

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

DIALECT, LLC,
Patent Owner.

Case IPR2024-00752
Patent 8,849,652

**DECLARATION OF BENEDICT OCCHIOGROSSO
IN SUPPORT OF PATENT OWNER'S RESPONSE**

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I, Benedict Occhiogrosso, hereby declare as follows:

I. INTRODUCTION

1. I have been retained as an expert on behalf of Patent Owner Dialect LLC (“Patent Owner” or “Dialect”) for this *inter partes* review (“IPR”) of U.S. Patent No. 8,849,652 (the “’652 patent”) filed by Google LLC (“Petitioner” or “Google”).

2. I am being compensated for my time in connection with this IPR at my standard rate for consulting services. My compensation is not dependent on the outcome of this proceeding, the results of my analysis, or on the substance of my opinions and testimony.

3. I have been asked to provide my opinion on the validity of the ’652 patent. In particular, I have been asked to consider whether the Coffman¹ reference discloses synchronizing a “context stack” (or “context set”) in one device with another “context stack” (or “context set”) in another device, as recited in independent claims 1, 14, and 20 of the ’652 patent. I have also been asked to consider whether Coffman discloses identification of “one or more domain agents associated with the one or more context entries, wherein the one or more domain agents are configured to process the command or request” and generating “a

¹ Ex. 1003, International Patent Application Publication No. WO 00/20962 to Coffman et al. (“Coffman”).

response to the command or request using the one or more domain agents,” as set forth in dependent claim 8, and as similarly recited in dependent claims 18 and 24.

Related to these opinions, I have also provided opinions on other matters as set forth in this Declaration, including how I believe a person of ordinary skill in the art (a “POSITA”) would understand Coffman’s disclosures relied upon by Petitioner to disclose the claimed “synchronizing” elements, and how a POSITA would understand Coffman’s conversationally-aware applications as they relate to Petitioner’s “domain agents” theory.

4. In preparing this Declaration, I have reviewed the following materials, including other materials discussed in this document:

Document Number	Exhibit Description
2	IPR2024-00752 Petition
9	Patent Owner’s Preliminary Response
11	Decision Granting Institution of <i>Inter Partes</i> Review
1001	U.S. Patent No. 8,849,652 (“’652 patent”)
1002	Declaration of Christopher M. Schmandt (“Schmandt”)
1003	International Patent Application Publication No. WO 00/20962 to Coffman et al. (“Coffman”).
1007	International Patent Application Publication No. WO 00/21075 to Maes et al. (“Maes”)
1012	Prosecution history of U.S. Patent No. 8,849,652 B2

Document Number	Exhibit Description
2007	Order (Construing Claim Terms), Dialect, LLC v. Amazon.com Inc., Civ. No. 1:23cv581, Dkt. 213 (E.D. Va. Apr. 29, 2024)
2011	Deposition Transcript of Christopher M. Schmandt (“Schmandt Deposition”)
2012	<i>Google LLC v. Dialect, LLC</i> , IPR2024-00746 Institution Decision, Paper 11 (P.T.A.B. Oct. 15, 2024)

II. BACKGROUND AND QUALIFICATIONS

5. A brief summary of my background and qualifications is provided in this section, which I believe qualifies me to opine as one skilled in the art of relevant technology. A true and correct copy of my *curriculum vitae*, attached hereto, provides additional details regarding my background and qualifications.

6. I hold a Bachelor of Science Degree in Electrical Engineering as well as a Master of Science Degree in Electrical Engineering, both from the Polytechnic Institute of Brooklyn (now part of New York University).

7. I have authored or co-authored nearly three dozen articles in peer-reviewed journals, conference proceedings, texts, industry trade publications, and monographs. These publications span a range of topics including: Integrated Voice–Data Communications/Switching, Integrated Packet-Circuit Switching, Voice Digitization, Packet Voice, Indoor Wireless distribution, Disaster Recovery

and Business Continuity, Data Center Engineering, Switching Processor Architecture, Telephone and Voice Mail Systems, PBX & LAN switching premises-based systems and related technologies and Internet of Things (IoT). I also co-authored a textbook on Artificial intelligence Applications using Deep Neural Networks which covers, among other subjects, Automatic Speech Recognition (ASR) and Natural Language Processing (NLP).

8. I have more than 40 years of telecommunications and information technology experience. I am the co-founder and President of DVI Communications Inc., a telecommunications, information technology, security and audio-visual consulting firm. Since establishing DVI in 1979, I have planned, designed, implemented, and managed large-scale projects involving wired and wireless communications systems, which included transmission of voice and data. Prior to founding DVI and for several years thereafter, I held a Department of Defense security clearance and worked on several classified programs within the defense industry, where I supported the development of several pioneering technologies that have served as the prototypes for many telecommunications and IT systems later utilized in commercial practice.

9. Throughout the course of my professional career, I have worked and consulted extensively in the fields of information processing, including transaction processing systems design and development (including centralized and distributed,

encompassing both fault-tolerant and real-time processing), various hardware and software platforms (including enterprise client/server incorporating different OS & DBMS), systems integration, and telecommunications. These telecommunications systems include wide area and local area networking technology, data, voice, and video switching systems, and both wired transmission (such as cable and fiber optic) and wireless transmission (such as UHF/VHF, Microwave, satellite, cellular, and Wi-Fi, for private networks, Intranets, and the Internet).

10. My technical expertise encompasses several disciplines, such as transaction processing systems design for various industries and applications, IT platform engineering, data center, and telecommunications network design. In addition, I have extensive experience with numerous interfaces and protocols, real-time synchronization as well as selected applications systems in various industries. These include financial services (including call centers, trading floors, supporting consumer, commercial and investment banking), health information systems (including patient information, clinical and laboratory systems), transportation and energy utilities (including dispatch, customer service, and trouble reporting), military aerospace (including Command and Control, position tracking and fusion centers), and telecommunications switching and operational support systems (order entry, billing, trouble reporting). Many of these solutions have included Interactive Voice Response (IVR) systems. I have also provided operational and strategic

planning consultation for client IT enterprise-level systems. Over the course of my career, I developed hardware and software, and I have also managed engineering development teams engaged in product development.

11. I have extensive expertise in voice-data-video switching, and transmission systems deployed in networks, including both circuit switching and packet switching using wireline and wireless distribution methods (including Land Mobile radio, Satellite, microwave, cellular, and Wi-Fi). In addition, I have developed various applications systems including voicemail, e-mail, unified messaging, and audio/video recording for a variety of facility types including call-contact centers, data centers, trading floors, and mission-critical communications centers. I have detailed knowledge of Internet Protocol (IP) technology in general, and also Voice over Internet Protocol (VoIP). I have extensive expertise in voice digitization, buffering, relay and delay techniques, as well as digital signal processing of voice signals. At present, my primary responsibilities encompass strategic planning and systems design of client IT Infrastructures and program management for major projects undertaken by DVI.

12. I also possess technical expertise with regard to telecommunication applications utilizing speech recognition, including call center and interactive voice response applications. I have supported numerous enterprise and institutional clients in the design of their call centers. My experience in this field includes the

use of both speaker-independent and speaker-dependent speech recognition algorithms in different applications utilizing isolated speech recognition and continuous speech recognition.

13. I have worked on behalf of New York State's Metropolitan Transportation Authority (MTA) on relay services and assistive technologies. For example, I worked on voice processing for captioning of live meeting proceedings, which are then made available for hearing-impaired people. For the MTA, I implemented a system for captioning live meetings' proceedings for hearing-impaired people in compliance with the Americans with Disabilities Act (ADA). The project included logistics, audio routing, voice processing, video display and captioning to generate a transcription of a speaker's voice at a public meeting and display of the resulting transcription on television monitors in the boardroom as well as over institutional broadcast channels and Internet feeds. In-line corrections would be generated and displayed by the transcriptionist during the proceedings. I have also worked on captioning or transcription of previously recorded information for compliance and record-keeping purposes.

14. With respect to telecommunication networking services and associated devices for the switching and transmission of voice and data over POTS lines, digital transmission facilities (such as T1, E1 and ISDN PRI and BRI), cellular voice and data and other wireless-based technologies (Line of Sight

Microwave, Land Mobile Radio, Satellite) and IP- and VoIP-based communications, I have deployed various types of switching and routing systems (supporting numerous voice and data communications networks) at major commercial and institutional clients such as Citicorp NY, City University of New York, Bear Stearns, Société Générale, RPCI, and Bertelsmann. For these projects, among other things, I had to understand the technical implications, shortcomings, and advantages of deploying different types of switching systems interconnecting voice and data channels, and the manner in which various communication protocols transmit voice and data and would use available bandwidth on different transmission facilities. The transmission facilities included both terrestrial (wired and wireless) as well as satellite-based communications. I also had to understand the compatibility issues with various end-user devices and central network components, both at my client's locale as well as with the telephone provider/network provider's switching systems. This encompassed both signaling and switching protocols and interfaces to support compatibility and interoperability.

15. With respect to speech recognition technology, I have worked on numerous projects that incorporated speech recognition technology in interactive voice response, dictation, and messaging systems. For example, some of my clients used speech recognition software to convert voice messages into text that could be

sent to the recipient via email or a text message (so-called unified messaging systems). For numerous clients, I deployed speech recognition technology into Interactive Voice Response (IVR) systems, improving the user experience as well as (in many instances) expediting the process flow for various real-time inquiry/response and transaction processing applications. For another of my clients, I worked on refining speech recognition protocols to be used in their telecommunications system for directory assistance. Other applications included use of speech recognition for medical transcription as well as record-keeping and compliance purposes. I have used, applied, and deployed multiple speaker-dependent and speaker-independent solutions.

16. I also have extensive experience related to the digitization of voice. For many of my projects related to call routing and switching, calls can come into the systems as digital communications or as analog POTS calls. I have frequently designed and implemented systems that can detect the digital or analog nature of the incoming voice and when analog, utilize an appropriate sample rate and codec to convert the analog voice into digital transmission. Under the same umbrella, I have designed and implemented voice messaging systems that digitally record an analog voice message in order to record or perform other digital processing on the voice signal as described above. For example, for DARPA (Defense Advanced Research Projects Agency), I performed comparisons among various voice

digitization algorithms' performance in the presence of noise and jamming. As another example, for both DARPA and Defense Communications Agency (DCA), I conducted studies comparing circuit, packet and hybrid or integrated (circuit/packet) switching systems of voice and data traffic comparing them relative to cost, expandability, complexity, performance and reliability/survivability. As part of typical reliability considerations, I would deploy manual and automatic recovery processes which provided fault-tolerant and resilient voice and data networking offering graceful degradation in the presence of errors or failures. Techniques employed encompassed error detection/retransmission, vigilant monitoring of correct operation coupled with switchover to backup, bypass and/or rerouting around failed switching and transmission facilities and reconnection.

17. As previously outlined, I have supported the deployment of several systems for generating transcriptions of previously recorded and real-time audio. For example, to support a medical dictation application, I deployed a system that used speech recognition to generate transcripts, both manual correction and auto text correction, of medical terms that were used, to correct the medical practitioner's dictation. For ADA-compliant broadcast of textual messages for hearing-impaired people at MTA public hearings and meetings, I designed, selected, and deployed remote text captioning of meetings with remote in-line

manual correction of errors in real-time. I also assessed captioning service accuracy and latency with the goal of improving service levels.

18. Finally, I have supported the architecting, design, development, deployment and acceptance testing of several real-time, distributed and centralized transaction processing systems and networks supporting a variety of applications including electronic funds transfer, demand deposit, point of sale, customer service and relationship management, telemarketing and collections, trading and quotation, multi-media messaging etc. These systems were implemented in various IT/telecom environments (OS, DBMS, public/private networks), required extensive interoperability with companion systems and processes and were often designed with high reliability, fault tolerance and scalable operation from the ground up.

III. UNDERSTANDING OF PATENT LAW

19. In forming the opinions expressed in this Declaration, I relied upon my education and experience in the relevant field of art, and I have considered the viewpoint of a person having ordinary skill in the relevant art at the time of the invention. I am not a patent attorney, nor have I independently researched the law of patent validity. Attorneys have explained certain legal principles to me that I have relied on in forming my opinions as set forth in my Declaration, including principles of prior art, anticipation, and obviousness.

20. I understand that in an *inter partes* review, the petitioner carries the burden of proving patent claim invalidity by a preponderance of the evidence on a claim-by-claim basis, based on either patents or printed publications. Each claim is analyzed independently. It is my understanding that when a party has the burden of proving a claim invalid by the preponderance of the evidence, the party must show that it is more likely than not that the claim is invalid. I further understand that the validity of each claim of a patent (whether presented in independent form or dependent form) shall be determined separately. In particular, the validity of a dependent claim should be considered as a whole, as if the dependent claim were presented as an independent claim with all of the limitations of the claims from which it depends set forth.

21. I understand that a patent claim can be invalid for anticipation or for obviousness.

22. I understand that a patent claim may be invalidated as anticipated under § 102 of the patent statutes only if a single prior art reference discloses each and every limitation of the invention. To render a claim anticipated, the single reference must disclose each and every limitation of the claim either expressly or inherently, and must disclose every limitation of the claim as those limitations are arranged in the claim. I understand that a limitation inherently exists in a reference only if that limitation is necessarily disclosed by the reference. The mere fact that

something may result from a given set of circumstances is not sufficient to show inherency, as inherency cannot be established by probabilities or possibilities.

23. I understand that under § 103 of the patent statutes, a patent claim may be invalid as obvious in view of a combination of prior art references or in view of a single prior art reference. Obviousness is determined from the perspective of a hypothetical POSITA as discussed below in ¶¶28-31.

24. I understand that an obviousness analysis involves three factual inquiries: (1) the scope and content of the prior art, (2) differences between the prior art and the claims at issue, and (3) the level of ordinary skill in the art.

