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Intra-Sentential Intricacies Pertaining to the AI- Recognition of Arabic Female Names Rendered into English

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Abstract

AI-translation models unexpectedly fail in communicating messages in between natural languages, leading to errors that vary according to the degree and nature of relatedness between the Source and Target languages. By examining the lapses in the AI-translation of Arab female names into English, this paper red-flags error metrics in dealing with such Arabic texts. A reliable MT evaluation tool, compared to 'BLEU and NIST measures' according to Turian (2003), is the unigram-based F-measure, which uses a bitext grid to identify the texts' similarities. Such evaluation mechanisms will evidently reflect the relegated TT quality resulted from the Source Text's nature, a matter that necessitates AI-translation developers to parameterize their models in a way that handles such imminent inadequacies. This paper calls for novice ways to evaluate the AI translation systems in order to improve their efficacy on the one hand, and to abide by proper translation theories on the other.

1. INTRODUCTION

Arabic language with its unique morphology often challenges fully-automated analysis. Grammatical states or roles of words like nouns and verbs, for example, are reflected on the word endings, identifying either a nominative, accusative or a genitive case of such a morphological form. Each word category is dealt with differently in its intra-sentential relations, as well as based on the semantic role it represents. Having a denotative value, Arabic proper names, particularly of females, need to be observed in translation, particularly when the Source Text in question is subject to AI considerations. Contemplate nouns like Rose (a girl name), Smith (a surname), Everest (mountains), India (a country), Friday (a day of the week), …etc. stand as special labels and signs of reference to those common nouns they indicate. Interestingly, the surname Smith, is originally, a common noun, the same applies to 'rose'. Names can be given to humans, as well as non-human creatures and even inanimate objects. Animals, plants, places and things in general have their common terms of reference in each linguistic code, indeed; still some are given special names by a particular person or a community. 'Tree' is a common noun, yet; any tree does have its general, as well as, scientific name. The same tree might have been given a very special name by some person/s, for example 'the big tree', 'the old tree', or 'the memorial tree', …etc. with a pragmatic sense understood

only by those particular ones to whom that tree bears that special sentimental, social, cultural and/or historical value. Proper nouns serve as special codes of reference to common nouns. Proper nouns, or names, are always given to persons, based on personal or social viewpoints of the society in general, and the family in particular. Whereas some families follow strict norms in naming their children and grandchildren, others are open for all options of the contemporary naming trends that sometimes cross cultural, social, as well as, geographical barriers.

Considering a particular text, a noun might generally be perceived as a simple piece of information. Since nouns are of various types, thinking about them as an integrated denotative component of any text, necessitates reconsidering them in translation, particularly when they lack a certain morphological demarcation that lexically identifies them as only proper names. The problem emanates when the usages of such various noun types are difficult to identify in a particular linguistic context, and consequently more problematic to handle by means of an AI-run widget. Imagine a girl named after a continent (e.g. "آسيا Asia"), another after a country (e.g. هند India), or a city or town (e.g. مكة Makkah, مدينة Madinah, ...etc.); or after a plant species (e.g. "روز Rose", …etc.). Nouns are found in all human languages. They label people, places, objects and concepts, whether concrete or abstract ones. In English, as an example, proper nouns often have their initials capitalized, but other noun types are capitalized only based on their intra-sentential grammatical roles. Obviously, the issue of capitalization –which is a visible initial marker of proper nouns- does not apply to the Arabic language that has no upper-case letters. Capitalization (or upper case) is a typological feature that does not exist in the Arabic writing system. In upper case symbols, "تشكيل /taʃki:l/ vowel signs are found as grammatical markers in Arabic keyboards to identify the proper noun based on its grammatical inflection in the different three cases (genitive, accusative and nominative).

Russell and Norvig (2021, 8) state that, "Philosophers staked out some of the fundamental ideas of AI, but the leap to a formal science required the mathematization of logic and probability and the introduction of a new branch of mathematics: computation." Artificial intelligence (AI), according to Boucher (2020, 1), "…is probably the defining technology of the last decade, and perhaps also the next." The presence of AI- based tools, undoubtedly brings about a number of dubitable repercussions on the life of individuals; yet, let's perceive the brightest side. So many questions arise, indeed, in the minds of the people outside the domains that deal with and/or apply AI, (e.g. how/why AI is utilized, and for what type of tasks?) Thinking of the term Artificial Intelligence, some may focus on its being *Artificial*, others may get impressed by the *Intelligence*!

Manning (2020, 1) contends that the term Artificial Intelligence (AI) was coined by emeritus Stanford Professor John McCarthy in 1955. Manning goes on citing McCarthy's definition of AI as, "the science and engineering of making intelligent machines", adding that, "Much research has humans program machines to behave in a clever way, like playing chess, but, today, we emphasize machines that can learn, at least somewhat like human beings do." In the same respect, Boucher (2020, 1) adopts the (2018) definition of AI by the European Commission Communication for AI as, "… systems that display intelligent behaviour by analysing their environment and taking action – with some degree of autonomy – to achieve specific goals." This definition, indeed, expands the AI spectrum as covering areas and

domains unspecified yet, meaning that it is- and can be- practicable in infinite types of tasks that needs 'autonomy' and fully-automated handling of various tasks.

