanian context, where the translation profession has received very little attention. There is scant research on Jordanian professional translators' use of translation technology (Mahadin 2018). Jordan lies in the heart of the Middle East which continues to witness constant political conflicts and changes that illustrate the significant role of translation and cross-cultural communication. Additionally, as a country that is home to over 1.5 million refugees and a hub for non-governmental organizations and media outlets, understanding the professional translation scene in Jordan can contribute to the larger debates in TS on different aspects of the profession.

The current study aims to investigate Jordanian translators' views on the use of MT for translating COVID-19 related terms with reference to Arabic. The study also explores Jordanian translators' use of COVID-19 glossaries to enhance the quality and accuracy of their translation. The study is organized as follows. The following section reviews translators' perspectives on the use of translation resources and tools within crisis situations, and provides a critical evaluation of relevant studies on MT with reference to Arabic. The data collection and analysis are outlined. The findings are explained, followed by concluding remarks and implications for future research.

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2. Literature Review

2.1 Translation Technology and Crisis Translation

Translation technology is deeply embedded in the language and translation industry. O'Hagan asserts that the language industry today uses "all computer-aided (or- assisted) translation (CAT)" (2019:1), including MT, TM, terminology management systems (TMS), and translation management tools, etc. The use of such tools in crisis translation, however, is only starting to receive due attention (O'Brien 2019).

Initially, MT appeared as a significant branch in TS, combining major features of computational linguistics and translation. MT deals mainly with processing and applying linguistic structure and rules in syntax, morphology, grammar, and semantics to both Source Language (SL) and Target Language (TL). The development and use of MT in the translation industry have seen huge leaps in recent years (Mellinger 2017). For example, MT has progressed from rule-based systems to statistical engines and more recently neural MT which has been touted by some scholars as capable of "bridging the gap between human and machine translation" (Wu et al. 2016). MT is also being used to produce content in large volumes in the TL (Castilho et al. 2014; Doherty and O'Brien 2014). Furthermore, its prevalence in the industry has prompted calls to integrate it into translator training programs (Mellinger 2017). Despite these advancements, translators' views on MT remain negative and scholars attribute these negative attitudes to the impact of MT on translators' long-term work and skills (Arenas 2013; Gaspari et al. 2015; Cadwell et al. 2018). In crises, where disruptive events occur, social groups are under threat, and timely dissemination of information is required, MT can be used to offer quick translation solutions (Cadwell 2018).

The role of MT in crises has received increased, albeit, insufficient interest in the past few years (Cadwell et al. 2019). One of the earlier studies conducted by Lewis (2010) evaluated the development of a Haitian Creole statistical MT engine from scratch as a rapid response to the 2010 Haiti earthquake by the Microsoft Translator team. Building on Lewis (2010), Lewis et al. (2011) advocated the development of an MT cookbook for future crises as "an integral part of a rapid-response infrastructure" (2011: 501).

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Other studies have compared translators' acceptability of different translation technologies and resources (Fulford 2002; Moorkens 2016). Moorkens (2016) sets out to challenge the long-held perception by translators that translation memory (TM) is a more useful tool than MT for translators. To investigate this, 7 translators were asked to rate 60 English-German translated segments to explore the acceptability of TM against statistical machine translation (SMT). The dataset was divided into two equal groups, with the first 30 being translated using a TM "without a quality threshold being set" (Moorkens 2016:141), and the second group using SMT. Although the study showed that only fuzzy matches of over 90% were considered more beneficial, MT output on average was more helpful. The study concludes that MT would be considered the more useful technology of the two if MT provided users with accurate quality thresholds.

In terms of investigating translators' perceptions of MT in crisis translation, studies are very limited. The focus has been directed at investigating the general attitudes of translators on using MT in their daily professions (Fulford 2002). In a recent study, Cadwell et al. (2018) surveyed the views of 70 European Commission DGT translators and 20 translators working with a specific language service provider (LSP), Alpha CRC. The study revealed that translators' use of MT was primarily motivated by the speed and accelerated productivity associated with it. The study also showed that post-editing of MT required more concentration by translators instead of carrying out the translation task without using MT.

Focusing on investigating MT in crises, Cadwell et al. (2019) developed a MT system in an under-resourced language pair, French to Swahili, in Kenya in 2017. The system was designed to be used by inexperienced post-editors to improve content in a relatively short time. Despite the limited scope of the study in the number of participants and the hypothetical nature of the crisis scenario, the study indicated that MT can perform well in crises. The system was positively evaluated by the citizen translators who were trained to post-edit its output.

The use of technology in crisis translation is not without challenges, however, as technology can be affected by power cuts and electricity shortages. In such circumstances, using shared glossaries can provide a lifeline to translators (O'Brien 2019). Preparing such glossaries, however, may be hindered by the unpredictable nature of disasters and crises. In regions where disasters tend to recur, such as weather disasters, some preparation can take place. There are

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examples of successful glossaries of terminology in disaster situations including the ReliefWeb and Translators Without Borders (TWB) glossaries. TWB has developed its glossary into an app including over 1300 terms in a number of languages which facilitates access to information at the click of a button (O'Brien 2019).

