The Impact Of Using Bionic Font In Speech-To-Text Tools On The Accuracy Of English-Into-Arabic Interpretation

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Abstract

Consecutive interpreting places considerable cognitive demands on interpreters, who must simultaneously manage listening, note-taking, comprehension, and verbal output under time pressure. This study aims to examine the potential of Bionic Reading font—a typographic system that highlights the initial parts of words to enhance visual fixation—to reduce cognitive load and improve the accuracy of English-into-Arabic consecutive interpretation. It also seeks to determine whether integrating this font into Automatic Speech Recognition (ASR) tools can enhance interpreters' real-time performance by facilitating faster comprehension and minimizing loss of meaning. A quasi-experimental within-subject design was employed. Five professional Arabic-speaking interpreters performed consecutive interpretation tasks under two distinct conditions: one using ASR transcripts displayed in a standard font, and another using transcripts formatted in Bionic Reading font. Interpretation output was analyzed using Daniel Gile's EOI framework, which identifies and categorizes Errors, Omissions, and Infelicities. The findings suggest that the use of Bionic Reading font within ASR tools contributes meaningfully to improved interpretation accuracy, particularly by reducing cognitive strain and enhancing lexical recognition. These results support the development of interpreter-friendly ASR tools with customizable visual settings, affirming the role of visual text design in promoting cognitive efficiency and linguistic precision. The study opens new pathways for research into multimodal interpreter support and accessible technology design.

Keywords: Consecutive Interpreting, Automatic Speech Recognition, Bionic Reading font

أثر استخدام الخط البيوني في أدوات تحويل الكلام إلى نص مكتوب على دقة الترجمة من الإنجليزية إلى العربية

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المستخلص

تتطلب الترجمة التتبعية جهداً ذهنياً بالغاً، حيث يضطر المترجمون إلى التوفيق بين الاستماع وتدوين الملاحظات والإخراج اللفظي في الوقت الفعلي، مما يجعلهم يعملون غالباً عند أقصى حدود طاقتهم الذهنية. وتهدف هذه الدراسة إلى استقصاء أثر استخدام الخط البيوني، الذي يعتمد على إبراز بدايات الكلمات لتعزيز التثبيت البصري، في تقليل العبء الذهني وتحسين دقة الترجمة من الإنجليزية إلى العربية في مهام الترجمة التتبعية. كما تهدف إلى تبيان ما إذا كان دمج هذا الخط في أدوات تحويل الكلام إلى نص يسهم في رفع جودة الأداء، من خلال تحسين القدرة على الاستيعاب وتقليل الفاقد في المعنى أثناء النقل الفوري.

وقد تم استخدام تصميم شبه تجريبي، حيث قام خمسة مترجمين محترفين بأداء مهام ترجمة شفهية تتبعية في وجود شرطين مختلفين: الأول باستخدام خط تقليدي، والثاني باستخدام الخط البيوني داخل أداة تحويل الكلام إلى نص. تم تحليل نواتج الترجمة باستخدام إطار جيل لتحليل الأخطاء والسهو وعدم الملاءمة .ولعل نتائج الدراسة تسهم في دعم تطوير أدوات تحويل الكلام إلى نص، وفي جعلها أكثر ملاءمة للمترجمين من خلال توفير خيارات خطوط محسّنة بصريًا، ويؤكد على فعاليته في تقليل العبء الذهني وتحسين جودة الترجمة. كما تمهد هذه النتائج الطريق لمزيد من الأبحاث حول توظيف التصميم البصري لدعم الأداء المعرفي واللغوي في بيئات متعددة اللغات.

الكلمات المفتاحي: الترجمة التتبعية، أدوات تحويل الكلام إلى نص، الخط البيوني

The Impact Of Using Bionic Font In Speech-To-Text Tools On The Accuracy Of English-Into-Arabic Interpretation

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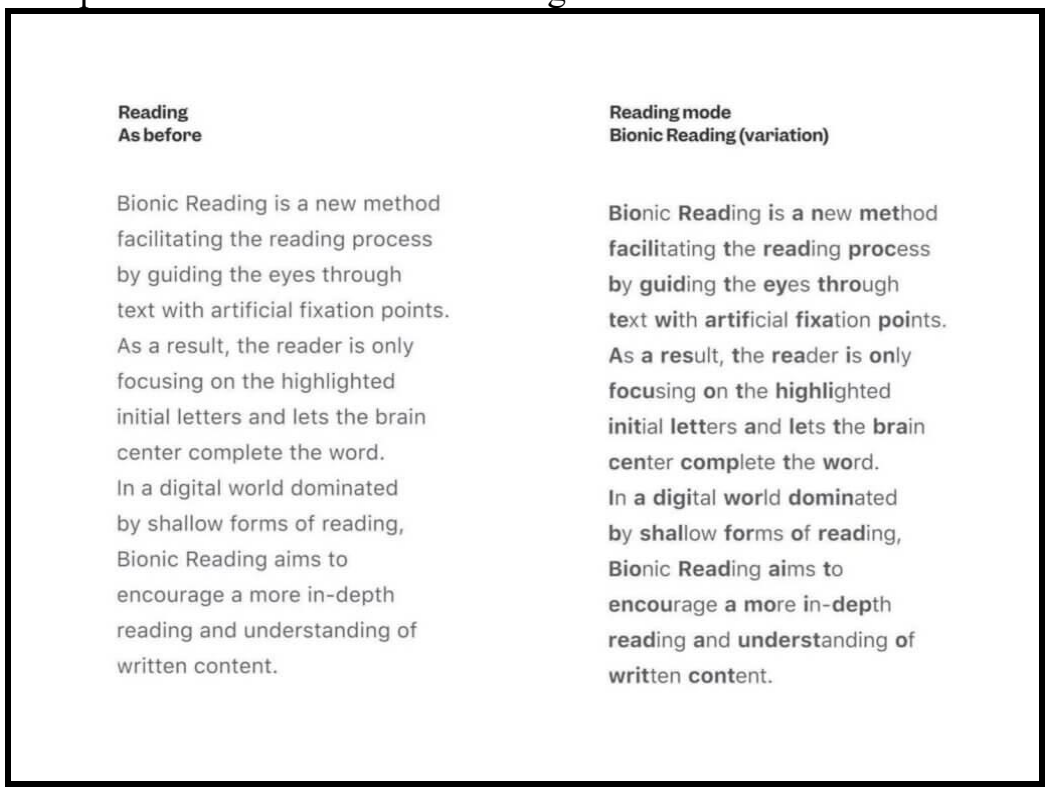
1. Introduction

Consecutive interpreting (CI) involves the sequential processes of listening, note-taking, and verbal output in another language, making it a cognitively demanding task. This study adopts Daniel Gile's Effort Model, which highlights the "tightrope hypothesis." According to Gile (1999), interpreters operate near their maximum processing capacity, balancing the efforts of listening, note-taking, memory, and verbal production. Any additional cognitive load can disrupt this balance, reducing performance accuracy. The integration of Bionic Reading font, designed to enhance reading efficiency, offers a potential method to alleviate some of the cognitive demands associated with CI tasks, Figure 1 below shows a Bionic Reading font sample.