25. I understand that a patent claim may not be obvious if the prior art, either alone or in combination, and even when combined with the knowledge of one having ordinary skill in the art, does not disclose or suggest all of the limitations of a claim, i.e. that there remain differences between the prior art and the claim at issue. I also understand that a patent claim may not be obvious if a POSITA would not have modified or combined the prior art in a manner that would have disclosed or suggested all of the limitations of the claim.

26. In addition, I understand that a variety of factors are considered in determining whether an invention would have been obvious to a person of ordinary skill in the art. For example, a teaching, suggestion, or motivation in the prior art that would have led a person of ordinary skill in the art to modify a prior art

reference or select multiple prior art references and combine them in such a fashion as in the claimed invention, may render an invention obvious. As well, a combination of elements that was obvious to try, for example, in light of market pressures, may render an invention obvious if there was a reasonable expectation of success. I understand that other factors can be considered in an obviousness analysis, including: whether known elements are combined using known methods to create predictable results; whether one known element is substituted for another known element to obtain predictable results; whether a known technique is used to improve a similar device in the same way; whether a known technique is applied to a known device ready for improvement to yield predictable results; and whether design incentives or other market forces would have prompted a POSITA to implement predictable variations in known work in one field of endeavor for use of those predictable variations in either the same field or a different one.

27. I understand that an invention may not be obvious if the prior art reference(s) teaches away from the proposed modification or combination of prior art references. In addition, an invention may not obvious if the proposed combination creates “unpredictable results.” Also, an invention may not obvious if the proposed modification or combination would render the prior art device inoperable.

IV. PERSON OF ORDINARY SKILL IN THE ART

28. I understand that the factors considered in determining the level of ordinary skill in the art include education and experience of persons working in the art, and the types of problems encountered in the art.

29. I have reviewed Mr. Schmandt's statement regarding what he believes to be the level of ordinary skill in the field of providing "mobile devices having a speech interface and/or a combination of a speech interface and a non-speech interface to enable natural language human-machine interactions" and enabling "mobile users to submit natural language speech and/or non-speech questions or commands in a wide range of domains." He states, "In my opinion, a person of ordinary skill in the art would have possessed a bachelor's degree in electrical engineering or computer science, and two years of work experience in the field of speech- and natural language-interfaces for interacting with and directing computer systems and software, including speech recognition and processing. A person could also have qualified as a person of ordinary skill in the art with some combination of (1) more formal education (such as a [Master of Science (MS)] degree) and less technical experience, or (2) less formal education and more technical or professional experience." Ex. 1002, ¶13. I agree with this statement.

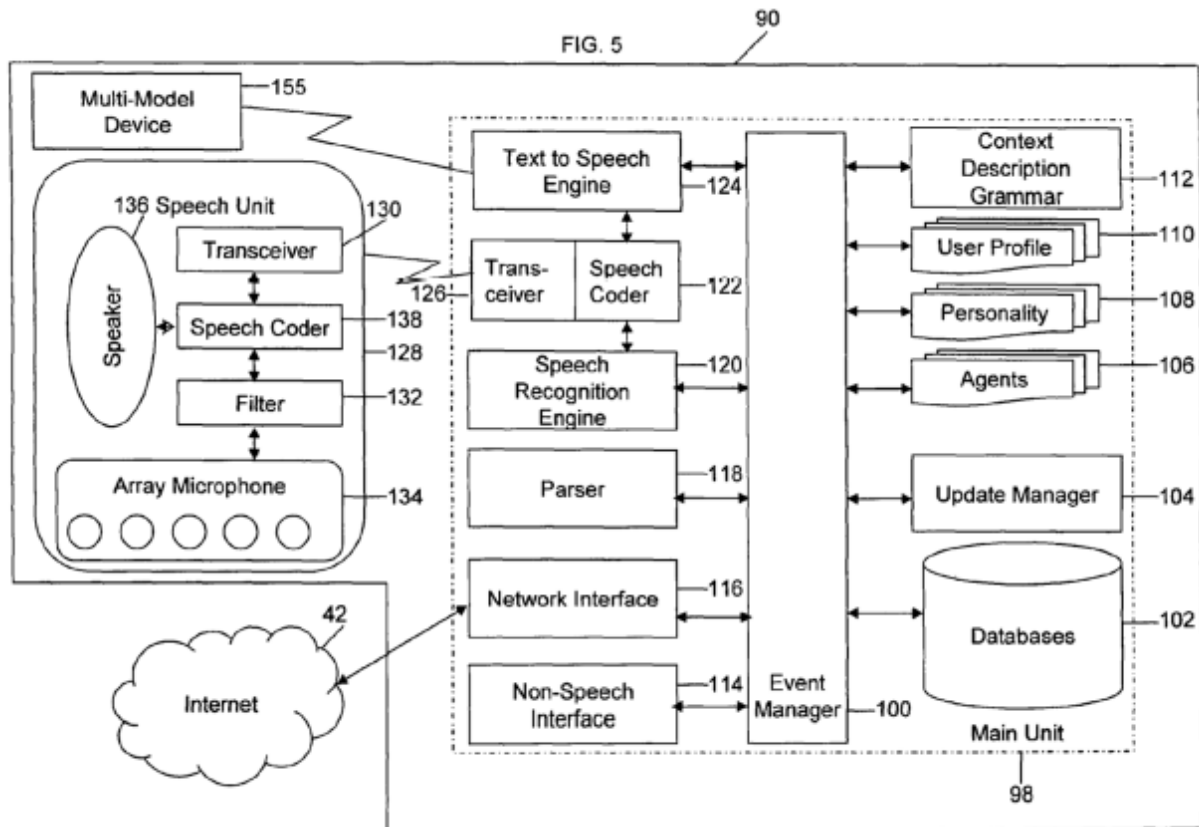
30. The patent application for the '652 patent was filed on May 13, 2013, and the filing date of the earliest patent application to which the '652 patent claims

priority (App. No. 11/212,693) is August 29, 2005. I note that Mr. Schmandt provides his analysis and opinions “based on the perspective of a person of ordinary skill in the art as of August 2005.” Ex. 1002, ¶15. So do I.

31. As noted above with regard to my education and experience as of August 29, 2005, I believe I possessed at least an ordinary level skill as of that date. I am familiar with the knowledge that a POSITA would have had at this time and the manner in which such a person would have viewed the available information at the time. My declaration and opinions are offered from this perspective, even if my declaration does not specifically refer to the perspective of a POSITA in every instance below.

V. TECHNICAL INTRODUCTION TO DIALECT'S '652 PATENT

32. The '652 patent is titled, "Mobile Systems and Methods of Supporting Natural Language Human-Machine Interactions." FIG. 5 of the '652 patent, reproduced below, is an overall diagrammatic view of an embodiment of the '652 patent:



'652 Pat., FIG. 5, 15:38-40. As illustrated, the system includes, among other things, a main unit 98, speech unit 128, speech recognition engine 120, context description grammar module 112, parser 118, agents 106, multi-modal device 155 and non-speech interface 114. '652 Pat., 23:38-39, 25:60-65.

33. Speech unit 128 includes a microphone to receive a spoken utterance from a user. '652 Pat., 25:50-52. After initial processing, the speech is passed to speech recognition engine 120 for processing. '652 Pat., 26:18-20. Then, “[a]ny recognized information may be processed by the parser 118, which transforms information into complete algorithms and questions using data supplied by knowledge agents.” '652 Pat., 26:20-23.

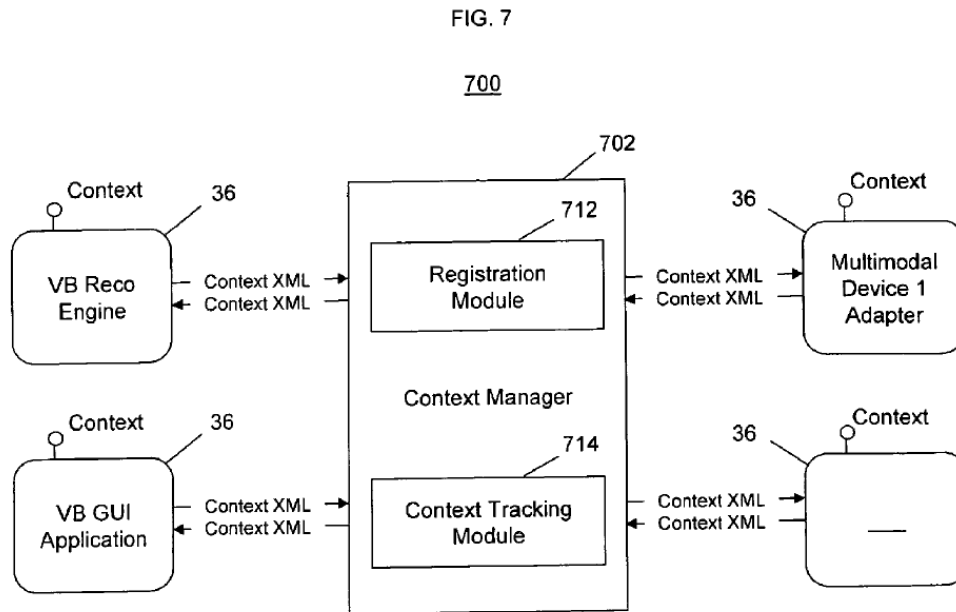
34. More particularly, after speech recognition, parser 118 “may determine a context for an utterance by applying prior probabilities or fuzzy possibilities to keyword matching, user profile 110, dialog history, and context stack contents.” '652 Pat., 34:2-5. “For example, a question with the keywords ‘temperature’ implies a context value of weather for the question.” '652 Pat., 34:7-8. “Once the context for the question or command has been determined, the parser 118 can invoke the correct agent 156, 150.” '652 Pat., 34:34-36.

35. To determine the context, the '652 patent discloses the use of a context stack. The context stack “includes an ordered list of command contexts, to enable follow-up requests.” '652 Pat., 20:10-12; *see also* '652 Pat., 36:13-14 (“Part of the dialog history is maintained in a context stack.”).).

36. The system of the '652 patent may be incorporated in a plurality of devices. Data and agents may be stored and synchronized in mobile structures 10,

mobile devices 36 and/or fixed systems 44 having one or more main speech-processing units 98. '652 Pat., 17:15-32.

37. FIG. 7 of the '652 Patent depicts a number of mobile devices 36:



Each mobile device 36 may track context. '652 Pat., 19:32-33. A context manager 702 may be centrally maintained to allow input to and output from multiple mobile devices 36. '652 Pat., 19:34-36.

38. Generally, the synchronization between different systems in the '652 patent can occur on the wide area wireless network 38, the data network 42, through the handheld interface 20, or other local data connections. '652 Pat., 17:18-21. The synchronization process attempts to determine which version of a data element or an agent are the newest or most up-to-date and propagates that element. '652 Pat., 17:25-28. Thus, synchronization can be an incremental change

process. '652 Pat., 17:28-29. In some cases, a complete replacement of a database, a portion of the database or of one or more agents may be performed rather than performing a series of incremental updates. '652 Pat., 17:29-32. The synchronization may be performed automatically when any two or more of the computers are connected to these networks. '652 Pat., 17:21-23. Alternatively, the synchronization may be performed on demand under user control. '652 Pat., 17:24-25.

39. The synchronization in the '652 patent preserves the ordered nature of the context stack or the ordered nature of a set of context entries (or “contexts”) from a context stack. For example, as stated in the '652 patent, a context stack can include “an ordered list of command contexts,” '652 Pat., 20:10-12, and a “set” of contexts can be stored in the context stack. '652 Pat., 20:19-22. Accordingly, a POSITA would understand that a context stack and a context set each provide an ordered list of contexts, and that the ordered list of a target context stack or set would be synchronized with the ordered list of a source context stack or set.

40. In FIG. 7, and with regard to context stack synchronization, each mobile device 36 “may communicate with the context manager 702 to register via registration module 712, wherein registration may indicate events that the mobile devices 36 may subscribe to.” '652 Pat., 19:33-39. The context manager 702 may receive input in Context XML form, for example. '652 Pat., 19:39-41.

41. Other registered mobile devices 36 may be informed of context changes through context tracking module 714, thereby synchronizing the context across the registered mobile devices 36. '652 Pat., 19:41-48, 4:27-32.

42. “The knowledge agents may then process the commands or questions.” '652 Pat., 26:27-31. Non-speech interface 114 and multi-modal devices 155 may be used as a substitute or complement to the speech interface. '652 Pat., 26:51-53.

43. Consistent with the '652 patent's disclosure, independent claims 1 and 14 of the '652 patent require synchronization of a context stack, and claim 20 requires synchronization of the context set. Claim 1 recites:

1. A system for processing natural language utterances where recognized words of the natural language utterances alone are insufficient to completely determine one or more commands or requests, the system comprising:
one or more physical processors programmed with one or more computer program instructions which, when executed, cause the one or more physical processors to:
generate a first context stack associated with a first device, the first context stack comprising context information that corresponds to a plurality of prior utterances;
synchronize the first context stack with a second context stack
associated with a second device such that the context

information of the first context stack is updated based on related context information of the second context stack; receive a natural language utterance associated with a command or request; determine one or more words of the natural language utterance by performing speech recognition on the natural language utterance; and determine the command or request based on the one or more words and the updated context information.

'652 Pat., Claim 1 (emphasis added).

44. Claim 14 recites:

14. A computer-implemented method of processing natural language utterances where recognized words of the natural language utterances alone are insufficient to completely determine one or more commands or requests, the method being implemented by a computer system that includes one or more physical processors executing one or more computer program instructions which, when executed, perform the method, the method comprising:

generating, by the one or more physical processors, a first context stack associated with a first device, the first context stack comprising context information that corresponds to a plurality of prior utterances;

synchronizing the first context stack with a second context stack associated with a second device such that the context

information of the first context stack is updated based on related context information of the second context stack; receiving, at the one or more physical processors, a natural language utterance associated with a command or request; determining, by the one or more physical processors, one or more words of the natural language utterance by performing speech recognition on the natural language utterance; and determining, by the one or more physical processors, the command or request based on the one or more words and the updated context information.