Another more recent study carried out by Way et al. (2020) investigated the mechanism of developing open-access COVID-19 MT engines using data available online. The motivation behind the work was to provide timely information to healthcare workers and the general public as more information became available in other languages. The 8 MT engines trained were based on the countries most affected by the virus, which may explain why the focus was on European languages (French, Italian, German, Spanish, and English), and why other languages, such as Arabic, were excluded. The results of the initiative, when compared to online MT engines, showed similar, if not, better performance by MT engines (Way et al. 2020). It also allowed the general public access to otherwise inaccessible data due to language barriers. It is unfortunate that the focus was on European languages which limits their usability with other languages. Furthermore, there is no way to understand how these MT engines would perform with complex and MT challenging languages, such as Arabic. The focus on European languages, while justified, also means that access to this "information is restricted by people's language competencies." (Way et al. 2020). For Jordanians, the ability to access COVID-19 information in Arabic assumes greater importance as Jordan continues to battle the COVID-19 pandemic. While the country had fielded the first wave of COVID-19 with very few deaths and infections, the current number of infections stands at 1.7 million and over 14,000 deaths (Ministry of Health 2022). The need to provide Jordanian society with timely and relevant information continues to be instrumental to protecting lives.

Rosetti et al. (2020) examined the impact of MT on comprehension and trust during weather crisis situations, such as flooding. The study asked 61 participants to evaluate their comprehension of, and trust in translated and post-edited messages in the English-Italian language pair. The study showed that the participants highlighted significant characteristics of crisis messages, such as clarity, helpfulness, and source. It also found that the participants' tendency to comply with the English messages was pronounced, which the researchers attributed to the tone and style of English as being more authoritative. Most importantly, the study

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concluded that there was "some beneficial effect of MT on comprehension and trust" (Rosetti et al 2020: 8), and that greater trust in the messages was associated with greater comprehension of the messages. Accordingly, this points out that translation and clear communication can facilitate greater compliance and increased trust between the public and those managing emergency and crises (Rosetti et al. 2020).

This short review has illustrated the significant role translation technology and resources play in conveying information in crises where time and cost are essential factors. However, the focus of these studies has tended to be on European languages while other languages, such as Arabic, are overlooked. The current study contributes to crisis translation literature in a different number of ways. It explores Jordanian translators' views on the significance of using two major resources of translation technology, namely, MT and glossaries, in enhancing and developing the translation of COVID-19 information with reference to Arabic. This is very important since the Arabic language is spoken by over 400 million people worldwide, and is the fourth most used language online (Kamel 2020). Furthermore, the effect of the crisis health situation of COVID-19 in the area of translation, particularly in the Jordanian context, has still not received due attention by translation theorists and scholars. The coming section will provide a short review of Arabic Machine Translation (AMT).

2.2 Arabic Machine Translation (AMT)

In the last few decades, Arabic has received increased scholarly interest driven by geo-political, socio-cultural, economic, and technological factors (Elsherif and Soomro 2017: 2315, Almahasees 2021). Research interest in Arabic was further facilitated by cross-cultural communication, increased Arabic online presence, and social media platforms which provided a huge "collective knowledge source" (Elsherif and Soomro 2017). Because Arabic content is increasing online, translating huge volumes of content into and from Arabic using both human translation and machine translation has become an urgent need.

According to Farghaly (2010), the first AMT was created by Weidner Communication Inc. using the direct approach, where English was the SL and Modern Standard Arabic (MSA) was the TL. Later, several English-to-Arabic systems of MT were developed, such as ArabTrans, *Al-Mutarjim Al-Araby*, and *Al-Alamiyah*. The direct approach systems of English-to-Arabic MT fell short in

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their linguistic analysis of the SL, and were limited to word order manipulation of the SL to conform to the TL. These shortcomings underscored the inability of this approach to handle the complexity of Arabic as a natural and organic language system (Farghaly 2010).

Alqudsi et al. (2012) explored different online MT approaches and techniques including: rule-based, statistical, example-based, knowledge-based and hybrid MT. The study highlighted the challenges associated with translating Arabic due its word order sequence and flexible sentence structure. This, according to Alqudsi et al. (2012), limits MT's ability where Arabic is concerned. Elsherif and Soomro (2017) found similar issues in their evaluation of recent AMT engines. They also underpinned the dearth of institutional academic attention to AMT, the limited-scope of studies, and the small amount of data traditionally used for analysis of its development, which hinder finding, classifying, and processing AMT resources.