Figure 1

A Comparison between Bionic Reading Font and Standard Font



A. Significance of the Study

Addressing the cognitive challenges faced by consecutive interpreters (CIs) is crucial for ensuring the quality and accessibility of interpreting

services. By exploring ways to optimize the user experience of ASR tools, this research contributes to a future where interpreters can perform at their best, facilitating effective multilingual communication.

B. Aim of the Study

This study aims to explore the potential of Bionic Reading font, also referred to as fast-reading fonts, to reduce cognitive load and improve interpretation accuracy in CI tasks. Specifically, it seeks to assess whether integrating Bionic Reading fonts into ASR tools can optimize the user experience for Arabic-speaking interpreters.

Research Questions

Building on the existing literature, this study aims to investigate the potential benefits of integrating Bionic Reading fonts with ASR for CIs working with Arabic languages. The study seeks to answer to the following questions:

a. Does the use of a Bionic Reading font within a speech-to-text tool, compared to a standard font, lead to improvement in interpretation accuracy for CIs?
b. Do CIs perceive a difference in their workload and ease of use when interpreting with a Bionic Reading font compared to a standard font in a speech-to-text tool?

2. Theoretical Framework

Interpreting is the oral or signed transfer of meaning from one language to another in real time, enabling communication between speakers who do not share a common language. It involves not only linguistic competence but also cultural mediation and cognitive skills to preserve the speaker's intent, style, and tone (Pöchhacker, 2016). As a complex communicative activity, interpreting requires active listening, memory retention, and reformulation skills to ensure accurate and contextually appropriate message delivery (Gile, 2009). The discipline has evolved from a practice-driven profession into a rich academic field exploring cognitive, sociocultural, and technological dimensions (Baxter, 2022).

CI is a mode of interpretation in which the interpreter listens to a speaker, takes notes, and then delivers the message in the target language after the speaker pauses. Unlike simultaneous interpreting, where speech is rendered in real-time, CI involves a sequential process that allows for greater accuracy and nuanced delivery (Pöchhacker, 2016). This method is commonly used in legal settings, medical consultations, diplomatic meetings, and press conferences where precise and well-structured communication is essential (Gile, 2009).

Gile's (2009) Effort Model (EM) provides a detailed explanation of the cognitive load during CI. Gile suggests that the interpreting process involves multiple mental efforts, which can be divided into listening, memory, note-taking, and reformulation. The model is composed of two main phases:

- Phase 1: Listening (CI - Listening = L + M + N + C)
  - L refers to the process of listening and analyzing the source message. The interpreter must perceive speech sounds (phonological level), form words (lexical level), and comprehend meaning (semantic level).
  - M is a short-term memory, where information is stored temporarily. This is particularly critical during the listening phase when interpreters must hold information in their minds before articulating it.
  - N represents note-taking, a key strategy to support memory retention during the listening phase. Notes are often used as a shorthand to capture key points that will be elaborated on during reformulation.
  - C stands for coordination, the mental effort required to balance these various activities, such aslistening, analyzing, memorizing, and writing notessimultaneously.
- Phase 2: Reformulation (CI - Reformulation = Rem + Read + P)
  - Rem involves recalling the stored information from memory.
  - Read refers to reviewing the notes taken earlier to assist in information retrieval.
  - P is the production phase, where the interpreter reformulates the source message into the target language. This involves retrieving meaning (semantic level), finding the correct words (lexical level), and producing speech (phonological level).

Gile's model is particularly useful for understanding the mental challenges interpreters face, illustrating how cognitive resources are distributed across different phases of the interpretation process (Gile, 2009).

Mankauskienė (2016, pp. 145–146) initially categorized problem triggers in simultaneous interpreting into four areas: sender-related, message-related, interpreter-related, and technical triggers. While these categories provide a foundational understanding, the cognitive and operational processes of CI differ significantly, especially concerning delayed reformulation, note-taking, and memory retention.

Message-related triggers in CI present various challenges, often universal regardless of the language pair. A psycholinguistic approach to CI highlights cognitive and linguistic constraints affecting accuracy (Aluthman & Al-Buraidi, 2021). Research on Chinese-English CI errors reinforces that interpreters commonly struggle with numbers, names, and idiomatic expressions (Li et al., 2022). These difficulties align with prior research on cognitive overload and linguistic discrepancies leading to errors (Moser-Mercer, 2000).

Numbers are particularly problematic due to their precise nature, where minor errors can distort meaning. Both Aluthman and Al-Buraidi (2021) and Li et al. (2022) emphasize the importance of effective note-taking for numerical accuracy. Numerics place a high cognitive load on working memory, increasing error likelihood if not efficiently recorded (Gile, 2009). Structured note-taking, using symbols and abbreviations, can alleviate this cognitive burden and enhance accuracy (Liu, 2021).

Names also pose a significant challenge, requiring accurate recall, pronunciation, and cultural appropriateness. Memory constraints can lead to mispronunciations or omissions (Aluthman & Al-Buraidi, 2021). Phonological and orthographic differences between languages exacerbate name-related errors, necessitating advanced memorization techniques (Kurz, 2001).

Idiomatic expressions represent another common difficulty, often lacking direct equivalents. Interpreters must rely on contextual reformulation to convey intended meaning (Baker, 2018), which requires a deep understanding of linguistic and cultural nuances. The dynamic nature of idioms further complicates this challenge (Katan, 2014).

Interpreter-related triggers include the interpreter's experience, background knowledge, and mental state (e.g., fatigue), all of which directly influence their ability to manage CI's cognitive demands. These factors can impair performance by affecting memory retention or note-taking efficiency. For instance, inexperienced interpreters may struggle with organizing notes during long speeches. This aligns with Gile's (2009) Effort Models, which emphasize the importance of strategic behavior in managing interpreting demands.

Rahmanpanah (2023) categorizes strategies into process-oriented (e.g., anticipation, chunking, delaying response) and product-oriented (e.g., compression, omission, paraphrasing) to manage cognitive load and ensure clarity. Implementing these strategies in training can enhance stress management and overall accuracy in CI.

Research on interpreting students by Arumí Ribas (2012) reveals that novice interpreters face more difficulties, especially during listening and comprehension, often due to unfamiliar topics and fast speech. While advanced students encounter fewer problems, they show greater awareness of unresolved issues and employ a broader range of tactics like paraphrasing and strategic omission. These findings align with Aluthman and Al-Buraidi's (2024) psycholinguistic approach, which stresses that memory retention and cognitive management are critical skills developed through training.

In CI, sender-related triggers are compounded by the need for memory retention and structured note-taking. Cognitive load is a pivotal factor, influencing interpreters' capacity to process and convey information accurately. CI involves listening, comprehension, note-taking, and message reformulation, all demanding substantial cognitive resources. High information density or rapid speech can overwhelm interpreters, leading to omissions or inaccuracies.

Daniel Gile's (2009) EM provides a theoretical framework, outlining four primary efforts:

1. Listening and Analysis Effort: Comprehending the source message.
2. Memory Effort: Temporarily storing information.
3. Production Effort: Note-taking and delivering the message.
4. Coordination Effort: Managing attention across tasks. Gile (2009) posits that when the total cognitive load exceeds available capacity, performance deteriorates—a phenomenon he terms "mental saturation."