'652 Pat., Claim 14 (emphasis added).

45. Claim 20 recites:

20. A computer-implemented method of processing natural language utterances where recognized words of the natural language utterances alone are insufficient to completely determine one or more commands or requests, the method being implemented by a computer system that includes one or more physical processors executing one or more computer program instructions which, when executed, perform the method, the method comprising:

generating, by the one or more physical processors, a first context set associated with a first device, the first context set comprising context information that corresponds to a plurality of prior utterances;

synchronizing the first context set with a second context set associated with a second device such that the context

information of the first context set is updated based on related context information of the second context set;
receiving, at the one or more physical processors, a natural language utterance associated with a command or request;
determining, by the one or more physical processors, one or more words of the natural language utterance by performing speech recognition on the natural language utterance; and
determining, by the one or more physical processors, the command or request based on the one or more words and the updated context information.

'652 Pat., Claim 20 (emphasis added).

46. I understand that during prosecution of the '652 patent, the Examiner identified Coffman's U.S. patent counterpart as a cited reference and considered it and Kennewick prior to allowing the '652 patent. Pet., 14-15; *see also* Ex. 1012, 175, 216, 224.

VI. CLAIM CONSTRUCTION

47. I understand that it is sometimes necessary or useful for claim terms in a patent to be further explained or interpreted. This process, as I understand it, is commonly referred to as claim construction.

48. I understand that in IPRs, the Patent Board applies the same claim construction standard used by District Courts. This process involves construing claim terms in accordance with the ordinary and customary meaning of such terms, as understood by a POSITA, in light of the claim language, the patent's

specification, and any relevant prosecution history of correspondence between the patent applicant and the USPTO during the application process.

49. I also understand that certain “extrinsic” evidence, such as dictionaries or publications, can sometimes be useful to understand the meaning of a claim term, but that extrinsic evidence should not be used to contradict the patent’s claim language or prosecution history.

50. I understand that the United States District Court for the Eastern District of Virginia has issued constructions for certain claim terms in a lawsuit brought by Patent Owner against Amazon, and in which the ’652 patent was not asserted. I also note that the Schmandt declaration (Ex. 1002) discusses the legal principles of claim construction but does not offer any explicit construction of any terms found in the ’652 patent. Ex. 1002, ¶¶16-21. Also, the Petitioner identifies no terms as requiring construction. Pet., 18. My opinions stated below respond to the Petition without adopting the District Court’s constructions.

VII. PETITIONER’S MERITS CHALLENGES

A. Overview

51. I understand Petitioner asserted three Grounds in its Petition. I have been asked to consider Ground 1, which is asserted against each independent claim, and contends that claims 1-9, 14-18, and 20-26 are obvious in view of Coffman alone, has merit.

52. It is my opinion that Petitioner's challenges against independent claims 1, 14, and 20 fail because Petitioner does not show the synchronization of any "context stacks" or "context sets" as required in those claims in Coffman. Also, I believe Petitioner's challenges against dependent claims 8, 18, and 24 fail for the separate reason that Coffman does not have the aspects of those claims directed to selection of "domain agents" as discussed in detail below.

53. Although the Petition states that "neither of Coffman's related U.S. patent publications ... were discussed during prosecution," Pet., 14, it is my opinion that the Examiner correctly allowed the claims over Coffman's counterparts because the distinction stated in the Examiner's reason for allowance—that adding or updating a context does not show synchronization of context stacks or synchronization of context sets—applies to Petitioner's challenges based on Coffman.

54. Although Coffman may add context to a context stack or update context in a context stack, a POSITA would not, in my opinion, view that as demonstrating Coffman discloses synchronization of a context stack or context set. This is because a context stack or context set includes attributes including the context entries of the context stack or set, along with the order of those context entries. In my opinion, a POSITA would not view two context stacks or context sets as synchronized if the order of the context entries is not made to be identical.

Additionally, it is my understanding that the Petitioner's expert also testified at deposition consistently with this opinion.

B. Coffman

1. Overview

55. In FIG. 6, reproduced below, Coffman discloses a conversational input/output interface (Coffman, FIG. 6 & 37:14-29):

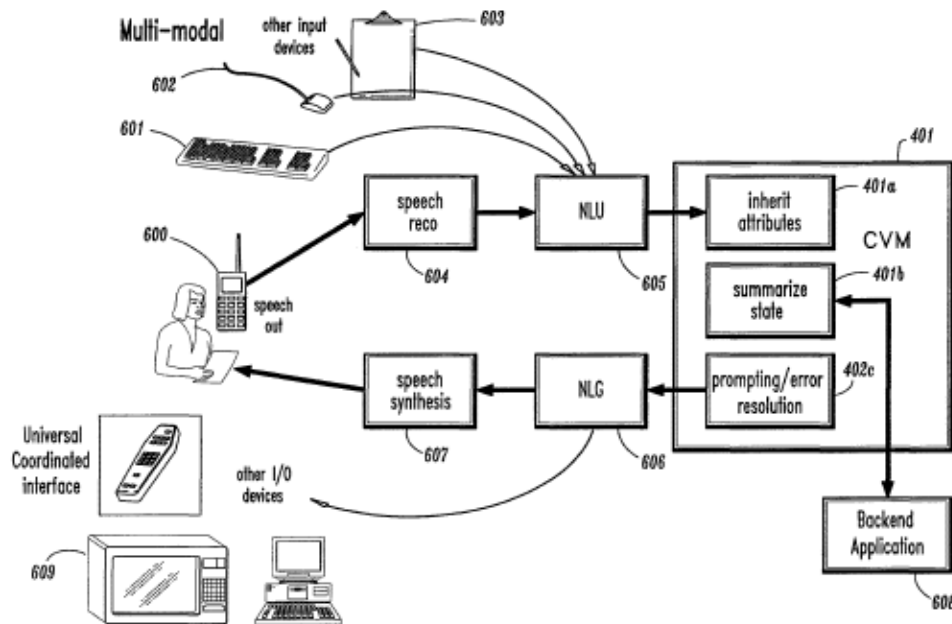
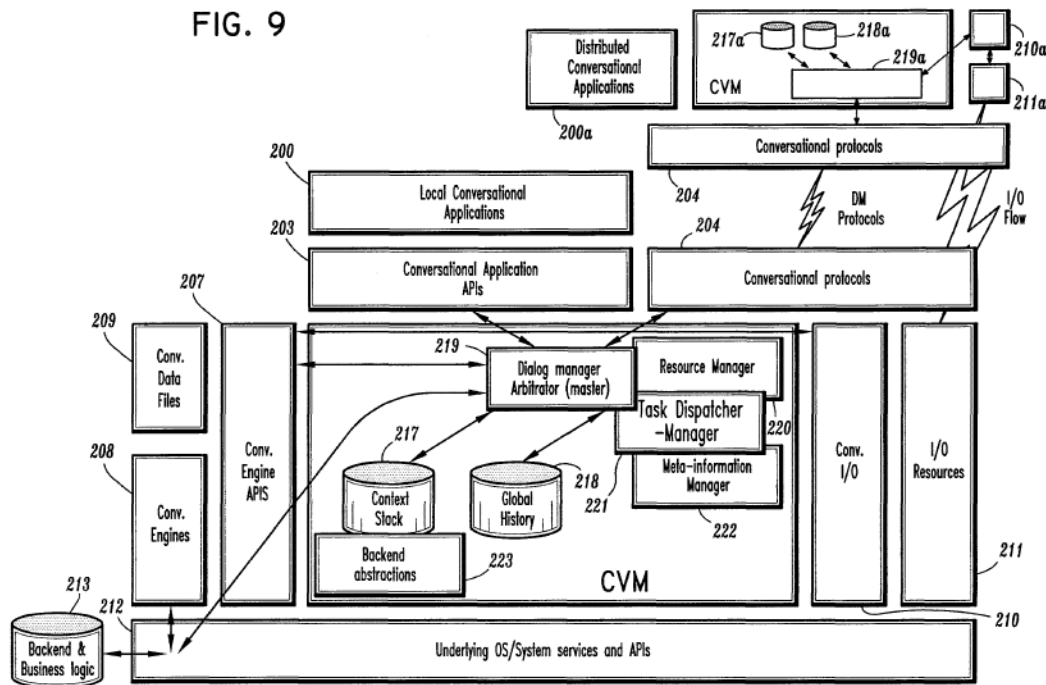


FIG. 6

56. The conversational input interface according to Coffman can process multi-modal inputs, such as files/streams/resources, speech via a phone 600, keyboard 601, pointing devices 602, and handwriting devices 603. The modalities are caught and transferred to a dialog manager that causes the inputs to be stored in the context stack. Spoken input from a speech client is subject to a speech

recognition process 604 and other input are subject to NLU [Natural Language Understanding] processing 605.

57. As illustrated in FIG. 9, reproduced below, the conversational protocols of Coffman include protocols for information exchange between dialog managers (DMs) of networked devices (Coffman, 26:28-30):



58. When applications are networked (distributed applications 200a), dialog management protocols are used for exchanging information to determine which dialog manager (219 or 219a) will execute a given function. Coffman, 26:30-27:1. As Coffman explains, typically, “different devices, CVMs [Conversational Virtual Machines] or different applications *will have their own*

dialog manager, *context stack 217, 217a* and global history 218, 218a.” Coffman, 27:1-2 (emphasis added).

2. Coffman’s CVM

59. Coffman discloses that a CVM may interact with multiple applications. Coffman discloses that the CVM provides applications and devices with “conversational services and behaviors as well as conversational protocols for interaction with *multiple applications* and devices also equipped with a CVM layer, or at least, conversationally aware.” Coffman, 11:2-4 (emphasis added). However, Coffman discloses that where there are different applications, “different devices, CVMs or different applications will have their own dialog manager, context stack 217, 217a and global history 218, 218a.” Coffman, 27:1-2.

60. A context stack for an application is further described with respect to FIG. 4’s context stack 405, “which operates and is managed under control of the dialog controller 404.” Coffman, 29:18-19. The context stack 405 “accumulates the context (i.e., full query arguments list of attribute value n-uples, and state/mode) of each active process with an activated discourse (i.e., conversational interaction associated with a given task/process/thread) along with any data files 413 (or at least identifiers of such conversational arguments) for the different engines that may be needed for input understanding (e.g., files or arguments that the engines use for performing their respective tasks such as active FSG [Finite

State Grammar], topic, vocabulary, HMM (Hidden Markov Models), voiceprints, language models or possible queries for a speech input).” Coffman, 29:21-27. In my opinion, this search of an application’s own context stack by Coffman does not cause Coffman’s CVM to then select a conversationally aware application to process a user’s command or request.

3. Coffman Lacks Synchronization of Context Stacks or Context Sets

61. Although Coffman provides a system with context stacks and allows for addition of entries and updates to those context stacks, it is my opinion that Petitioner has not identified, in Coffman, synchronization of a context stack or context set in a first device with a context stack or context set in a second device. In this regard, I find that Coffman is unlike the ’652 Patent, which seeks to determine “which version of a data element ... or an agent are the newest or most up-to-date and propagates that element” (’652 pat., 17:26-27), and which can entail “complete replacement,” rather than a series of incremental updates (’652 pat., 17:29-32), and also synchronizes a context stack across different devices (’652 pat., 4:29-32 & 19:41-44).

62. Petitioner argues that Coffman synchronizes context stacks, and in support of this argument, Petitioner cites portions of Coffman dealing with a device instructing another device to add context entries (Pet. 30-31 & Ex. 1002, ¶70 (each citing Coffman, 25:10-14)) and to update context. But it is my opinion

that those actions do not result in synchronization of context stacks or context sets in the devices.

63. I note that Coffman's context stack includes not only context entries, but an order of those context entries in the context stack. In my opinion, a synchronization of two context stacks would require not only identical context entries, but also identical orders of those context entries in the context stack. While Coffman discloses that a device may instruct another device to add or update context entries (Pet. 30-31 & Ex. 1002, ¶70; Coffman, 25:10-14), Coffman does not disclose or suggest that the order of the context entries in two context stacks is also somehow adjusted or modified to ensure that both the order of and the entries themselves in the two context stacks are also identical.

64. Based on my review of Coffman, nothing in Coffman's protocols modifies the order of a target context stack (or set) based on a source context stack (or set), such that both the source context stack (or set) is synchronized with the target context stack (or set).

65. Coffman's failure to disclose synchronization of context stacks or context sets stands in contrast to its other detailed disclosures regarding what information can be exchanged between the different dialog managers and why that information is exchanged. When describing the protocols for the operation of the different dialog managers in Coffman's system, Coffman lists at least fifteen (15)

items of information that *can be—but not “must be”*—exchanged between the different dialog managers in Coffman’s system. Coffman, 27:7-22. None of this information is required to be exchanged, and Coffman also fails to disclose any “synchronization” protocol to synchronize any of these fifteen items among different context stacks in different devices.

66. Further showing a lack of synchronization, Coffman allows the individual dialog managers the choice to act *or not act* on received information when managing their own context stack, since “different devices, CVMs or different applications ***will have their own ... context stack 217, 217a.***” Coffman, 27:1-2 (emphasis added). For example, Coffman states that the dialog managers provide “notification of I/O events such as ... addition to contexts” (Coffman, 27:12-13 (item 5)), which allows the recipient to act on the notification *without requiring any synchronization* of the entire context stack. Similarly, Coffman allows for “transfer of ... ***proposed*** context changes” (Coffman, 27:16-18 (item 11) (emphasis added)) and data associated with the proposed context changes (Coffman, 27:19-20 (item 15) (“data files, context and state updates due to action”). Coffman’s use of the term “proposed” rather than “required” illustrates that Coffman does not even require any synchronization of individual context items, much less synchronization of the context stack. Items 12 and 14 provide context update and context change notifications but, again, do not require any

synchronization of the context stack. *See* Coffman, 27:16-18 (item 12: “decision notification, context update, action update, state update, etc.” & item 14: “notification of context changes”).