Nevertheless, AI does remain a product of humans, that always needs to be programmed, adjusted, improved and even 'trained'. AI is trained to self-learn (like what happens in saving previous search results, passwords, text suggestions, ...etc.). Texts are parameterized in order for an AI-software to translate or analyze them. AI-systems, then, are varied, and are expected to manipulate other never dreamt-of domains. Russell and Norvig (2021, 1021) postulate that, "…no AI system measures to" tasks that are often only done by humans. They further explain that,

> "…some proponents of general or human-level AI (HLAI) insist that continued work on specific tasks (or on individual components) will not be enough to reach mastery on a wide variety of tasks; that we will need a fundamentally new approach. It seems to us that numerous new breakthroughs will indeed be necessary, but overall, AI as a field has made a reasonable exploration/ exploitation tradeoff, assembling a portfolio of components, improving on particular tasks, while also exploring promising and sometimes far-out new ideas."

The remarkable successes of AI in the various areas of life, have led –according to Russell and Norvig (2021, 26), "…to a resurgence of interest in AI among students, companies, investors, governments, the media, and the general public", further contemplating that, "It seems that every week there is news of a new AI application approaching or exceeding human performance, often accompanied by speculation of either accelerated success or a new AI winter."

2. THEORETICAL FRAMEWORK

Observing the major efforts of the Expert Advisory Group on Language Engineering Standards (EAGLES) -launched by the European Commission- that concentrate on various types of activities, this paper focusses on the first of these activities represented in, "Detecting those areas ripe for short-term standardisation vs. areas still in need of basic research and development"; and the last activity which addresses, "Suggesting actions to be taken for a stepwise procedure leading to the creation of multilingual reusable resources, elaboration of evaluation methodologies and tools, etc." (Calzolari et. al., 1996). Moreover, and drawing on the essentials of EAGLES, this paper aims to ensure the provision of standards for the AI-translation tools (focusing on Google Translate), by means of testing the quality of AI-rendering into English various selected Arabic Source Texts. Nida's 'Functional Equivalence" is also set as a frame of reference to prove the quality of the TTs. As long as translation highly involves linguistic theories, the adoption of a proper translation theory is essential to determine the quality of the Target Texts. Investigating the effort of a machine attempting to produce a 'functionally' oriented translation, Nida's "Functional Equivalence" is sought in this paper as the main principle in evaluating the AI-translation quality.

3. LITERATURE REVIEW

This paper addresses the processing of Arabic female names by means of an AI- system, in meaningful contexts, investigating the applicability of Artificial Intelligence in name

recognition, particularly when such names are variedly chosen by families based on a number of personal impulses, like expressing a social trait, achieving a name rhyming with those of the newborn's siblings, maintaining social norms, and/or strengthening ties with those after whom the name is given, …etc. The only recent study dealing with Arabic female names is titled "Morphological Reference of Certain Contemporary Female Names", (in Arabic), by (Alfoutawi, M. A. 2023); yet, the scope of the study was not related to translation at all. It was a study that investigates the morphology and meaning of selected female names. Another study that was conducted in 2012, investigates the translation of nouns from Persian into English, but nothing was related to AI-analysis of such name formations.

To further screen the previous studies and to bridge the theoretical gap in noun translation, Xiaoyan, Siok and Che Mat (2024, 50) thoroughly examined the content of the articles selected adopting systematic literature review, based on the procedures specified by PRISMA, including detailed information on the inclusion and exclusion criteria, it is concluded that, "In total, 106 articles were removed in this stage due to their insufficient focus on the translation of nouns from non-English languages to English as the target language." After systematic thematic analysis of the previous studies, Xiaoyan, Siok and Che Mat (2024, 51) highlighted a study on (MT) system (identification of nouns, paraphrase, and shallow segmentation). Such research screening emphasizes the fact that the translation of nouns into English by means of a machine have not received sufficient investigation. In between (Harsh et al. 2015) and (Shi 2023) as explained in Table 3 in (Xiaoyan, Siok and Che Mat, 2024, 53), the research gap in MT translation of nouns appears to be huge, a reason that necessitates carrying out the current study. This study, thus, seeks to explore the wide varieties of proper name types in Arabic, drawing the attention of AI system developers to observe the morphology of Arabic female names in AI- translation. Selected Arabic female names are categorized in tables in order to facilitate error ratio statistics of their AI-rendering into English (this research paper uses Google Translate). The same texts have also been human-translated to identify the AI lapses in ST recognition. This paper investigates the constraints imposed by the varied forms of the Arabic female names in their AI-translation.