Technical triggers, such as poor audio quality or visibility issues, further complicate CI. These issues, along with environmental distractions or inadequate preparation time, exacerbate existing difficulties during the listening phase. Technical or channel-related issues significantly impact CI due to equipment limitations and environmental factors, leading to decreased accuracy and increased cognitive load.

Key causes include:

- Audio Quality and Transmission: Poor audio quality hinders comprehension, which is critical in CI where interpreters must listen attentively before delivering their translation (Fantinuoli, 2016).
- Equipment Malfunctions: Technical failures like microphone malfunctions or improper headset use create significant barriers. Experimental studies show audio distortions and inadequate booth setups lead to delays and increased cognitive load (Cheung & Li, 2022).

- Mental Fatigue from Unclear Audio: Interpreters experience increased mental fatigue when compensating for unclear audio, leading to diminished fluency and consistency (Tammasrisawat & Rangponsumrit, 2023).

The initial wave of technological advancements in CI focused on tablet-based note-taking tools rather than full automation (Drechsel & Goldsmith, 2016; Altieri, 2020). These digital tools aim to modernize traditional note-taking methods by offering interpreters the ability to organize, edit, and store notes more efficiently. Moreover, some interpreters remain reluctant to switch from traditional pen-and-paper methods due to concerns over confidentiality and operational practicality (Riccardi, 2003). These challenges paved the way for researchers to explore more advanced digital solutions, such as ASR.

ASR technology is increasingly being integrated into CI workflows, with the aim of supporting interpreters in managing cognitive load, improving accuracy, and facilitating terminology rendition. Recent research has provided a nuanced understanding of both the benefits and challenges associated with ASR in CI (Chen & Kruger, 2023). ASR is particularly effective at capturing numbers, names, and acronyms, which are common sources of errors in traditional note-taking (Restuccia, 2023). By providing a real-time transcript, ASR aims to reduce the risk of mishearing or omitting critical details. Chen & Kruger (2023) examined how interpreters interact with ASR-assisted transcripts and found that having a textual reference can improve accuracy and completeness. However, their study also raised concerns about the cognitive burden of simultaneously reading and listening, which can affect message delivery and reformulation quality.

Despite its benefits, ASR does not eliminate all challenges associated with CI. One major concern is overreliance on transcripts, which can lead to a passive approach to interpretation (Fantinuoli, 2017). These technical limitations make it necessary for interpreters to continuously verify and correct ASR outputs, adding an additional cognitive burden.

Several studies have compared the effects of different font types on reading comprehension and memory. Dressler (2019) investigated the impact of font type under time constraints, finding that students reading extended texts in an easy-to-read font (Times New Roman) scored higher on comprehension and memory tasks than those reading in a difficult-to-read font (Haettenschweiler). The study concluded that when cognitive resources are diverted to decode complex typography, fewer resources

remain for comprehension, leading to lower performance. This finding aligns with the broader literature suggesting that serif fonts, like Times New Roman, are generally perceived as more readable for extended texts due to their visual cues, which help guide the reader's eye and reduce cognitive effort. In addition to font style and spacing, font weight or boldness has emerged as a critical factor in shaping visual attention and reading efficiency, especially in typographically demanding environments. Eye-tracking studies have shown that bold fonts can both attract attention and affect the dynamics of eye movements. For instance, Vladić et al. (2024) investigated bold, semi-bold, and regular font weights in product packaging contexts and found that bold fonts captured gaze for longer durations, although these differences were not always statistically significant. The visual salience of bold text appeared to enhance focal attention, even subconsciously.

Bionic Reading font is a typographic method that bolds the initial letters of words to create artificial fixation points, aiming to enhance reading speed and comprehension by guiding the reader's eye (Casutt, n.d.). The technique leverages the brain's ability to recognize words through minimal visual input, reducing cognitive load during reading tasks (Reading, 2025). While evidence is mixed, several studies suggest Bionic Reading font may enhance reading comprehension, particularly for struggling readers or those with cognitive differences, benefits that could carry meaningful implications for CI, where rapid comprehension and recall are essential.

In a quasi-experimental study, Budomo et al. (2023) demonstrated the ability of Bionic Reading font in improving considerably the motivation and self-efficacy of students with learning disabilities, two factors closely linked to improved reading performance. These findings suggest that Bionic Reading font can create a more accessible and confidence-boosting reading environment, which may benefit novice interpreters or trainees dealing with dense source material.

From a training perspective, Bionic Reading font could enhance note readability and help learners identify key information faster by bolding essential words. This is particularly relevant in CI, where interpreters must rely on quick visual retrieval and structured memory cues to reconstruct meaning accurately and fluently. Lastly, the Studyory (2025) meta-review concluded that while many findings are inconclusive, positive outcomes do exist, especially for readers who struggle with traditional text presentation. This supports the idea that Bionic Reading font may be most effective when targeted toward specific learner profiles or used as a supplementary tool in interpreter education. Additional

research indicated that while Bionic Reading font font might not significantly enhance comprehension or speed, they could have positive effects on students' motivation to read when combined with other technologies like text-to-speech (Language Educators Assemble, 2023). Although improvements in comprehension were not consistently significant across all participants, these findings align with Gile's EM of CI, which emphasizes the interpreter's need to balance cognitive resources among listening, memory, and note-taking tasks. By reducing visual load through enhanced text presentation, Bionic Reading font may help free up attentional capacity, allowing interpreters and readers to allocate more cognitive effort to comprehension and memory processes. This suggests that Bionic Reading font could be a valuable tool for managing cognitive demands in complex multitasking environments.

3. Methodology

This study investigates the impact of Bionic Reading font on (CI) accuracy using a quasi-experimental within-subjects design.

3.1 Variables

Participants completed CI tasks under two conditions: using an Automatic Speech Recognition (ASR) tool displaying transcripts in a Bionic Reading font and in a standard font. The independent variable was font type (bionic vs. standard), and the dependent variable was interpretation accuracy, operationalized as the percentage of accurately rendered units of meaning.

3.2 Participants

Three participants from the Faculty of Al-Alsun, Ain Shams University, Cairo, Egypt, took part in this study. The three participants are professional interpreters, all actively engaged in interpretin. All were native Arabic speakers with high English proficiency and normal/corrected-to-normal vision.

3.3 Study Conditions and Materials

The experiment was conducted in a soundproof laboratory to ensure consistent audio quality and transcription accuracy. Participants used ASR-generated transcripts as their primary reference, aiming to assess performance when relying on ASR output over traditional note-taking.

Speech Data: Two 6-minute segments from IBM Technology YouTube videos, "Putting AI to Work for Finance" and "Putting AI to Work for Marketing," were used for the standard and Bionic font conditions, respectively. These videos were matched for information density, thematic complexity, and speech rate. Each 6-minute segment

was divided into three approximately 2-minute parts. All interpretations were audio-recorded and analyzed for accuracy using Gile's EOI (Errors, Omissions, Infelicities) framework.

ASR Tool and Font Conditions: A MacBook's built-in microphone and integrated Speech-to-Text (STT) feature generated real-time transcripts. In Stage 1 (standard font condition), participants interpreted using transcripts displayed in Times New Roman. In Stage 2 (experimental condition), the same participants interpreted using transcripts converted to Bionic Reading font via the Bionic Reading desktop application, which bolds initial letters/syllables to guide reading focus. The STT output was either directly used (Stage 1) or converted (Stage 2) before presentation.