Benaida et al. (2018) conducted an analytical study on the effect of AMT of the e-commerce website of Alibaba on the quality of the output. The study found that the omission of diacritics, whose use in Arabic can change the function, meaning, and pronunciation of the word, had severely affected the output. While the study highlighted the beneficial aspects of AMT in minimizing cost and providing a large, translated content, it also underscored the need for MT post-editing by human translators to ensure the output quality and accuracy. In critical health crises, where speed is a deciding factor, AMT can be used in the first stage, followed by post-editing by a human translator.

In a more recent study, focusing on user evaluation as opposed to analysing AMT system behaviour, Al-Anazi (2019) used a mixed method approach utilising an observational experiment and an online survey. The study on Arab translators' use and evaluation of CAT and MT revealed a tendency among Arab translators to carry out "extensive post editing to MT suggestions" (2019:77). The study's observational experiment involved 13 Arabic translators, while the online survey was completed by 49 translators. While Al-Anazi argued that Arabic translators exhibited a significant inclination to use MT despite its challenges, he also highlighted the need to improve AMT performance. Despite the mixed method approach, the limited number of participants by Al-Anazi's own acknowledgment makes the generalisation of the study findings too difficult.

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This is further complicated by the fact that it is unclear where these translators come from, and as such, it is hard to assess the comprehensiveness of the Arab translator representation sample.

As for studies related to COVID-19 and MT, Almahasees and Jaccomard (2020) illustrated that Jordanians relied on Facebook MT as a primary source of translated COVID-19 information during the lockdown. Although the use of Facebook MT provided Jordanians with quick access to necessary information in a time of crisis, it also raises questions about the quality and accuracy of the translated COVID-19 content. In addition, Almahasees et al. (2021) investigation of Google MT translation of COVID-19 texts extracted from different corpora highlights serious problems with AMT. The findings show that Google MT had multiple semantic, grammatical, lexical, and punctuation errors which inhibited "the intelligibility of the translated text" (ibid: 2065).

It could be concluded that despite increased research interest in AMT, it is rather limited in scope. The majority of studies have focused primarily on AMT systems rather than user experience, such as AMT's ability to render the syntactic, lexical, morphological, and textual complexities of Arabic into acceptable and accurate translations (Habash and Sadat 2006; Habash 2010; Alqudsi et al. 2012; Soudi et. al 2012; Ebrahim et al. 2015; Alkhatib and Shaalan 2017; Zakraoui et al. 2020). Studies have also highlighted the lack of accessible datasets for researchers to produce machine-translated texts in Arabic (Zakraouri et al. 2020), but little research has focused on user experience (Almahasees and Jaccomard 2020). This study, however, examines Jordanian translators' perceptions of using MT and glossaries during the COVID-19 pandemic. The next section summarizes the methods and procedures adopted for the data collection and analysis.

3.   Method

3.1 Data Collection

The current survey was created using Google Forms and then was distributed to Jordanian professional translators via LinkedIn, the professional networking platform. The survey was open from the 20th of July to the 10th of August 2020 and was completed by 106 Jordanian translators. The survey was divided as follows: The first section provided a general information sheet containing research significance and aims, ethical considerations, and participants' rights

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including confidentiality, anonymity, and right of withdrawal. This was followed by a consent form and a section on the participants' demographic information. The main sections of the survey explored the translators' views on three major issues: the use of MT for translating COVID-19 information, the use of glossary of COVID-19 terminology, and translating COVID-19 materials into Arabic. The final section of the survey included an open-ended question asking the participants to add any comment or suggestion relevant to the topics under research.

Prior to distributing the questionnaire, its content and design were reviewed by professional translators as well as translation academics to ensure language clarity, comprehension, and structure. A few stylistic changes and sentence reformulations were recommended. The suggestions made were incorporated into the final draft.

3.2 Data Analysis

Descriptive analysis was used to analyse the Likert-scale close-ended questionnaire statements where the basic features of a data set are presented, outlined, and described (O'Leary 2014). In the final open-ended section, respondents' comments were coded and analysed using thematic analysis (Braun and Clarke 2013).

4.   Findings

4.1 Demographic Information

This section of the questionnaire elicited demographic information on the cohort of participants. The participants of the study consisted of 80 (75.5%) female and 26 (24.5%) male professional translators, which is in agreement with the traditional view of the profession as being dominated by females (Pym et al. 2012).

The participants were divided into three groups in terms of the respondents' professional experience. More specifically, 47.5% had worked in the Jordanian translation market for less than five years, 32.2% had a 5-15-year work experience, and 22.6% had over 15 years' experience in professional translation. Participants were also asked to provide information on their academic background. Here, 50% of the respondents had received undergraduate education, while the other 50% had postgraduate education (MA or PhD).

