

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Misuse of Internet Protocol (IP) Captioned Telephone Service)	CG Docket No. 13-24
)	
Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities)	CG Docket No. 03-123
)	

To: Chief, Consumer and Governmental Affairs Bureau,
Internet-Based TRS Certification Application Amendment

**AMENDMENT TO APPLICATION OF MEZMO CORPORATION FOR
CERTIFICATION AS A PROVIDER OF IP CAPTIONED TELEPHONE SERVICES**

/s/ Cristina O. Duarte

Cristina O. Duarte

Director of Regulatory Affairs
Mezmo Corporation (dba InnoCaption)
14111 Robert Paris Court
Chantilly, VA 20151
cristinaduarte@innocaption.com

March 13, 2020

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**AMENDMENT TO APPLICATION OF MEZMO CORPORATION FOR
CERTIFICATION AS A PROVIDER OF IP CAPTIONED TELEPHONE SERVICES**

Mezmo Corporation (dba InnoCaption) (“InnoCaption”) respectfully submits this Amendment to its Application for Certification to provide Internet Protocol Captioned Telephone Service (“IP CTS”), filed on November 23, 2011 (“Application”) with the Federal Communications Commission (“FCC” or “Commission”).¹ This Amendment updates the Application to include an Automated Speech Recognition (“ASR”) Calling Feature as part of InnoCaption’s IP CTS offerings.² This Amendment demonstrates that the ASR Calling Feature meets or exceeds all applicable mandatory minimum standards with the exception of the requirement that a Communication Assistant (“CA”) must alert the Telecommunications Relay Service (“TRS”) user to the presence of a recorded message or interactive menu through a hot

¹ Application of Miracom USA, Inc. for Certification to Provide IP Captioned Telephone Service, CG Docket No. 03-123 (filed Nov. 23, 2011). *See also Notice of Conditional Grant of Application of Miracom Usa, Inc. for Certification as a Provider of Internet Protocol Captioned Telephone Service Eligible for Compensation from the Telecommunications Relay Services Fund*, Public Notice, 29 FCC Rcd 5105 (2014); *Misuse of Internet Protocol (IP) Captioned Telephone Service, et. al*, Order, 31 FCC Rcd 7023 (2016).

² A certification certifying that the information provided in this submission is true, accurate, and complete was executed by the undersigned is attached herein as Attachment A.

key on the CA's terminal, as this is not technologically feasible for InnoCaption.³ Accordingly, InnoCaption is filing a Request for Limited Waiver in conjunction with this Amendment.

I. Background

At InnoCaption, we strive to engage with our user community as much as possible and seek to offer the best modern technology solutions to meet their diverse accessibility needs. Since relaunching the InnoCaption service in 2016, our mobile app has undergone multiple updates and feature additions (*e.g.*, caller ID settings and inbound call forwarding) as we continue to improve our accessibility service based on user feedback. As with most of InnoCaption's previous feature additions and upgrades, we began to test and develop ASR captioning technology in July 2017 due to the number of individual user requests for these features.

On June 7, 2018, the FCC adopted a Declaratory Ruling authorizing the use and compensation of fully automated speech recognition to produce captions for IP CTS calls.⁴ Encouraged by the Commission's interest in incorporating this new technology into IP CTS services, as well as the MITRE report reaffirming consumer interest in using ASR captions, InnoCaption accelerated development and testing efforts for ASR. By March 2019, InnoCaption had completed development of its ASR Calling Feature and began user trials by adding a beta ASR caption option on the InnoCaption mobile app.⁵

³ See 47 C.F.R. § 64.604(a)(3)(vii).

⁴ See *Misuse of Internet Protocol (IP) Captioned Telephone Service; Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing Loss and Speech Disabilities*, Report and Order, Declaratory Ruling, Further Notice of Proposed Rulemaking, and Notice of Inquiry, 33 FCC Rcd 5800 (June 8, 2018) ("Declaratory Ruling").

⁵ We note that no ASR captioned call minutes have been submitted for reimbursement and all ASR-related costs have been at InnoCaption's own expense.

InnoCaption’s development has always been guided by our philosophy that accessibility options, first and foremost, should be determined by each user based on his or her individual needs and circumstances. Accordingly, InnoCaption’s ASR Calling Feature has been implemented as an optional feature that users can choose to trial if they feel their accessibility needs and challenges would be met with this technology. After nearly a year of ASR user trials, which has included over 123,000 minutes of ASR captioned calls and various incremental feature improvements, InnoCaption believes that the ASR Calling Feature has been sufficiently tested and should be incorporated into our Application for Certification as an IP CTS provider.