3.1.Artificial Intelligence (AI) in Translation

Being the top-topic of today's scientific advancements, this paper deals with one of the highly influential domains of Artificial Intelligence (AI), i.e. AI-translation, also termed as Machine Translation (MT). Wilks (2009, 27) takes AI "…to be the enterprise of causing automata to perform peculiarly human tasks, and by appropriate methods". Wilks, though, refrains from going into great detail about the word "appropriate", which he labels as 'difficult'- there. Regarding what he calls "an Artificial Intelligence (AI) approach to machine translation", he enumerates three reasons, this paper is concerned with the first of them in which Wilks states that, "…. if fully developed, the system to be described for representing natural language would contain two methods for expressing the content of any given utterance: one logical, the other linguistic, in a broad sense of that term." And because the logical method alone does not work, the linguistic is, therefore, required, with all its intricacies and complications like the ones dealt with in this paper.

Highlighting the early beginnings of automated translation attempts, Hutchins (2007, 6) states that, "In the 1950s optimism was high; developments in computing and in formal linguistics, particularly in the area of syntax, seemed to promise great improvements in

quality." Those great promises are practically administered in a number of fully-automated systems, despite continuous challenges that persist to date. Contrarily, Crisostomo and Ambag (2022, 188) denotes that, "The development of artificial intelligent programs for language translation is growing exponentially, with a neural machine translation of language offering more precise interpretation as unlike statistical machine translation, which interprets sentence fragments, neural machine translation translates complete sentences"; indeed, neural machine translation of 'complete sentences', necessitates giving a more precise definition for the concept of 'completion'.

Most people are almost always in continuous or intermittent contact with translation software for simple text translation, as an example. Even students and laypersons sometimes revert to MT to assist them in understanding any text any foreign language. Arnold and Sadler (1994, 4) assert that the topic of MT "is undoubtedly an important topic — socially, politically, commercially, scientifically, and intellectually or philosophically — and one whose importance is likely to increase as the 20th Century ends, and the 21st begins." Artificial Intelligence (AI), then, has a far-reaching impact on the lives of individuals. Education, health, business, …etc. are almost somehow manipulated by AI systems, like having a number tasks carried out partially or fully by the aid of AI. It continuously proves to be an inseparable part of the mechanisms used to facilitate, or, complicate life! In translation, AI has its greater contribution that has never been dreamt of, despite a few lapses, that vary from minor to major ones.

Highlighting the significance of AI, Boucher (2020, 18) states that, "The primary reason as to why AI matters is because of its immense potential benefits.", he enumerates a number of the benefits of AI, such as the, "…serious improvements to our health, production, mobility and decision-making, as well as indirect benefits such as efficiency gains and frivolous gadgets providing novelty or entertainment value." AI, with its increasing roles played in so many areas of life, it is promising to dominate jobs that were previously believed to be done only by humans. Translation is one of these domains, yet, no 'artificially-intelligent' system can entirely replace humans in dealing with texts that are a genuine product of humans themselves. Arabic Texts' translation, as investigated by this paper, unmistakably proves the fact that a machine, even though supported by what is so-called 'AI'- needs to be revised in terms of the mechanism adopted in handling such texts, particularly those comprising female names within them. In the same vein, and respect to MT evaluation efforts, Turian et. al (2003), refer to the early 1990s competitions sponsored by the U.S. government to evaluate MT systems, stating that, "One of the valuable outcomes of that enterprise was a corpus of manually produced numerical judgments of MT quality, with respect to a set of reference translations (White *et al.*, 1993)." In the same source, and identifying (Melamed, 1995) approach as an example, Turian et. al (2003) state that, "Early approaches to scoring a "candidate" text with respect to a reference text were based on the idea that the similarity score should be proportional to the number of matching words."

"AI can significantly enhance the efficiency and accuracy of translation services, particularly for Hebrew, English, and Arabic", Turjuman website (2024) explains, denoting key applications such as Machine Translation, Terminology Management and Quality Assurance, in addition to the use of Translation Memory. Turjuman clearly demonstrates that "Despite the advancements in AI, human translators remain indispensable for several reasons",

indicating Cultural Nuance, Contextual Understanding and Creative Flair. In the same respect, Naeem (2023, 487)'s study investigates the stylistic problems in English-Arabic (Google Translate), particularly "…when translating collocations in a scientific (semantic) context". Naeem's study also reveals "…the extent to which one of the neural Machine Translation programs (Google Translate) can translate scientific texts from English into Arabic,…".

3.2.Human vs AI translation

Koehn (2012, 179) states that, "An important driver of current machine translation research are annual evaluation campaigns where research labs use the latest prototype of their system to translate a fixed test set, which is then ranked by human judges." Referring to the same source, in highlighting the nature of the translation process and its possible problems, Koehn stipulates that, "…where everybody seems to disagree on what the right translation of a sentence is, it comes of no surprise that the methods used to obtain human judgments and rank different systems against each other is also under constant debate."