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Respondents were also asked to signal their employment status as free-lancers or fulltime/in-house translators. Out of 106, 46 (43.4%) participants worked full time and 56 (52.85%) worked as freelancers, which is also in line with the general trend in the translation profession on the increase of freelance work (EU et al. 2017). Only four (3.8%) respondents indicated that they worked both fulltime and as freelancers. In terms of their field of translation work, (24.4%) of the respondents indicated that they do not specialize in a specific field, and work in a number of fields, such as economic, legal, health, and political translation. This is also in line with previous studies on Jordanian translators, such as Olimat, (2010) and Mahadin (2018), which showed a general tendency among Jordanian translators to work in more than one field. Although the education, legal, and media fields of translation received the highest responses (17.9%), (15.1%), and (11.3%) respectively, the participants were quick to point out that they also work in other fields. The following section presents respondents' views on using MT for translating COVID-19 terminology.

4.2 Machine Translation of COVID-19 Terminology

The first section of the questionnaire includes six close-ended statements investigating Jordanian translators' attitudes towards the use of MT for translating COVID-19 information.

Table 1: Translators' Responses on MT of COVID-19 Terminology

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I resort to MT for COVID-19 related texts as an accessible, cheap, and quick option.	4 (3.8%)	19 (17.9%)	20 (18.9%)	42 (39.6%)	21 (19.8%)
I frequently resort to MT for COVID-19 related texts in both my SL and TL.	1 (0.9%)	16 (15.1%)	25 (23.6%)	41 (38.7%)	23 (21.7%)
I only resort to MT when I do not know the correct COVID-19 terminology.	8 (7.5%)	41 (38.7%)	23 (21.7%)	22 (20.8%)	12 (11.3%)

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I never use MT for COVID-19 related texts.	18 (17%)	23 (21.7%)	23 (21.7%)	32 (30.2%)	10 (9.4%)
I am aware of the semantic limitations of MT for COVID-19 related texts.	43 (40.6%)	53 (50%)	8 (7.5%)	2 (1.9%)	0 (0.0%)
I am aware of the syntactic limitations of MT for COVID-19 related texts.	40 (37.7%)	53 (50%)	11 (10.4%)	2 (1.9%)	0 (0.0%)

The participants in the first statement were asked whether they used MT to translate COVID-19 material as it is the quickest and most accessible option. Nearly 60% of respondents showed a high percentage of disagreement or strong disagreement to this statement. 21.7% of respondents showed agreement with 3.8% showing strong agreement, and 17.9% mild agreement. However, 18.9% of the respondents were neutral. These findings support previous studies on translators' disfavour of MT, albeit not in crisis situations (Way 2013; Moorkens and O'Brien 2016).

In the second statement, there was also a high percentage of disagreement on using MT for COVID-19 directional translation in the SL and the TL. In more detail, 21.7% of the respondents strongly disagreed, and 38.7% of them disagreed, bringing total disagreement to 60.4%. Although previous studies suggested that translators are open to work with efficiency-facilitating new technology (Koskinen and Ruokonen 2016), the results here suggest a resistance to MT despite its potential role in facilitating directional translation i.e. foreign language to native language (Moorkens and Way 2016). Only 0.9% strongly agreed and 15.1% agreed with this statement bringing total agreement to 16%, and 23.6% of the respondents provided neutral responses.

The third statement asked the respondents whether they resorted to MT when they did not know the correct or accurate term. Responses here were more in favour of MT than the first two statements. 7.5% of respondents showed strong agreement, and 38.7% showed agreement bringing total agreement to 46.2%. However, 21.7% of the respondents were neutral while 20.8% showed disagreement and 11.3% showed strong disagreement. The results indicate that Jordanian translators look to MT as a research tool to facilitate their translation work, and suggest that

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translators use MT as TM repositories, which are viewed more favourably than MT (Moorkens and Way 2016).

In the fourth statement, the respondents were asked if they never used MT to translate COVID-19 texts. Responses to this statement were divided. 17% of respondents showed strong agreement, and 21.7% showed mild agreement with a total agreement of 38.7%. By contrast, 9.4% showed strong disagreement, and 30.2% showed mild disagreement bringing total disagreement to 39.6%. This division on the use of MT was mentioned in previous studies. For example, Cadwell et al. (2018) reported on professional translators having an "equally diverse set of reasons for using MT as not using it" (Cadwell et al. 2018: 302).

The last two statements investigated translators' views on MT limitations. In the fifth statement, the respondents were asked about their knowledge of semantic limitations of MT where COVID-19 is concerned. Their responses showed a very high percentage of agreement including 50% with strong agreement and 40.6% with mild agreement bringing total agreement to 90.6%. Disagreement with this statement stood at only 1.9% and only 7.5% of respondents were neutral. This could be due to the challenge of incorporating Arabic in MT, as explained earlier in section 2.2, and as O'Brien (2019) explains "Where the languages concerned have low, or no, digital data, or are not standardized from an orthographical perspective, or indeed have multiple variants (e.g., Arabic), data-driven translation technology is considerably challenged" (O'Brien 2019: 213). Similarly, in the sixth statement, the respondents showed a high level of agreement on MT syntactic limitations. 37.7% showed strong agreement, and 50% showed agreement, bringing total agreement to 87.7%. Disagreement stood at only 1.9% while 10.4% of respondents were neutral.