C. Petitioner’s Ground 1 Fails to Show the Synchronization of Context Stacks or Context Sets of Independent Claims 1, 14, and 20

67. In my opinion, Coffman fails to disclose every claim requirement of the challenged ’652 patent claims. In particular, claims 1 and 14 of the ’652 patent recite a “first context stack associated with a first device” and requires *synchronizing “the first context stack with a second context stack* associated with a second device.” Similarly, claim 20 recites a “first context set associated with a first device” and “*synchronizing the first context set with a second context set* associated with a second device.”

68. Petitioner asserts (Pet. 30-31) (emphasis in original):

Coffman further makes clear that a master device’s context stack ... is ‘**synchronized**’ with a slave device’s context stack ..., explaining:

With a master/slave network configuration, the master dialog manager can compile all the lists and match the functions and needs with conversational capabilities. In addition, context information may be transmitted by indicating passing or pointing to the context stack/history of the device or application that the controller can access and add to its context stack.

(Coffman, 25:10-14; Schmandt, ¶70.) Coffman further explains that, using dialog manager protocols, devices can exchange various kinds of information, including notification of “addition to contexts,” “context update” and “notification of context changes.” (Coffman, 27:7-20.)

69. In my opinion, none of these passages address synchronizing a “context stack” or “context set” in one device with another “context stack” (or “context set”) in another device.

70. These actions cited in Coffman indicate that the master dialog manager may instruct a slave dialog manager *to add* or *update* an entry to its context stack, but Coffman does not disclose or suggest that the stacks themselves would be synchronized as required by the claims of the ’652 patent. A POSITA would not interpret the activities of “addition” to a context stack or updating existing information for a context entry in context stack to produce two context stacks that are synchronized because a POSITA would understand synchronization to require more than the operations disclosed in Coffman. For example, since a stack is an ordered list, simply ‘adding’ an entry based on an instruction from another device would not have the effect of synchronizing two context stacks without knowing that the entry is in the same relative location in both stacks, along with other conditions of synchronization.

71. One attribute of two synchronized context stacks is that the content of each stack is the same. For example, for two stacks to be synchronized, they must contain the same entries.

72. Another attribute of two synchronized context stacks is that the order of the context entries in the stack is the same. For example, for two stacks to be synchronized, it is not enough that they contain the same entries. For two stacks to be synchronized, they would contain stack entries in an identical order as well, because order is an attribute of a stack.

73. During deposition, Petitioner's expert Mr. Schmandt was asked about two "stacks [with] the same content but in different orders within their stacks," and whether "a POSITA [would have viewed those stacks as identical?" Mr. Schmandt's response was unequivocal, "No, because order is a – order is an attribute of stack." Ex. 2011, 13:10-17. Mr. Schmandt's testimony confirms that for two stacks to be synchronized, it is not enough that they contain the same entries; they also must contain those entries in an identical order because order is an attribute of a stack. Ex. 2011, 13:10-17, 14:13-16 (Q: "And I think we both agree that order of data within a stack is an attribute of a stack, correct? A: Yes, correct."); 14:25-15:6 ("So if one stack has different data or more data than the other stack, then they are not identical ..."). I agree with this characterization.

74. Coffman’s disclosure that a master dialog manager may instruct a slave dialog manager *to add* or *update* context in a context stack is not sufficient to conclude that these context stacks or context sets are “synchronized.”

75. Further, it is my opinion that a POSITA would understand Coffman’s disclosure that “different devices, CVMs or different applications *will have their own ... context stack 217, 217a*,” Coffman, 27:1-2, to suggest a lack of synchronization of the context stacks because the protocols for information exchange between different dialog managers propose, rather than require, context changes (Coffman, 27:16-18 (item 11)), as I have explained above.

76. Further, I could not locate anything in Mr. Schmandt’s declaration or testimony, or the Petition, concerning the desirability of synchronized context stacks in Coffman. Ex. 1012, ¶70; Pet. 30-31.

77. Thus, it is my opinion that the Petition’s Ground 1 fails to demonstrate that independent claims 1, 14, and 20 are unpatentable.

D. Petitioner’s Ground 1 Challenge Against Dependent Claims 8, 18, and 24 Also Fails

78. It is also my opinion that Coffman fails to disclose every claimed requirement of at least dependent claims 8, 18, 24.

79. Claim 8 depends from claim 3, and therefore as I understand it claim 8 incorporates the features of claim 3 as well as base independent claim 1. I have already recounted claim 1 above. Claims 3 and 8 recite:

3. The system of claim 1, wherein the first context stack includes a plurality of context entries, and wherein the one or more physical processors are further caused to:

identify, from among the plurality of context entries, one or more context entries that correspond to the one or more words, wherein the updated context information includes the one or more context entries.

8. The system of claim 3, wherein the one or more physical processors are further caused to:

identify one or more domain agents associated with the one or more context entries, wherein the one or more domain agents are configured to process the command or request; and

generate a response to the command or request using the one or more domain agents.

'652 Pat., Claims 3, 8 (emphasis added).

80. Claim 18 depends from claim 16, and therefore as I understand it claim 18 incorporates the features of claim 16 as well as base independent claim

14. I have already recounted claim 14 above. Claims 16 and 18 recite:

16. The method of claim 14, wherein the first context stack includes a plurality of context entries, the method further comprising:

identifying, by the one or more physical processors, from among the plurality of context entries, one or more context entries

that correspond to the one or more words, wherein the updated context information includes the one or more context entries.

18. The method of claim 16, further comprising:

identifying, by the one or more physical processors, one or more domain agents associated with the one or more context entries, wherein the one or more domain agents are configured to process the command or request; and

generating, by the one or more physical processors, a response to the command or request using the one or more domain agents.

'652 Pat., Claims 16, 18 (emphasis added).

81. Claim 24 depends from claim 22, and therefore as I understand it claim 24 incorporates the features of claim 22 as well as base independent claim

20. I have already recounted claim 20 above. Claim 22 and 24 recite:

22. The method of claim 20, wherein the first context set includes a plurality of context entries, the method further comprising:

identifying, by the one or more physical processors, from among the plurality of context entries, one or more context entries that correspond to the one or more words, wherein the updated context information includes the one or more context entries.

24. The method of claim 22, further comprising:

identifying, by the one or more physical processors, one or more domain agents associated with the one or more context

*entries, wherein the one or more domain agents are configured to process the command or request; and
generating, by the one or more physical processors, a response to the command or request using the one or more domain agents.*

'652 Pat., Claims 22 and 24 (emphasis added).

82. I note that Petitioner takes the position that Coffman's "executable software of a conversationally-aware application (and associated data, such as vocabulary, grammar, language models and NLU symbolic mapping)" discloses the claimed "domain agent" of claim 8. Pet., 54. Petitioner also states that Coffman's conversationally-aware application is "associated with the one or more context entries" of claim 8. Pet., 55.

83. It is my opinion that Petitioner's position is incorrect. Specifically, it is my opinion that Petitioner's characterization of Coffman's conversationally-aware application as a "domain agent" is unsupported by Coffman. As I discuss below, I believe that my opinion on this point is consistent with the Board's analysis in other IPRs filed by Google against Dialect, including in the Institution Decision issued in IPR2024-00746.

1. Coffman’s Non-Proprietary Speech Engine and Application Program Interfaces (APIs) Receive Speech Inputs from Conversationally-Aware Applications But Do Not Select or Invoke Conversationally-Aware Applications

84. As I explain below, it is my opinion that Coffman’s “executable software of a conversationally-aware application (and associated data, such as vocabulary, grammar, language models and NLU symbolic mapping)” does not disclose the claimed “domain agent” of claim 8.

85. In particular, as I explain, a user who interacts with a conversationally-aware application on the front end of Coffman’s system will communicate with the conversationally-aware application via speech, and the conversationally-aware application will access Coffman’s CVM layer (or kernel) via conversational application APIs so that the CVM can perform the backend operations. Coffman’s CVM and backend operations are hidden from the conversationally-aware applications, and do not select another application to carry out the operation requested by the user’s speech. *See* Coffman, 5:5-6, 29:10-11. Instead, Coffman’s backend can process queries formulated at the CVM, and provide the results back to the CVM for communicating them to a conversationally-aware application, which presents the results of the processed query to the user, such as by a user interface. As disclosed by Coffman: “conversational sub-systems 18 are responsible for converting voice requests into queries and converting outputs and results into spoken messages using the

appropriate data files 17 (e.g., contexts, finite state grammars, vocabularies, language models, symbolic query maps etc.).” Coffman, 13:8-10.

86. According to dependent claims 8, 18, and 24, the domain agent is “configured to process the command or request,” and is used to “generate a response to the command or request.” Coffman’s backend, rather than a conversationally aware application, executes the command or request associated with a user’s speech. Therefore, as I discuss in more detail below, Coffman’s conversationally aware applications cannot satisfy the requirements of the claimed domain agent set forth in these dependent claims.

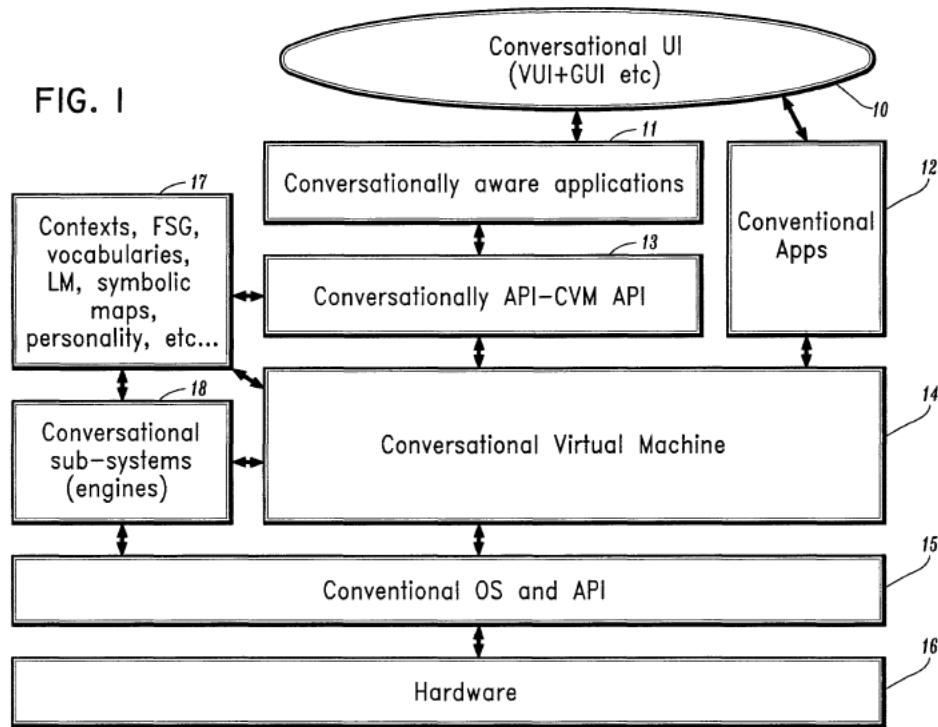
87. In my opinion, a POSITA would understand Coffman to be seeking to provide a backend system that would more easily allow a developer to program a voice-based interactive telephone application to converse with a user, without having to build an entire backend speech engine or API.

88. Coffman’s purpose is to provide a “conversational virtual machine” with a speech engine and application program interfaces (APIs) usable by application developers “for implementing conversational computing” with conventional applications and conversationally-aware applications. Coffman, 1:7-17. Coffman, therefore, seeks to provide a “universal conversational user interface.” Coffman, 3:30.

89. Coffman’s Conversational Virtual Machine, or “CVM,” “utilizes conversational subsystems (which may be local or distributed) including speech recognition, speaker recognition, text-to-speech, natural language understanding and natural dialog generation engines to understand and generate dialog between ... user and machine.” Coffman, 5:1-4. Coffman refers to these aspects of the CVM as a “subsystem,” and notes that the “subsystem [is] accessed through the CVM.” Coffman, 5:4-5. As an aid to software developers, Coffman explains that the “development environment offered by the CVM ... allows a developer to build, simulate and debug conversational aware application [*sic*] for CVM.” Coffman, 18:16-18. An application developer does not need to build a speech engine or APIs, and instead accesses the CVM through the system’s established APIs. The system’s speech “engines are *hidden* to the application through the conversational application APIs.” Coffman, 5:5-6 (emphasis added).

90. The relationship of Coffman’s CVM to conventional applications, conversationally-aware applications, and the APIs is illustrated in Coffman’s FIG. 1. Coffman’s FIG. 1 is described as a “block diagram of a conversational computing system according to an embodiment of the present invention.” Coffman, 9:27-28.

FIG. 1



91. Per Coffman, the CVM system “comprises a plurality of applications including conversationally aware applications 11 (i.e., applications that ‘speak’ conversational protocols) and conventional applications 12.” Coffman, 12:26-28.

92. As I note below, it is my opinion that the PTAB correctly evaluated Coffman’s disclosures in IPR2024-00746. I am reproducing the Board’s analysis from its Decision on Institution (Ex. 2012) at pages 25-29 concerning Coffman’s disclosures and its reasoning in concluding that Coffman’s conversationally-aware applications do not disclose the claimed “domain agent.” I agree with the Board’s conclusion that Petitioner’s argument is incorrect on this point.

93. As the Board explains, referring to Figure 1, Coffman describes “conversationally aware application 11 (i.e., applications that ‘speak conversational protocols’)” as “applications that are specifically programmed for operating with a CVM core layer (or kernel) 14 via conversational application APIs 13.” Coffman, 12:26–30. Coffman further discloses that “CVM kernel 14 controls the dialog across applications and devices on the basis of their registered conversational capabilities and requirements and provides a unified conversational interface.” Coffman, 12:30– 32. Conversational sub-systems 18 (not conversationally aware applications) are responsible for converting voice requests into queries and outputs into spoken messages. Coffman, 13:8–11. Although Coffman discloses that “[c]onversational application API 13 conveys all the information for the CVM 14 to transform queries into application calls and conversely output into speech,” (*id.* at 13:11–13), Coffman does not disclose a conversationally aware application including executable software for selecting a domain agent.