3.4 Data Analysis Procedures

Interpretation accuracy and output information were analyzed using Gile's EOI framework (2011). This involved identifying and quantifying:

- Errors (E): Incorrect or misleading information, factual inaccuracies, grammatical mistakes altering meaning, or unoriginal additions.
- Omissions (O): Left-out words, phrases, or segments, whether unintentional (memory lapses, cognitive overload) or intentional strategic choices.
- Infelicities (I): Awkward, unnatural, or inappropriate renderings in the target language (e.g., stilted phrasing, inappropriate register).

C. 4. Analysis

This part presents the findings of the study, which is targeted specifically at evaluating the impact of font type, standard versus Bionic Reading Font, on the performance of Arabic-speaking professional interpreters during CI tasks. The analysis is divided into two main sections. The first section presents the objective analysis of interpreting performance, specifically examining the accuracy of the interpretations based on Gile's (EOI) framework. Raw scores for each participant are first summarized in Table 1, which details the number of errors, omissions, and infelicities observed under each font condition.

4.1 Quantitative Analysis of Interpreting Performance

This section presents the raw error counts observed in the interpretations under each font condition. The number of errors, omissions, and infelicities made by each participant is summarized in Table 1. The analysis aims to identify any consistent trends or improvements in performance when using the Bionic Reading Font versus the standard font.

Table 1

Raw Accuracy Errors by Participant and Font Type

Participant	Font	E	O	I
1	Standard	18	10	13
1	Bionic	9	6	8
2	Standard	25	10	18
2	Bionic	15	7	9
3	Standard	19	9	14
3	Bionic	8	6	9

D. 4.2 Qualitative Analysis of Error Types

This section presents examples of the different types of errors (as defined by Gile's EOI framework). Each example includes a brief explanation of the error, its potential impact on meaning, and a suggested correction.

E. 4.2.1 Bionic Reading Font Condition

Interpreter 1

In analyzing the interpretation of the three segments, many EOI were identified, some of which significantly distorted the meaning for example in segment 3:

"Now the second disruptive opportunity is personalization, where generative capabilities may have even more impact. For years, AI has been helping marketers identify targets, predict attrition, recommend products and more, but the AI couldn't create content. Generative AI and its ability to create or customize at speed, means it's now possible to personalize messages in much more granular ways. This allows for micro-segmentation, addressing very specific needs and attributes, while still ensuring a brand's voice and offer is properly represented."

Which is interpreted as:

"ان الفرصة الثانية التي يمكن للذكاء الاصطناعي التوليدي أن يوفره هو التشخيص . فيمكن للذكاء الاصطناعي أن يساعد العاملين في مجال التسويق أن يحددوا الجمهور المستهدف الذي يقدمون إليه الخدمات أو المنتجات، فبالطبع لأن الذكاء الاصطناعي التوليدي يعني السرعة فبالطبع هذا يعني أن تشخيص الرسائل، وتشخيص الخدمات أو المنتجات أو أيٍّ يكن، تحدث بسرعة وبطريقة فعالة فبالطبع، هذا يتيح لنا الفرصة بأن يكون هناك العديد من الرسائل الفردية،

وهذا ما نسميه بالتشخيص، وهذا ما يستطيع الذكاء الصناعي التوليدي أن يفعله .فهذا النظام يجعل بإمكاننا أن نفعل ذلك بسرعة فعالة وأكثر دقة."

First, there is a terminological error in the translation of the word “personalization”, which was rendered as “التشخيص.” This term is typically used in medical or diagnostic contexts and does not convey the intended marketing concept of tailoring experiences or content to individual user preferences. A more accurate translation would be “التخصيص” or “التفريد.” Additionally, the interpreter omits several key elements from the source text, such as AI’s prior role in predicting attrition and recommending products, which are central to understanding the progression and enhancement that Generative AI introduces. There is also a noticeable infelicity in the phrasing “ تشخيص الرسائل، وتشخيص الخدمات أو المنتجات أو أيٍّ يكن”, which is vague and repetitive, lacking the precision and coherence of the source. The overall interpretation reduces the clarity and impact of the original message. A more complete rendition would include:

"لقد ساعد الذكاء الاصطناعي المسوّقين سابقًا في تحديد الجمهور المستهدف والتنبؤ بفقدان العملاء وتقديم التوصيات، لكنه لم يكن قادرًا على إنشاء المحتوى. وهنا يأتي دور الذكاء الاصطناعي التوليدي ".

This provides necessary context for the audience.

Another clear error appears in the treatment of the abbreviation "CMOs" in the source speech: “67% of CMOs stated that they plan on implementing Generative AI…”. This is generalized and incorrectly interpreted as "67% من الشركات التي تعمل في مجال التسويق...". This translation substitutes a group of individuals (Chief Marketing Officers) with corporate entities, thereby misrepresenting the referent and the source of the data. This results in an inaccurate portrayal of who is planning the adoption. A better rendering would be: "67٪ من كبار مسؤولي التسويق صرّحوا بأنهم يخططون...", which correctly refers to decision-making individuals rather than organizations.

Among the infelicities, one example is the Arabic rendering of: “Generative AI can assemble the information from her viewing history with the incident she experienced…”, which in the production becomes: "استطاع الذكاء الصناعي أن يجمع المعلومات من خلال استرجاع الذاكرة الخاصة به...". The phrase "استرجاع الذاكرة الخاصة به" presents the AI in an awkward and unnatural way. It is stylistically inappropriate, as it assigns a cognitive function ("memory") to a machine. A better phrasing would be: " استنادًا إلى سجل مشاهدتها والبيانات المتعلقة بالحادثة...", which grounds the action in data retrieval and removes unnecessary figurative language. Another infelicity appears toward the end of the speech in the phrase: " أن استخدام الذكاء الاصطناعي التوليدي بشكل آمن هو الشيء ذو الفاعلية". This is a semantically vague

and stylistically clunky expression. It incorrectly conflates "safety" with "effectiveness" and omits the idea of responsible implementation conveyed in the source speech: “to do it safely, responsibly and effectively.” A more fluent and accurate rendering would be: " لكن لا بد من استخدام الذكاء الاصطناعي التوليدي بطريقة آمنة ومسؤولة وفعالة." This version maintains the triadic structure and reflects the original’s rhetorical emphasis.

One area where the interpreter's production showed strength was in personalizing customer feedback, aligning well with the source speech’s narrative example. The source speech says: “Stephanie, I’m so sorry the projector broke down yesterday at Queensway Mall…”, and the interpreter renders this as: " أنا آسف على عطل الفيلم ليلة أمس في المكان المحدد للفيلم، وذُكر اسم المكان، وأن التذكرة القادمة الخاصة بها ستكون مجانية." Although this was somewhat paraphrased and not as precise, it preserved the personal tone, the apology, and the customer service gesture, which are the key communicative intentions. However, clarity and cohesion could be improved by reconstructing it as: " نعتذر لكِ يا ستيفاني عن تعطل جهاز العرض ليلة أمس في سينما كوينزواي، ونود إعلامكِ بأن تذكرتكِ التالية ستكون مجانية كتعويض عن ذلك." This version aligns better with Arabic discourse norms and is clearer in structure.