It can be concluded that the translator's reliance on MT requires further consideration because MT may fail to consider semantic, syntactic, and cultural variations between the SL and the TL which may result in use of offensive or strong language in the target culture. For example, the Arabic MT translation of "herd immunity" is undesirable, and the preference is given to "community immunity". Arabic culture influenced by Islam views humans as venerated among all of God's creation, and the use of an animal-reference to refer to humans is unacceptable as

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these terms are often uttered as insults in Arab communities. This may generate a negative impression for target readers about (in)formality, grammatical mistakes, contextual ambiguity, impersonality, accuracy, correctness, reliability, timeliness, and appropriateness of the machine-translated text. The next section examines the translators' views on using or creating a glossary of COVID-19 terminology.

4.3 Glossary of COVID-19 Terminology

This survey section also contains six close-ended statements on the translators' views on the use and usefulness of a glossary of COVID-19 related terms. The table below illustrates their responses and percentages.

Table 2: Translators' Responses on COVID-19 Terminology Use

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I have a comprehensive glossary of COVID-19 terms in both my SL and TL.	9 (8.5%)	39 (36.8%)	29 (27.4%)	24 (22.6%)	5 (4.7%)
My COVID-19 glossary of terms is based on official websites and global organization, such as WHO and CDC	21 (19.8%)	51 (48.1%)	24 (22.6%)	8 (7.5%)	2 (1.9%)
My COVID-19 glossary of terms is sensitive to cultural and linguistic differences.	15 (14.2%)	35 (33%)	36 (34%)	18 (17%)	2 (1.9%)
My COVID-19 glossary of terms increased my extralinguistic knowledge of the COVID-19 pandemic.	26 (24.5%)	53 (50%)	20 (18.9%)	5 (4.7%)	2 (1.9%)

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I update my COVID-19 glossary of terms regularly to ensure it is up to date.	16 (15.1%)	42 (39.6%)	37 (34.9%)	9 (8.5%)	2 (1.9%)
I find it useful to have an open-source COVID-19 glossary as it helps with efficient, reliable and up to date COVID-19 translations.	28 (26.4%)	53 (50%)	21 (19.8%)	3 (2.8%)	1 (0.9%)

In the first statement, 48 respondents, constituting more than 45% of the total number of the selected sample, stated that they have a comprehensive glossary of COVID-19 terms in both the SL and the TL. By contrast, 29 respondents, equalling 27.3% of the study sample, showed disagreement, and similarly the same number of respondents provided neutral responses. In the second statement, 72 respondents, almost 70% of the respondents, expressed agreement that their glossary of COVID-19 terms was created based on official information sources and global organizations, such as WHO and CDC. Only 10 respondents expressed their disagreement and 24 provided neutral responses.

In the third statement, 50 respondents, nearly half of the total number of the sample population, agreed that their glossary of COVID-19 terms considers cultural and linguistic differences. Only 20 respondents equalling 18.9% of the sample, disagreed with this issue, whereas 36 respondents equalling 34% of the study sample were neutral. In the fourth statement, 74.5% of respondents, almost three quarters, expressed agreement that their glossary of COVID-19 terms increased their extralinguistic knowledge and awareness of COVID-19 pandemic. By contrast, less than 7% of the sample showed disagreement to this statement, while 20 respondents provided a neutral response.

In the fifth statement, 16 and 42 respondents, which make up more than half of the total number of respondents, expressed strong and mild agreement respectively that they keep their glossaries of COVID-19 terms updated regularly. On the other hand, 11 respondents showed disagreement, whereas 37 respondents provided neutral responses. In the final statement, more than a quarter of respondents expressed strong agreement that they found it useful to have an online COVID-19 glossary which provides them with efficient, updated, and reliable COVID-19 information which,

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in turn, allows them to improve their translation quality and accuracy. Furthermore, exactly half of the respondents expressed mild agreement with this statement. While 21 respondents provided neutral responses to the statement, only 4 disagreed with it. The next section explains the Jordanian translators' views on translating COVID-19 information into Arabic.

4.4. Translation of COVID-19 Terminology into Arabic

The final section of the questionnaire included six close-ended statements addressing translators' perspectives on translating COVID-19 related texts into Arabic. The table below illustrates the participants' responses and their percentages:

Table 3: Translators' Responses on Translation of COVID-19 Terminology into Arabic