To further improve upon the ASR Calling Feature’s usability and reliability, we are also in the final development stages of an in-call caption mode switching feature that will allow users to switch between Communication Access Realtime Translation (CART) and ASR captioning during a call. This enables InnoCaption’s users to determine which caption source can best meet their accessibility needs under varying call situations, depending on call content, connection and the other party to the call. The benefits of this feature are further illustrated in scenarios discussed at Section II herein.

II. InnoCaption ASR Calling Feature

InnoCaption users are able to select ASR captioning as a default captioning mode on their mobile app if they feel it meets their accessibility needs generally or, alternatively, may use ASR captioning for a particular call. Consistent with InnoCaption’s belief that we do not define the accessibility needs of our users, if a user does not wish to use ASR for their calls, they are able to have their calls handled exclusively by CART. Accordingly, we offer three “Caption Mode” settings from which a user can choose on their InnoCaption app to set their default caption methodology.

The three “Caption Mode” options are:

- (1) **CA Priority** – This option defaults to a live CART CA but temporarily routes to ASR captioning in the event of an unprojected call surge. The CA Priority option ensures that even in the case of an unprojected call surge or other unforeseen circumstance, which would normally result in a “system busy” message, users’ incoming and outgoing calls would begin using the ASR captioning system and then automatically transition over to the first available CART CA once the circumstances returned to normal.
- (2) **CA Only** – This option always routes calls to a live CART CA and ensures the user will never be routed to ASR captioning. This option is for users who do not feel ASR captions meet their accessibility needs under any circumstances.
- (3) **ASR Only** – This option always routes calls to ASR captioning. These users’ traffic, however, will be routed to a CART CA in the event of a 911 call.

In addition to these default caption capabilities, we are in final stages of developing an additional function that allows users to switch between CART CA and ASR captioning during a call. This functionality is essential in providing functional equivalence and maximum service reliability due to the current limitations of ASR technology, especially on calls with poor connections or speakers with accents. The ability to switch between captioning modes was developed to account for calls where a user feels that the ASR Calling Feature is no longer meeting their accessibility needs and ensures that that they are able to seamlessly switch over to a CART CA without having to disconnect the call. Likewise, a user that begins a call supported by a CART CA will also be able to switch to ASR captioning if they feel that ASR will better meet their needs during a call. This feature has been added within the public version of the InnoCaption app for final testing and development but has not yet been announced to the broader user community.

The following are just a few examples of the numerous scenarios where a user could benefit from using this in-call switch feature:

- **Scenario #1:** Samantha, an InnoCaption user, calls her airline and knows the airline will have an interactive voice response (IVR) system answer the phone. She places the call using the ASR feature because she knows that ASR understands computer generated voices well and knows she will get fast and accurate captions. Once Samantha has worked her way through the IVR system, she is transferred to a live representative. The representative who answers Samantha's call has a heavy accent and the ASR Calling Feature is no longer providing accurate captioning. Without disconnecting, Samantha is able to seamlessly switch to a CART CA using the in-call switching feature. As a result, Samantha was able to optimize the captioning she received during her call with the airline.
- **Scenario #2:** Alfie calls the Social Security Administration and begins the call using a CART CA. There are very long hold times and Alfie does not want to keep the CART CA waiting on a silent call for an extended period of time. The user clicks the button to switch to ASR captioning mode. The representative from the office comes back on the line and Alfie is able to determine whether he wants to continue with ASR captioning or switch to a CART CA, depending on his accessibility needs, the speaker, and the quality of the captions.
- **Scenario #3:** Riley calls her significant other for a deeply personal conversation. Riley knows that the InnoCaption system is secure and confidential, but she still does not want a live CART CA on such a personal call. To ensure the call is just between her and her significant other, Riley switches over to ASR captioning and feels that not only are her accessibility needs being met, but the call with her significant other is functionally equivalent to what a hearing person experiences on the phone because she knows there is no third party on the line.