Interpreter 2

In examining the interpretation of the three segments, many EOI were identified, many of which significantly distorted the meaning, tone, or technical precision of the source speech.

In segment 3: “Now the second disruptive opportunity is personalization, where generative capabilities may have even more impact. For years, AI has been helping marketers identify targets, predict attrition, recommend products and more, but the AI couldn’t create content.”

was misinterpreted as:

"وأيضًا يتيح لهم توجيه تركيزهم على العمل الاستراتيجي والابتكاري، مما يعطي فرصًا للتخصيص ولإعطاء القدرات التوليدية. وهذه القدرات التوليدية ممكن أن يكون لها تأثير أكبر بالنسبة للذكاء الاصطناعي. الذكاء الاصطناعي كان يساعد، ولا يزال يساعد، أخصائيين التسويق للتعرف واستهداف وتوقع الأشياء، وإعطائهم التوصيات بالنسبة للمنتجات وأكثر بكثير. ولكن نعم، أنا لم أستطع أن أقوم بابتكار المحتوى"

A critical error occurred in the mismanagement of pronouns, most notably when “but the AI couldn’t create content” was misinterpreted as “ولكن نعم، أنا لم أستطع أن أقوم بابتكار المحتوى,” introducing a grammatical and referential shift from third person to first person. This created a misleading personal attribution and severely compromised coherence, as

the original message refers to AI in the third person, not as a personal struggle. The correct translation would be: " لكن الذكاء الاصطناعي لم يكن قادرًا على ابتكار المحتوى," preserving the third-person reference to the AI.

Another major error involved the mistranslation or dilution of key technical terms. For example, "content velocity" was rendered as " سرعة المحتوى," which does not accurately convey the concept of rapid, scalable content production. A better translation would be: "سرعة إنتاج المحتوى" or "سرعة إنشاء المحتوى," which emphasizes both speed and the process of production. Furthermore, "personalisation at scale" lost its strategic and data-driven implications through vague repetition. A more accurate translation would be: "التخصيص على نطاق واسع," which conveys the strategic ability to personalize content for large numbers of customers, based on data.

There were also idiomatic errors, such as the misinterpretation of "the writing's on the wall," which was replaced with "ويتحدث الكلام عن نفسه" a different idiom that lacks the original's connotation of impending inevitability and foreshadowing. The correct idiomatic expression in Arabic might be "الكتابة على الجدار," or simply, "الأمر أصبح واضحًا الآن" to retain the meaning of something inevitable approaching.

Numerous infelicities were observed in the register and tone, where the interpreter fluctuated between formal and colloquial Arabic (e.g., " أنا أريد أن أكون قادرة"), disrupting the stylistic consistency and undermining the professional tone expected in a corporate marketing context. In formal contexts, the phrase should ideally be rendered as "أرغب في أن أكون قادرة," maintaining a consistent, formal register throughout. The interpreter also added redundant elements, such as "وأنا أرى العديد من الشكاوى تأتي لنا," which unnecessarily elaborates on the already clear context of incoming complaints.

While the general meaning of the segments was maintained, these issues disrupted the flow and precision of the original message, which is particularly crucial in a professional and technical discourse such as this.

Interpreter 3

In segment 3:

"For Generative AI to be used at scale within the enterprise, tuning and training models to be brand knowledgeable it's a necessity. Once we have models that understand your company, your brand, your products and services, and most importantly, your customers, how are we going to take advantage of this powerful capability? Let's start at the beginning of the creative process and change the way creatives ideate; provide guidance as to the customer need, persona, concept; and put Gen AI to work creating a raft of ideas to jumpstart your product teams, writers and

designers. Once you get past ideation, you can land on your idea and move into what I'll call the creative production process. The magic of the big creative idea, it needs to be brought to life through a series of disciplined steps. We call this the content supply chain. And for enterprise clients, it's truly like a production line."

Was rendered as:

"الذكاء الاصطناعي الإنشائي تستعمله الشركات على مدى واسع من داخل الشركات عن طريق تدريب نماذجه وتحديدها، لتخصص نموذج الشركة ويكون معلومًا للناس، وأيضًا أهمية مرة تتيح لهذه النماذج في الشركة أن تسوق المنتج وخدماته، وأهم شيء أن العملاء سيستنفعون من هذا الأمر، وقابلية استعماله في بداية العملية الإبداعية تتغير بناء على المشورة المقدمة في البداية، لأن العميل سيحتاج بعض الأفكار الأساسية التي ممكن يعمل عليها الذكاء الصناعي وتكون دفعة للمنتج والكتاب في الفريق وأيضًا المنشئين. بمجرد أن تتخطى فكرة إنشاء الفكرة يمكن أن تتعامل مع إنشاء المحتوى، وتوفيره للعملاء أو الشركات الأخرى هو عملية إنتاج أو خط إنتاج سيكون متوفرًا عندك بمجرد أن تحقق الأهداف المطلوبة منك، وتحقق رسالتك التي تحاول أن تعرضها، وإبداعك الذي تحاول أن تجعله ملكية ممكن تستعملها عن طريق القنوات المختلفة."

A similar error pattern is repeated in this longer segment with terms such as "content supply chain" becoming "عملية إنتاج أو خط إنتاج," which misses the industrial-metaphor nuance and structured nature of the content pipeline. Additionally, "derivative versions of your creative" is rendered too vaguely as "أستطيع أن أستعملهم بطرق مختلفة في العملية الإبداعية," which omits the core idea of localized or format-specific content assets.

Several key ideas are omitted, including the distinction between ideation and creative production, the manual nature of current production processes, and the role of Gen AI in automating them. For example, the source's point that "once you get past ideation... move into creative production" is condensed into a vague mention of " إنشاء فكرة إنشاء الفكرة... المحتوى" without elaborating on the structured, step-by-step process mentioned in the original. There are multiple examples of clumsy or unclear phrasing, such as: " من خلال فقط أساليب بسيطة... والذي يتيح قابلية المشاركة وأهمية مرة مثل بعض الكتابات البسيطة," which is repetitive and lacks fluency. " تتيح لهذه النماذج" is awkward and unclear in Arabic.

One of the most frequent and significant issues in this segment is the misuse of fixed technical terminology, particularly in the repeated rendering of "Generative AI" in the source speech as " الذكاء الاصطناعي الإنشائي" in the output. The adjective "الإنشائي" connotes meanings related to construction or structural composition terms used in engineering or architecture, rather than the generative, creative output implied in "Generative AI." This mistranslation demonstrates a fundamental misunderstanding of established compound technical terms in Arabic.

The correct and widely accepted equivalent in Arabic is “ الذكاء الاصطناعي التوليدي”, which accurately reflects the concept of AI that generates new content. This error, which recurs across the segment, has high severity due to its potential to misinform audiences about a core concept in the source speech.

Conceptually, the interpreter captures the general idea that generative AI can be used within companies and that it supports content creation, but some key elements are either distorted or missing.