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I can easily access sufficient reliable information sources or platforms on COVID-19 in the Arabic language to facilitate my understanding and translation of COVID-19 related texts.	11 (10.4%)	43 (40.6%)	34 (32.1%)	15 (14.2%)	3 (2.8%)
There is no consistency in COVID-19 terms in the Arabic speaking outputs.	6 (5.7%)	47 (44.3%)	30 (28.3%)	22 (20.8%)	1 (0.9%)
There is a need to develop a unified Arabic COVID-19 terminological glossary.	31 (29.2%)	60 (56,6%)	10 (9.4%)	2 (1.9%)	3 (2.8%)
I find translating COVID-19 related texts into Arabic more difficult because of the level of text-formality.	5 (4.7%)	36 (34%)	29 (27.4%)	34 (32.1%)	2 (1.9%)
I find translating COVID-19 related texts into Arabic more difficult because of new technical terms.	10 (9.4%)	52 (49.1%)	23 (21.7%)	20 (18.9%)	1 (0.9%)
I find translating COVID-19 related texts into Arabic more difficult because of culture-bound variations.	4 (3.8%)	41 (38.7%)	29 (27.4%)	31 (29.2%)	1 (0.9%)

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The statements elicited information on ease of access to reliable resources in the Arabic language and difficulties associated with translating COVID-19 information into Arabic. In the first statement, on resource availability in the Arabic language, almost half of the respondents showed agreement; of those, 10.4% showed strong agreement, and 40.6% showed mild agreement. Only 14.2% disagreed with this statement and 2.8% strongly disagreed. However, 32.1% of respondents were neutral.

In the second statement, half of the respondents expressed agreement that there is a lack of consistency in COVID-19 terms in Arabic speaking outlets (printed and visual media). 44.3% of the respondents showed mild agreement, and 5.7% of them strongly agreed. By contrast, 21.7% of the respondents disagreed and 28.3% were neutral. Mahadin (2018) had reported on the terminological consistency challenges encountered by professional translators working across the Arab world, and hinted at the political influences affecting unifying Arabic terminology. Similarly, in the third statement, there was a high percentage of agreement among the respondents on the urgent need to develop a unified Arabic COVID-19 terminological glossary. In more detail, 29.2% strongly agreed with this suggestion and 56.6% showed mild agreement bringing total agreement to 85.8%. This issue was flagged again in the Further Comments Section (4.5) that translators provided, which will be discussed next.

The last three statements investigated the difficulties of translating COVID-19 material from three aspects; text formality, introduction of new technical terms, and cultural variations. In the fourth statement, on the difficulty of translating COVID-19 due to the level of text formality, the participants' responses were closely divided. 38.7% of the respondents showed agreement, 34% of them showed disagreement, and 27.4% of them were neutral. We may need further research to gain a better understanding of the formality of the COVID-19 texts.

In the fifth statement, roughly 60% of the Jordanian translators agreed that the use of new technical terms within the COVID-19 context was a source of difficulty for them. Only 19.8% of the respondents disagreed with this statement, and 21.7% of respondents provided neutral responses. This is perhaps due to the speed with which new terms are being introduced and the lack of Arabic online content. There have been several calls on the need to increase Arabic

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content online which currently stands at between 1-3% (Kamel 2020). This raises questions of not only the dominance of certain languages online, but also issues of equal access to information which Way et al. (2020) already highlighted in their work on developing MT engines for COVID-19 in a variety of languages, predominantly European.

The final statement in this section investigated difficulties in translating COVID-19 texts due to cultural differences between the SL and the TL. Here, 3.8% of the respondents strongly agreed, and 38.7% mildly agreed with this statement, bringing total agreement to 42.5%. On the other hand, 30.1% and 27.4% of respondents expressed disagreement and neutral responses to this statement respectively. The participants' answers on the open-ended question in the final section of the survey reveal some insights into their responses here, and those will be discussed below.

4.5. Further Comments

In the final section of the survey, the Jordanian translators were invited to discuss any relevant issues that the survey did not include, or they wanted to highlight. Of 106, 21 respondents provided comments. The data was analysed and thematically coded (Braun and Clarke 2013). The themes that were elicited from the data centred around 3 issues; the first of which is the introduction of new terminology which had no equivalents in Arabic. These included expressions, such as "contact tracing", "personal protective equipment" and "herd immunity". Translators underscored the role of Arab linguists, academics, and medical health professionals to help coin acceptable and relevant Arabic terms. This matter was also closely linked with the second theme on the need for unifying terms in Arabic. A number of participants argued that when carrying out translation for different Arab clients, there would be discrepancies in the terms used. This, the respondents argued, affected their translation work. The problem with unifying new terms in Modern Standard Arabic, which is the language used in all Arabic media platforms and online, has also been reported in Mahadin (2018). Despite the fact that Arabic is estimated to be spoken by 440 million worldwide (Kamel 2020), many of the language academies[1], tasked with

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[1] There are 13 language academies to date. They are located in Damascus, Algeria, Baghdad, Lebanon, Jordan, Palestine, Egypt, Sudan, Morocco, Tunisia, Libya, and two in Saudi Arabia.

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maintaining the Arabic language and the introduction of new terms, do not work in union. Geographical distance, political upheavals, and disagreement which prevail in the Arab region could explain the lack of cooperation, and the slow pace at which these academies have been working.