94. In Coffman, task dispatcher/controller 402 (in FIG. 4) associates each task or device with a conversational engine and with conversational arguments. Coffman, 40:20–21. Coffman discloses that, based on the modality (e.g., pointer keyboard, file, speech) task dispatcher 402 in the CVM redirects the stream to the appropriate conversational subsystem (or conventional subsystem) with speech

inputs being transcribed and understood. Coffman, 41:2–4. The outputs of those subsystems are run down context stack 405 in the CVM to extract a query and complete it. Coffman, 41:4–5. Context stack 405 is traversed until the input context is established; this means finding and selecting the active discourse between the user and the machine from among the last and past discourses. *Id.* at 41:10–13. The results of complete and unambiguous commands are returned to conversation engine 407, which includes speech and speaker recognition, NLU, and TTS services. Coffman, 41:24–25.

95. As in IPR2024-00746, Petitioner cites to Coffman’s disclosures at 42:1-7 for support for its argument. That disclosure states that a new query is compared by a dialog engine (within the CVM) going down the context stack (within the CVM) and, if a context is found that fits the utterance, Coffman activates the context and the corresponding process. Coffman, 42:1–7. This disclosure does ***not*** state that after traversing context stack 405 in the CVM, Coffman selects an application to process a user’s command. As the Board noted in IPR2024-00746, Coffman’s disclosure that “[e]ach action, completed query and conversational argument of an active task as well as each returned value/result are stored on the context stack 405” (40:27–29) indicates that traversing the context stack concerns determining the context based on an ***application that has already been selected***. I also agree with the Board’s conclusion that Petitioner has not

shown that the CVM's decision about which application is already active and has made a call to the CVM constitutes selecting a domain agent based on the determined meaning of an utterance.

96. As Coffman also discloses, “[e]ach application may be associated with multiple discourses (e.g. the application management discourse and the application content navigation discourses).” Coffman, 29:4-8. An application’s context stack 217 “comprises all the information associated with an application.” Coffman, 21:23-24. “Such information includes all the variable, states, input, output and queries *to the backend* that are performed in the context of the dialog and any extraneous event that occurs during the dialog.” Coffman, 21:24-26 (emphasis added).

97. A POSITA would understand that Coffman’s mention in this passage of “queries to the backend” is explained further by the inclusion of Coffman’s “backend abstraction layer 223” in the CVM Kernel 202. The “backend abstraction layer 223 ... allows access to backend business logic 213 via the dialog manager 219 (rather than bypassing the dialog manager 219).” Coffman, 22:1-3. The “backend abstraction layer 223 can translate input and output to and from the dialog manager 219 to database queries. This layer 223 will convert standardized attribute value n-uples into database queries and translate the result of such queries into tables or sets of attribute value n-uples back to the dialog manager 219.”

Coffman, 22:4-7. As such, Coffman’s backend can process queries formulated at the CVM, and provide the results back to the CVM for communicating them to a conversationally-aware application, which presents the results of the processed query to the user. Coffman does not, however, select a conversationally-aware application to process a query, contrary to Petitioner’s theory. This opinion is also supported by Coffman’s disclosure regarding FIG. 4, which states that “instructions/commands that are initiated by the user are explicitly *sent to the background* of the system.” Coffman, 43:1-2 (emphasis added).

98. A POSITA reading Coffman would understand that a user who interacts with a conversationally-aware application on the front end of Coffman’s system will communicate with the conversationally-aware application via speech, and the conversationally-aware application will access the CVM layer (or kernel) via conversational application APIs so that the CVM can perform the backend operations. And, as noted, Coffman’s CVM and backend operations are hidden from the conversationally-aware applications. *See* Coffman, 5:5-6, 29:10-11. As disclosed by Coffman: “conversational sub-systems 18 are responsible for converting voice requests into queries and converting outputs and results into spoken messages using the appropriate data files 17 (e.g., contexts, finite state grammars, vocabularies, language models, symbolic query maps etc.).” Coffman, 13:8-10.

2. Ground 1 Fails to Satisfy the Identification of Domain Agents Configured to Process a Command or Request of Dependent Claims 8, 18, and 24

99. As noted above, Coffman’s conversationally-aware applications are merely gateways to use the system, providing an interface (UI) for a user to provide the speech-based content for a given conversationally-aware application to interact with users. A conversationally-aware application in Coffman accesses the tools provided by Coffman’s conversational virtual machine (CVM) via Coffman’s application program interfaces (APIs), and awaits a response from the CVM to continue a communication with a user. In my opinion, a POSITA would not find the conversationally-aware applications in Coffman to be comparable to what the claimed “domain agent” is required to do when claim 8 is viewed in its entirety. This opinion also applies to claims 18 and 24.

100. In my opinion, Coffman’s CVM does not identify any conversationally-aware application, based on an identified context entry, configured to process a command or request, and the conversationally-aware application does not generate a response to the command or request.

101. In Coffman, a user “selects” a conversationally-aware application to be used. In response to a particular conversationally-aware application making an API call containing a user’s utterance, Coffman’s CVM activates a processing thread that accesses a context stack specific to that conversationally-aware

application, identifies the active discourse (or conversation) from that context stack, and carries out a process associated with the active discourse's context.

102. It is my opinion that a POSITA would understand that there is no identifying a conversationally-aware application based on an identified context entry in Coffman, and that Coffman's conversationally-aware application is not configured to process a command or request.

103. Coffman searches for an active context in a stack of contexts by comparing "new queries or arguments" to the stack "until an acceptable match is obtained and optionally confirmation is obtained from the user." Coffman, 42:1-7). Coffman's determination of an active context does not lead to an identification of any conversationally-aware application as a "domain agent." Rather, the search for an active context follows the user's selection of, and interaction with, a conversationally-aware application and the identification of that application's corresponding context stack.

104. My view of Coffman is supported by Coffman's disclosure at 42:1-7 (reproduced below):

Completion/search for the active context is performed from context to context down the stack. That is, new queries or arguments are compared by the dialog engine by going down the stack until an acceptable match is obtained and optionally confirmation is obtained from the

user. As soon [as] a context is found that fits the utterance at the level of the NLU symbolic language, the *context becomes active and the corresponding process becomes active*. Until the active command is completed, or until a new command is provided, the selected context is marked active, and pushed to the top of the context stack 405.

Coffman, 42:1-7 (emphasis added). Regarding the “corresponding process” disclosed in this passage, Coffman does not disclose that this “process” occurs at a “conversationally-aware application,” and does not disclose that activating a process is the same as selecting a conversationally-aware application, at least because Coffman associates a “process” with tasks and threads performed *at the CVM*. See Coffman, 42:16-17 (“This stack structure allows to maintain non-ambiguous conversational interactions with multiple tasks, threads or processes.”); 21:1-3 (“The task dispatcher/manager 221 dispatches and coordinates different tasks and processes that are spawned (by the user and machine) on local and networked conventional and conversational resources”); 30:1-2 (“context stack (as well as other CVM components)”; 30:4-5 (“[E]ach new task, process, or thread creates a new stack entry and is associated with a discourse.”); FIG. 2 (illustrating CVM components including task dispatcher/manager 221). This confirms that Coffman processes user requests and commands at the CVM and system backend, and that Coffman does not select a conversationally-aware

application to process a user request and command, or generate a response to a user request or command.

105. Also, Coffman expressly discloses that the task dispatcher/controller 402 of the CVM 401 “dispatches and coordinates different tasks and processes that are spawned” Coffman, 30:26-28. Nothing in Coffman’s discussion of the task dispatcher/controller 402 suggests or discloses identifying a conversationally-aware application based on a match in the context stack, or even that the task dispatcher/controller 402 is capable of identifying a conversationally-aware application.

106. Further, Coffman discloses that “all conversational subsystem calls are hidden to the application” Coffman, 29:10-11, 5:5-6. This means that the CVM 401, not any application, “will locate the requested conversational subsystem 407 (via the conversational subsystem services manager 406), drive its execution and return appropriately the *results*” to the application. Coffman, 29:10-11, 5:5-6 (emphasis added). It is the CVM 401 that includes the “context stack 405.” Coffman, 29:10-11, 5:5-6. Once again, this disclosure confirms that Coffman processes user requests and commands at the CVM, and that Coffman does not select a conversationally-aware application to process a user request and command, or generate a response to a user request or command.

107. Coffman fails to disclose the claimed “identify one or more domain agents” feature because identification of a context in a context stack in Coffman does not yield any identification of a conversationally-aware application to process a user’s request or command. The subsystems underlying Coffman’s system are invisible to the conversationally-aware application, which receives the final results to be reported to the user.

108. Confirming that Coffman’s determination of an active context in the context stack does *not* lead to an identification of a conversationally-aware application based on an identified context entry, Coffman discloses that where there are different applications, “different devices, CVMs or different applications will have their own dialog manager, context stack 217, 217a and global history 218, 218a.” Coffman, 27:1-2. Similarly, Coffman explains that a “context stack 217 comprises all the information associated with *an application.*” Coffman, 21:23-24 (emphasis added). A context stack for one application does not direct Coffman’s CVM to call another conversationally-aware application to generate a response to a user’s command or request.

109. As such, a search of an application’s own context stack 217 may identify an active context and active process for that application. But that does not mean that Coffman’s CVM will then identify a conversationally-aware application among many applications to process a user’s request based on the context stack

search. A user interacting with a conversationally-aware application in Coffman may result in an identification of an active context for that user's current discourse within that application. *See* Coffman, 30:4-5 (“[E]ach new task, process, or thread creates a new stack entry and is associated with a discourse.”); 29:4-5 (“Each application may be associated with multiple discourses”); 30:23-24 (“[F]or any new input from a user, the dialog controller 404 may traverse the context stack 405 until the input context can be appropriately established. This essentially amounts to finding and *selecting the active discourse between the user and machine* among the last and past discourses.”) (emphasis added). In my opinion a POSITA would *not* interpret these disclosures as disclosing or suggesting an identification of an application configured to process a user's request or command by Coffman's CVM.

110. It is also my opinion that Coffman fails to disclose “generat[ing] a response to the command or request using the one or more domain agents,” as claimed. Petitioner takes the position that Coffman “discloses that a conversationally-aware application returns output as a result of processing the command or request, which is used to generate a response to provide to the user.” Pet., 56 (citing Schmandt, ¶117).

111. A POSITA would understand that a user initiates interaction with a conversationally-aware application in Coffman, and that a conversationally-aware

application is neither selected or later invoked based on the determined meaning of an utterance. Moreover, generating a response to the command or request does not occur within Coffman's conversationally-aware application. Nowhere in the discussion of Coffman do I find a selection of an application, such as a calendar application, based on a determined meaning of a user's utterance. Any selection of an application is by a user who chooses to interact with a conversationally-aware application, not by the CVM based on a context entry identification. Coffman's identification of a context entry or even activation of a process does not then lead to an application selection, as the Petition argues.

112. Petitioner also cites to Coffman's 13:8-13 and 58:9-11. Pet., 57. I do not believe these disclosures can support Petitioner's conclusions because Coffman's disclosures at 13:8-13 and 58:9-11 describe actions at the CVM 14, not a conversationally-aware application. *See* Coffman, 13:8-13, 58:9-11.

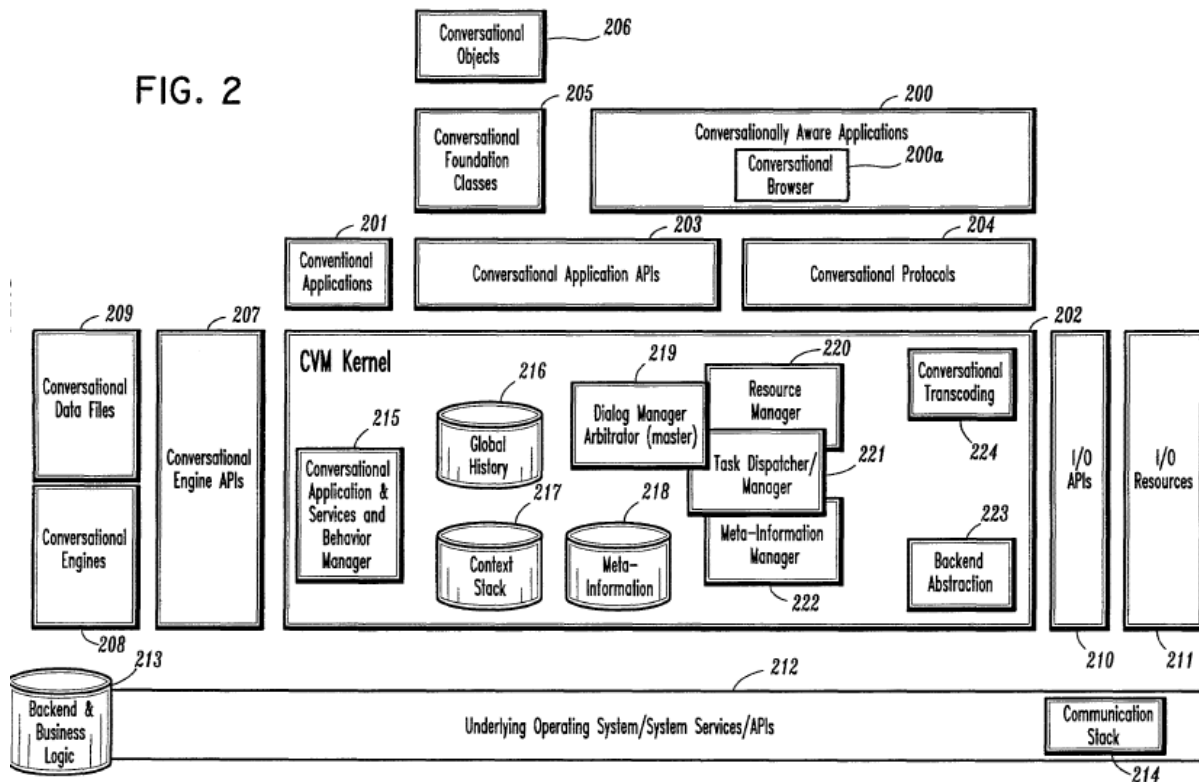
113. Coffman's disclosure at 30:4-10 begins by disclosing that "each new task, process, or thread creates a new stack entry and is associated with a discourse," and that each "application may be associated with multiple discourses" Coffman, 30:4-6. But Coffman also makes clear that each application has its own context stack,² and Coffman's description of the context stack contents for

² Where there are different applications, "different devices, CVMs or different applications will have their own dialog manager, context stack 217, 217a and global history 218, 218a." Coffman, 27:1-2.

various discourses for an individual application does not support Petitioner's theory that a conversationally-aware application is identified to process a user's request. A POSITA would recognize that the creation of a new stack entry in a specific application's context stack as in Coffman does not support the invocation of another application based on a determined meaning of an utterance or an identified context entry corresponding to a user's words.