4.2.2 Standard Font Condition

Interpreter 1

The rendition contains a series of EOIs that impair the precision and informative value of the output. Furthermore, the source speech's illustrative scenario comparing manual financial analysis versus Gen AI–driven automation in segment 2:

“Consider how much time you might spend creating a financial analysis in Excel. You have to gather and input data from multiple sources, build charts and pivot tables to visualize the results, then format it all into a stakeholder-ready presentation. That’s roughly half a day’s worth of work, minimum. You could spend 50% of your day sorting through spreadsheets, or you could spend 10% of your day prompting a Gen AI model to help you create what you would need in a fraction of the time. Instead of spending hours on data entry and designs, let’s say you decided to use Gen AI. It quickly ingests and structures your financial data, provides you with relevant insights and packages everything in a presentable, shareable format. How much time do you think it took to create your financial analysis using Gen AI??

"ففكّركم من الوقت تقضي في إنشاء ملف حسابات خاص بالتحاليل التي لها علاقة بالأمور المالية الخاصة بشركتك؟ وكم من الوقت تستغرقه في جمع المعلومات من مصادر مختلفة، وإنشاء العديد من الرسوم البيانية والجداول؟ وكم من الوقت تستغرقه في النظر في النتائج؟ وكيف تقدم ذلك خلال عرض لأصحاب المصلحة؟ فبالطبع، يتم طلب منك ذلك في وقت قصير جدًا. فيمكن أن تقضي خمسين في المئة من يومك في محاولتك محاولة أن تنشئ مثل هذه الملفات، ولكن إن استخدمت نموذج الذكاء الاصطناعي هذا التلقائي، فيمكنك أن تستغرق من وقتك فقط عشرة في المئة من يومك. وهذا سيساعدك على إنشاء ما تريد بجزء صغير جدًا بالمقارنة بالطرق التقليدية العادية. دعوني أقول إنك قد قررت أن تفعل ذلك بسرعة، أردت أن تفعل ذلك بسرعة، وأردت أن يكون لديك أفكار لها علاقة بالبيانات التي لديك، وتريد أن تخلق أو تنشئ ملفًا خاصًا بالتحليل المالي الخاص بشركة لك، ولديك فقط بضع ساعات قليلة لإنشاء مثل هذه الملفات. فماذا تفعل؟"

The Arabic interpretation of this segment demonstrates several omissions, errors, and infelicities that collectively result in a loss of clarity, precision, and alignment with the original source. The original sentence, “Consider how much time you might spend creating a financial analysis in Excel,” is rendered loosely as " ففكّركم من الوقت تقضي في إنشاء ملف

حسابات خاص بالتحاليل التي لها علاقة بالأمور المالية الخاصة بشركتك؟" This rendering suffers from awkward phrasing, infelicity, and introduces redundancy and verbosity, such as "التحاليل التي لها علاقة بالأمور المالية الخاصة بشركتك," which could be more succinctly and clearly translated as "تحليل مالي باستخدام Excel."

The next original sentence, "You have to gather and input data from multiple sources, build charts and pivot tables to visualize the results, then format it all into a stakeholder-ready presentation," is significantly reduced in the interpretation. While it loosely references collecting information and creating charts, it omits the critical technical term "pivot tables," and fails to clearly articulate the idea of data visualization and presentation formatting for stakeholders. The interpretation says: " وكم من الوقت تستغرقه في جمع المعلومات من مصادر مختلفة، وإنشاء العديد من الرسوم البيانية والجداول؟ وكم من الوقت تستغرقه في النظر في النتائج؟ وكيف تقدم ذلك خلال عرض لأصحاب المصلحة؟" which splits the sentence unnaturally and reduces the clarity and flow of the original process-oriented description. Furthermore, "النظر في النتائج" (looking into the results) is a vague rendering of "visualize the results," which would have been better translated as "تصوّر النتائج" or "عرض النتائج بصريًا."

The critical sentence, "That's roughly half a day's worth of work, minimum," is completely omitted, which eliminates a key time benchmark for comparison in the overall argument.

The explanation of how Gen AI works is greatly simplified and some crucial benefits are omitted. For example, the original: "Instead of spending hours on data entry and designs… Gen AI quickly ingests and structures your financial data, provides you with relevant insights and packages everything in a presentable, shareable format," is compressed into: " أردت أن يكون لديك أفكار لها علاقة بالبيانات التي لديك، وتريد أن تخلق أو تنشئ ملفًا خاصًا بالتحليل المالي الخاص بشركة لك، ولديك فقط بضع ساعات قليلة لإنشاء مثل هذه الملفات", which distorts the causal relationship (cause and effect of using Gen AI) and fails to capture the system's functionality like structuring, and presentation formatting.

Furthermore, the original rhetorical question "How much time do you think it took to create your financial analysis using Gen AI?" is entirely omitted, and instead replaced with a generic question: "فماذا تفعل؟" This significantly weakens the persuasive, reflective effect the original question was intended to evoke.

One prominent issue is the repeated and inconsistent use of the term "الذكاء الاصطناعي التلقائي" to refer to various forms of AI. The source speech clearly distinguishes between Traditional AI, which performs

routine, rule-based tasks "for you", and Generative AI (Gen AI), which assists "with you" in more complex and creative processes. In the rendition, however, both concepts are referred to interchangeably as "الذكاء الاصطناعي التلقائي", leading to conceptual confusion. For instance, in the source speech statement: "Gen AI helps you create content using deep learning models… to generate something brand new", the interpreter paraphrases this as: " نُعلّم تلك الآليات الذكاء الاصطناعي الأنماط المتشابهة والهياكل التي نستخدمها لإدرار المعلومات", omitting the generative aspect and the role of deep learning altogether. A more accurate and informative translation would use "الذكاء الاصطناعي التوليدي" and include "نماذج التعلم العميق" to retain the technical clarity of the source speech.

Another example lies in the omission of the four primary finance workflows listed in the source speech: "order to cash, financial planning and analysis, record to report, and procure to pay." These foundational industry terms were entirely skipped in the interpreter's production, despite their relevance to finance professionals and their centrality to the argument about AI's impact areas. Similarly, the source speech highlights that "organizations that have implemented AI report an 18% ROI… operationalized AI 24%... optimized AI 51%". These compelling statistics, which provide quantifiable proof of AI's value, were omitted entirely in the interpreter's production. This represents a major Omission (O) under Gile's EOI framework, as it weakens the persuasive force and informational accuracy of the interpretation.

In conclusion, the errors observed in these segments are not minor lapses but rather systematic issues that significantly distort the source message. The overgeneralization of AI terminology, omission of key concepts and figures, and failure to preserve the rhetorical and technical specificity of the original content all contribute to a notably reduced communicative value in the interpretation.

Interpreter 2

A key trend across all segments was the interpreter's conflation of traditional AI and generative AI capabilities, leading to multiple semantic errors.

In segment 2:

"Traditional AI does routine tasks for you, so you don't have to. Generative AI, on the other hand, does complex tasks with you so you can work more efficiently. Gen AI helps you create content using deep learning models. These models analyze your existing data, learn its common patterns and structures, then use that information to generate something brand new. Using prompts, like specific queries or instructions, you can guide and refine your Gen AI content as needed.

Consider how much time you might spend creating a financial analysis in Excel. You have to gather and input data from multiple sources, build charts and pivot tables to visualize the results, then format it all into a stakeholder-ready presentation."