The final theme highlighted by the Jordanian translators was the cultural differences between Arabic and English. Participants discussed translating problematic terms due to cultural differences, such as "herd-immunity" and "mask". For example, the participants did not expound much on the topic, but they indicated they were never comfortable with adopting the literal translation of "herd immunity", and opted to use "community immunity" instead. The participants insisted that the introduction of new terms should take into consideration the cultural divergences between languages. This also opens the door for further research on COVID-19 terminology from a cultural perspective, and their translation into Arabic.

These few comments provide fresh insight into translators' views on issues that would not have been possible using quantitative methods alone, and raise questions for further research on the state of translation in a region that is going through monumental political changes. One such example is the translators' views on the need for terminological consistencies in MSA and the problems associated with those inconsistencies across the Arab World. Understanding how language academies work, and the possible political ramifications on language policy are also topics worth further investigation as translators' experiences and work seem to be affected by such policies.

5. Discussion

This study explored Jordanian translators' perceptions on the use of translation technology, namely MT and glossaries during the COVID-19 pandemic. The findings indicate that the majority of Jordanian translators are resistant to using MT in rendering COVID-19 material. Previous studies on Arab translators (Al-Anazi 2019) had revealed that AMT output required translators' extensive post-editing work, which may explain why Jordanian translators have expressed such a high level of disfavour to MT use. Jordanian translators' resistance to using MT

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was not limited to translating into English, but also into Arabic. This can be explained in light of the morphological, syntactic, phonetic, and phonological challenges that a number of past studies reported in designing AMT engines (Alqudsi et al. 2012; Elsherif and Soomro 2017; Benaida et al. 2018). Although previous studies (Koskinen and Ruokonen 2016) had reported on translators' openness to using new technologies that facilitate efficiency, AMT challenges and the need to edit extensively may explain Jordanian translators' resistance to these translation technologies. Further research on how Jordanian translators use CAT tools and the difficulties they encounter during their translation work may provide new insights into the underlying reasons for their attitude.

The study also revealed that Jordanian translators tend to use MT as a last resort when they cannot find the correct term. This would seem to indicate that MTs are used more as a research tool to look for definitions and meanings, and almost as a TM rather than a time-saving technology that can provide accurate and quick translations. Other studies had reported on translators' resistance to MT as it limits translator creativity (Moorkens and O'Brian 2015). It is possible that Jordanian translators share that same attitude, and do not want to be influenced by the suggested translation of MT. As there is little research on how Jordanian translators use MT, and how often, these remain unanswered questions.

Where AMT limitations are concerned, Jordanian translators showed high agreement on its syntactic and semantic limitations. This high agreement may go a long way to explain why Jordanian translators are resistant to use AMT. As illustrated in various studies examining the challenges associated with AMT, the Arabic language is a very complex language system. One such example of its complexity is the use of Arabic diacritics which set the morphosyntactic boundaries of the word. These markers tend to be absent from printed media and text (Soudi et al. 2012). Despite the absence of diacritics, Arabic language readers are capable of understanding and deciphering lexical and syntactic ambiguities based on their knowledge of Arabic and their understanding of the context (ibid). This absence, however, exacerbates the problem of automatic Arabic language processing systems, and might be one of the reasons why Jordanian translators resist using MT.

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The data analysis also shows that more than half of the respondents do not have comprehensive glossaries of COVID-19 terminology in both the SL and the TL. Translators are the most frequent users of terminology collected from several resources when working on a particular translation project. According to Arenas (2013), translators viewed that consulting glossaries can improve the translation process in general and MT in particular. According to the Jordanian translators' responses, specialized glossaries of COVID-19 related terms retrieved from official resources and organizations, such as WHO and CDC, can facilitate the process of translating COVID-19 materials into/from Arabic. According to Motlaq and Mahadi (2020), nearly 90% of the translation learners utilized online glossaries as one of the most useful translation resources and tools for MT post-editing. As a response to the ongoing COVID-19 crisis, the Translation Initiative for COVID-19 (TICO-19) was established at the early stages of COVID-19 outbreak as a collaborative effort between public and private entities seeking to make the collection of translation memories and technical glossaries of COVID-19 content available in several official languages. This project provides common COVID-19 terms, phrases, and sentences for language service providers (LSPs), translators, and volunteers so as to improve the translation consistency and accuracy (TICO-19 2020).

In such a health crisis scenario, considering cultural and linguistic differences between the SL and the TL when designing or using a glossary of unified terms is a critical issue for translators. According to Toury (1978), translation is an activity which unavoidably explores at least two languages and two cultures. Therefore, translators should be fully aware of complexities of cultural and linguistic variations between the SL and the TL. Approximately, half of the total number of the Jordanian respondents ascertained that their glossary of COVID-19 terminology is sensitive to cultural and linguistic differences between the SL and the TL. The main concern for the Jordanian translators is that it is almost impossible to find full equivalences of COVID-19 expressions in both the TL and the SL. Therefore, translators may refer to other translation strategies, such as transcription, literal translation, paraphrase, near equivalence, componential analysis, coining new words, footnotes, and transference (Newmark 1981). Major misunderstandings and misinterpretations of crucial health information among the diverse communities' members may occur if linguistic and cultural gaps have not been considered in the process of creating or utilizing COVID-19 terminology glossaries. Attention should be given by

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linguists and translation theorists on investigating language needs in multilingual health crisis settings, e.g. COVID-19, to avoid any kind of cultural and linguistic barriers (Cadwell and O'Brien 2016).