114. Further, Coffman's conversationally-aware application is not configured to process a user's request or command, as claimed. Coffman explains that "all conversational subsystem calls are hidden to the application" Coffman, 29:10-11. This would inform a POSITA that the CVM 401, not any application, "will locate the requested conversational subsystem 407 (via the conversational subsystem services manager 406), drive its execution and return appropriately the *results*" to an application. Coffman, 29:10-11 (emphasis added).

115. Coffman's FIG. 2 shows and describes this process. Coffman's conversationally-aware application 200 communicates with the CVM Kernel 202, including the dialog manager 219, backend abstraction layer 223, and backend business logic 213:



116. Coffman’s “backend abstraction layer 223 ... allows access to backend business logic 213 via the dialog manager 219 (rather than bypassing the dialog manager 219).” Coffman, 22:1-3. The “backend abstraction layer 223 can translate input and output to and from the dialog manager 219 to database queries. This layer 223 will convert standardized attribute value n-uples into database queries and translate the result of such queries into tables or sets of attribute value n-uples back to the dialog manager 219.” Coffman, 22:4-7.

117. Coffman’s conversationally-aware applications rely on the CVM, including dialog manager 219 and backend business logic 213, to implement its tools and generate a response to a user’s utterance. The processing of user

questions, queries and commands is performed by the CVM and the backend subsystems, not by Coffman's conversationally-aware applications.

118. For these reasons, it is my opinion that the Petition is wrong in trying to establish that Coffman's conversationally-aware applications disclose the claimed "one or more domain agents" of dependent claims 8, 18, and 24.

119. Thus, it is my opinion that the Petition's Ground 1 fails to demonstrate dependent claims 8, 18, and 24 are unpatentable.

3. The Board's Understanding of Coffman's Conversationally Aware Applications Was Correct

120. I have reviewed the Board's Institution Decision in IPR2024-00746 (Ex. 2012) and find that the Board's analysis of Coffman in that decision matches my understanding of Coffman, specifically whether Coffman's conversationally-aware application discloses a claimed "domain agent" as that term appears in both the claims-at-issue in IPR2024-00746 and in dependent claims 8, 18, and 24 of the '652 patent.

121. I understand that the claims at issue in IPR2024-00746 included a claim limitation (designated as limitation 1[e]) that recites "selecting at least one domain agent based on the determined meaning, the selected domain agent being an autonomous executable that receives, processes, and responds to requests associated with the determined context" and that Petitioner's arguments focused on

interpreting Coffman's conversationally-aware applications as the claimed "domain agent." Ex. 2012, 22-23.

122. After thoroughly reviewing and understanding Coffman, the Board found that "Petitioner has not demonstrated Coffman discloses a conversationally aware application includes executable software for selecting a domain agent," Ex. 2012, 26, that "Petitioner does not explain how Coffman's disclosure of activating a process after traversing context stack 405 in the CVM teaches a conversationally aware application executing software that selects a domain agent," Ex. 2012, 27, that "Petitioner does not explain how selection of the active discourse teaches selecting a domain agent," Ex. 2012, 27, and that "Petitioner has not shown that the CVM's decision about which application is already active and has made a call to the CVM constitutes selecting a domain agent based on the determined meaning of an utterance," Ex. 2012, 28.

123. The Board also found Coffman's conversationally aware applications did not satisfy a "selected domain agent" invoked "to process" formulated requests. Ex. 2012, 28 ("limitation 1[g] recites 'invoking the selected domain agent to process the formulated request,'" because "a conversational subsystem, rather than a conversationally aware application executes the request." Ex. 2012, 29.

124. The Board's analysis in reaching these conclusions was sound and correct, and, in my opinion, was also consistent with my understanding of Coffman set forth above.

IPR2024-00752 Declaration of Benedict Occhiogrosso

This declaration and my opinions herein are made to the best of my knowledge and understanding, and based on the material available to me, at the time of signing this declaration. I declare under penalty of perjury under the laws of the United States of America that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true. I understand that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. 1001) and may jeopardize the validity of the application or any patent issuing thereon.

By: 
Benedict Occhiogrosso

Dated: February 21, 2025



Benedict Occhiogrosso

Curriculum Vitae

Professional Summary

Mr. Occhiogrosso is recognized in the field of Telecommunications and Information Technology. His expertise encompasses a broad range of technical and managerial disciplines including voice communications, data networking, carrier services for public/private switched & dedicated networks, image processing, wireless and cable transmission systems, security systems including intruder detection, access control and video surveillance as well as operational and strategic planning. As co-founder and President of DVI Communications, Inc. he is responsible for overseeing corporate operations and providing executive level direction on strategically significant projects. During the course of his career, he has worked for various organizations in a consultative, design/engineering and managerial capacity. He has supported numerous clients with respect to technology consulting in the financial services, high technology, legal, corporate, health care and education sectors. His technical practice presently encompasses Strategic Planning and Expert Witness litigation support. Earlier in his career, he worked in the military aerospace industry developing strategic and tactical command and control systems for various agencies in the defense and intelligence communities.

Expertise

- Automated out dialing systems
- Access control systems
- Automatic Call Distribution (ACD) & Interactive Voice Response (IVR)
- Cabling & Wire-based systems
- Cellular telephony
- Intrusion detection systems
- LOS Microwave Systems
- Mission - Critical Infrastructure Design for Data Centers
- Mobility management
- Packet Radio
- Packet Switching /Internet Protocol
- Packet Speech / Voice over IP
- Satellite communications
- Telephone switching systems
- Video Surveillance Systems & video Digitization
- Voice digitization/voice processing
- Voice messaging
- Wireless Communications Systems

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Education

<u>Year</u>	<u>College or University</u>	<u>Degree</u>
1975	Polytechnic Institute of Brooklyn	MS, Electrical Engineering
1975	Polytechnic Institute of Brooklyn	BS, Electrical Engineering

Enterprise Consulting Engagements

Mr. Occhiogrosso has been affiliated with DVI Communications since 1979, below are significant consulting engagements for which he has served as Principal-in-Charge and/or Project Manager.

- **Bertelsmann - New York, NY** (1992- 1994)

Mr. Occhiogrosso led the DVI team that provided planning, design, procurement and implementation management services associated with the “fast-track” relocation of 2,400 employees and 6 corporate subsidiaries into a new 900,000-sq. ft. office tower. A Northern Meridian telephone switch supporting 3,000 users, Satellite antenna farm, high speed LAN and Cat 5 cabling plant was deployed. Our services covered voice/data communications and video network infrastructure, data center design and rooftop satellite communications.

- **Bear Stearns & Co., New York, NY** (1999-2002)

Mr. Occhiogrosso served as DVI's Principal-in- charge and Lead designer supporting the design, engineering acquisition and implementation management of a 1500 position trading floor and an 8,000 plus Centrex replacement for Bear Stearns' new world headquarters. The floor employed dual handsets, digital recording, VOIP, global hoot n' holler and traditional intercom with CTI hookups to application processors. IPC IQMX (IP turrets) with a Racal Tienna (all-digital, disk based/recording systems were deployed.

DVI had provided the project management and voice technologies consulting for the design, engineering and acquisition of all Back Office Voice, and Trader Voice, Communications Systems for BSC's new headquarters. This included: 8,000+ lines metro area switching system, a 5000+ user unified messaging system, as well as conferencing, intercom, paging and wireless systems. Systems examined included leading edge technologies from Lucent and Nortel as well as Verizon's Centrex offering. A massive research effort was mobilized in order to specify the major telecommunications systems to be purchased for the new headquarters building at 383 Madison Avenue. As part of developing the new Voice Technology for Bear Stearns HQ, DVI also contributed to the installation of a Demonstration and Test lab at Bear Stearns. DVI coordinated support from IPC, Bell, Lucent and Nortel. DVI furthermore managed the implementation and installation of two PBX's, Nortel 81C and a Nortel Meridian1 (Option 11c), IPC Tradenet MX Alliance system and Octel and Call Pilot voicemail, as well as the installation of a QSIG interface between IPC, Lucent, and Nortel. The installation consisted of managing the scope of the project, as well as supervising the various Trades (electricians, IPC, cabling) for the installation of PBX's, Trunks, Lines (T1, E1 and PRI's), phone sets, voicemail, and supervising and coordinating the demonstration of voice products for BSC's management and IT personnel. DVI also contributed to the

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Installation of two Unified Messaging solutions, Octel and Call Pilot. Octel was installed as a separate system, isolated from the BSC environment. The Nortel Unified Messaging was installed and rolled out to test users in the BSC environment.

- **City University of New York, College of Staten Island** (1990-1997)

Mr. Occhiogrosso served as project executive where DVI provided systems engineering, design, and procurement and implementation services in conjunction with the development of the College's new 19 building Willowbrook campus. This encompassed all voice, data, and video communications systems, inter/intra-building cabling, and radio and telemetry systems for the campus. The systems deployed support over 12,000 students and essential operations including administrative and academic computing, registration, finance, departmental, library, media/educational center, building and grounds. The systems designed and acquired included cabling, fiber backbone, LANs, telephone switch and data communications servers. Three (3) AT&T Definity G3s with Audix supporting over 2,000 extensions were deployed. DVI was also responsible for developing a technology implementation and transition plan for the relocation and consolidation of the College's previous campuses to the new campus.

- **Brooklyn Union Gas** (1989- 1992)

Mr. Occhiogrosso oversaw the analysis, design and engineering, selection for all voice (PABX/ACD/VRU), cabling and data communications for the new headquarters complex at Metrotech. This encompassed BUG's general office as well as the command-control System Control Complex which employed specialized LAN, video and process control telemetry data. An AT&T Definity G3i System supporting Audix voice mail and ACD were deployed. The Melita automated outdialler for credit collection was also deployed.

- **Société Générale - New York, NY** (1993-1995)

In conjunction with the relocation of the Bank's U.S. headquarters to a new 350,000-sq. ft. office, DVI provided a full suite of telecommunications consulting services. The project involved the needs assessment, design, selection and implementation of technology for the bank's 300+ position trading floor (Etrali turrets/Triarch ITP), data networks (LAN/WAN), voice communications (PABX, voice mail), market data services and premises cabling infrastructure.

- **Roswell Park Cancer Institute – Buffalo, NY** (1992-1997)

Mr. Occhiogrosso as project director, provided project planning, design, engineering, and procurement and implementation management services in support of the modernization of this nationally recognized cancer care center. The complex, consisting of an 18 building campus, underwent a \$241MM modernization, which included a state-of-the-art telecommunications network interconnecting the complex with a new telephone/voice mail system (NTI), in-building wireless telephony and high-speed local area networking. These systems were designed to support a new 180 bed hospital, new lab/vivarium complex, several renovated buildings, bed side computing and high resolution medical imaging transmissions.

- **Citibank - New York, NY** (1979- 2000)

Mr. Occhiogrosso served as project manager, project principal and lead investigator for DVI's efforts in support of Citicorp. DVI designed and procured a multi-node N.Y. City wide voice

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communications system supporting over 20,000 lines (Citipax). This distributed system replaced several large existing PBXs as well as Centrex service based upon digital central office technology. Three NTI SL-100s were deployed to serve five locations. This included the tower at Court Square, LIC (1.1 MM sq. ft.). This system was expanded to include an 8000-user voice Messaging system (VMS). DVI supported feasibility, economic and requirements analyses as well as the design, engineering and implementation support for Citipax. DVI also performed a detailed disaster recovery plan/vulnerability analysis.

In addition to the Citipax PABX system, Mr. Occhiogrosso had also supported numerous diverse projects for Citicorp, including:

- Analyzed and improved the performance of a large-scale international message switching system (Citiswitch II), which supports numerous EFT applications. He subsequently participated in a task force to redesign Citibank's international message switching network.
- Specified and supported the design of an international packet switching network (CitiWIN) that integrated numerous Citibank applications and is deployed in some ninety (90) countries.
- For the domestic banking group, supported the analysis and design of home services offering advanced banking and investment services to customers in the privacy of their homes.
- For NYBOPS, analyzed alternate disaster recovery strategies for a multi-site ACD, including the Rockwell System and Periphonics VRU.
- For CitiSatcom, supported the complete procurement cycle for Citibank's VSET network deployment.
- He also supported several new business ventures including: DTS (Digital Transmission Services), FM subcarrier information service distribution and Videotex.
- He also provided ongoing technological consultation to Citibank in the areas of protocol conversion, digital PABX's and Local Area Networks.