That earlier progress in Machine Translation systems, indeed, sparked the subsequent efforts to make a machine literally impersonating humans in so many aspects, if not all of them. Those earlier efforts were the nucleus that has launched the current advents in the production of quality tasks by means of AI-supported systems, including natural languages' processing and translation from and into a huge number of languages; something that no ordinary person, during or before the 1800s, can ever believe that what is so called 'AI' may come true one day. AI-translation, becomes an indispensable concomitant tool that unconditionally provides aid to translators in preparing editable drafts to be carefully revised, saving both time and effort, and augmenting translation production.

Needless to say that, Human translation simply refers to the translation tasks carried out by humans (with or without the aid of a computer in text receiving, retrieving and/or sending, processing, editing, …etc.). Human translators may even make use of AI-based translation models which serve as a first draft to be scrutinized and freed from possible lapses. Being the sole possessors of the minds that make it possible to understand, anticipate and tackle shackles of ambiguity or semantic multiplicity with the respective Source Text before starting the translation process, humans are always more reliable in handling natural languages, particularly texts that have direct impact on the people' lives, such as legal, medical and/or financial documents. Despite the spread fears among ordinary persons regarding machines' imminent replacement of human translators, human translators themselves, being the most cognizant of the complications encountered during the translation process, are quite assured that MT, albeit AI-supported, can never be perceived as an absolute replacement for human translators.

Machine or AI-Translation, then, often refers to fully-automated inter-lingual processing of texts. AI, with its uses in various domains, provides greater advents in the field of natural language processing. Moneus and Sahari (2024, 11) define 'Human translation and AI translation', as "…different approaches to translating text from one language to another." They further explain that while "Human translation should be performed by a person fluent in both the source and target languages who profoundly understands the cultural context and nuances of the text", "AI translation, however, is performed by a computer program using algorithms and large amounts of data to translate the text." Among -what they describe as

"widely available"- Artificial intelligence (AI)-based translation software models, Moneus and Sahari (2024, 1) mention, "Google Translate, Bing, Microsoft Translator, DeepL, Reverso, Systran Translate, and Amazon Translate." Several "computer-aided translation (CAT) tools such as Memoq, Trados, Smartcat, Lokalise, Smartling, Crowdin, TextUnited, and Memsource", are also available, according to the same source.

3.3.Intelligence level of Artificial Intelligence in translation

According to Bass (1999, 3), "The limitations of MT are clearly recognized by the makers of the software themselves", further emphasizing that, software makers, "… are no longer touting 98% accuracy rates (which translates to two errors per hundred words)." This clearly states that Artificial Intelligence is not that intelligent, indeed, to render everything! Scrutinizing 'Intelligence', Boucher (2020, 1) emphasizes that, "Various forms of 'Turing test' declare machines as intelligent when humans cannot differentiate their actions from those of a human." This statement, so how, assumes that machines are intelligent only when their performance is similar to that of humans. I do not fully agree with this assumption, since for a machine to be depicted as possessing 'Intelligence', it must –indisputably- surpasses human performance in that particular job. Since machines' intelligence is 'Artificial', we must not be too optimistic to close our eyes and get things blindly handled by means of AI. A human intervention is always required, particularly if the influence of the text rendered does have a farther outreach. On the other hand, Highlighting the logic adopted by AI systems to represent knowledge, Filman (2012, 160), explains that:

> "Logic, which was one of the first representation schemes used in AI, has two important and interlocking branches. The first is consideration of what can be said—what relations and implications one can formalize, the axioms of a system. The second is the deductive structure—the rules of inference that determine what can be inferred if certain axioms are taken to be true. Logic is quite literally a formal endeavor: It is concerned with the form, or syntax, of statements and with the determination of truth by syntactic manipulation of formulas."

Yet, how intelligent can an Artificial Intelligence be?! Also, how can it possess that outstanding ability to decode, recode and encode texts as complicated as Arabic texts, particularly when the problem of such texts lies not only in the words in their intra-sentential dimension, but also in their typological, as well as morphological realities, among other problems. Naming forms (names) of females, where selection norms sometimes supersede the language in question, stand as a critically challenging test for AI-tools as proved by the sample texts covering a wide range of female naming variations in Arabic.

"Within the context of machine translation", Dorr (1993, 4) states that, "the use of parameterized principles permits the system to operate without recourse to ad hoc stipulations found in pattern matching approaches (i. e., direct translators) or rule-based approaches (i.e., transfer translators)." Dorr further explains the primary characteristic of the *Direct Translation* approach, that it is an approach, "designed to translate out of one specific language into another Systems that adopt this approach generally consist of one large [monolithic] program with highly language-specific word- for-word replacement routines and ad hoc transformations that are per formed after lexical substitution". The *Transfer Translation*, on the other hand, "…maps the source language sentence into a machine-readable form corresponding to the

source language; this form is then mapped into a machine-readable form for the target-language, from which the target-language text is generated", according to the same source. A central claim of Dorr (1993, 14)'s study is that, "not only should the syntactic component of a machine translation system be parameterized, but other components of a machine translation system would also benefit from parameterization". Dorr's study, as well, assumes that, "In particular, the lexical-semantic component should be constructed in such a way as to allow principles of the lexicon to be parameterized". In line with Dorr's study, the findings of this research paper agree with the same. Parameterizing, then, and in order to be beneficial for an AI-translation system, needs to take more veteran measures.