Approximately, three quarters of the selected Jordanian translators considered that the current glossaries of COVID-19 terms improved their level of extralinguistic knowledge and awareness of COVID-19 disease. Hanoulle et al. (2015) found that professional translators habitually spent more time consulting glossaries in comparison to dictionaries or the Internet. The status quo of the COVID-19 pandemic requires managing a very large amount of information for different users around the world. Thus, more approved glossaries should be created. Integrating accessible, multilingual, and domain-specific glossaries of COVID-19 terminology into the translation process has many advantages. In addition to reducing the translator's time, workload and potential terminological mistakes in the translation process (Hanoulle et al. 2015), it also enables translators to increase their extra-linguistic knowledge and information related to COVID-19 disease.

The Jordanian translators stated that they update their glossaries of COVID-19 terms regularly as new terms of the on-going health crisis are introduced. The translator is responsible for using the most up-to-date glossaries of COVID-19 terminology. Matis (2010) argued that translators should systematically check all the terminology in existing or approved glossaries as new terms are added or adjusted. Matis points out that this process is time-consuming and requires the translator's proactivity and interest. In the case of COVID-19 where new information continues to flow, translators may not be supplied with official glossaries or linguistic resources. Instead, they can create their own glossaries or share them with other translators or the wider community via a freely-accessible public database. Compiling new glossaries or updating and maintaining existing glossaries may require a collaborative contribution by specialists, clients, terminologists, and translators in order to guarantee the quality of the terminology. Likewise, the Jordanian translators pointed out that the use of open-access or online glossaries with updated and reliable COVID-19 related terms allows them to develop the consistency and accuracy of their translated projects. Hanoulle et al. (2015) indicated that using free-access glossaries decreases the translator's time spent on terminology, workload, and terminological errors in the translation process.

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Where issues on Arabic Language resource access, and COVID-19 term consistency are concerned, there were high levels of agreement on translators' ability to access sources in Arabic to facilitate understanding, and consequently translation of COVID-19 material. Despite this, the lack of consistency in Arabic COVID-19 terms was a problem for Jordanian translators, and this lends support to Mahadin (2018) which highlighted the missing role of language academies and the effect of that on providing up-to-date consistent terminology in Arabic. This becomes more pertinent during a time of urgency and crisis, and where access to accurate and reliable information is essential for protecting lives. Other previous studies have also shed light on the difficulties of "finding consistent levels" (Al-Anazi 2019: 24) when standardizing new terms, and have attributed these to geographical distance of language academies, lack of cooperation, slow progress, and language gaps between language users and language standardizers (Saraireh 2001). These factors continue to hinder the ever-expanding needs of translators, particularly as large amounts of information and new words are introduced online and in printed form.

6. Conclusion and Implications for Future Research

In health crisis situations, such as COVID-19, access to pertinent information may be facilitated by translation. Therefore, crisis translation plays a significant role in making potentially timely and up-to-date COVID-19 information accessible and comprehensible for professionals and the general public from different parts of the world. Human translation in the current COVID-19 situation is challenged by time constraints, high volumes of information, and steep financial costs which MT has the potential to facilitate, particularly for speakers of wide-dispersion languages. Nonetheless, using AMT in rendering COVID-19 information in the Jordanian context remains a difficult task due to the complexity of the Arabic language system, and the generally negative attitudes of Jordanian translators.

Developing a unified glossary of COVID-19 terminology can be a dynamic linguistic resource for translators provided it is updated frequently as new terms arise. Providing a free-access, researchable, and plain-language glossary of key and consistent COVID-19 terms is an urgent issue for a number of reasons. To start with, it will assist the general public in different parts of the world to raise their awareness and knowledge about COVID-19 disease. In addition, it will offer more help for communities of translators regarding COVID-19 translation difficulties and

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issues. Moreover, it will help global organizations and bodies in publicizing COVID-19 information for their non-English speaking community members on several issues, such as social distancing, infection prevention and control information, the spread of rumours and inaccurate information, and treatment and care. Finally, the glossary of COVID-19 terms will provide more help for community-based institutions, aid agencies, and health workers who support COVID-19 infected people in the hardest-hit regions.

This research has also raised questions for further research. While this research has focused on translators' perspectives on MT during the COVID-19 pandemic, there is a need to understand the underlying reasons behind Jordanian translators' negative attitudes towards MT in general, and how it is being used in the Jordanian translation market.

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