"الذكاء الاصطناعي التقليدي يقوم بعمل الاختبارات الروتينية بدلًا عنك، لذلك ليس عليك أن تقوم بها بنفسك. ولكن على الجهة الأخرى، الذكاء الاصطناعي الابتكاري يقوم بعمل المهام المعقدة معك من أجل أن تقوم بأداء عملك بصورة أكثر جودة. يساعدك الذكاء الاصطناعي التوليدي في عمل المحتوى باستخدام نماذج التعليم العميق. هذه النماذج تقوم بتحليل متعلمي البيانات الموجودين، وتحليل الأنماط الشائعة والتراكيب، وتستخدم هذه المعلومات لإنتاج أو ابتكار شيء جديد جدًا باستخدام نماذج مثل الأسئلة المعينة أو الإرشادات المخصصة التي تستطيع أن تسترشد بها لتقوم بتلميع محتوى الذكاء التوليدي كما تحتاج. قم بوضع في الاعتبار كمية الوقت التي تحتاجها في التحليل التمويلي باستخدام برنامج الإكسل، حيث يجب عليك تجميع وإدخال البيانات من مصادر متعددة، وتحتاج إلى أن تقوم ببناء الجداول وتحريكها وتضبيطها لإعطائك النتائج المرئية، وبعدها تقوم بوضعها في خط معين لتكون جاهزة للأشخاص الذين ستعرضها لهم."

The Arabic interpretation of this segment contains a mix of accurate rendering and several problematic areas. Starting with the sentence "Traditional AI does routine tasks for you, so you don't have to," it is rendered as " الذكاء الاصطناعي التقليدي يقوم بعمل الاختبارات الروتينية بدلًا عنك". The word "الاختبارات" (tests) is a mistranslation; the original "routine tasks" should have been rendered as "المهام الروتينية" to maintain the correct contextual meaning. This is a lexical error that significantly alters the intended message.

In the sentence "Generative AI, on the other hand, does complex tasks with you so you can work more efficiently," the Arabic version " يقوم بعمل المهام المعقدة معك من أجل أن تقوم بأداء عملك بصورة أكثر جودة" introduces an infelicity with "بصورة أكثر جودة", which literally means "in a more quality way." A more natural and precise rendering would be "بشكل أكثر كفاءة" or "بصورة أكثر فاعلية", to better match "more efficiently."

Further, the phrase "These models analyze your existing data" is mistranslated as "تحليل متعلمي البيانات الموجودين", which introduces a semantic error—"متعلمي البيانات" (data learners) is a misinterpretation. The original clearly refers to the system analyzing data, not learners. A correct rendering would be "تحلل البيانات الموجودة لديك". This confusion reflects a misunderstanding of technical terminology related to deep learning.

The expression "using prompts, like specific queries or instructions" is rendered as " باستخدام نماذج مثل الأسئلة المعينة أو الإرشادات المخصصة", which again misinterprets "prompts" as "نماذج" (models). This is another terminological error; the intended meaning of "prompts" is closer to "مُدخلات" or "أوامر". A better translation might be: " باستخدام أوامر مثل الاستفسارات المحددة أو التعليمات".

Lastly, the description of financial analysis in Excel is mostly faithful but includes several awkward constructions. For example, "وتحريكها وتضبيطها" (move and fix them) used for "build charts and pivot tables" is not standard terminology and lacks precision. This part could be improved by saying "وإنشاء المخططات والجداول المحورية". The final phrase, "تقوم بوضعها في خط معين" (put it in a specific line), is vague and does not clearly reflect the intended meaning of "format it all into a stakeholder-ready presentation." A more accurate phrase would be " وتنسيقها في عرض تقديمي جاهز للمساهمين أو أصحاب المصلحة."

Another central concept error appeared, where the list of key finance workflows "order to cash, financial planning and analysis, record to report, and procure to pay" was misinterpreted and reorganized incoherently as: "طلب التخطيط التمويلي، تحليل التقارير، دفع الخطط التمويلية، وتحليلها." This not only distorts the original categories but also introduces repetition and semantic vagueness. A more accurate version should read: " من الطلب إلى التحصيل، والتخطيط والتحليل المالي، والتسجيل حتى التقارير، ومن الشراء حتى الدفع." This preserves the technical terms used in finance and reflects the intended procedural logic.

Omissions were frequent, often diminishing the rhetorical and persuasive power of the original message. The metaphor "consultants are like doctors for companies" was interpreted, but the follow-up analogy "both roles aim to improve the overall well-being of their respective clients" was omitted. This weakened the narrative coherence and metaphorical symmetry of the speaker's argument. Additionally, the impactful contrast in time management "You could spend 50% of your day... or 10%..." was partially rendered with distorted percentages and without maintaining the rhetorical contrast. A more precise translation would be: " قد تقضي 50٪ من يومك في تصنيف الجداول، بينما يمكنك تقليص ذلك إلى 10٪ فقط باستخدام الذكاء الاصطناعي التوليدي."

The interpreting also suffered from several infelicities, awkward or unnatural Arabic phrasing that, while not strictly incorrect, detracted from fluency and audience comprehension. For example, phrases like " تحريك الجداول وتظبيتها" (to describe visualizing data in Excel) are colloquial and imprecise. A better alternative would be: " إنشاء الجداول المحورية والمخططات لعرض النتائج بشكل مرئي." Similarly, the repeated use of awkward connectors such as "دعنا نقول أن..." instead of the more formal "على سبيل المثال" or "افترض أن..." reduced the professional tone of the output.

In sum, the interpreting output, while capturing the general themes and intent of the original discourse, failed to consistently preserve terminological accuracy, logical sequencing, and metaphorical resonance,

which are crucial for conveying specialized content such as AI applications in finance and marketing.

Interpreter 3

There are several issues with accuracy and clarity for example in segment 3:

"For the first time ever, we're able to automate complex workflows, tasks, and processes at speed. AI technology is capable of so much more. And if you're searching for use cases to prove its value to your finance organization, the wealth of opportunities may seem like choice overload. So, where should you start? Where is the best place to focus your efforts? Of the four key finance workflows, order to cash, financial planning and analysis, record to report, and procure to pay, financial planning and analysis will see the biggest impact from AI technology. This domain is where you budget, forecast, and analyze your financial performance."

Which was rendered as:

"ولأول مرة على الإطلاق، استطعنا أن نميكن طريقة سريان الأعمال ومهاماته والإجراءات التي يتم تسريعتها من خلال تكنولوجيا الذكاء الاصطناعي، والتي تتيح أشياء أكثر بكثير من التي تبحث عنها في حالاتك، والتي تثبت أهميتك كشركة مالية، وهذا يتيح لك العديد من الفرص، والتي ممكن تبدو لك فرصًا كثيرة جدًا وصعب الاختيار منها. فمن اين ابدا ما هو أفضل مكان ممكن أن تركز عليه؟ كل مجهوداتك في هذا الأمر تعتمد على مفاتيح أربعة مالية، وهي التي تتحكم في سريان العمل، والتي تساعدك في عمل وإنشاء خطة مالية، و أيضا إنشاء تقارير تحليلية، والتي تجعلك تخطط ماليًا، وتنشئ تحليلات تظهر أفضل مدى وأفضل نتيجة من استعمالها من خلال تكنولوجيا الذكاء الاصطناعي في هذا المجال."