Mr. Occhiogrosso has continued to support several consulting clients. A summary of consulting projects as follows:

For ***Capital One Financial*** (2004-2005), Glen Allen VA a Credit Card Processing concern, he performed analysis and design of replacement VoIP technology for Cap One's existing voice communications systems in its HQ, front and back offices and call/ contact centers at multiple corporate campuses. This included PBX, voice mail, ACD and examined both premises-based systems as well as managed service alternatives.

For ***Medical & Health Research Associates (MHRA)*** (2005-2007), NY, he designed and selected the PBX, Voice mail, Access control, Video Surveillance and Telecommunications Services which support their new HQ operations.

For ***Montclair State University*** (2006-2008), Montclair NJ as part of their Campus IT Infrastructure Upgrade, he performed a critical design review of the new Fiber Optic Backbone Cabling and Transmission Systems.

For the ***Port Authority of NY & NJ*** (2007), he provided consulting services for Strategic Plan for VoIP Migration & Financial Analysis of both premise-based and managed services to support 12,000+ users.

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For the **NYC School Construction Authority** (2005-2007), to Enhance Physical security at dozens of Elementary & intermediate Public Schools in NYC, he headed up a Quality Assurance team which evaluated the Digital Video over IP Surveillance systems installed. The system employed analog cameras, video codecs, LAN distribution and video compression, motion detection and image processing.

For **SES Americom** (2005 –2009), Princeton NJ, he provided consulting services for Telecommunications Systems upgrades and New Service Introduction.

This included: VoIP System design and deployment for the Maritime Mobile Broadband service, Encrypted IPTV, and a future Ka-band Satellite Communications system.

For the **NYC Transit Authority, MTA** (2007-2015), he is the Principal –in –charge of a major project to replace and upgrade the Radio System which presently serves 5000 buses, 1000 support vehicles and hundreds of portable users throughout NYC, the edge of NJ and parts of Westchester. The system operates at 800 MHz will use Digital TDMA Radios and will also deploy over 2 dozen new base stations(with wired and microwave backhaul) as well as a state-of-the-art Command & Dispatch center (manned 7/24) with full security and back-up. All buses will support 2-way communications, Automatic Vehicle Location and Tracking and emergency Notification system.

For **Governors Island** (2008 -2011), he developed the Island-wide Telecommunications, IT and Security infrastructure which encompasses 2-way digital radio, telephone and data switching, fiber optic and copper cabling plant, video surveillance and perimeter security system, master security console, Audio – visual subsystems and wireless backhaul to support Island operations as well as that of future prospective tenants.

Over the course of his career, Mr. Occhiogrosso has also conducted detailed audits of telecom bills analyzing and optimizing telecommunications services for numerous clients (commercial and institutional) reconciling the services provided with the charges invoiced by telecommunications carriers and service providers. These audits would often identify anomalies such as overcharging for nonexistent services or facilities, misapplication of tariffed offerings. This often-generated refunds and credits for the client. DVI's 3-phase Reconomize service (Reconciliation, Economization and Optimization) quantified opportunities for not merely cost recovery/ refunds but also long – term cost reduction and cost containment as well as optimization considering cost-performance tradeoffs and alternate services and providers.

Research & Development

For DARPA (1976-1979), Mr. Occhiogrosso supported research into packetized voice communications and integrated packet –circuit switching systems of voice, data and wideband applications. He also supported the analysis and design of low-bit rate vocoders with cryptosystems in shared user networks (mixed satellite and terrestrial) for survivable communications (pre-post and trans-attack).

Among the other Military C3I systems he worked on included:

- Marine Integrated Fire and Air Support System (MIFASS) for Navalex and USMC (1979-1982)
- Landing Force Integrated Communications System (LFICS) for Navalex and USMC (1981-82)
- Position Location Reporting System (PLRS) for USA/USMC (1980-82)
- Digital Communications Terminal (DCT) for USA(1982)
- AUTODIN II (for Defense Communications Agency (DCA) (1976-78)
- SORAK (for USAF, on behalf of Republic of South Korea) (1982)

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- ULCS/ULMS (Unit Level Circuit and Message Switches) for Tri-Tac (1976-1978)
- JTIDS (Joint Tactical Information Distribution System) for USAF (1977)
- Integrated Local Regional Access Network (ILRAN) for DCA (1976-7)
- Several classified initiatives (1975-79)

For DVI Communications internally and under development to TIE/Communications (1982-1986), Mr. Occhiogrosso led an engineering development team which developed a Store-and-Forward voice messaging system, the Speech Message Switch (SMS) for integrated use with TIE's voice-data PABX and standalone use for general industry. Product development encompassed hardware, component selection, circuit design, PC layout fabrication and testing, as well as software: specification, coding, debug and test.

For Xerox Corporation (1977-79), Mr. Occhiogrosso served as the Program Manager for a major support effort to develop a distributed satellite and microwave-based nationwide network (XTEN), providing advanced communications features to the business community, including: electronic document distribution, high speed data communications, communications security, and video teleconferencing. He was responsible for technical activities in the areas of system architecture and design, communications protocol development and implementation, security architecture, system service specifications, and simulation model development for traffic loading and performance evaluation.

Wireless Experience

He has also supported numerous radio communications/wireless systems technologies including: Satellite (C- and Ku-band), LOS Microwave (4-40 GHz), UHF/VHF (AM/FM/TV Broadcast), Cellular (800 MHz), PCS (1.9GHz), paging (150/400/900 MHz) as well as in-building wireless 802.11 a/b/g). He is also thoroughly familiar with transmission characteristics of various channels and the tradeoffs in power management, modulation and encoding schema and reception techniques. Among the engagements he have supported spanning these technologies include:

- Design and implementation management of C and Ku-band satellite networks using TDMA & FDMA access methods for the United Nations and Citigroup (1988-1995)
- Rooftop Satellite Systems Deployment for Data and TVRO applications for BMG and various Financial Services Firms (1991)
- Design and Implementation Management of Digital Page/ Radio –based Alerting System for Con-Edison and Power Authority of the State of NY (Indian Point); this included Radio frequency selection and radio control system design, based on frequency allocations, availability of base station and repeater, and path profile calculations.(1979-1982)
- Design and Implementation of 2-way digital TDMA Land Mobile Radio system (GPS-capable) for Governors Island NYC (2010)
- Design and Implementation management of Satellite Antenna Farm and LOS Microwave Back-up Links for Major Newspaper Worldwide Publishing Network (2005-2006)
- Expert Witness support in VSAT Ku- band deployment litigation (1993-95)
- Expert Witness support in Breach of Contract suit for Air-to-Ground in-Flight Communications Systems(1994 – 1998)
- Rooftop Site Management, Survey and Upgrade Plans for Metropolitan Life Real Estate (multiple Properties) (1992-95)

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- Numerous In-building Wireless Systems deployments using Wi-Fi 802.11a/b/g technology (university, corporate and Health care applications) including coverage /capacity analysis, security , hardening and integration with existing LAN infrastructure (2005-2015)
- Analysis of use of cellular data communications systems for Back-up and Recovery links to traditional wire line facilities (1985-89)
- Design and Implementation Management of LOS Microwave and Point-to-point Infrared High Speed Communications Links for various corporate, institutional and Government applications (2000-15)

Litigation Support Experience

Mr. Occhiogrosso served as an expert witness in various cases for several high-tech corporations encompassing patent infringement, trade secrets, product malfunctions Class Action for Service Level Agreements and breach of contract. Detailed technical subject matter encompassed the following disciplines:

- Voice digitization/voice processing
- Voice over Internet Protocol (VoIP)
- Voice Mail and Electronic messaging
- Automatic Call Distribution (ACD) & Interactive Voice Response (IVR) Systems
- Cellular telephony and data communications
- Air-to-ground communications (S/L Band)
- Satellite communications (C and Ku Band)
- Telephone switching systems
- Predictive/ progressive dialing systems
- Gesture recognition. Video/ Image processing

A summary of major cases he has supported as either a testifying or consulting expert witness follows:

Type of Matter:	Class Action Lawsuit regarding CO-based System Performance of Voice Mail services
Client Law Firm:	Stewart and Irwin P.C. - for Class (Marion County Circuit Court, Indiana)
Case Name:	Class v. Ameritech
Services Provided:	Reviewed and analyzed extensive amount of documentation; provided consultative expert assistance and deposition testimony
Disposition:	Case was settled favorably for our side (the class)
Date:	2003-2004
Type of Matter:	Patent Infringement (IDDD Blocking for Public Pay Telephones)
Client Law Firm:	Baker Botts LLP (Houston TX) - for SWBT
Case Name:	Gammino v. SWBT (US District Court for the Northern District of Texas, Dallas)
Services Provided:	Patent infringement & Invalidity Analyses, rendered Expert Reports and provided deposition Testimony & Court Testimony at a Markman Hearing for Payphone Blocking patents (Instrument and CO based)
Disposition:	Case was decided in favor of our client SBC Communications/ SWBT; and upheld on appeal
Date:	2006-2007

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Type of Matter: Patent Infringement (VoIP Telephony and Wireless)
Client Law Firm: **Step toe & Johnson LLP (Washington DC) - for Vonage**
Case Name: Vonage v. Verizon (US District Court for the Eastern District of Virginia, Alexandria)
Services Provided: VoIP Patent infringement, Enablement & Invalidity Analyses, **rendered Expert Reports, was deposed & provided Expert Testimony at Trial** for VoIP/Wireless patents
Disposition: Of the 3 patents in a 7 patent portfolio (that we handled) which Verizon alleged Vonage infringed, we assisted S&J In getting 2 patent infringement allegations withdrawn; Infringement Verdict against Vonage was overturned on Appeal for a third Wireless patent. Case subsequently settled.
Date: 2006-2007

Type of Matter: Recapture of PE & O Insurance payout for IVR System Patent License
Client Law Firm: **D'Amato Lynch (NYC) - for AIG**
Case Name: AIG Specialty Lines v. American Century (US District Court for the Southern District of New York, New York City)
Services Provided: **provided Expert consulting services** with respect to Computer telephony integration, IVR Systems Development and call center technology
Disposition: Client sued and recovered Policy benefit payout from IVR developer
Date: 2004-2007

Type of Matter: Patent Infringement (Cellular Telephony)
Client Law Firm: **Hogan Hartson LLP (Los Angeles) – for Kyocera Wireless Corp.(KWC)**
Case Name: MLR v. KWC (US District Court for the Southern District of California, San Diego)
Services Provided: On behalf of a Telecommunications Electronics Manufacturer in Wireless and Cellular Telephony & Data communications, **performed Patent Infringement, & Invalidity Analyses on a 5 patent portfolio**
Disposition: Case was settled favorably for our side (KWC)
Date: 2006-2007

Type of Matter: Class Action Lawsuit regarding Junk Digital Fax (TCPA 1991 & JFPA 2005)
Client Law Firm: **Phillips Murrah P.C. - for AAF&R (Oklahoma City, OK)**
Case Name: Class v. All American Fitness & Racquetball Centers Inc. (AAF&R) (Oklahoma County Circuit Court, OKC)
Services Provided: Reviewed and analyzed extensive amount of documentation; provided **consultative expert assistance and expert report**
Disposition: Case was settled
Date: 2008

Type of Matter: Patent Infringement (Specialty Communications Cabling & Wire)
Client Law Firm: **LaRiviere, Grubman & Payne, LLP (Monterey CA) for Monster Cable**
Case Name: Audiovox Corp. v Monster Cable Products Inc. & Counterclaim (US District Court for the Eastern District of New York)
Services Provided: Reviewed and analyzed extensive amount of documentation; provided **consultative expert assistance and expert report**

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Disposition: Case was settled
Date: 2008

Type of Matter: Patent Infringement (VoIP & Mobile Telephony)
Client Law Firm: **Ropes & Gray LLC**(New York) for Rebtel
Case Name: Stanacard, LLC v Rebtel Networks, AB & Rebtel Mobile, Inc. (US District Court for the Southern District of New York, New York City)
Services Provided: Reviewed and analyzed extensive amount of documentation; provided **consultative expert assistance and expert report**
Disposition: Case was settled favorably for our side
Date: 2008-2010

Type of Matter: Copyright Infringement re: Digital Ringtones for Mobile Telephony
Client Law Firm: **Lovells LLC** (New York) for ASCAP
Case Name: United States of America v ASCAP (US District Court for the Southern District of New York, New York City)
Services Provided: Reviewed and analyzed extensive amount of documentation; provided **consultative expert assistance**
Disposition: Case resolved
Date: 2009-2010

Type of Matter: IP Indemnification to Recapture of Payments for RAKTL Patent Portfolio License(s)
Client Law Firm: **Bryan Cave (Atlanta,GA) - for AFLAC**
Case Name: American Family Life Assurance Company of Columbus v Intervoice, Inc. (US District Court for the Middle District of Georgia, Macon Division)
Services Provided: Provided Expert consulting services with respect to IVR Systems Deployment, Computer telephony integration, and call center technology; performed **infringement Analyses for IVR applications patents, rendered Expert Reports & was deposed.**
Disposition: Case was resolved in Intervoice's favor and decision was subsequently upheld on appeal based upon intellectual property infringement indemnification clauses in Purchase Agreement between the parties.
Date: 2010-2014

Type of Matter: Patent Infringement re: Call blocking for cellular telephony
Client Law Firm: **K&L Gates LLC (Boston MA), representing Sprint**
Case Name: Gammino v. Sprint Communications Co., Sprint Spectrum L.P., Nextel Operations, Inc. & Virgin Mobile USA L.P. (US District Court for the Eastern District of Pennsylvania)
Services Provided: Reviewed and analyzed extensive amount of documentation; provided consultative expert assistance ; provided tutorial to court on cellular technology; testified at Markman hearing
Disposition: Case was resolved in Sprint's favor for Non- infringement and this was upheld on appeal.
Date: 2011 – 2013

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Type of Matter: Patent Infringement re: Captioned Telephony
Client Law Firm: **Baker Botts LLP (Austin TX), Akin Gump (NY NY) and Maschoff - Brennan (SLC,UT)** all representing Caption Call LLC and Sorenson Communications

Case Name: *Ultratec, Inc. v. Sorenson Communications*, U.S. District Court for the Western District of Wisconsin, Case No. 3:13-cv-00346

Related Proceedings: Petition for *Inter Partes* Review denied by Patent Trial and Appeals Board in the following proceedings: IPR2013-00540 through 00545, as well as 00549, 00550, IPR 2013-00288 and IPR2014-00780. IPR2015-00636,00637, IPR2015-01355 and 01357 through 01359, IPR2015-01886 and 01889, Petition for *Post Grant* Review denied by PTAB in PGR2016-00037

Services Provided: Reviewed and analyzed 20 patents in suit (dozens of claims), numerous pieces of prior art; Rendered expert reports on Invalidity and Non – Infringement of Ultratec patents; Rendered expert reports on Validity and Infringement of Sorenson patents; Testified at trial; Deposed in both litigation and related IPR proceedings.