III. Quality Control/ Data & Usability

InnoCaption understands the importance of data and quality control not only when it comes to existing IP CTS offerings but also for implementation of new technology in the marketplace, such as the new ASR Calling Feature. Due to the nature of IP CTS services and confidentiality requirements, we are unable to test real-world accuracy of ASR captioning by comparing recorded audio of actual IP CTS calls to text transcripts. Instead we have been carefully monitoring captioning quality and user satisfaction through a combination of data

collected from our 5-star call rating system,⁶ internal live call test calls, as well as anecdotal feedback from our user community. Conducting controlled lab tests for caption quality that properly reflects the myriad of different environments and call situations that InnoCaption users will face in their daily lives is incredibly difficult to do. Therefore, we believe the 5-star ratings provided by our users represent a far more accurate representation of the overall usability of the ASR Calling Feature.

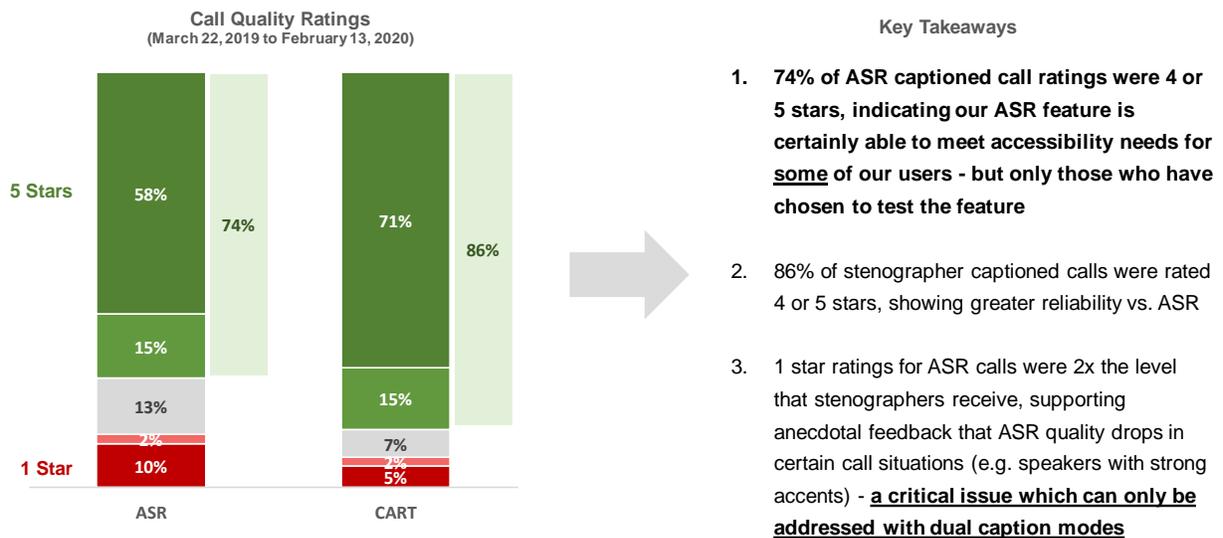
In addition to our 5-star rating system, at the end of each ASR captioned call, users have been receiving the following message at the end of their transcripts, providing an additional opportunity to send feedback around their experience using this new feature: “AI/ASR captioning is still under development and any feedback around the quality would be appreciated. ASR@innocaption.com.”

As illustrated by Figure A below, over the 47-week period from March 22, 2019 to February 13, 2020, InnoCaption provided over 123,000 minutes of ASR captioning calls to its users who opted to trial the ASR Calling Feature and received 5,489 call quality ratings on calls where only ASR captioning was used. Of these rated calls, 74% received a rating of 4 or 5 stars, which indicates that the ASR Calling Feature is certainly able to meet the accessibility needs of our users who participated in these trials in a significant number of call situations. However, we reemphasize that the ASR Calling Feature has been trialed as an optional feature for our users and was not tested by the entire InnoCaption user base. A comparative review of call quality ratings for InnoCaption CART CA captioned calls over the same 47-week period shows that 86% of those calls were rated 4 or 5 stars. This illustrates the higher level of overall reliability

⁶ At the end of every InnoCaption call, the user receives a pop-up asking how they would rate the captioning accuracy using a 5-star system, with 1 star labeled as a “low” rating and 5 stars labeled as a “high” rating.

and quality that InnoCaption’s CART CA captions offer our broader user community. In addition, the fact that quality ratings for ASR captioning received double the proportion of 1-star ratings (10%) compared to CART CA captioning (5%), appears to support internal testing and user anecdotal feedback that ASR technology has critical limitations in certain call settings. InnoCaption firmly believes that having dual caption modes will resolve this technological limitation. Furthermore, we believe that InnoCaption’s in-call caption mode switching feature will enhance the usability of ASR captions and help achieve functional equivalency.