3.4.Proper Names in AI-Translation

As stated by Rodríguez (2003, 123), "The translation of proper names shows itself as one of the most complex issues…", driving the attention towards 'literary translation', where names present integrated messages. Rodríguez ascribes this complexity to two problems: "the lack of a specific theory relative to the translation of names and the trends currently in force." Whether proper names (or nouns) are used in literary or other general texts, they cannot blindly be handled by AI. Even human translators need to think twice before they choose a specific name in the place of that one given to a place or a character in the Source Text, since a name is a far-flung utensil of symbolism, musicality, meaning, values, norms, memories, and contemplation. An essential component of advertising is the right choice of a properly-representative naming 'effect'. If this is the case with names in general, then how about AI dealing with special names of a particular weight and personal or social representation.

In the same respect, Abdolmaleki (2012, 832) emphasizes that, "Theoretically speaking, proper nouns are beyond the scope of language and are to be sought in encyclopedias rather than in dictionaries." Considering proper nouns in general and names of Arab females in particular, as linguistic units that are beyond linguistic analysis, AI cannot simply ignore them in most cases, due to their tricky formations that assimilate grammatical cases. Seemingly, names of different morphological forms are likely to incur deeper analysis, unless the machine is trained in parameterized translation that perceive nouns as different from other segments of the sentence, where parameterized translation input covers almost all of the recent name forms.

3.5.Name Selection Norms in the Arabic Social Context

Naming tendencies in the Arab social context have recently witnessed the use of various name kinds and types, and along with the advent of a globalized culture, and the attempts of the current generation to incur changes in the traditional naming norms of their grandparents, many young families think of choosing names for their children that often meet one or more of the following criteria, among others:

- Uniqueness of sound, musicality and/or meaning.
- Birth-coincidence with a special occasion, or a particularly special day of the week, month or season of the year, …etc.
- In less circumstances, parents name their children after their own parents, or one of their endeared relatives or friends.
- Using the name of someone to win his or her intimacy for some future plans.

3.6.Research Objectives

The study, therefore, aims to:

1) identify the challenges pertaining to the identification and recognition of Arabic female names in the context of AI-translation.

2) draw the attention of AI-translation software developers to revise text input parameters in a way that enables the machine to apply the necessary measures to avoid poor recognition of either the proper name/s or the overall context, or both,

3.7.Research questions

Research questions raised to achieve research aims, are:

1) What negatively affects AI-translation results of Arabic texts containing proper names of Arab females?

2) To what extent does female name selection vary in the Arabic-speaking communities?

3.8.Research Hypothesis

AI-Translation mistakes most Arabic female names to ordinary word categories and that is most probably due to the fact that naming norms in the Arabic speaking communities tend to adopt special name forms; nay, some of the proper names chosen by some families for their children and grandchildren do not even belong to the category of nouns. Other than proper nouns, a huge number of female name forms in Arabic can morphologically be categorized as common nouns, adjectives, verbs, and even nominal or verbal phrases!

4. METHODOLOGY

Integrating quantitative and qualitative research strategies, this paper adopts a mixed method approach, with data collected and analyzed to facilitate comparing and contrasting between the quality of translation rendered by AI-tool and by a human translator. According to King (2011, 252):

> "The EAGLES Evaluation Group decided to concentrate its efforts on adequacy evaluation of writers' aids and translators' aids, in the hope that looking at areas where the technology was relatively stable and where there were already products on the market or very close to the market would lead to tangible results in the fairly limited thirty-month life-span of the initiative."

Therefore, this paper seeks to collect data from several AI-translation attempts, analyzing errors committed in rendering texts replete with Arabic morphological intricacies. Using human translation attempts as a standard for evaluating fully-automated ones, facilitates identifying the points of AI-failure in recognizing female name forms in Arabic Source Texts. Two professional human translators were employed to translate and cross-check each one's translation, and to come-up with an agreed-upon version of the human-rendered Target Texts.

4.1.Instrument and Data Collection

For data collection, tables with selected name samples based on a specified category, are designed to show the disparities in morphological forms of such names, in addition to the inconsistency in automated recognition and analysis of such names upon rendering them from Arabic into English, first off-context, then within a meaningful context. Grammatical inflectional ending vowels are also shown in some examples to give the chance for full-option analysis of the names in context. Error ratio of every single table is calculated. The scale of the AI Attempts gives the value (1) for Error-free AI-attempts, and (0) for attempts that have errors. The percentages of the erroneous versus error-free attempts in AI-recognition of the selected

Arabic female names in context, are considered in drawing the study's conclusion and recommendations. The type of the data collected are primary data. Error ratio in the AI-translation of the selected Arabic female names in contexts is used to prove this research paper's hypothesis.