The phrase "For the first time ever, we're able to automate complex workflows, tasks, and processes at speed" is rendered as " ولأول مرة على الإطلاق، استطعنا أن نميكن طريقة سريان الأعمال ومهاماته والإجراءات التي يتم تسريعتها من خلال تكنولوجيا الذكاء الاصطناعي." Next, "the wealth of opportunities may seem like choice overload," is interpreted as " والتي ممكن تبدو لك فرصًا كثيرة جدًا وصعب الاختيار منها." The phrase "choice overload" is not fully captured here, with the translation sounding more vague and informal. A more precise rendering would be "قد تشعر بالحيرة لكثرة الخيارات المتاحة." Additionally, the line "Of the four key finance workflows" is interpreted as "تعتمد على مفاتيح أربعة مالية، وهي التي تتحكم في سريان العمل," where the key workflows are omitted entirely, which is a critical omission that undermines the meaning of the source. The specific workflows, including "order to cash," "financial planning and analysis," "record to report," and "procure to pay," should be explicitly mentioned. " budget, forecast, and analyze your financial performance" is interpreted as " تخطط ماليًا، وتنشئ تحليلات تظهر أفضل مدى," where the meaning is somewhat lost. The term

“أفضل مدى” (best range) is vague and does not adequately capture the sense of budgeting, forecasting, and analyzing financial performance. A clearer translation would be "تضع الميزانية، وتُجري التنبؤات، وتحلل الأداء المالي." Next, "impact sales, marketing, and supply chains" is interpreted as "تتعامل سلاسل مع مبيعات الشركات," which is grammatically awkward and unclear. A more accurate translation would be "تؤثر على المبيعات والتسويق وسلاسل التوريد." The phrase “Traditional AI can automate the data aggregation process” is interpreted as "يجعل الأمر أوتوماتيكيًا عندما نتعامل مع تجميع المعلومات," which is slightly vague and colloquial. A more precise translation would be " يمكن للذكاء الاصطناعي التقليدي أتمتة عملية تجميع البيانات." The phrase “To get the most out of your AI investments…” is rendered as " لتحصل على أفضل ما يمكن أن تحصل عليه من استثمارات الذكاء الاصطناعي," which is an acceptable translation, though the phrase “أفضل ما يمكن أن تحصل عليه” sounds slightly redundant. A smoother version might be " لتحقيق أقصى استفادة من استثماراتك في الذكاء الاصطناعي."

Overall, the translation contains several EOI that impact the accuracy and clarity of the message in some instances. Several technical terms and concepts are not rendered appropriately, and some key content from the source speech is either omitted or inaccurately conveyed.

5. Discussion and Conclusion

This study investigated the effect of integrating Bionic Reading font into ASR tools on the accuracy of English-into-Arabic consecutive interpreting. Drawing on both quantitative and qualitative data, the findings revealed that the Bionic Reading font condition led to a clear improvement in interpreting performance, most notably through the reduction of errors and omissions. The results also underscored the role of punctuation, particularly as displayed in real-time ASR transcripts, in aiding interpreters' syntactic parsing and message segmentation. The findings of this study revealed that the use of Bionic Reading font within ASR-generated transcripts significantly improved interpreting performance during CI tasks. Quantitative analysis demonstrated a statistically significant reduction in Errors and Omissions, while Infelicities also decreased, albeit not significantly. These improvements can be attributed to the font’s typographic design, which bolds the initial letters or syllables of words. This stylistic emphasis appears to guide the reader’s eye more effectively, reduce unnecessary saccades, and support faster lexical recognition. As a result, interpreters were able to allocate more cognitive resources to essential efforts such as comprehension, retention, and reformulation.

One of the most prominent themes that emerged from the qualitative data was the role of punctuation in supporting syntactic

parsing and meaning segmentation. Participants consistently reported that ASR transcripts with accurate and well-timed punctuation, particularly full stops and commas, facilitated smoother interpretation. These visual cues helped interpreters identify clause boundaries, distinguish main ideas from elaborative details, and follow the source speaker's rhetorical structure with greater clarity. This clarity, in turn, reduced both Omissions and Infelicities, especially those related to incomplete propositions, dangling modifiers, or ambiguous references.

By contrast, when punctuation was inconsistent or absent, interpreters occasionally failed to detect sentence breaks or conflated separate ideas. This sometimes resulted in literal or awkward renditions that weakened the overall coherence of the interpretation. Thus, punctuation in ASR output should not be viewed as a merely aesthetic element, but as a functional feature that directly impacts message segmentation and interpretive fidelity.

These findings resonate with Mankauskienė's (2016) classification of problem triggers in interpreting, which provides a useful framework for understanding the types of challenges interpreters encounter, and how typographic enhancements like the Bionic Reading font may help mitigate them:

- Message-Related Triggers: These include lexical complexity, syntactic ambiguity, and information density characteristics present in the AI-focused source speeches used in this study. The interpreters' improved performance under the Bionic Reading font condition suggests that this visual structure helped them decode complex terminology and layered sentence structures more efficiently.
- Interpreter-Related Triggers: These refer to internal constraints such as fatigue, limited working memory, and cognitive overload, all central concerns in Gile's Effort Model. The observed reduction in EOI errors when using the Bionic Reading font suggests that the font's visual guidance acted as external scaffolding, easing the cognitive burden associated with real-time reformulation.
- Technical Triggers: While ASR tools are designed to support interpreters by reducing the need to rely solely on auditory input, they can also introduce challenges such as transcription errors, delayed text rendering, or the absence of prosodic cues. In this study, however, the Bionic font's clarity and emphasis on word-initial components appeared to offset some of these drawbacks by

making key content easier to identify and visually scan, thereby enhancing interpreter confidence and accuracy.

Furthermore, the Bionic Reading font appeared to assist in the accurate rendition of technical terms and numerical data. Interpreters under the Bionic condition more consistently retained terms such as "ROI," "Generative AI," and "micro-segmentation," particularly in high-density segments. Additionally, when punctuation clearly separated list items or comparative structures (e.g., "efficiency, cost reduction, and decision-making"), interpreters were more likely to render complete and accurate enumerations. These results underscore the importance of typographic and syntactic clarity in ASR output, not only for readability but as fundamental supports for cognitive processing and target-language production.

These outcomes also align with Gile's EM, particularly in relation to the redistribution of cognitive resources. The Bionic Reading font may help reduce the mental load required for visual decoding, thereby freeing up capacity for memory retention (Rem) and target language production (P) two phases that are often strained during live interpreting tasks. In this way, the font operates as a compensatory mechanism, stabilizing interpreter performance under cognitively demanding conditions. This supports Gile's "tightrope hypothesis," which asserts that even small changes in resource demand or task support can prevent performance breakdown when interpreters are operating at the edge of their cognitive capacity.

The results of this study carry important implications for interpreter training, ASR tool development, and broader interpreter-support technologies. First, the use of Bionic Reading font in ASR output appears to enhance interpreters' accuracy by reducing cognitive load during real-time processing. This suggests that Bionic Reading Font or similarly optimized typographic designs could be integrated into digital tools used in interpreter training programs to support message retention, improve visual tracking, and assist in syntactic segmentation.

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