Figure A



IV. Compliance with Applicable Mandatory Minimum Standards

The InnoCaption ASR Calling Feature meets or exceeds applicable mandatory minimum standards. We note, however, that some mandatory minimum standards are not applicable or have not been impacted by the implementation of the ASR Calling Feature, so they are not met by InnoCaption at this time.

(1) **Speed**⁷ – InnoCaption has successfully tested its ASR Calling Feature for speeds of up to 240 words per minute through simulations using audio files used for stenographer tests and meets the FCC’s speed minimum standard.

(2) **Confidentiality and Conversation Content**⁸

a. **Verbatim:** This portion of the FCC’s rules prohibits CAs from intentionally altering a relayed conversation, which accounts for the human element intrinsic to CA-assisted TRS services.⁹ By design, ASR/cloud speech-to-text is a verbatim, real-time transcription software; so, this requirement does not apply to ASR captioning services because software, instead of a human element, is utilized to provide captioning.

b. **Confidentiality:** InnoCaption takes appropriate measures to uphold the FCC’s confidentiality minimum standards. InnoCaption currently uses Google Cloud Speech-to-Text API (without data logging), augmented using our own proprietary software, to provide the optional ASR Calling Feature.¹⁰ User call audio and transcripts are never stored or used for machine learning purposes. Consistent with CART CA InnoCaption calls, audio and transcripts are not stored within the InnoCaption servers and are deleted as soon as a call has ended. The ASR Calling Feature does not “log” any data and does not keep any records of the content of any conversation beyond the duration of the call. The only transcript which remains after a call is stored locally on the user’s device. In the event a user deletes or loses a transcript, InnoCaption is unable to access or restore it. In addition, InnoCaption is not bound to any specific ASR provider and continues to explore the marketplace for other ASR solutions which may better meet InnoCaption’s users’ accessibility needs.

(3) **Emergency Calling Requirements**¹¹

a. **Prioritization:** All 911 calls placed on InnoCaption are prioritized according to the FCC’s rules, regardless of the Caption Mode selected.

⁷ See 47 C.F.R. § 64.604(a)(1)(iii).

⁸ See § 64.604(a)(2).

⁹ See § 64.604(a)(2)(ii).

¹⁰ Information regarding the Google Cloud Speech-to-Text API without data logging can be found here: <https://cloud.google.com/speech-to-text>.

¹¹ See 47 C.F.R. § 9.14.

- b. Handling of 911 Calls: InnoCaption’s 911 Call Handling Procedures remain the same.¹² All 911 calls placed through the InnoCaption app are routed to an InnoCaption CART CA regardless of the local device settings. As discussed above in Section II, whether a user sets their InnoCaption app to “ASR Only” or “CA Priority” modes, in the event of a 911 call, those settings are automatically overridden, and the call is sent to a CART CA.

V. Conclusion

Creating technology solutions that provide functional equivalence to the deaf and hard of hearing community is the ultimate goal for InnoCaption. We know there is no one-size-fits-all solution for telecommunications accessibility. InnoCaption’s users’ needs are diverse, and each call made through our app is a unique interaction. We understand that the best way to provide functional equivalence is to give users the best toolkit of accessibility features we can provide and to enable them to tailor their experience to meet their specific needs. As detailed herein, InnoCaption’s ASR Calling Feature is designed to help us achieve these goals. Therefore, InnoCaption respectfully requests that the FCC grant the Amendment to the Application so that InnoCaption may provide ASR Calling Features as part of our IP CTS offerings.

¹² See Amendment to Application of Mezmo Corporation for Certification as a Provider of Internet Protocol Captioned Telephone Services, CG Docket No. 03-123, at 2-3 (filed Nov. 16, 2015).

ATTACHMENT A

CERTIFICATION OF CRISTINA O. DUARTE,
DIRECTOR OF REGULATORY AFFAIRS

I swear under penalty of perjury that I am Cristina O. Duarte, Director of Regulatory Affairs, an officer of the above-named applicant.

I further swear that: (1) I have examined the foregoing submissions, (2) all information required under the Commission's rules and orders has been provided, and (3) all statements of fact, as well as all documentation contained in this submission, are true, accurate, and complete.

A handwritten signature in black ink, appearing to be 'Cristina O. Duarte', written over a horizontal line.

Cristina O. Duarte
Director of Regulatory Affairs
Mezmo Corporation (dba InnoCaption)

Date: March 13, 2020