4.2.Data Analysis

The data analysis was on the basis of the data collected from the tables with the Target Texts resulted from MT rendering of the selected Arabic proper names –in meaningful contexts-into English. Quantitative data are calculated by counting the frequency of the errors in AI-supported translation processes, reflecting the applicability of computational analysis of Arabic texts comprising female proper names, and the required computational measures to overcome any possible lapses.

5. RESULTS AND DISCUSSION

Let's first of all, have a look at the following attempts as rendered by Google Translate (an AI-translation software). In these examples, AI-translation encountered two different problems, the first is represented in the two female names "زهرة /zahra/, means 'a flower', and زهور /Zuhur/" which means 'flowers'; the second problem lies in the bound pronoun "ت" which has a reference to the third person pronoun (*she*). It is confused in some of these examples to its homograph (the ت of the first person pronoun *I*).

Table 1. below, clearly shows that the bound personal pronoun 'ت' of the past tense of the transitive verb يَقْطِفُ /yaqtifu/ as in قَطَفَتْ =/qatafat/ (which means *she* picked), is confused with the bound personal pronoun "ت" as in قَطَفْتُ =/qataftu/ (which means *I* picked); as well as to the passive voice قُطِفَتْ /qutifat/ (which means was picked). Those three 'ت's are mere homographs when they are left without showing their grammatical inflectional end vowels reflecting their intra-sentential grammatical roles. Therefore, AI-based translation software developers need to reparametrize their widgets to handle such grammatical subtleties, so as to avoid any unprecedented shortcoming in the AI-output.

In the following table, Arabic STs are attempted (with and/or without end grammatical inflectional vowels):

	Arabic STs	**Human-Rendered**	**AI- Rendered**	**Error free =1 Has errors =0**
1 2	قطفت زهرة زهرة. قَطَفَتْ زهرةُ زهرةً.	Zahra picked a flower.	I picked a flower. A flower picked a flower.	0 0
3 4	قطفت أزهار زهرة. قَطَفَتْ أزهارُ زهرةً.	Azhar picked a flower.	I picked the flowers of a flower. The flowers picked a flower.	0 0
5 6	قطفت زهور زهرة. قَطَفَتْ زهورُ زهرةً.	Zuhoor picked a flower.	I picked the flowers of a flower. She picked a flower.	0 0
7	قَطَفَتْ زهرةُ زهرتين.	Zahra picked two flowers.	A flower picked two flowers.	0
8	قَطَفَتْ أزهارُ زهرتين.	Azhar picked two flowers.	She picked two flowers.	0

9	قَطَفَتْ زهورُ زهرتين.	Zuhoor picked two flowers.	She picked two flowers.	0
10	قُطِفَتْ زهرةٌ بواسطة زهور.	A flower was picked by Zuhoor.	A flower was picked by flowers.	0
Correct AI-Attempts		0%		
Incorrect AI-Attempts		100%		

Table 1. AI and Arabic Female Name Processing: Text vs Context

Table 2. below shows that AI-translation completely failed in recognizing the singular form-based Arabic female names شروق /ʃuruq/ and شمس /ʃams/. The two names have been given a semantic value, rather than merely being identified as proper names.

Selected Names	**English Meaning**	**STs**	**Human-Attempt**	**AI- Attempt**	**Error free =1 Has errors =0**
شروق /ʃuruq/	Sunrise	إنها شروق على الهاتف.	It's Shurooq on the phone.	It's Sunrise on the phone.	0
شمس /ʃams/	Sun	إنها شمس على الهاتف.	It's Shams on the phone.	It's sun on the phone.	0
Correct AI-Attempts					0%
Incorrect AI-Attempts					100%

Table 2. AI-Translation of Singular Form-Based Arabic Female Names

Table 3. below shows that AI-translation resulted in a 50% for correct, and a similar percentage for incorrect attempts. Namely; whereas the Arabic female name نوران /nuræn/ has correctly been rendered into English as a proper name, AI failed to recognize the female proper name جيلان /ʒilæn/, and, therefore, it has been identified as a dual form that means 'two generations'.

Selected Names	**English Meaning**	**STs**	**Human-Attempt**	**AI- Attempt**	**Error free =1 Has errors =0**
نوران /nuræn/	Two lights	رأيت نوران.	I saw Nuran.	I saw Nouran.	1
جيلان /ʒilæn/	Two generations	رأيت جيلان.	I saw Jeelan.	I saw two generations.	0
Correct AI-Attempts					50%
Incorrect AI-Attempts					50%

Table 3. AI-Translation of Dual Form-Based Arabic Female Names

Table 4. below shows that AI-translation resulted in a 50% for correct, and a similar percentage for incorrect attempt/s. Namely; whereas the Arabic female name أماني /Amæni/has correctly

been rendered into English as a proper name, AI failed to recognize the female proper name أفكار /Afkær/, and, therefore, it has been identified as a plural form that means 'ideas'.