Disposition: Re: CaptionCall patent – the PTAB determined the claims in the patent to be invalid and CaptionCall’s infringement claims were withdrawn.

Re: Ultratec’s patents - Case was resolved initially in Ultratec’s favor on Summary Judgement and for the remaining claims at trial with CaptionCall found to Infringe valid claims and Ultratec awarded damages. Subsequently nearly all claims in suit were found to be Invalid by the PTAB, and the case(s) have been stayed pending final resolution of the PTAB’s decisions. The IPR decisions of the PTAB - finding in favor of CaptionCall were reaffirmed and Ultratec. withdrew all outstanding litigation.

Date: 2013 – 2022

Type of Matter: Patent Infringement re: Call Management and Softswitches
Client Law Firm: **Cooley** , representing Broadsoft
Case Name: Broadsoft v Callwave (Case No. 1:13-cv-00711-RGA)
Services Provided: Invalidity Analysis of asserted patents provided expert reports on invalidity, deposition and also declaration in summary judgement motion for invalidity on a subset of the claims. Technology involved caller ID spoofing, ANI and sequential and simultaneous ring protocols

Disposition: Case is ongoing, summary judgement motion pending
Date: 2015- 2019

Type of Matter: Patent Infringement re: Prison Telecommunications Systems
Client Law Firm: **Bragalone & Conroy**, representing Securus
Case Name: Securus Technology v Value – Added Communications
Services Provided: Invalidity Analysis of voice mail patents in prison resulting in a petition for IPR against the patent owner.

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Disposition: IPR petition prepared, unfiled
Date: 2016- 2017
Type of Matter: Patent Infringement & Validity Analysis re: Digital Recording
Client Law Firm: **Fox Rothschild**, representing Verint
Case Name: Verint Systems v Red Box recorders (USD SNY 1:14-cv-05403-SAS)
Services Provided: Infringement Analysis of Defendant Technology (6 patents) and Validity Analysis of Plaintiff's patents (against 31 pieces of prior art), Expert reports, deposition and declaration in a motion for summary judgement in 101 Alice proceedings.
Disposition: Case was settled: defendant took out licenses for all asserted claims from Verint's IP licensing entity , the Open Innovation Network
Date: 2016-2017

Type of Matter: Patent Infringement & Invalidity Analysis re: VoIP Switching
Client Law Firm: **Fish Richardson**, representing Metaswitch
Case Name: Sonus Networks v Metaswitch Networks Ltd (C.A. NO2:18-CV-00057RWS).
Services Provided: Invalidity Analysis of Asserted patents, IPRs filed
Disposition: Case was settled; IPR terminated
Date: 2018-2019

Type of Matter: Patent Infringement re: Call Center
Client Law Firm: **DLA Piper**, representing Call Miner
Case Name: NICE Ltd.et al. v. Cal/Miner, Inc. (C.A. No.18-02024-RGA (USDC D. Del.)
Services Provided: Invalidity Analysis of Asserted patents
Disposition: Case settled IPRs filed
Date: 2019 -2022

Type of Matter: TCPA Violation
Client Law Firm: **Bursor Fischer** representing Lorenzo Quintana et al
Case Name: Quintana et al v BB&T Co. Case No. 1:18-CV-00748-WO-JLW)
Services Provided: Expert Analysis of Predictive Dialer technology
Disposition: Case Withdrawn in light of SCOTUS ruling on TCPA ADT
Date: 2019 -2021

Type of Matter: Defense of Patent Owner in **IPR Proceedings**
Client Law Firm: **Mintz Levin** representing Parus
Case Name: IPRs 2020-00686-7& IPRs 2020-00846-7
Services Provided: Expert Analysis of Voice Browser Technology
Disposition: 2nd set of IPRs decided in favor of Petitioner
Date: 2019 -2022

Type of Matter: Defense of Patent Owner in **IPR Proceedings & Litigation (USDC)**
Client Law Firm: **Williams Simon Landis** representing Gesture Technology Partners
Case Name: IPR 2021-00917 & IPRs 2021-00920-3 (inclusive)
Gesture Technology Partners LLC v Huwaei & Samsung C.A. NO. 2:21-cv-00040 & 41-JRG
Services Provided: Expert Analysis of Gesture Recognition Technology-Validity/Infringement
Disposition: IPRs Ongoing,, litigation settled

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Type of Matter:	Defense of Patent Owner in Patent Re-Exam
Client Law Firm:	Clayton McKay Bailey representing SOTAT
Case Name:	USPTO, <i>Ex Parte</i> Reexamination– US Pat. No. 9,854,207
Services Provided:	Expert Analysis / Declaration of Mobile Surveillance System patent no.
Disposition:	Awaiting Office Action
Date:	2024
Type of Matter:	Infringement & Validity Analysis of ASR and NLP technology
Client Law Firm:	McKool Smith representing Parus Holdings
Case Name:	Parus Holdings Inc. v Charles Schwab & Co., Inc. et al CASE NO. 2:21-CV-393/394/395/396 -JRG USDC EDTX
Services Provided:	Expert Analysis of Voice Browser Technology
Disposition:	Settlements reached among all litigants
Date:	2022-24
Type of Matter:	Infringement and validity analysis on behalf of Patent Owner in
Client Law Firm:	Williams Simon Landis representing Estech Systems IP, LLC
Case Name:	Estech Systems IP LLC v Carvana et al (USDC EDTX) C.A. NO. 2:21-cv-000482/00475/00478/00483 JRG & Case no. 2:22-cv-00006-JRG-RSP Estech Systems IP LLC v Mitel Networks, Inc. (USDC EDTX) Case no. 2:21-cv-00473-JRG-RSP
Services Provided:	Expert Analysis- Estech Systems patented Technology Validity/Infringement
Disposition:	All litigation settled
Date:	2021-24

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Professional Affiliations, Achievements & Awards

- Institute of Electrical & Electronics Engineers (IEEE)
- Association for Computing Machinery (ACM) (former)
- Society of Telecommunications Consultants (STC) (former)
- Health and Information Management Systems Society (HIMSS) (former)
- Communications Managers Association (CMA) Consultant Partner (former)
- Electronic Industries Association (EIA) (former)
- Association of Old Crows (AOC) (former)
- Wall Street Technology Association (Author/Speaker)

Publications

Mr. Occhiogrosso was the sole, primary or contributing author to the following works encompassing a variety of technical subject matter which appeared in industry publications, technical journals, and chapters in technical textbooks or as a provisional application for a US patent.

Voice Mail, Digitized and Packetized Voice Systems

1. "Human Factors Considerations in the Design of Voice Mail Systems," Second International Symposium on Computer Message Systems. Washington D.C., September 1985.
2. "Voice Mail Technology Comes of Age Part I and II," Telephony, September 1984.
3. "Voice Store and Forward: A Rapidly Maturing Technology," Proceedings of ELECTRO '84. Boston, Massachusetts, May 1984
4. "Issues in Packet Voice Communication," Proceedings of IEEE, August 1979.
5. "Digitized Voice Comes of Age: Part II Techniques," Data Communications, April 1978.
6. "Digitized Voice Comes of Age: Part I Tradeoffs," Data Communications, March 1978.

Local Area Networks (LAN)

"LAN vs. PABX?" in Local Area and Multiple Access Networks. Computer Science Press, edited by R.L. Pickholtz, 1986.

Network Analysis & Design

1. "Analysis and Design of Hybrid Switching Networks," IEEE Transactions on Communications, September 1981.
2. "Packet Switched Voice and Data Networks Advantages and Costs," Telecommunications, December 1978.

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3. "Economic Analysis of Integrated Voice and Data Networks: A Case Study," Proceedings of the IEEE, November 1978.
4. "Design of Hybrid Switched Networks for Voice and Data," Proceedings of the International Conference on Communications, June 1978.
5. "Performance Analysis of Integrated Switching Communications Systems," Proceedings of the National Telecommunications Conference. Los Angeles, California, December 1977.

Data Center Design and Engineering

1. "Maximizing Uptime for Mission Critical Applications", Development NY, May 2004
2. "Data Center Design and hardening tips", Development NY, May 2005
3. "New Challenges in Data Center Design and Hardening", Development NY, May 2006
4. "An Economic Imperative: Reducing Data center Expenses", Perspective NY, October 2008*

Disaster Recovery

1. "Business Continuity and Disaster Recovery in an Age of Heightened Awareness", Development NY, April 2003
2. SOS: Selected Observations on Sandy ... A Technology Perspective, Perspective NY, Mission Critical Issue, 2013

In-Building Wireless

1. "The Ins and Outs of Building Wireless", Development NY, September 2004
2. "In-Building Technology: IP Convergence, Rise of Wireless & Building Emergency Communications", NYC Real Estate Expo, November 2010

Physical Security

1. "Safety and Security Retrospective: 5 Years after 9-11", Development NY, September 2006
2. "Growing Impact of Information Technology (on Security)", Development NY, November 2005
3. "IT Trends in Healthcare: The effect of EMRs on Hospitals", Perspective NY, Spring 2008

Internet of Things (IoT) Smart City/Smart Buildings/Energy/Transportation

1. "IoT Considerations, Requirements, and Architectures for Smart Buildings – Energy Optimization and Next Generation Building Management Systems", IEEE IoT Journal, February 2017
2. "Internet of Things (IoT)-based Apparatus And Method For Rail Crossing Alerting Of Static Or Dynamic Rail track Intrusions", Proceedings of Joint Rail Conference (JRC), April 4-7, 2017, Philadelphia, PA
3. "An Overview of IoT Technologies and Solutions for Smart Cities". Chapter in Internet of Things, Editors: Q. Hassan, A. R. Khan, S. A. Madani, Wiley/IEEE Press, to be published in 2018
4. "The Emerging Energy Internet of Things", Chapter in Internet of Things, Editors: Q. Hassan, A. R. Khan, S. A. Madani, Wiley/IEEE Press, to be published 2018
5. "Distributed Sensor Systems: Mobile IPv6, Proxy MIPv6, and Related Protocols for Crowd-sensing Applications in Smart Cities Environments" (submitted to Conference & Expo on Emerging Technologies for a Smarter World (CEWIT2017))

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6. “Practical Aspects for the Integration of 5G Networks and IoT Applications in Smart Cities Environments”, Journal of Wireless Communications and Mobile Computing, August 2019

Internet of Things (IoT) E-health and Insurance

1. “Security Considerations for IoT Support of E-Health Applications”, Chapter in Internet of Things, Editors: Q. Hassan, A. R. Khan, S. A. Madani, CRC Press, 2017, ISBN 9781498778510
2. “IoT Considerations, Requirements, and Architectures for Insurance Applications”. Chapter in Internet of Things, Editors: Q. Hassan, A. R. Khan, S. A. Madani, CRC Press, 2017, ISBN 9781498778510.
3. “IoT Security (IoT Sec) Mechanisms For e-Health and Assisted Living Applications “ (2nd IEEE/ACM International Workshop on Safe, Energy-Aware & Reliable Connected Health (SEARCH 2017))

Internet of Things (IoT) Security

1. “System and Method for a uniform measure and assessment of an institution’s aggregate cyber security risk and of the institution’s cybersecurity confidence index“ (submitted as Non – Provisional Application 15/296,005 to the United States Patent & Trademark Office (USPTO), October 17,2016)
2. “IoT Security (IoT Sec) Considerations, Requirements and Architectures”, 14th IEEE Annual Consumer Communications & Networking Conference (CCNC), January 2017, Las Vegas, NV

Emerging IoT Applications

1. “Issues in Multimedia IoT Systems and Applications”, IEEE IoT TsC (Transactions on Service Computing), the IoT Forum and IPv6 Forum (collocated with the IoT Week), June 2017, Geneva, Switzerland.
2. “Energy – efficient IoT- based “Black Box” for Aeronautical and other applications (submitted to Consumer Communications & Networking Conference (CCNC), 2018 related to Vehicular Communications and Applications in Water, Land, and Sky)
3. “A Review of Wireless and Satellite-based M2M Services in Support of Smart Grids” 1st EAI International Conference on Smart Grid Assisted Internet of Things (SG IoT 2017) July, 2017, Sault Ste. Marie, Ontario, Canada
4. “IoT-Driven Advances in Commercial and Industrial Building Lighting”, Chapter in Industrial IOT, Editor: I. Butun, Springer Nature, 2020, ISBN 978-3-030-42500-5
5. “Situational Awareness for Law Enforcement and Public Safety Agencies Operating in Smart Cities” to appear as a chapter in Springer Nature’s book ,2022 : IoT and WSN based Smart Cities: A Machine Learning Perspective., part of the Series EAI/Springer Innovations in Communication and Computing, ISSN 2522-8595.

Artificial Intelligence

AI Applications to Communications and Information Technologies: The Role of Ultra Deep Neural Networks, (textbook co-authored with Daniel Minoli)

ISBN: 978-1-394-18999-1, November 2023 Wiley-IEEE Press