Selected Names	English Meaning	STs	Human-Attempt	AI- Attempt	Error free =1 Has errors =0
أماني /Amæni/	Wishes	زارتنا أماني.	Amani visited us.	Amani visited us.	1
أفكار /Afkær/	Ideas	زارتنا أفكار.	Afkar visited us.	Ideas visited us.	0
Correct AI-Attempts					50%
Incorrect AI-Attempts					50%

Table 4. AI-Translation of Plural-Based Arabic Female Names

Table 5. below shows that AI-translation resulted in a 50% for correct, and a similar percentage for incorrect attempt/s. Namely; whereas the Arabic female name صفاء /safaʔ/ has correctly been rendered into English as a proper name, AI failed to recognize the female proper name سمراء /samraʔ/, and, therefore, it has been identified based on its semantic value, as 'brunette'. The long vowel a' – اء (in female names such as, سناء /sanaʔ/; رجاء /raʒaʔ/; …etc.), …etc. may be misinterpreted in AI-translation as the example above has shown. Probably, that was because of the higher semantic value of such name types. Only names that are so frequently used, and those previously parameterized ones, are expected to be properly handled in AI-translation.

Selected Names	English Meaning	STs	Human-Attempt	AI- Attempt	Error free =1 Has errors =0
صفاء /sˤafaʔ/	Clarity/purity.	جاءت صفاء.	Safaa came.	Safaa came.	1
سمراء /samraʔ/	Brown	جاءت سمراء.	Samra came.	Brunette came.	0
Correct AI-Attempts					50%
Incorrect AI-Attempts					50%

Table 5. AI-Translation of Arabic Female Names with the Feminizing "اء - aʔ"

Table 6. below shows that AI-translation resulted in a 50% for correct, and a similar percentage for incorrect attempt/s. Namely; whereas the Arabic female name عائشة /ajiʃa/ has correctly been rendered into English as a proper name, AI failed to recognize the female proper name آمنة /amina/, and, therefore, it has been identified based on its semantic value, 'safely' according to the grammatical role (adverb of manner) as assumed by the AI.

Selected Names	English Meaning	STs	Human-Attempt	AI- Attempt	Error free =1 Has errors =0
عائشة /ajiʃa/	Living	جاءت عائشة.	Aisha came.	Aisha came.	1
آمنة /amina/	Safe	جاءت آمنة.	Amina came.	She came safely.	0
Correct AI-Attempts					50%
Incorrect AI-Attempts					50%

Table 6. AI-Translation of Arabic Classical Female Names

Table 7. below shows that AI-translation resulted in a 50% for correct, and a similar percentage for incorrect attempt/s. Namely; whereas the Arabic female name ليليان /lajlæn/ has correctly been rendered into English as a proper name, AI failed to recognize the female proper name

ياسمين /jasmin/, and, therefore, it has been identified based on its semantic value, as a rose type, i.e. 'jasmine'.

Selected Names	**English Meaning**	**STs**	**Human-Attempt**	**AI- Attempt**	**Error free =1 Has errors =0**
ليليان /lajlæn/	Lily	أعطيتها ليليان.	I gave it to Lillian.	I gave it to Lillian.	1
ياسمين /jasmin/	Jasmine	أعطيتها ياسمين.	I gave it to Yasmin	I gave her jasmine.	0
Correct AI-Attempts					50%
Incorrect AI-Attempts					50%

Table 7. AI-Translation of Female Names Based on Rose & Flower Names

Table 8. below shows that there are evident discrepancies in AI-recognition of the selected Arabic female names in meaningful contexts. These attempts show that AI-translation has completely failed in recognizing the adjective-based Arabic female names جميلة /ʒamila/ and سعيدة /saida/. The two names have been given a semantic value, rather than merely being identified as proper names. Noteworthy, not all female names are adhered to feminizing suffixes, and, indeed, there are even a number of male names with feminizing suffixes (e.g. حمزة /ħamza/; طلحة /; حُذيفة /ħuðaifa/, البراء /albaraʔ and علاء /ʕalaʔ…etc.

Selected Names	**English Meaning**	**STs**	**Human-Attempt**	**AI- Attempt**	**Error free =1 Has errors =0**
جميلة /ʒamila /	Beautiful	إنها أخت جميلة.	She is Jameela's sister.	She is a beautiful sister.	0
سعيدة /saida/	Happy	إنها أخت سعيدة.	She is Saeeda's sister.	She is a happy sister.	0
Correct AI-Attempts					0%
Incorrect AI-Attempts					100%

Table 8. AI & Adjective-Based Arabic Female Names

Table 9. below shows that AI-translation has completely failed in recognizing the proper names صباح /sabæħ/ and سهام /sihæm/. The two names have been given a semantic value, rather than merely being identified as proper names.

Selected Names	**English Meaning**	**STs**	**Human-Attempt**	**AI- Attempt**	**Error free =1 Has errors =0**
صباح /sabæħ/	Morning	جاءت صباح.	Sabah came.	Morning came.	0
سهام /sihæm/	Arrows	جاءت سهام.	Siham came.	Arrows came.	0
Correct AI-Attempts					0%
Incorrect AI-Attempts					100%

Table 9. AI-Translation of Interchangeably-Used Names for both Males and Females

Table 10. below shows that AI-translation completely failed in recognizing the Arabic proper names ست البنات /sit-tƟl-banæt/ and منة الله /minnat-u-Allah/. The two names have been given a semantic value, rather than merely being identified as proper names.

Selected Names	English Meaning	STs	Human-Attempt	AI- Attempt	Error free =1 Has errors =0
ست البنات /sit-tƟl-banæt/	The mistress of the girls.	جاءت ست البنات.	Sit-ul-Banat came.	The six girls came.	0
منة الله /minnat-u-Allah/	The Blessing of Allah	جاءت منة الله.	Minnat-u-Allah came.	It came from God's grace.	0
Correct AI-Attempts					0%
Incorrect AI-Attempts					100%

Table 10. AI-Translation of Nominal Phrase-Based Arabic Female Names

Table 11. below shows that AI-translation has completely failed in recognizing the proper names أشرقت /ʔʃraqat/ and رضينا /radʕina/. The two names have been given a semantic value, rather than merely being identified as proper names, most probably because of their formation that projects them as independent syntactic structures.

Selected Names	English Meaning	STs	Human-Attempt	AI- Attempt	Error free =1 Has errors =0
أشرقت /ʔʃraqat/	It shone.	هذه ثياب أشرقت.	These are Ashraqat's clothes.	These clothes shine.	0
رضينا /radʕina/	We are satisfied.	هذه ثياب رضينا.	These are Radheena's clothes.	These are the clothes we are satisfied with.	0
Correct AI-Attempts					0%
Incorrect AI-Attempts					100%

Table 11. AI-Translation of Intransitive Verb-Based Arabic Female Names (past form)

Table 12. below shows that AI-translation reflects discrepancies in recognizing the selected Arabic female names of unusual name forms. It shows that AI-translation has completely failed in rendering the proper names أشرقت /ʔʃraqat/ and رضينا /radʕina/. The two names have been given a semantic value, rather than merely being identified as proper names, most probably because of their formation that projects them meaningful phrases, instead of proper names. The complicated syntactic structures of these names made them more like phrases than names of persons. While the use of an intransitive verbs as a naming component, assumes the presence of the subject, the use of transitive verbs even necessitates the representation of both a subject, as well as an object.

Selected Names	English Meaning	STs	Human-Attempt	AI- Attempt	Error free =1 Has errors =0
عجبت /ʔʒabƟt/	She was liked by others.	هذه ثياب عجبت.	These are Ajabat's clothes.	These clothes are amazing.	0
تسواهن /tƟswæhin/	She is as equal to them all together.	هذه ثياب تسواهن.	These are Taswahen's clothes.	These are clothes worthy of them.	0
Correct AI-Attempts					0%
Incorrect AI-Attempts					100%

Table 12. AI-Translation of Phrase-Based Arabic Female Names

6. CONCLUSION

Human translators' abidance by the major translation theories, is an act that machines are still unable to be subdued to. AI-analysis of natural languages such as Arabic, necessitates adopting more sophisticated models of Source-Target texts pairing. Nida's fundamental principles of translation he evoked into his 'Functional Equivalence', are expected to be taken into the AI-software developers' consideration. Challenges that preclude AI-translation' quality need to be reassessed and properly handled so as to ensure Target Text's functional, as well as communicative effect. The huge strides taken by AI, indeed, are –so far- great, yet, no one contends the absolute 'ability' of AI to carry out tasks that are, and can only be, fully carried out by humans. At the end, a machine remains a 'machine', whatsoever advances are made in its respect.

A general confession by Hermjakob et. al (2008, 389) is that, "State-of-the-art statistical machine translation (SMT) is bad at translating names that are not very common, particularly across languages with different character sets and sound systems". Hermjakob et. al (2008, 389) further contemplate that, "…although names are important to human readers, automatic MT scoring metrics (such as BLEU) do not encourage researchers to improve name translation in the context of MT", a statement dates back to more than a decade and a half. The current paper extends the same claim, that names may persist to impede MT quality, unless naming norms are standardized all over the world for machines to easily identify them in translation; a thing that is unlikely to be achieved as long as people are bearing names, not figures.

This paper asserts that further research need to carried out to investigate parameterized translation of Arabic texts that are replete with sophisticated morphological processes, multiplicity of meaning of particular words or concept, varied naming forms that stand as meaningful utterances in themselves, among others.

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